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TECHNICAL REPORT R10-TP-107
BIBLIOGRAPHY / ALASKA REGION
FOREST HEALTH PROTECTION

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BIBLIOGRAPHY
ALASKA REGION

FOREST HEALTH PROTECTION
1919 - 2001

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ABSTRACT

This bibliography cites 799 published and unpublished references. All abstracted citations are cross-referenced by author and subject. The majority of citations are abstracted. There are a few citations, however, without abstracts as the original documents could not be located. Citations are grouped by year in ascending order.

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Foreword

This bibliography of publications focuses on Alaskan forest health issues. Though many of the citations reference studies devoted to forest insect and disease problems, the content of this bibliography has been expanded to reflect current emphasis on disturbance ecology and allied topics such as forest succession, regeneration, impact, abiotic agents of disturbance and forest management issues. It is complete as of December 2001. All references were found in the Forest Health Protection Offices in Anchorage or Juneau. They are indexed by author and subject and grouped by year. Some National Park Service, USGS, State of Alaska, Bureau of Land Management, and Alaska Native Corporation documents are also included. Copies of most references can be obtained from: Ken Zogas, Forest Health Protection, USDA Forest Service, S&PF, 3301 C St., Suite 522, Anchorage, AK 99503, or by e-mail at: kzogas@fs.fed.us.

BIBLIOGRAPHY / ALASKA REGION

1919

1. Jaenicke, A.J. 1919. Report: The Defoliation of Western Hemlock and Sitka Spruce on the Tongass, N.F. in 1918 and 1919. USDA Forest Service. 2 p.

Abstract: A report by Forest Examiner A.J. Jaenicke of the Bureau of Entomology regarding defoliation of western hemlock and Sitka spruce between Petersburg and Juneau during the summer of 1918. The defoliation was attributed to a sawfly, most likely *Neodiprion tsugae,* the hemlock sawfly, and a small lepidopteran, probably *Acleris gloverana,* the western black-headed budworm.

1922

2. Hopkins, A.D. 1922. Letter: Spruce Beetle; Copper River-Alaska. USDA. Bur. of Entomol., Washington, DC. 1 p.

Abstract: A letter to F.H. Moffit of the U.S. Geological Survey, Alaskan Mineral Resources Branch, acknowledging the receipt of Mr. Moffit's letter regarding his observation of an infestation of spruce beetle in the Copper River Valley, between McCarthy and Chitina in the summer of 1922.

3. Moffit, F.H. 1922. Letter: Spruce Beetle; Copper River-Alaska. USDI/USGS. Washington, DC. 1 p.

Abstract: A letter to Dr. A.D. Hopkins of the USDA Bureau of Entomology reporting his observations of what Hopkins determined to be a spruce beetle infestation in the Chitina River Valley during the summer of 1922.

1927

4. Anon. 1927. Notes on Dying Timber, Dry Pass, Prince of Wales Island (*M. fulvoguttata*). USDA Forest Service, RS, Coop, D-8. 3 p.

Abstract: A report from an anonymous author regarding observations made in the Dry Pass and El Capitan Passage areas of Prince of Wales Island in July, 1927. The observer noted considerable hemlock mortality, inspected several trees, and suggested the damage may be caused by a Buprestid beetle, most likely *Melanophila fulvoguttata,* the hemlock borer.

5. Archbold, C.M. 1927 Letter/Memorandum: Hemlock and Cedar Foliage Discoloration. USDA Forest Service. Alaska Region. 2 p.

Abstract: Field notes from a trip to Thomas Bay on Kupreanof Island to investigate discolored foliage appearing on hemlock and cedar. No insect activity was found and the conclusion was reached that the discoloration was caused by an unknown blight.

6. Boyce, J.S. 1927 Letter/Memorandum: Sitka Spruce Foliage Discoloration. USDA Forest Service. Alaska Region. 1p.

Abstract: Results of an investigation conducted by pathologist J.S. Boyce of samples of discolored Sitka spruce foliage collected by T.T. Munger near Wrangell, Alaska, in July 1927. No insect activity was noted, however, fungal mycelium was found in the dead needles.

7. Munger, T.T. 1927. Letter/Memorandum: Sitka Spruce Foliage Discoloration. USDA Forest Service. Alaska Region. 3 p.

8. **Munger, T.T. 1927** Letter: Hemlock and Cedar Foliage Discoloration. USDA Forest Service. Alaska Region. 1 p.

Abstract: Letter to Mr. Flory, District Forester, regarding pathologist J.S. Boyces' investigation of discolored hemlock and cedar foliage collected from Kupreanof Island. No insect agent, blight, rust or fungi were found.

1929

9. Jaenicke, A.J. 1929. Letter: Comments on the Insect Situation Near Dry Pass and El Capitan, Prince of Wales Island. USDA Forest Service, Juneau, AK. 3 p.

Abstract: Agent of tree-mortality confirmed as the western hemlock borer, *Melanophila fulvoguttata*. Letter goes on to discuss the life history of the borer as well as a description of the damage and recommended control measures.

1932

10. Taylor, R.F. 1932 Report: Insect Infestation: Report for Field Season of 1932. USDA Forest Service, Juneau, AK. 11 p.

Abstract: A report by forest examiner R.F. Taylor to the Regional Forester detailing the results of his 1932 field season. The report includes maps, graphs and trip reports from south central and southeast Alaska.

1933

11. Williams, J.P. 1933. Report of Timber Reconnaissance (Spruce Beetle): Afognak Island, Chugach National Forest; Alaska. USDA Forest Service, Alaska Region Report. 17 p.

Abstract: The first part of this report gives a physical description of the region as well as a discussion of the climate, population, and wildlife. The balance of the report divides the island into units and gives estimates of timber volumes within the unit as well as on the general condition of the resource.

1935

12. Capps, S.R. 1935. The Southern Alaska Range (Spruce Beetle). USDI Geol. Surv. Bull. 862. 101 p.

Abstract: This book is an account of explorations by U.S.G.S. personnel to assess mineral potential in the southern Alaska Range. Brief mention is made of the vegetation in the area and of an outbreak of bark beetles in spruce in the Susitna River valley.

13. Capps, S.R. and R. Tuck. 1935. The Willow Creek-Kashwitna District, Alaska (Spruce Beetle). USDI Geol. Serv. Bull. 864-B. 19 p.

Abstract: This book details mineral explorations in the Susitna River valley by U.S.G.S. personnel and makes brief mention of a bark beetle problem in spruce stands in the lower valley.

1936

14. Forward, C.H. 1936. Letter: Report on Mitchell Bay Infestation (Sawfly). USDA Forest Service, Juneau, Alaska. 2 p.

Abstract: The hemlock sawfly infestation at Mitchell Bay was examined in August 1932. This1936 re-examination of the area found little or no indication of current sawfly activity.

1939

15. Baxter, D.V. and F.H. Wadsworth. 1939. Forest and Fungus Succession in the Lower Yukon Valley. University of Michigan School of Forestry and Conservation. Bulletin No. 9. 52 p.

Abstract: The authors trace the changes that characteristically take place in fungi populations within a stand of timber as it advances in age and those that accompany the transformation of the forest from the pioneer to the climax type. The meander belt of the lower Yukon is particularly well suited for such a study since it provides examples of all stages of forest succession, and since it has been so little disturbed by man.

1942

16. Baxter, D.V. and R.W. Varner. 1942. Importance of Fungi and Defects In Handling Alaskan Airplane Spruce. University of Michigan School of Forestry and Conservation. Circular No. 6. 34 p

Abstract: This circular is published in the hope that it may help in reducing loss due to the fact that wood is subject to certain defects that should be avoided in the selection of material for airplane stock and that unwise handling results in incipient decay which wastes both timber and shipping space. It is based on field observations and laboratory studies.

1946

17. Furniss, R.L. 1946. Memorandum Regarding an Outbreak of *Dendroctonus* on Kosciusko Island. Alaska Forest Research Center No. 453.141. 20 p.

Abstract: Preliminary report of a bark beetle outbreak on Kosciusko Island from R.L. Furniss, Entomologist, to the Regional Forester in Juneau, AK.

18. Furniss, R.L. and I.H. Jones. 1946. A Second Report Concerning the Bark Beetle Outbreak on Kosciusko Island. Alaska Forest Research Center, Juneau, Alaska. 11 p.

Abstract: This report is a detailed supplement to the preliminary report dated August 5, 1946. It concerns the findings of I.H. Jones and C.M. Armstrong of the Forest Service and R.L. Furniss of the Bureau of Entomology and Plant Quarantine, during the period November 9 to 27, 1946 as they pertain to the beetle outbreak on Kosciusko Island.

1947

19. Baxter, D.V. 1947. Occurrence of Fungi in the Major Forest Types of Alaska. Pp. 93-117. In: eds., McCartney, E.S. and Van Der Schalie, H. Papers of the Michigan Academy of Science Arts and Letters. Vol. XXXI, Part I: Botany and Forestry. The University of Michigan Press, Ann Arbor, MI. 117 p.

Abstract: In this study, the role of fungi in plant succession has been carried out largely in Alaska. A series of observations from five different forests of the region are presented. This information was made available to foresters to assist them in anticipating the need for protection and to take measures to prevent pests from developing.

1948

20. Furniss, R.L. 1948. Afognak Island Outbreak: Summary: Letter to Regional Forester, Alaska Region. 1 p.

Abstract: This letter is in regard to a bark beetle infestation at Blue Fox Bay on Afognak Island.

21. Hughes, M.T. 1948. Insect Killed Timber Along the Haines Cut-off Highway. Dom. Entomol. Lab. Victoria, B.C. Letter. 2 p.

Abstract: Letter from Insect Ranger M.T. Hughes to R.F. Taylor, Forester in Charge regarding an outbreak of spruce beetle and spruce budworm in the vicinity of the Alaska-British Columbia border.

22. Jacobsen, E.M. 1948. Report on Afognak Timber Infestation. Alaska Forest Research Center No. 453.41. 1 p.

Abstract: Letter to Regional Forester discussing the declining spruce beetle populations on Afognak Island. The infestation had first been noted in 1936 and at that time, nearly 90% of the trees observed were under attack. At this time, all areas of infestation were in decline, and previously attacked stands were recovering.

1949

23. Chamberlin, J.C. 1949. Insects of Agric. & Household Importance in Alaska. USDA Agric. Res. Admin. Alaska. Exp. Stat. Circ. No. 9. 59 p.

Abstract: This paper discusses a variety of insect pests, mites and slugs that impact agriculture and households in Alaska as well as suggesting control measures. Further, the nature of damage caused by these pests, their parasites and predators, and their life histories are presented.

24. Heintzleman, B.F. 1949. Letter: *Dendroctonus*-Haines Highway. 1 p.

Abstract: Letter from Regional Forester Heintzleman to the Chief of the Forest Service regarding a spruce beetle infestation in the Haines area of southeast Alaska.

25. Taylor, R.F. 1949. First Records of Growth for Southeast Alaska's Young Stands. USDA Forest Service, Alaska Forest Research Center, Juneau, Alaska. Technical Note No. 1. 2p.

Abstract: The growth data obtained from remeasuring 25 sample plots established 20 years ago, confirms the need for cutting the old climax forest which is estimated to average only 4,000 merchantable cubic feet per acre.

The second-growth that would replace it after logging would more than double this volume per acre at 80 to 100 years of age.

1950

26. Baxter, D.V. 1950. Pathology in the Future Forest Practice in Alaska. In Proceedings: Alaskan Science Conference,. November 9-11, 1950. Washington D.C. 9 p.

Abstract: This paper discusses the need for clear direction with regard to forest practices and management in Alaska to provide ample wood for local uses as well as for export on a considerable scale.

27. Furniss, R.L. 1950. Forest Insect Situation in Alaska. Unpublished Report, 8 p.

Abstract: Alaska Forest Insect Conditions Report for 1950. Areas investigated include south-central and interior Alaska along the road system and southeast Alaska.

28. Hughes, M.T. 1950. Memorandum: Insect-Killed Timber Along the Haines Cut-off Highway. 2 p.

Abstract: This letter from M.T. Hughes, Insect Ranger to R.F. Taylor, Forester in Charge, describes a widespread outbreak of *Dendroctonus borealis* in the white spruce stands extending northward from timberline at the northern end of the Chilkat Pass. Hughes also notes a light infestation of spruce budworm occurring on Sitka spruce at the southern end of Chilkat Pass.

29. Richmond, H.A. 1950. Letter: Haines area spruce beetle reply. Canadian Forestry Service. 1 p.

Abstract: Letter from H.A. Richmond, Officer-in-Charge, Division of Entomology, Canadian Dept. Of Agriculture to R.F. Taylor responding to Taylor's report of a bark beetle outbreak near Haines, AK.

1951

30. Lutz, H.J. 1951. Damage to Trees by Black Bears in Alaska. Journal of Forestry **49**(7): 522-523.

Abstract: Author describes damage to white spruce and aspen trees on the Kenai Peninsula that he attributes to black bears. The damage consists of stripping the bark from the basal portion of the trees. The reason for this behavior is presently a matter of conjecture.

1952

31. McCambridge, W.F. 1952. The Black-Headed Budworm Survey on The Tongass National Forest, Alaska. Mimeo. 10 p.

Abstract: The black-headed budworm epidemic on the Tongass National Forest extends over approximately 11,640,000 acres of forest land. It affects primarily western hemlock but also occurs on Sitka spruce and mountain hemlock.

1953

32. Cash, E.K.G. 1953. Plant Disease Reporter Supplement: A Checklist of Alaskan Fungi. 70 p.

Abstract: A supplement published in the Plant Disease Reporter on February 15, 1953. It compiles the available references to the fungi reported from Alaska in a single list and includes records from herbarium specimens.

33. Hutchison, F.T. 1953. An Aerial Appraisal of Black-Headed Budworm Damage on Selected Areas of the Tongass National Forest. Mimeo. 8 p.

Abstract: Results of an aerial survey conducted during August, 1953 to appraise damage caused by an outbreak of the black-headed budworm on Prince of Wales, Revillagigedo, Etolin, and Wrangell Islands and the Cleveland Peninsula.

34. McCambridge, W.F. 1953. The Black-Headed Budworm Survey on the Tongass National Forest, Alaska. Mimeo. 16 p.

Abstract: The black-headed budworm outbreak in southeast Alaska extends over much of the Tongass National Forest - an area of 16,073,000 acres.

35. McCambridge, W.F. 1953. Studies of the Biology, Habits and Control of the Black-Headed Budworm in Alaska. Season of 1953. USDA Forest Service, Alaska Region. 25 p.

Abstract: Reports the results of studies undertaken in 1953 to determine the biology, habits and control of the black-headed budworm in southeastern Alaskan forests.

1954

36. McCambridge, W.F. 1954. Entomological Activities in Alaska. Progress Report R-A1 September-October, 1954. Juneau, AK: USDA Forest Service, Alaska Forest Research Center. 3 p.

Abstract: Reports primarily on the black-headed budworm activity in southeast Alaska and briefly mentions infestations of the Cedar bark beetle and the rusty tussock moth.

37. McCambridge, W.F. 1954. Entomological Activities in Alaska. Progress Report R-A1 July- August. Juneau, AK. USDA Forest Service, Alaska Forest Research Center. 3 p.

Abstract: Reports on black-headed budworm activity in southeast Alaska, spruce beetle on the Kenai Peninsula in south-central Alaska and larch beetle along the Kuskokwim River in interior Alaska during the summer of 1954.

38. McCambridge, W.F. 1954. The Black-Headed Budworm Survey on the Tongass National Forest, Alaska. Season of 1954. RX-AL Insect Survey Program Reports, Black-Headed Budworm. 11 p.

Abstract: 1954 update of the black-headed budworm outbreak on the Tongass National Forest. In 1954, the outbreak covered 6,740,000 acres or about 1/3 of the acres infested in 1953.

39. McCambridge, W.F. 1954. Studies of the Biology and Control of the Black-Headed Budworm in Alaska. Season of 1954. 14 p.

Abstract: Continuation of studies begun in 1953 investigating the biology, habits and control of the black-headed budworm in southeast Alaska.

40. McCambridge, W.F. 1954. A Summary Statement of Forest Insect Conditions in Alaska - Season of 1954. Juneau, AK. USDA Forest Service. Alaska Forest Research Center. 1 p.

Abstract: Brief summary of the major forest insect activity in Alaska during the summer of 1954.

41. Shaw, C.G. II and R. Sprague. 1954. Additions to Alaskan Fungi. Research Studies of the State College of Washington. Vol. XXII, No. 3. Scientific Paper No. 1334. September 1954. p. 170-178.

Abstract: The fungi discussed in this note are either new to Alaska or occur on newly reported hosts, and do not fall into any of the groups handled separately.

1955

42. McCambridge, W.F. 1955. Forest Entomological Activities in Alaska. Progress Report May-June. R10-AK Reports, General. 2 p.

Abstract: Reports on cone collections from Sitka and white spruce from 5 sites around the state. Cones were collected to identify cone moths and seed chalcids. Bark beetle populations were low and hatching of black-headed budworm eggs was retarded by a very cold spring.

43. McCambridge, W.F. 1955. Forest Entomological Activities in Alaska. Progress Report September-October. RX-AL Reports, General. 1 p.

Abstract: Reports that the black-headed budworm outbreak is over. Hemlock sawfly is epidemic in confined areas.

44. McCambridge, W.F. 1955. A Summary Statement of Forest Insect Conditions in Alaska. Season of 1955. Juneau, AK. Alaska Forest Research Center. 14 p.

Abstract: Bark beetle activity has increased while black-headed budworm activity has declined.

45. McCambridge, W.F. 1955. Effects of Black-Headed Budworm Feeding on Second-Growth Western Hemlock and Sitka Spruce. In: Proceedings of the 1955 Society of American Foresters Meeting. USDA Forest Service, Alaska Forest Research Center. 4 p.

Abstract: A single year of heavy black-headed budworm defoliation in second-growth western hemlock caused top kill in the majority of those trees whose crowns were most exposed to sunlight. Top kill occurred in 3/4 of the Sitka spruce but was confined to the current year's growth at the time of defoliation.

46. McCambridge, W.F. 1955. Forest Entomological Activities in Alaska. Progress Report November-December. RX-AL Reports, general. 3 p.

Abstract: A summary of the studies prepared on the biology and control of the black-headed budworm is presented.

47. McCambridge, W.F. 1955. A Summary Statement of Forest Insect Conditions in Alaska. Season of 1955. Alaska Forest Research Center, Juneau, Alaska. 4 p.

Abstract: Forest insect activity in Alaska shows upward trends or more diversity in active epidemic species. The black-headed budworm outbreak in Southeast Alaska continued to diminish. Hemlock sawfly has become epidemic over a wide area. Bark beetle activity in Interior Alaska increased on the Kenai Peninsula. Numerous small pockets of epidemic-level *Ips* activity were noted on the Yukon/Porcupine/Chandalar/Coleen Rivers.

48. McCambridge, W.F. 1955. Studies on the Biology and Control of the Black-Headed Budworm in Alaska During

the 1955 Field Season. 11 p.

Abstract: Details of the third successive year of studies on the black-headed budworm. Identifies several parasites of the budworm. Discusses the influence of weather on budworm development and the effects of growth rate, crown position, species composition and site and exposure on susceptibility of mature hemlock to budworm defoliation.

49. McCambridge, W.F. 1955. Letter/Memorandum: Tree Poisoning Program. USDA Forest Service, Yakutat, Alaska. 3 p.

Abstract: Briefly discusses a tree poisoning program initiated to impact beetle populations in the Yakutat area. However, beetle populations in the area were too low to obtain significant results.

50. Sprague, R. 1955. A Checklist of Fungi of Glacier Bay, Alaska. Research Studies of the State College of Washington. Vol. XXIII, No. 3. Scientific Paper No. 1394. September, 1955. 202-224.

Abstract: At the request of Donald Lawrence, leader of a 1952 study in this area, the author prepared this companion list of fungi known from this region. At this date the list includes information obtained from 542 specimens, of which 533 are known from 1952 collections. The gill fungi, represented by about 160 additional specimens, have not yet been identified.

1956

51. Downing, G.L. 1956. Sitka Spruce Beetle: South Tongass National Forest: Appraisal Survey. USDA Forest Service, Alaska Forest Research Center, Juneau, AK. 1 p.

Abstract: Discusses an outbreak of Sitka spruce beetle at Port Bazan, Dall Island that has been ongoing for probably 10 years. Approximately 1.5 million board feet of timber has been killed.

52. Downing, G.L. 1956. Forest Insect Surveys. Quarter Rep. July – October, 1956. Juneau, AK. USDA Forest Service, Alaska Region. 2 p.

Abstract: Report relates results of aerial surveys conducted during the summer of 1956. Heavy white spruce losses to *Ips interpunctus* near Fort Yukon were observed. *Dendroctonus obesus* remains active in southeast and interior Alaska. Black-headed budworm has returned to endemic levels in all areas. Hemlock sawfly remains active.

53. Downing, G.L. 1956. Forest Insect Aerial Survey Public Domain Lands. Interior Alaska. USDA Forest Service, Alaska Research Center, Juneau, AK. 5 p.

Abstract: Two areas of concern were noted in this aerial survey: 1) a large outbreak of *Ips interpunctus* north of Fort Yukon and 2) a considerable amount of spruce beetle activity along the Gulkana and Matanuska Rivers, between Anchorage and Palmer and on the Kenai Peninsula.

54. Downing, G.L. 1956. Forest Insect Aerial Survey. Southeastern Alaska. USDA Forest Service, Alaska Forest Research Center. Juneau, AK. 6 p.

Abstract: Current forest insect activity was the lowest in several years. No new outbreaks were observed and all active infestation areas of 1955 were at or below their previous activity levels.

55. Downing, G.L. 1956. Sitka Spruce Beetle, South Tongass National Forest. Port Bazan, Dall Island. USDA Forest Service, Alaska Forest Research Center. Forest Insect Survey. Alaska. 2 p.

Abstract: Examination of these areas on the ground indicate that the infestation has been in progress for some time, probably about 10 years. Approximately 200 acres of trees are infested and 300 trees have been killed by the beetle.

56. Downing, G.L. 1956. Forest Insect Conditions in Alaska in 1956. USDA Forest Service, Alaska Forest Research Center, Juneau, Alaska. 3 p.

Abstract: *Ips interpunctus* continues to cause widespread mortality in white spruce near Fort Yukon. Hemlock sawfly populations declined during 1956. The black-headed budworm outbreak has ended and a small population of Sitka spruce beetle continues to be active on Dall Island.

57. Kimmey, J.W. 1956. Cull Factors for Sitka Spruce, Western Hemlock and Western Redcedar in Southeast Alaska. USDA Forest Service, Alaska Forest Research Center Station Paper No. 6. 31 p.

Abstract: This publication presents a tool for estimating defect; cull factors are given here for the three principal tree species as determined by a study made at eight locations.

58. Lutz, H.J. 1956. Damage to Paper Birch by Red Squirrels in Alaska. Journal of Forestry. January 1956: 31-33.

Abstract: Author describes previously unreported injury to young birch trees along Turnagain Arm at the head of Cook Inlet in Alaska. A large portion of the trees in the young stand exhibited horizontal girdles about ¼ inch wide that exposed the xylem and often extended nearly, or completely around the stems. Many of the damaged trees were dead. Available evidence points to the red squirrel as the cause of the injury.

59. Lutz, H.J. 1956. Ecological Effects of Forest Fires in the Interior of Alaska. USDA Forest Service and USDI Bureau of Land Management. Technical Bulletin No. 1133. March 1956. 120 p.

Abstract: This study was undertaken during the summers of 1949 to 1952 to provide a better understanding of the ecological effects of forest fires in the Alaska interior. The information sought related primarily to the effects of forest fires on vegetation, but effects on soils, fur-bearers, big game and hydrology were included. Fieldwork extended from the Kenai Peninsula on the south to the Yukon River Valley on the north.

60. McCambridge, W.F. 1956. U.S. Government Office Memo, Subject: RX-AL, Insect Survey Program-Alaska 1955, Yakutat. 3 p.

Abstract: During May, 1954, all residual hemlock and spruce trees over an area of 490 acres within the Yakutat timber sale area, were poisoned by ammonium sulfamate. During May, 1955, an additional 500 acres of residual trees were poisoned. This was done to study the effects of large scale tree poisoning on insect populations.

61. McCambridge, W.F. 1956. Progress Report: Studies of the Biology and Control of the Black-Headed Budworm in Alaska. 11 p.

Abstract: This study concluded that seasonal weather variations have a decided influence on budworm development and that cumulative average daily temperatures above 42°F appear related to the development of various budworm stages. Recovery of budworm-damaged second-growth Sitka spruce is well in progress two years after defoliation. Most of the budworm damage to mature hemlock stands occurs between elevations of 450 to 900 feet and on the north and east slopes. Budworm controlling parasites are identified.

1957

62. Downing, G.L. 1957. Biological Evaluation of an Alaskan Spruce Beetle Infestation in Spruce Stands on the Kenai Ranger District. USDA Forest Service. Forest Insect Survey Report. No. 4. 6 p.

63. Downing, G.L. 1957. Forest Insect Conditions in Alaska in 1957. USDA Forest Service, Alaska Forest Research Center, Juneau, Alaska. 3p.

Abstract: Forest insect activity in most parts of Alaska was at a low level. Hemlock sawfly activity in southeast Alaska subsided completely and the infestation north and west of Fort Yukon caused by *Ips interpunctus* has declined sharply. Spruce beetle was locally active on the Kenai Peninsula and the Sitka spruce beetle was active in Prince William Sound at scattered points.

64. Downing, G.L. 1957. Western Hemlock Damage Caused by the Black-Headed Budworm: Appraisal Survey. Thayer Lake, Admiralty Island, Alaska. 7 p.

Abstract: The net volume loss of western hemlock attributable to the black-headed budworm outbreak has been given as 7,258 board feet per acre. Tree kills represented 13.1% of the stand and all classes of damage combined was 41.6% of the stand.

65. Downing, G.L. 1957. Surveys and Control of Forest Insect Pests. Conduct and Coordination of Forest Insect Surveys in Alaska. U.S. Department of Agriculture Uniform Project System. Line Project Number: FS-AL. 3 p.

Abstract: This paper is an aerial survey accomplishment report for calendar year 1956. Aerial surveys covered approximately 16 million acres of commercial forestlands. Total flying time was 77.2 hours. Included are brief descriptions of major destructive forest insect activity.

66. Downing, G.L. 1957. The Recent History of Destructive Forest Insect Activity in Alaska**.** Forest Insect Survey Reports of the Alaska Forest Research Center. USDA Forest Service. Number 1. 4 p.

Abstract: This paper was presented at the Alaska Science Conference on September 10-13, 1957. It is a history of destructive forest insect activity from the outbreak of black-headed budworm in southeast Alaska in 1917 to the current outbreak of Sitka spruce beetle on Dall Island, also in southeast Alaska.

67. Downing, G.L. 1957. An *Ips interpunctus* Infestation in White Spruce of Northern Interior Alaska. Forest Insect Survey Reports of the Alaska Forest Research Center. USDA Forest Service. Number 2. 4 p.

Abstract: This infestation covers a gross timbered acreage of 1,152,000 acres or 1,800 square miles. The small number of samples and the limited number of sampling locations were sufficient to indicate a decided downward trend of the infestation. Tree mortality appears to have been greatest two to five or more years ago, with a sharp decrease in losses during 1956 and 1957. It is apparent that this infestation has come to an end.

68. Downing, G.L. 1957. USDA Forest Service, Alaska Forest Research Center. Forest Insect Surveys. Quarterly Progress Report October-December. 2 p.

Abstract: Lists office work accomplished and initiated during the fourth quarter of 1957 including a revision of the Hopkins file, preparation of a pest leaflet on the hemlock sawfly and maintenance of the insect collection.

69. Downing, G.L. 1957. USDA Forest Service, Alaska Forest Research Center. Forest Insect Surveys. Quarterly Progress Report. July-September 1957. 2 p.

Abstract: This reporting period was devoted mainly to the annual aerial survey program and attendant ground reconnaissance. It also describes personnel changes, meetings attended and visitors to the Alaska Forest Research Center in Juneau.

70. Downing, G.L. 1957. USDA Forest Service. Alaska Forest Research Center. Forest Insect Survey. Forest Insect Aerial Survey, Juneau, Alaska. July-September, 1957. 5 p.

Abstract: This survey was confined to southeast, south central, and Prince William Sound. Only one flight, near McGrath was undertaken in interior Alaska due to poor visibility as a result of widespread forest fires. Insect activity was found to be at a generally low level throughout the area surveyed.

71. Downing, G.L. 1957. USDA Forest Service. Alaska Forest Research Center. Forest Insect Surveys. March-June, 1957. 2 p.

Abstract: Details aerial survey flights to areas impacted by black-headed budworm and hemlock sawfly in southeast Alaska and to 1.2 million acres of spruce-type impacted by *Ips interpunctus* near Fort Yukon. Also discusses personnel changes at the Research Center.

72. Downing, G.L. 1957. U.S. Department of Agriculture Uniform Project System. Foliage-Feeding Insects Affecting Trees. Black-headed Budworm in Alaska-Biology and Control. Line Project Number FS-2-14-10-AL. 1 p.

Abstract: This paper is an accomplish report for this project. During 1956, black-headed budworm populations have dropped to a low level and all studies have been suspended. Future work will involve collecting data on damage resulting from the black-headed budworm infestation.

73. Kimmey, J.W. and J.A. Stevenson.1957. A Forest Disease Survey of Alaska. The Plant Disease Reporter. Plant Disease Epidemics and Identification Section. Crops Protection Research Branch. Plant Industry Station, Beltsville, MD. Plant Disease Reporter Supplement 247. September 15, 1957. 86-98.

Abstract: This report is a brief summary of the general disease conditions found and a listing of the fungi collected during the survey. No foreign or introduced diseases were found. No epidemic disease conditions were found, but some native diseases were abundant and widespread.

74. McCambridge, W.F. 1957. A Record of Spruce Cone Insects in Alaska. USDA Forest Service, Alaska Forest Research Center, Juneau, Alaska. Technical Note No. 34. March 1957. 2p.

Abstract: Five hundred cones of each spruce species present were picked at each of six locations during the first few days of May. 250 cones were dissected to determine the frequency of cone moth larvae and 250 cones were held for adult insect emergence. Results of the study are presented in two tables.

75. Taylor, R.F. 1957. Alaska Forest Research. Biennial Report for 1956-1957. USDA Forest Service. Juneau, Alaska. 7 p.

Abstract: Details the decline of bark beetle infestations in southeast and south-central Alaska, decline in southeast and increase in the interior of defoliator activity, determination of hemlock volume loss due to black-headed budworm and hemlock sawfly in southeast Alaska and descriptions of the current insect collecting efforts and insect survey activities throughout Alaska.

76. U.S.D.A. 1957. Summary of Forest Insect Conditions in Alaska. Forest Insect Survey. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska. 2 p.

Abstract: Forest insect activity in most areas of Alaska was at a low level. The hemlock sawfly outbreak has subsided completely and the *Ips interpunctus* infestation near Ft. Yukon has declined sharply. Spruce beetle activity on the Kenai Peninsula and in Prince William Sound is light.

1958

77. Dahms, W.G. 1958. Silvical Characteristics of Mountain Hemlock. USDA Forest Service. Pacific Northwest Forest and Range Experiment Station. Portland, Oregon. Silvical Series No. 11, December 1958. 8p.

Abstract: A brief history of the use of mountain hemlock in Alaska is provided along with the silvical characteristics of this tree species. Life history is discussed along with a discussion of pathogens and insect pests affecting hemlock.

78. Downing, G.L. 1958. Index of Unpublished Forest Insect Reports. Alaska Forest Research Center. Juneau, Alaska. Mimeo. 9 p.

Abstract: Lists 24 unpublished reports on insects and insect activity within Alaska from 1932 to 1957 by entomologists working in Alaska.

79. Downing, G.L. 1958. Summary of Forest Insect Conditions in Alaska--1958. USDA Forest Service, Alaska Region. Juneau, AK 2 p.

Abstract: Forest insect activity increased in 1958. The spear-marked black moth epidemic in interior Alaska is coming to an end. New infestation centers of black-headed budworm and hemlock sawfly were identified for the first time in two years in southeast Alaska. Spruce beetle is nearing epidemic status in a few areas of the Kenai Peninsula. Sitka spruce beetle is endemic throughout its range.

80. Downing, G.L. 1958. Forest Insect Surveys. Quarterly Progress Report. January-March 1958. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska. 2 p

Abstract: Final drafts of pest leaflets on black-headed budworm and the hemlock sawfly are complete. In the process of preparation is a work plan for systematic insect collecting in interior Alaska. Over 1/4 billion board feet of western hemlock were damaged as a result of the 1948-1955 outbreaks of the black-headed budworm and hemlock sawfly in southeast Alaska.

81. Downing, G.L. 1958. Forest Insect Surveys. Quarterly Progress Report. April-June 1958. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska. 2 p.

Abstract: Field work on the spear-marked black moth was begun in May. Field control tests using DDT have been made; results are pending. Mention is made that several different defoliators are at work in birch, aspen and larch stands around Fairbanks. Rearings are in progress. Summer personnel have been brought on board.

82. Downing, G.L. 1958. Forest Insect Surveys. Quarterly Progress Report. July-September 1958. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska. 2 p

Abstract: A general understanding of the life history and habits of the spear-marked black moth was obtained. Two chemical control measures for spear-marked black moth were tested, and excellent results were obtained with both. Spruce beetle activity on the Kenai Peninsula is increasing and following two years of decline, light defoliation caused by both black-headed budworm and hemlock sawfly was again noted in southeast Alaska. A systematic sampling system used along the highways of interior Alaska is discussed.

83. Downing, G.L. 1958. Forest Insect Surveys. Quarterly Progress Report. October-December 1958. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska.1 p.

Abstract: Reports on the move to new office and lab space as well as a discussion on a shift in program emphasis to a system similar to the insect survey program in Canada.

84. Downing, G.L. 1958. Status of a Spear-Marked Black Moth Infestation in Interior Alaska. Forest Insect Survey Reports of the Alaska Forest Research Center. USDA Forest Service. Number 3. Juneau, Alaska. 3 p.

Abstract: By July 1958 it was evident that the spear-marked black moth population had been severely reduced because of disease and parasitism. Spear-marked black moth populations declined by 97% while the larval parasite population increased by 260%.

85. Downing, G.L. 1958. An Outbreak of the Spear-Marked Black Moth (*Eulype hastata* (L.)) in Alaska. In Proceedings: Ninth Alaskan Science Conference. College, AK. September 2-5, 1958. 7 p.

Abstract: This paper discusses the biology and life history of the spear-marked black moth as well as control measures. Aerial surveys during August, 1957 identified 5.8 million acres of birch infested with spear-marked black moth. In August 1958, populations declined by 97%.

86. Lutz, H.J. 1958. Observations on "Diamond Willow" with Particular Reference to its Occurrence in Alaska. The American Midland Naturalist. **60**(1): 176-185.

Abstract: It appears that the diamond-shaped markings are caused by a fungus, or perhaps better, by fungi. *Valsa sordida* Nitschke is held to be responsible for the lesions on feltleaf willow and may also attack other willows. This paper further discusses the historical uses of diamond willow and presents characteristics useful in identifying diamond willow.

1959

87. Anderson, H.E. 1959. Silvical Characteristics of Alaska-Cedar. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska. Station Paper No. 11, October 1959. 10p.

Abstract: In this paper, the silvical characteristics of Alaska-cedar are discussed along with it's life history and a brief discussion of the pathogens and insect pests affecting this tree species.

88. **Cooke, W.B. and D.B. Lawrence. 1959.** Soil Mold Fungi Isolated from Recently Glaciated Soils in Southeastern Alaska. J. Ecol. **47**: 529-549.

Abstract: A soil plate dilution technique was used to isolate soil fungi from two series of soil samples obtained from glacier ice and glaciated surfaces of various ages in southeastern Alaska. The soil mold populations in the two areas studied are fairly homogeneous. No special trend is shown for dominance of a particular horizon by a special fungus. Certain species appeared only in pioneer communities, others in intermediate stages, and still others in mature conifer forests.

89. Downing, G.L. 1959. Forest Insect Surveys. Quarterly Progress Report. July-September, 1959. Juneau, AK. USDA Forest Service. Alaska Region. 3 p.

Abstract: Systematic sampling for black-headed budworm and hemlock sawfly indicate increasing populations. Concern over the use of DDT for insect control near salmon streams is raised. Spruce beetle on the Kenai Peninsula has reached epidemic levels in some areas. Collection of white spruce cones to determine the amount of insect damage by each insect species in the Fairbanks area has begun. Work on an outplanting site has begun.

90. Downing, G.L. 1959. Forest Insect Conditions in Alaska, 1959. USDA Forest Service. Alaska Forest Research Center. Juneau, Alaska. 2 p.

Abstract: Forest insect activity has increased this year. Black-headed budworm and hemlock sawfly numbers in southeast Alaska are up. Spruce beetle on the Kenai Peninsula has reached epidemic levels in some areas. Spear-marked black moth has fallen to endemic levels in the interior. *Ips interpunctus* has killed a large number of white spruce near the Gerstle River in interior Alaska.

91. Downing, G.L. 1959. Forest Insect Surveys. Quarterly Progress Report, April-June 1959. USDA Forest Service. Alaska Forest Research Center. Juneau, Alaska. 2 p.

Abstract: Systematic insect collections along the highway system in interior Alaska have begun. A 10-acre outplanting site in Juneau has been acquired. The spear-marked black moth epidemic has ended in most areas of interior Alaska. Serious damage to decked spruce logs at a mill site near the Gerstle River in interior Alaska has been noted. Unidentified flat- and round-headed borers seem to be responsible. Control measures are discussed. Several thousand white spruce trees in the same area have been killed by *Ips interpunctus* that have built-up in logging slash.

92. Downing, G.L. 1959. Forest Insect Surveys. Quarterly Progress Report, January-March 1959.USDA Forest Service. Alaska Forest Research Center. Juneau, Alaska. 2 p

Abstract: Major activities this quarter were attendance at meetings, rearing insects, analyzing data from last season, writing reports and preparing work plans for the coming season.

93. Downing, G.L. 1959. Biological Evaluation of the Black-Headed Budworm and Hemlock Sawfly in the Hemlock-Spruce Stands of Southeast Alaska-Season of 1959. Forest Insect Survey Reports of the Alaska Forest Research Center. USDA Forest Service. Juneau, Alaska.3 p.

Abstract: This evaluation reports a build-up of black-headed budworm and hemlock sawfly populations in southern southeast Alaska. A brief description of the life cycle of each insect is given.

94. Downing, G.L. 1959. Forest Insect Survey Reports of the Alaska Forest Research Center. September 1959. USDA Forest Service. Juneau, Alaska. 6 p.

Abstract: This catalog of forest insect and disease reports of 1959 includes quarterly progress reports, 1959 forest insect and disease conditions report and a biological evaluation of black-headed budworm and hemlock sawfly activity in southeast Alaska in 1959.

95. Downing, G.L. 1959. Biological Evaluation of an Alaska Spruce Beetle Infestation in Spruce Stands on the Kenai Ranger District. USDA Forest Service. Alaska Forest Research Center. No. 4. September 1959. 5 p.

Abstract: From August 26-31,1959, evaluations of spruce beetle infestations were conducted at Quartz Creek, Granite Creek, Resurrection Creek and Palmer Creek on the Kenai Peninsula, Alaska. Included is a discussion of the biology of the beetle, its hosts and control options. Predictions are made that the beetle population will continue to grow.

96. Lutz, H.J. 1959. Aboriginal Man and White Man as Historical Causes of Fires in the Boreal Forest, with Particular Reference to Alaska. Yale University School of Forestry Bulletin No. 65. p. 35-43.

Abstract: The author chronicles forest fires of known and uncertain origin in Alaska between 1897 and 1915.

97. Sprague, R. and D.B. Lawrence. **1959.** The Fungi on Deglaciated Alaskan Terrain of Known Age--Part I. Research Studies of the State College of Washington. Vol. XXVII, No. 3. Scientific Paper No. 1815. September 1959. 110-128.

Abstract: This paper summarizes the findings of a 1952 expedition to study the development of vegetation and soil in deglaciated terrain in southeastern Alaska. Such a study might eventually have practical results in finding ways to hasten the decay of organic matter. By speeding the release of nutrients from litter and making nitrogen more available, perhaps the climax could be maintained as a spruce or spruce-hemlock forest instead of proceeding to moss-sedge muskeg.

98. Sprague, R. and D.B. Lawrence. 1959. The Fungi on Deglaciated Alaskan Terrain of Known Age--Part II. Research Studies of the State College of Washington. Vol. XXVII, No. 4. December 1959. 214-229.

Abstract: This paper is a continuation of the 1952 studies begun by these authors in Glacier Bay, Alaska. The findings of fungus flora collected in a different area are reported here. This area, Herbert Glacier, was less disturbed by the activities of man and was richer in fungus flora, at least in fleshy forms.

1960

99. Downing, G.L. 1960. Summary of Forest Insect Conditions in Alaska, 1960. USDA Forest Service, Alaska Region. Juneau, AK. 2 p.

Abstract: The forest insect situation in Alaska in 1960 can be summed up as an increase in bark beetle activity and a decrease of defoliator activity.

100. Downing, G.L. 1960. Conditions of Forest Insects in Forest Regions, Alaska. In Forest Insect Conditions in the United States 1960. USDA Forest Service. Alaska Region. Juneau, Alaska. 1 p.

Abstract: The spruce beetle continues to cause epidemic losses in some areas of the Kenai Peninsula. Populations of black-headed budworm and hemlock sawfly declined sharply in southeast Alaska. The cedar bark beetle was responsible for the death of large numbers of Alaska yellow cedar and western red cedar on Kuiu and Kupreanof Islands.

101. Downing, G.L. 1960. Forest Insect Surveys. Quarterly Progress Report, January-March 1960. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska. 2 p.

Abstract: Dissection of 240 white spruce cones collected from Fairbanks in August 1959 found a considerable increase of insect damage over similar collections in 1958.

102. Downing, G.L. 1960. Forest Insect Surveys. Quarterly Progress Report April-June 1960. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska. 3 p.

Abstract: Egg surveys for black-headed budworm and hemlock sawfly were begun. Discussions with the U.S. Fish and Wildlife Service and the Alaska Dept. of Fish and Game took place regarding the potential use of insecticides to control the black-headed budworm.

103. Downing, G.L. 1960. Forest Insect Surveys. Quarterly Progress Report, October-December 1960. USDA Forest Service, Alaska Forest Research Center. Juneau, Alaska. 2 p.

Abstract: Egg sampling for black-headed budworm was completed in October and the results show a population decline of 85-90%. Weather appears to be responsible for the decline.

104. Downing, G.L. 1960. A Cedar Bark Beetle Outbreak: Petersburg Ranger District-North Tongass National Forest. Forest Insect Survey Reports of the Alaska Forest Research Center. USDA Forest Service. Number 6, Juneau, Alaska, October 1960. 2 p.

Abstract: This outbreak covers several thousand acres on the Petersburg Ranger District and there is no indication that the outbreak is dying out. Chemical control in not considered due to the cost of control. The insect responsible for the outbreak is the cedar bark beetle, *Phloeosinus squamosus*.

105. Gregory, R.A. 1960. Cubic-Foot Volume Tables for Paper Birch in Alaska.USDA Forest Service, Alaska Forest Research Center, Juneau, Alaska. Technical Note No. 49. June 1960. 3 p.

Abstract: The four cubic-foot tree volume tables for paper birch in this report are based on 340 tree measurements distributed from the Yukon River south to the Kenai Peninsula, and from the Alaska-Canada border west to McGrath. The volume tables were prepared by the combined variable method.

106. Sprague, R. And D.B. Lawrence. 1960. The Fungi on Deglaciated Alaskan Terrain of Known Age--Part III. Research Studies of the State College of Washington. Vol. XXVIII, No. 1. March 1960. 1-20.

Abstract: This paper is a continuation of studies begun in 1952 and reported in parts 1 and 2 of this paper published in 1959. New sites where collections were made are included in this paper.

107. USDA Forest Service and Alaska Dept. of Fish and Game. 1960. Logging and Fish Habitat. Pamphlet 21 p.

Abstract: This pamphlet, directed mainly to timber sale administrators and loggers, describes some of the major habitat requirements of trout and salmon and lists some basic practices that will help to protect the habitat.

1961

108. Crosby, D. 1961. Conditions of Forest Insects in Forest Regions, Alaska. In Forest Insect Conditions in the United States / 1961. USDA Forest Service, Alaska Region. Juneau, AK 2 p.

Abstract: There were no major outbreaks of forest insects in Alaska in 1961. A needle rust, *Chrysomyxa ledicola*, has been prevalent on spruces throughout much of Alaska during the 1961 season.

109. Downing, G.L. 1961. Biological Evaluation of a Black-Headed Budworm Infestation in Southeast Alaska-Season of 1960. Forest Insect Survey Reports of the Alaska Forest Research Center, USDA Forest Service. Number 7, March 1961. Juneau, Alaska. 24 p.

Abstract: This study concluded that populations of the black-headed budworm and the hemlock sawfly will cause no more than light defoliation in any area of southeast Alaska in 1961.

110. Werner, R.A. 1961. Quarterly Progress Reports. July-September and October-December. USDA Forest Service, Northern Forest Experiment Station. Forest Insect Research Project. 2 p.

Abstract: The white spruce cone collection study to identify seed and cone insects is progressing satisfactorily. A study to evaluate the effects of different aspects and elevations on development of the black-headed budworm was conducted during 1961.

1962

111. Childs, T.W. 1962. Office Report: Diseased Hemlocks at Edna Bay, South Tongass National Forest. 2 p.

Abstract: There are at least two diseases killing hemlocks in this area - *Armillaria mellea* and an unknown twig and stem canker.

112. Crosby, D. 1962. Insect and Disease Conditions in Alaska, 1962. USDA Forest Service, Alaska Region. Juneau, AK. 2 p.

Abstract: There has been a general increase in black-headed budworm populations in the northern portion of southeast Alaska. Bark beetles continue their upward trend on the Kenai Peninsula and in the Copper River Valley. Cedar bark beetle populations remain high on poorer sites in southeast Alaska. Engraver beetles remain endemic throughout interior Alaska.

113. Crosby, D. 1962. Forest Insect Conditions in Alaska in 1962. USDA Forest Service, R-10. Branch of State and Private Forestry. Insect and Disease Control Section. 3 p.

Abstract: There has been a general increase in black-headed budworm populations in the northern portion of southeast Alaska. Bark beetles continue their upward trend on the Kenai Peninsula and in the Copper River Valley. Cedar bark beetle populations remain high on poorer sites in southeast Alaska. Engraver beetles remain endemic throughout interior Alaska.

114. U.S.D.A. Forest Service. 1962. Quarterly Progress Reports. January-March and April-June 1962. USDA Forest Service, Northern Forest Experiment Station. Forest Insect Research Project. 1 p.

Abstract: Field and laboratory work was begun to gather data for a life study of the black-headed budworm. U.S. Fish and Wildlife Service has taken responsibility of determining the effects of insecticides on salmon spawning streams in southeast Alaska.

115. U.S.D.A. Forest Service. 1962. Quarterly Progress Reports. July-September 1962. USDA Forest Service, Northern Forest Experiment Station. Forest Insect Surveys. 2 p.

Abstract: A lab and field study was begun to determine the factors affecting survival of black-headed budworm eggs. A lab study using an undescribed nematode in the genus *Neoaplectana* as a control agent against black-headed budworm is underway. High populations of bark beetles were observed killing white and Sitka spruce on the Kenai Peninsula and in the Copper River Valley.

1963

116. Crosby, D. 1963. Condition of Forest Insects in Alaska, 1963. USDA Forest Service, Alaska Region. Juneau, AK. 3 p.

Abstract: Bark beetles are present only in endemic numbers while black-headed budworm and hemlock sawfly are now becoming critical in southeast Alaska.

117. Embry, R.S. 1963. Estimating How Long Western Hemlock and Western Red Cedar Trees Have Been Dead.

USDA Forest Service, Northern Forest Experiment Station. Research Note NOR-2. 2 p.

Abstract: This report modifies and expands the unpublished report as a guide for estimating how long western hemlock and western red cedar have been dead. Annual observations were made from 1950 to 1958. Needles, branchlets, secondary branches, primary branches, bark and bole were described according to their degree of absence. Disintegration rates did not appear to be influenced by tree diameters.

118. Hopping, G.R. 1963. Two New Species of *Ips* DeGeer (Coleoptera: Scolytidae) from Western Canada and Alaska. Can. Ent. **95**: 213-217.

Abstract: The two species described here, *Ips semirostris* and *Ips amiskwiensis*, were discovered during studies on a revision of the *Ips* of North America.

119. Karr, R.W., Pontious, M., Crosby, D., and B. Roettgering. 1963. Skowl Arm DDT Pilot Project, June 1963. USDA Forest Service. Region 10. 46 p.

Abstract: This report is an evaluation of the operational and biological phases of the Skowl Arm DDT pilot project. The study proved the operational feasibility of spraying the forests of southeast Alaska from a floating base using both the amphibious PBY plane and a helicopter. The spray coverage obtained with the helicopter was superior to that of the PBY.

120. Lutz, H.J. 1963. Early Forest Conditions in the Alaska Interior: A Historical Account with Original Sources. USDA Forest Service. Northern Forest Experiment Station, Juneau, Alaska. June 1963. 74p.

Abstract: This report is based almost wholly upon the journals, records, and publications of early observations of forest conditions in Alaska's interior. It is an attempt to bring together all available information on these early forest conditions. The terminal date generally adopted was 1912, but a few later observations are also included.

121. Lutz, H.J. 1963. Sitka Spruce Planted in 1805 at Unalaska by the Russians. USDA Forest Service. Northern Forest Experiment Station. Juneau, Alaska. May 1963. 25p.

Abstract: Over 150 years ago a number of Sitka spruce trees were planted by the Russians on naturally treeless Unalaska Island. This was perhaps the first attempt at reforestation on the North American continent. This report discusses the results of that planting along with a discussion of the causes of treelessness of the Aleutian Islands.

122. Werner, R.A. 1963. The Collection, Identification, and Preservation of Forest Insect Pests of Alaska and Their Parasites and Predators. Miscellaneous Paper. USDA Forest Service, Northern Forest Experiment Station. Juneau, AK. 15 p.

1964

123. Crosby, D. 1964. Alaska Forest Insect Conditions in 1964. USDA Forest Service, Alaska Region. Juneau, AK. 2 p.

Abstract: Black-headed budworm and hemlock sawfly populations continue to build in southeast Alaska. No important hardwood defoliators were reported in 1964. Bark beetle populations are low.

124. Kimmey, J.W. 1964. Heart Rots of Western Hemlock. USDA Forest Service, Forest Pest Leaflet 90. 7 p.

Abstract: Pest leaflet that describes types of decay, occurrence, location in tree, entry points for fungi, indicators and mitigation.

125. Merriam, H.R. and K.A. Neiland. 1964. Effects of 1/4 Pound DDT per Acre on Bird and Mammal Populations in Southeast Alaska. State of Alaska. Alaska Dept. Of Fish and Game. March 1964. 8 p.

Abstract: In June 1963, the U.S. Forest Service, Region 10, conducted a pilot project to determine the effectiveness of a 1/4-pound DDT per acre spray application for controlling black-headed budworm populations in the Skowl Arm area of southeast Alaska. There were no indications of bird or mammal mortality from the spray. Small mammals were more abundant in the July than in the June collection. Resident birds were at least as abundant 30 days after the spray as before. The investigations to date have shown no measurable effect on bird and mammal populations.

126. Reed, R.J. 1964. Effects of DDT on the Ecology of Salmon Streams in Southeastern Alaska. USDI Fish and Wildlife Service. Manuscript Report MR 63-4. May 1964. 34 p.

Abstract: The most pronounced effect of the DDT spraying in Skowl Arm was the complete eradication of aquatic insects in streams within the treated area. Significant repopulation of aquatic insects in the sprayed watersheds did not occur during the 1963 sampling period. Fish mortality attributable to DDT did not occur during or after the Skowl Arm spray project. The DDT that reached the two treated watersheds was flushed out of the systems within 10 hours after spraying began.

127. Spencer, D.L. and J.B. Hakala. 1964. Moose and Fire on the Kenai. U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife. p.10-33.

Abstract: Although this report is primarily aimed at the effects of wildfire on moose populations, it affords a good discussion of wildfire as a disturbance agent and discusses vegetative succession following a wildfire.

128. Werner, R.A. 1964. White Spruce Seed Loss Caused by Insects in Interior Alaska. Canadian Entomologist **96**:1462-1464.

Abstract: Insects caused serious damage to cones and seeds of white spruce during one of the five years of this study. A new seed and cone insect, *Pegohylemyia* sp. was recorded for the first time from Alaska. This insect destroyed an average of 50% of the seeds per cone.

1965

129. Crosby, D. 1965. Conditions of Forest Insects in Alaska: 1965. USDA Forest Service, Alaska Region. Juneau, AK 2 p.

Abstract: Forest insect conditions are considerably improved over those in 1964. The black-headed budworm outbreak in southeast Alaska has succumbed to natural control factors. Hemlock sawfly is down considerably from last year. No active bark beetle infestations were observed and hardwood defoliators have caused no appreciable defoliation.

130. Harris, A.S. 1965. Subalpine Fir on Harris Ridge near Hollis, Prince of Wales Island, Alaska. Northwest Science **39**:4. 123-128.

Abstract: Robert A. Gregory of the U.S. Forest Service reported a sighting of subalpine fir at timberline near Hollis, Prince of Wales Island, in 1960. This is approximately 80 miles northwest of the nearest previously reported occurrences at Very Inlet and Boca De Quadra and constitutes the only occurrence of this species on any island in southeast Alaska. This report describes the site where this species was found.

131. Schmiege, D.C. 1965. The Fecundity of the Black-headed Budworm *Acleris variana* (Fern.) (Lepidoptera: Tortricidae) in Coastal Alaska. Can. Ent. **97**: 1226-1230.

Abstract: Each female produced from 13 to 179 eggs. Forcing late-instar larvae to feed on old foliage did not reduce fecundity significantly. Individuals with an early seasonal development produced more eggs than those with a late seasonal development. Pupal size provides only a rough estimate of expected fecundity.

1966

132. Crosby, D., and B.H. Baker. 1966. Forest Insect and Disease Conditions in Alaska During 1966. USDA Forest Service, Alaska Region. Juneau, AK. 11 p.

Abstract: No visible defoliation attributed to black-headed budworm was noted this year. A general increase in hemlock sawfly populations is expected this year. Large aspen tortrix is causing defoliation in interior Alaska. A small western hemlock looper outbreak is ongoing near Wrangell. Bark beetles are active in localized areas of the Chugach National Forest and ambrosia beetles are infesting felled spruce in southeast Alaska. Western dwarf mistletoe is active in areas of southeast Alaska.

133. Laurent, T.H. 1966. Dwarf Mistletoe on Sitka Spruce--A New Host Record. Plant Disease Reporter **50**(12): 921.

Abstract: A Sitka spruce infected by dwarf mistletoe (*Arceuthobium campylopodum* f. *tsugensis* (Rosendahl) Gill) was found in July, 1965 on Chichagof Island, Alaska.

134. Schmiege, D.C. 1966. A Note on the Occurrence of the Larch Sawfly in Alaska. Can. Ent. **98**(6): 671-672.

Abstract: Larvae of the larch sawfly, *Pristiphora erichsonii* (Htg.), were collected in Alaska in 1965. This is the first record of this insect in Alaska.

135. Schmiege, D.C. 1966. Mortality of Overwintering Eggs of the Black-headed Budworm and Hemlock Sawfly in Southeast Alaska. Res. Note NOR-15. USDA Forest Service, Northern Forest Experiment Station. Juneau, AK. 4 p.

Abstract: The greatest losses of budworm eggs were recorded after heavy snowfalls when eggs were swept away by sliding clumps of snow and ice. Mortality of sawfly eggs was caused by drying of the egg-bearing needles due to oviposition or other injury.

136. Schmiege, D.C. 1966. The Relation of Weather to Two Population Declines of the Black-headed Budworm, *Acleris variana* (Fernald) (Lepidoptera: Tortricidae), in Coastal Alaska. Can. Ent. **98**: 1045-1050.

Abstract: Hot, dry weather accompanied the decline of black-headed budworm populations in 1955 and 1965. A study of weather records for southeast Alaska for the period 1945 to 1965 shows that the collapse of high populations occurred in years of unusually warm, dry weather during July.

137. Schmiege, D.C. and J.S. Hard. 1966. Oviposition Preference of the Black-headed Budworm and Host Phenology. USDA, Northern Forest Experiment Station. Res. Note NOR-16. Juneau, AK. 5 p.

Abstract: Budworms prefer hemlock foliage for egg laying. During prolonged outbreaks, when hemlock is severely defoliated, budworms may be forced to lay eggs on spruce. It is likely that fewer of these budworm

larvae survive than those on hemlock because rapidly expanding spruce shoots do not provide the shelter found in hemlock buds.

138. Schmiege, D.C. and J.S. Hard. 1966. A Field Test in Southeast Alaska of *Bacillus thuringiensis* Against the Black-headed Budworm, *Acleris variana* (Fern.). USDA Forest Service, Northern Forest Experiment Station. Juneau, AK. Res. Note NOR-17. 4 p.

Abstract: Mortality after 120 hours of exposures to *B.t.* concentrations of 1-20 and 1-100 was 80% and 84% respectively. In all tests, the surviving insects were lethargic and not feeding.

1967

139. Anon. 1967. Evaluation of Hemlock Sawfly: Jamestown Bay-Sitka, Alaska. Mimeo. 5 p.

Abstract: This evaluation concluded that a moderate population of hemlock sawfly will be present in this area in 1968. The authors also predict some occurrence of top kill and scattered tree mortality. The authors recommend chemical control be used to mitigate losses.

140. Crosby, D. 1967. Alaska Forest Insects: Interim Status Report. USDA Forest Service, Alaska Region. Juneau, AK 6 p.

Abstract: Hemlock sawfly populations are relatively high in certain locations on the Tongass National Forest. Black-headed budworm populations remain low for the third season. Large aspen tortrix defoliation is widespread in interior Alaska and defoliation is quite severe in some of those areas. Spruce beetle is quite active on portions of the Chugach National Forest and a trap-tree program to deal with beetles in high-use recreation areas is discussed.

141. Hanks, L.F. and C. Swanson. 1967. Lumber Grade Yields from Paper Birch and Balsam Poplar Logs in the Susitna River Valley, Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Institute of Northern Forestry, Juneau, Alaska. Research Paper PNW-51. 30p.

Abstract: A study was conducted at Wasilla, Alaska, in 1964 to determine the lumber grade recovery from paper birch and balsam poplar logs. Actual recoveries are summarized by scaling diameter for each of the three U.S. Forest Service log grades.

142. Hard, J.S. 1967. Identification of Destructive Alaska Forest Insects. USDA Forest Service, Northern Forest Experiment Station Juneau, AK. 19 p.

Abstract: This guide uses characteristic damage symptoms to host trees to identify the causal insects.

143. Hutchison, O.K. 1968. Alaska's Forest Resource. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Institute of Northern Forestry, Juneau, Alaska. Resource Bulletin PNW 19. 74p.

Abstract: This report presents the results of the first forest inventory of Alaska, made as part of the nationwide Forest Survey authorized by the McSweeney-McNary Act of 1928. Forest inventory work began in Alaska in 1954.

144. Patric, J.H. 1967. Frost Depth in Forest Soils near Juneau, Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Report No. PNW-60. 7p.

Abstract: Frost penetration has not been measured in old-growth western hemlock – Sitka spruce forests, widespread over southeast Alaska. Although limited in scope, the following frost measurements help fill this gap in the forest literature of southeast Alaska and add to the knowledge of water behavior in local forest soils.

145. Siegle, H. 1967. Microbiological and Biochemical Aspects of Heartwood Stain in *Betula papyrifera* Marsh. Canadian Journal of Botany **45**(2): 147-154.

Abstract: This paper discusses the cause of “red heart” stain, a common stain of paper birch in Alaska. Discoloration tests with wood meal and wood extracts showed that red heart of white birch is the result of an enzymatic oxidation.

146. Torgersen, T.R. and B.H. Baker. 1967. The Occurrence of the Hemlock Looper (*Lambdina fiscellaria* [Guenee]) (Lepidoptera: Geometridae) in Southeast Alaska, With Notes on its Biology. Res. Note PNW-61. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. 6 p.

Abstract: This study found Sitka spruce was the preferred host in this infestation. The report also offers notes on the life history of the hemlock looper and discusses natural mortality factors.

1968

147. Beckwith, R.C. 1968. The Large Aspen Tortrix, *Choristoneura conflictana* (Wlkr.), in Interior Alaska. USDA Forest Service, PNW Forest and Range Experiment Station Research Note PNW-81. 10 p.

Abstract: In this paper, the life history of the insect is given and natural mortality is discussed with emphasis on the effect of larval starvation on survival and egg production.

148. Crosby, D. and D.J. Curtis. 1968. Forest Insect and Disease Conditions in Alaska During 1968. USDA Forest Service, Alaska Region. Juneau, AK. 7 p.

Abstract: Spruce beetle remains at epidemic levels in areas of the Kenai Peninsula and areas of activity were noted in the Copper River Valley. Large aspen tortrix was common throughout interior Alaska. Hemlock sawfly declined sharply in southeast Alaska. Black-headed budworm populations remained low for the fourth season in southeast Alaska. The hemlock looper infestation in southeast Alaska has completely subsided. Local infestations of the cedar bark beetle were noted in southeast Alaska. A budminer, *Zeiraphera* sp. is causing heavy localized damage on the Kenai Peninsula.

149. Galea, J. 1968. Completion Report: Kenai Lake Trap Tree Study. USDA Forest Service, Alaska Region. Mimeo. 22 p.

Abstract: This reference is a packet of correspondence between a number of individuals involved in the Kenai Lake Trap Tree Study. Subjects covered in these letters are project work plans, results of the study, discussions of chemical control, project proposals, project costs, accomplishments, and maps.

150. Hard, J.S. and D.C. Schmiege. 1968. The Hemlock Sawfly in Southeast Alaska. Res. Pap. PNW-RP-65. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Portland, OR.11 p.

Abstract: Hemlock sawfly is discussed in terms of its taxonomy, life history, larval sexing, larval feeding, cocoon size relationship to sex, fecundity, distribution and hosts, oviposition habits and egg distribution and natural controls.

151. Miller, O.K. 1968. Interesting Fungi of the St. Elias Mountains, Yukon Territory, and Adjacent Alaska. Mycologia, Vol. LX, No. 6, pp. 1190-1203, Nov.-Dec., 1968.

Abstract: Nine species of agarics and agaric allies are described from the tundra and boreal forests of the Yukon and Alaska. All 9 species are previously unreported from the St. Elias Mountains, and adjacent Alaska.

Descriptions and ecological data are given for all species, accompanied by drawings of the salient morphological features and photographs of 4 species.

152. Smith, M.C. 1968. Red Squirrel Responses to Spruce Cone Failure in Interior Alaska. The Journal of Wildlife Management **32**(2): 305-317.

Abstract: This paper presents some aspects of red squirrel ecology during two consecutive years of cone crop failure in a mature white spruce forest in interior Alaska. The work was part of a study aimed at determining the ecological relationships of red squirrels to the production and supply of white spruce seed in interior Alaska.

153. Torgersen, T.R. 1968. Parasites of the Hemlock Sawfly, *Neodiprion tsugae*, in Coastal Alaska. Ann. Entomol. Soc. Am. **61**: 1155-1158.

Abstract: The primary parasites of the hemlock sawfly in coastal Alaska are Hymenopterous species representing 8 genera. A key to the parasites based on adult characters is included.

154. USDA Forest Service. 1968. Hemlock Sawfly Evaluation, Jamestown Bay Sitka, Alaska. USDA Forest Service. 6 p.

Abstract: New defoliation was discovered 1 mile southeast of Sitka in Fall, 1967. The area was evaluated in order to predict the future course of the infestation. The results of the examination suggested that a moderate population of hemlock sawfly would be present in 1968. The infestation was predicted to increase in size and that there would be some occurrence of top-kill and scattered mortality. Chemical control was recommended.

<u>1969</u>

155. Crosby, D. and D.J. Curtis. 1969. Forest Insect and Disease Conditions in Alaska during 1969. USDA Forest Service, Alaska Region. Juneau, AK.15 p.

Abstract: The spruce beetle remains the most damaging forest insect in Alaska. It is at epidemic proportions on the Kenai Peninsula and is active in the Copper River Valley. Cedar bark beetle remains quite active in localized areas in southeast Alaska. Salvage logging is being used to control a small outbreak of the flatheaded fir borer near Hyder, Alaska. Black-headed budworm activity has increased slightly in southeast Alaska and in Prince William Sound. Three separate infestations totaling 29,000 acres have been detected. There was a sharp increase in hemlock sawfly activity in southeast Alaska. Large aspen tortrix activity has declined in interior Alaska.

156. Curtis, D.J. 1969. Evaluation of Saddleback Looper, *Ectropis crepuscularia*. 5200, Forest Insect and Disease Control. USDA Forest Service, Alaska Region. 4 p.

Abstract: This infestation is located in the Ward Creek Drainage, along the west shore of Connell Lake near Ketchikan. At least 1/4 of the dominant and codominant trees have been defoliated in excess of 90%, and 1/2 of the remaining overstory has been defoliated in excess of 50%. Mortality is estimated to be approximately 15% of the overstory.

157. Harris, A.S. 1969. Alaska-Cedar: A Bibliography with Abstracts. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Institute of Northern Forestry, Juneau, Alaska. Research Paper PNW-73. 47 p.

Abstract: This bibliography contains references to North American and European literature containing information about Alaska-cedar (*Chamaecyparis nootkatensis* (D. Don) Spach). Abstracts are given for many of those references considered more significant, and a subject matter index is included.

158. Harris, A.S. 1969. Ripening and Dispersal of a Bumper Western Hemlock – Sitka Spruce Seed Crop in Southeast

Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Institute of Northern Forestry. Research Note PNW-105. 11p.

Abstract: During a bumper seed year, a mature western hemlock – Sitka spruce stand in southeast Alaska produced 131 pounds of seed per acre, 63% of which was sound. Seed was dispersed over a 1-year period beginning on October 22, with cone scales opening and closing in response to moisture, and seedfall increased by wind. Information on cone condition, seed ripening, and weather conditions associated with seed dispersal is given.

159. Miller, O.K. 1969. Notes on Gastromycetes of the Yukon Territory and Adjacent Alaska. J. Botany **47**: 247-250.

Abstract: *Cyathus* in the Nidulariales and seven species in five genera of Lycoperdales including *Battarrea, Calbovista, Calvatia, Lycoperdon,* and *Tulostoma* are reported from the Yukon Territory and adjacent Alaska. Descriptions and notes of each species are given and accompanied by photomicrographs of the salient microscopic characters. Macrophotographs of four species are included.

160. Noste, N.V. 1969. Analysis and Summary of Forest Fires in Coastal Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Institute of Northern Forestry, Juneau, Alaska. 12p.

Abstract: In this paper, the author has analyzed and summarized information available from fire reports. The objective was to identify factors associated with fire occurrence and acreage burned and to provide a statistical summary. The information is intended to answer questions concerning who, when, where, and magnitude of the fire problem.

161. Torgersen, T.R. 1969. Hymenopterous Parasites of the Hemlock Sawfly, *Neodiprion tsugae* Middleton, in Southeast Alaska, with a Key to Larval Remains. J. Entomol. Soc. Brit. Columbia **66**: 53-62.

Abstract: A key is supplied to identify parasitic Hymenoptera reared from hemlock sawfly cocoons in southeast Alaska. It is based on the size of the exit hole in the host cocoon and characters visible on the final-instar larval skin. Brief biological and descriptive notes are given for each species appearing in the key.

162. Werner, R.A. 1969. The Amount of Foliage Consumed or Destroyed by Laboratory-Reared Larvae of the Black-headed Budworm, *Acleris variana* (Fern.), in Southeast Alaska. Can. Ent. **101**: 286-290.

Abstract: Sitka spruce produces twice as many needles per linear inch of twig as western hemlock. Defoliation by the black-headed budworm is more severe on hemlock than spruce because of differences in the phenological development of the hosts and in the feeding behavior of first- and second-instar larvae on each of the hosts.

163. Werner, R.A. 1969. Development of the Black-headed Budworm, *Acleris variana* (Fern.) (Lepidoptera: Tortricidae), in the Laboratory. J. of Econ. Ent. **62**: 1050-1052.

Abstract: Two successive generations of black-headed budworm were successfully reared in the lab on both Sitka spruce and western hemlock foliage. There was no difference in development time from egg to adult.

164. USDA Forest Service. 1969. Forest Insect Conditions in the United States 1969. USDA Forest Service. P. 5-7.

Abstract: Summary of forest insect conditions in the Alaska Region during 1969.

1970

165. Beckwith, R.C. 1970. Influence of Host on Larval Survival and Adult Fecundity of *Choristoneura conflictana* (Lepidoptera: Tortricidae). Can. Ent. **102**: 1474-1480.

Abstract: Laboratory experiments indicate a diet of quaking aspen is essential to give impetus to a population increase of large aspen tortrix. The effects of starvation and of five different host plants on larval survival, pupal weights, and adult egg potential are reported.

166. Crosby, D. and D.J. Curtis. 1970. Forest Insect Conditions in the United States: 1970. USDA Forest Service. 10 p.

Abstract: Active spruce beetle infestations range over 250,000 acres on the Kenai Peninsula. Hemlock sawfly populations are up in southeast Alaska and black-headed budworm populations are declining in Prince William Sound. Black-headed budworm populations are at endemic levels in southeast Alaska. Cedar bark beetle activity has declined slightly. Hemlock sawfly is active at moderate levels.

167. Crosby, D. and D.J. Curtis. 1970. Forest Insect Conditions in the Various Regions. USDA Forest Serv. Alaska Region. 3 p.

Abstract: Active spruce beetle infestations range over 250,000 acres on the Kenai Peninsula. Hemlock sawfly populations are up in southeast Alaska and black-headed budworm populations are declining in Prince William Sound. Black-headed budworm populations are at endemic levels in southeast Alaska. Cedar bark beetle activity has declined slightly. Hemlock sawfly is active at moderate levels.

168. Curtis, D.J. 1970. Spruce Aphid, *Neomyzaphis abietina,* Sitka Area. Office Report. USDA Forest Service. Alaska Region. 2 p.

Abstract: This report offers observations of a localized outbreak of the spruce aphid in the Jamestown Bay area, Sitka National Monument and on several small islands in Sitka Sound.

169. Curtis, D.J. 1970. Spruce Beetle Detection. USDA Forest Service. Office Report. 5200 Forest Insect and Disease Control. Alaska Region. 4p.

Abstract: This report describes the results of an aerial detection survey flown over portions of the Kenai National Moose Refuge and adjacent State and private lands to monitor a previously reported infestation of spruce beetle that has been active for several years and to obtain an up to date picture of spruce beetle activity on the Refuge and adjacent lands. The report concludes that spruce beetle mortality has significantly increased in the mature and overmature stands of white spruce on the Kenai Peninsula.

170. Howard, H.R. 1970. 5200 Suppression, Saddle-backed Looper 1/12/70. USDA Forest Service, Forest Insect and Disease Control. Alaska Region. 7 p.

Abstract: This report is a cost-benefit evaluation, and local adverse-effects evaluation for a proposed insecticide control project of an infestation of saddle-backed looper near Ketchikan.

171. Schmiege, D.C. and D. Crosby. 1970. Black-Headed Budworm in Western United States. USDA Forest Service Forest Pest Leaflet 45. 4 p.

Abstract: Leaflet describing the life history, range, natural control factors and host information for the black-headed budworm in the Western United States.

172. Shea, K.R. and J.L. Stewart. 1970. Special Report: An Examination of the Dwarf Mistletoe Situation in Western Hemlock Forests of Southeast Alaska. 15 p.

Abstract: This report examines and evaluates the mistletoe problem, helps to develop practical control procedures and recommends studies on mistletoe control needs and practices.

173. Torgersen, T.R. 1970. Parasites of the Black-headed Budworm, *Acleris gloverana* (Lepidoptera: Tortricidae), in Southeast Alaska. Can. Ent. **102**: 1294-1299.

Abstract: The parasites known to attack the black-headed budworm in Alaska and the relative importance of each species are presented. A key for the identification of parasite adults and notes on the bionomics of each species are given.

174. Zasada, J.C. and L.A. Viereck. 1970. White Spruce Cone and Seed Production in Interior Alaska, 1957-68. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Research Note PNW-129. September 1970. 11 p.

Abstract: Estimates of seedfall per acre, seed dispersal over time, cone production by individual trees, number of seeds per cone and per tree, and crop rating are reported from white spruce stands in interior Alaska for the period 1957-68. These observations indicate that very good seed years may be separated by at least 10 to 12 years although, during this interval, individual stands may produce from one to several fair or good cone crops.

1971

175. Crosby, D., Curtis, D.J. and C. Swanson. 1971. Forest Insect and Disease Conditions in the United States, 1971. USDA Forest Service. 6 p.

Abstract: Spruce beetle continues to be active however, mortality produced by this pest has decreased. Hemlock sawfly is still observed at moderate levels in the southern portion of southeast Alaska. Black-headed budworm has virtually disappeared from Prince William Sound and is at low levels throughout southeast Alaska. Dwarf mistletoe continues to be a serious problem in second-growth stands in southeast Alaska.

176. Curtis, D.J. and C.W. Swanson. 1971. Forest Insect and Disease Conditions, Alaska Region-1971. USDA Forest Service, Alaska Region. 18 p.

Abstract: Spruce beetle continues to be active, however, mortality produced by this pest has decreased. Hemlock sawfly is still observed at moderate levels in the southern portion of southeast Alaska. Black-headed budworm has virtually disappeared from Prince William Sound and is at low levels throughout southeast Alaska. Dwarf mistletoe continues to be a serious problem in second-growth stands in southeast Alaska.

177. Farr, W.A. and A.S. Harris. 1971. Partial Cutting of Western Hemlock and Sitka Spruce in Southeast Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Research Paper PNW-124. 10 p.

Abstract: Crop trees left after partial cutting were able to increase or maintain about the same rate of diameter growth as before thinning, but growth in diameter of trees in an unthinned stand followed the normal pattern of decline. Opening the stand stimulated epicormic branching, thus reducing quality of trees in the future. Partially cut plots became well stocked with conifer regeneration, mostly western hemlock.

178. Hard, J.S. 1971. Sequential Sampling of Hemlock Sawfly Eggs in Southeast Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-142. Portland, OR. 9 p.

Abstract: Hemlock sawfly egg population concentrations are classified rapidly through examination of branch samples from the upper crowns of intermediate crown class western hemlock trees selected randomly in sequence. The tree is “infested” if the sample yields one or more eggs and “uninfested” if it yields none.

179. Hard, J.S. 1971. Effects of Semi-starvation During Late Larval Stages on Survival and Fecundity of the Hemlock

Sawfly in the Laboratory. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-157. Portland, OR. 8 p.

Abstract: Laboratory feeding tests indicate that hemlock sawfly populations are partially regulated by food quality. Semi-starvation of late-instar larvae, due to feeding on current year's foliage rather than on a normal diet of previous year's foliage, caused a 65% reduction in survival of females versus 10% in males and a 26% reduction in fecundity of surviving females.

180. Harris, A.S. 1971. Alaska-Cedar. USDA Forest Service. American Woods – FS 224. November 1971.7p.

Abstract: This pamphlet discusses the distribution, description and growth, common names, supply, related commercial species, production, characteristics and properties, and principal uses of Alaska-cedar.

181. Miller, D. 1971. An Extensive Forest Disease Survey of Second-Growth Stands in Southeast Alaska. USDA Forest Service, Alaska Region. 4 p.

Abstract: The young second-growth stands examined in southeast Alaska were generally well stocked and in good health. Dwarf mistletoe is being fairly well controlled in the younger stands through clearcutting.

182. Torgersen, T.R. 1971. Parasites of the Western Hemlock Looper, *Lambdina fiscellaria lugubrosa* (Hulst), in Southeast Alaska. Pan-Pac. Ent. **47**: 215-219.

Abstract: A key was designed to identify the ichneumonid parasite adults obtained from hemlock looper pupae in Alaska. The pupal parasites recorded are probably only a partial list as the records are based on a single season's work.

1972

183. Anon. 1972. Seasonal History of the Sitka Spruce Beetle, *Dendroctonus obesus* Mannerheim, in the Granite Creek Basin, Kenai Peninsula. Written Observation. 1 p.

Abstract: Observations of the seasonal development of the spruce beetle at Granite Creek on the Kenai Peninsula, Alaska. Discussion of predation by woodpeckers, symptoms of infestation, and hibernation is presented.

184. Baker, B.H. and D.J. Curtis. 1972. Forest Insect and Disease Conditions In Alaska, 1972. USDA Forest Service, Alaska Region. Juneau, AK 9 p.

Abstract: The spruce beetle continues to be the most damaging forest insect in Alaska. The Kenai Peninsula outbreak continues to be quite active while the outbreak on the west side of Cook Inlet is causing widespread and extremely heavy mortality. Both hemlock sawfly and black-headed budworm continue to be active at a moderate level in southeast Alaska. The forest disease situation is little changed from 1971. Dwarf mistletoe and hemlock dieback continue to be the most serious disease problems in second-growth stands in southeast Alaska.

185. Baker, B.H. and D.J. Curtis. 1972. Forest Insect and Disease Conditions in the United States, 1972. USDA Forest Service. 4 p.

Abstract: The spruce beetle continues to be the most damaging forest insect in Alaska. The Kenai Peninsula outbreak continues to be quite active while the outbreak on the west side of Cook Inlet is causing widespread

and extremely heavy mortality. Both hemlock sawfly and black-headed budworm continue to be active at a moderate level in southeast Alaska. The forest disease situation is little changed from 1971. Dwarf mistletoe and hemlock dieback continue to be the most serious disease problems in second-growth stands in southeast Alaska.

186. Beckwith, R.C. 1972. Scolytid Flight in White Spruce Stands in Alaska. Can. Ent. **104**: 1977-1983.

Abstract: Within white spruce stands near Fairbanks, Alaska, and on the Kenai Peninsula, *Dendroctonus rufipennis, Ips* spp., and *Trypodendron lineatum* disperse in late May and early June; other scolytids fly during June and July. Flight in interior Alaska precedes by about 2 weeks flight on the Kenai Peninsula.

187. Beckwith, R.C. 1972. Key to Adult Bark Beetles Commonly Associated With White Spruce Stands in Interior Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-189. Portland, OR. 6 p.

Abstract: A dichotomous key enables the determination of adult Scolytidae commonly found in white spruce stands in interior Alaska and the Kenai Peninsula. Schematic drawings are included.

188. Beckwith, R.C. and D.J. Curtis. 1972. The Spruce Beetle, Kenai Peninsula, Alaska, 1971-72. USDA Forest Service. Alaska Region. Office Report. 7 p.

Abstract: This report documents the examination of 20 spruce beetle impact plots established on the Kenai Peninsula in 1971. The general result of the infestation in most areas of the Kenai Peninsula is a reduction in the size of the residual stand. Type conversion has not occurred. The course of this infestation will depend on local weather and the availability of suitable host material.

189. Curtis, D.J. 1972. 5220 Detection, Summary of Detection Surveys on the South Tongass. 9/29/72. USDA Forest Service, Alaska Region. 5 p.

Abstract: The results of the survey indicate that defoliator populations are significantly increasing. New outbreaks of hemlock sawfly cover approximately 14,000 acres.

190. Curtis, D.J. 1972. 5220 Detection, Forest Insect Detection Survey (Aerial Reconnaissance) 9/25/72. USDA Forest Service, Alaska Region. 7 p.

Abstract: A spruce beetle outbreak was noted near Tyonek on Cook Inlet. The spruce beetle populations in the northern Kenai Peninsula are declining. Abiotic defoliation caused by winter drying was observed on approximately 60,000 acres near Yakutat.

191. Curtis, D.J. 1972. 5220 Detection, Summary of Detection Surveys on the North Tongass. 10/2/72. USDA Forest Service, Alaska Region. 5 p.

Abstract: The results of these surveys indicate that insect populations have not significantly increased since 1971. Chronic defoliation caused by the hemlock sawfly continues in several locations. No new defoliator outbreaks were observed. A small outbreak of spruce beetle was noted in the vicinity of Silver Bay.

192. Curtis, D.J. 1972. 5220 Detection, Summary of Detection Surveys on the Chugach N.F., 10/10/72. USDA Forest Service, Alaska Region. 3 p.

Abstract: This report concludes that insect populations on the Chugach National Forest have not significantly increased since 1971. Chronic spruce beetle activity continues in several locations in the Granite Creek-East Fork Drainages. However, no new outbreaks of either defoliators or spruce beetle were observed.

193. Curtis, D.J. 1972. Biological Evaluation-Hemlock Sawfly, South Tongass National Forest. Ketchikan Ranger District, October 1972. USDA Forest Service, Alaska Region. 5 p.

Abstract: The results of this evaluation indicate that considerable damage has resulted from the current sawfly feeding and that high larval populations of both the hemlock sawfly and the black-headed budworm are likely to occur in 1973. Approximately 1/2 of the overstory trees have been defoliated in excess of 50%. Recommendations for control are discussed.

194. Curtis, D.J. 1972. 5230 Evaluation: Evaluation of Saddle-back Looper Feeding at Connell Lake. March 9, 1992. USDA Forest Service, Alaska Region. 8 p.

Abstract: The results of this evaluation indicate that looper feeding resulted in moderate to severe defoliation over the entire area with tree killing and defoliation most evident in the larger dominant and codominate crown classes.

195. Hard, J.S. 1972. Letter: Reply to 5230 Evaluation: Hemlock Sawfly Outbreak at Ward Lake. USDA Forest Service, Forestry Sciences Laboratory, Juneau, AK. 1 p.

Abstract: This letter is a reply to a Russ Lockhart, Timber Management, Region 10, request for clarification of the roles of the various species of insects that have caused defoliation near Ward and Connell Lakes. Discussed are: saddle-backed looper, hemlock sawfly and the black-headed budworm.

196. Peacock, C.R. 1972. Letter: Cook Inlet, Bark Beetle Infestation, 1972. USDA Forest Service. 1 p.

Abstract: Letter from C.R. Peacock, Chief of State and Private Forestry, to the State Forester advising him of the spruce beetle outbreak on the west side of Cook Inlet and on the Kenai Peninsula. Infestations cover 200,000 acres and 60,000 acres respectively.

197. Schmid, J.M. and R.C. Beckwith. 1972. The Spruce Beetle. USDA Forest Service, Forest Pest Leaflet 127. Pacific Northwest Forest and Range Experiment Station. Portland, OR. 7 p.

Abstract: Pest leaflet offers a brief history of spruce beetle activity in Alaska, it's geographical distribution, morphological notes, life history, and natural and silvicultural control strategies.

198. Shea, K.R. and J.L. Stewart. 1972. Hemlock Dwarf Mistletoe. USDA Forest Service Forest Pest Leaflet No. 135. October 1972. 6p.

Abstract: This forest pest leaflet discusses the range, hosts, life cycle, symptoms and signs of infection, spread and intensification, damage and control of hemlock dwarf mistletoe.

199. Yates, C.A. 1972. 5230 Evaluation: Hemlock Sawfly and Black- headed Budworm. USDA Forest Service, Alaska Region. 5 p. December 1972.

Abstract: This evaluation concludes that more hemlock sawfly defoliation can be expected to occur in 1973 in the Ward Lake area. Saddle-backed looper is at endemic levels at Connell Lake. If the summer of 1973 is warmer than normal we can expect both the sawfly and the black-headed budworm to cause more damage than has occurred so far.

200. Zasada, J.C. 1972. Guidelines for Obtaining Natural Regeneration of White Spruce in Alaska. USDA Forest

Service. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. 16 p.

Abstract: Basic requirements for natural regeneration of white spruce are outlined. Methods are recommended for creating conditions that meet these requirements, and survey techniques are summarized for determining adequacy of seedbed preparation and regeneration.

201. Zasada, J.C. and R.A. Gregory. 1972. Paper Birch Seed Production in the Tanana Valley, Alaska. USDA Forest Service. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Research Note PNW-177. 5 p.

Abstract: A study of seedfall was conducted from 1958 to 1963 in four *Betula papyrifera* stands near Fairbanks, Alaska. Total seed crops varied between 542 and 72,805 seeds per square meter; viable seed per square meter varied between 42 and 27,520. Seed crops adequate for natural regeneration of 100-foot-wide clearcuts occur in at least 1 out of 4 years in this portion of the taiga.

1973

202. Baker, B.H. l973. Biological Evaluation of Hemlock Sawfly and Black-headed Budworm in Southeast Alaska During l973. USDA Forest Service, Alaska Region. 10 p.

Abstract: This report summarizes the status of sawfly and budworm populations and discusses briefly some forest management implications. It includes the results of larval sampling, aerial surveys, egg surveys and hemlock mortality plot data.

203. Baker, B.H. and T.H. Laurent. l973. Forest Insect and Disease Conditions by Region, 1973. USDA Forest Service, Division of Timber Management, Alaska Region. 8 p.

Abstract: Spruce beetle continues to be quite active in the Cook Inlet Basin. Hemlock sawfly and black-headed budworm populations were most conspicuous near Ketchikan. Renewed *Ips* beetle activity in white spruce was recorded along the Yukon and Porcupine Rivers. Principal disease activities were suppression and evaluation efforts in dwarf mistletoe infections of western hemlock and cooperative updating of cull factor data in southeast Alaska forests.

204. Barney, R.J. and E.R. Berglund. 1973. Summary of Climatic Data for the Bonanza Creek Experimental Forest, Interior Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Research Note PNW-201. 43p.

Abstract: A summary of climatic data during the 1968-71 growing seasons is presented for subarctic Bonanza Creek Experimental Forest located near Fairbanks, Alaska. Data were obtained from three weather station sites at elevations of 1,650, 1,150, and 550 feet from May until September each year. Data are for relative humidity, rainfall, and maximum, minimum, and mean temperatures.

205. Beckwith, R.C. 1973. The Large Aspen Tortrix. Forest Pest Leaflet 139. USDA Forest Service, Alaska Region. 5 p.

Abstract: Pest leaflet describing the life history of the large aspen tortrix along with a morphological description of the insect, and a discussion of it's hosts and natural control factors.

206. Laurent, T.H. l973. Biological Evaluation of Sulfur Oxide Emissions in the Ward Creek Area, Ketchikan, AK., USDA Forest Service, Division of Timber Management. Alaska Region. 8 p.

Abstract: The results of the analyses showed significantly higher percentages of sulfur in foliage near the mill than were found in background samples. The percentages of sulfur in the background samples were negligible. Higher nitrogen content was found in foliage near the mill, possibly indicating the emission of ammonia and ammonium.

1974

207. Baker, B.H. 1974. Did Beetles Do That? Alaska Magazine. 46-47

Abstract: This magazine article provides an overview of spruce beetle activity in the Cook Inlet region. Written for the general public, it offers a non-technical discussion of spruce beetle population dynamics and management options available to the public. A brief discussion of *Ips* beetle activity in Interior Alaska is also presented.

208. Baker, B.H. and J.A. Kemperman. **1974.** Spruce Beetle Effects on a White Spruce Stand in Alaska. J. of For. **72**(7): July 1974. 3 p.

Abstract: A severe infestation of spruce beetle in a white spruce-paper birch stand caused 64.4% mortality of spruce 5 inches d.b.h. and larger. Survival of spruce was greater in smaller diameters. Birch is the dominant tree species in the residual stand.

209. Baker, B.H. and T.H. Laurent. 1974. Forest Insect and Disease Conditions in Alaska, 1973. USDA Forest Service, Alaska Region. Division of Timber Management. 10 p.

Abstract: The largest insect outbreak of the year was the rapid upsurge of the spear-marked black moth. The infestation covered 1.3 million acres in interior Alaska. Previously high populations of spruce beetle on the Kenai Peninsula have subsided for the most part. Spruce beetle continues to be active on the west side of Cook Inlet. Eastern larch beetle continues to infest larch in the Mt. McKinley area. The infestation covers 129,000 acres. Aphids on birch affected approximately 117,000 acres. Black-headed budworm levels increased at various locations throughout southeast Alaska. Hemlock dwarf mistletoe and decay are common in southeast Alaska old-growth forests.

210. Gressitt, J.L. and C.M. Yoshimoto. 1974. Insect Dispersal Studies in Northern Alaska. Pacific Insects **16**(1): 11-30.

Abstract: Studies of natural dispersal of insects were carried out at Point Barrow and Cape Thompson during the summers of 1966 and 1969. Large nylon nets were arranged to constantly face the wind, and were emptied three times per day. Weather data and activities of free-living insects were correlated with trapping results. At Point Barrow, 2,745 specimens were trapped in 1966 and 7,020 in 1969. At Cape Thompson, 4,465 were trapped in 1966 and 551 in 1969.

211. Hard, J.S. 1974. The Forest Ecosystem of Southeast Alaska-Forest Insects. USDA Forest Service. Pacific Northwest Forest and Range Experiment Station. General Technical Report PNW-13. 32 p.

Abstract: This, the second in a series of publications summarizing knowledge about the forest resources of southeast Alaska, deals with destructive forest insects. The report covers the impact of the major defoliators and bark beetles that affect trees in southeast Alaska. Suggested alternatives for pest management are offered as well as a discussion of future forest research needs.

212. Hard, J.S. 1974. Budworm in Coastal Alaska. Journal of Forestry **72**(1): 26-31.

Abstract: The defoliation trend-ratio of acres defoliated in a given year to acres defoliated the year before-was directly related to regional temperature index. Since old-growth stands have recovered from past outbreaks, widespread defoliation need not be viewed with alarm.

213. Harris, A.S. 1974. Clearcutting, Reforestation and Stand Development on Alaska's Tongass National Forest. Journal of Forestry **72**(6): June 1974.

Abstract: This study concluded that after large-scale clearcutting, natural reforestation has generally been adequate on most upland sites, but some problem situations have been identified. Continued reliance on natural reforestation is anticipated, with increasing use of planting to supplement natural reforestation on difficult sites.

214. Holsten, E.H. and R.I. Gara. 1974. Entomol. Investigations of the Noatak River Valley. Pp. 326-353 in Young, S.B. (ed.): The Environment of the Noatak River Basin, Alaska; Contrib. from the Center for Northern Studies. No. 1. 584 p.

215. Holsten, E.H. and R.I. Gara. 1974. Entomol. Investigations in the Yukon-Charley River Area. Pp. 57-71 in Young, S.B. (ed.), Studies on the Environment of the Yukon-Charley River Area; Final Field Report from the Center for Northern Studies. 101 p.

216. Laurent, T.H. l974. Biological Evaluation of Sulfur Oxide Emissions in the Silver Bay Area, Sitka, Alaska. U.S. Forest Service, Division of Timber Management, Alaska Region. 8 p.

Abstract: The results of the analyses showed significantly higher percentages of sulfur in foliage near the mill than were found in the background samples. The percentages of sulfur in the background samples were negligible.

217. Laurent, T.H. 1974. The Forest Ecosystem of Southeast Alaska: Forest Diseases. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. General Technical Report PNW-23. 30p.

Abstract: Reports on the "state-of-the-art" in respect to forest diseases in southeast Alaska.

218. Price, F.E. 1974. Eastern Larch Beetle: Letter to D. Tindall, BLM. USDA Forest Service, Alaska Region. 2 p.

Abstract: The purpose of this memo is to summarize the findings of an evaluation of dead eastern larch in the McKinley River Drainage in July 1974. The damage agent has been identified as the eastern larch beetle, *Dendroctonus simplex* LeC.

219. Torgersen, T.R. and R.C. Beckwith. 1974. Parasitoids Associated With The Large Aspen Tortrix, *Choristoneura conflictana* (Lepidoptera: Tortricidae), in Interior Alaska. Can. Ent. **106**: 1247-1265.

Abstract: 24 species of parasitoids were found associated with the large aspen tortrix in interior Alaska. Keys are supplied for identifying adults and, in the absence of adults, the parasitoids based on host stage and on late-instar larval remains. Brief biological and descriptive notes are given for each species appearing in the key.

1975

220. Baker, B.H. 1975. Sampling Point Location. USDA Forest Service, Office Report: 5230 Forest Insect and Disease Evaluation. Alaska Region. 29 p.

Abstract: This report consists of two sections, both devoted to providing ideas that will help in referencing field locations adequately and with little waste of time. Part I is titled "Procedures for Field Sample Measurements", and Part II is "Field Procedures for the Cooperative Forest Inventories of Interior Alaska" (Institute of Northern Forestry).

221. Baker, B., Hostetler, B. and T.H. Laurent. 1975. Forest Insect and Disease Conditions in Alaska, 1974. USDA Forest Service, Alaska Region. Juneau, AK. 23 p.

Abstract: Spruce beetle on the west side of Cook Inlet is infesting 167,000 acres. On the Kenai Peninsula, it remains at low levels. Spear-marked black moth is defoliating 2.7 million acres in interior Alaska. Eastern larch beetle is causing scattered mortality over 350,000 acres near Mt. McKinley National Park. Black-headed budworm and hemlock sawfly are at low levels in southeast Alaska. Hemlock dwarf mistletoe, *Sirococcus* shoot blight and western gall rust are the diseases of note in southeast Alaska. Air pollution is damaging trees near the pulp mills at Sitka and Ketchikan.

222. Hard, J.S. and T.R. Torgerson. 1975. Field and Laboratory Techniques for Evaluating Hemlock Sawfly Infestations. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-252. Portland, OR. 23 p.

Abstract: This paper discusses techniques that will permit pest management personnel to determine trends in sawfly populations that could influence resource management decisions. Procedures for sampling and handling all stages of the sawfly and methods for determining population parameters such as larval instar composition, survival, sex ratio, fecundity, and classes of mortality are presented. Figures, descriptions, and a key are given to help the user diagnose and identify specific sources of mortality.

223. Holsten, E.H. and R.I. Gara. 1975. Preliminary Studies on Arctic Bark Beetles (Coleoptera: Scolytidae) of the Noatak River Drainage. Z. ang. Ent. **78**: 248-254.

Abstract: Eight scolytid species were found associated with white spruce and a significant range extension for *Dendroctonus punctatus* was noted. Little overlap between scolytid species attacking the same host was observed. The survival value of the different scolytid behaviors is discussed.

224. Meehan, W.R., Lotspeich, F.B. and E.W. Mueller. 1975. Effects of Forest Fertilization on Two Southeast Alaska Streams. Journal of Environmental Quality **4**(1): 50-55.

Abstract: Four streams in southeast Alaska were studied to determine the effects of forest fertilization with urea on basic productivity and water quality. An initial, short-term increase in ammonia-nitrogen was observed in the treated streams, and nitrate-nitrogen levels increased and remained high compared to control stream levels during the year following treatment. Concentrations did not approach those considered toxic to aquatic life or unsafe for human consumption. Changes in biomass of periphyton and benthic fauna were not detected.

225. Ruth, R.H. and A.S. Harris. 1975. Forest Residues in Hemlock – Spruce Forests of the Pacific Northwest and Alaska—A State-of-Knowledge Review with Recommendations for Residue Management. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. General Technical Report PNW-39. 52 p.

Abstract: The approach of this report is a general look at forest residues as part of the ecosystem, then a closer look at dead and decaying material after logging, considering fire hazard and the silvicultural, physical, chemical, and esthetic effects of this material. Residue treatments are described, evaluated, and recommended. The report is intended to provide an improved scientific framework for management decisions.

226. Schmid, J.M. and R.C. Beckwith. 1975. The Spruce Beetle. USDA Forest Service, Forest Pest Leaflet No. 127. Slightly revised, February 1975. 7 p.

Abstract: This forest pest leaflet describes the spruce beetle, discusses evidence of attack, the life cycle of the beetle, it's range, and natural control. Alternatives for control are presented.

227. Viereck, L.A. 1975. Forest Ecology of the Alaska Taiga. In Proceedings: Circumpolar Conference on Northern Ecology, September 15-18, 1975, Ottawa, Canada. p. I-1 / I-22.

Abstract: The relationship of the Alaska taiga to subdivisions proposed for the boreal forests of Canada and Eurasia is discussed. The main vegetation types are classified and arranged on a temperature-moisture gradient.

1976

228. Alaska Dept. of Natural Resources and USDA Forest Service. 1976. Alaska's Birch. Alaskan Woods Series No. 2. 30 p.

Abstract: This booklet introduces Alaska's birch and discusses it's general habitat conditions, grading and measurement, average properties, basic strength and mechanical properties.

229. Beckwith, R.C. and A.E. Helmers. 1976. A Penetrometer to Quantify Leaf Toughness in Studies of Defoliators. Environmental Entomology. **5**(2): 291-294.

Abstract: An understanding of the physical characteristics of a leaf is necessary in feeding behavior studies of phytophagous insects. A penetrometer based on a strain gauge transducer, miniature lathe, and recorder readout was devised to measure leaf toughness. Details of its construction and use are reported.

230. Farr, W.A., LaBau, V.J. and T.H. Laurent. 1976. Estimation of Decay in Old-growth Western Hemlock and Sitka Spruce in Southeast Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Pap. PNW-RP-204. Portland, OR 24 p.

Abstract: For hemlock, decay was best related to position of external indicators and to geographic location. For spruce, the most useful indicator of decay was the position of external indicators.

231. Furniss, M.M., Baker, B.H. and B.B. Hostetler. 1976. Aggregation of Spruce Beetles (Coleoptera) to Seudenol and Repression of Attractant by Methyl-cyclohexenone in Alaska. Can. Ent. **108**: 1297-1302.

Abstract: Seudenol and alpha-pinene attracted more spruce beetles than did frontalin and alpha-pinene. The addition of MCH reduced the number of spruce beetle caught by 87% and 99% respectively.

232. Hard, J.S. 1976. Natural Control of the Hemlock Sawfly, *Neodiprion tsugae* (Hymenoptera: Diprionidae), Populations in Southeast Alaska. Can. Ent. **108**: 485-498.

Abstract: Biotic factors that limit sawfly populations are a fungus, food quality as affected by host site and defoliation and three ichneumonid parasitoid species. Fecundity was directly related to cumulative heat units during the summer. The apparent widespread collapse of sawfly populations in 1974 was associated with low temperatures.

233. Hard, J.S. 1976. Estimation of Hemlock Sawfly (Hymenoptera: Diprionidae) Fecundity. Can. Ent. **108**: 961-966.

Abstract: Mean fecundity of sawfly females emerging from cocoons collected on heavily defoliated hemlock trees was significantly less than fecundity of females collected from lightly defoliated trees. Fecundity was highly correlated with female cocoon diameter and female forewing length, but was most highly correlated with both variables combined. Timesaving double sampling techniques are discussed for determining mean fecundities of new samples when mean cocoon diameter and forewing length are known.

234. Hard, J.S., Torgersen, T.R. and D.C. Schmiege. 1976. Hemlock Sawfly. USDA Forest Service, Forest Insect and Disease Leaflet 31. 7 p.

Abstract: Pest leaflet describing the geographical distribution, host information, evidence of infestation, life history and habits, morphology and natural control of the hemlock sawfly.

235. Hostetler, B., Rush, P.A. and T. H. Laurent. 1976. Forest Insect and Disease Conditions in Alaska: 1975. USDA Forest Service, Alaska Region. Juneau, AK. 11 p.

Abstract: Spruce beetle remains active on the west side of Cook Inlet, and on the Kenai Peninsula, remain at low levels. 2.7 million acres of birch in the interior were defoliated by the spear-marked black moth. Eastern larch beetle is causing scattered mortality over 350,000 acres in interior Alaska. A significant decrease in black-headed budworm activity was noted in southeast Alaska. Tree diseases of interest in southeast Alaska were hemlock dwarf mistletoe, *Sirococcus* shoot blight, western gall rust and winter drying. Air pollution from the pulp mills at Sitka and Ketchikan damaged nearby conifers.

236. Hutchison, O.K. and D.R. Schumann. 1976. Alaska's Interior Forests: Timber Resources and Utilization. Journal of Forestry **74**(6): 337-341.

Abstract: Of 229 million acres inventoried in interior Alaska, 105.8 million acres are forest land. This report details acreages of potential commercial forest land and discusses past, present and future utilization of this resource.

237. Rush, P.A. 1976. An Evaluation of Spear-Marked Black Moth Infestations in Alaska-1975. USDA Forest Service, Alaska Region, State & Private Forestry. Biological Evaluation R10-76-2. 11 p.

Abstract: Aerial surveys revealed that 2.7 million acres of paper birch had been defoliated by the spear-marked black moth, however pupal surveys showed significant reductions in spear-marked black moth populations. The sudden decline in population levels is due primarily to increased larval parasitization and disease.

238. Rush, P.A. and B.H. Baker. 1976. An Evaluation of Spruce Beetle Infestations in the Cook Inlet Basin-1975. USDA Forest Service, Alaska Region, State & Private Forestry; Mimeo. 4 p.

239. Rush, P.A., Laurent, T.H., Yarger, L. and R. Lawrence. 1976. Forest Insect and Disease Conditions in the United States, 1976. USDA Forest Service, Alaska Region. 4 p.

Abstract: Spruce beetle remains active on the west side of Cook Inlet, and on the Kenai Peninsula, remain at low levels. 2.7 million acres of birch in the interior were defoliated by the spear-marked black moth. Eastern larch beetle is causing scattered mortality over 350,000 acres in interior Alaska. A significant decrease in black-headed budworm activity was noted in southeast Alaska. Tree diseases of interest in southeast Alaska were hemlock dwarf mistletoe, *Sirococcus* shoot blight, western gall rust and winter drying. Air pollution from the pulp mills at Sitka and Ketchikan damaged nearby conifers.

240. Van Cleve, K. and Zasada, J.C. 1976. Response of 70-year-old White Spruce to Thinning and Fertilization in Interior Alaska. Can. J. of For. Res. **6**: 145-152.

Abstract: Applications of 112 kg ha^{-1} N as NH_4NO_3, 56 kg ha^{-1} P as treble superphosphate, and 112 kg ha^{-1} K as KCL in combination with thinning of 61% of initial basal area increased diameter increment 3.6 times over the control within one summer. Fertilizer was applied annually at these rates for 5 years. After 5 years, growth increment continued. For 70-year-old white spruce growing on upland sites, a combination of both thinning and fertilization appears necessary to obtain maximum growth response.

241. Werner, R.A. 1976. Sex Identification of Adults and Pupae of a Birch Defoliator, *Rheumaptera hastata*, in Interior Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-275. Portland, OR. 4 p.

Abstract: A method is described for determining the sex of adults and pupae of *Rheumaptera hastata* (L.) based on external sexual characteristics such as shape of the abdomen and location of genital openings.

242. Werner, R.A. and T. Ward. 1976. Biomass and Density of Arthropods Inhabiting the Black Spruce Ecosystem. In: Proceedings, 27th Alaska Science Conference, Science in Alaska; 1976 August 4-7; Fairbanks: 220. Abstract.

243. Woodfin, R.O. and T.A. Snellgrove. 1976. Western Hemlock in Southeast Alaska—Utilization, Lumber Recovery, and Chip Yield. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Research Paper PNW-208. 33 p.

Abstract: Lumber recovery from western hemlock from southeast Alaska National Forest land is presented with cubic volume yields, cull log lumber recovery, estimates of chippable wood, and logging residue from sample trees.

244. Zasada, J.C. 1976. Ecological and Silvicultural Considerations: Alaska's Interior Forests. J. of For. **74**(6): 333-341.

Abstract: Productivity is adequate for forestry to be considered a legitimate land use. Current research indicates that the stands can be regenerated. Silvicultural practices developed in other northern forests should be evaluated to determine their applicability in the taiga.

1977

245. Beckwith, R.C., Wolff, J.O. and J.C. Zasada. 1977. Bark Beetle Response to Clearcut and Shelterwood Systems in Interior Alaska Following Whole Tree Logging. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Portland, OR. Research Note PNW-287. 7 p.

Abstract: After logging, adult populations declined in clearcuts; adults increased dramatically in the 1st year and declined the 2nd year in shelterwoods. The spruce beetle does not appear to be a major threat after whole tree logging under conditions of the study.

246. Berglund, E.R. and R.J. Barney. 1977. Air Temperature and Wind Profiles in an Alaskan Lowland Black Spruce Stand. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Research Note PNW-305. 12 p.

Abstract: Results of this study indicate wind speeds measured 14.8 feet (4.5 meters) above the canopy are over four times faster than those measured at 1.6 feet (0.5 meters) above ground vegetation. Temperature measurements indicated a persistent positive lapse rate between 11.5 and 14.8 feet (3.5-4.5 m). Inversions were apparently more persistent at 0 to 4.9 feet (0-1.5 m) above ground, regardless of solar energy input.

247. Copes, D.L. and R.C. Beckwith. 1977. Isoenzyme Identification of *Picea glauca*, *P. sitchensis*, and *P. lutzii* Populations. Bot. Gaz. **138**: 512-521.

Abstract: This paper reports a biochemical method for detecting genetic variation in trees. Correct identification of spruce stands in which various levels of introgressive hybridization have occurred between white and Sitka populations can often be done with starch gel electrophoretic techniques. Sufficient enzyme variation existed in three enzymes to detect significant mean distinctiveness differences. These estimates were based on 13 heteromorphic isoenzymes.

248. Farr, W.A., Smith, H.A. and B. Benzian. 1977. Nutrient Concentrations in Naturally Regenerated Seedlings of *Picea sitchensis* in Southeast Alaska. J. of For. **50**(2): 103-112.

Abstract: P, Mg, and Mn concentrations of seedlings from mature soils were larger than in those from youthful soils. Differences in N, K, and Ca concentrations were small. Seedlings on sites with alder tended to have more N, P, and K than on those without.

249. Rush, P.A., Lawrence, R.K., and B.H. Baker. 1977. Preliminary Evaluation of Color Aerial Photography to Assess Beetle-Killed Spruce in Alaska. USDA Forest Service, Alaska Region, Bio. Eval. R10-77-2. 12 p.

Abstract: Small-format 70-mm color positive transparencies at 1:8000 scale appear to contain sufficient detail to estimate numbers of trees. Detail in the photography and consistency of the interpreters show promise for application in spruce mortality surveys.

250. Rush, P.A., Laurent. T.H., Yarger, L. and R. Lawrence. 1977. Forest Insect and Disease Conditions in Alaska: 1976. USDA Forest Service, Alaska Region. Juneau, AK. 7 p.

Abstract: Spruce beetle activity in the Cook Inlet Basin has decreased substantially from that reported in 1975. Eastern larch beetle continues to cause scattered mortality over 350,000 acres in interior Alaska. Spear-marked black moth populations have collapsed in interior Alaska. Cedar bark beetle continues to cause mortality in southeast Alaska. Hemlock sawfly and black-headed budworm populations are at endemic levels in southeast Alaska. Localized flare-ups of birch leaf rollers are causing public concern in south central Alaska. Tree diseases of interest in southeast Alaska included hemlock dwarf mistletoe, *Sirococcus* shoot blight, spruce needle rust and a root disease.

251. U.S.D.A. Forest Service 1977. Draft Addendum: Herbicide Use on National Forests of Alaska, Calendar Year 1977. An Addendum to U.S.D.A. Forest Service Environmental Statement Herbicide Use on National Forests of Alaska Calendar Year 1975. Alaska Region. 59 p.

Abstract: This draft addendum discusses the proposed use of herbicides on National Forests in Alaska during 1977. For each area of proposed herbicide treatment, environmental effects, alternatives to the proposed action, etc. are discussed.

252. U.S.D.A. Forest Service 1977. Forest Insect and Disease Conditions in Alaska, l977. USDA Forest Service, State and Private Forestry, Alaska Region. 11 p.

Abstract: Spruce beetles are active on the Chugach National Forest. Salvage logging continues on the west side of Cook Inlet in areas killed by the spruce beetle. Eastern larch beetle continues to cause scattered mortality in interior Alaska-this year 215,000 acres are impacted. The most widespread defoliation in interior Alaska was caused by leaf rollers, blotch miners, leaf beetles and an unidentified noctuid moth. Black-headed budworm and hemlock sawfly remain at endemic levels in southeast Alaska. Moderate, scattered spruce aphid damage was noted particularly near Sitka. Hemlock dwarf mistletoe, *Sirococcus* shoot blight, and a needle rust of western hemlock continue to be the most damaging tree diseases in southeast Alaska.

253. Werner, R.A. 1977. Behavioral Responses of the Spear-marked Black Moth, *Rheumaptera hastata*, to a Female-Produced Sex Pheromone. Annals of the Ent. Soc. of America **70**(1): 84-86.

Abstract: A sex pheromone was detected by laboratory and field bioassays in “calling” females. Male behavior is described in response to pheromone produced by 2-9-day-old live females and to extracts of female abdominal tips. Males that were 3-10 days old displayed mating behavior, with maximum response recorded from 5-day-old males.

254. Werner, R.A. 1977. Morphology and Histology of the Sex Pheromone Gland of a Geometrid, *Rheumaptera hastata.* Annals of the Ent. Soc. of America. **70**: 264-266.

Abstract: A new type of sex pheromone gland has been found in females of a birch defoliator, *Rheumaptera hastata*. The gland consists of a pair of internal tubular organs composed of glandular epithelial cells. These paired glands are located dorsal to the rectum and oviduct and extend from their common opening in the 9th abdominal segment anteriorly into the 7th abdominal segment. Bioassays with male moths confirmed that the paired glands produce the sex pheromone.

255. Werner, R.A. 1977. Morphology of the Internal Reproductive Organs in Relation to the Sex Pheromone Glands of the Spear-Marked Black Moth. USDA Forest Service, PNW Research Note PNW-294. 6 p.

Abstract: The morphology of the male and female internal reproductive organs of *Rheumaptera hastata* (L.) is described and illustrated. Unlike those of other lepidoptera whose glands are modified intersegmental membranes, the paired glands of this geometrid moth are internal in structure and function.

256. Werner, R.A. 1977. Diapause Termination in Over-wintering Pupae of *Rheumaptera hastata* in Interior Alaska. Canadian Entomologist **109**: 1149-1152.

Abstract: A method was developed to terminate pupal diapause in *Rheumaptera hastata* through experimentation using controlled abiotic factors. Temperature, treatment exposure time and moisture content were all important in terminating diapause. Light periods of short duration had a minimum effect.

257. Werner, R.A. l977. Biology and Behavior of the Spear-Marked Black Moth, *Rheumaptera hastata*, in Interior Alaska. Annals of the Ent. Soc. of America **70**(3): 328-336.

Abstract: This paper discusses the life history, geographical distribution, behavior and natural control organisms of the spear-marked black moth. A brief history of spear-marked black moth activity in Alaska is also offered.

258. Werner, R.A. and B.H. Baker. 1977. Spear-marked Black Moth. USDA Forest Insect and Disease Leaflet 156. 8 p.

Abstract: This forest pest leaflet discusses the life history, geographical distribution, behavior and natural control organisms of the spear-marked black moth. A brief history of spear-marked black moth activity in Alaska is also presented.

259. Werner, R.A., Baker, B.H. and P.A. Rush. 1977. The Spruce Beetle in White Spruce Forests of Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Tech. Pap. PNW-61. Portland, OR. 13 p.

Abstract: This report provides information on the biological relationships between the spruce beetle and white spruce in Alaska.

260. Zasada, J.C., Van Cleve, K., Werner, R.A., McQueen, J.A. and E. Nyland. 1977. Forest Biology and Management in High-Latitude North American Forests. In Proceedings: North American Forest Lands at Latitudes North of 60 Degrees. University of Alaska, Fairbanks, Alaska. p. 137-195.

Abstract: This paper is a fairly exhaustive presentation of current research and management as they pertain to high latitude forests in Canada and Alaska. Future needs are discussed.

261. Ziemer, R.R. and D.N. Swanston. 1977. Root Strength Changes after Logging in Southeast Alaska. USDA Forest

Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Research Note PNW-306. 10 p.

Abstract: Measurements of change in strength of roots remaining in the soil after logging at Staney Creek on Prince of Wales Island, southeast Alaska, indicate that loss of strength in smaller roots occurs rapidly for all species the first two years. Western hemlock roots are more resistant to loss of strength than are Sitka spruce roots. By 10 years, even the largest roots have lost appreciable strength.

1978

262. Averill, R.D. 1978. Spruce Beetle-Summit Lake. Chugach National Forest. Biological Evaluation R10-78-3. USDA Forest Service, Alaska Region. 8 p.

Abstract: This is a biological evaluation of a mature and overcrowded white spruce stand along the Seward Highway in the vicinity of Summit Lake. It is predicted that this stand has the potential for increasing spruce beetle populations. Management implications and control alternatives are also discussed.

263. Densmore, R. and J.C. Zasada. 1978. Rooting Potential of Alaskan Willow Cuttings. Can. J. of For. Res. **8**: 477-479.

Abstract: The riparian species, *Salix alaxensis* and *Salix novae-angliae* rapidly produced roots on all submerged portions of the cuttings. Only a few cuttings of the nonriparian species, *Salix scouleriana* and *Salix glauca,* produced roots, and only at the basal end of the cuttings. *Salix bebbiana* cuttings did not produce roots.

264. Hinds, T.E. and T.H. Laurent. 1978. Common Aspen Diseases Found in Alaska. Plant Disease Reporter. **62**(11): 4 p.

Abstract: Aspen diseases in south-central and interior Alaska were surveyed in 1977. Disease collection data and locations are given.

265. Holsten, E.H. 1978. Birch Leaf Rollers Anchorage Bowl. USDA Forest Service, State and Private Forestry. Biological Evaluation R10-78-1. 10 p.

Abstract: This is a biological evaluation of leaf rollers in the Anchorage area. Leaf roller biology, life stages, life history and control alternatives are discussed.

266. Laurent, T.H. 1978. Kenai Peninsula Campgrounds, Hazard Trees. Chugach National Forest. USDA Forest Service. Biological Evaluation R10-78-2. 8 p.

Abstract: This report gives the results of a hazard survey conducted on all (but one) of the Forest Service campgrounds on the south-central portion of the Chugach National Forest.

267. McBeath, J.H. 1978. Rust Diseases (Uredinales) on White Spruce (*Picea glauca (Moench) Voss)* in Interior Alaska. Cooperative Research Report, November 1, 1978. 42 p.

Abstract: This report presents the current understanding of witchs' broom, bud, cone, Fairbanks and Tyonek needle rust diseases on white spruce and on their alternate host based on field observations, light and electron microscopic studies. Also included is a short description of a recently discovered disease on white spruce causing a type of witches' broom, called "green" witches' broom.

268. Weatherston, J., Grant, C.G., MacDonald, L.M., Frech, D., Werner, R.A, Leznoff, C.C. and T.M. Fyles.

1978. Attraction of Various Tortricine Moths to Blends Containing *cis*-11-tetradecenal. J. Chem. Ecol. **4**: 543-549.

Abstract: The results indicate that *cis*-11-tetradecenal alone is a very potent attractant for male *C. conflictana.*

269. Werner, R.A. 1978. The Spruce Beetle in Alaska Forests [Brochure]. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Portland, OR. 6 p.

Abstract: Pest leaflet giving a brief description of spruce beetle population dynamics, evidence of infestation, life history and guidelines for reducing beetle infestations.

270. Werner, R.A. 1978. Overwinter Survival of the Spear-marked Black Moth, *Rheumaptera hastata* Pupae, in Interior Alaska. Can. Ent. **110**: 877-882.

Abstract: Snow depth is the most important environmental factor in the survival of overwintering *Rheumaptera hastata* (L.) pupae in interior Alaska. Winter survival is also dependent on diapause and the development of cold-hardiness.

271. Wicker, E.F., Laurent, T.H. and S. Israelson. 1978. *Sirococcus* Shoot Blight Damage to Western Hemlock Regeneration at Thomas Bay, Alaska. USDA Forest Service, Intermountain Forest and Range Experiment Station. Research Paper INT-198. 11 p.

Abstract: Clearcut areas regenerated to western hemlock and Sitka spruce in southeast Alaska were surveyed for damage by *Sirococcus* shoot blight. A disease index was calculated for potential crop trees. All western hemlock regeneration was infected.

272. Zasada, J.C., Foote, M.J., Deneke, F.J. and R.H. Parkerson. 1978. Case History of an Excellent White Spruce Cone and Seed Crop in Interior Alaska: Cone and Seed Production, Germination, and Seedling Survival. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. General Technical Report PNW-65. 53 p.

Abstract: The 1970 white spruce cone and seed crop was the best crop produced by this species since 1958 in interior Alaska. Reported in this paper are detailed observations of growth and development of cones and seeds, seed dispersal, seed germination and seedling establishment.

1979

273. Drummond, D.B. and F.G. Hawksworth. 1979. Dwarf Mistletoe in Western Hemlock in Southeastern Alaska. USDA Forest Service, Methods Application Group, Forest Insect and Disease Management. Report No. 79-6. Davis, CA. 14 p.

Abstract: Recent research on hemlock dwarf mistletoe in southeast Alaska suggest that earlier recommendations aimed at minimizing adverse effects of this mistletoe may not be appropriate in Alaska. The parasite seems to be intensifying in young stands at much lower rates in Alaska. Past observations are discussed, and recommendations considering the more recent information are presented.

274. Furniss, M.M., Baker, B.H., Werner, R.A. and L.C. Yarger. 1979. Characteristics of Spruce Beetle (Coleoptera) Infestation in Felled White Spruce in Alaska. Can. Ent. **111**: 1355-1360.

Abstract: The antiaggregation pheromone MCH was ineffective in preventing spruce beetle infestation in felled spruce near Hope, Alaska. The lack of reduction in spruce beetle attacks in treated trees is thought to involve a

lower than desired elution rate of MCH. Cooler temperatures in the study area than those in previous test areas are believed to be responsible for the low elution rate.

275. Holsten, E.H. 1979. Birch Leaf Rollers. USDA Forest Service, Alaska Region Leaflet No. 64. 9 p.

Abstract: In this pest leaflet, a brief history of leaf roller activity in Alaska is offered. The life history and habits of the insect are given as well as guidelines for reducing leaf roller damage.

276. Holsten, E.H. 1979. Supplement: Spruce Beetle Risk Rating System for White Spruce on the Kenai Peninsula. Chugach National Forest. USDA Forest Service, Alaska Region. Technical Report R10-3. 10 p.

Abstract: The principal objective of this paper is to report the results of ground checks and aerial surveys of the medium-high and high-risk white spruce stands for beetle activity and to discuss the operability of the risk rating system. It appears that the risk rating system is valid to a certain degree.

277. Holsten, E.H. 1979. Large Aspen Tortrix. Willow, Alaska. Chugach National Forest. USDA Forest Service. Alaska Region. Biological Evaluation R10-79-3. 9 p.

Abstract: Both parasitism and the effects of starvation will probably reduce tortrix populations in the affected areas next year.

278. Holsten, E.H. and R.L. Wolfe. 1979. Spruce Beetle Risk Rating System for White Spruce on the Kenai Peninsula. Chugach National Forest. USDA Forest Service, Alaska Region.Technical Report R10-1. 21 p.

Abstract: The risk rating system is based on the stand rating system developed for Englemann spruce-subalpine fir stands in the Rocky Mountain Region by Schmid and Frye (1976). This system is based on average diameter, stand age, stand condition and proportion of white spruce in the canopy.

279. Holsten, E.H. and K. Zogas. 1979. Screening of Synthetic Lepidopteran Pheromones; Southcentral Alaska. Technical Report R10-2. Forest Insect and Disease Management. State and Private Forestry, Alaska Region. 11 p.

Abstract: A total of 10 species (8 of which are probably new Alaska records), representing 9 genera and 5 families were trapped. The appendix provided shows the attractive compound(s) for a given species. A brief description of hosts and life histories are given where known.

280. Holsten, E.H. and K. Zogas. l979. Spruce Beetle: Summit Lake, Dry Gulch, Cooper Landing. Chugach National Forest. USDA Forest Service, Alaska Region. Biological Evaluation R10-79-4. 18 p.

Abstract: A biological evaluation was conducted in these areas to determine the spruce beetle population trends. The results of the ground surveys indicated increasing populations in all three areas.

281. Holsten, E.H., Zogas, K., Werner, R.A. and R.L. Wolfe. 1979. Resurrection Creek Spruce Beetle Infestation; A Three-Year Interim Report. USDA Forest Service, Alaska Region, State & Private Forestry. Technical Report R10-1-79. 19 p.

Abstract: The pre-outbreak volume loss of spruce was only 44% of the volume lost during the 1976-1978 period. Total mortality throughout the permanent plots was 163 trees over three years with only 13% due to causes other than spruce beetle. The prediction was made that the spruce beetle population is static to declining.

282. Shaw, C.G. III. 1979. Hemlock Dwarf Mistletoe and Young-growth Management in Southeast Alaska--A Problem or Concern? Proc. 27th Western International Forest Disease Work Conf. p. 21-29.

Abstract: These data suggest that in southeast Alaska young-growth hemlock developing beneath residual trees heavily infected with dwarf mistletoe are currently infected by dwarf mistletoe at a relatively low level.

283. Shaw, C.G. III and E.R. Florance. 1979. Scanning Electron Microscopy Reveals Differences in Surface Morphology Between Basidiospores and Conidia of *Heterobasidion annosum*. Son. aus Eur. Journ. of Forest Pathology, Heft 3-4:249-254.

Abstract: SEM clearly demonstrated that conidia have relatively smooth surfaces whereas basidiospores are consistently ornamented with numerous echinulations. SEM also demonstrated a definite dissimilarity in the shape and location of the apicular structures on basidiospores and conidia.

284. Shaw, C.G. III and R. Molina. 1979. Ectomycorrhizal Inoculation of Containerized Sitka Spruce Seedlings. Proc. 4th North American Conf. on Mycorrhizae, Fort Collins, CO. (abstract).

Abstract: At Corvallis, Oregon, Juneau, Alaska and Petersburg, Alaska, 100%, 100% and 85% of the seedlings respectively, inoculated with *L. laccata*, formed mycorrhizae, while 100%, 98% and 80% respectively of the seedlings inoculated with *C. geophilum* formed mycorrhizae.

285. U.S.D.A. Forest Service. 1979. Forest Insect and Disease Conditions in Alaska in 1978. R10-62. USDA Forest Service, Alaska Region. 17 p.

Abstract: Spruce beetle remains quite active in south-central Alaska including the Chugach National Forest. *Ips* sp. is responsible for scattered mortality in white spruce along the Porcupine River near Fort Yukon in interior Alaska. Eastern larch beetle has decreased dramatically in interior Alaska to only 14,000 acres. Hardwood defoliators have defoliated nearly 220,000 acres throughout south-central and interior Alaska. Spruce budworm is responsible for spruce defoliation around Anchorage, Fairbanks and on the Kenai Peninsula. Black-headed budworm and hemlock sawfly remain at endemic levels in southeast Alaska. Nearly 300,000 acres of spruce were infected with needle rust throughout interior Alaska.

286. Werner, R.A. 1979. Effects of Fire on Arthropod Distribution. In: Viereck, L.A.; Dyrness, C.T., eds. Ecological Effects of the Wickersham Dome Fire Near Fairbanks, Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Gen. Tech. Rep. PNW-90. Portland, OR. 53 p.

287. Werner, R.A. 1979. Influence of Host Foliage on Development, Survival, Fecundity, and Oviposition of the Spear-Marked Black Moth, *Rheumaptera hastata* (Lepidoptera: Geometridae). Can. Ent. **111**: 317-322.

Abstract: Spear-marked black moth females tend to oviposit more readily on paper birch than other deciduous plants indigenous to interior Alaska. Larval feeding intensity was about 40% higher on birch foliage than on other host plants. Food quality of host plants on which females were reared as larvae affected oviposition, fecundity and egg viability. Larval development rate and survival decreased when fed foliage from birch trees that were repeatedly defoliated for 2 and 3 years.

1980

288. Anon. 1980. Proceedings of the First Alaska Integrated Pest Management Conference. Univ. of Alaska, Anchorage, Alaska, Oct. 20-21, 1980, Sponsored by USDA Forest Service and Univ. of Alaska-CES. 92 p.

Abstract: This first IPM conference in Alaska focused on the current state-of-affairs of pest problems in the State and the potential for integrating the IPM concept into management decision making.

289. Eglitis, A.E. 1980. Western Black-Headed Budworm: Heceta Island, Southeast Alaska. Tongass National Forest, February 1980. USDA Forest Service, Alaska Region. Biological Evaluation R10-80-2. 9 p.

Abstract: Since budworm defoliation was not severe on Heceta Island during 1979, and the localized infestation is recent, little or no mortality and/or top-kill of western hemlock will result in 1980.

290. Fox, J. 1980. Forest Regeneration of Upland Areas Following Logging in Interior Alaska. Agroborealis, January 1980. p. 31-34, 63.

Abstract: The results of this study, undertaken to determine the stocking levels of commercially desirable tree species, are reported here. This was a reconnaissance study of post-harvest revegetation on selected upland areas between Fairbanks and Nenana on the Parks Highway.

291. Hennon, P.E. and C.G. Shaw III. 1980. Dwarf Mistletoe Demonstration Area. Thorne Bay, Prince of Wales Island, Alaska. USDA Forest Service, Forest Pest Management, Region 10, Juneau, Alaska. 9 p.

Abstract: This publication is a guidebook for a stop-by-stop walking tour of the Thorne Bay Dwarf Mistletoe Demonstration Area.

292. Holsten, E.H. 1980. The Large Aspen Tortrix: An Insect Pest of Quaking Aspen. USDA Forest Service, Alaska Region Leaflet No. 91. 8 p.

Abstract: This pest leaflet offers a brief history of large aspen tortrix activity in Alaska as well as its current status. The life history of the insect is given and guidelines for reducing tortrix damage are presented. A short discussion of chemical treatment alternatives is given.

293. Holsten, E.H. 1980. The Spruce Budworm: A Pest of Alaska White Spruce. USDA Forest Service, Alaska Region Leaflet No. 99. 8 p.

Abstract: This pest leaflet gives an overview of tree damage caused by the spruce budworm as well as a discussion of the life history of the insect and guidelines for reducing budworm damage.

294. Holsten, E.H. 1980. The Status of Spruce Budworms in South-Central Alaska. Chugach National Forest and Adjacent Lands. USDA Forest Service, Alaska Region. Biological Evaluation R10-80-1. 14 p.

Abstract: This biological evaluation identifies and delineates the life cycles of the spruce budworm, determines the parasite-predator complex associated with the spruce budworm, gives the distribution in Alaska of the insect, and discusses screening of synthetic spruce budworm pheromones for possible deployment in detection measures. Control alternatives are discussed.

295. Holsten, E.H. 1980. Spruce Beetle: Copper Valley Electric. USDA Forest Service, Alaska Region. Biological Evaluation R10-80-4. 14 p.

Abstract: The majority of the downed material along the powerline is at low risk for potential spruce beetle build-up with the exception of the Tiekel-Tsina area. Spruce beetles have been and are active in this area. It is not known whether activity in these beetle spots will increase or subside.

296. Holsten, E.H., Ward, T. and K.P. Zogas. 1980. Large Aspen Tortrix: Pt. McKenzie-Alaska and Laboratory Evaluation of *Bacillus thuringiensis*. USDA Forest Service, State and Private Forestry, Alaska Region Biological Evaluation R10-80-15. 14 p.

Abstract: Early and late season variable plots were examined to determine tortrix impact on refoliation. 86% of the aspen examined had refoliated. The results of the lab study to determine effects of treatment with *B. thuringiensis* showed a significant increase of cumulative mortality of large aspen tortrix larvae compared to

cumulative mortality of the controls. Large aspen tortrix larvae stopped feeding approximately one day after exposure to the treated foliage.

297. Holsten, E.H., Werner, R.A. and T.H. Laurent. 1980. Insects and Diseases of Alaskan Forests. Alaska Region Rep. No. 75. Washington, DC. USDA Forest Service. 187 p.

Abstract: This handbook is divided into insect and disease sections; each with it's own keys, illustrations, and host index. Literature cited, glossary, and general index follow at the end of the book**.**

298. Laurent, T.H. 1980. Dwarf Mistletoe on Prince of Wales Island, Ketchikan Area, Tongass National Forest. USDA Forest Service, Alaska Region Biological Evaluation R10-80-3. 6 p.

Abstract: Dwarf mistletoe infected residuals on the Beach Road, Lake Ellen Road and North Thorne Road cutting areas will serve as a source of inoculum for the regeneration if not removed. Control is recommended.

299. Miller, K. and R.A. Werner. 1980. Supercooling to -60^{o}C: An Extreme Example of Freezing Avoidance in Northern Willow Gall Insects. Cryobiology. **17**: 621-622.

Abstract: The extreme winter supercooling capability in all cases was associated with the seasonal buildup of very high levels of glycerol. All larvae were remarkably free of ice-nucleating substances at all seasons.

300. Shaw, C.G. III and R. Molina. 1980. Formation of Ectomycorrhizae Following Inoculation of Containerized Sitka Spruce Seedlings. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-351. Portland, OR. 8 p.

Abstract: Percentage of short roots on colonized seedlings that were mycorrhizal at Corvallis, Juneau, and Petersburg, respectively, were 92, 38, and 77 for *L. laccata*, and 91, 7, and 12 for *C. geophilum*.

301. U.S.D.A. Forest Service. 1980. Forest Insect and Disease Conditions in Alaska in 1979. R10-115. USDA Forest Service, Alaska Region. 17 p

Abstract: Spruce beetle infestations increased by 100,000 hectares over 1978 levels. *Ips* sp. has infested 8,700 acres in interior Alaska. Eastern larch beetle infestations decreased for the third consecutive year. Large aspen tortrix populations remain high in south-central Alaska. Spruce budworm remains quite active in the Anchorage area. Black-headed budworm and hemlock sawfly remain at endemic levels while populations of the saddle-backed looper remain high in southeast Alaska. Hemlock dwarf mistletoe, *Sirococcus* shoot blight and needle rust continue to be the most damaging tree diseases in Alaska.

302. Werner, R.A. 1980. Biology and Behavior of Larch Bud Moth, *Zeiraphera* sp., in Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-356. Portland, OR. 8 p.

Abstract: A possibly new species or subspecies of larch bud moth of the genus *Zeiraphera*, closely related to *Z. improbana* (Walker), was found associated with tamarack stands in interior Alaska. Parasites and disease killed 99.6% of the pupal stage in 1976.

303. Werner, R.A. and J. Weatherston. 1980. A Synthetic Sex Pheromone for the Large Aspen Tortrix in Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-354. Portland, OR. 4 p.

Abstract: Cis-11-tetradecenal was found to be the specific attractant for adult male large aspen tortrix populations in aspen forests of interior Alaska.

1981

304. Eglitis, A.E. l981. Spruce Beetle: Taku River Tongass National Forest. USDA Forest Service, Alaska Region. Biological Evaluation R10-81-2. 17 p.

Abstract: Within the infested patches totaling 1,200+ acres along the Taku River, about 1/2 of the spruce has been killed by spruce beetle. Additional mortality is likely to occur within these patches. Suppression alternatives are discussed. However, this report recommends no control measures be employed at this time since the area is designated as roadless/wilderness.

305. Eglitis, A.E. 1981. Yakutat Windthrow Salvage, Specialist Report to Interdisciplinary Team. Entomology/Pathology. USDA Forest Service, Alaska Region. 7 p.

Abstract: In the Yakutat blowdown, most of the windthrow has occurred in mature sawtimber. Many of the trees blown over are of medium-range diameters-those in which decay proceeds rapidly. If salvage logging is to be spread over many years, significant loss in merchantable volume during that time should be anticipated.

306. Eglitis, A.E. l981. Trip Report, Alaska Lumber & Pulp Co., Wrangell. USDA Forest Service, Alaska Region. 5 p.

Abstract: The recommendation given to mill personnel was to prevent attacks by the ambrosia beetle on newly cut cants by applying water to the decked material.

307. Eglitis, A.E. 1981. Spruce Needle Aphid. USDA Forest Service, Alaska Region. Forest Pest Management Leaflet R10-TP-3. 1 p.

Abstract: The life history and a description of the damage done by the spruce needle aphid is presented. Guidelines for reducing damage are discussed.

308. Holsten, E.H. 1981. Spruce Beetle: Chugach National Forest and Adjacent Lands. USDA Forest Service, Alaska Region Biological Evaluation R10-81-1.18 p.

Abstract: This report is a biological evaluation of 6 individual areas on and around the Chugach National Forest assessing current spruce beetle activity and offering predictions about the future trends of spruce beetle activity. A discussion of management alternatives follows.

309. Holsten, E.H. l981. Spruce Beetle: Copper Valley Electric Association. USDA Forest Service, Alaska Region Biological Evaluation R10-81-3. 11 p.

Abstract: This evaluation stems from an initial evaluation made at the request of the Copper Valley Electric Association to evaluate potential spruce beetle problems associated with right-of-way construction. One recommendation was to make regular, periodic surveys of the line. The results indicate that spruce beetle impact thus far has been minimal.

310. Holsten, E.H. 1981. Spruce Beetle: Chugach National Forest, Anchorage Ranger District. USDA Forest Service, Alaska Region Biological Evaluation R10-81-4. 20 p.

Abstract: This evaluation looks at stands in the Granite Creek area, within the Anchorage Ranger District, with an eye to assessing them for current and potential spruce beetle impacts. Management alternatives are offered.

311. Holsten, E.H. and J.S. Hard. 1981. An Evaluation of *Bacillus thuringiensis* Berl. for Suppressing Large Aspen Tortrix Populations in Alaska. Anchorage, AK: USDA Forest Service, State and Private Forestry. Tech. Rep. R10-4. 18 p.

Abstract: Analysis of post-spray larval numbers at 2 and 4 weeks and larval mortality at 4 weeks showed statistically significant differences between spray and check treatments. It appears that the Dipel 2X and Thuricide 2X treatments provided the best suppression in terms of reduction in larval numbers.

312. Holsten, E.H. and R.L. Wolfe. 1981. Collecting Ambrosia Beetles (Coleoptera: Scolytidae) with an Increment Borer. Can. Ent.: 79-80.

Abstract: An increment borer was adapted for collecting recently attacking ambrosia beetles. The best time for collecting ambrosia beetles with the borer is immediately after spring flight begins and before the entrance gallery forks.

313. Shaw, C.G. III. 1981. Infection of Western Hemlock and Sitka Spruce Thinning Stumps by *Fomes annosus* and *Armillaria mellea* in Southeast Alaska. Plant Disease **65**: 967-971.

Abstract: 182 western hemlock and 182 Sitka spruce were cut and 1/2 of the stumps inoculated with *F. annosus.* 6-15 months later, 12% of the western hemlock and 16% of the Sitka spruce were infected with *A. mellea*. Of those inoculated with *F. annosus,* 11% of the western hemlock and 15% of the Sitka spruce were infected. Of the uninoculated stumps, 3 and 12%, respectively, were infected.

314. Shaw, C.G. III. 1981. Basidiospores of *Armillaria mellea* Survive an Alaskan Winter on Tree Bark. Plant Disease **65**: 972-974.

Abstract: Sterile water was applied to the outer bark of 28 western hemlock and 26 Sitka spruce growing at different locations in southeast Alaska. The runoff was incubated. Colonies of *F. annosus* developed from runoff of 2 hemlock and 1 spruce and colonies of *A. mellea* from 12 hemlock and 8 spruce.

315. Shaw, C.G. III, Laurent, T.H. and S. Israelson. 1981. Development of *Sirococcus* Shoot Blight Following Thinning in Western Hemlock Regeneration at Thomas Bay, Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note. PNW-RN-387. Portland, OR. 6 p.

Abstract: The disease was observed on nearly all hemlock crop trees remaining in thinned stands. It appears however, to be causing little damage after thinning. This conclusion substantiates the earlier suggestion that potential crop trees are in little danger from the disease.

316. Stednick, J.D. 1981. Precipitation and Streamwater Chemistry in an Undisturbed Watershed in Southeast Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Research Paper PNW-291. 8 p.

Abstract: Total nitrogen accumulated at 1.0 kg/ha per year and ammonium-nitrogen at 3.3 kg/ha per year; other monitored elements showed a net loss or export from 0.1 kg/ha per year of total phosphorus to 256 kg/ha per year of calcium. Precipitation and weathering of soil and bedrock material account for these elemental losses in streamflow.

317. U.S.D.A. Forest Service. 1981. Forest Insect and Disease Conditions in Alaska-1980. Anchorage, AK. USDA Forest Service, Alaska Region. R10-146. 17 p.

Abstract: Bark beetles are infesting white spruce at approximately the same level as in 1979. Engraver beetle activity has decreased in interior Alaska and eastern larch beetle has increased slightly. Large aspen tortrix infestations have decreased. Spruce budworm populations have declined in the Anchorage area. Birch leaf roller populations increased dramatically near Dillingham. In southeast Alaska, black-headed budworm and hemlock sawfly populations remain at endemic levels. Cedar dieback, hemlock dwarf mistletoe and *Sirococcus* shoot blight continue to be the major tree diseases in southeast Alaska.

318. Werner, R.A. 1981. Advantages and Disadvantages of Insect Defoliation in the Taiga Ecosystem. In: Proceedings, 32nd Alaska Science Conference, Fairbanks, Alaska: 148. Abstract.

Abstract: Three consecutive years of 50% defoliation appeared to stimulate terminal growth and leaf biomass production in both aspen and birch trees one year after the 3rd defoliation. Other examples of defoliation-induced changes to trees and to the insects involved are discussed.

319. Werner, R.A., Furniss, M.M., Yarger, L.C. and T. Ward. 1981. Effects on Eastern Larch Beetle, *Dendroctonus simplex*, of its Natural Attractant and Synthetic Pheromones in Alaska.. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note PNW-371. Portland, OR. 6 p.

Abstract: Traps baited with Seudenol + alpha-pinene caught 87% more eastern larch beetles than did tamarack logs infested with females. Males responded to the synthetic attractant in greater numbers than females. Attraction was reduced by 92 and 86% by addition of MCH and frontalin but by only 36% when trans-verbenol was added.

1982

320. Alaback, P.B. 1982. Dynamics of Understory Biomass in Sitka Spruce – Western Hemlock Forests of Southeast Alaska. Ecology **63**(6): 1932-1948.

Abstract: Understory vegetation undergoes successional stages during the first 300 years after logging or fire disturbance in the coastal *Picea-Tsuga* forests of southeast Alaska. The development and duration of depauperate understory that succeeds canopy closure in southeast Alaska is closely related to the canopy structure of shade-tolerant *Tsuga* forests with their high foliar biomass.

321. Anon. 1982. Proceedings of the Second Alaska Integrated Pest Management Conference. Matanuska-Susitna Community College, Jan. 21-22, 1982, Sponsored by the Univ. of Alaska-CES and USDA Forest Service. 112 p.

Abstract: These proceedings cover a wide range of issues germane to Alaska. An integrated pest management approach to solving these problems is emphasized.

322. Eglitis, A.E. and T.H. Laurent. 1982. Land Management Plan for Hoonah-Totem Corporation, Hoonah, Alaska: Insect, Disease and Vegetation Pest Considerations. USDA Forest Service, Alaska Region. Technical Report R10-5. 10 p.

Abstract: This report gives general considerations about each group of forest pests, follows with a description of the most important agents, and discusses how these pests may specifically affect Huna-Totem lands. Several recommendations are given in the summary to help minimize pest damage to harvested products and to the regenerated forest.

323. Eglitis, A.E. 1982. Incidence of Bark and Ambrosia Beetles in Blowdown. Yakutat, Alaska. USDA Forest Service, Alaska Region Biological Evaluation R-10-81-5. 14 p.

Abstract: A severe windstorm in January of 1981 caused extensive damage to timber stands near Yakutat. About 100 MMBF of Sitka spruce and western hemlock were blown down. Given the low insect populations associated with the Yakutat blowdown, no threat of an outbreak is foreseen. It is recommended that harvesting be aimed at minimizing deterioration of the windthrown material.

324. Eglitis, A.E. 1982. Spruce Beetle Glacier Bay National Park. USDA Forest Service, Alaska Region Biological

Evaluation R-10-82-1. 22 p.

Abstract: The results of this evaluation indicate that stand conditions and resident beetle populations are such that additional tree mortality is expected to occur in the Glacier Bay area during 1982. Recommendations for suppression activities and silvicultural manipulations are given.

325. Farr, W.A. and C.G. Shaw, III. 1982. Initial Testing of the Shigometer in Healthy Even Aged Stands of Western Hemlock and Sitka Spruce in Southeast Alaska. Proc. 30th West. Int. For. Dis. Work Conf.:15-22.

326. Holsten, E.H. 1982. Carpenter Ants: Insect Pests of Wood Products. USDA Forest Service, Alaska Region Leaflet P-061. 8 p.

Abstract: This forest pest leaflet gives a morphological description of carpenter ants and their life history. The publication discusses signs of infestation, the damage they cause, precautionary measures and control measures to take to mitigate damage caused by these insects.

327. Holsten, E.H. 1982. Spruce Beetle: Copper Valley Electric Assoc. USDA Forest Service, State and Private Forestry, Alaska Region Biological Evaluation R10-82-3. 12 p.

Abstract: This report summarizes the findings of the August 1982 evaluation of right-of-way clearing along the Copper Valley Electric Association 138 kV transmission line. The results of this survey indicate that downed spruce along the powerline have been attacked minimally by spruce beetle. The majority of the spruce timber scattered along the right-of-way has deteriorated to such a degree as to be unsuitable as spruce beetle brood material.

328. Holsten, E.H. 1982. Spruce Beetle: Anchor Point, Alaska. USDA Forest Service, Alaska Region Biological Evaluation R10-82-2. 15 p.

Abstract: Bark beetle infested areas in the study sites appear to be declining. Apparently the beetle populations are low and appear to be kept in check, in part, by high woodpecker predation. Abiotic factors such as winter temperatures and snowfall may have contributed as well.

329. Shaw, C.G. III. 1982. Development of Dwarf Mistletoe in Western Hemlock Regeneration in Southeast Alaska. Can. J. For. Res. **12**: 482-488.

Abstract: In all stands, advanced regeneration was more frequently infected and accounted for a significantly greater proportion of crop trees than new reproduction. A significantly higher proportion of hemlock crop trees were infected than noncrop trees.

330. Shaw, C.G. III. 1982. Mountain Hemlock is an Occasional Host for Hemlock Dwarf Mistletoe *(Arceuthobium tsugense)* in Alaska. Plant Disease **66**: 852-854.

Abstract: Hemlock dwarf mistletoe was found on mountain hemlock near Homeshore, AK. This is the first and only confirmed occurrence on this host in Alaska since a single, uncertain collection in 1913. The relative infrequency of infection, unusually large swellings at the point of infection, and sparse shoot development suggest some degree of host-parasite incompatibility.

331. Shaw, C.G. III, Molina, R. and J. Walden. 1982. Development of Ectomycorrhizae Following Inoculation of Containerized Sitka and White Spruce Seedlings. Can. J. For. Res. **12**: 191-195.

Abstract: White spruce were successfully colonized by *C. geophilum* and *H. crustuliniforme. Pisolithus tinctorius* (Pers.) Coker and Couch failed to form mycorrhizae on either spruce.

332. U.S.D.A. Forest Service. 1982. Forest Insect and Disease Conditions in Alaska (R-10), 1981-1982. USDA Forest Service, Alaska Region Rpt. 173. 20 p.

Abstract: Spruce beetle infestations covered 193,000 hectares in 1982, a 100% increase over 1981 levels. Interior Alaska engraver beetle activity decreased 90% over 1981 levels. Large aspen tortrix infestations covered 11,444 hectares in 1982. A 2,709 hectare infestation of spruce budworm near Copper Center and a 3,350 hectare infestation of a cottonwood blotchminer, *Lyonetia* spp., near Seward in 1981 fell to undetectable levels in 1982. Spruce aphids were prevalent around Kodiak. A 2,000 hectare infestation of spruce beetle was observed in Glacier Bay National Monument. There were significant increases in the black-headed budworm and hemlock sawfly populations in southeast Alaska. Spruce needle rust and needle cast were active in interior and south central Alaska. Cedar decline and hemlock dwarf mistletoe were the major diseases in southeast Alaska.

333. Werner, R.A. 1982. The Spruce Beetle in Alaska Forests. Forest Pest Leaflet P-060. USDA Forest Service. Pacific Northwest Forest and Range Experiment Station. Portland, OR. I978. Revised 1982.

Abstract: This forest pest leaflet gives the life history of the spruce beetle as well as a discussion of the symptoms evident when beetle infestation occurs. Management and control are discussed.

334. Whitmore, M.C. 1982. Final Report on Co-op Aid Study of the Predators and Parasites Affecting Scolytid Populations from White Spruce in Alaska. Univ. of Wash., Seattle, WA. 95 p. mimeo.

1983

335. Alden, J.N. and J.C. Zasada. 1983. Potential of Lodgepole Pine as a Commercial Forest Tree Species on an Upland Site in Interior Alaska. In: Lodgepole Pine: Regeneration and Management. General Technical Report PNW-157. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. P. 42-48.

Abstract: This study concluded that the potential of lodgepole pine as a commercial species in Alaska is revealed by the rapid juvenile growth and winter resistance of northern provenances.

336. Cooke, W.B. 1983. Letter: A List of Baxter's Alaska Polypores. Personal Correspondence. 17 p.

Abstract: A letter from W.B. Cooke to Terry Shaw providing Shaw with a list of Baxter's Alaska polypores. A discussion of the problems of the nomenclature of fungi is also presented.

337. Eglitis, A.E. and T.H. Laurent. 1983. Follow-up Survey of Ambrosia Beetles and Deterioration in Blowdown. Yakutat, Alaska. January 1983. USDA Forest Service, Alaska Region Biological Evaluation, R10-83-1. 15 p.

Abstract: Light attacks occurred on numerous stems. Temperature patterns will determine when and how intensively additional attacks occur. If summer temperatures in 1983 are similar to those in 1982, then light to moderate attacks may spread out over a large number of currently uninfested windthrows.

338. Foote, M.J. 1983. Classification, Description, and Dynamics of Plant Communities After Fire in the Taiga of Interior Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Research Paper PNW-307. 108 p.

Abstract: One hundred thirty forest stands ranging in age from 1 month postfire to 200 years were sampled and described by successional series and developmental stage. Patterns of change in the two successional series are described. In addition, 12 mature forest communities are described in quantitative and qualitative terms.

339. Gabriel, H.W. and G.F. Tande. 1983 A Regional Approach to Fire History in Alaska. USDI Bureau of Land Management. SD 421.32 A4 G3 4 c.2. 31 p.

Abstract: This study organizes the available fire statistical data according to recognized geographical classification schemes, demonstrates that fire data can be stratified in meaningful ways to aid in management decisions and makes the definitions and methodology of fire history studies known to a wider spectrum of users with the hope of standardizing the terminology in Alaska.

340. Hard, J.S., Werner, R.A. and E.H. Holsten. 1983. Susceptibility of White Spruce to Attack by Spruce Beetles During the Early Years of an Outbreak in Alaska. Can. J. of For. Res. **13**(4): 678-684.

Abstract: Diameter was not an important criterion for spruce susceptibility to attack or death unless large diameter was coupled with slower than average radial growth in the last 5 years, an apparent indicator of current tree vigor.

341. Miller, C.R. 1983. A Revegetative Guide for Alaska. Alaska Rural Development Council Publication No. 2. A-00146. 88 p.

Abstract: This guide provides information on plant materials for revegetation of disturbed sites and for forage production. The cultural practices necessary for optimum results in revegetation and forage production are given. The guide is organized to allow a user to relate soil types to his area of interest and to develop a program for planting. The last section is appendices which refer to plant characteristics and to other reference materials.

342. Shaw, C.G. III. 1983. Production and Outplanting of Ectomycorrhizal Sitka Spruce Seedlings in Alaska. Merlewood Res. & Dev. Paper No. 95: 4 (abstract).

343. Shaw, C.G. III. 1983. Root Diseases and Mycorrhizae of Sitka Spruce. American Philosophical Society Yearbook. p. 138-139.

344. Shaw, C.G. III and R.C. Sidle. 1983. Evaluation of Planting Sites Common to a Southeast Alaska Clear-Cut. I. Nutrient Status. Can. J. For. Res. **13**: 1-8

Abstract: Rotten wood had a significantly higher C:N ratio indicating lower nitrogen availability in rotten wood. Higher levels of N indicate that N availability increases as decay advances. Available P was low and could be a major factor limiting growth in all micro sites.

345. Sidle, R.C. and Shaw, C.G. III. 1983. Evaluation of Planting Sites Common to a Southeast Alaska Clear-Cut. II. Available Inoculum of the Ectomycorrizal Fungus *Cenococcum geophilum* . Can. J. For. Res. **13**: 9-11.

Abstract: Undisturbed duff had significantly greater numbers of sclerotia per gram or per cubic centimeter of soil than either exposed mineral soil or rotten wood. There were significantly fewer viable sclerotia per cubic centimeter of rotten wood than in either exposed mineral soil or undisturbed duff.

346. U.S.D.A. Forest Service. 1983. Forest Insect and Disease Conditions in Alaska – 1983. USDA Forest Service. Forest Pest Management. State and Private Forestry. Alaska Region. 3430. 25 p.

Abstract: Spruce beetle decreased by 30% over 1982 levels. Large aspen tortrix infestations increased by 17% over 1982 levels. Spruce budworm populations are increasing. Spear-marked black moth populations are up in interior Alaska. Ambrosia beetles continue to cause substantial problems in parts of southeast Alaska. Hemlock

sawfly increased dramatically in southeast Alaska. Hemlock dwarf mistletoe continues to be quite active in southeast Alaska.

347. U.S.D.A. Forest Service. 1983. Forest Insect and Disease Conditions in the United States, 1983. Status of Insects in Alaska. USDA Forest Service, Alaska Region. Anchorage, AK. p. 56-59.

Abstract: Spruce beetle decreased by 30% over 1982 levels. Large aspen tortrix infestations increased by 17% over 1982 levels. Spruce budworm populations are increasing. Spear-marked black moth populations are up in interior Alaska. Ambrosia beetles continue to cause substantial problems in parts of southeast Alaska. Hemlock sawfly increased dramatically in southeast Alaska. Hemlock dwarf mistletoe continues to be quite active in southeast Alaska.

348. Viereck, L.A., Dyrness, C.T., Van Cleve, K. and M.J. Foote. 1983. Vegetation, Soils, and Forest Productivity in Selected Forest Types in Interior Alaska. In: The Structure and Function of a Black Spruce Forest in Relation to Other Fire-Affected Taiga Ecosystems. Can. J. of For. Res. **13**(5): 703-720.

Abstract: The data presented in this paper support the basic hypothesis of the taiga black spruce ecosystem study, that black spruce is a nutrient-poor, unproductive forest type. This low productivity is primarily the result of low forest floor and mineral soil temperatures, and high soil moisture content which retard nutrient cycling and mineralization of organic matter

349. Werner, R.A. 1983. Biomass, Density, and Nutrient Content of Plant Arthropods in the Taiga of Alaska. Can. J. For. Res. **13**: 729-739.

Abstract: Arthropod composition was similar in six vegetation types in a taiga ecosystem of Alaska. Of all vegetation types, ground herbs contained the highest density of arthropods. Black spruce types had the highest arthropod densities at the tree level but the lowest diversity of species.

350. Werner, R.A., Elert, E.E. and E.H. Holsten. 1983. Evaluation of Beetle-Killed White Spruce for Pulp and Paper. Can. J. For. Res. **13**: 246-250.

Abstract: White spruce in south-central Alaska showed no difference in pulp yield between trees dead for 1 year and those dead for as long as 50 years. Strength properties remained extremely high in all dead trees regardless of how long they had been dead.

351. Werner, R.A., Hastings, F.L. and R.D. Averill. 1983. Laboratory and Field Evaluation of Insecticides Against the Spruce Beetle (Coleoptera: Scolytidae). J. Econ. Ent. **76**: 1144-1147.

Abstract: Nine insecticides were tested by topical application on mixed sexes of adult spruce beetles. Fenitrothion at 2% provided the best remedial control but had a high impact on parasites and predators. Permethrin was almost equally effective but had the least impact on parasites and predators.

352. Werner, R.A. and E.H. Holsten. 1983. Effect of Phloem Temperature on Development of Spruce Beetles in Alaska. In: Proceedings of the IUFRO Conference: The Role of Host in the Population Dynamics of Forest Insects. September 4-7, 1983. Banff, Alberta, Canada. (ed. Safranyik, L.). Published jointly by the Canadian Forestry Service and the USDA Forest Service: 155-163.

Abstract: Spruce beetle development was manipulated by rotating infested standing and infested felled trees during the first instar in mid- to late June. A threshold ambient air temperature of 6.7^{o}C was required for larval development of two-year-cycle beetles to reach fourth instar by the end of the first summer after eclosion. For one-year-cycle beetles to develop, phloem temperatures above a threshold of 16.5^{o}C were necessary. During years of heavy cloud cover and low solar radiation, when days with temperatures above 16.5^{o}C are rare, only two-year-cycle beetles develop.

353. Werner, R.A. and E.H. Holsten. 1983. Mortality of White Spruce During a Spruce Beetle Outbreak on the Kenai Peninsula in Alaska. Can. J. For. Res. **13**: 96-101.

Abstract: Between 1976 and 1980, 29% of all white spruce in the Resurrection Creek permanent plots were killed by spruce beetles. This loss accounted for 59% of the commercial white spruce volume in the watershed. Mortality was greatest in the large diameter classes. The impact of spruce beetles on structure and species composition of white spruce stands is given along with a discussion of management implications.

1984

354. Alaback, P.B. 1984. A Comparison of Old-Growth Forest Structure in the Western Hemlock – Sitka Spruce Forests of Southeast Alaska. Meehan, W.R., Theodore R. Merrell Jr. and Thomas A. Hanley (Eds.). 1984. Fish and Wildlife Relationships in Old-Growth Forests: Proceedings of a Symposium held in Juneau, Alaska, 12-15 April 1982. Amer. Inst. Fish. Res. Biol. 425 p.

Abstract: The greatest variation in stand structure occurred in stands greater than 200 years of age. A discriminant analysis of old-growth and second-growth stands showed a variance in mean stand diameter, wider average tree spacing, increased dominance of western hemlock, and increased understory productivity to be key structural characteristics that distinguish the two forest age-classes. Old-growth stands have wider tree diameter distributions than second-growth.

355. Alaback, P.B. 1984. Plant Succession Following Logging in the Sitka Spruce – Western Hemlock Forests of Southeast Alaska: Implications for Management. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. General Technical Report PNW-173. 27 p.

Abstract: Recent clearcuts (0-30 years old) produce the most shrubby vegetation of any age class in forest succession. Eve-aged forests (30-150 years old) produce the least understory vegetation. Uneven aged, old-growth forests sustain the most structurally diverse understory vegetation. Forests with open, patchy canopies tend to produce the most understory vegetation.

356. Eglitis, A.E. 1984. Survey of Ambrosia Beetles in Blowdown: Final Report. Yakutat, Alaska January l984. USDA Forest Service, Alaska Region Biological Evaluation, R-10-84-2. 11 p.

Abstract: In 1983, cumulative ambrosia beetle damage was found on 53% of the down Sitka spruce and 33% of the western hemlock. The information shows that material cut in the fall will be attractive to beetles in the following spring, and that low-grade logs cut between September and December could be useful baits for trapping ambrosia beetle populations.

357. Eglitis, A.E. 1984. Permanent Plots for Monitoring Population Trends of the Spruce Beetle in the Taku River Drainage. February 1984. USDA Forest Service, Alaska Region Biological Evaluation, R10-84-1. 16 p.

Abstract: A summary of beetle-killed spruce on all 21 permanent plots shows that only 3 of 63 spruce can be called recent kills, and that the majority of tree mortality along the Taku River occurred before 1981. The information indicates that the Taku River infestation is fairly inactive and that additional tree mortality from beetle attacks in 1984 will probably be minimal.

358. Gray, T.G., Slessor, K.N., Grant, C.G., Shepherd, R.F., Holsten, E.H. and A.S. Tracey. 1984. Identification and Field Testing of Pheromone Components of *Choristoneura orae* (Lepidoptera:Tortricidae). Can. Ent. **116**: 51-56.

Abstract: The chemicals *cis (Z)* and *trans (E)*11-tetradecenyl acetate (11-14:Ac), *trans* 11-tetradecen-1-ol (*E*11-14:OH) and *trans* 11-tetradecenal (*E*11-14:Ald) were isolated from unmated female *Choristoneura orae* Freeman and shown to be highly attractive when used in lures in sticky traps. The identification of these components of the sex pheromone facilitates the separation of *C. orae* from other *Pinaceae*-feeding *Choristoneura* in the same area.

359. Hawksworth, F.G. and C.G. Shaw, III. 1984. Damage and Loss Caused by Dwarf Mistletoes in Coniferous Forests of Western North America. **24**: 285-297.

Abstract: This report discusses a variety of damage caused by dwarf mistletoes and their ecological effects. Silvicultural control strategies to deal with dwarf mistletoe impacts are given.

360. Hennon, P.E., Shaw, C.G. III, and E.M. Hansen. 1984. Onset, Spread, and Community Relationships of Decline in *Chamaecyparis nootkatensis* in Southeast Alaska. Proceedings of the Atlantic White Cedar Wetlands Conference. October 9-11, 1984. Woods Hole, Massachusetts: 331-337.

Abstract: The objective of this study was to investigate the epidemiology of Alaska-cedar mortality. Dating the onset of mortality, assessing the spread of the mortality and a discussion of the plant community relationships are included. Alaska-cedar decline appeared nearly simultaneously in widely separated and often remote bog sites throughout southeast Alaska before the turn of the century. The development of patterns of spreading mortality has followed an ecological gradient, with slow encroachment from bogs to better-drained sites.

361. Hennon, P.E., Shaw, C.G. III and E.M. Hansen. 1984. Is a Pathogen the Primary Cause of Decline and Mortality of *Chamaecyparis nootkatensis* in Southeast Alaska? Proceedings of the 32nd Western International Forest Disease Work Conference: 15-23.

Abstract: This report details an investigation into the hypothesis that cedar decline is caused by a pathogenic agent. Discussed is: symptoms of decline; organisms associated with fine roots; basal scars; epidemiology of mortality; spread of mortality and plant community relationships. The report concludes that although symptoms of dying cedars suggest pathogen involvement, no likely primary pathogen has been found.

362. Holsten, E.H. 1984. Spruce Beetle Re-emergence. Office report to Group Leader, USDA Forest Service, Forest Pest Management. Alaska Region, Anchorage, AK. 3 p.

Abstract: There is some evidence indicating that a small percent of parent adults re-emerge and construct second galleries. Re-emergence is brought about by a variety of factors such as competition, resin flow, etc. which interrupts initial gallery construction. However, the majority of re-emerging parent adults cannot fly due to degenerated flight muscles. However, some may initiate second galleries on the same tree they emerged from. There is little data indicating the viability and quantity of brood produced from these second galleries.

363. Holsten, E.H. 1984. Factors of Susceptibility in Spruce Beetle Attack on White Spruce in Alaska. J. Ent. Soc. Brit. Columbia. **81**:39-45.

Abstract: Data confirmed bark beetle preference for attacking large-diameter, slow-growing spruce. Increased bark beetle activity was noted on north facing slopes. A rudimentary guide is given to rate uninfested spruce timber for probable high or low losses if attacked by spruce beetles.

364. Holsten, E.H. and W. Vandre. 1984. Gall Aphids and Wooly Aphids on Spruce and Hemlock. USDA Forest Service, Alaska Region Leaflet AO-062. 8 p.

Abstract: A forest pest leaflet which provides the homeowner with descriptions of aphid damage and aphid life history and guidelines to reduce damage by aphids.

365. Holsten, E.H. and W. Vandre. 1984. Birch Aphids. USDA Forest Service, Alaska Region Leaflet AO-063. 8 p.

Abstract: A forest pest leaflet which provides the homeowner with descriptions of aphid damage and aphid life history and guidelines to reduce damage by aphids.

366. Holsten, E.H. and R.A. Werner. 1984. Evaluation of Methylcylohexenone (MCH) in Preventing or Suppressing Spruce Beetle Attacks in Alaska. USDA Forest Service, State and Private Forestry. Technical Report R10-6. 16 p.

Abstract: The high dosage (450 mg) of liquid MCH appeared to provide the best tree protection with a 70% reduction in attacks/m^2, a 70% reduction in beetle gallery length/m^2, and a 61% reduction in progeny/m^2 as compared to check trees.

367. Julin, K. R. 1984. Western Hemlock Fluting in Southeastern Alaska. I: Preliminary Observations on Distribution and Cause. College of Forest Resources. University of Washington, Seattle, Abstract. 2 p.

Abstract: Fluting on western hemlock is common in coastal stands of southeastern Alaska and is associated with certain conditions: 1) stands of fluted hemlock can be found primarily on relatively productive, low elevation coastal sites; 2) initial flute formation is correlated with the onset of accelerated growth; and 3) the more dominate trees in fluted stands exhibit the most pronounced fluting.

368. Krasny, M.E., Vogt, K.A. and J.C. Zasada. 1984. Root and Shoot Biomass and Mycorrhizal Development of White Spruce seedlings Naturally Regenerating in Interior Alaskan Floodplain Communities. Can. J. of For. Res. **14**: 554-558.

Abstract: Mean seedling biomass was highest in the open community and lowest in the spruce community. Seedlings growing in the open community had higher root:shoot ratios (0.50) compared with seedlings growing in the willow (0.34), alder (0.20), and spruce (0.24) communities. Essentially all short roots of spruce seedlings growing in all four communities were infected by mycorrhizal fungi throughout the growing season.

369. McBeath, J.H. 1984. Symptomology on Spruce Trees and Spore Characteristics of a Bud Rust Pathogen. Phytopathology **74**: 456-461.

Abstract: Spruce bud rust attacked both the leaf (needle) buds and ovulate strobili of *Picea glauca* and *P. mariana*. The infected needle buds produced extremely stunted shoots with bright yellow-colored needles. Infection of ovulate strobili resulted in the impairment of seed development and production.

370. Mowrey, R.A. and J.C. Zasada. 1984. Den Tree Use and Movements of Northern Flying Squirrels in Interior Alaska and Implications for Forest Management. Meehan, W.R., T.R. Merrell Jr. and T.A. Hanley (Eds.). 1984. Fish and Wildlife Relationships in Old-Growth Forests: Proceedings of a Symposium held in Juneau, Alaska, 12-15 April 1982. Amer. Inst. Fish. Res. Biol. 425 p.

Abstract: Forest management practices for flying squirrels in the taiga should include maintenance of red squirrel habitat and potential den trees with cavities and witches' brooms. Particular attention should be given to keeping cutting units small and maintaining relatively undisturbed corridors of trees for travel between denning sites and foraging areas. The group-selection silvicultural system appears to best meet the requirements of both squirrel species and needs for regeneration and growth of the trees.

371. Post, K.E. 1984. Wood Borer (Cerambycidae and Buprestidae) Infestation, Development and Impact on Wood

Quality in Recently Felled White Spruce Trees in the Interior of Alaska. Masters Thesis, Univ. of Alaska-Fairbanks, Abstract. 1 p.

Abstract: Populations of *Monochamus scutellatus* and buprestids were more intense in the clearcut area where the decked logs had lower bark moisture content than in the partially shaded thinned stand, where *Tetropium* species were more abundant. *Monochamus scutellatus* was more abundant on the south sides and buprestids more common on the top sides of decked logs in the clearcut.

372. Post, K.E. 1984. Wood-boring Insects in Alaska. USDA Forest Service, Alaska Region, 1984. Leaflet. In cooperation with: Cooperation Extension Service, University of Alaska. 6 p.

Abstract: The life histories of the most common wood boring insects of Alaska are given along with a discussion of detection of damage and control measures.

373. Setzer, T.S., Mead, B.R. and G.L. Carroll. 1984. Timber Resource Statistics for the Willow Block, Susitna River Basin Multiresource Inventory Unit, Alaska, 1978. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Resource Bulletin PNW-114. 47 p.

Abstract: Statistics regarding forest area, timber volumes, and growth and mortality from this inventory are presented.

374. Shaw, C.G. III, **Eglitis, A.E., Laurent, T.H. and P.E. Hennon. 1984.** An Overview of Decline and Mortality of *Chamaecyparis nootkatensis* in Southeast Alaska. Proceedings of the Atlantic White Cedar Wetlands Conference. October 9-11, 1984. Woods Hole, Massachusetts: 327-330.

Abstract: The absence of a recognizable biotic cause of decline and mortality, coupled with the temporal pattern of death and decline by tree size, is consistent with the pattern of mortality and decline that might be expected from an environmental stress such as winter drying.

375. Werner, R.A., Averill, R.D., Hastings, F.L., Hilgert, J.W., and U.E. Brady. 1984. Field Evaluation of Fenitrothion, Permethrin, and Chlorpyrifos for Protecting White Spruce Trees from Spruce Beetle (Coleoptera: Scolytidae) Attack in Alaska. J. Econ. Ent. **77**(4): 995-998.

Abstract: Concentrations of 0.25 and 0.5% permethrin, 0.5 and 1% chlorpyrifos, and 1 and 2% fenitrothion provided acceptable protection for 4 months to white spruce trees from attack by spruce beetle. At 16 months after application, 0.25% permethrin and 2% fenitrothion still provided adequate protection.

376. Werner, R.A. and E.H. Holsten. 1984. Scolytidae Associated with White Spruce in Alaska. Can. Ent. **116**: 465-471.

Abstract: Pheromone baited traps and trap trees attracted an aggregate of 29 scolytid species associated with white spruce in three localities in Alaska. Species diversity was higher in Fairbanks than in the Brooks Range or the Kenai Peninsula. Scolytids were found inhabiting all bark-producing areas of the tree.

1985

377. Eglitis, A.E. 1985. Permanent Plots for Monitoring Population Trends of the Spruce Beetle in Glacier Bay National Park. USDA Forest Service, Alaska Region, State & Private Forestry Technical Report R10-85-1. 18 p.

Abstract: Spruce beetle activity in Glacier Bay National Park was fairly low in 1982, but substantial mortality occurred in 1983 and 1984. As of 1984, over 30% of the spruce on the monitoring plots have died. Further mortality is expected in 1985.

378. Hard, J.S. 1985. Spruce Beetles Attack Slowly Growing Spruce. For. Sci. **31**: 839-850.

Abstract: Larger average tree diameters and faster radial growth rates of spruce occurred in stands with lower stocking levels. Results suggest that stand resistance to spruce beetle could be enhanced by decreasing stocking to reduce tree competition and increase vigor of residuals.

379. Hard, J.S. and E.H. Holsten. 1985. Managing White and Lutz Spruce Stands in South-central Alaska for Increased Resistance to Spruce Beetle. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Portland, OR. Gen. Tech. Rep. PNW-188. 21 p.

Abstract: Thinning is recommended for maintaining vigorous tree growth to minimize losses caused by spruce beetles and windthrow in residual stands of spruce in south-central Alaska. The anatomy of conifer stems, the variation in stem diameter growth, and the variability of tree response to wounding are discussed to explain why trees become vulnerable to attack by bark beetles. A working hypothesis is presented as a rationale for maintaining vigorous tree growth.

380. Hennon, P.E. 1985. Introduction to Forest Diseases in Alaska. USDA Forest Service, Forest Pest Management. Alaska Region, Juneau, AK. 10 p.

Abstract: This paper is a listing of the more commonly encountered fungi, rusts, foliage and twig diseases, cankers, root diseases, abiotic damage, dwarf mistletoe, greenhouse and nursery diseases, decays and hazard trees found in Alaska. Symptoms and control measures are also discussed.

381. Hennon, P.E., Newcomb G.B., Shaw, C.G., III and E.M. Hansen. 1985. Nematodes Associated With Dying *Chamaecyparis nootkatensis* in Southeast Alaska. Plant Disease **70**: 352. Abstract.

Abstract: Except for a sample with 14 nematodes per gram of dry weight soil, the number of nematodes were low (6 or fewer per gram of dry soil weight), regardless of tree health. However, *Sphaeronema* and *Crossonema* were found in 20 and 26 samples, respectively, from both healthy and declining trees. This frequency of recovery suggests that the role of these obligate parasites in cedar decline should be elucidated.

382. Hennon, P.E. and C.G. Shaw III. 1985. A Management Strategy for Stands Suffering from Alaska-cedar Decline. Proceedings of the 36th Alaska Science Conference, Sept. 27-29, 1985. University of Alaska, Fairbanks. p. 161.

Abstract: This paper gives a brief history of Alaska-cedar decline and the potential value of salvage logging operations.

383. Holsten, E.H. 1985. Evaluation of Monosodium Methane Arsenate (MSMA) for Lethal Trap Trees in Alaska. USDA Forest Service, State and Private Forestry, Alaska Region, Forest Pest Management Tech. Rpt. R10-11. 12 p.

Abstract: MSMA treatment efficacy in reducing spruce beetle brood was 99% for the Glowon treatment and 66% for the Silvisar treatment. However, both formulations resulted in a reduction in the number of attacks compared to untreated check trees. Possible factors responsible for this reduction, such as repellency, are discussed.

384. Holsten, E.H. 1985. Evaluation of Monosodium Methane Arsenate (MSMA) for Lethal Trap Trees in Alaska. USDA Forest Service, State and Private Forestry, Forest Pest Management, Alaska Region Tech. Rpt. R10-7. 20 p.

Abstract: MSMA treatment efficacy in reducing spruce beetle populations was assessed in September, 1984 and indicated a 99% reduction in brood for both treatments compared to untreated check trees. The 80 g/l dosage

showed no repellency of attacking adults compared to untreated check trees whereas the 160 g/l dosage resulted in 33% repellency.

385. Holsten, E.H. and J.S. Hard. 1985. Possible Carry-over Effect of *Bacillus thuringiensis* One Year After Treatment of Large Aspen Tortrix *Choristoneura conflictana* (Lepidoptera: Tortricidae). USDA Forest Service, Alaska Region, Forest Pest Management. Anchorage, AK Tech. Rep. R10-8. 7 p.

Abstract: An example of an apparent carryover effect of *B.t.* treated large aspen tortrix populations is reported in this paper. From 60 to 75% of the larvae, regardless of treatment, survived until the pupal stage. Approximately 29% of all pupae died. Pupal mortality with respect to the sexes was not equal. 56% of male pupae reared from larvae collected from Thuricide 2X treated trees died, but no female pupae died. This differential pupal mortality is significant and may be a result of a *B.t.* carryover effect.

386. Holsten, E.H. and J.S. Hard. 1985. Efficacy of *Bacillus thuringiensis* Berliner for Suppressing Populations of Large Aspen Tortrix in Alaska. Can. Ent. **117**: 587-591.

Abstract: Treatments with Dipel 4L and Thuricide 32LV resulted in population reductions of 69 and 76% respectively. Both products provided significant foliage protection.

387. Holsten, E.H., Hennon, P.E. and R.A. Werner. 1985. Insects and Diseases of Alaskan Forests. USDA Forest Service, Alaska Region, Juneau, AK. Report 181. Revised October 1985. 181 p.

Abstract: This handbook is divided into insect and disease sections; each with it's own keys, illustrations, and host index. Literature cited, glossary, and general index follow at the end of the book**.**

388. Holsten, E.H. and R.A. Werner. 1985. Evaluation of a Controlled Release Formulation of Methylcyclohexenone (MCH) in Preventing Spruce Beetle Attacks in Alaska. USDA Forest Service, Forest Pest Management, Alaska Region, Anchorage, AK October 1985. Tech. Rep. R10-12. 9 p.

Abstract: There were no significant differences between treatments and checks with respect to the variables. The variability within treatment was significant, negating any treatment effect. This lack of suppression and/or elimination of spruce beetle attacks was probably due to the lower than expected release rates of the formulated MCH.

389. Holsten, E.H. and R.A. Werner. 1985. Evaluation of a Controlled Release Formulation of Methylcyclohexenone (MCH) in Preventing Spruce Beetle Attacks in Alaska. USDA Forest Service, Alaska Region, Forest Pest Management. Anchorage, AK. Tech. Rep. R10-9. 9 p.

Abstract: A controlled release formulation of the anti-aggregation pheromone, MCH, was tested at three dosage rates (6.9, 9.2, and 11.5 kg/ha) for prevention of spruce beetle attacks in felled white spruce near Granite Creek, Alaska. There were no significant differences between treated trees and felled check trees. Factors affecting expected release rates are discussed.

390. Richmond, A.P. 1985. Moose-Browsing Damage in a Recently Thinned Stand of Sapling Paper Birch in Interior Alaska. Agroborealis **17**(1): 7-10.

Abstract: This study makes two recommendations regarding the reduction of moose damage to thinned sapling birch stands, particularly mainstem breakage: 1) The thinning in sapling birch stands should not be performed prior to age 20, and; 2) No stem smaller than 1.8 inches dbh should be retained as residual trees.

391. Shaw, C.G. III. 1985. Colonization of Conifer Thinning Stumps by Root Disease Fungi in SE Alaska. Phytopathology **75**: 1294 (abstract).

392. Shaw, C.G. III, Eglitis, A.E., Laurent, T.H. and P.E. Hennon. 1985. Decline and Mortality of *Chamaecyparis nootkatensis* in Southeastern Alaska, A Problem of Long Duration, But Unknown Cause. Plant Disease **69**:13-17.

Abstract: *Armillaria* sp. occurred frequently on dead and dying trees but not consistently on recently killed trees, suggesting that it is not the primary cause of cedar decline. No other pathogens were isolated from affected trees. The patterns of tree death and decline are consistent with a hypothesis that environmental stress is the primary cause of the problem.

393. Shaw, C.G. III, Jackson, R.M. and G.W. Thomas. 1985. Effects of Fertilization Fungal Strain on Ectomycorrhizal Development of Sitka Spruce Seedlings. Proc. 6th North American Conf. on Mycorrhizae. p. 217.

Abstract: The percentage of short roots colonized was significant by fungal type, but not by fertilizer level. Isolates of the same fungus did not differ significantly from one another in the percentage of short roots colonized. Total height, shoot wt., and root wt. were significant by fertilizer level, but not by fungal type. Levels of N, P, K, and Mg in foliage were significant by fertilizer level, but not by fungal type.

394. Shaw, C.G. III and R.C. Sidle. 1985. Performance of Ectomycorrhizal Sitka Spruce Seedlings Outplanted in Southeast Alaska. Proc. 6th North American Conf. on Mycorrhizae. p. 216.

Abstract: Four ectomycorrhizae were established on Sitka spruce seedlings. Survival and growth of these mycorrhizal seedlings, 2 years after planting on specific microsites in a clearcut near Pavlof Harbor, Chichagof Island, are presented here.

395. Sidle, R.C. and C.G. Shaw III. 1985. Growth and Nutrient Status of Ectomycorrhizal Sitka Spruce Seedlings Outplanted in a Southeast Alaska Clear-cut. Agronomy Abstracts. p. 224.

396. Tait, S.M., Shaw III, C.G., and A.E. Eglitis. 1985. Occurrence of Insect and Disease Pests on Young-growth Sitka Spruce and Western Hemlock in Southeastern Alaska. USDA Forest Service Research Note PNW-433. 16 p.

Abstract: Insects and diseases were surveyed in 16 even-aged, young-growth stands of Sitka spruce and western hemlock in southeastern Alaska. Although some organisms with damage potential were observed, no pests occurred at levels likely to cause damage.

397. U.S.D.A. Forest Service. 1985. Forest Insect and Disease Conditions in Alaska, Region 10, 1984 USDA Forest Service, Alaska Region. Report. R10-149. Anchorage, AK. 26 p.

Abstract: Spruce beetle increased by 22% over 1983 levels. Large aspen tortrix populations collapsed near Anchorage but are still active in interior Alaska. Spear-marked black moth populations increased fourfold over 1983 levels near Fairbanks. Hemlock sawfly populations are high for the second year in a row in southeast Alaska. Cedar decline and hemlock dwarf mistletoe continue to be the major diseases in southeast Alaska.

398. U.S.D.A. Forest Service. 1985. Forest Insect and Disease Conditions in Alaska R-10, 1985. USDA Forest Service, State and Private Forestry, Forest Pest Management, Anchorage, AK. 28 p.

Abstract: Spruce beetle increased by 22% over 1983 levels. Large aspen tortrix populations collapsed near Anchorage but are still active in interior Alaska. Spear-marked black moth populations increased fourfold over 1983 levels near Fairbanks. Hemlock sawfly populations are high for the second year in a row in southeast Alaska. Cedar decline and hemlock dwarf mistletoe continue to be the major diseases in southeast Alaska.

399. Werner, R.A. and E.H. Holsten. 1985. Factors Influencing Generation Times of Spruce Beetles in Alaska. Can.

J. For. Res. Vol. **15**: 438-443.

Abstract: Direct solar radiation to the bark surface of white spruce is the primary environmental factor influencing the developmental rate of spruce beetles in Alaska. A phloem threshold temperature of 16.5^{o}C is required to initiate the development of 1-year life cycle beetles. Tree location within a stand and stand aspect in relation to direct solar radiation determine which trees or areas of the tree support beetles with 1- and 2-year life cycles.

400. Werner, R.A. and E.H. Holsten. 1985. Effect of Phloem Temperature on Development of Spruce Beetles in Alaska. In: Safranyik, L., ed. The Role of the Host in the Population Dynamics of Forest Insects: Proceedings of the IUFRO Conference; 1983 September 4-7; Banff, AB. Victoria, BC: Canadian Forestry Service, Pacific Northwest Forest Research Centre: 155-163.

Abstract: A threshold ambient air temperature of 6.7^{o}C was required for larval development of two-year-cycle beetles to reach fourth instar by the end of the first summer after eclosion. For one-year-cycle beetles to develop, phloem temperatures above a threshold of 16.5^{o}C were necessary. During years of heavy cloud cover and low solar radiation, when days with temperatures above 16.5^{o}C are rare, only two-year-cycle beetles develop.

401. Werner, R.A. and K.E. Post. 1985. Effects of Wood Boring Insects and Bark Beetles On Survival and Growth of Burned White Spruce. In: Early Results of the Rosie Creek Fire Research Project 1984. Juday, G.P. and C.T. Dyrness eds. Agricultural and Forestry Experiment Station, School of Agriculture and Land Resources Management, University of Alaska – Fairbanks. Misc. Pub. 85-2. December 1985 p.14-16.

Abstract: Tree mortality in partially burned areas of the fire perimeter was primarily due to wood borer and bark beetle attacks. Adjacent unburned, healthy trees can be invaded within 1-2 years by root-inhabiting fungi which were transmitted by root grafts from infected to healthy trees in the partially burned perimeter area. These live trees in the unburned areas are subsequently weakened by the root fungi and are predisposed to attack by bark beetles.

1986

402. Eglitis, A.E. 1986. Hemlock Sawfly in Southeast Alaska. USDA Forest Service, Alaska Region, Forest Pest Management Biological Evaluation R10-87-1. 16 p.

Abstract: Several small-scale evaluations were carried out to assess tree recovery and to document the incidence of hemlock mortality and top-kill in some of the more heavily affected areas. Results of those evaluations and other observations on this extensive sawfly outbreaks are presented in this report.

403. Eglitis, A.E. 1986. Spruce Beetle in Glacier Bay National Park: 1985 Update. USDA Forest Service, State and Private Forestry, Alaska Region Biological Evaluation R10-86-1. 16 p.

Abstract: Most of the findings from field work during 1984 and 1985 indicate that the active portion of the infestation is fairly localized. No beetle activity has been noted in recent years on Young Island and further west on the mainland, very little additional spruce mortality has occurred in the last two years. The infestations will probably not expand in these areas.

404. Eglitis, A.E. and P.E. Hennon. 1986. Porcupine Damage on Mitkof Island. USDA Forest Service. State and Private Forestry, Forest Pest Management, Juneau, Alaska. Technical Report R10-86-1. 21 p.

Abstract: Porcupine damage was noted on about 25% of the 640 trees on the sampling plots. Porcupine showed a preference for Sitka spruce (33% of trees damaged) over western hemlock (15% of trees damaged) and damaged spruces were slightly taller than undamaged ones.

405. Ford, L.B. 1986. Attack Dynamics of the Spruce Bark Beetle, *Dendroctonus rufipennis* (Kirby) in South-central Alaska. Univ. of Wash. PhD Dissertation, Seattle, WA. 216 p.

Abstract: This dissertation presents results of experiments that studied primary and secondary attraction of beetles to host trees and identified tree and stand characteristics associated with beetle landing and attack, as well as tree mortality, during outbreaks.

406. Hennon, P.E. 1986. Pathological and Ecological Aspects of Decline and Mortality of *Chamaecyparis nootkatensis* in Southeast Alaska. Ph.D. Thesis. Department of Botany and Plant Pathology, Oregon State University. 279 p.

Abstract: More than 50 taxa of fungi were isolated and collected from lesions and other symptomatic tissues. The possible roles of 4 pathogens, vesicular-arbuscular mycorrhizae, bark beetles and nematodes in decline are discussed. This thesis concludes that biotic agents are not responsible for the decline and that some abiotic factor is more likely the cause.

407. Hennon, P.E. 1986. Spruce Needle Rust. USDA Forest Service. Alaska Region. R10-TP. 6 p.

Abstract: This pest leaflet describes the life history of the rust, a description of the damage it causes and guidelines for reducing rust damage.

408. Hennon, P.E. and C.G. Shaw III. 1986. Noteworthy Forest Diseases in Alaska: Proceedings of Thirty-Fourth Annual Western International Forest Disease Work Conference. Sept. 8-12. Juneau, Alaska. Pp. 13-19.

Abstract: This paper provides a discussion of the most important tree diseases by geographic region in Alaska.

409. Holsten, E.H. 1986. Carpenter Ants: Insect Pests of Wood Products. USDA Forest Service, Alaska Region, and Cooperative Extension Service, University of Alaska. Pamphlet A-0-061. 5 p.

Abstract: This forest pest leaflet, written for the homeowner, introduces the carpenter ant and discusses it’s description, life history, signs of infestation, damage and control.

410. Holsten, E.H. 1986. *Ips* Infestation-Bonanza Creek Experimental Forest. USDA Forest Service. State and Private Forestry, Forest Pest Management, Anchorage, AK. Biological Evaluation. 8 p.

Abstract: The present infestation is believed to have developed from a combination of factors: 1) large amounts of breeding material resulting from the Rosie Creek Fire and broken tops originating from heavy snowfalls in the 1984-85 winter, and 2) abnormally low snowfall in 1985-86 and drought-like conditions in spring 1986, resulting in water-stressed spruce. Management alternatives are presented to mitigate the *Ips* problem.

411. Holsten, E.H. 1986. Decline of Alaska-yellow Cedar. Letter to Regional Forester, Alaska Region.

Abstract: Letter to Regional Forester with a list of acreage of land affected by Alaska-yellow cedar decline that was calculated from a composite map developed from mapping dead and dying cedar during annual aerial surveys conducted over the previous 20 years. Photocopies of affected areas from this composite map are included.

412. Shaw, C.G. III and E.M. Loopstra. 1986. Pathogenicity and Identification of Some Alaskan Isolates of *Armillaria.* Phytopathology **76**: 1081. Abstract.

Abstract: Nine isolates of *Armillaria* spp. From somatic mushroom tissues, spores, or decaying wood were inoculated onto Sitka spruce seedlings which were inspected after 2 and 3 years for *Armillaria* infections. Single-spore isolates of both NABS V & IX infected substantially more seedlings than did the parent mushroom isolates. The three isolates from wood infected $\geq$ 50% of the inoculated seedlings.

413. U.S.D.A. Forest Service. 1986. Forest Insect and Disease Conditions in Alaska R10, 1986. USDA Forest Service, Alaska Region. Anchorage, AK. 36 p.

Abstract: Spruce beetle activity increased dramatically in 1996. Aerial surveys detected 370,000 acres of spruce mortality. *Ips* beetle activity increased as well to nearly 17,000 acres near Fairbanks. Spear-marked black moth populations fell and infestations covered only 19,000 acres. Large aspen tortrix infestations covered 370,000 acres near Fairbanks. Their numbers, however, remained low in south-central Alaska. Leaf rollers defoliated approximately 12,000 acres of birch around Cook Inlet and 21,000 acres of willow were severely defoliated in interior Alaska. Hemlock sawfly declined in southeast Alaska. Cedar decline covered in excess of 200,000 acres.

414. Viereck, L.A., Van Cleve, K., and C.T. Dyrness. 1986. Forest Ecosystem Distribution in the Taiga Environment. In: Van Cleve, K., Chapin, F.S. III, Flanagan, P.W. (and others), eds. Forest Ecosystems in the Alaskan Taiga: A Synthesis of Structure and Function. New York: Springer – Verlag; 1986: 22-43. Chapter 3. #PNW-4351, 1.

Abstract: This chapter discusses forest site types in Interior Alaska. Each site type is described along with comments on soils, successional stages, productivity, and mature forest types.

415. Werner, R.A. 1986. Associations of Plants and Phytophagous Insects in Taiga Forest Ecosystems. In: Van Cleve, K.; Chapin, F.S., III; Flanagan, P.W.; Viereck, L.A.; Dyrness, C.T., eds. Forest Ecosystems in the Alaskan Taiga: a Synthesis of Structure and Function. New York: Springer-Verlag: 205-212.

Abstract: The taiga forest ecosystems of interior Alaska have variable site characteristics, including aspect and slope. These site differences affect both plant species composition and plant growth and vigor, which in turn affect the population dynamics of phytophagous insects.

416. Werner, R.A. 1986. The Eastern Larch Beetle in Alaska. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, OR. Res. Pap. PNW-357. 25 p.

Abstract: The eastern larch beetle exists throughout the range of tamarack in interior Alaska where it has a 1-year life cycle. Beetles overwinter as adults in the bark of the trunk below snowline in infested trees. Tamarack trees that are slow growing because of repeated defoliation by larch bud moth or that inhabit cold, wet bottom sites underlain with permafrost are usually susceptible to attack by eastern larch beetles.

417. Werner, R.A., Hastings, F.L., Holsten, E.H. and A.S. Jones. 1986. Carbaryl and Lindane Protect White Spruce from Attack by Spruce Beetles (Coleoptera: Scolytidae) for Three Growing Seasons. J. Econ. Ent. **79**(4): 1121-1124.

Abstract: Individual, high-value white spruce can be protected from attack by spruce beetle by spraying the boles of the trees to a height of 12 m with 1 and 2% carbaryl or 0.5% lindane. At 16 months after application, these insecticides provided 100% protection. Carbaryl (1 and 2%) and lindane (0.5%) were 89, 96, and 94% effective, respectively, at the end of the third growing season after treatment.

418. Werner, R.A., Holsten, E.H. and F.L. Hastings. 1986. Evaluation of Pine Oil for Protecting White Spruce from Spruce Beetle (Coleoptera:Scolytidae) Attack. J. Ent. Soc. Brit. Columbia. **83**: 3-6.

Abstract: Fifty percent of the pheromone-baited trees were protected by Norpine 65 for one year after treatment whereas only 33% were protected by BBR-2. Baited trees sprayed with Norpine 65 and BBR-2 were attacked less frequently than were baited check trees and sustained a lower attack density per tree

419. Werner, R.A. and K.E. Post. 1986. Effects of Wood-boring Insects and Bark Beetles on Survival and Growth of Burned White Spruce. In: Juday, Glenn P.; Dyrness, C. Theodore, eds. Early results of the Rosie Creek Fire Research Project 1984. Misc. Pub. 85-2. Fairbanks, AK: University of Alaska, Agricultural and Forestry Experiment Station: 14-16.

Abstract: Tree mortality in partially burned areas of the fire perimeter was primarily due to woodborer and bark beetle attacks. In addition, adjacent unburned, healthy trees can be invaded within 1 to 2 years by root-inhabiting fungi that were transmitted by root grafts from infected to healthy trees in the partially burned perimeter area. These live trees in the unburned areas are subsequently weakened by the root fungi and are predisposed to attack by bark beetles.

1987

420. Bryant, J.P., Clausen, T.P., Reichardt, P.B. McCarthy, M.C. and R.A. Werner. 1987. Effect of Nitrogen Fertilization Upon the Secondary Chemistry and Nutritional Value of Quaking Aspen *(Populus tremuloides* Michx.) Leaves for the Large Aspen Tortrix *(Choristoneura conflictana* (Walker)). Oecologia. **73**: 513-517.

Abstract: Nitrogen fertilization resulted in decreased concentrations of condensed tannin and phenolic glycosides in aspen leaves and an increase in their nitrogen concentration and value as food for the large aspen tortrix. The results of these tests are consistent with the prediction that the nutritional value of woody plant foliage is strongly influenced by plant carbon-nutrient balance.

421. Eglitis, A.E. 1987. Spruce Beetle in Glacier Bay National Park: 1986 Update. USDA Forest Service, Alaska Region, State & Private Forestry, Biological Evaluation R10-87-4. 13 p.

Abstract: Aerial surveys indicated that nearly 15,000 acres in Glacier Bay National Park are impacted by spruce beetle with mortality on those acres ranging from 5 to 70%. It appears that the spruce beetle infestation is declining in areas where the plots are located.

422. Eglitis, A.E. 1987. Hemlock Sawfly on Heceta Island--Southeast Alaska. USDA Forest Service, Alaska Region Forest Pest Management Biological Evaluation R10-88-1. 8 p.

Abstract: About 400 acres of western hemlock stands on Heceta Island sustained top-kill and mortality during the sawfly epidemic in 1983-1984. Nearly 2/3 of all hemlocks showed evidence of permanent sawfly damage. Two of the 5 stands surveyed were identified as candidates for salvage harvesting.

423. Eglitis, A.E. and P.E. Hennon. 1987. Porcupine Damage to Conifer Stands in Southeast Alaska. Symposium on Animal Damage Management in Pacific Northwest Forests. Mar 25-27, 1987. Spokane, WA. Cooperative Extension, Washington State University. Abstract (p.79) and Poster.

424. Eglitis, A.E. and E.H. Holsten. 1987. Cottonwood Leaf Beetle. USDA Forest Service, Alaska Region Leaflet R10-TP-6. 6 p.

Abstract: This forest pest leaflet describes the life history of the cottonwood leaf beetle, gives a description of the damage caused by the beetle and offers guidelines for reducing damage.

425. Farr, W.A. and J.S. Hard. 1987. Multivariate Analysis of Climate Along the Southern Coast of Alaska--Some Implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. Res. Pap. PNW-RP-372. 38 p.

Abstract: Ten significantly different climatic groups were delineated along the southern coast of Alaska based on a multivariate analysis of 24 variables. Differences among the climate groups was not great. Only three groups were obviously different.

426. Hamm, P.B., Hansen, E.M., Hennon, P.E., and C.G. Shaw III. 1987. Pears, Bears and *Phytophthora* in Southeast Alaska (or the Indication that *P. drechsleri* is Endemic to SE Alaska). Proc. 34th Western International Forest Disease Work Conf.: 68-71.

Abstract: *Phytophthora dreschsleri* was recovered in southeast Alaska. Areas of recovery were remote and undisturbed, decreasing the chance of fungal introduction. This fact, plus additional information discussed, indicates that this *Phytophthora* is endemic to southeast Alaska.

427. Hard, J.S. 1987. Vulnerability of White Spruce with Slowly Expanding Lower Boles on Dry, Cold Sites to Early Seasonal Attack by Spruce Beetles in South-Central Alaska. Can. J. For. Res. **17**: 428-435.

Abstract: Attacks peaked during the early phase of tree radial growth on both aspects as the rate of tree expansion slowed. The first trees attacked expanded more slowly before and after beetle attack than did trees attacked later or not at all. High attack densities were concentrated in trees on dry, cold soils.

428. Hennon, P.E. 1987. Biology, Diagnosis, and Control of Ornamental Plant Diseases in Alaska. Proceedings of the 6th Annual Alaska Greenhouse and Nursery Conference. Feb. 11-12, 1987. Anchorage, Alaska. University of Alaska, Cooperative Extension Service: 52-59.

429. Hennon, P.E. 1987. Brown Bears Scar Alaska-Yellow Cedar in Southeast Alaska. Symposium on Animal Damage Management in Pacific Northwest Forests. Mar. 25-27, 1987. Spokane, WA. Cooperative Extension, Washington State University. Abstract. p. 155 and Poster.

430. Hennon, P.E. 1987. Spruce Broom Rust. USDA Forest Service, Alaska Region, Juneau, Alaska. R10-TP-7. 6 p.

Abstract: This forest pest leaflet discusses the distribution of spruce broom rust in Alaska, the life history of the rust, and guidelines for reducing damage caused by spruce broom rust.

431. Hennon, P.E. 1987. Root Diseases in Western North America: A Geographical Perspective--Alaska. Proceedings of Thirty-Fifth Annual Western International Forest Disease Work Conference. Aug. 18-21, 1987. Nanaimo, British Columbia, Canada. p. 66.

432. Hennon, P.E. 1987. Hemlock Canker on Prince of Wales Island. USDA Forest Service. Alaska Region. Forest Pest Management Biological Evaluation R-10-87-3. Juneau, AK. 7 p.

Abstract: The fungus *Xenomeris abietis* killed small hemlocks and the lower crowns of larger hemlocks on Prince of Wales Island. Hemlock trees in such young stands were not affected by this disease during it's recent outbreak. Although the outbreak appears to be over for now, it can probably be expected to reappear at some future date.

433. Hennon, P.E. and E.M. Hansen. 1987. Nuclear Behavior of *Phellinus arctostaphyli, P. igniarius,* and *P. tremulae.* Mycologia **79**(4): 501-507.

Abstract: The nuclear behavior of the three fungal species was similar.

434. Holsten, E.H. 1987. Spruce Beetle: Chugach National Forest and Adjacent Lands. USDA Forest Service, State and Private Forestry, Alaska Region Biological Evaluation R10-87-2. 17 p.

Abstract: This biological evaluation details a re-evaluation of stands on the Chugach National Forest and adjacent lands. The original evaluations were conducted between 1979 and 1981. These stands were, at that time, rated for their potential susceptibility to spruce beetle impacts. Details of the re-evaluations are given in this report along with an assessment of the validity of the original predictions of susceptibility. Management strategies for reducing potential impacts by spruce beetle are discussed.

435. Holsten, E.H. 1987. Evaluation of Daconate for Lethal Trap Trees in Alaska. USDA Forest Service, State and Private Forestry, Forest Pest Management, Alaska Region Tech. Rpt. R10-13, 14 p.

Abstract: There were no significant differences in attack levels between treatments and checks, there were significantly fewer egg galleries in both Daconate 6 treatments than the check trees, no significant differences in the number of parent adults in the galleries of treated vs. check trees but there were significantly fewer progeny in the MSMA treated trees than the checks. Thus, Daconate 6 is a good candidate for use in lethal trap trees.

436. Holsten, E.H. 1987. Spruce Beetle: Yukon River. USDA Forest Service, State and Private Forestry, Alaska Region, Forest Pest Management Biological Evaluation R10-87-5. 11 p.

Abstract: Spruce beetle attacks declined in 1987 over 1986 levels. To date, 44% of the commercial spruce in the evaluated areas have either been killed or were successfully attacked in 1987. Approximately 45% of the commercial spruce are currently unattacked. However, these uninfested trees are of sufficient diameter to be susceptible to future spruce beetle attack.

437. Holsten, E.H. and R.A. Werner. 1987. Engraver Beetles in Alaska Forests. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. 6 p.

Abstract: This forest pest leaflet gives a brief history of engraver beetle activity in Alaska. Discussed further are: characteristics of beetle attack, the life history of the beetle and guidelines for reducing damage caused by engraver beetles.

438. Holsten, E.H. and R.A. Werner. 1987. Use of MCH Bubble Caps in Preventing Spruce Beetle Attacks in Alaska. USDA Forest Service, Alaska Region. Anchorage, AK. Tech. Rep. R-10-14. 12 p.

Abstract: Treatments using MCH reduced the number of attacks from 43-53% but differences among treatments were not significant. Treatments had no effect on mean numbers of egg galleries and progeny but did cause a reduction in egg gallery length.

439. Manski, D. 1987. Monitoring Spruce Bark Beetles in Katmai National Park and Preserve. Park Science **8**(1): 5. Fall, 1987. 1 p.

Abstract: This study was undertaken to provide baseline conditions on the incidence of beetle killed spruce in Brooks Camp, the major developed area in Katmai, and to identify potential human activities that might be enhancing beetle population growth.

440. Miller, M.C., Moser, J.C., McGregor, M., Gregoire, J.C., Baisier, M., Dahlsten, D.L. and R.A. Werner. 1987. Potential for Biological Control of Native North American *Dendroctonus* Beetles (Coleoptera: Scolytidae). Annals of the Ent. Soc. of America. **80**(3): 417-428.

Abstract: Potential of insect enemies of allied pests is considered in light of Pimentel's theory of "new associations". Extraregional and exotic bark beetle predators from different forest ecosystems are shown to be able to detect aggregating pheromones of beetles related to their normal prey.

441. Miller, L.K. and R.A. Werner. 1987. Extreme Supercooling as an Overwintering Strategy in Three Species of Willow Gall Insects From Interior Alaska. Oikos **49**: 253-260.

Abstract: Mean supercooling points in summer were unusually low. Winter supercooling points were the lowest that have been recorded for any insect. Low supercooling points in winter were associated with accumulation of glycerol. None of the willow gall larvae were freezing-tolerant, and all relied on freezing avoidance by extreme supercooling in order to survive low winter habitat temperatures.

442. Miller, L.K. and R.A. Werner. 1987. Cold-Hardiness of Adult and Larval Spruce Beetles, *Dendroctonus rufipennis* (Kirby) in Interior Alaska. Can. J. Zool. **65**: 2927-2930.

Abstract: Mean supercooling points in both larvae and adults dropped from -12^{o}C in summer to about -31^{o}C in winter. The decrease in supercooling points in larvae was closely associated with synthesis of glycerol, but the decline in adult supercooling points partially preceded the synthesis of glycerol in the fall. Neither larvae or adults were freezing tolerant at any time of the year.

443. Shaw, C.G. III, Jackson, R.M. and G.W. Thomas. 1987. Fertilizer Levels and Fungal Strain Influence the Development of Ectomycorrhizae on Sitka Spruce Seedlings. New Forests **3**: 215-223.

Abstract: The level of fertilization significantly influenced all dependent variables except root/shoot ratio; however, fungus type did not affect growth and was significant only for percentage of short roots colonized. Seedlings reared at the low level of fertilization were significantly smaller than those reared at the medium or high levels.

444. Shaw, C.G. III, Sidle, R.C. and A.S. Harris. 1987. Evaluation of Planting Sites Common to a Southeast Alaska Clear-cut. III. Effects of Microsite Type and Ectomycorrhizal Inoculation on Growth and Survival of Sitka Spruce Seedlings. Can. J. For. Res. **17**: 334-339.

Abstract: Three different ectomycorrhizae were established on container-grown Sitka spruce seedlings. Seedling survival after 3 years was over 92% and did not differ by microsite or fungal treatment. These data suggest that prior colonization by these ectomycorrhizal fungi provides little survival or growth benefit after outplanting Sitka spruce seedlings on various microsites in southeastern Alaskan clearcuts.

445. Sidle, R.C. and C.G. Shaw III. 1987. Evaluation of Planting Sites Common to a Southeast Alaska Clear-cut. IV. Nutrient Levels in Ectomycorrhizal Sitka Spruce Seedlings. Can. J. For. Res. **17**: 340-345.

Abstract: Sitka spruce seedlings were colonized by 3 different ectomycorrhizal fungi. There were no significant interactions between fungal treatments and microsite types for uptake or concentration of any nutrient. Greater nutritional benefits were derived by planting on certain microsite types (duff and protected duff) than by inoculating with specific ectomycorrhizal fungi.

446. U.S.D.A. Forest Service. 1987. Forest Insect and Disease Conditions in Alaska-1987. USDA Forest Service, Alaska Region. R10-87-C-1. 22 p.

Abstract: Spruce beetle infestations declined in 1987 to 285,000 acres and *Ips* beetle infestations fell in interior Alaska to only 3,000+ acres. Spear marked black moth populations increased slightly while large aspen tortrix decreased by 50%. Spruce beetle in southeast Alaska increased slightly. Hemlock sawfly is still active in southeast. Cedar decline increased to more than 250,000 acres.

447. Weixelman, D.A. 1987. Prescribed Burning for Moose Habitat Improvements—Chugach National Forest 1987 Progress Report. USDA Forest Service, Alaska Region Report R10-MB-38. 36 p.

Abstract: Twelve burn sites were evaluated before and after burning to determine: 1) changes in browse productivity due to burning; 2) moose utilization of forage on burned sites during winter; 3) changes in nutritive quality of browse forage due to burning; and 4) changes in moose carrying capacity due to burning. Results are presented and discussed.

448. Zogas, K. 1987. Re-Evaluation of Daconate 6 for Lethal Trap Trees in Alaska. USDA Forest Service, State and Private Forestry, Alaska Region Tech. Report R10-87-15. 9 p.

Abstract: There were significantly more beetle attacks on check trees than on treated trees. This may indicate some degree of repellency to adult female spruce beetles. The repellency is probably a result of cool ambient and soil temperatures that retard the translocation of MSMA. This may have increased the phloem arsenic concentrations which, in turn, resulted in repellency.

449. Zogas, K. 1987. Spruce Beetle-Mallard Bay, Kachemak Bay State Park. USDA Forest Service, State and Private Forestry, Alaska Region Biological Evaluation R10-87-6. 9 p.

Abstract: 37% of the spruce have been killed or recently infested within the evaluated area since 1981. The stand structure at Mallard Bay is highly susceptible to an expanding beetle population, and given proper climatic circumstances, the spruce beetle infestation could continue to expand.

1988

450. Eglitis, A.E. 1988. Spruce Mortality in Yakutat Forelands-1987.USDA Forest Service, Forest Health Management. Biological Evaluation R10-88-2. 8 p.

Abstract: Annual beetle-caused mortality in this area has been fairly constant in 1985, and nearly 10% of live trees are currently infested. The beetles in these trees may kill additional spruces in the near future. Management alternatives are discussed.

451. Eglitis, A.E. 1988. Spruce Beetle in Glacier Bay National Park: 1987 Update. USDA Forest Service, Forest Pest Management Biological Evaluation R10-89-1. 13 p.

Abstract: Although the overall affected area did not expand substantially, there was increased spruce mortality in 1987. Spruce beetle populations remain low but will likely continue to kill slow-growing spruce trees near the developed area of the park.

452. Eglitis, A.E. and P.E. Hennon. 1988. Effects of High Water on Vegetation During Glacial Closure of Russell Fjord in 1987. USDA Forest Service, Forest Pest Management, Anchorage, AK. Biological Evaluation R10-88-4. 10 p.

Abstract: Most spruce and cottonwoods near the beach were dead following 3-4 months of submersion. Survival was high for trees submerged less than 2 months. The incidence of spruce beetles and ambrosia beetles was low, and was limited to trees submerged for the longest period of time. Understory vegetation displayed a wide range of tolerance for submersion under water.

453. Hamm, P.B., Hansen, E.M., Hennon, P.E. and C.G. Shaw III. 1988. *Pythium* Species from Forest and Muskeg Areas of Southeast Alaska. Trans. Brit. Mycol. Soc. **91**: 385-388.

Abstract: Five *Pythium* species are reported from muskeg and forested areas in southeast Alaska including locations that are remote and undisturbed. They are new reports from Alaska. *Pythium* isolates were more abundant in streams flowing from muskegs than in streams flowing through forested areas.

454. Hansen, E.M., Hamm, P.B., Hennon, P.E. and C.G. Shaw III. 1988. *Phytophthora drechsleri* from Remote Areas of Southeast Alaska. Fifth International Congress of Plant Pathology. Kyoto, Japan. Aug 20-27. Abstract. p. 181.

Abstract: *Phytophthora drechsleri* was recovered from remote, undisturbed muskeg and forested sites and from one accessible area of native vegetation in southeast Alaska. This fungus was not found to be pathogenic to Alaska yellow cedar in inoculation tests. Its presence in this habitat and its limited pathogenicity suggest that it may be indigenous to the forests of northwestern North America.

455. Hansen, E.M., Hamm, P.B., Shaw, C.G. III and P.E. Hennon. 1988. *Phytophthora drechsleri* in Remote Areas of Southeast Alaska. Trans. Brit. Mycol. Soc. **91**: 379-388.

Abstract: *Phytophthora drechsleri* was recovered from remote, undisturbed muskeg and forested sites and from one accessible area of native vegetation in southeast Alaska. This fungus was not found to be pathogenic to Alaska yellow cedar in inoculation tests. Its presence in this habitat and its limited pathogenicity suggest that it may be indigenous to the forests of northwestern North America.

456. Hard, J., Shea, P.J., and E.H. Holsten. 1988. Field Trials of Fenvalerate and Acephate to Control Spruce Bud Midge, *Dasyneura swainei* (Diptera: Cecidomyiidae). J. Ent. Soc. Brit. Columbia. **85**(1988): 40-44.

Abstract: Three concentrations each of fenvalerate and acephate were tested for efficacy against the spruce bud midge on black and white spruce in south-central Alaska in 1985. Only the highest concentration of fenvalerate (0.025%) provided significant protection.

457. Hennon, P.E. 1988. Spruce Needle Cast. USDA Forest Service. Alaska Region, Juneau, Alaska. R10-TP-12. 6 p.

Abstract: This forest pest leaflet gives an identification guide and life history of the needle cast, a description of the damage and guidelines for reducing damage caused by the needle cast.

458. Hennon, P.E. 1988. *Phoma* and Other Fungi Infecting Seed of Two Larch Species Imported From the Soviet Union. USDA Forest Service, Forest Pest Management, Juneau, AK Report R10-88-3. 6 p.

Abstract: The incidence and identity of fungi on seeds of two exotic *Larix* spp. imported from the Soviet Union was studied to determine if any of these fungi posed a threat if introduced into Alaska. The fungus of most concern, *Phoma glomerata*, was isolated from 2% of the seeds of *L. sibirica*, but is probably not a threat to native larch or other vegetation in Alaska because it is known primarily as a saprophyte and is already extensively distributed throughout the world.

459. Hennon, P.E., Hansen, E.M. and C.G. Shaw III. 1988. A Naturally Occurring Forest Decline of Abiotic Origin Affecting *Chamaecyparis nootkatensis* in Southeast Alaska. 1988 Annual Meeting of the American Phytopathological Society, San Diego, CA. Nov 13-17. Phytopathology (Abstract).

460. Hennon, P.E. and C.G. Shaw III. 1988. Hemlock Dwarf Mistletoe Demonstration Area. USDA Forest Service, Forest Pest Management, Juneau, Alaska. R10-TP5. 9 p.

Abstract: This leaflet describes a walking tour of the hemlock dwarf mistletoe demonstration area at Thorn Bay.

461. Holsten, E.H. 1988. North Shore Kenai Lake. 1988 Conventional Trap Tree Project. USDA Forest Service, State and Private Forestry, Forest Pest Management, Anchorage, AK. Biological Evaluation R10-88-2. 10 p.

Abstract: This project has demonstrated that the use of felled trap trees can reduce the incidence of spruce beetle attacks in standing timber. It appears that the use of felled trap trees reduced the number of attacks on standing spruce by a factor of 10.

462. Holsten, E.H. 1988. Spruce Budworm. USDA Forest Service, Alaska Region Leaflet R10-TP-11. 4 p.

Abstract: This forest pest leaflet gives a brief history of spruce budworm activity in Alaska, the life history of the insect, a description of the damage caused by the budworm and guidelines for reducing damage caused by this insect.

463. Holsten, E.H. and R.A. Werner. 1988. Spruce and Larch Bud Moths. USDA Forest Service, Alaska Region Anchorage, AK. Leaflet R10-TP-3. 6 p.

Abstract: This forest pest leaflet gives a brief history of the budmoth in Alaska along with a life history, damage symptoms and guidelines for reducing damage by the budmoth.

464. Loopstra, E.M., Shaw, C.G. III and R.C. Sidle. 1988. Ectomycorrhizal Inoculation Fails to Improve Performance of Sitka Spruce Seedlings Outplanted on Clearcut Sites in Southeastern Alaska. West. J. Appl. For.: 110-112.

Abstract: This paper gives results of a test of 3 fungi that were established as ectomycorrhizae on Sitka spruce seedlings. Four growing seasons after planting, seedling survival exceeded 99%. Heights and diameters varied by treatment with ectomycorrhizae and fertilization.

465. Post, K.E. and R.A. Werner. 1988. Wood Borer Distribution and Damage in Decked White Spruce Logs. North. J. Appl. For. **5**(1): 49-51.

Abstract: Populations of the white-spotted sawyer, *Monochamus scutellatus*, a cerambycid, and buprestids were higher in the clearcut area where bark of decked logs contained less moisture. Two other cerambycids, *Tetropium* spp., were more abundant in the partially shaded, thinned stand. The white-spotted sawyer was more abundant on the south sides and the buprestids were more common on the top sides of decked logs in the clearcut area. The recommendation was made to locate log decks in shaded areas away from the cutting area.

466. Schulz, B. 1988. Spider Bites and Implications for Alaska. Office Report. USDA Forest Service, Forest Health Management, Region 10. 9 p.

Abstract: This report reviews what is known about medically significant spider bites in North America, the species that may be encountered in Alaska and the diagnosis, treatment and prevention of spider bites.

467. Shaw, C.G. III, Hennon, P.E. and E.M. Hansen. 1988. Decline and Mortality of *Chamaecyparis nootkatensis* in Southeast Alaska. Fifth International Congress of Plant Pathology. Kyoto, Japan. Aug. 20-27. Abstract. P. 361.

468. Shaw, C.G. III and E.M. Loopstra. 1988. Identification and Pathogenicity of Some Alaskan Isolates of *Armillaria.* Phytopath. **78**: 971-974.

Abstract: Twenty-six isolates of *Armillaria* spp. were paired in culture with haploid tester strains of known NABS of *Armillaria*. Two were identified from material available. None of the isolates tested on Alaska-cedar infected any seedlings, however, on Sitka spruce they were pathogenic to varying degrees.

469. U.S.D.A. Forest Service. 1988. Forest Insect and Disease Conditions in Alaska-1988. USDA Forest Service, Alaska Region. Anchorage, AK. R10-88-C-1. 16 p.

Abstract: 387,000 acres of spruce forest were infested by spruce beetle. *Ips* beetles and hardwood defoliator activity in interior Alaska declined this year. Black-headed budworm populations were high in Prince William Sound. 145,000 acres of defoliation were observed. Forest insect problems were relatively minor in Southeast Alaska in 1988. 340,000 acres of cedar decline have been observed in southeast Alaska.

470. U.S.D.A. Forest Service. 1988. Forest Insect and Disease Conditions in the United States, 1987, Alaska Region--Diseases. USDA Forest Service, Forest Pest Management. Washington, DC. p. 90-93.

Abstract: A table of Alaskan diseases active in 1987 is presented in this annual, national report.

471. Werner, R.A. 1988. Recommendations for Suppression of an *Ips perturbatus* Outbreak in Interior Alaska Using Integrated Control. IUFRO Working Party, 3-8 July 1988, Vancouver, BC., 3-8 July 1988.

Abstract: Populations of *Ips perturbatus* were reduced in stands of upland white spruce in interior Alaska using several integrated pest management strategies such as conventional and lethal trap trees, baited funnel traps and preventative and remedial chemical treatments.

472. Werner, R.A., Hard, J. and E.H. Holsten. 1988. The Development of Management Strategies to Reduce the Impact of the Spruce Beetle in South-Central Alaska. The Northwest Environmental Journal **4**: 319-328.

Abstract: These notes and comments describe a wide variety of research projects recently completed or underway on forest pest research and management in Alaska. The research includes insecticide tests against the spruce beetle, the development of a rudimentary stand hazard-ranking model, pheromone research, and work with silvicides to create trap trees in uninfested spruce stands.

1989

473. Dyrness, C.T., Van Cleve, K. and J.D. Levison. 1989. The Effect of Wildfire on Soil Chemistry in Four Forest Types in Interior Alaska. Can. J. of For. Res. **19**: 1389-1396.

Abstract: This paper reports the results of a study to look into the immediate postfire chemistry of the forest floor and surface 5 cm of mineral soil in typical examples of lowland and upland forest types. These types are typical of those occurring in interior Alaska.

474. Eglitis, A.E. 1989. Permanent Plots for Monitoring Spruce Mortality in the Yakutat Forelands. USDA Forest Service, Forest Pest Management, Alaska Region Technical Report R10-89-16. 17 p.

Abstract: This report describes permanent plot establishment and gives current spruce beetle population levels in the Yakutat Forelands. Plots were established in areas where over 20% of the spruces have died. Live spruce beetle broods were found in 4% of the plot trees, indicating that the potential exists for additional spruce mortality in the future. Management alternatives are presented.

475. Eriksen, K. 1989. An Evaluation of Public Knowledge About Spruce Beetle Infestation on the Kenai Peninsula. Unpub. 103 p.

Abstract: The purpose of this study was to understand what the public already knew about the spruce beetle problem, to find out how they would like to get further information, and to recommend a public relations and education campaign based on the results of the survey. The results showed that 91% of the respondents felt there was a problem, that they felt strongly about using preventive methods of control, and that they were strongly in favor of using pesticides as one of those methods.

476. Hard, J.S. 1989. Sequence of Trees Attacked By Spruce Beetles in a Mature Even-aged Spruce Stand in South-central Alaska. Northwest Science **63**(1): 5-12.

Abstract: Initially attacked trees ("focus" trees) were apparently moisture stressed due to extensively frozen soils and rapidly warming temperatures. Continued warm weather caused many more spruce beetles to emerge from hibernation and soils to thaw. Some newly emerged beetles attracted by odors from beetles already established in focus trees attacked the focus trees, but many attacked nearby unstressed trees ("recipient" trees). As a result, all focus trees and many recipient trees within 10m of the focus trees were killed. Furthermore, many recipient trees weakened by unsuccessful attacks were reattacked the following season.

477. Harris, A.S. 1989. Wind in the Forests of Southeast Alaska and Guides for Reducing Damage. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. Gen. Tech. Rep. PNW-GTR-244. 63 p.

Abstract: This paper is a review of wind conditions and blowdown in the forests of southeast Alaska based on the literature and the author's experience. Storm winds resulting in damage to forest stands are described, and some ecological and management considerations of wind that are a concern to forest managers are reviewed.

478. Holsten, E.H. 1989. North Shore Kenai Lake-Efficacy of a Fuel Oil Remedial Treatment Against Spruce Beetle. USDA Forest Service, Forest Pest Management Technical Report R10-89-17. 6 p.

Abstract: The fuel oil treatment at Kenai Lake probably reduced spruce beetle brood by 65%. The use of fuel oil appears to be an effective measure for destroying spruce beetle brood when other measures such as debarking, burning, or processing infested trap trees is not feasible due to accessibility, economic or environmental constraints.

479. Julin, K. R., and W.A. Farr. 1989. Stem Fluting of Western Hemlock in Southeast Alaska. USDA Forest Service, Pacific Northwest Research Station Pamphlet. 4 p.

Abstract: This forest pest leaflet describes fluting, discusses its occurrence and causes and offers guidelines for reducing fluting through silvicultural manipulation.

480. Miller, M.C., McGregor, M., Dahlsten, D.L., Whitmore, M.C., Gregoire, J.C., Jia-xi, C., Werner, R.A., Chow, T. and B. Tovar. 1989. Responses of Insect Associates of Allied Species to *Dendroctonus* and *Ips* (Coleoptera: Scolytidae) Aggregation Pheromones. In, Potential for Biological Control of *Dendroctonus* and *Ips* Bark Beetles. Pp 213-230. D.L. Kulhavy; M.C. Miller, eds. Stephen F. Austin State University, Nacogdoches, TX. 255 p.

481. Putman, W.E. 1989. Lower Yukon Spruce Beetle Epidemic Report: Data Compilation. Tanana Chiefs Conference, Inc., Forestry Dept. Fairbanks, AK. 4 p.

Abstract: Data sheets from Tanana Chief's Conference 1988 allotment inventory were examined for information relating to bark beetle activity. 7 of the 19 stands nearest the bark beetle infestation had actual tallies of bark beetle activity.

482. Shaw, C.G. III. 1989. Root Diseases Threat Minimal in Young Stands of Western Hemlock and Sitka Spruce in Southeastern Alaska. Plant Dis. **73**: 573-577.

Abstract: This study concludes that there is little likelihood that root disease fungi will damage young, managed stands of Sitka spruce and western hemlock within the current 90- to 120-yr rotation.

483. Shaw, C.G. III. 1989. Is *Heterobasidion annosum* Poorly Adapted to Incite Disease in Cool, Wet Environments? In: Proc. Symposium on *Heterobasidion annosum*, Pacific Grove, CA, April 1989. USDA Forest Service, Pacific SW Forest and Range Exp. Stn., Gen.Tech. Rept. PSW-116: 101-104.

Abstract: In general, frequent rains reduce the population of airborne spores and wash many of them from stump surfaces. Cool temperatures reduce evaporation of water that helps to maintain high moisture content in stumps that hinders development of *H. annosum*. This cool, wet condition also lowers overall metabolic rates and reduces the availability of oxygen, which further inhibits infection by, and survival of this fungus in stumps.

484. Shaw, C.G. III. 1989. Simulation of Impacts of *Annosus* Root Disease with the Western Root Disease Model. In: Proc. The Symposium on Research and Management of *Annosus* Root Disease in Western North America. Monterey, Calif. April 18-21, 1989. 11 p.

Abstract: The Western Root Disease Model as it currently exists is described. The simulations indicate that with no action, or with continued improper management, *Annosus* root disease will severely reduce timber yields in affected stands of true fir. This exercise provides a framework from which to build an *Annosus* variant of the Western Root Disease Model.

485. U.S.D.A. Forest Service. 1989. Forest Insect and Disease Conditions in Alaska-1989. R10-89-C-1. Anchorage, AK. USDA Forest Service, Alaska Region. 20 p.

Abstract: Spruce bark beetle activity decreased throughout Alaska in 1989. Hardwood defoliator activity decreased in interior Alaska for the fourth consecutive year. Black-headed budworm populations decreased in Prince William Sound. Forest insect problems were relatively minor in southeast Alaska in 1989. In southeast Alaska, cedar decline was observed on 390,000 acres. Wood decays, decline of Alaska-yellow cedar, and hemlock dwarf mistletoe persist as the most important forest diseases in Alaska. More than 390,000 acres of cedar decline have been detected throughout southeast Alaska. Heartrot and buttrot fungi caused significant cull in all tree species in Alaska. Spruce needle cast and most other foliar pathogens occurred at low to moderate levels in 1989.

486. Zogas, K. 1989. Re-Evaluation of Daconate and Silvisar for Lethal Trap Trees in Alaska. Nov. 1989. USDA Forest Service, Forest Pest Management, Alaska Region. Technical Report R10-89-17. 11 p.

Abstract: There were significantly fewer and shorter galleries in the Daconate-treated trees than the check trees in the Mile 34 study area. A 75.6% reduction in living larvae in the Daconate-treated trees was reported. Although this reduction is significant, it represents the lowest progeny reduction of any previous Daconate study in Alaska.

1990

487. Anon. 1990. Spruce Bark Beetles: Control Options for the Home or Lot Owner. Cooperative Extension Service, University of Alaska Fairbanks & USDA Cooperating. 4 p.

Abstract: This handout for the homeowner lists suggestions for reducing the possibility of spruce beetle infestation and control options for those with existing problems. A flow chart to assess spruce beetle damage is presented.

488. Gray, D.R., Holsten. E.H. and M. Pascuzzo. 1990. Effects of Semiochemical Baiting on the Attractiveness of Felled and Unfelled Lethal Trap Trees for Spruce Beetle (Coleoptera:Scolytidae) Management in Areas of High and Low Beetle Populations. Can. Ent **122**: 373-379.

Abstract: Tree felling had a significant effect on attack density. Semiochemical baiting did not have a significant effect on within-tree attack distribution in Alaska. The felled treatment captured more beetles than the non-felled treatment, but only in the absence of a semiochemical bait in Alaska. The report concludes that effective spruce beetle management with MSMA-treated trees requires tree-felling, and that beetle capture can be improved with the use of a semiochemical bait.

489. Hennon, P.E. 1990. Fungi on *Chamaecyparis nootkatensis.* Mycologia **82**(1): 59-66.

Abstract: Twenty taxa of fungi were isolated and 33 collected to help determine if any could be the primary cause of the extensive decline and mortality of Alaska yellow cedar. None of these appear to be the primary cause of the extensive decline and mortality.

490. Hennon, P.E. 1990. Sporulation of *Lirula macrospora* and Symptom Development on Sitka Spruce in Southeast Alaska. Plant Disease **74**: 316-319.

Abstract: Ascospore release was initiated about the time that spruce buds broke. Peak sporulation occurred when spruce shoots were about 50% (in 1987) and 85% (in 1988) fully elongated. Once shoots reached their maximum length and needles began to appear dark green and feel stiff, sporulation had nearly ceased.

491. Hennon, P.E. 1990. Climate Change, Air Pollution, Forest, and Pest Interactions. Proceedings of Thirty-seventh Western International Forest Disease Work Conference. Bend, OR. Sep. 12-15, 1989. Bend, OR. 46 p.

Abstract: This model attempts to simplify the possible interactions among humans, pests, climate and forests. Climate change and pollution have been suggested as possible causal factors in some of the numerous forest declines with unsolved etiologies. Several forest declines are apparently independent of humans and may have been triggered by climate change.

492. Hennon, P.E. 1990. Etiologies of Forest Declines in Western North America. p.154-159. In: Proceedings of Society of American Foresters: Are Forests the Answer? Washington, D.C. July 29-August 1, 1990. Bethesda, MD. 614 p.

Abstract: This abstract describes the three most extensively distributed forest declines in North America. Biotic factors are probably incidental but specific site factors are strongly associated with all three declines.

493. Hennon, P.E. 1990. Pathogenicity of *Phoma* sp. Isolated From Seed of Larch Imported From the Soviet Union. USDA Forest Service, Forest Pest Management Report R10-90-1. Juneau, AK. 3 p.

Abstract: The fungus lacked pathogenicity in spore suspension sprays and stem inoculations of four larch species, except that necroyic lesions developed in several stem inoculations on *L. laricina*. No seedling died from inoculation. Inoculation by spore suspension caused no injury to seedlings. *Phoma* showed no capability for inciting disease on native larch in Alaska.

494. Hennon, P.E. 1990. Alaska Region--Diseases. p. 100-102. In: Forest Insect and Disease Conditions in the United States, 1989. USDA Forest Service. Forest Pest Management. Washington, DC. 112 p.

Abstract: Wood decays, decline of Alaska-yellow cedar, and hemlock dwarf mistletoe persist as the most important forest diseases in Alaska. More than 390,000 acres of cedar decline have been detected throughout southeast Alaska. Heartrot and buttrot fungi caused significant cull in all tree species in Alaska. Spruce needle cast and most other foliar pathogens occurred at low to moderate levels in 1989.

495. Hennon, P.E. 1990. Wounding on Residual Sitka Spruce and Western Hemlock Remaining After Thinning on Prince of Wales Island, Alaska. USDA Forest Service, State and Private Forestry, Juneau, AK. Forest Pest Management Report R10-90-2. 9 p.

Abstract: This study was conducted to determine the incidence of wounding from logging activities. Frequency of wounding was similar among the three sites: 61% of spruce and 33% of hemlock had one or more scars. Most wounds were on the lower 16 feet of the bole. Few trees had more than 30% of their bole's circumference wounded, suggesting that outright mortality due to bole scars should be rare.

496. Hennon, P.E. 1990. Establishment, Growth, and Shoot Blight of Planted Alaska Yellow-cedar Seedlings on Etolin Island, Alaska. USDA Forest Service, State and Private Forestry, Juneau, AK. Forest Pest Management Report R10-90-10. 10 p.

497. Hennon, P.E., Hansen, E.M. and C.G. Shaw III. 1990. Causes of Basal Scars on *Chamaecyparis nootkaensis* in Southeast Alaska. Northwest Science **64**(2): 45-54.

Abstract: The study concludes that brown bears and, to a much lesser extent, humans are responsible for the numerous basal scars on Alaska yellow-cedar on Chichagof and Baranof Islands. These basal scars were not consistently associated with dying yellow-cedars and are not the primary cause of the extensive decline and mortality of this species.

498. Hennon, P.E., Hansen, E.M. and C.G. Shaw III. 1990. Dynamics of Decline and Mortality of *Chamaecyparis nootkatensis* in Southeast Alaska. Can. J. Bot. **68**: 651-662.

Abstract: The decline does not appear to have spread to new sites since it's onset. The spread of mortality is along a specific, preexisting ecological gradient. These results, and the apparent lack of any site-to-site spread in the last 100 years, suggest that cedar-decline is not caused by some biotic agent.

499. Hennon, P.E., Shaw, C.G. III and E.M. Hansen. 1990. Dating Decline and Mortality of *Chamaecyparis nootkatensis* in Southeast Alaska. Forest Science **36**: 502-515.

Abstract: Aerial photographs, the rope tree method of dating cedar death, and historical references all support the suggestion that the onset of extensive mortality of Alaska yellow cedar began before the turn of the century (about 1880), perhaps too early for some forms of human involvement, particularly anthropogenic pollutants, to be considered directly causal.

500. Hennon, P.E., Shaw, C.G. III and E.M. Hansen. 1990. *Chamaecyparis nootkatensis*: The Ecology and Epidemiology of its Decline in Southeast Alaska. Proceedings of V International Congress of Ecology. Aug. 23-30, 1990. Yokohama, Japan. Abstract. 126 p.

Abstract: Remote, unmanaged forests of Alaska yellow cedar have been dying on over 200,000 ha. throughout southeast Alaska since about 1880. Natural abiotic factors likely incited this extensive decline. Its long duration and remote location suggest it is independent of direct human involvement.

501. Hennon, P.E., Shaw, C.G. III and E.M. Hansen. 1990. A Synthesis From Studies on Decline of *Chamaecyparis nootkatensis*. Proceedings of the American Phytopathological Society. Grand Rapids, Michigan. Aug 12-16, 1990. Abstract.

Abstract: This decline, which covers approximately 200,000 ha., began circa 1880. The decline is associated with poorly drained soils and there is no evidence of spread from one site to another. Symptoms of the decline include dead fine roots, necrotic lesions on coarse roots and boles, slowed radial growth, and thinning or yellowing crowns. Over 50 taxa of fungi, nematodes and bark beetles are associated with dying cedars, but none can kill healthy trees. Natural abiotic factors are likely the primary cause of this extensive forest decline.

502. Hennon, P.E., Shaw, C.G. III and E.M. Hansen. 1990. Symptoms and Fungal Associations of Declining. *Chamaecyparis nootkatensis* in Southeast Alaska. Plant disease **74**: 267-273

Abstract: The roots of 35 dying and healthy Alaska yellow-cedar trees were excavated to study symptoms and organisms associated with decline and death. Of 1,864 isolations, 1,047 from both healthy and dying cedars yielded fungi. When cedar seedlings were inoculated with the 11 most commonly isolated fungi, none killed seedlings. These results suggest that pathogens are not the primary cause of Alaska yellow-cedar decline.

503. Holsten, E.H. 1990. Alaska Region--Insects. p. 97-99. In: Forest Insect and Disease Conditions in the United States, 1989. USDA Forest Service, Forest Pest Management. Washington, DC. 112 p.

Abstract: This report is in the form of a table presenting insects impacting Alaskan forests, their hosts, general location of activity and general remarks.

504. Holsten, E.H. 1990. Spruce Beetle Activity in Alaska, 1920-1989. USDA Forest Service, Alaska Region Technical Report R10-90-18. 28 p.

Abstract: This report gives the history of spruce beetle activity in Alaska from 1920 - 1989. Maps are included, as is an extensive Alaska spruce beetle bibliography.

505. Holsten, E.H. 1990. Spruce Bark Beetle: Homer Electric Assoc. and Alaska Energy Authority R.O.W. Clearing Program. Oct. 1990. Forest Pest Management Report. Biological Evaluation R10-90-3. 23 p.

Abstract: This report details a number of site visits along the Homer Electric right-of-way to assess current and potential spruce beetle problems. The report concludes that, for the most part, clearing debris along the right-of-way is no longer a threat as spruce beetle breeding material. The majority of the material is more than two years old; too old to be of use as breeding material. An increase of wind thrown trees is expected along the edges of the transmission corridor.

506. Holsten, E.H. 1990. Spruce Bark Beetle: Tern Lake, Quartz Creek and Trail River Campground; Chugach National Forest. Aug 1990.USDA Forest Service, Forest Pest Management Report. Biological Evaluation R10-90-6. 17 p.

Abstract: This biological evaluation presents the evaluations of three campgrounds on the Chugach National Forest as to the presence and severity of spruce beetle activity. Recommendations and management alternatives are presented.

507. Holsten, E.H. and Hard, J.S. and P.J. Shea. 1990. Summit Lake Pilot Study: Standing Lethal Trap Tree. USDA Forest Service, State and Private Forestry, Forest Pest Management.Technical Report R10-90-19. 8 p.

Abstract: There were significantly fewer new attacks in the treated plots than in the 10 untreated check plots (18% vs. 33%). Not one of the carbaryl treated trees was successfully attacked. It appears that the use of standing lethal trap trees at a density of one trap tree cluster per acre can significantly reduce the number of new attacks but cannot effectively “trap-out” beetle populations when those populations are high.

508. Holsten, E. H. and G. Lessard. 1990. Spruce Beetle Silviculture Demonstration Area. Chugach National Forest, Alaska. Nov. 1990.USDA Forest Service, Forest Pest Management Report. Biological Evaluation R10-90-9. 12 p.

Abstract: The purpose of the silvicultural demonstration area is to demonstrate multi-resource silvicultural practices in mixed spruce and hardwood stands. A total of 7,536 infested trees were marked on approximately 100 acres (75 trees/acre). More than 80% of all spruce 8" in diameter or greater have been attacked. If suppression measures are not taken, the remaining susceptible spruce will probably be killed within the next two years thus reducing the value of the area as a silvicultural demonstration area.

509. Holsten, E.H., Sorenson, F. and B.S. Blitz. 1990. Clearwing Birch Borers. USDA Forest Service, Alaska Region Leaflet R10-TP-19. 7 p.

Abstract: This forest pest leaflet describes the life history of the clearwing birch borer along with methods to assess the damage caused by this insect and offers control measures.

510. Holsten, E.H. and R.A. Werner. 1990. Comparison of White, Sitka, and Lutz Spruce as Hosts of the Spruce Beetle in Alaska. Can. J. For. Res. **20**: 292-297.

Abstract: When white spruce is infested with spruce beetle broods, more beetles are produced than when Lutz and Sitka spruce are infested. Host suitability may be as important as host susceptibility and weather conditions in the development of spruce beetle outbreaks in south central Alaska.

511. Klinger, L.F., Elias, S.A., Behan-Pelletier, V.M. and N.E. Williams. 1990. The Bog Climax Hypothesis: Fossil Arthropod and Stratigraphic Evidence in Peat Sections from Southeast Alaska, USA. Holarctic Ecology **13**: 72-80.

Abstract: Results indicate at least three major landscape types have dominated since deglaciation: deciduous woodland, coniferous woodland, and peatland. There is further evidence for directional changes from woodland to peatland. There is no evidence for peatland to woodland transitions in the absence of large-scale disturbance.

512. Lessard, G. 1990. Hazard Tree Evaluation Bird Creek Campground. Alaska Division of Parks and Outdoor Recreation. Nov. 1990. USDA Forest Service, Forest Pest Management Report. Biological Evaluation R-10-90-4. 9 p.

Abstract: A technique to assess tree hazard specific to forested campgrounds in south-central Alaska is currently under development. The purpose of this survey was to field test this technique and to identify hazard trees that have the potential to fail and cause damage to persons or property within the campground.

513. Lessard, G. 1990. Seed and Cone Insect Assessment in the Cooper Landing Area, Kenai Peninsula, Alaska. Nov. 1990. USDA Forest Service, Forest Pest Management Report. Biological Evaluation R10-90-10. 5 p.

Abstract: Percent undamaged seed ranged from 40% near Sunrise to 83% at Kenai Bend. For the entire survey area, about 46% of the seed was visibly affected by no more than two insects.

514. MacCracken, J.G. and L.A. Viereck. 1990. Browse Regrowth and Use by Moose After Fire in Interior Alaska. Northwest Science **64**(1): 11-18.

Abstract: The purpose of this study was to estimate browse regrowth and use by moose two months to two years after fire in interior Alaska. A second objective was to examine yearly trends in browse nutrient composition following the fire, as well as differences among species.

515. Newton, M., and E.C. Cole. 1990. Vegetation Management in the Cooper Landing Area. Chugach National Forest. Aug. 1990. USDA Forest Service, Forest Pest Management Report. Biological Evaluation R10-90-5. 18 p.

Abstract: This biological evaluation discusses at length, management options for dealing with the impacts of the large-scale spruce bark beetle outbreak that has run its course in the Cooper Landing area. Identification of the existing problems is followed by a discussion of management options to mitigate those problems.

516. Packee, E.C. 1990. White Spruce Regeneration on a Blade-Scarified Alaskan Loess Soil. Northern J. of App. For. **7**: 121-123.

Abstract: Following hardwood removal from a mixed spruce-birch-aspen forest stand, portions of the stand were blade-scarified to encourage natural white spruce regeneration. Six years after treatment the number and height of white spruce seedlings were significantly greater on scarified than on unscarified plots. Exposure of mineral soil and removal of grass competition are essential for the satisfactory natural regeneration of white spruce.

517. Phillips, S. 1990. Memo: Field Report of Insect Problems Associated with the May 10, 1989 Ninilchik Burn, Kenai Peninsula. Alaska Division of Forestry. 2 p.

Abstract: This memo details the results of a site visit to the Oilwell Road area to assess post fire insect problems. The memo concludes that the timbered stands adjacent to the burn area are at high risk of spruce beetle infestations. The report goes on to recommend remedial actions intended to minimize potential insect problems.

518. Phillips, S. 1990. Memo: Field Report on Spruce Beetle/Ips Beetle Infestation of Klukwan Forest Products Log Decks, Ninilchik, Kenai Peninsula. Alaska Division of Forestry. 2 p.

Abstract: This memo describes site visits to three areas of decked logs in the Oilwell Road area of the Kenai Peninsula. These sites were inspected to assess current and expected infestations of these log decks. Recommendations for action are presented.

519. Phillips, S. 1990. Memo: Field Report on Insects Associated with the 5/26/90 Teklanika Fire. Alaska Division of Forestry. 2 p.

Abstract: This report details site visits to the area of the 1990 Teklanika Fire. The residual timber is assessed for current and potential insect problems. Recommendations for remedial action to minimize potential insect problems are presented.

520. Reynolds, K.M. 1990. Preliminary Classification of Forest Vegetation of the Kenai Peninsula, Alaska. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. Res. Pap. PNW-RP-424. 67 p.

Abstract: Brief descriptions are presented for the 11 recognized communities with a discussion of their relation to basic physiographic and edaphic characteristics.

521. Reynolds, K.M. 1990. Response of Three Southcentral Alaskan Spruce Species to Inoculation with Local Blue-stain Isolates. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. 19 p. Draft of unpublished paper.

Abstract: Results from this study indicate that local isolates of *L. abietinum* are at least weakly pathogenic to Lutz, Sitka, and white spruce in south-central Alaska.

522. U.S.D.A. Forest Service. 1990. Forest Insect and Disease Conditions in Alaska-1990. USDA Forest Service, Alaska Region, Anchorage, AK. R10-90-C-1. 25 p.

Abstract: Forest insect populations and related damage increased significantly in 1990. Spruce beetle is currently infesting 232,406 acres of spruce forests in south-central and interior Alaska and in the Copper River Valley. Hardwood defoliator activity increased throughout interior Alaska and Prince William Sound. Needle rust infected 17,000 acres of spruce in interior Alaska. Forest insect activity was relatively light in southeast Alaska. Cedar decline was observed on 465,000 acres of cedar in southeast Alaska.

523. Yarie, J., Van Cleve, K. and R. Schlentner. 1990. Interaction Between Moisture, Nutrients and Growth of White Spruce in Interior Alaska. Forest Ecology and Management **30**: 73-89.

Abstract: Results indicate that thinning is necessary to obtain a growth response to fertilizer applied at the rate of 111 kg nitrogen ha^{-1}. The response to fertilization after fertilization ended lasted for 4 years in plots thinned to 800 stems per ha^{-1}, while a significant response continued for only 2 years in plots thinned to 1600 stems per $ha^{-1.}$

524. Youngblood, A.P. 1990. Effect of Shelterwood Removal Methods on Established Regeneration in an Alaska White

Spruce Stand. Can. J. of For. Res. **20**: 1378-1381.

Abstract: Almost three times more mortality was associated with rubber-tired ground skidding than with skyline cable yarding. Seedlings ranging in height from 0.4 to 1.0 m generally received less damage or had lower mortality rates from cable yarding than did shorter or taller seedlings. Snowpack disturbance and percentage of seedling mortality were positively correlated.

525. Zasada, J. 1990. Developing Silvicultural Alternatives for the Boreal Forest: An Alaskan Perspective on Regeneration of White Spruce. Forest Industry Lecture Series, Forestry Program, Faculty of Agriculture and Forestry, University of Alberta, 7 November 1990. Forest Industry Lecture No. 25. 24 p.

Abstract: This lecture describes the research conducted in Alaska over about a 20-year period regarding the regeneration of white spruce and the development and testing of alternatives for natural and artificial regeneration.

1991

526. Burnside, R.E. 1991. Spruce Beetle (*Dendroctonus rufipennis* Kirby) Occurrence on Seldovia Native Association Land/Timber Trading Company Timber in Kachemak Bay State Park. State of Alaska, Dept. of Natural Resources, Division of Forestry. Technical Report. 4 p.

Abstract: This preliminary report summarizes what is currently known about the spruce bark beetle in the Kachemak Bay area and vicinity based on prior aerial surveys and biological evaluations in conjunction with ongoing survey and evaluation work projects.

527. Burnside, R.E. 1991. Letter: Information to Kachemak Bay Citizens Coalition re: Spruce Beetle Population Dynamics and Recent Spruce Beetle Damage Trends Within and Adjacent to Kachemak Bay State Park, Southern Kenai Peninsula. Personal correspondence. 5 p.

Abstract: This letter to Ann Wieland of the Kachemak Bay Citizens Coalition updates the spruce beetle situation in Kachemak Bay State Park and adjacent lands. Background information regarding spruce beetle on the Kenai Peninsula is offered as well as a discussion of spruce beetle population dynamics.

528. Burnside, R.E. 1991. Falls Creek Trap Tree Sampling Study-September 16-17, 1991. State of Alaska, Dept. of Natural Resources, Division of Forestry File No. 9-3185. 10 p.

Abstract: A sampling study was initiated in 1991 in an area near Clam Gulch on the Kenai Peninsula to determine relative numbers of spruce beetle present in down spruce trees. The figures included demonstrate the potential for downed spruce to attract spruce beetles and enhance brood development compared to standing live trees. It also demonstrates the effectiveness of trap trees as a management tool to suppress beetle populations and as a management strategy to beetle-proof stands with endemic beetle populations.

529. Cooperative Extension Service. 1991. Spruce Bark Beetles: Control Options for the Home or Lot Owner. Cooperative Extension Service, University of Alaska, Fairbanks, Alaska and USDA Forest Service. Pamphlet. 4 p.

Abstract: A pamphlet written for the homeowner that presents suggestions for reducing the possibility of spruce beetle infestation, details how to recognize spruce beetle damage and recommends control options.

530. Daniel, T.C., Orland, B., Hetherington, J. and J.L. Paschke. 1991. Public Perception and Attitudes Regarding Spruce Bark Beetle Damage to Forest Resources on the Chugach National Forest, Alaska. Final Report Prepared for: USDA Forest Service, Forest Pest Management, R10. 35 p.

Abstract: Reported here are the results of an assessment of perceptually preferred forest conditions and acceptable forest management policies as judged by residents and visitors in the affected area. Computer visual simulations were employed to depict a range of forest conditions projected to occur over the next 50 years as a result of the spruce bark beetle infestation. Conditions expected to result from alternative forest management actions were also simulated for comparison.

531. Deal, R.L., Oliver, C.D. and B.T. Bormann. 1991. Reconstruction of Mixed Hemlock-Spruce Stands in Coastal Southeast Alaska. Can. J. of For. Res. **21**: 643-654.

Abstract: This study investigates the origin of selected mature and old-growth hemlock-spruce stands in southeast Alaska to determine if they can develop after major disturbances, minor disturbances, or both; examines rooting media for hemlock and spruce to determine if specific microsites are important for regeneration; and examines regeneration and subsequent growth patterns that allow Sitka spruce and western hemlock to coexist in these stands.

532. Eriksen, K. 1991. An Evaluation of Public Knowledge About Spruce Beetle Infestation on the Kenai Peninsula. Research Summary Prepared under RSA for Alaska Division of Forestry. 43 p.

Abstract: The purpose of this project was to determine the level of public knowledge and concern about the spruce beetle as well as knowledge about related control problems, and to create a plan to increase that knowledge. It concludes that people already affected know how serious the problem is and are likely to be open to suggestions about control methods because they are concerned. Those in unaffected areas are less concerned and are likely to be more difficult to educate and to motivate to take action.

533. Hard, J.S. and E.H. Holsten. 1991. Spruce Beetle Attacks and Surviving Brood in Limbed and Bucked Spruce in South-Central Alaska. Northwest Sci. **65**: 205-212.

Abstract: In this study, bucking of stems into short lengths, a costly treatment that failed to reduce bark moisture content, also failed to reduce beetle attack densities or numbers of brood that developed into adults.

534. Hennon, P.E. 1991. Survival, Growth, Grazing, and Shoot Blight of Planted Seedlings of Alaska Yellow-Cedar in Southeast Alaska. USDA Forest Service, Alaska Region, Forest Pest Management. Juneau, AK. Gen. Tech. Rep. No. R10-90-20. 14 p.

Abstract: Seedling survival and growth were best on sites with adequate light exposure and soil moisture drainage, but were poor on sites with heavy shade or with impeded drainage. Burned clearcut sites supported the best survival, height growth and diameter growth among site types. On productive sites, grazed seedlings maintain rapid diameter growth and appeared capable of rapid height growth unless they are grazed in successive years. Shoot blight was common on sites where natural vegetative reproduction of Alaska yellow-cedar was present nearby.

535. Hennon, P.E. and E.M. Loopstra. 1991. Persistence of Western Hemlock and Western Red-Cedar Trees 38 Years After Girdling at Cat Island in Southeast Alaska. USDA Forest Service, Pacific Northwest Research Station, Research Note PNW-RN-507. 5 p.

Abstract: Dead western hemlock and western redcedar trees were examined 38 years after intentional girdling to describe their condition as wildlife habitat. Snags of neither species had cavities excavated by animals. Dead hanging bark of all three tree species may provide roosting habitat for bats.

536. Holsten, E.H., Thier, R. and J.M. Schmid. 1991. The Spruce Beetle. FI&DL No. 127. USDA Forest Service. 12 p.

Abstract: This forest pest leaflet offers a brief history of spruce beetle activity in Alaska, a description of its hosts, the life history of the beetle, and evidence of infestation. Stand conditions conducive to infestations are discussed as well as management alternatives for mitigating impacts associated with spruce beetle activity.

537. Kruse, J. 1991. Developing a Public Consensus on the Management of Spruce Beetles on the Kenai Peninsula. A Report Prepared for the Division of Forestry, Alaska Department of Natural Resources. 36 p.

Abstract: This study reports the results of a survey conducted in south central Alaska to gather responses to different management alternatives, and what management techniques they would like to see applied to State forestlands on the peninsula. The survey covers both the general public and private landowners.

538. Kruse, J. and R. Pelz. 1991. Research Summary: Managing Beetle-Killed Spruce on the Kenai Peninsula. Instit. of Soc. & Econ. Res. Univ. of Alaska, Anchorage. RS-51. 4 p.

Abstract: This report gives the results of a telephone survey of 400 Kenai Peninsula households and 100 Anchorage households regarding management of the 700,000 acres of spruce beetle-impacted lands on the Kenai Peninsula. This represents about 35% of the forested lands on the peninsula.

539. Mask, R.A. 1991. Investigation of Spruce Beetle and Spruce Budworm Activity Near Haines, Alaska. Feb 1991. USDA Forest Service, Forest Pest Management Report. Biological Evaluation R10-90-7. 9 p.

Abstract: Investigation of spruce beetle activity within the sale area revealed the presence of right-of-way logs and standing timber infested in 1989 and 1990. The current timber harvesting alone did not cause the noted beetle activity. The spruce budworm infestation in this area had been bordering on epidemic levels, but now appears to be declining.

540. Reynolds, K.M., and J.S. Hard. 1991. Risk and Hazard of Spruce Beetle Attack in Unmanaged Stands on the Kenai Peninsula, Alaska Under Epidemic Conditions. For. Ecol. and Mgmt. **43**: 137-151.

Abstract: Forest community type was the most important variable determining risk of a spruce beetle outbreak. High-hazard stands would be at high risk early in an epidemic cycle. Consequently, management of high-hazard stands could be an effective means of regulating beetle populations and reducing the risk of an epidemic.

541. Richardson, S. 1991. Spruce Beetle Pheromone Research in Alaska. In: Forestry Research West. USDA Forest Service. November, 1991. 22 p.

Abstract: This article presents a general description of current pheromone research involving spruce beetle in Alaska. A discussion of the spruce beetle problem is offered as well as a five-year plan for continuing research.

542. Schulz-Blitz, B. 1991. Vegetation Management Plan: Bird Creek Campground. USDA Forest Service, Alaska Region Biological Evaluation R10-MB-162. 9 p.

Abstract: The major stress factors acting on campground vegetation include spruce bark beetle infestations, root and butt rots, and pressure from campground visitor activities. Visual resources can be enhanced by removing some of the deciduous trees along the Inlet side of the bike path. Encourage natural regeneration where it occurs as well as transplanting young trees in openings created when older trees must be removed.

543. Shaw, C.G. III, and P.E. Hennon. 1991. Spread, Intensification, and Upward Advance of Dwarf Mistletoe in Thinned, Young Stands of Western Hemlock in Southeast Alaska. Plant Dis. **75**: 363-367.

Abstract: The probability of a tree being infected was significantly greater if the tree was in the understory before logging rather than having become established in the understory after logging. The study concludes that there is little likelihood of damaging disease levels developing in thinned stands on high quality sites within the planned 90- to 120-year rotation.

544. Shaw, C.G. III, and E.M. Loopstra. 1991. Development of Dwarf Mistletoe Infections on Inoculated Western Hemlock Trees in Southeast Alaska. Northwest Sci. **65**: 48-52.

Abstract: Mature seeds of hemlock dwarf mistletoe were placed on needles and twigs of young western hemlock trees growing on a clearcut in Juneau, Alaska to provide information on seed retention and germination, infection development and survival, and generation time. The study concludes that the lack of seed production from well established infections and the death of numerous infections through natural pruning of lower crown branches could explain the limited number of dwarf mistletoe infections that develop naturally in young stands in southeast Alaska.

545. Shea, P.J., Holsten, E.H. and J.S. Hard. 1991. Bole Implantation of Systemic Insecticides Does Not Protect Trees From Spruce Beetle Attack. West. J. Appl. For. **6**: 4-6.

Abstract: Two experiments were conducted on the Kenai Peninsula to evaluate the effectiveness of acephate, dimethoate, and carbofuran delivered by Medicap implants in previously unattacked spruce trees to prevent tree mortality; and in successfully attacked spruce trees to kill the brood of the spruce beetle. These compounds, delivered as they were, were judged inadequate for preventing tree mortality and there was no evidence of associated brood mortality.

546. U.S.D.A. Forest Service. 1991. Forest Insect and Disease Conditions in Alaska in R-10, 1991. USDA Forest Service, State and Private Forestry, Forest Pest Management Report R10-TP-22, Juneau, AK. 26 p.

Abstract: Forest insect and disease populations and related damage increased throughout Alaskan forests in 1991. Spruce bark beetle increased for the third consecutive year and now covers 375,000 acres. Hardwood defoliator activity increased for the second consecutive year. More than 170,000 acres of defoliator activity were mapped in 1991. Yellow cedar decline and hemlock dwarf mistletoe continue to be the most significant diseases in Alaska. More than 526,000 acres of yellow cedar decline were noted in 1991.

547. van Hees, W.W.S. and F.R. Larson. 1991. Timberland Resources of the Kenai Peninsula, Alaska, 1987. USDA Forest Service Res. Bull. PNW-RB-180. 29 p.

Abstract: Cubic volume on this timberland was estimated at 1,211,577 thousand cubic feet. Timber growth and mortality were estimated at 9,245 and 7,958 thousand cubic feet, respectively. Detailed tables provide additional breakdowns of inventory results.

548. Youngblood, A.P. 1991. Radial Growth after a Shelterwood Seed Cut in a Mature Stand of White Spruce in Interior Alaska. Can. J. of For. Res. **21**: 410-413.

Abstract: After a 2-year lag, radial growth of residual trees accelerated an average of 27% in 5 of the next 6 years. Net mean increase in growth after 8 years was 164%. Basal area growth of individual shelterwood trees increased 26.8% over the 14-year post-treatment period, while control trees increased 16.5%.

1992

549. Alaska Department of Natural Resources. 1992. Forest Health Management Plan for the Western Kenai Peninsula and Kalgin Island. State of Alaska, Division of Forestry. 40 p.

Abstract: This plan provides practical information that allows the public and land managers to cooperate effectively in making forest health management decisions. It presents management strategies that deal with issues important to the public while allowing forest owners and managers to better achieve their objectives.

550. Burnside, R.E. 1992. Memo: Report of Spruce Beetle Spot Infestations Near Girdwood, AK, Sept. 21-22, 1992. 5 p.

Abstract: This memo reports on a survey of spruce beetle-impacted stands in the Girdwood Valley. The report concludes that spruce beetle-infestation levels in the Girdwood area are considered to be at endemic levels; probably less than 1% overall infestation of total spruce and no existing, active infestations in most areas of the valley. Spruce blowdown is a probable source of the current spruce beetle activity at Girdwood.

551. Burnside, R.E. 1992. Memo: Report on a Small Scale Pheromone Trapping Study in Log Decks, Homer Spit, Klukwan Forest Products Operation. 4 p.

Abstract: This memo reports to Dave Wallingford, Chief of Resources, the effort to trap emerging spruce beetles from log decks stored near Homer, Alaska in pheromone-baited traps. Trap catch numbers are given.

552. Burnside, R.E. 1992. Letter to City of Homer Planning Department. State of Alaska, Department of Natural Resources, Division of Forestry. File # 9-3185. 2 p.

Abstract: Letter to Planning Department, City of Homer regarding the storage of spruce beetle-infested logs on the Homer Spit.

553. Capp, J., Van Zee, B., Alaback, P.B., Boughton, J., Copenhagen, M. and J. Martin. 1992. Final Report: Ecological Definitions for Old-Growth Forest Types in the Alaska Region. USDA Forest Service, Alaska Region. 63 p.

Abstract: This report constitutes a final report to the Regional Forester and includes: 1) A matrix to illustrate minimum stand characteristics for each old-growth forest type; 2) Narrative descriptions of each old-growth type; 3) A technical report documenting definition development process, and 4) Recommendations for old-growth attributes to record during future inventories.

554. Densmore, R.V. 1992. Paper Birch Regeneration on Scarified Logged Areas in Southcentral Alaska. Northern J. of App. For. **9**: 63-66.

Abstract: This study evaluates paper birch regeneration in two logged sites that had been scarified differently and examined the effects of substrate and vegetative competition on seedling establishment and growth.

555. Elias, S.A. 1992. Late Quaternary Beetle Faunas of Southwestern Alaska: Evidence of a Refugium for Mesic and Hygrophilous Species. Arctic and Alpine Research, **24**(2): 133-144.

Abstract: This paper summarizes the results of late Quaternary fossil insect investigations from three lowland basins in southwestern Alaska. These investigations demonstrate the survival of an abundant mesic to hygrophilous beetle fauna in this refugium before, during and after the last glacial interval.

556. Hard, J.S. 1992. Success of Spruce Beetle Attacks in Pruned and Unpruned Boles of Lutz Spruce in South-central Alaska. For. Ecol. and Mgmt. **47**: 51-70.

Abstract: Pruning live branches from different heights and sides on the boles of long-crowned Lutz spruce baited with frontalin reduced successful spruce beetle attacks in pruned sections of most trees. The benefits of pruning seemed to be primarily from increased temperature and light intensity resulting from greater exposure and insolation on pruned boles.

557. Hennon, P.E. 1992. Diseases, Insects, and Animal Damage of Yellow Cypress. Pp.36-43. In: ed. Lousier, J.D., Proceedings of Yellow Cypress-Can We Grow It? Can We Sell It? Mar. 26-28, 1990. Richmond, B.C., Forest Resources Development Agreement, Nanaimo, B.C., FRDA Report 171, 57 p.

Abstract: This paper discusses a variety of biotic agents that impact Alaska yellow-cedar and briefly describes cedar decline and it's associated mortality.

558. Hennon, P.E. 1992. Survival and Growth of Planted Alaska-Cedar Seedlings in Southeast Alaska. Tree Planters' Notes **43**(3): 60-66.

Abstract: Seedling survival and growth were best where light exposure and soil drainage were adequate but were poor in heavy shade or soils exhibiting impeded drainage. Burned and unburned clearcut sites supported the best survival, height growth, and diameter growth among site types.

559. Hennon, P.E. 1992. Third Reported Outbreak of Hemlock Canker Along Roads of Prince of Wales Island. USDA Forest Service, Alaska Region, Forest Pest Management. Juneau, AK. Biol. Evaluation. R10-TP-25. 9 p.

Abstract: This study reports the third outbreak of this disease in 20 years. Absence of the disease in areas where roads are now paved and continued high levels of the disease on unpaved roads suggest that road dust may be an important environmental factor in the development of the disease.

560. Hennon, P.E. 1992. Current Knowledge of Ecology and Silviculture of Yellow-cedar in Southeast Alaska: Information Exchange at Sitka Alaska, November 1991. USDA Forest Service, Forest Pest Management, Juneau, AK. Gen. Tech. Rep. R10 -TP24. 31 p.

Abstract: The purpose of this document is to report the various comments and information presented at a meeting of 20 resource specialists who met to discuss the ecology and silviculture of yellow-cedar in southeast Alaska.

561. Hennon, P.E. 1992. Alaska Region Diseases. Pp. 125-127. In: Forest Insect and Disease Conditions in the United States 1991. USDA Forest Service. Forest Pest Management. Washington, DC. 139 p.

Abstract: The most significant diseases of Alaskan forests remain yellow cedar decline, wood decay of live trees and hemlock dwarf mistletoe. More than 526,000 acres of cedar decline were mapped in 1991. Spruce needle rust was present at relatively high levels throughout Alaska. Aspen leaf blight was conspicuous for the second consecutive year on portions of the Kenai Peninsula.

562. Hennon, P.E., Mask, R.A. and E.H. Holsten. 1993. Forest Insect and Disease Conditions in Alaska-1992. Forest Pest Management Report R10-TP-32, State and Private Forestry, USDA Forest Service. Anchorage, AK. 29 p.

Abstract: Forest insect and disease populations and related damage increased throughout Alaskan forests in 1992. Spruce bark beetle activity was observed on over 600,000 acres. Hardwood defoliator activity increased for the third consecutive year throughout most of south-central and interior Alaska with willow defoliation accounting for the majority of the increase. In southeast Alaska, three different defoliating insects caused substantial defoliation of western hemlock and Sitka spruce. The most significant diseases are yellow cedar decline that covers more than 526,000 acres, wood decay of live trees and hemlock dwarf mistletoe.

563. Hennon, P.E., Shaw, C.G. III and E.M. Hansen. 1992. Age Structure and Estimated Mortality Rate of *Chamaecyparis nootkatensis* in Declining Forests of Southeast Alaska. Ecological Society of America. Bulletin of Ecological Society America **73**(2): 205. Abstract.

Abstract: Yellow-cedar forests began to exhibit severe mortality shortly before 1900 and continues on over 250,000 ha. of unmanaged forests throughout southeast Alaska. The primary incitant is likely abiotic, but the cause remains a mystery. Coupled with negligible regeneration, mortality is markedly altering this cedar ecosystem.

564. Hennon, P.E., Shaw, C.G. III and E.M. Hansen. 1992. Cedar Decline: Distribution, Epidemiology, and Etiology. Pp. 108-122. In: eds., Manion, P.D.; Lachance, D., Forest Decline Concepts, American Phytopahtological Society Press, St. Paul, MN. 249 p.

Abstract: The cumulative results from these studies do not support the hypothesis that an organism is the primary cause of mortality. The specificity of mortality to Alaska yellow-cedar and evidence of local spread seem to suggest a pathogen-caused disease; however, no new sites of mortality appear to have developed. It now seems most likely that the primary cause of Alaska yellow-cedar decline is some abiotic factor(s).

565. Holsten, E.H. 1992. Alaska Region Insects. Pp. 123-125. In: Forest Insect and Disease Conditions in the United States 1991. USDA Forest Service. Forest Pest Management. Washington, DC. 139 p.

Abstract: Forest insect and disease populations and related damage increased throughout Alaskan forests in 1991. Spruce bark beetle populations increased for the third consecutive year. 375,000 acres were impacted in 1991. Hardwood defoliator activity increased for the second year and conifer defoliator populations remain high throughout Alaska. The most significant diseases of Alaskan forests remain yellow cedar decline, wood decay of live trees and hemlock dwarf mistletoe. More than 526,000 acres of cedar decline were mapped in 1991. Spruce needle rust was present at relatively high levels throughout Alaska. Aspen leaf blight was conspicuous for the second consecutive year on portions of the Kenai Peninsula.

566. Holsten, E.H. and R.E. Burnside. 1992. Evaluation of Potential for Spruce Bark Beetle Population Build-up in Right-of-Way Clearing Debris; Tyonek/Beluga. Aug. 1991. USDA Forest Service, State and Private Forestry, Forest Pest Management Biological Evaluation R10-MB-174. 18 p.

Abstract: Forest Pest Management and Alaska Department of Natural Resources personnel were requested to undertake an evaluation of the right-of-way debris and to determine what treatment practices should be undertaken to minimize spruce bark beetle population buildup. Overall, very low numbers of beetle attacks and progeny were encountered in any of the thirty evaluation plots. Various management alternatives are discussed.

567. Holsten, E.H., Werner, R.A. and P.J. Shea. 1992. Aerial and Ground Applications of Methylcyclohexenone (MCH) to Reduce Tree Mortality by Spruce Beetles in South-central Alaska. USDA Forest Service, Alaska Region. Anchorage, AK. Tech. Rep. R10-TP-23. 12 p

Abstract: The anti-aggregation pheromone (MCH) was tested for the prevention of spruce beetle buildup in spruce right-of-way debris near Tyonek, Alaska. A granular controlled release formulation was tested with aerial and ground application at two dosage rates each. There were no significant differences in numbers of spruce beetle attacks and progeny produced between treatments and untreated control plots. The lack of significance was, in part, due to low endemic beetle populations resulting in low attack levels on the untreated check material. Thus, there was not significant beetle pressure to test the effectiveness of MCH treatments.

568. Hoyt, M.J. and W.E. Putman. 1992. Supplemental Report-Forest Resources of Doyon Lands, Spruce Bark Beetle Project, Lower Yukon District, Alaska, 1992. Prepared for Alaska Division of Forestry by Tanana Chiefs Conference, Inc., under USFS/State Matching Grant. 24 p.

Abstract: This report concludes that a significant amount of timber (25,408 MBF) has been impacted by spruce bark beetles in the Lower Yukon District and that bark beetle population levels have subsided from epidemic levels of the late 1980's to more endemic levels. Bark beetle attacks were most intense in the white spruce sawtimber mixed with hardwood poletimber-medium stocked and least intense in well-stocked white spruce sawtimber mixed with hardwood poletimber.

569. Landolt, J.C., Stephenson, S.L., Laursen, G.A. and R. Densmore. 1992. Distribution Patterns of Cellular Slime Molds in the Kantishna Hills, Denali National Park and Preserve, Alaska, U.S.A. Arctic and Alpine Research. **24**(3): 244-248.

Abstract: The distribution patterns of dictyostelid cellular slime molds (CSM) in soils of 14 different study sites in the Kantishna Hills of Denali National Park and Preserve were investigated during the 1991 field season. Six CSM species were isolated, but two of these-*Dictyostelium mucoroides* and *D. sphaerocephalum*-were overwhelming dominants. The total number of clones per gram of wet soil ranged from 0 to 1203, with an average value of 259 for all 14 study sites.

570. Mask, R.A. 1 992. Spruce Beetle Activity in the Yakutat Forelands: 1991 Update. USDA Forest Service, State and Private Forestry, Forest Health Management, Alaska Region Biological Evaluation R10-TP-27. 9 p.

Abstract: During the winter of 1981, a windstorm caused extensive blowdown in the Yakutat area. In 1988, 20 permanent plots were established to monitor spruce beetle activity. A reevaluation of these plots in 1991 revealed low spruce beetle populations and minimal tree mortality since 1988.

571. Mask, R.A. 1992. Western Black-headed Budworm and Hemlock Sawfly in Alaska. Historical Summary and Bibliography. USDA Forest Service, State and Private Forestry, Forest Health Management, Alaska Region Gen. Tech. Rep. R10-TP-21. 27 p.

Abstract: This report is a historical summary of hemlock sawfly and black-headed budworm activity in southeast Alaska and Prince William Sound from 1918 to the present. A bibliography is included.

572. Mask, R.A. 1992. Spruce Beetle Activity on State Land Near Haines, AK.-1992 Update. Dec. 1992. USDA Forest Service, Forest Pest Management, Alaska Region, Juneau, AK. Biological Evaluation R10-TP-31. 21 p.

Abstract: As of 1992, beetle-caused spruce mortality ranged from 8 to 68% of the spruce component within 5 sample areas. Continued beetle activity and tree mortality are expected for at least the next two to three years. Management alternatives are discussed.

573. Moore, N.J. 1992. Fort Richardson Off-Road Vehicle (ORV) Revegetation Project. State of Alaska, Dept. of Natural Resources, Division of Agriculture, Alaska Plant Materials Center. May 1992. 12 p.

Abstract: Five commercial grass species were planted on sections of off-road vehicle trails with different slope, aspect, elevation and moisture conditions. Based on the results of these test plantings, a mix of Norcoast Bering hairgrass, Arctred Fescue and possibly a small quantity of Gruening alpine bluegrass would be the best choices of commercially available grasses for controlling erosion on these trails.

574. Orland, B., Daniel, T.C., Lynch, A.M. and E.H. Holsten. 1992. Data-driven Visual Simulation of Alternative Futures for Forested Landscapes. Proceedings: IUFRO-Integ. For. Inform. Over Space and Time. Jan. 13-17, 1992. Canberra, Australia. 12 p.

Abstract: Computer tools have been developed which show promise for dramatically improving the forest manager's ability to communicate complex forest issues to the general public. Computer video-simulation helps the public, managers, and scientists visualize--and compare--many outcomes. It offers the opportunity to visualize relationships across time and space, and to explore ranges of possibility.

575. Putman, W.E. 1992. Accuracy Assessment of Landsat-Derived Map Data for Spruce Bark Beetle Damage and Vegetation Cover Type Near Kaltag, Alaska. Prepared for Alaska Div. of Forestry by Tanana Chiefs Conference, Inc., For. Dept., FPM Matching-Grant Agt. 14 p.

Abstract: Overall, the Geonix map shows relatively low accuracies for beetle mortality and timber type. For beetle mortality, the map appears to be more accurate for the lower mortality classes. For timber type, accuracies for density and size class are relatively low, but accuracy for species is higher.

576. Reynolds, K.M. 1992. Relations Between Activity of *Dendroctonus rufipennis* Kirby in Lutz Spruce and Blue Stain Associated with *Leptographium abietinum* (Peck) Wingfield. For. Ecol. and Mgmt. **47**: 71-86.

Abstract: Pruning and girdling treatments to frontalin-baited Lutz spruce trees were evaluated in 1987 and 1988 for their effects on five responses: number of spruce beetle attacks, length of egg galleries, percent of stemwood perimeter area visibly affected by blue stain, and percent of cambial discoloration.

577. van Hees, W.W.S. 1992. An Analytical Method to Assess Spruce Beetle Impacts on White Spruce Resources, Kenai Peninsula, Alaska. USDA Forest Service Res. Paper PNW-RP-446. 22 p.

Abstract: This report presents the results of a study conducted to analyze point-in-time forest inventory data in a manner allowing evaluation of current and near-term spruce beetle infestation trends. These estimates indicate that the current infestation is larger than in the recent past, that the infestation will likely maintain it's current magnitude, and that it may increase its magnitude in the near future.

578. Werner, R.A. 1992. Progress Report: Use of Pheromones to Increase Interspecific Competition Between Spruce Beetles and Other Bark Beetles (Scolytidae) Inhabiting White, Lutz, and Sitka Spruce in Alaska. 7 p.

Abstract: This paper reports on the progress in a study to test the feasibility of using scolytid pheromones to increase interspecific competition with spruce beetle in order to reduce spruce beetle brood establishment. Preliminary results indicate that the addition of methyl butenol or exo-brevicomin to any of the treatments resulted in a slight decrease in the spruce beetle catch but the addition of both methyl butenol and exo-brevicomin reduced spruce beetle catches to the lowest numbers.

579. Werner, R.A. 1992. Research on the Use of Semiochemicals to Manage Spruce Beetles in Alaska. In Proceedings: Symposium on Management of Western Bark Beetles with Pheromones: Research and Development. Kailua-Kona, Hawaii. June 22-25, 1992. p. 15-21. USDA Forest Service, Pacific Southwest Research Station General Technical Report PSW-GTR-150.

Abstract: Field tests on the efficacy of various scolytid bark beetle pheromones to attract *Dendroctonus rufipennis* (Kirby) were conducted from 1977 through 1991 in stands of white spruce and Lutz spruce in interior and south-central Alaska. Current studies examine several operational use strategies such as beetle trap-out, spot baiting, and diversion trapping using baited traps and trees; antiaggregation semiochemicals such as MCH; and inducing interspecific competition with spruce beetle pheromone-baited trap trees.

580. Werner, R.A. and J.W. Hilgert. 1992. Effects of Permethrin on Aquatic Organisms in a Freshwater Stream in South-Central Alaska. J. Econ. Entomol. **85**(3): 860-864

Abstract: Trout fry, aquatic insect larvae, and periphyton (attached algae) within and below the treatment site during and after treatment did not show signs of mortality compared with an upstream untreated control site.

581. Werner, R.A. and E.H. Holsten. 1992. Effectiveness of Sevin^{R} for Remedial Control of Spruce Beetles (Coleoptera: Scolytidae) in Infested Spruce in Alaska. J. Econ. Entomol. **85**(2): 473-476.

Abstract: From the information reported here, remedial treatment of individual spruce trees infested with spruce beetles can probably significantly reduce the number of beetles that would normally emerge and attack adjacent standing green trees.

582. Youngblood, A and T.A. Max. 1992. Dispersal of White Spruce Seed on Willow Island in Interior Alaska. USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon. Research Paper PNW-RP-443. 17 p.

Abstract: Analysis of the 1987 crop showed that production of total and filled seed in both uncut and shelterwood stands differed greatly and was not related to total basal area, basal area of white spruce, number of living white spruce stems per hectare, average d.b.h. of all trees, and average height of dominant trees.

1993

583. Adams, D.L. 1993. Forest Health in South-Central Alaska. In: International Forestry Panel Reports on Forest Health of Alaska's Spruce Forests. August 1993. 6 p.

Abstract: This report presents impressions and opinions on the current large and rapidly increasing spruce beetle infestation in south-central Alaska.

584. Ahlstrand, G.M. and C.H. Racine. 1993. Response of an Alaska, U.S.A., Shrub-Tussock Community to Selected All-Terrain Vehicle Use. Arctic and Alpine Research **25**(2): 142-149.

Abstract: Mat-forming dwarf evergreen shrubs (*Empetrum nigrum* and *Vaccinium vitis-idaea*) were least affected by ATV traffic, while densely branched, low deciduous shrubs, such as *Betula nana* were most susceptible.

585. Alaska Dept. Nat. Res. 1993. Spruce Bark Beetles in Firewood. Fact Sheet. 1 p.

Abstract: This fact sheet offers guidelines for preventing spruce beetle infestations in homeowner trees as a result of firewood storage.

586. Alden, J.N. 1993. Final Report: Genetic Diversity in the Spruce Complex of Coastal Alaska. Alaska Science and Technology Grant Agreement 89-1-015. 1989 – 1993. 28 p.

Abstract: Author investigated the genetic variation in adaptability, growth, and wood quality of the coastal spruce complex in order to determine selection responses for tree improvement and harvest indexes for future forest industries. One result of the study demonstrated that Sitka and Lutz spruce of south central and southwest Alaska are genetically diverse.

587. Anon. 1993. A Study Report of the Deterioration of Forest Health of South-Central and Interior Alaska. AK. State Soc. of Amer. Foresters. 8 p.

Abstract: This report concludes that lack of forest management, non-recognition of the biological/ecological impacts, and lack of expressed professional concern have all contributed to this forest health problem. An aggressive forest restoration and forest health maintenance program to fully address the severity and extent of impacts to forest resources, to develop coordinated forest management actions to restore damaged ecosystems, and to prevent unnecessary additional ecological impacts is necessary.

588. Anon. 1993. Analysis of Spruce Bark Beetle Infestation Data, Clam Gulch/Kasilof Area, Kenai Peninsula, 1990 & 1991. Alaska Department of Natural Resources, Division of Forestry. June 30, 1993. 23 p.

Abstract: This analysis presents various summary measures of the data gathered, discusses the limitations of the data for causal analysis or prediction of infestation, presents various ANOVA calculations that show which of the measured variables have statistically significant correlations with the percent of infestation, presents an attempt at regression analysis which would have used the measured variables to explain the observed differences in infestation, evaluates the hazard of an infestation and finally, presents recommendations for further data gathering to provide more useful management information at the lowest cost.

589. Bryant, J.P., Reichardt, P.B., Clausen, T.P. and R.A. Werner. 1993. Effects of Mineral Nutrition on Delayed Inducible Resistance in Alaska Paper Birch. Ecology **74**: 2072-2084.

Abstract: In subarctic forests, birch trees respond to severe manual defoliation by delayed inducible resistance (DIR). This plant response to defoliation is characterized by a decline in nutritional quality of leaves for immature insects for several years after defoliation events and concomitant changes in leaf chemistry that may be detrimental to insect nutrition, that is, a decline in leaf nitrogen and an increase in leaf phenols.

590. Hennon, P.E., Mask, R.A. and E.H. Holsten. 1993. Forest Insect and Disease Conditions in Alaska--1993. USDA Forest Service, Alaska Region General Technical Report R10-TP-40. 36 p.

Abstract: Forest insect and disease populations and related damage increased throughout Alaskan forests in 1993. All of Alaska experienced the driest summer in almost 75 years. Spruce bark beetle now is infesting in excess of 700,000 acres. Hardwood defoliator activity has decreased from 150,000 acres in 1992 to 41,000 acres in 1993. In southeast Alaska forests are experiencing the largest black-headed budworm epidemic in the past 40 years. Over 258,000 acres of black-headed budworm defoliation were observed. In southeast Alaska, yellow cedar decline is present on more than 526,000 acres. Wood decay of live trees and hemlock dwarf mistletoe continue to be the two other most significant diseases of Alaskan forests**.**

591. Hennon, P.E. and J.R. Douglas. 1993. Suppression of Spruce Needle Blight in Alaska. Journal of Arboriculture **19**(3): 168-172.

Abstract: To evaluate the efficacy of disease suppression, three fungicides were applied to 72 young Sitka spruce trees near Juneau, Alaska in an area of endemic infection by the needle blight fungus, *Lirula macrospora*. Trees treated with each of the three fungicides had significantly fewer dead needles one year after infection than did trees treated with the control. These results suggest that the disease can be controlled by applying chemical treatment at the correct time, that is, in spring shortly after bud break of spruce.

592. Hennon, P.E. 1993. Yellow-Cedar Decline. USDA Forest Service. Alaska Region, Juneau, Alaska. Pamphlet, Color Illus. R10-TP-36. 6 p.

Abstract: This forest pest leaflet provides the reader with an overview of the history of yellow-cedar decline in southeast Alaska, it's possible causes, and the results of a number of studies conducted on this forest decline.

593. Hennon, P.E. 1993. Pine Gall Rust. USDA Forest Service. Alaska Region, Juneau, Alaska. Pamphlet, Color Illus. R10-TP-37. 6 p.

Abstract: In this forest pest leaflet, a brief description of pine gall rust is given with a simple way to identify this disease. A description of the damage is given along with a discussion of the life cycle of the disease. Control measures are discussed.

594. Hennon, P.E. and C.G. Shaw, III. 1993. Possible Trigger of Climatic Warming on Onset and Development of Cedar Decline in Southeast Alaska. In: Fox, D.G., ed., Proceedings of 88th Annual Air and Waste Management Association. June 13-18, 1993. Denver, CO. Paper No. 93-WA-85, 02. 19 p.

Abstract: Climatic warming, which apparently began at about the same time as extensive yellow-cedar mortality, is likely responsible for triggering some stress factor that has led to the demise of yellow-cedar forests over more than 200,000 ha. Changes in temperature or precipitation may affect decomposition processes, perhaps resulting in the formation of compounds toxic to yellow-cedar.

595. Holsten, E.H. 1993. Spruce Beetle Activity--Hope Analysis Area. USDA Forest Service, Forest Health Management, Anchorage, AK. Biological Evaluation R10-TP-42. 20 p.

Abstract: Forest Health Management was requested by the Seward Ranger District to assess the current situation and to identify options that could reduce resource impacts associated with spruce beetle activity. The report concludes that the greatest benefit appears to be from thinning programs in highly susceptible areas where beetles have not reached epidemic proportions. There is also benefit to be gained from taking suppression actions in those higher value areas where heavy beetle populations are present.

596. Holsten, E.H. 1993. Spruce Beetle Activity. Lake Clark Nat. Park. USDA Forest Service, Forest Health Management, Anchorage, AK. Biological Evaluation R10- TP-43. 23 p.

Abstract: This biological evaluation was conducted in Lake Clark National Monument to assess the current status of spruce beetle activity and to make predictions as to the future trends of these infestations. Following an aerial survey of the Park, four areas were selected for ground truthing.

597. Holsten, E.H. 1993. Office report: Forest Health Survey/ Unit 9. USDA Forest Service, Forest Health Management, Anchorage, AK. September 13, 1993. 3 p.

Abstract: The results of this biological evaluation show that there is very little spruce beetle activity in either thinned or unthinned stands. However, in the long run, the treated (thinned and pruned) stands will be much more resistant to future spruce beetle attacks than the surrounding untreated stands. Neighboring untreated high value stands should come under management such as thinning and pruning.

598. Holsten, E.H. and R.A. Werner. 1993. Effectiveness of Polyethylene Sheeting for Remedial Control of Spruce Beetles (Coleoptera: Scolytidae) in Infested Stacks of Spruce Firewood in Alaska. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. Res. Pap. PNW-RP-466. 6 p.

Abstract: Covering stacks of spruce firewood with either clear or black polyethylene sheeting does not raise log temperatures high enough to kill spruce beetle brood in the logs. Higher bark surface temperatures were obtained under the clear polyethylene sheeting (36^0C) than under the black sheeting (27^0C) or in the uncovered check stacks (30^0C). The highest inner bark temperature of 30^0C was from the uncovered check stack; however, this was not lethal to spruce beetle brood.

599. Illman, B.L. and R.A. Werner. 1993. Natural Defenses of Spruce to Bark Beetle and Stain Fungi in Alaska. Sustainable Economics and Sustainable Resources: Roles of Forest Products Research. Forest Products Research Conference-27-29 Sept. 1993. Madison, WI.

600. Illman, B.L. and R.A. Werner. 1993. Hypersensitive Reaction Zones of White, Sitka, and Lutz Spruce Induced by Bark Beetle-Associated *Leptographium abietinum* (Peck). Phytopathological Society, Nashville, TN. November 1993. Phytopathology **83**: 12.

Abstract: White, Sitka and Lutz spruce at four locations on the Kenai Peninsula, AK, responded with hypersensitive reaction (HR) following inoculation with the bark beetle-associated fungus *Leptographium abietinum* (Peck). The HR lesion length was greater in wounds associated with fungi than in mechanical wounds.

601. Julin, K.R., Shaw, C.G. III, Farr, W.A. and T.M. Hinckley. 1993. The Fluted Western Hemlock of Southeast Alaska. I. Morphological Studies and Experiments. For. Ecol. and Mgmt. **60**: 119-132.

Abstract: Morphological studies revealed that flutes occur between roots at the root collar, and are vertically aligned with non-functional branches in the lower crown. Any factor or treatment that decreased the supply of growth substances to the stem reduced growth rates, thereby producing flutes.

602. Julin, K.R., Shaw, C.G. III, Farr, W.A. and T.M. Hinckley. 1993. The Fluted Western Hemlock of Southeast Alaska. II. Stand Observations and Synthesis. For. Ecol. and Mgmt. **60**: 133-141.

Abstract: A survey of the forests of southeast Alaska revealed that fluted western hemlock trees occur primarily along coastlines in even-aged stands. Dominant and codominant hemlocks were more severely fluted than understory hemlocks. Evidence suggests that western hemlock in southeast Alaska is genetically predisposed to form fluted trunks. Silvicultural treatments that favor other tree species, and reduce branch size and retention period of western hemlock would greatly reduce this problem.

603. Mask, R.A. 1993. Forest Insect Activity-Northeast Chichagof Island, Historical Summary. Unnumbered Report for Chatham Area Ecoteam. 10 p.

Abstract: This summary focuses on three defoliating insects common to the spruce-hemlock forests of southeast Alaska with specific information pertaining to northeast Chichagof Island. These defoliators are the black-headed budworm, hemlock sawfly and the spruce needle aphid.

604. Mask, R.A. 1993. Black-headed Budworm. USDA Forest Service, Forest Health Management, Alaska Region. Forest Pest Leaflet R10-TP-39. 8 p.

Abstract: This forest pest leaflet gives a brief history of budworm activity in Alaska, discusses morphology to aid in identification of this insect, life history, impact, and offers control alternatives.

605. Mask, R.A. 1993. Use of Airborne Video to Evaluate Spruce Beetle Outbreaks in Southeast Alaska. Final Report. Technology Development Project R10-92-21. Appendix to Airborne Video System Users Guide. FPM/MAG. 11 p.

Abstract: As a result of this project, airborne video technology was determined to be a valuable operational tool in the evaluation of spruce beetle activity.

606. Reed, F.L.C. 1993. Realizing the Potential of Alaskan Forest Resources, An Agenda for Action. In: International Forestry Reports on Forest Health of Alaska's Spruce Forests. August 1993. 17 p.

Abstract: The objective of this report is to make a positive contribution to the health of Alaska's forests at a time of unprecedented loss due to the spruce bark beetle. Offered is a description of the impacted forest resource and a description of the current problem. An agenda for action is presented with a cost/benefit analysis.

607. Schulz, B.K. 1993. Movement of Metasystox-R2 in an Alaskan Landscape Soil. Univ. of Alaska-Fairbanks, Master of Science Thesis, Fairbanks, AK. 79 p.

Abstract: Results of this study suggest the downward transport of oxydemeton-methyl and its toxic sulfone metabolite can be minimized by limiting depth of soil saturation during post-application irrigation.

608. Schulz-Blitz, B.K. 1993. Insects and Disease of Alaska Woody Ornamental Plants. CES Pub. No. 100-B-0-067, Fairbanks, AK. 100 p.

Abstract: This publication provides homeowners and landscape managers with a guide to the most common pests of trees and shrubs grown in Alaska. It covers insects, diseases and non-infectious problems. An integration of pest management strategies is emphasized. Each entry includes a description of the insect or disease symptom, the type and possible extent of the damage, and control options.

609. Werner, R.A. 1993. Response of the Engraver Beetle, *Ips perturbatus*, to Semiochemicals in White Spruce Stands of Interior Alaska. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. Res. Pap. PNW-RP-4659 p.

Abstract: Several pheromones attracted high numbers of *Ips perturbatus* and species of the predator *Thanasimus* to baited funnel traps. Test results also indicate that attacks by *Ips perturbatus* may be deterred by certain semiochemicals.

1994

610. Alaska Department of Natural Resources and USDA Forest Service. 1994. Alaska Forest Insect and Disease Survey Maps-1993 [GIS Map Product]. Misc. Pub. 62 p.

611. Berg, E.E. and F.S. Chapin III. 1994. Needle Loss as a Mechanism of Winter Drought Avoidance in Boreal Conifers. Can. J. of For. Res. **24**: 1144-1148.

Abstract: Regression models indicate that desiccation of black spruce responds primarily to cumulative vapor pressure deficit (drought), which becomes severe as spring daylight rapidly increases (R^2 = 80%). In larch, the effect of cumulative drought was offset by increased spring air temperatures.

612. Bettini, L. 1994. Eriophyid Mites. Alaska Cooperative Ext. Serv. & USDA Forest Service, Alaska Region Pamphlet 100C-1-066. 8 p.

Abstract: This forest pest leaflet discusses mites in general, but specifically eriophyid mites. A morphological description of the mite as well as a discussion of its life history is presented. Plant abnormalities caused by eriophyid mites are addressed and control measures are offered.

613. Boutin, T. 1994. Memorandum: Overview of Past and Recent Spruce Beetle Activity on Lands Acquired from Seldovia Native Association, Inc. South side Kachemak Bay. Alaska Division of Forestry, Anchorage, AK. 3 p.

Abstract: This memo to Harry Noah, Commissioner of Natural Resources-State of Alaska, from Tom Boutin, State Forester, gives an assessment of the current spruce beetle infestation in the Kachemak Bay area.

614. Burnside, R.E. 1994. Alaska Forest Health and the Spruce Beetle, with Emphasis on South-Central Alaska, Kenai Peninsula Region. State of Alaska, Department of Natural Resources, Division of Forestry, [Unnumbered Report] 10 p.

Abstract: This briefing paper prepared for forestry tours in conjunction with the 1994 SAF/CIF Convention outlines the current status of the spruce beetle infestation on the Kenai Peninsula and discusses management implications and alternatives to deal with this insect problem.

615. Chapin, F.S. III, Walker, L.R., Fastie, C.L. and L.C. Sharman. 1994. Mechanisms of Primary Succession Following Deglaciation at Glacier Bay, Alaska. Ecological Monographs **64**(2): 149-175.

Abstract: Life history traits determine the patterns of succession. Changes in competitive balance accompanying successional changes in environment provide the mechanism for changes in species dominance. Initial site conditions influence the rate of change and final state of community composition and productivity. No single factor or mechanism fully accounts for primary succession at Glacier Bay.

616. Cooper, D.J. and B.P. Van Haveren. 1994. Establishing Felt-Leaf Willow from Seed to Restore Alaskan, U.S.A., Floodplains. Arctic and Alpine Research **26**(1): 42-45.

Abstract: Felt-leaf willow seedlings are readily established on placer tailings well above the water table by removing the limiting factor of summer drought. Addition of native organic-rich soils enhances establishment, but reduces survival. Willow seedling establishment is recommended for restoration sites where the water table

is less than 1 to 2 m from the soil surface. It is estimated that seedlings will root to the water table in approximately 5-yr.

617. Deal, R.L. and W.A. Farr. 1994. Composition and Development of Conifer Regeneration in Thinned and Unthinned Natural Stands of Western Hemlock and Sitka Spruce in Southeast Alaska. Can. J. of For. Res. **24**: 976-984.

Abstract: The amount of regeneration increased and the percentage of hemlock decreased with increasing thinning intensity. Thinning of young stands on upland sites appears to benefit understory conifers, which rapidly expand to fill in the available growing space. Heavy thinning in older stands promotes dense germination of understory conifers making it difficult for other understory plants to become established.

618. Densmore, R.V. 1994. Succession on Regraded Placer Mine Spoil in Alaska, U.S.A., in Relation to Initial Site Characteristics. Arctic and Alpine Research **26**(4): 354-363.

Abstract: A riparian plant community with vigorous *Salix alaxensis* developed rapidly on regarded spoil with respread topsoil, while a similar plant community with less vigorous *S. alaxensis* developed more slowly on unprocessed spoil and spoil amended with a small amount of topsoil. Processed spoil remained almost bare of vegetation after 5 yr. *Salix alaxensis* was able to establish, but growth was stunted, while *Alnus crispa* had difficulty establishing, but the few established seedlings grew well.

619. Develice, R.L., Queitzsch, W.E. and E.H. Holsten. 1994. Undergrowth Vegetation Succession Following Beetle-induced Tree Mortality and Fire in South-central Alaska. Bull. Ecol. Soc. America **75**(2): 53. Abstract.

Abstract: Species richness did not change on burned plots but declined 24% on the non-burned plots. Compositional changes resulted in changed vegetation types for about one half of both the burned and not-burned plots. It appears that regeneration requirements (e.g., mineral soil) for *Picea* and *Betula* are not produced as a result of spruce bark beetle infestations and light, spring surface fires.

620. Eglitis, A.E. 1994. Spruce Needle Aphid. USDA Forest Service and University of Alaska, Fairbanks Cooperative Extension Service Forest Pest Leaflet No. 100C-1-063. 5 p.

Abstract: This forest pest leaflet, written for the homeowner, introduces the spruce needle aphid and discusses its' life history, damage, and offers guidelines for reducing that damage.

621. Geiser, L.H., Dillman, K.L., Derr, C.C., and M.C. Stensvold. 1994. Lichens of Southeastern Alaska. USDA Forest Service, Alaska Region Report R10-TB-45. 145 p.

Abstract: This inventory includes 453 lichen species from 112 genera and 15 subspecies, 4 varieties and 2 forms from southeastern Alaska. The inventory was compiled primarily from data collected at 258 sites on the Tongass National Forest between 1989 and 1993. Each species entry includes information about its sensitivity to sulfur dioxide, its abundance and habitat in southeastern Alaska, abundance in North America, and range.

622. Golden, D.J. 1994. 1993 Forest Health Initiative: Project Report. State of Alaska. 30 p.

Abstract: This report provides an exhaustive history of spruce bark beetle activity on the Kenai Peninsula**,** Alaska. It describes the impacts to the ecosystem and the management challenges encountered as a result of these impacts. Strategies to mitigate these impacts are discussed as well as the economic impacts of this infestation.

623. Haggstrom, D. 1994. The Effects of Fire and Forest Management Policies on the Boreal Forest and Wildlife of Interior Alaska. In workshop proceedings: Fire Effects in Alaska. Alaska Fire Service and the Alaska Interagency Fire Management Council, held at Fort Wainwright, Alaska, October 4-5, 1994. p. 31-38.

Abstract: This paper presents a discussion of the ecological role of fire in Alaska as a necessary agent of disturbance and the efforts of biologists to enlighten the policy makers to this fact.

624. Hennon, P.E., Mask, R.A. and E.H. Holsten. 1994. Forest Insect and Disease Conditions in Alaska--1994. USDA Forest Service, Alaska Region General Technical Report R10-TP-51. 42 p.

Abstract: Spruce beetle declined slightly, by 80,000 acres, in 1994. Hardwood defoliation declined from 113,000 acres in 1993 to only 24,221 acres in 1994. Spruce forests**,** however, showed an increase of insect activity of nearly 200,000 acres primarily due to the budworm outbreak near Tanana. In southeast Alaska, the black-headed budworm outbreak impacted vast areas for the fourth consecutive year. Over 193,000 acres of defoliation were observed. Hemlock sawfly populations declined significantly. Yellow-cedar decline was observed on more than 550,000 acres of southeast Alaskan forests. Wood decay of live trees and hemlock dwarf mistletoe continue to be the two other most significant diseases of southeast Alaskan forests. Foliar diseases of conifers were at moderate levels.

625. Hennon, P.E. and R.A. Mask. 1994. Forest Health Evaluation; Sitka National Historical Park; Jan. 1994. USDA Forest Service, Forest Health Management, Juneau, AK. Biological Evaluation R10-TP-41. 15 p.

Abstract: Currently, the most significant insect and disease activity in the Sitka National Historical Park is caused by spruce needle aphid, hemlock dwarf mistletoe, and heart rot decay fungi. Also discussed is the occurrence of fluted hemlock in the Park. Hazard trees and management alternatives are also discussed.

626. Hennon, P.E., and C.G. Shaw III. 1994. Did Climatic Warming Trigger the Development of Yellow-cedar Decline in Southeast Alaska? Eur. J. For. Path. **24**: 399-418.

Abstract: A warming climate, which coincided with the onset of extensive tree mortality about 100 years ago, may have triggered one of the possible abiotic causes such as freezing damage and/or soil toxicity.

627. Holsten, E.H. 1994. Suitability of Powerline Right-of-Way Clearing Debris as Breeding Material for Spruce Bark Beetles. USDA Forest Service, Alaska Region, Forest Health Management, Anchorage, AK. Tech. Report R10-TP-49. 6 p.

Abstract: Based on the results of a preliminary study, it appears that limbed and bucked logs, if not attacked during the first spruce beetle dispersal flight, are significantly less productive as breeding material if attacked the second flight season.

628. Holsten, E.H. 1994. The Role of Spruce Beetle Pheromones as Management Strategies in Alaska. In: Management of Western Bark Beetles with Pheromones: Recent Research and Development. Proceedings of a Symposium; 1992 June 22-25; Kona, HI.. USDA Forest Service, Pacific Southwest Forest & Range Experiment Station. Albany, CA. Gen. Tech. Rep. PSW-GTR-15011-15.

Abstract: The most promising tools for reducing losses to natural resource productivity from spruce beetles in Alaska appear to involve the use of pheromones. Results of past research and development activities on spruce beetle pheromones suggest a high probability that successful management systems can be developed through an aggressive research, development, and application effort.

629. Holsten, E.H. 1994. Bibliography-Alaska Region, Forest Health Management. USDA Forest Service. R10, Technical Report R10-TP-50. 54 p.

Abstract: This bibliography cites 495 published and unpublished references. All citations are cross-referenced by author and subject. Citations are grouped by year in ascending order.

630. Holsten, E.H. 1994. Large Aspen Tortrix. Alaska Cooperative Extension Service and USDA Forest Service cooperating. Forest pest leaflet No. 100C-1-061. 4 p.

Abstract: This forest pest leaflet, written for the homeowner, introduces the large aspen tortrix and discusses its' life history, damage and guidelines for reducing tortrix damage.

631. Holsten, E.H. 1994. Spruce Budworm. Alaska Cooperative Extension Service, University of Alaska, Fairbanks, USDA Forest Service cooperating. Forest pest leaflet No. 100C-1-064. 4 p.

Abstract: This forest pest leaflet, written for the homeowner, introduces the spruce budworm and discusses its' life history, damage and offers guidelines for reducing budworm damage.

632. Holsten, E.H. and W. Vandre. 1994. Birch Aphids. Alaska Cooperative Extension Service, University of Alaska Fairbanks and USDA Forest Service cooperating. Forest pest leaflet No. 100C-0-063.5 p.

Abstract: This forest pest leaflet, written for the homeowner, introduces the birch aphid and discusses its' life history, damage and offers guidelines for reducing aphid damage.

633. Holsten, E.H. and W. Vandre. 1994. Gall Aphids and Woolly Aphids on Spruce and Hemlock. Alaska Cooperative Extension Service, University of Alaska, Fairbanks and USDA Forest Service cooperating. Forest pest leaflet No. 100C-0-062.

Abstract: This forest pest leaflet, written for the homeowner, introduces gall and woolly aphids and discusses their life history. It offers guidelines for reducing aphid damage.

634. Mask, R.A. and P.E. Hennon. 1994. Evaluation of Bud Damage on Young-Growth Sitka Spruce, Long Island, Alaska; March 1994. USDA Forest Service, Alaska Region, Forest Health Management, Juneau, AK. Biological Evaluation R10-TP-44. 15 p.

Abstract: The cause of necrosis of the buds that appeared intact but which did not flush in 1993 is not clearly understood. There was no evidence that insects or fungal pathogens are the cause. Damage by some environmental variable (e.g. freezing damage) appears more likely.

635. Mathiasen, R.L. 1994. Natural Infection of New Hosts by Hemlock Dwarf Mistletoe. USDA Forest Service Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado. Research Note RM-RN-530. 6 p.

Abstract: New and additional host/parasite combinations for hemlock dwarf mistletoe based on natural infection are reported from Oregon, Washington and Alaska. A summary of the host range of hemlock dwarf mistletoe based on natural infection and artificial inoculations is included.

636. Packee, E.C. 1994. Examining Alaska's Forest Vegetation Zones. Agricultural and Forestry Experiment Station, University of Alaska Fairbanks. Forest Sciences Notes No. 1; January 1994. 4 p.

Abstract: The zones suggest that within-state differences may have as a great a significance as differences with western Canada. Also, one can expect forest health problems, vegetation competition, and growth rates to vary among the zones.

637. Reynolds, K.M. and E.H. Holsten. 1994. Classification of Spruce Beetle Hazard, *Dendroctonus rufipennis* (Kirby), in Lutz Spruce, *Picea lutzii* Little, Stands on the Kenai Peninsula, Alaska. Can. J. For. Res. **24**:1015-1021.

Abstract: Stand data from Lutz forest types occurring on the Kenai Peninsula were analyzed by tree-based classification to develop a decision tree for classifying spruce beetle hazard. Model verification and model validation results were considered very acceptable.

638. Reynolds, K.M. and E.H. Holsten. 1994. Relative Importance of Risk Factors for Spruce Beetle Outbreaks. Can. J. For. Res. **24**: 2089-2095.

Abstract: Stand hazard and windthrown trees were identified as the two most important factors determining risk of a spruce beetle outbreak. Hazard and windthrow were considered about equally important.

639. Reynolds, K.M., Holsten, E.H. and R.A. Werner. 1994. Sbexpert Users Guide (Version 1.0): A Knowledge-Based Decision-Support System for Spruce Beetle Management. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. Gen. Tech. Rep. PNW-GTR-345. 72 p.

Abstract: Basic features of the Sbexpert system include an intuitive graphical user interface, efficient presentation and retrieval of information through hypertext and hypergraphics, easy access to an extensive help system for Microsoft Windows system-level help, topic- and window-specific help, a text editor that facilitates preparing standard reports from **Textbook**, and automatic report generation in **Analysis.**

640. Shea, P.J. 1994. Management of Western Bark Beetles with Pheromones: Recent Research and Development. USDA Forest Service Gen. Tech. Rep. PSW-150. 1 p.

Abstract: The existence of bark beetle pheromones was suggested some 70 years ago. Twenty-six years ago the first bark beetle pheromone was identified, described, and synthesized. Present-day research emphasis centers on attempting to develop semiochemical-based bark beetle management systems that will reduce tree mortality.

641. van Hees, W.W.S. and E.H. Holsten. 1994. An Evaluation of Selected Spruce Bark Beetle Infestation Dynamics Using Point in Time Extensive Forest Inventory Data, Kenai Peninsula, Alaska. Can. J. For. Res. **24**: 246-251.

Abstract: This study shows that extensive forest inventory data can be used to evaluate selected spruce bark beetle infestation dynamics. Trends in the amount of area that has been infested and is currently undergoing infestation can be estimated. Trends in size and health of attacked trees and in degradation of radial growth can play a role in monitoring forest health changes.

642. Volk, T.J., Burdsall, H.H. and K.M. Reynolds. 1994. Checklist and Host Index of Wood-Inhabiting Fungi of Alaska. Mycotaxon. **52**(1): 1-46.

Abstract: In this study of 754 collections of wood-inhabiting fungi in Alaska, we report 254 species of wood-inhabiting fungi. One hundred fifty-one of these are new records for the state of Alaska, and nine are new records for North America. A host index to fungi collected is included. This study provides a baseline study for fungi in old growth forests of Alaska.

643. Werner, R.A. 1994. Research on the Use of Semiochemicals to Manage Spruce Beetles in Alaska. In: Management of Western Bark Beetles with Pheromones: Recent Research and Development. Proceedings of a Symposium; 1992 June 22-25; Kona, HI. Albany, CA. USDA Forest Service, Pacific Southwest Forest and Range Experiment Station. Gen. Tech. Rep. PSW-GTR-150:15-22.

Abstract: The use of semiochemicals to manipulate populations of spruce beetles is under way, and current studies examine several operational use strategies such as beetle-trap out, spot baiting, and diversion trapping using baited traps and trap trees; antiaggregation semiochemicals such as MCH; and inducing interspecific competition with spruce beetles in pheromone-baited trap trees.

644. Werner, R.A. 1994. Forest Insect Research in Boreal Forests of Alaska; Trends in Agricultural Sciences-Entomology. Council of Scientific Research Integration. Entomology **2**: 35-46.

Abstract: This paper provides information on current forest insect research in the boreal forests of Alaska, research needs, management implications, accomplishments and future research goals.

645. Werner, R.A. and B.L. Illman. 1994. Response of Lutz, Sitka, and White Spruce to Attack by the Spruce Beetle, *Dendroctonus rufipennis* (Kirby), (Coleoptera: Scolytidae) and Blue-stain Fungi. Environ. Entomol. **23**(2): 472-478.

Abstract: All three species of spruce responded with an induced reaction to mechanical wounding alone and wounding plus inoculation of blue-stain fungus. There were no differences in lesion length among tree species; however, the effects of wounding versus wounding plus inoculate were highly significant. Other studies found that lesion length was greater in wounds associated with the inoculation of fungi than mechanical wounds.

1995

646. Adams, G.C., Klomparens, K.L., and P.E. Hennon. 1995. Unusual Reticulated Parenthosomes Surround the Dolipore of a Hyphomycete with Clamp Connections, *Ditangifibulae dikaryotae* gen. et sp. nov. Mycologia **87**(6), 1995 pp. 909-921.

Abstract: *Ditangifibulae dikaryotae* gen. et sp. nov. is described from culture and by electron microscopy.

647. Bormann, B.T., Spaltenstein, H., McClellan, M.H., Ugolini, F.C., Cromack, K. and S.M. Nay. 1995. Rapid Soil Development after Windthrow Disturbance in Pristine Forests. J. of Ecology **83**: 747-757.

Abstract: The authors observed rates of change that were higher than those previously reported for secondary succession, and were similar to those described for primary succession. Well-developed spodic and albic (podzol) horizons with characteristic C, Fe, and Al signatures were found in soil surfaces less than 150 years old. Windthrow or disturbances that mimic windthrow may be required at intervals of about 200-400 years to maintain soil productive capacity in these ecosystems.

648. Burnside, R.E., See, J. and S. Phillips. 1995. Forest Health on the Kenai Peninsula. Western Forester **40**(2): 12-13 & p. 23.

Abstract: This article in the Western Forester presents an overview of the history and reviews the current activity of spruce beetle on the Kenai Peninsula, Alaska. The role of fire in shaping the current forests on the Peninsula is discussed as well as the States' efforts to manage the current situation.

649. Fastie, C.L. 1995. Causes and Ecosystem Consequences of Multiple Pathways of Primary Succession at Glacier Bay, Alaska. Ecology **76**(6): 1899-1916.

Abstract: Multiple pathways of compositional change at Glacier Bay appear to be a function of landscape context, which, in conjunction with species life history traits, affects seed rain to newly deglaciated surfaces and thereby alters the arrival sequence of species. Differences among pathways probably include long-term differences in ecosystem function resulting from substantial accumulation of nitrogen at sites where nitrogen-fixing shrubs are important.

650. Fastie, C.L., Swetnam, T.W. and E.E. Berg. 1995. Annual Report of the Kenai National Wildlife Refuge Spruce Bark Beetle History Project. U.S. Fish and Wildlife Service Project Number 74525-93-2. 23 p.

Abstract: Recent spruce beetle caused mortality and the subsequent growth releases in surviving trees probably resulted from the ongoing outbreak of bark beetles. The general similarity between the recent releases during a known beetle outbreak and earlier, turn of the century releases suggests that the earlier canopy disturbance was also caused by a lethal outbreak of bark beetles.

651. Gara, R.I., Werner, R.A., Whitmore, M.C., and E.H. Holsten. 1995. Arthropod Associates of the Spruce Beetle *Dendroctonus rufipennis* (Kirby) (Col., Scolytidae) in Spruce Stands of South-Central and Interior Alaska. J. Appl. Ent. **119**: 585-590. (1995).

Abstract: The impact of competitors, parasites and predators on spruce beetle broods was studied at an endemic population site near Fairbanks, Alaska, as well as at an epidemic area near Summit Lake and Cooper Landing, Alaska. The impact of dipteran and coleopteran predators and hymenopteran parasites on spruce beetle survival was of less importance than interspecific competition.

652. Helm, D.J. and E.B. Allen. 1995. Vegetation Chronosequence near Exit Glacier, Kenai Fjords National Park, Alaska, U.S.A. Arctic and Alpine Research **27**(3): 246-257.

Abstract: This study describes the vegetation on various-aged surfaces on the deglaciated outwashplain of Exit Glacier. Secondly, it provides preliminary data on seedling colonization and survival during initial establishment on the active floodplain.

653. Hennon, P.E. 1995. Decay Fungi—Indicators of Tree Defect in Southeast Alaska. USDA Forest Service, Juneau, Alaska. R10-TP-47 Color illustrated card set.

Abstract: A set of laminated cards with color pictures and descriptions to aid in the identification of fungi and tree defect factors in southeast Alaska.

654. Hennon, P.E. 1995. *Chamaecyparis nootkatensis.* In: eds., Schutt, Schuck, Aas, Lang. Enzyklopadie der Holzgewachse. Landsberg, Germany: Ecomed Verlag. 9 p.

Abstract: Text not available in English.

655. Hennon, P.E. 1995. Are Heart Rot Fungi Major Factors of Disturbance in Gap-Dynamic Forests? Northwest Science **69**(4): 284-293.

Abstract: As heart rot induces trees to die standing, or more commonly, by bole breakage, the fungi that cause heart rot can be viewed as both a pathogen and an agent of disturbance. This paper uses the temperate rainforest of southeast Alaska to explore ecological consequences of heart rot, including the role of heart rot fungi in canopy gap formation.

656. Holsten, E.H., Werner, R.A., and R.L. Develice. 1995. Effects of a Spruce Beetle (Coleoptera: Scolytidae) Outbreak and Fire on Lutz Spruce in Alaska. Environ. Entomol. **24**(6): 1539-1547.

Abstract: Tree species composition remained essentially the same after the outbreak. Forest structure changed with decreased tree density, and species richness declined significantly on the unburned, spruce beetle-effected plots. The reduction in plant diversity was probably a result of the significant increase, and competitive advantage, of blue-joint grass and fireweed in the heavily beetle-effected plots. Although species richness did not change 7 years after a prescribed fire, species composition did change. Specifically, the occurrence and percentage of bluejoint and fireweed cover significantly increased.

657. Jacoby, G.C. and R.D. D’Arrigo. 1995. Tree Ring Width and Density Evidence of Climatic and Potential Forest Change in Alaska. Global Biogeochemical Cycles **9**(2): 227-234.

Abstract: Ring width variations and recorded data in central and northern Alaska indicate annual temperatures increased over the past century, peaked in the 1940’s, and remain near the highest level for the past three centuries. The recent increase in temperatures combined with drier years may be changing the tree response to climate and raising the potential for some forest changes in Alaskan and other boreal forests.

658. Kruger, L.E. and C.B. Tyler. 1995. Management Needs Assessment for the Copper River Delta, Alaska. USDA Forest Service Pacific Northwest Research Station General Technical Report PNW-GTR-356. 45 p.

Abstract: This report assesses needs, problems, and perceptions relevant to management of the Copper River Delta. The assessment provides a basis for planning and decision-making and a framework for ongoing research, development and application.

659. Lowell, E. 1995. Beetle-killed White Spruce on the Kenai Peninsula Lumber Recovery Study, Seward, Alaska. Preliminary Results. USDA Forest Service Pacific Northwest Research Station, Timber Quality Research, Study 43-03. 20 p.

Abstract: Much of the defect found in the sample was present prior to attack by the spruce beetle. Heart and sap rot were responsible for a major portion of volume loss. Once a tree has been killed by beetles, little further deterioration occurs from heart and sap rot. Sap rot and weather check are the forms of deterioration associated with beetle-killed trees.

660. Mann, D.H., Fastie, C.L., Rowland, E.L. and N.H. Bigelow. 1995. Spruce Succession, Disturbance, and Geomorphology on the Tanana River Floodplain, Alaska. Ecoscience **2**(2): 184-199.

Abstract: The results of this study refute the Drury Hypothesis that states black spruce replaces white spruce after several centuries of primary succession on floodplains. Predictions of the Drury Hypothesis regarding active-layer and organic-horizon thicknesses are not substantiated. Forest communities in the study area are distributed along geologically based environmental gradients and are shaped by secondary succession following fires and probably floods.

661. Mask, R.A. 1995. Use of Methylcyclohexenone (MCH) Beads to Protect Windthrown Sitka Spruce from Spruce Beetle Attack. USDA Forest Service Alaska Region. Technical Report R10-TP-52. 14 p.

Abstract: MCH beads deployed at rates of 8.2 and 12.3 lbs. per acre were not successful in reducing number of spruce beetle attacks or the number of resulting brood among the windthrown Sitka spruce in this study. Preliminary conclusions are that beads appear to be an inadequate release medium unless the active season is short or multiple applications are used to extend the coverage period.

662. Mask, R.A. 1995. Use of Methylcyclohexenone (MCH) Bubblecaps to Protect Live and Windthrown Sitka Spruce from Spruce Beetle Attack. USDA Forest Service, Alaska Region Technical Report R10-TP-54. 16 p.

Abstract: In live Sitka spruce, MCH bubblecaps deployed at 16 and 25 caps per one-half acre did not significantly reduce the number of spruce beetle attacks or resulting brood. In windthrown Sitka spruce, MCH bubblecaps deployed at 2 caps per fallen tree did not significantly reduce mean number of spruce beetle attacks or resulting brood.

663. Mead, B.R. 1995. Plant Biomass in the Tanana River Basin, Alaska. USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon, Research Paper PNW-RP-477. 78 p.

Abstract: Vegetation biomass tables are presented for the Tanana River basin. Average biomass for each species of tree, shrub, grass, forb, lichen, and moss in the 13 forest and 30 nonforest vegetation types is shown. Tree biomass is reported for the entire aboveground tree, thereby allowing estimates of total fiber content.

664. Newton, M. and E.C. Cole. 1995. Forest Regeneration and Vegetation Management in Northern Boreal and Coastal Forests. Office Report. 21 p.

Abstract: This report outlines the ways vegetation competes with trees, and offers insights into how various management tools and prescriptions permit managers to favor desirable tree species and compositions and concurrently to maintain good wildlife habitat, especially for moose.

665. Richmond, J.A., Werner, R.A., and A.T. Drooz. 1995. Larch Sawfly, *Pristiphora erichsonii* (Hymenoptera: Tenthredinidae) and its Parasitoids from Alaska. J. Entomol. Soc. Brit. Columbia **92**: 25-27. December 1995.

Abstract: The larch sawfly and four parasitoids were reared in the laboratory from cocoons collected in Alaska for two consecutive years. Emergence of adult sawflies exceeded thirty percent each year. The number of parasitoids emerging was four times greater from the 1993 collection than from the subsequent year.

666. Schulz, B. 1995. Changes Over Time in Fuel-loading Associated with Spruce Beetle-impacted Stands of the Kenai Peninsula, Alaska. USDA Forest Service, Alaska Region. Anchorage, AK. Technical Report R10-TP-53. 17 p.

Abstract: There is a general tendency for increasing fuel loads in later stages of infestation for all size classes of downed woody material except for the smallest size class and for rotten pieces three inches in diameter or greater. Duff depths decrease with later stages of infestation, while fuel height and percent grass cover increase. Fuel loads calculated for spruce stands in early stages of spruce beetle outbreak are less than fuel loads calculated for stands that have gone through an epidemic.

667. Shea, P.J., Hard, J.S., E.H. Holsten. 1995. Tests of Pheromone-Baited Standing Trap Trees Treated with Carbaryl to Reduce Spruce Beetle-Caused Tree Mortality in South-central Alaskan Stands: Preliminary Assessment and Suggested Changes for New Tests. USDA Forest Service Technical Report R10-TP-55. 8 p.

Abstract: The first year data demonstrated that baited, standing, insecticide-treated trap trees can significantly reduce standing tree mortality. There is less confidence in the second year data because improper controls were used. Suggestions for future field tests of lethal standing trap trees to suppress spread of spruce beetles in lightly infested stands are offered.

668. Thilenius, J.F. 1995. Phytosociology and Succession on Earthquake-Uplifted Coastal Wetlands, Copper River Delta, Alaska. USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon. General Technical Report PNW-GTR-346. 58 p.

Abstract: In 1964, an earthquake of Richter scale 8.4 to 8.6 raised the entire Copper River Delta from 1.8 to 3.4 meters above the previous mean sea level. This paper documents the changes in tidal areas and plant succession in those areas. The uplift appears to have altered locations and rates, but not the nature, of wetland plant succession on the delta.

669. Trummer, L.M., Hennon, P.E., and E.M. Hansen. 1995. Retrospective Dwarf Mistletoe Research: Assessing the Importance, Opportunities and Challenges. In: Proceedings of the Forty Third Western International Forest Disease Work Conference. Whitefish, Mont. Pp. 35-36.

Abstract: Studies that quantify the long-term spread and intensification of hemlock dwarf mistletoe following partial harvest of the overstory canopy are lacking. Therefore, the assumption was made that wind disturbed stands can be a mimic for clearcutting since the parasite would likely behave in a similar way in either circumstance. Retrospective dwarf mistletoe studies provide a unique opportunity to glimpse the distant future. Careful unraveling of past stand history can allow a wealth of dwarf mistletoe information to be available in a short period of time.

670. U.S.D.A. Forest Service. 1995. Forest Insect and Disease Conditions in the United States-1995. USDA Forest Service. 12 p.

Abstract: Overall, 1995 Alaska forest insect and disease damage levels increased relative to 1994 levels; more than 1,961,000 forested acres were impacted. Spruce beetle increased by 40% this year while engraver beetles declined by 70%. Hardwood and conifer defoliators both increased this year. In southeast Alaska, black-headed budworm and hemlock sawfly populations both declined. Wood decay of live trees, hemlock dwarf mistletoe,

and yellow-cedar decline were the most important diseases of Alaskan forests in 1995. More than 595,000 acres of yellow-cedar decline were mapped.

671. Werner, R.A. 1995. Effects of Fertilization on Induced Host Resistance to Attack by Spruce Bark Beetles in Lutz Spruce in Alaska. In: Proceedings: Bark Beetles, Blue-stain Fungi, and Conifer Defense Systems. As, Norway. July 31-August 2, 1995. P. 22-23.

Abstract: Mechanical wounding and wounding plus inoculation with a blue-stain fungus caused an induced reaction zone or lesion around the wound sites in Lutz spruce in Alaska. Trees inoculated with both the blue-stain infested bark plugs and cotton plugs in the P fertilizer treated plots had significantly longer inner and outer lesions than other inoculated and control trees in the study. Trees with infested bark plugs had significantly longer inner and outer lesions than infested cotton plugs.

672. Werner, R.A. 1995. Toxicity and Repellency of 4-Allylanisole and Monoterpenes from White Spruce and Tamarack to the Spruce Beetle and Eastern Larch Beetle (Coleoptera: Scolytidae). Environ. Entomol. **24**(2): 372-379. (1995).

Abstract: Monoterpenes found in oleoresin of white spruce and tamarack, and 4-allylanisole were bioassayed for their toxicity to adult spruce beetles. Exposure of spruce beetle and eastern larch beetle adults for 24 h to various dosages of monoterpenes from white spruce and tamarack resulted in 100% mortality when treated with 80 ppm of alpha pinene, limonene, myrcene, beta phellandrene and 4-allylanisole. Limonene and 4-allylanisole were the most toxic and inhibitory monoterpenes tested in this study.

673. Werner, R.A., and E.H. Holsten. 1995. Current Status of Research with the Spruce Beetle, *Dendroctonus rufipennis.* In: Application of Semiochemicals for Management of Bark Beetle Infestations-proceedings of an informal conference-Annual Meeting of the Entomological Society of America Indianapolis IN. December 12-16, 1993. USDA Forest Service Gen. Tech. Rep. INT-GTR-318. Ogden UT. P. 23-29.

Abstract: One of the most promising tools for reducing natural resource productivity losses due to spruce beetles in Alaska involves the use of semiochemicals. Results to date have been inconclusive but the use of semiochemical mixes is promising if applications can be adapted for cold climates.

674. Werner, R.A., and E.H. Holsten. 1995. Use of Semiochemicals to Reduce Impact of Bark Beetles on Spruce Forests of Boreal Ecosystems. Poster Abstract In: Caring for the Forest: Research in a Changing World. IUFRO XX World Congress. Tampere, Finland. August 6-12, 1995. P. 98.

Abstract: MCH bubblecaps at 120 per hectare protected 95% of the trees, whereas 77 bubblecaps per hectare protected 83% of the trees. The application of MCH beads provided no protection to stands from beetle attack. The elution rate of the MCH from beads is inadequate at cold climates, characteristic of boreal forests, to provide protection of uninfested stands.

675. Wurtz, T.L. 1995. Understory Alder in Three Boreal Forests of Alaska: Local Distribution and Effects on Soil Fertility. Can. J. of For. Res. **25**: 987-996.

Abstract: The distribution and effects on soil chemistry of shrub alders occurring in the understory of the boreal forest of Alaska were examined. Allometric biomass models were developed for alder ramets; maps of the spatial distribution of ramets and of estimated aboveground alder biomass are presented. In undisturbed forest, alder soils tended to have more nitrogen than nonalder soils. This study suggests that the effect of understory alders on the boreal forest soil mosaic is a function of site characteristics such as canopy openness and soil background fertility.

676. Youngblood, A. 1995. Development Patterns in Young Conifer-Hardwood Forests of Interior Alaska. Journal of Vegetation Science **6**: 229-236.

Abstract: The age structure and growth patterns of 53 young conifer-hardwood stands on upland, south-facing sites of interior Alaska were analyzed to determine the length of time for stand establishment after disturbance, the composition of early-successional stands compared to existing stands, and the potential for late-successional stands dominated by conifers.

677. Zhong, H., Hastings, F.L., Hain, F.P. and J.F. Monahan. 1995. Carbaryl Degradation on Tree Bark as Influenced by Temperature and Humidity. J. Econ. Entomol. **88**(3): 558-563.

Abstract: Tree species and relative humidity were the main factors affecting the degradation process. Several metabolites of carbaryl were found on the bark of white spruce. Two major metabolites were identified based on chromatography. Maximum amounts of these metabolites reached ~28 and 24% respectively.

678. Zhong, H., Hastings, F.L., Hain, F.P., and W.C. Dauterman. 1995. Comparison of the Metabolic Fate of Carbaryl-Naphthyl-1-^{14}C in Two Beetle Species (Coleoptera: Scolytidae). J. Econ. Entomol. **88**(3): 551-557.

Abstract: Methylolcarbaryl was the major metabolite in both beetle species. The southern pine beetle metabolized ^{14}C-carbaryl and excreted its metabolites more quickly than the spruce beetle. Several unidentified metabolites were also present.

679. Zhong, H., Hastings, F.L., Hain, F.P., Holsten, E.H., and R.A. Werner. 1995. Rate of Penetration and Residual Toxicokinetics of Carbaryl on Southern Pine Beetle and Spruce Beetle (Coleoptera: Scolytidae). J. Econ. Entomol. **88**(3): 543-550.

Abstract: The amount of methanolic unextractable compounds was similar for both beetle species: unextractable compounds increased as the incubation times increased. LD_{50} levels for carbaryl indicated that the spruce beetle was more susceptible to carbaryl than the southern pine beetle. This information and results of the toxicity tests suggest that decreased exoskeletal penetration may be one of the major mechanisms of southern pine beetle tolerance to carbaryl.

1996

680. Borden, J.H., Gries, G., Chong, L.J., Werner, R.A., Holsten, E.H., Wieser, H., Dixon, E.A., and H.F. Cerezke. 1996. Regionally-specific Bioactivity of Two New Pheromones for *Dendroctonus rufipennis* (Kirby) (Col., Scolytidae) J. Appl. Ent. **120**: 321-326 (1996).

Abstract: 1-Methyl-2-cyclohexen-1-ol (MCOL) was shown, for the first time, to occur in the frass produced by female spruce beetles. Results indicate that for wide-ranging scolytid species, operational evaluation of new semiochemicals should be regionally specific.

681. Collins, W.B. 1996. Wildlife Habitat Enhancement in the Spruce-Hardwood Forest of the Matanuska and Susitna River Valleys. Federal Aid in Wildlife Restoration Final Research Report 1 July 1990 – 31 December 1995. Alaska Department of Fish and Game, Division of Wildlife Conservation. Study 1.44. 52 p.

Abstract: This report details results of a study of timber harvest, scarification, burning, livestock grazing, various mechanical treatments and herbicide treatment tested for their effectiveness in stimulating early successional hardwood production and enhancing wildlife habitat in boreal forests of southcentral Alaska.

682. Golden, D.J. 1996. Economic Ecosystem Indicators in Declining Forest Health. State and Private Forestry. USDA Forest Service. Anchorage, Alaska. 39 p.

Abstract: This report prepares an analysis and suggests a methodology to determine losses of selected forest amenities resulting from catastrophic events currently degrading Alaskan forests. This report evaluates models

for determining losses that are currently “non-priced” forest amenities such as wildlife, water quality, tourism etc.

683. Haggstrom, D.A. and D.G. Kelleyhouse. 1996. Silviculture and Wildlife Relationships in the Boreal Forest of Interior Alaska. The Forestry Chronicle **72**(1): 59-62.

Abstract: Differences between logging, prescribed fire and wildland fire, and their effects on wildlife are discussed. Authors also discuss the value of riparian and late successional forest types within the boreal forest and their concerns for proposals that seek to optimize timber harvests for large areas.

684. Hanley, T.A. 1996. Small Mammals of Even-Aged, Red Alder – Conifer Forests in Southeastern Alaska. Canadian Field Naturalist **110**(4): 626-629.

Abstract: Results of this study indicate that even-aged, red alder – conifer stands may be valuable small mammal habitat in southeastern Alaska and that red alder may be an especially important component of young stands. Clearcut logging that favors red alder might have significantly better consequences for some small mammal species than does high-lead clearcut logging that discourages alder.

685. Holsten, E.H. 1996. *Ips tridens*; A Pest of Managed Stands? USDA Forest Service. Alaska Region. Anchorage, AK. Biological Evaluation R10-TP-64. 8 p.

Abstract: *Ips*-caused tree mortality has declined over the years in the Quartz Creek area. Little or no future mortality is expected in this area. Based on findings from Quartz Creek, continued, but declining spruce mortality can be expected in the Granite Creek area.

686. Holsten, E.H., Hennon, P.E., Wittwer, D., and K. Matthews. **1996.** Forest Insect and Disease Conditions in Alaska--1995. USDA Forest Service, Alaska Region. Anchorage, AK. 40 p.

Abstract: Overall, 1995 Alaska forest insect and disease damage levels increased relative to 1994 levels; more than 1,961,000 forested acres were impacted. Spruce beetle increased by 40% this year while engraver beetles declined by 70%. Hardwood and conifer defoliators both increased this year. In southeast Alaska, black-headed budworm and hemlock sawfly populations both declined. Wood decay of live trees, hemlock dwarf mistletoe, and yellow-cedar decline were the most important diseases of Alaskan forests in 1995. More than 595,000 acres of yellow-cedar decline were mapped.

687. Martin Environmental. 1996. Monitoring the Effects of Timber Harvest Activities on Fish Habitat in Streams of Coastal Alaska 1992 to 1996. Project Status Report prepared for Sealaska Corporation, Juneau, Alaska. August 30, 1996. 12 p.

Abstract: Though not a final report, this status report concludes that changes in watershed parameters that can be associated with logging have not had a significant effect on the quantity and quality of fish habitat to date. Small or localized changes in habitat have occurred in association with blowdown, but the effect on habitat at a reach scale has not been significant.

688. Mask, R.A., and P.E. Hennon. 1996. Forest Health Considerations for Heceta Island. USDA Forest Service, Alaska Region. Juneau, Alaska. Technical Report R10-TP-59. 23 p.

Abstract: This report is provided at the request of the interdisciplinary team for independent timber sales, Thorne Bay Ranger District. Included are the results of a recent hemlock sawfly evaluation and other forest insect and disease information pertinent to ongoing planning efforts for Heceta Island.

689. Reynolds, K.M., and E.H. Holsten. 1996. Classification of Spruce Beetle Hazard in Lutz and Sitka Spruce Stands on the Kenai Peninsula, Alaska. Forest Ecology and Management **84**: 251-262.

Abstract: Stand data from Lutz and Sitka spruce forest types occurring on the Kenai Peninsula were analyzed by tree-based classification and abductive inference to develop decision models for classifying spruce beetle hazard. Results of model verification and model validation were both considered very acceptable.

690. Schultz, M. 1996. Dall Island Sitka Spruce Mortality Survey. USDA Forest Service. Alaska Region. Juneau, Alaska. Technical Report R10-TP-63. 13 p.

Abstract: Spruce beetle probably increased in numbers after the winter of 1990-91 following weather conditions that resulted in blowdown in various stands throughout southeast Alaska. A sustained air temperature above that required for flight activity may have contributed to the broad dispersal of these beetles. Future beetle activity will depend upon weather conditions and the susceptibility of residual trees, however, no new beetle activity is predicted for Dall Island and the surrounding islands.

691. Schulz, B. 1996. Response of Residual Spruce Beetle-impacted Stands in Resurrection Creek Drainage, Kenai Peninsula, Alaska. USDA Forest Service. Alaska Region. Anchorage, AK. Technical Report R10-TP-62. 20 p.

Abstract: Radial growth of trees surviving a spruce beetle outbreak was assessed for the past 35 years. Evidence of release events was apparent for 28% of the trees in spruce beetle impacted plots, and for 4% of the trees in unimpacted stands. Radial growth was decreasing prior to and increased after the beetle outbreak in both impacted and unimpacted stands.

692. Scott, G.M., Bormett, D.W., Sutherland, N.R., Abubakr, S., and E. Lowell. 1996. Pulpability of Beetle-Killed Spruce. USDA Forest Service. Forest Products Laboratory Research Paper FPL-RP-557. 8 p.

Abstract: Tests were conducted to evaluate the value of beetle-killed spruce as pulpwood. The results showed that live and dead spruce wood can be pulped effectively. Log deterioration had mixed effects on paper properties.

693. Werner, R.A. 1996. Forest Health in Boreal Ecosystems of Alaska. The Forestry Chronicle.**72**(1): 43-46.

Abstract: Forest health can be addressed through short-term tactical approaches and long-term strategies. Management practices must match the ecological capabilities of each site in order to create and maintain healthy forests. This is the focus of ecosystem management.

694. Werner, R.A. and B.L. Illman. 1996. The Role of Stilbene-like Compounds in Host Tree Resistance of Sitka Spruce to the Spruce Beetle, *Dendroctonus rufipennis.* In: Proceedings of a Joint IUFRO Working Party Conference. Maui, Hawaii. Feb. 6-11, 1994. Pp.123-133.

Abstract: The study of chemical defense mechanisms in Sitka spruce phloem tissues indicates several lines of defense operate to inhibit feeding by the spruce beetle and colonization of potentially pathogenic fungi. If wounding occurs, the formation of surface periderm and resinosus acts as an initial defense to further beetle colonization. If this defense is overcome by beetles and blue-stain fungi, increased production of potentially toxic monoterpenes act as a second line of defense to beetles and antimicrobial stilbenes to the fungi.

695. Werner, R.A., and J.R. Meeker. 1996. Fire/Forest/Insect Interactions. In Proceedings: North American Forest Insect Work Conference. Forest Entomology: Vision 20:21. San Antonio, Texas. April 8-12, 1996. P. 136.

Abstract: The opportunity exists in most forest ecosystems of North America to use prescribed fire to manipulate forest insect pests and associated organisms, including bark beetles. The interactions among fire, forests, and insects are many, complex, and poorly understood.

696. Wiens, D., Nickrent, D.L., Shaw, C.G. III, Hawksworth, F.G., Hennon, P.E., and E.J. King. 1996. Embryonic and Host-associated Skewed Adult Sex Ratios in Dwarf Mistletoe. Heredity **77** (1996). 55-63.

Abstract: Embryonic sex ratios were determined for the first time in dioecious flowering plants by utilizing malate dehydrogenase (*Mdh-3*) as a genetic marker. Host environment apparently influences adult sex ratios in hemlock dwarf mistletoe.

697. Wurtz, T.L. and A.F. Gasbarro. 1996. A Brief History of Wood Use and Forest Management in Alaska. The Forestry Chronicle **72**(1): 47-50.

Abstract: This paper chronicles wood use and forest management in Alaska from pre-European contact with native Alaskan populations to the present.

1997

698. Alaska Division of Forestry. 1997. Fire Resistant Plants of Southcentral and Interior Alaska. Urban and Community Forestry Program. 5 p.

Abstract: The following plant list includes a few of the common species used for landscaping in Alaska, which also have characteristics of fire resistive vegetation.

699. Alaska Division of Forestry. 1997. Spruce Beetle Activity and Potential Wildland Fire Hazards in Southcentral Alaska. Alaska Department of Natural Resources, Division of Forestry. 3 p.

Abstract: This report explains how the potential for fire hazard increases as a result of spruce bark beetle infestations. Changes in cover type and forest structure as a result of bark beetle-induced tree mortality are discussed.

700. Alaska Society of American Foresters. 1997. Action Program to Identify and Restore Key Spruce Ecosystems Killed, Infested or Threatened by Spruce Bark Beetle. Open letter to members dated Feb. 10, 1997. 11 p.

Abstract: This paper provides action plans for the following issues with regard to the spruce beetle-impacted forests of southcentral Alaska: 1) fire hazard/fuels buildup; 2)forest resource inventory; 3) reforestation; 4) provide incentives to develop a viable forest industry; 5) protect hydrologic and fisheries resource values.

701. Anon. 1997. Wildfire Alert ’97. Homer Forest Health and Safety Project, Homer Volunteer Fire Department and Alaska Division of Forestry. 4 p.

Abstract: This wildfire alert is a fire prevention and preparation advisory to the general public.

702. Burnside, R.E., Gorham, M., Hennon, P.E., Holsten, E.H., Matthews, K., Schulz, B., Schultz, M., Trummer, L.M., Wittwer, D., and K. Zogas. 1997. Forest Insect and Disease Conditions in Alaska--1997. USDA Forest Service. Alaska Region. Anchorage, AK. General Technical Report R10-TP-70. 58 p

Abstract: Insect and disease activity declined by one third over 1996 levels. Spruce beetle numbers fell 50% to 563,741 acres. Spruce budworm, a major conifer defoliator in interior Alaska, declined by 84% in 1997. Willow leaf blotchminer populations in interior Alaska fell by 93% to only 3,500 acres. Larch sawfly and hemlock sawfly both declined in numbers. In southeast Alaska, approximately one third of the gross volume of forests is defective due to heart and butt rot fungi. Yellow-cedar decline was mapped on 477,000 acres.

703. Deal, R.L. 1997. Understory Plant Diversity in Riparian Alder – Conifer Stands After Logging in Southeast Alaska. USDA Forest Service Pacific Northwest Research Station, Portland, Oregon. Research Note PNW-RN-523.8 p.

Abstract: The four stands with the most alder had high species richness of shrubs, herbs, ferns, and mosses, but the predominantly spruce stand had slightly fewer species of shrubs and ferns, and considerably fewer herbs. Mixed alder-conifer stands have maintained species-rich understories for 45 years after logging, and stands with conifers and alders of relatively equal stocking contained the largest diameter conifers. Riparian alder-conifer stands maintain plant diversity and also will provide some large-diameter conifers for large woody debris for streams.

704. Eglitis, A.E., and P.E. Hennon. 1997. Porcupine Feeding Damage in Precommercially Thinned Conifer Stands of Central Southeast Alaska. West. J. Appl. For **12**(4):115-121.

Abstract: This study describes feeding damage by porcupines in precommercially thinned young growth stands of Sitka spruce and western hemlock on Mitkof Island in central southeast Alaska. Four categories of feeding damage are described. Sitka spruce sustained significantly higher damage than western hemlock.

705. Handel, C.M. 1997. Southcoastal Alaska Regional Conservation Priorities for Landbirds. Southcoastal Alaska Bioregional Working Group, Boreal Partners in Flight Annual Meeting. 3-4 December 1996, Anchorage, Alaska. 9 p.

Abstract: This workshop focused on the threat to landbird populations in the Anchorage Bowl posed by the current spruce beetle epidemic and subsequent habitat disturbance and by timber harvesting.

706. Hennon, P.E. 1997. Summary of Panel Papers: Disturbance in the Boreal and Sub-Boreal Forests of North America. In Proceedings: The Forty-Fifth Western International Forest Disease Work Conference. Panel-Boreal Disturbance Ecology. Prince George, British Columbia. September 15-19, 1997: 11-12.

Abstract: This panel explored the disturbance process in North American boreal and sub-boreal forests. It described a number of interactions among biotic and abiotic factors in the disturbance processes of the forest and considered the overarching influence of climate. The panel also covered ecosystem response to disturbance and how subsequent stand development might then affect the various disturbance agents and processes.

707. Hennon, P.E. 1997. Brown Crumbly Rot. Compendium of Conifer Diseases. ed. Everett M. Hansen and Katherine J. Lewis. APS Press: 23

Abstract: This note offers a brief description of *Fomitopsis pinicola* symptoms and diagnosis, disease cycle, ecological significance and disease management, and distribution and hosts.

708. Hennon, P.E. 1997. Pole Blight. Compendium of Conifer Diseases. ed. Everett M. Hansen and Katherine J. Lewis. APS Press: 71.

Abstract: This note offers a brief description of pole blight symptoms and diagnosis, ecological significance and disease management, causal agent and distribution.

709. Hennon, P.E. 1997. Yellow-Cedar Decline. Compendium of Conifer Diseases. ed. Everett M. Hansen and Katherine J. Lewis. APS Press: 70-71.

Abstract: This brief note discusses yellow-cedar decline symptoms and diagnosis, development of decline, predisposing factors and possible causes, ecological significance and disease management, causal agents, and distribution.

710. Hennon, P.E. and A.S. Harris, comps. 1997. Annotated Bibliography of *Chamaecyparis nootkatensis.* USDA Forest Service, Pacific Northwest Research Station. Portland, OR. Gen. Tech. Rpt. PNW-GTR-413 112 p.

Abstract: Some 680 citations from literature treating *Chamaecyparis nootkatensis* are listed alphabetically by author in this bibliography. Most citations are followed by a short summary. A subject index is included.

711. Hennon, P.E., and D.J. DeMars. 1997. Development of Wood Decay in Wounded Western Hemlock and Sitka Spruce in Southeast Alaska. Can. J. For. Res. **27**: 1971-1978 (1997).

Abstract: Each of the 119 selected Sitka spruce and western hemlock tree was dissected and measured for extent of internal stain and decay to determine wood volume losses over time caused by fungi. Decay extended less than 1 m above wounds and consumed less than 5% of gross tree volume in all but a few trees that had large, old scars.

712. Hennon, P.E., and C.G. Shaw III. 1997. The Enigma of Yellow-Cedar Decline-What is Killing These Long-Lived, Defensive Trees? Journal of Forestry **95**(12): 4-10.

Abstract: Yellow-cedar decline appears to be an outstanding example of a naturally induced forest decline. Climatic warming could be responsible for triggering some stress factor that has led to the demise of yellow-cedar forests on some 500,000 acres. If climate has been a trigger, then yellow-cedar decline in Alaska may be an excellent example of the devastating effects of a moderate climate shift on a forest ecosystem. The inability to adapt could explain the enigma of what is killing this defensive tree.

713. Holsten, E.H. 1997. Sitka Spruce Weevil (Coleo.: Curculionidae; *Pissodes strobi* Hopk.) A Risk to Ornamental and Native Spruce in South-Central Alaska?? In Proceedings: 16th Alaska Greenhouse and Nursery Conference. Soldotna, Alaska. Feb. 20-21, 1997. P.25-29.

Abstract: This presentation at the Alaska Greenhouse Conference discussed the problem of the Sitka spruce weevil in Anchorage. It's damage and life cycle is discussed. The problem of the establishment of introduced pests into Alaska is discussed.

714. Holsten, E.H. 1997. *Ips tridens*; A Pest of Managed Stands? 1997 Update. USDA Forest Service. Alaska Region. Anchorage, AK. Biological Evaluation R10-TP-71. 7 p.

Abstract: In the Granite Creek area, 40 and 24% of the standing live residuals in the North-side and South-side, respectively, were killed by *Ips* compared to an average 11% mortality in 1996. The percentage of live residual spruce in the Granite Creek thinned area now averages 55% vs. 77% in 1996. A sample of dispersing *Ips* adults was sent to Dr. M. Furniss, University of Idaho, for species determination. The majority of the *Ips* specimens were identified as *I. perturbatus*, not *I. tridens,* as previously speculated. Management implications and options are discussed.

715. Holsten, E.H., and R.E. Burnside. 1997. Forest Health in Alaska: An Update. Western Forester. **95**(5): 8-9.

Abstract: This magazine article provides an update of forest health in Alaska in 1997. Major forest insect pests and diseases are discussed in light of their impacts on the forest. A brief overview of current research is offered.

716. Illman, B.L., and B.A. Dowd. 1997. Synchrotron Applications in Forestry and Forest Products. Synchrotron Radiation News **10**(2):18-23.

Abstract: This article discusses current research using X-ray computed microtomography to better understand spruce beetle structure and function, to assist in identification of fungal species, and to locate fungi on/in beetles and reduction of Mn *in situ* during degradation of wood.

717. Matsuoka, S.M., Handel, C.M. and D.D. Roby. 1997. Nesting Ecology of Townsend's Warblers in Relation to Habitat Characteristics in a Mature Boreal Forest. The Condor **99**: 271-281.

Abstract: Most nesting failure (80%) was attributable to predation. Nests that escaped predation were placed in white spruce with larger diameter than those lost to predation; nests that escaped blow-fly parasitism were located higher in nest trees and in areas with lower densities of woody shrubs than those that were infested.

718. Matthews, K., Wittwer, D., Zogas, K., Holsten, E.H., Trummer, L.M., Hennon, P.E., Schultz, M., and R.E. Burnside. 1997. Forest Insect and Disease Conditions in Alaska--1996. USDA Forest Service, Alaska Region General Technical Report R10-TP-67. 52 p.

Abstract: Insect activity showed a marked increase in 1996. The spruce bark beetle outbreak now covers 1.13 million acres and engraver beetle numbers are up in interior Alaska. Larch sawfly and willow defoliator populations have both increased dramatically. Spruce beetle activity in southeast Alaska has increased. While black-headed budworm populations have fallen, hemlock sawfly numbers are up. Yellow-cedar decline is present on 475,000 acres throughout southeast Alaska. Wood decay of live trees and hemlock dwarf mistletoe remain the two other most important diseases of Alaskan forests.

719. McDonald, K.A., Hennon, P.E., Stevens, J.H., and D.W. Green. 1997. Mechanical Properties of Salvaged Dead Yellow-cedar in Southeast Alaska-Phase 1. USDA Forest Service. Forest Products Laboratory Research Paper FPL-RP-565. 9 p.

Abstract: Obtaining information on wood properties from yellow-cedar snags is necessary to correctly assess their utilization potential. Initial property analyses, Phase 1, showed no evidence that even the oldest snags have lost strength.

720. Municipality of Anchorage. 1997. Spruce Bark Beetles and Wildfires. Are You Prepared? Office of Emergency Management. 2 p.

Abstract: This brochure discusses what the Alaskan homeowner can do to help prevent a spruce beetle infestation in their trees and how to reduce fire hazard if they live in a forested area.

721. Newton, M., and E.C. Cole. 1997. Reforestation and Vegetation in Central Alaska. USDA Forest Service. Alaska Region. Anchorage, AK. Forest Health Protection Special Report R10-TP-65. 80 p.

Abstract: The three papers herein summarize nine years of research relating to the principal obstacles to artificial regeneration in south-central Alaska. The key elements include: 1) determination of severity of plant competition and consequences of not weeding in the first five years of spruce plantations; 2) comparisons of methods of controlling competition and; 3) evaluation of environmental impacts of the various methods of vegetation control. Also addressed are preliminary findings on the importance of the size of planting stock after various forms of mechanical and chemical site preparation.

722. Reynolds, K.M., and E.H. Holsten. 1997. Sbexpert Users Guide (Version 2.0): A Knowledge-Based Decision-Support System for Spruce Beetle Management. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. Gen. Tech. Rep. PNW-GTR-401. 62 p.

Abstract: Sbexpert version 2.0 is a knowledge-based decision-support system for spruce beetle management developed for use in Microsoft (MS) Windows with Knowledge-Pro Windows development language. Basic features of the Sbexpert system include an intuitive graphical user interface, efficient presentation and retrieval of information through hypertext and hypergraphics, easy access to an extensive help system for MS Windows system-level, window-specific help, a text editor that facilitates preparing standard reports from Sbtext, and automatic report generation in Sbexpert.

723. Schulz, B. 1997. Cooper Landing Regeneration Surveys-Preliminary Results. USDA Forest Service. Alaska Region. Anchorage, AK. Special Report R10-TP-66. 24 p.

Abstract: This report summarizes the results of the Cooper Landing Reforestation Surveys from 1993 through 1996. Findings from several other regeneration surveys are also included. Preliminary indications for management are considered, along with recommendations for continuing survey efforts.

724. Skillen, E.L., Beirsford, C.W., Camaan, M.A., and R.C. Reardon. 1997. Semiochemicals of Forest and Shade Tree Insects in North America and Management Applications. USDA Forest Service. Forest Health Technology Enterprise Team FHTET-96-15. September 1997. P. 40-42 and p. 73.

Abstract: This publication lists pheromones available for many forest insects. Referenced here are the pheromones for spruce beetle and *Ips* beetles, their current status, commercial availability, host compounds and comments on their use.

725. Werner, R.A., and E.H. Holsten. 1997. Dispersal of the Spruce Beetle, *Dendroctonus rufipennis*, and the Engraver Beetle, *Ips perturbatus*, in Alaska. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. Res. Pap. PNW-RP-501. 8 p.

Abstract: Mark-release-recapture experiments were performed with spruce beetles and *Ips* engraver beetles to determine distance and direction of dispersal. The recapture rate of beetles marked with fluorescent powder was extremely low. Adult *I. perturbatus* dispersed up to 30 m from release points compared to adult *D. rufipennis*, which dispersed 90 to 300 m from their overwintering sites. *Ips perturbatus* beetles were caught up to 90 m and *D. rufipennis* up to 600 m from the point of release.

726. Willson, M.F., and P.E. Hennon. 1997. The Natural History of Western Skunk Cabbage (*Lysichiton americanum*) in Southeast Alaska. Can. J. Bot. **75**:1022-1025.

Abstract: Western skunk cabbage is protogynous, with great seasonal variation in floral sex ratios. It is pollinated chiefly by a small staphylinid beetle (*Pelecomalius testaceum*). Yellow spathes attracted more beetles than green ones. The gelatinous coat around the seed impeded local dispersal, slowed germination slightly, had no detectable effect on seed predation, and had a possible deterrent effect on a pathogenic fungus.

727. Wipfli, M.S. 1997. Terrestrial Invertebrates as Salmonid Prey and Nitrogen Sources in Streams: Contrasting Old-growth and Young-growth Riparian Forests in Southeastern Alaska, U.S.A. Can. J. Fish. Aquat. Sci. **54**: 1259-1269 (1997).

Abstract: Data from pan-traps placed on stream surfaces showed that terrestrial invertebrate (TI) biomass and nitrogen inputs averaged up to 66 and 6 $mg.m^{-2}$.day-1, respectively, with no significant difference between habitats. Stomach contents from salmon and trout revealed that TI and aquatic-derived invertebrates were equally important prey. These results showed that TI were important juvenile salmonid prey and that riparian overstory with more alder and denser shrub understory may increase their abundance.

1998

728. Collins, W.B. and C.C. Schwartz. 1998. Logging in Alaska's Boreal Forest: Creation of Grasslands or Enhancement of Moose Habitat. Alces **34**(2): 355-374.

Abstract: Estimates of carrying capacity following poor harvest practices with no scarification seldom exceed 0.2 moose/km^2, similar to that of mature forest. Properly regenerated clearcuts yield high qualities of moose browse for approximately 20 years following logging. Authors discuss the importance of appropriate timber harvesting practices relative to moose and the boreal forest ecosystem in Alaska.

729. Fuxa, J.R., Ayyappath, R., and R.A. Goyer. 1998. Pathogens and Microbial Control of North American Forest Insect Pests. USDA Forest Service. Forest Health Technology Enterprise Team. FHTET-97-27.

Abstract: This report lists a number of forest insect pests, provides a short narrative of the pest situation for each insect, lists the pathogens of the insect and lists appropriate references.

730. Geiser, L.H., Dillman, K.L., Derr, C.C., and M.C. Stensvold. 1998. Lichens and Allied Fungi of Southeast Alaska. Lichenographia Thomsoniana: North American Lichenology. ed. M.G. Glenn, R.C. Harris, R. Dirig, and M.S. Cole. Mycotaxon Ltd., Ithaca, NY. 1998. P. 201-243.

Abstract: A checklist of 508 lichen and allied fungal species with regional habitat, distribution and abundance information has been compiled for southeastern Alaska. This checklist represents over 100 years of exploration.

731. Hastings, F.L., Werner, R.A., Shea, P.J., and E.H. Holsten. 1998. Persistence of Carbaryl Within Boreal, Temperate and Mediterranean Ecosystems. J. Econ. Entomol. **91**(3): 665-670 (1998).

Abstract: The dissipation and movement of carbaryl within soils of wet and dry sites in boreal (south central Alaska), temperate (north western North Carolina) and Mediterranean (east central California) ecosystems was determined by high-pressure liquid chromatography analyses at 1, 30, 60, 90, 365, and 485 d after applications of aqueous 2% Carbaryl to forest soils. Highest levels of carbaryl occurred within the uppermost soil layers of each site.

732. Hennon, P.E., Shaw, C.G. III, and, E.M. Hansen. 1998. Reproduction and Forest Decline of *Chamaecyparis nootkatensis* (yellow-cedar) in Southeast Alaska, USA. Coastally Restricted Forests. ed. Aimlee D. Laderman. New York, Oxford: Oxford University Press, 1998. P. 54-69.

Abstract: In 1981, the authors initiated the first detailed studies on reproduction, community relationships, and etiology and epidemiology of *C. nootkatensis* decline in southeast Alaska. This chapter briefly reviews the resource and silvics of *C. nootkatensis* and summarizes recent studies.

733. Holsten, E.H. 1998. *Ips perturbatus;* A Pest of Managed Stands?? 1998 Update. USDA Forest Service. Alaska Region, Forest Health Protection Biological Evaluation R10-TP-77, November 1998. 9 p.

Abstract: An average of only 3.6% of the live residual spruce were successfully attacked and killed in 1998 as compared to 32% in 1997 and 11% in 1996. Thus, a total of 47% of the residual spruce in the Granite Creek thinned areas were killed in a three-year period.

734. Kielland, K. and J.P. Bryant. 1998. Moose Herbivory in Taiga: Effects on Biochemistry and Vegetation Dynamics in Primary Succession. Oikos **82**: 377-383.

Abstract: Moose browsing affects soil chemistry and vegetation dynamics in ways that influence subsequent plant establishment and ultimately forest development. The authors of this study conclude that the rate of initial plant establishment and early forest succession in taiga is under significant control by mammalian herbivores.

735. LaBau, V.J. 1998. Results of a Pilot Study to Evaluate Spruce Bark Beetle-Induced Tree Mortality on the Kenai Peninsula, 1997. Environmental and Natural Resources Institute, University of Alaska, Anchorage, AK. August 1998. 25 p.

Abstract: Of the 1.2 million acres evaluated with photo and ground plots, about 517,000 acres were forested. 33% were in high impact areas, 23.7% in moderate impact areas and 19.7% in low impact areas. Approximately 15% of the 1992 growing stock are now dead. The greatest mortality occurred in the 7-16 inch diameter class. The annual rate of mortality for all growing stock is inferred at 3% per year. Of all the five-year mortality trees tallied, 89.7% were insect-killed white and Lutz spruce.

736. Lowell, E.C., and S.A. Willits. 1998. Lumber Recovery from Beetle-Killed Spruce Trees, Kenai Peninsula, Alaska. West. J. Appl. For. **13**(2): 54-59.

Abstract: A four-level, visual classification system based on tree condition was developed for the beetle-killed spruce on Alaska's Kenai Peninsula. The lumber recovery study estimated lumber volume and value recovery for each of the deterioration classes. Information on individual deterioration classes is also provided.

737. McCullough, D.G., Werner, R.A., and D. Neumann. 1998. Fire and Insects in Northern and Boreal Forest Ecosystems of North America. Annu. Rev. Entomol. 1998. **43**:107-27.

Abstract: This publication is a literature review pertaining to effects of fire-insect interactions on ecological succession, use of prescribed fire for insect pest control, and effects of fire on insect diversity from northern and boreal forests in North America.

738. Mead, B.R. 1998. Phytomass in Southeast Alaska. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. Res. Pap. PNW-RP-505. 48 p.

Abstract: Phytomass tables are presented for the southeast Alaska archipelago. Average phytomass for each sampled species of tree, shrub, grass, forb, lichen, and moss in 10 forest and 4 nonforest vegetation types is shown.

739. Nowacki, G.J., and M.G. Kramer. 1998. The Effects of Wind Disturbance on Temperate Rainforest Structure and Dynamics of Southeast Alaska. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. Gen. Tech. Rpt. PNW-GTR-421. 25 p.

Abstract: Wind disturbance plays a fundamental role in shaping forest dynamics in southeast Alaska. Mapping wind disturbance patterns across the landscape may provide a useful template for developing and evaluating land management practices. This paper synthesizes results from wind disturbance studies and unpublished data sets in southeast Alaska and discusses their possible implications for forest management.

740. Ottmar, R.D. and R.E. Vihnanek. 1998. Stereo Photo Series for Quantifying Natural Fuels. Volume II: Black Spruce and White Spruce Types in Alaska. USDA Forest Service, Forestry Sciences Laboratory, Seattle, Washington. 63 p.

Abstract: Two series of single and stereo photographs display a range of natural conditions and fuel loadings in black spruce and white spruce ecosystem types in Alaska. Each group of photos includes inventory information summarizing vegetation composition, structure and loading, woody material loading and density by size class, forest floor depth and loading and various site characteristics. The natural fuels photo series is designed to help land managers appraise fuel and vegetation conditions in natural settings.

741. See, J. 1998. Kenai Peninsula Spruce Beetle Epidemic Fire Danger/Behavior Status Report, January 1998. State of Alaska, Department of Natural Resources, Division of Forestry. 12 p.

Abstract: This status report discusses the severity of the current spruce bark beetle epidemic, how widespread it is, and the expected scope of the infestation. A partial bibliography of recent writings and maps of the affected areas are on appendices to this report.

742. Thistle, H.W., Shea, P., Holsten, E.H. and D. Quilici. 1998. Pheromone Dispersion in the Canopy Trunk Space. Conference Proceedings, Volume II. The 1998 Brighton Conference: Pests and Diseases. Proceedings of an International Conference held at The Brighton Centre, Brighton, UK. 16-19 November 1998 p. 669-674.

Abstract: Preliminary results strongly support the idea that the dispersive environment is evolving as the day progresses, at least on the test days that there was not a strong synoptic gradient resulting in high winds at the site. Therefore, the dispersion of the pheromone will be closely correlated to the time it is released.

743. Trummer, L.M., **Hennon, P.E., Hansen, E.M. and P.S. Muir. 1998.** Modeling the Incidence and Severity of Hemlock Dwarf Mistletoe in 110-year-old Wind-disturbed Forests in Southeastern Alaska. Can. J. For. Res. **28**: 1-8.

Abstract: A model was developed to predict the severity of dwarf mistletoe in western hemlock trees that developed within forests of southeast Alaska that experienced near-catastrophic windthrow in the late 1800's. The model suggests that the degree of dwarf mistletoe severity on western hemlock trees was significantly and positively correlated with levels of dwarf mistletoe infection and basal area in large and small residual trees that survived the wind disturbance. The model demonstrates the overriding importance of infected residual trees to predict future severity of dwarf mistletoe.

744. U.S.D.A. Forest Service. 1998. Forest Insect and Disease Conditions in the United States—1997. USDA Forest Service, Forest Health Protection. December 1998. 81 p.

Abstract: The report describes the extent and nature of insect and disease-caused damage of national significance in 1997. Maps are provided for some pests showing affected areas. Graphs are provided for some pests showing acreage trends over the last several years. Also provided are tables showing acreages affected for selected pests by State. The second section of this report brings together insect, disease, and abiotic agent damage from each affected Region under the organism or agent's name.

745. Wittwer, D., Matthews, K., Zogas, K., Trummer, L.M., Holsten, E.H., Schulz, B., Hennon, P.E., Schultz, M.,. **Riggs, J., and R.E. Burnside. 1998.** Forest Insect and Disease Conditions in Alaska--1998. USDA Forest Service. Alaska Region. Anchorage, AK. General Technical Report R10-TP-74. 57 p.

Abstract: In interior and south-central Alaska, spruce beetle declined by 42% in 1998, falling to only 316,000 acres. More than 1/2 of the large aspen tortrix damage observed in Alaska this year (14,245 acres) was located on the Kenai Peninsula. Spruce budworm along the Yukon River increased by 128% over 1997 levels. More than 87,000 acres of defoliation were observed. Willow leaf blochminer activity increased significantly this year. Over 123,000 acres of affected willow were mapped. For the sixth consecutive year, larch sawfly is impacting major areas of interior Alaska, this year defoliating almost one half million acres of larch. In southeast Alaska, spruce needle aphid occurred on 44,300 acres and spruce beetle activity fell by almost one half. Hemlock sawfly levels decreased and no defoliation attributed to the black-headed budworm was observed. Cedar decline was mapped on 477,000 acres. Approximately one third of the gross volume of forests is defective due to stem and butt rot. Hemlock dwarf mistletoe continues to cause growth loss.

1999

746. Anon. 1999. Update: Basin Beetles. Ecosystem News. First Quarter, 1999. pg. 3

Abstract: Various authors contribute short notes regarding spruce bark beetle infestation impacts in the Copper River Basin. Subjects include grasses, voles, birds, spruce trees and spruce beetles.

747. Berman, M., Juday, G.P., and R.E. Burnside. 1999. Climate Change and Alaska's Forests: People, Problems and Policies. In: Assessing the Consequences of Climate Change for Alaska and the Bering Sea Region. Proceedings of a workshop at the University of Alaska Fairbanks. 29-30 October 1998. Gunter Weller and Patricia A. Anderson, eds. p. 21-41.

Abstract: This paper discusses potential human effects of climate change on Alaska's forests. It includes a summary of the role of forests in Alaska's economy, including both commercial and ecosystem values contributed by forests. It analyzes climate-driven change specifically hypothesized for Alaska forest ecosystems.

748. Cole, E.C., Newton, M. and A. Youngblood. 1999. Regenerating White Spruce, Paper Birch, and Willow in South-Central Alaska. Can. J. of For. Res. **29**: 993-1001.

Abstract: Four vegetation-management treatments were compared: broadcast site preparation with herbicides, banded site preparation with herbicides, mechanical scarification, and untreated control. Spruce seedlings had the greatest growth in the broadcast site preparation treatment. Stocktype was the most important factor in spruce growth. Treatment effects for paper birch and willow were confounded by moose browsing. Results indicate spruce can be regenerated and moose browse enhanced simultaneously in forests in interior Alaska.

749. Densmore, R.V., Juday, G.P. and J.C. Zasada. 1999. Regeneration Alternatives for Upland White Spruce after Burning and Logging in Interior Alaska. Can. J. For. Res. **29**: 413-423.

Abstract: After 5 and 10 years, white spruce regeneration did not differ among the four scarification methods but tended to be lower without scarification. Broadcast seeding was also successful. Natural regeneration after 12 years exceeded expectations. The results show positive effects of burning in interior Alaska, and suggest planting seedlings, broadcast seeding, and natural seedfall, alone or in combination, as viable options for similar sites.

750. Hennon, P.E., and M.H. McClellan. 1999. Heart Rot and Other Causes of Small-scale Disturbance in the Temperate Rain Forests of Southeast Alaska. In: Trummer, L., comp. Proceedings of the Forty-sixth Western Forest Disease Work Conference; 1998 Sept. 28 – Oct. 2; Reno, NV. Anchorage AK: Dept. of Agric., For. Ser.: 97-105.

Abstract: Wind has received the most attention as a disturbance force in southeast Alaska. This paper considers other factors of small-scale disturbance, especially heart rot disease, and describes preliminary results from a large effort to measure how trees die in unmanaged, old-growth forests of southeast Alaska.

751. Hennon, P.E., and M.G. McWilliams. 1999. Decline Symptoms Do Not Develop with Grafting from Dying Yellow-cedar. Can. J. For. Res. **29**(12): 1985-1988.

Abstract: Branchlets from dying yellow-cedar trees were grafted on healthy saplings to determine if agents transmissible through grafts are associated with the widespread yellow-cedar decline in Alaska. Grafting treatment produced no detectable effect on height or diameter growth of the recipient saplings. This study produced no evidence that a graft-transmissible agent is associated with the yellow-cedar decline.

752. Hennon, P.E., and D. Wittwer. 1999. Evaluating the Dead Yellow-cedar Resource on the Tongass National Forest. In: Proceedings of the Fifth Joint Meeting of the Western International Forest Disease Work Conference and Western Forest Insect Work Conference. Breckenridge, CO. Sept. 13-17, 1999.

Abstract: A five-class snag rating system relating time-since-death to foliage and branch retention is discussed. Results of a mill study to evaluate dead yellow-cedar wood for domestic and export use are reported. The results demonstrate an encouraging rate of recovery from dead yellow-cedar. Further, results from the first phase of this study indicate no reduction in the strength properties of wood from snags, even long after death.

753. Holsten, E.H. 1999. *Ips perturbatus* Text Book, Software. USDA Forest Service, Forest Health Protection, Alaska Region, Anchorage, AK.

Abstract: An "electronic" textbook has been recently placed on the Internet at: **http://www.fs.fed.us/r10/spf/fhpr10.htm.** A disk version is also available upon request from the author. This

text provides background information on the biology, ecology and management of *Ips perturbatus***.** There is also an annotated reference section of the most pertinent *Ips* information. Subject matter of this hypermedia textbook is displayed by selecting a chapter and section to view. Within chapter sections, expanded discussions on selected topics, literature references, and graphic illustrations are accessed by selecting **hypertexts or links.**

754. Holsten, E.H., Their, R.W., Munson, A.S., and K.E. Gibson. 1999. The Spruce Beetle. USDA Forest Service. Forest Insect and Disease Leaflet 127. 12 p.

Abstract: This leaflet is a revision of Forest Pest Leaflet 127, "The Spruce Beetle" by J.M. Schmid and R.C. Beckwith written in 1975.

755. LaBau, V.J. 1999. U.S. Army Attacks Spruce Bark Beetle Problem. Western Forester **44**(4): 22.

Abstract: This short magazine article relates the U.S. Army's response to a spruce bark beetle infestation on Fort Richardson Army Base in Anchorage, Alaska.

756. Nuss, M.E. 1999. Bark Beetle Activity Assessed on the Kenai. Western Forester **44**(2): 12.

Abstract: This assessment estimated the total number of forestland acres on the Kenai Peninsula in high, medium and low impact status with respect to spruce beetle activity. Authors estimated the annual mortality rate to be 3%.

757. Schultz, M., Hennon, P.E., D. Wittwer. 1999. Yellow-cedar Heartwood Stain: What Causes the Concentric Bands of Stained Wood? In: Proceedings of the Fifth Joint Meeting of the Western International Forest Disease Work Conference and Western Forest Insect Work Conference. Breckenridge, CO. Sept. 13-17, 1999. Poster abstract.

Abstract: The concentric patterns of stained wood occurred approximately 40, 100, 200, and 300 years ago in Wrangell, AK. Wounds and insect galleries associated with these stain patterns led the authors to hypothesize that wood boring insects were involved in the infection process. A woodwasp was found within some of the more recently stained trees. A long-horned beetle, *Opsimus quadrilineatus,* was found on yellow-cedar bark; yellow-cedar sapwood could be the host-substrate of this beetle.

758. Schultz, M., Hennon, P.E., D. Wittwer. 1999. Spruce Beetle and Plant Succession in the Glacial Rebound Areas of Glacier Bay National Park. In: Proceedings of the Fifth Joint Meeting of the Western International Forest Disease Work Conference and Western Forest Insect Work Conference. Breckenridge, CO. Sept. 13-17, 1999. Poster abstract.

Abstract: Pioneer stands of predominately Sitka spruce occur on glacial rebound sites in lower Glacier Bay National Park. Conditions (nutrient immobilization, blow-down, and dry weather) were optimal for a spruce beetle outbreak in the late 1970's. In 1982, 45 fifth-acre plots were established in the area. Over time, it appears there will be a conversion of many of these sites to western hemlock.

759. Thistle, H., Shea, P.J., Holsten, E.H. and D. Quilici. 1999. Pheromone Dispersion in a Canopy Trunk Space. Analysis of Plume Data. Paper No. 991013 written for presentation at the 1999 ASAE/CSAE International Meeting, Toronto, Ontario, Canada. July 18-21, 1999. 14 p.

Abstract: A tracer study was designed to investigate pheromone dispersion in a canopy trunk space. The study utilizes SF_6 as a tracer released in a managed ponderosa pine (*Pinus ponderosa*) stand. Data indicate high variability in the concentration and extent of the tracer gas plumes that appear to be due at least in part to small variations in wind speed and turbulence.

760. Trummer, L.M. 1999. The Artillery Fungus, a Mulch Problem in Alaska? USDA Forest Service. Forest Health Protection, Alaska Region. Anchorage, AK. Biological Evaluation R10-TP-81. 4 p.

Abstract: This paper provides information related to the biology, ecology, and management options for mitigating problems caused by the artillery fungus, *Sphaerobolus stellatus.*

761. Trummer, L.M. 1999. Tomentosus Root Rot. USDA Forest Service. Forest Health Protection, Alaska Region, Anchorage, AK. Pamphlet, color illus. R10-TP-80.

Abstract: This forest disease leaflet provides a guide to identification of tomentosus root rot, a description of its life history, impacts associated with the fungus and provides management options for mitigation of spread of the disease.

762. Trummer, L.M. and R. Ott. 1999. Decay of White Spruce in Pre-commercially Thinned Stands in Tok, AK. USDA Forest Service. Forest Health Protection, Alaska Region. Anchorage, AK. Biological Evaluation R10-TP-78. 12 p.

Abstract: This evaluation concludes that currently, less than 10% of the white spruce trees in the surveyed Tok Native allotments are estimated to be infected by *P. chrysoloma*, a wood decay fungus that causes white pocket trunk rot. Within infected trees, decay columns are substantial, currently averaging 10 feet in length. Decay columns will likely expand radially and vertically within infected trees in the future.

763. U.S.D.A. Forest Service. 1999. Forest Insect and Disease Conditions in the United States—1998. USDA Forest Service, Forest Health Protection. Washington, D.C. December 1999. 80 p.

Abstract: The report describes the extent and nature of insect and disease-caused damage of national significance in 1998. Maps are provided for some pests showing affected areas. Graphs are provided for some pests showing acreage trends over the last several years. The second section of the report brings together insect, disease, and abiotic agent damage from each affected region under the organism or agent's name.

764. Wesser, S. and J. Allen. 1999. Stand and Landscape Level Analyses of a Spruce Bark Beetle (*Dendroctonus rufipennis* (Kirby)) Infestation within Wrangell-St. Elias National Park and Preserve. A Natural Resources Preservation Program Project, Wrangell-St. Elias National Park and Preserve, WRST Technical Report 99-01.

Abstract: This study concludes that spruce beetles had a substantial immediate influence on forest structure in terms of canopy and basal area reduction, and changes in forest species composition. Factors that increase risk of infestation are also discussed.

765. Wheeler, B. 1999. Spruce Bark Beetles: A Guide to Tree Management Options for Home and Woodlot Owners for Southcentral and Interior Alaska. Alaska Cooperative Extension, University of Alaska, Fairbanks. PMC-10067. 4 p.

Abstract: This guide provides a quick reference for commonly asked questions regarding the spruce bark beetle, what you can do to protect healthy unattacked spruce trees, and determining what your options are if your tree is under attack.

766. Zogas, K., and E.H. Holsten. 1999. Bibliography-Alaska Region, Forest Health Protection. USDA Forest Service, Alaska Region Technical Report R10-TP-79. 142 p.

Abstract: This bibliography cites 641 published and unpublished references. All abstracted citations are cross-referenced by author and subject. Abstracted citations are grouped by year in ascending order.

2000

767. Campbell, S., Dale, J., Hooper, C., Ripley, K., and B. Schulz. 2000. Forest Health in West Coast Forests 1997-1999. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. 76 p.

Abstract: This report examines some forest health issues current in West Coast states in 1997, 1998 and 1999. The narrative discusses forest ecosystem disturbance, two significant forest insect and disease problems – Swiss needle cast and spruce beetle – forest fragmentation and urbanization, and introduction of exotic organisms. The Forest Health Monitoring program is briefly described and aerial survey and FHM plot data are presented in the appendices.

768. Caouette, J.P., Kramer, M.G. and G.J. Nowacki. 2000. Deconstructing the Timber Volume Paradigm in Management of the Tongass National Forest. In: Conservation and Resource Assessments for the Tongass Land Management Plan Revision. C.G. Shaw III, Technical Coordinator. USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon. General Technical Report PNW-GTR-482. 20 p.

Abstract: In this report, authors establish a rough indicator of forest structure that uses trees per acre and quadratic mean diameter to examine the relation between timber volume and forest structure. Results indicate that timber volume and forest structure are not interchangeable attributes. Results also indicate that the original photointerpreted timber volume stratification did not always capture differences in timber volume.

769. Cater, T.C. and F.S. Chapin III. 2000. Differential Effects of Competition or Microenvironment on Boreal Tree Seedling Establishment after Fire. Ecology **81**(4): 1086-1099.

Abstract: The preferential establishment of naturally occurring spruce and birch seedlings in patches of horsetail and the relative exclusion of spruce and birch from bluestem patches demonstrate the importance of understory vegetation in determining patterns of postfire tree regeneration. The authors suggest that many of the asymmetrical species interactions that are thought to cause structuring and changes in vegetation may be due more to the differential effects of species on environment or to the association between species and certain microenvironments, rather than to differences in competitive impact among species.

770. DeGroot, R.C., Woodward, B., and P.E. Hennon. 2000. Natural Decay Resistance of Heartwood from Dead, Standing Yellow-cedar Trees: Laboratory Evaluations. Forest Products Journal **50**(1): 53-59.

Abstract: The objectives of this study were to characterize the durability of heartwood in living and dead stems using standard American Society for Testing and Materials procedures and to determine if durability of heartwood differs between living and dead trees, with tree size, with position relative to pith, and with years following tree death. Results are discussed.

771. Hennon, P.E., Wittwer, D.T., Stevens, J.H., K. Kilborn. 2000. Pattern of Deterioration and Recovery of Wood from Dead Yellow-cedar in Southeast Alaska. West. J. Appl. For. **15**(2): 49-58.

Abstract: Comparisons among live yellow-cedar trees and five classes of snags dead up to 81 years were made based on the retention of bark and sapwood; the penetration of stain, decay and weather checks; and the volume and grade of lumber recovered. The results indicate little to no measurable difference of recovered wood from live trees and the first three snag classes, dead up to 26 yr., and a modest reduction in volume and grade in snags dead up to 81 yr.

772. Holsten, E.H. 2000. Evaluation of Larch Sawfly Damage and Spruce Blowdown: Innoko National Wildlife Refuge; August 2000. USDA Forest Service, Forest Health Protection, Alaska Region, Anchorage, AK. Biological Evaluation R10-TP-88. 11 p.

Abstract: This evaluation was conducted to assess the extensive mortality of tamarack and lack of natural regeneration of tamarack within the Refuge as well as to assess the increasing spruce bark beetle activity as a result of a wide-scale wind event that occurred in the Fall/Winter of 1998/1999. 21% of the 1,300 tamarack examined were dead. This mortality was presumed to be caused by five or more consecutive years of larch sawfly defoliation. 70% of the live tamarack was 70% defoliated. Very few of the windthrown spruce had signs of spruce or engraver beetle activity.

773. Holsten, E.H., Burnside, R.E., and S.J. Seybold. 2000. Attractant Semiochemicals of the Engraver Beetle, *Ips perturbatus*, in South-central and Interior Alaska. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. Research Paper PNW-RP-529. December 2000. 9 p.

Abstract: Data from three years of field and laboratory studies on the efficacy of potential engraver beetle semiochemicals are summarized. The addition of *cis*-verbenol to racemic ipsdienol caught significantly higher numbers of beetles than ipsdienol alone. When combined with ipsdienol and *cis*-verbenol, ipsenol more than doubled trap catches.

774. Lance, E.W. and S. Howell. 2000. Survey of Songbirds During a Spruce Beetle (*Dendroctonus rufipennis*) Outbreak on the Kenai Peninsula, Alaska. Northwest Naturalist **81**: 1-10.

Abstract: Avian species diversity and richness was greatest in the early successional stage of the logged forest and least in the heavily infested forest stand where many spruce trees killed by the spruce beetle had fallen to the ground. As predicted, ground nesting and foraging bird species increased where trees had fallen or were removed. Conversely, the abundance of mature conifer forest birds decreased in those forest stands that lost overstory structure.

775. Lewis, K.J., and L.M. Trummer. 2000. Tomentosus Root Rot: Comparisons of Disease Expression and Management between Alaska and British Columbia, Canada. University of Northern British Columbia and USDA Forest Service, Alaska Region, Anchorage, AK. Technical Report R10-TP-83. 16 p.

Abstract: Disease incidence and expression is similar within the two regions. There is potential for an increase in disease incidence in managed stands over time as a result of forest management practices. Occurrence of the root rot within managed recreation areas may create hazardous conditions. Recommendations for disease management, survey work, and research studies in Alaska are included.

776. Magoun, A.J. and F.C. Dean. 2000. Floodplain Forests Along the Tanana River, Interior Alaska: Terrestrial Ecosystem Dynamics and Management Considerations. Agricultural and Forestry Experiment Station, University of Alaska Fairbanks. AFES Miscellaneous Publication 2000-3. 139 p.

Abstract: In this report, the authors provide a synthesis of the most recent research regarding floodplain ecosystems in the Tanana Valley, including plant and animal communities and forest processes and functions.

777. McClellan, M.H., Swanston, D.N., Hennon, P.E., Deal, R.L., DeSanto, T.L, and M.S. Wipfli. 2000. Alternatives to Clearcutting in the Old-growth Forests of Southeast Alaska: Study Plan and Establishment Report. USDA Forest Service. Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-494. June 2000. 40 p.

Abstract: A short-term retrospective study and a longer-term, operational-scale, experimental study are planned. A wide variety of ecosystem and social responses will be evaluated. The extensive pretreatment site assessments will add significant new knowledge of old-growth forests and associated aquatic ecosystems.

778. National Park Service. 2000. Wrangell – St. Elias National Park and Preserve Spruce Bark Beetle Project CDROM. National Park Service, Alaska Region.

Abstract: This CDROM is a compilation of reports, field data sets, GIS data sets, and ArcView GIS applications developed during the project, which was conducted from 1997 to 1999. The objectives of the project were to map and analyze the distribution of forest types and beetle infestation in the Basin, to describe the beetle-driven changes in vegetation structure, and to determine the stand and landscape characteristics influencing infestation.

779. Schulz, B. 2000. Resurrection Creek Permanent Plots Revisited. USDA Forest Service, Forest Health Protection, Alaska Region, Anchorage, AK. Technical report R10-TP-89. 14 p.

Abstract: Vegetation plot data suggests that bluejoint reed grass is becoming less vigorous twenty years after initial spruce beetle outbreak. Lack of spruce in-growth in burned plots suggests that the fire destroyed most regenerating trees. Minimal numbers of spruce seedlings may be attributed to a limited seed source following the fire. Birch seedlings were found on more burned plots than unburned, reflecting species composition prior to the burn.

780. Scott, G.M., Bormett, D.W., Ross-Sutherland, N., Abubakr, S. and E. Lowell. 2000. Beetle-Killed Spruce Utilization in the Kenai Peninsula. TAPPI Journal **83**(6): 1-7.

Abstract: The results of this study showed that live and dead sprucewood can be pulped effectively. The presence of saprot decay was found to be an important indicator of pulping efficiency and resultant pulp quality. Log deterioration had mixed effects on paper properties.

781. U.S.D.A. Forest Service. 2000. Forest Insect and Disease Conditions in the United States, 1999. USDA Forest Service, Forest Health Protection. December 2000. 94 p.

Abstract: This report describes the extent and nature of insect- and disease-caused damage of national significance in 1999. Maps are provided for some pests. The second section of the report brings together insect, disease, and abiotic agent damage from each affected region under the organism or agent's name.

782. U.S.D.A. Forest Service and State of Alaska Dept. of Natural Resources. 2000. Forest Insect and Disease Conditions in Alaska—1999. USDA Forest Service. Alaska Region, Anchorage, AK. and State of Alaska, Dept. of Natural Resources, Anchorage, AK. General Technical Report R10-TP-82. 55 p.

Abstract: Total area of active spruce beetle infestations declined 19% from 1998 levels and 77% since 1996. Some areas of heavy activity remain. Spruce needle aphid in southeast Alaska declined 90% from 1998. Spruce budworm fell from 87,000 acres in 1998 to 708 acres in 1999. Willow leaf miner rose for the second consecutive year throughout interior Alaska. Large aspen tortrix declined by 41%. Larch sawfly activity fell by more than 50% and hemlock sawfly activity in southeast Alaska declined to endemic levels. The most important diseases and declines of Alaskan forests in 1999 were wood decay of live trees, root disease of white spruce, hemlock dwarf mistletoe and yellow-cedar decline.

783. Wurtz, T.L. 2000. Interactions Between White Spruce and Shrubby Alders at Three Boreal Forest Sites in Alaska. USDA Forest Service. Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-481. 29 p.

Abstract: No consistent relations existed between alder stem location and total soil nitrogen. After five years, survival and growth of white spruce were excellent on all sites but were not related to either preharvest distribution of naturally occurring alder or to alders planted in the mixed plantations.

2001

784. Charton, J. 2001. Scarification Intensity, Its Effect on First Year Survival and Growth of Machine Planted Spruce Seedlings. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Environmental Science, Alaska Pacific University, March 2001. 68 p.

Abstract: Survival rates and seedling growth were significantly higher in the dry plots. In the dry plots, survival rates significantly increased with scarification intensity, but growth rates were not significantly different between treatments. In the wet plots, survival rates were not significantly different by treatment but seedling growth decreased with scarification intensity.

785. Furniss, M.M., Holsten, E.H., Foote, M.J. and M. Bertram. 2001. Biology of a Willow Leafblotch Miner, *Micurapteryx salicifoliella* (Lepidoptera: Gracillariidae) in Alaska. Environmental Entomology **30**(4): 736-741.

Abstract: This report describes the life stages and present information on the biology and seasonal history of *M. salicifoliella.* In addition, the authors report observations on the relative susceptibility of willow species within the outbreak area.

786. Hastings, F.L., Holsten, E.H., Shea, P.J. and R.A. Werner. 2001. Carbaryl: A Review of Its Use Against Bark Beetles in Coniferous Forests of North America. Environmental Entomology **30**(5): 803-810.

Abstract: The authors reviewed the application of carbaryl against bark beetles in forest trees of North America. The objective of this report was to encapsulate carbaryl's 30-yr history of successes and limitations against these beetles and to present appropriate safety and environmental information that relates to this usage.

787. Hennon, P.E., and L.M. Trummer. 2001. Yellow-cedar (*Chamaecyparis nootkatensis*) at the Northwest Limits of Its Natural Range in Prince William Sound, Alaska. Northwest Science **75**(1): 61-71.

Abstract: Two small populations of yellow-cedar were mapped in northcentral Prince William Sound. A population of yellow-cedar on the eastern shore of Unakwik Inlet represents the furthest known northwest extent of the natural range. Results from plot established indicate that yellow-cedar is common in all diameter classes, but is younger than the associated western hemlock and mountain hemlock.. Reproduction, growth, and the vigorous appearance of trees suggest that yellow-cedar is currently thriving and increasing in abundance near the edge of its range.

788. Holsten, E.H. and J.S. Hard. 2001. Dispersal Flight and Attack of the Spruce Beetle, *Dendroctonus rufipennis,* in South-central Alaska. USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon. Research Paper PNW-RP-536. 13 p.

Abstract: More dispersing beetles were trapped in flight near the middle to upper tree bole than the lower bole. There were no significant differences between trap location and ambient temperatures. Initial attacks, however, were concentrated on the lower tree bole. Dispersal flight preceded initial attack by 1 to 2 weeks.

789. Holsten, E.H., Hennon, P.E., Trummer, L.M. and M. Schultz. 2001. Insects and Diseases of Alaskan Forests. USDA Forest Service, Alaska Region. R10-TP-87. 242 p.

Abstract: This handbook is divided into insect and disease sections; each with it's own illustrations and host index. Literature cited, glossary, and general index follow at the end of the book**.** There is also a web-accessible version of this handbook located at: www.fs.fed.us/r10/spf/fhp/.

790. Holsten, E.H., Shea, P.J., and R.A. Werner 2001. Production of MCH from Artificially and Naturally Infested

Lutz Spruce by the Spruce Beetle in South-central Alaska. USDA Forest Service, Forest Health Protection, Alaska Region, Anchorage, AK. Technical Report R10-TP-90. 14 p.

Abstract: Based on the results of this study, a very small amount of naturally produced MCH is being released into the forest atmosphere as compared to the amount of synthetic MCH (usually mg/acre/day) that is released from either bubble cap or granular releasers.

791. Matsuoka, S.M., Handel, C.M. and D.R. Ruthrauff. 2001. Densities of Breeding Birds and Changes in Vegetation in an Alaskan Boreal Forest Following a Massive Disturbance by Spruce Beetle. Canadian Journal of Zoology **79**: 1678-1690.

Abstract: Forest stands that had suffered a high level of spruce mortality did not support lower densities of tree-nesting birds than stands that had suffered low mortality, nor were densities of woodpeckers higher in areas with high densities of beetle-killed spruce. Densities of species that nest in the forest understory and on the ground were significantly higher in high-mortality stands.

792. Matthews, K.M. and E.H. Holsten. 2001. Green Leaf Volatiles and MCH as Spruce Beetle Disruptants: An Exploratory Study. USDA Forest Service, Forest Health Protection, Alaska Region, Anchorage, AK. Technical Report R10-TP-92. 7p.

Abstract: Two treatments, MCH and hexanol, each had a significant disruptive effect on the spruce beetle trap catches, 95% and 77% respectively. There was no significant difference between hexanol with and without MCH. This study concluded that green leaf volatiles do significantly affect trap catches. MCH however, is as effective as either of the green leaf volatile treatments or a combination of MCH and green leaf volatiles.

793. Ross, D.W., Daterman, G.E., Boughton, J.L. and T.M. Quigley. 2001. Forest Health Restoration in South-Central Alaska: A Problem Analysis. General Technical Report PNW-GTR-523. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 38p.

Abstract: Based on information obtained through workshops and outreach to resource managers and diverse stakeholders, the authors have developed priority issues for restoring lands impacted by a spruce bark beetle outbreak. The research approach outlines a "what if" scenario of management options based on levels of investment and targets for restoration.

794. Schultz, M. 2001. Changing Forest Structure and Composition in Glacier Bay National Park Long-Term Spruce Beetle Mortality Plots. USDA Forest Service, Forest Health Protection, Juneau, Alaska. Biological Evaluation R10-TP-93. 16 p.

Abstract: This paper reports on changes that occurred in forest composition and structure by following 45 fifth-acre plots established in 1982.

795. Trummer, L.M. 2001. Assessment of Stain and Decay in Paper Birch, Point Mckenzie, Alaska: An Interim Report. USDA Forest Service, Alaska Region, State and Private Forestry, Forest Health Protection. Biological Evaluation R10-TP-106. 11 p.

Abstract: The purpose of the study was to determine the extent, patterns, and causes of stain and decay in even-aged unmanaged paper birch stands in mature and older age classes. This study also investigated whether site factors, age-class, and regional location affect pathogen incidence and severity, the presence of decay indicators, and associated decay columns.

796. Trummer, L.M. and R. Ott. 2001. Evaluation of Stem Wounds on 80 Year-old White Spruce Near Tok, Alaska. USDA Forest Service, Forest Health Protection, Alaska Region, Anchorage, AK. Biological Evaluation R10-TP-84. 6 p.

Abstract: Debarking by snowshoe hare during winter apparently was the cause of all but one of the wounds on the white spruce stems. Teeth marks were found on exposed, weathered wood on several of the dissected wounds, and on other unsampled wounds in the area. The low height of the wounds is consistent with the interpretation that wounds were caused by hares. Management implications are discussed.

797. U.S.D.A. Forest Service. 2001. Forest Insect and Disease Conditions in Alaska—2000. USDA Forest Service, Forest Health Protection, Alaska Region, Technical Report R10-TP-86. 62 p. color illus.

Abstract: This paper reports the results of aerial survey and detection flights to map current and on-going insect and disease activity within the State of Alaska during the year 2000. Report provides maps, tables and appendices relating to selected insects, disease organisms, and ecological information. World wide web links and annual bibliography are provided.

798. U.S.D.A. Forest Service and State of Alaska, Dept. of Natural Resources. 2001. Forest Insect and Disease Conditions in Alaska – 2001. USDA Forest Service, Forest Health Protection, Alaska Region. Technical Report R10-TP-102. 61 p.

Abstract: This paper reports the results of aerial survey and detection flights to map current and on-going insect and disease activity within the State of Alaska during the year 2001. Report provides maps, tables and appendices relating to selected insects, disease organisms, and ecological information. World wide web links and annual bibliography are provided.

799. Zogas, K. 2001. Summary of Thirty Years of Field-testing of MCH: Antiaggregation Pheromone of the Spruce Bark Beetle and the Douglas-fir Beetle. USDA Forest Service, Forest Health Protection, Alaska Region, Anchorage, AK. Technical report R19-TP-91. 27 p.

Abstract: MCH has been field tested since the early 1970's for its ability to suppress the build-up to damaging levels of spruce beetle and Douglas-fir beetle populations. Results of spruce beetle studies have been inconsistent and inconclusive. Suggested factors contributing to these mixed results include microenvironmental influences and problems with the release devices that dispense the MCH. The appendix of this report provides a synopsis of MCH field studies in the Pacific Northwest, Alaska and Canada undertaken since 1971.

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