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U.S. DEPARTMENT OF AGRICULTURE

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2025 FOREST HEALTH CONDITIONS -ALASKA-

A FOREST HEALTH PROTECTION REPORT

FOREST SERVICE STATE, PRIVATE, & TRIBAL FORESTRY, ALASKA REGION

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Cover Photo | A severely defoliated stand of birch trees in Salcha, Alaska, infested with both amber-marked birch leafminer (upper right inset image) and late birch leaf edgeminer. Light brown mines can be seen on nearly every leaf, which is caused by the larval feeding of these two invasive birch leafmining species. USDA Forest Service photos by Dr. Sydney Mullen.

AERIAL SURVEY REQUEST

You can request for our team to examine specific forest health concerns in your area. Simply email the following information or fill out this form and mail it to:

Garret Dubois, USDA Forest Service SP&TF/FHP, 161 East 1st Avenue, Door 8, Anchorage, AK 99501
email: garret.d.dubois@usda.gov

1. Name: _____ 2. Organization: _____

3. Contact Information: _____

4. General description of forest health concern (e.g., hosts species affected, damage type, disease or insects observed).

_____

_____

_____

5. General location of damage. If possible, attach a map or marked USGS Quadrangle map or provide GPS coordinates. Please be as specific as possible, such as including references to a specific island, river drainage, lake system, nearest locale/town/village.

_____

_____

_____

6. Do you need additional forest pest information (e.g., GIS data, extra copies of Forest Health Conditions in Alaska reports, etc.)? Please be as specific as possible.

_____

_____

_____

WE NEED YOUR FEEDBACK

Would you like to remain on our mailing list for the annual Forest Health Conditions in Alaska Report?

Simply email the following information or fill out this form and send it to:

MAIL: Garret Dubois, USDA Forest Service SP&TF/FHP, 161 East 1st Avenue, Door 8, Anchorage, AK 99501

PHONE: (907)-272-1161 **EMAIL:** garret.d.dubois@usda.gov

☐ Hard Copy ☐ Electronic Report

Do corrections need to be made to your physical or electronic address? Has the contact person for your organization changed?

_____

_____

Please update any details here.

_____

_____

_____

How can we make this report more useful to you and/or your organization?

_____

_____

_____

How do you and/or your organization use the information in this report and/or maps on our website (https://www.fs.usda.gov/r10/natural-resources/forest-health)?

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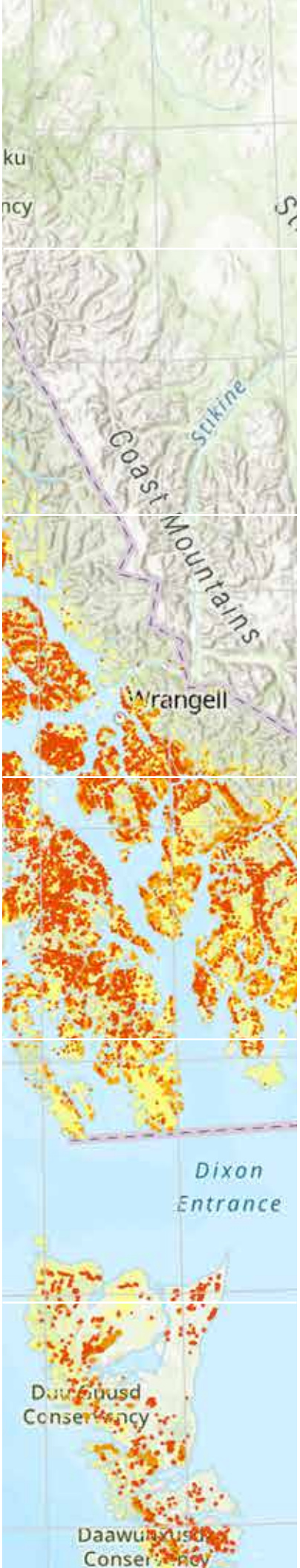
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INTRODUCTION

By the Alaska Region Forest Health Protection Team, State, Private, and Tribal Forestry

The *Alaska Forest Health Conditions Brief – 2025* summarizes forest health monitoring data from Alaska's forests, collected annually by the Forest Health Protection team, the Alaska Division of Forestry & Fire Protection team, and other key partners. These annual summaries are included in the congressionally mandated *Forest Insect and Disease Conditions in the United States report*. The Forest Health Protection (FHP) mission is to protect and enhance forest health by providing landowners and managers with information and resources. The FHP team monitors the extent and impacts of damaging insects, diseases, and invasive plants; provides timely survey and monitoring information; and offers technical and financial assistance to prevent and control forest pest outbreaks across a wide variety of land ownerships statewide.

This brief, the associated *2025 Species Update* and other reporting products from 2025 and past years, are all available at the Alaska Region Forest and Grassland Health website. Additional reporting products available on that webpage include annual forest health highlights, aerial detection survey damage and flightline maps, and a data dashboard that houses cumulative ground detection survey observations statewide.

One of our core missions is to provide technical assistance and information to stakeholders on the forest conditions in Alaska. Our partners and indi viduals can request that Forest Health Protection staff investi gate specific forest health concerns. Visit our website or reach out to the following staff regarding specific program area questions or requests:

Remote sensing: Karen Hutten, karen.hutten@usda.gov
Aerial Detection Survey: Garret Dubois, garret.d.dubois@usda.gov
Ground Detection Survey & Hazard Tree Mgmt: Robin Mulvey, robin.mulvey@usda.gov

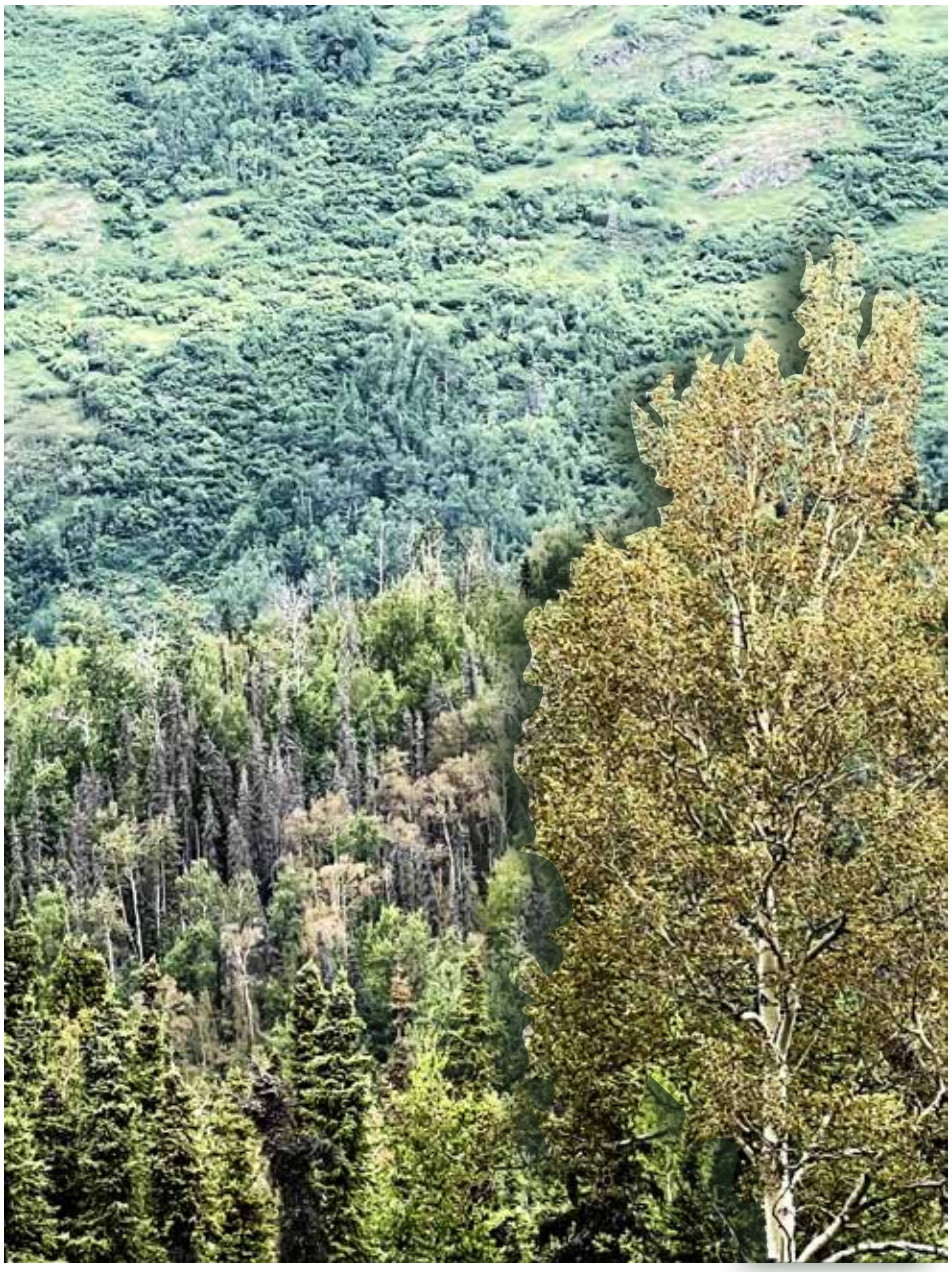


Figure 1. Aspen leaf and shoot blight in the Juneau Creek area was also mapped during aerial surveys on almost 1,000 acres of the western Kenai Peninsula. To confirm this damage agent, samples will be collected from upper and lower canopy positions in 2026. USDA Forest Service photo by Steven Swenson.

STAFFING CHANGES

The FHP Team lost several members in 2025, reducing our staff from 13 to eight. We wish the best of luck to Dr. Kymberly Draeger, Christina Das, and Sayde Ridling on their new ventures and to Samantha Carroll in her new position within the agency. We also want to acknowledge two of our team members who retired in 2025 following long careers in Forest Health, as well as two new positions.

RETIREMENTS:

DR. LORETTA WINTON

The field of forest pathology has lost a passionate expert and a forest health technology pioneer with the retirement of Dr. Loretta Winton (fig. 2).



Figure 2. Dr. Loretta Winton, recently retired Alaska Region Forest Pathologist. USDA Forest Service photo.

Dr. Winton joined FHP in 2009 as forest pathologist working out of both the Anchorage and Fairbanks offices. Her keen eye in the field and adeptness at fostering partnerships led to significant scientific contributions, including new lines of research inquiry at the University of Alaska Fairbanks and beyond. Aspen running canker, first discovered by Dr. Winton in 2015 near Tok, AK, was one of the most significant diseases/pathogens that she worked on until her retirement from the Forest Service in 2025. Dr. Winton first noticed aspen running canker symptoms while conducting baseline forest health assessments across the Cooperative Alaska Forest Inventory plot network with state partners. With her at the helm, the disease has now been documented throughout Alaska's boreal forest, from the foothills of the Brooks Range down to the Kenai Peninsula and eastwards to the Canadian border. Dr. Winton and her colleagues published multiple peer-reviewed journal articles, formally describing both the disease and causal pathogen, as well as an annotated genome of the causal fungus. They also established study sites with varying soil moisture levels in Interior Alaska to assess the role of drought in inciting disease, as well as to evaluate the molecular response of impacted aspen trees. Dr. Winton was instrumental in establishing a working group focused on aspen running canker with forest managers and modelers from University of Alaska Fairbanks, the National Park Service, the Bureau of Land Management, and the Bonanza Creek Long-Term Ecological Research. Another significant contribution of Dr. Winton includes her spearheading the modernization of forest health ground detection survey efforts in Alaska using the latest GIS tools and technologies for data collection and visualization. To ensure nationwide standardization of data collection efforts, she encouraged Forest Health teams across the country to employ these same data collection tools. These methods have since been adopted nationwide. Dr. Winton continues to share her expertise as a member of a graduate student committee and mentor to many in the forest health community. Dr. Winton will be missed, both as a driven and dedicated colleague and as a dear friend to all who had the pleasure of working alongside her.

MICHAEL SHEPHARD

Michael Shephard retired as the Alaska Region Deputy Director of State, Private, and Tribal Forestry in 2025 (fig. 3).



Figure 3. Michael Shephard, Alaska Region's recently retired Associate Director for State, Private, and Tribal Forestry in Alaska. USDA Forest Service photo.

Michael is rooted and invested in Alaska and has had a long career in federal service within the Alaska Region. He worked as an Ecologist on the Tongass National Forest before joining the FHP team in 2002 as the Invasive Species Program Manager.

Michael created the Alaska FHP invasive plant program. He raised awareness of invasive species and played a role in helping get the Committee for Noxious and Invasive Plant Management off the ground (today known as the Alaska Invasive Species Partnership). Michael increased the capacity to manage invasive plants in the state and produced technical resources for both invasive plant managers and Alaskan citizens — resources that are still used today. After a stint working for the National Park Service as an Inventory and Monitoring Coordinator, he rejoined the FHP team in 2015 as Deputy Director of State, Private, and Tribal Forestry. Having an interest in finding lasting solutions to the needs of the public, Michael most enjoyed his work with Cooperative Forestry and Urban & Community Forestry, fostering novel partnerships that help small Alaskan communities. Michael has served several working groups, including the Southeast Alaska Sustainability Strategy and the Anchorage Soil and Water Conservation District.

In his retirement, Michael continues to be involved in forest planning by serving in the Agriculture Conservation Experienced Services Program (ACES). We miss his humble and caring leadership in FHP, but he continues to inspire, not only in service, but also in skiing, ice lantern creation, and seasonal berry picking.

NEW POSITIONS:

STEVE SWENSON, FOREST HEALTH SPECIALIST

Congratulations to Steve Swenson on his new position as Forest Health Specialist for Region 10 FHP (fig. 4). Steve has served as a Biological Science Technician since 2009, taking on more responsibilities each year. Steve's vast knowledge of, and experience in, the forests of Alaska make him an asset to any crew and project. The FHP team is grateful to have Steve stepping into this new role as we continue to deliver our mission in Alaska.



Figure 4. Steve "Eagle Eye" Swenson recently moved into the Alaska Region Forest Health Specialist position. USDA Forest Service photo by Jessie Moan.

GRACE GRAHAM, FOREST HEALTH FORESTER

In early 2025, Grace Graham joined the State of Alaska Division of Forestry and Fire Protection (DFFP) Forest Health Program, filling the Forest Health Forester position (fig. 5). Her addition to the program brought the DFFP Forest Health team back to full staffing for the first time since early 2024. Grace recently returned to Anchorage after completing an M.S. degree in Natural Resources Science and Management at the University of Minnesota where her research focus included tree defenses and bark beetles in eastern larch. She worked in tourism, fisheries, science support, and as an educator at the Anchorage Museum prior to beginning graduate school.



Figure 5. Grace Graham conducting phytosanitary inspections at Edna Bay. Photo Courtesy of Grace Graham, Alaska Division of Forestry and Fire Protection.

BACKGROUND

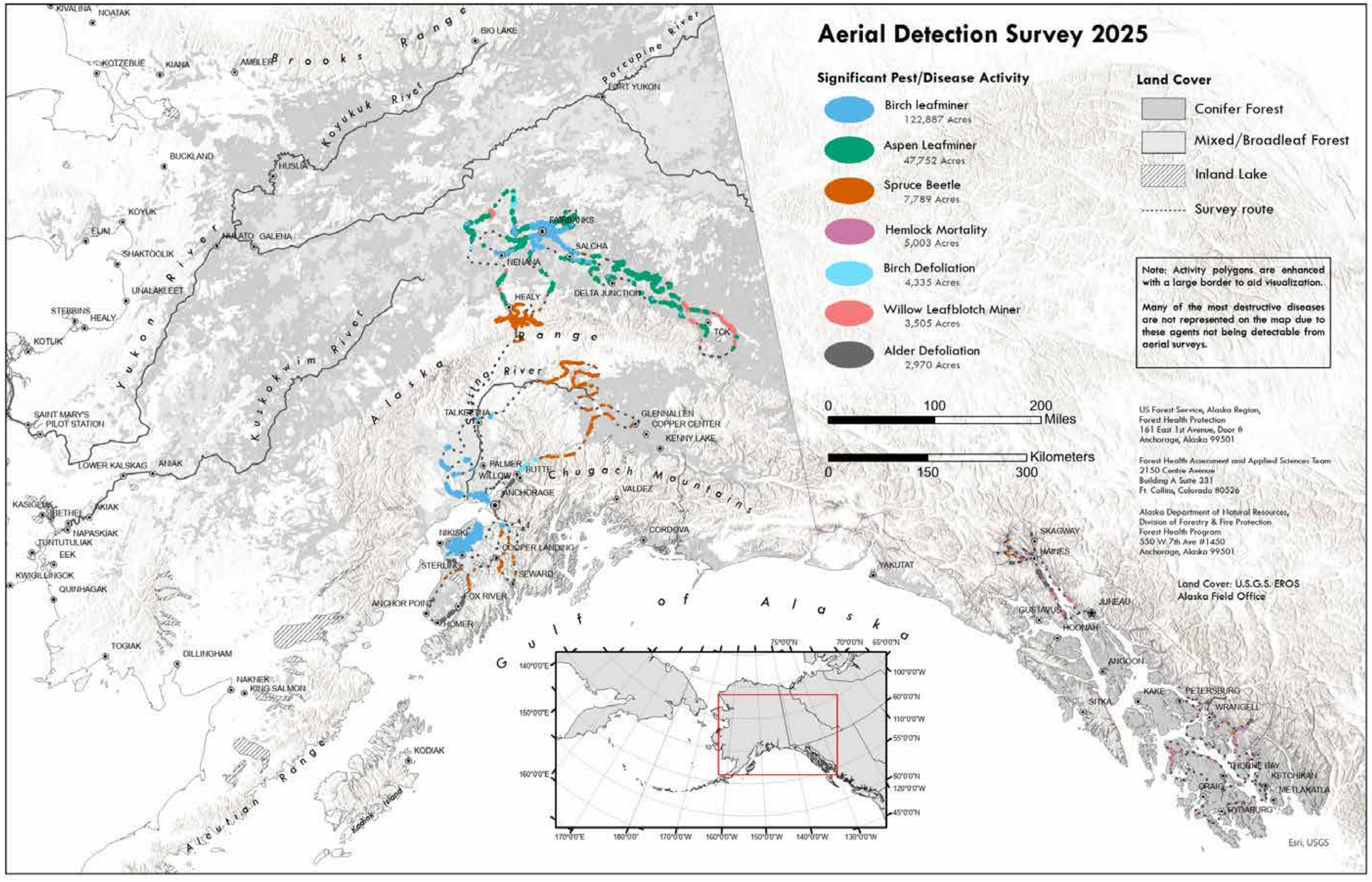
The 2025 Forest Health Conditions Brief reports on forest damage from insects, pathogens, noninfectious disorders and declines, and invasive plants. FHP was unable to conduct Aerial Detection Surveys due to the absence of funding and aviation vendor contracts in 2025. The limited acres surveyed by air were thanks to the State of Alaska Division of Forestry & Fire Protection. Moreover, reduced staffing hamstrung the team's Ground Detection Survey coverage around the state, particularly for pathology. As a result, the FHP team includes a disclaimer with this year's report: The ADS acreage and the number of GDS observations were significantly reduced in 2025; as a result, making comparisons and drawing inferences regarding landscape level trends are not recommended. More detailed information about Alaska's forest damage through the years, as well as descriptions of aerial detection survey, ground detection survey, and remote sensing methodology and data, can be found on our Alaska Forest and Grassland Health website.

The Forest Health Protection team provides forest health monitoring, evaluation, and technical assistance across the varied ecoregions and ownerships of Alaska's 126 million acres of forestland. Forest health issues, like insect and disease outbreaks and invasive plant infestations, are not restricted by management boundaries. Alaska is home to two of the Nation's largest national forests: the Chugach (5.4 million acres) and the Tongass (17 million acres), while 115 million acres of boreal forest are found outside the National Forest System. Alaska contains one-quarter of all federal forestland and 43% of all state-owned forestland in the United States. More than 200 Alaska Native Corporations own 35 million acres of non-industrial private forestland.

In 2025, just over 213,000 acres of forest damage were mapped across the 8,000,000 acres aerially surveyed (table 1, maps 1 and 2). This corresponds to 2.6% of the surveyed forest with mapped damage (Tables 2 and 3). In addition, our forest health team made 902 ground observations of forest damage from diseases, insects, and noninfectious agents (tables 4 and 5).
Ground detection survey observations of forest insects and pathogens are summarized alongside research grade observations gathered from the Alaska Forest Health Observations project in iNaturalist (tables 4 and 5). This citizen science project received 3,660 observations, 1,811 of which are research grade observations in 2025. Organisms that commonly damage trees and plants in Alaska are automatically filtered into the project. Learn more at:
https://www.inaturalist.org/projects/alaska-forest-health-observations.



MAP 1 | 2025 Aerial Detection Survey mapped damage. Information about aerial detection survey methodology and data acquisition is available on the Alaska's Aerial Detection Survey webpage. Defoliation data collected with satellite imagery is not represented in this aerial survey map. Please see the essay on page 12 and western blackheaded budworm on page 23.



MAP 2 | Aerial Detection Survey flight paths. Information about aerial detection survey methodology and data acquisition is available on the Alaska Aerial Detection Survey webpage.

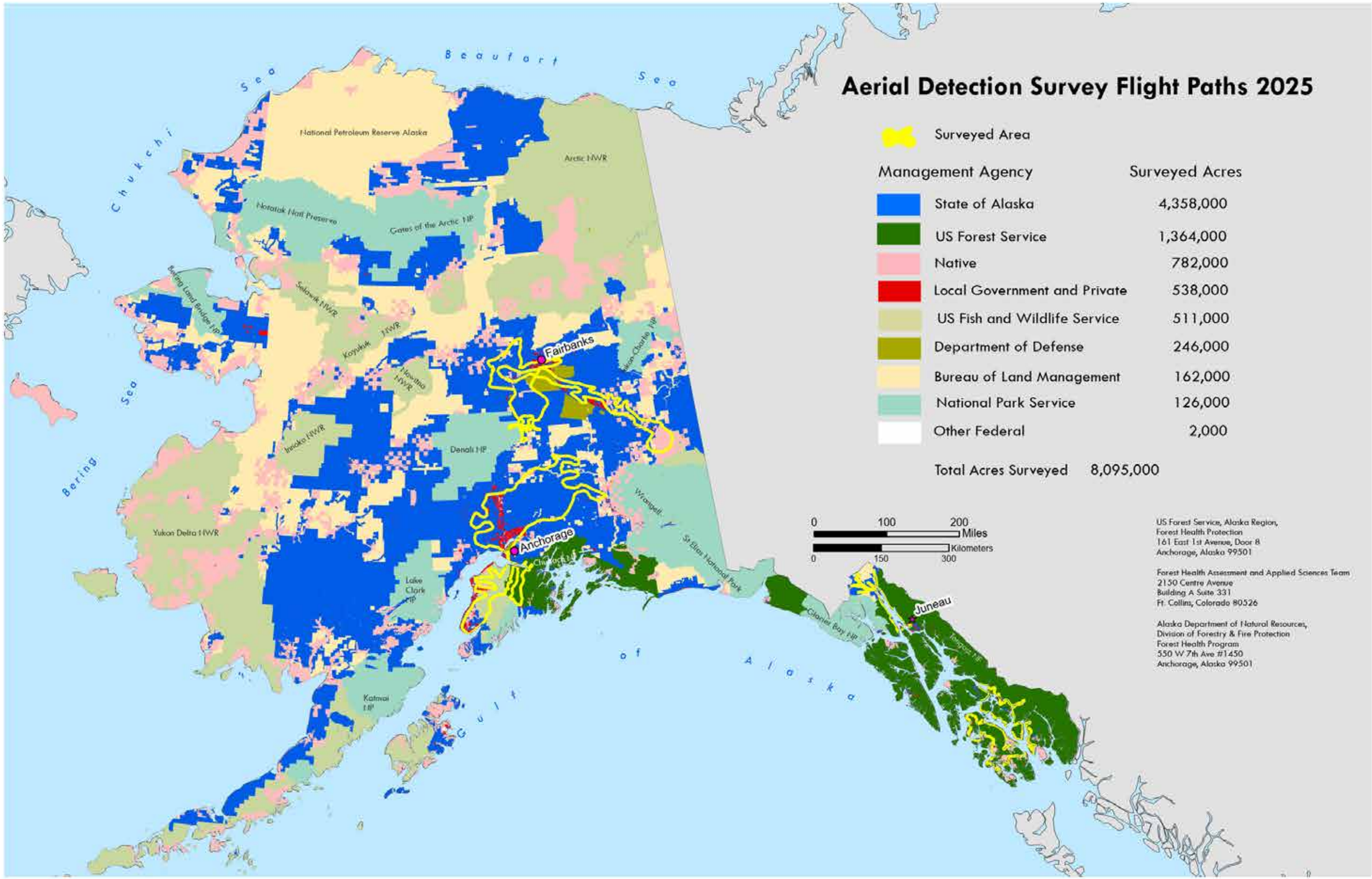


TABLE 1 | 2025 forest insect and disease activity detected during aerial detection surveys in Alaska, by land ownership and agent.

Category	Agent	Total Acres	National Forest	Native	Other Federal	State & Private
Disease	Alder dieback	89	0	0	0	89
Disease	Aspen leaf and shoot blight	1,771	327	52	1,066	326
Disease	Dothistroma needle blight	51	45	0	0	5
Disease	Spruce broom rust	16	0	1	0	14
Disease	Western gall rust dieback	80	74	0	0	6
Noninfectious	Flooding/high-water	2,260	104	106	96	1,954
Noninfectious	Landslide/avalanche	53	7	0	0	46
Noninfectious	Porcupine damage	2	0	2	0	0
Noninfectious	Snow/ice	2,512	0	0	0	2,512
Noninfectious	Windthrow/blowdown	223	0	0	0	223
Noninfectious	Yellow-cedar decline	2,464	2,393	33	0	38
Insect	Aspen leafminer	47,752	0	7,732	484	39,536
Insect	Birch leafminer	122,887	194	1,393	75,617	45,683
Insect	Hemlock mortality-past year[2]	5,003	3,883	541	0	579
Insect	Northern spruce engraver	595	0	7	4	583
Insect	Northern spruce engraver/spruce beetle	7	0	0	7	0
Insect	Spruce beetle	7,789	39	58	1,672	6,020
Insect	Spruce needle aphid	372	340	4	0	28
Insect	Western balsam bark beetle	4	0	0	0	4
Insect	Western blackheaded budworm	2,434	1,896	36	0	502
Insect	Western blackheaded budworm topkill	51	0	0	0	51
Insect	Willow leafblotch miner	3,505	0	2,890	281	334
General Damage[3]	Alder defoliation	2,970	1,522	179	95	1,173
General Damage	Aspen defoliation	2,106	0	128	0	1,978
General Damage	Birch defoliation	4,335	0	389	43	3,904
General Damage	Conifer defoliation	6	6	0	0	0
General Damage	Cottonwood defoliation	1,989	578	90	0	1,321
General Damage	Hardwood defoliation	293	16	6	3	268
General Damage	Sparsely leafed aspen	198	0	17	19	161
General Damage	Unknown	10	10	0	0	0
General Damage	Willow defoliation	1,522	2	17	40	1,462

All values are rounded to the nearest whole acre[1]. Defoliation data collected with satellite imagery is not represented in this aerial survey table.

Please see the essay on page 12 and western blackheaded budworm on page 23.

[1] Acre values are only relative to survey transects and do not represent the total possible area affected. Table entries do not include many diseases (e.g., decays and dwarf mistletoe), which are not detectable in aerial surveys.

[2] Hemlock mortality-past year is mortality as resultof the defoliation event that took place between 2018 and 2023.

[3] General Damage is tree damage that cannot be attributed to a particular agent because more than one agent is known to similarly damage the same host. Insects, pathogens, or abiotic issues may cause the damage. Damage caused by a currently unidentified agent is also included in this category.

TABLE 2 | Mapped affected area (in thousands of acres) from 2021 to 2025 from aerial detection survey, by damage category. Defoliation data collected with satellite imagery is not represented in this aerial survey table. Please see the essay on page 12 and western blackheaded budworm on page 23.

Damage Category [1]	2021	2022	2023	2024	2025 [2]
Abiotic damage	16.7	3.4	2.6	52.7	5.0
Alder defoliation	3.1	12.7	11.1	1.5	3.0
Alder dieback	0.1	1.0	0.4	1.3	0.1
Aspen defoliation	150.5	39	85.2	205.0	49.9
Aspen dieback	0.0	0.0	0.0	0.0	1.8
Aspen mortality	0.1	0.05	0.1	0.0	0.0
Birch defoliation	55.6	22.6	1.7	23.4	127.2
Cottonwood defoliation	0.7	0.7	1.5	15.4	2.0
Fir mortality	0.1	0.0	0.0	0.0	0.0
Hardwood defoliation	0.4	1.0	0.7	0.4	0.3
Hemlock defoliation	520.0	1.3	1.3	3.1	2.4
Hemlock mortality	21.0	73.5	28.7	22.0	5.1
Porcupine damage	0.2	0.0	0.3	0.0	0.0
Shore pine damage	0.5	0.6	0.1	0.3	0.1
Spruce damage	7.6	4.2	8.3	0.8	0.4
Spruce mortality	193.7	49.6	91.0	36.2	8.4
Spruce/hemlock defoliation	0.0	685.8	61.8	0.0	0.0
Undetermined	0.0	0.0	0.0	0.0	0.2
Willow defoliation	58.3	17	7.6	69.8	5.0
Willow dieback	0.0	0.0	0.1	0.0	0.0
Yellow-cedar decline	8.2	11.7	20.2	14.4	2.5
Total damage acres [3]	**1019.7**	**874.8**	**322.5**	**446.2**	**213.4**
Total acres surveyed	15,724	16,314	16,731	20,078	8,094
Percent of acres surveyed showing damage	6.5%	5.4%	1.9%	2.2%	2.6%

[1]Agents specific to each category are listed in Table 3 on page 9.

[2]In 2025 only highest priority areas were targetted for aerial detection survey due to budget and contracting challenges.

[3]Total damage acres do not double count overlapping damage areas, do not include older spruce damage collected in the current year, and may include minor damage not reported above.

TABLE 3 | Damage Type by Category[1]

Abiotic
Drought
Flooding
Landslide/avalanche
Mud volcano
Windthrow
Winter damage

Alder Defoliation
Alder defoliation
Alder leafroller
Alder sawfly

Alder Dieback
Alder dieback

Aspen Defoliation
Aspen defoliation
Aspen leaf blight
Aspen leafminer
Large aspen tortrix

Aspen Dieback
Aspen leaf and shoot blight

Aspen Mortality
Aspen running canker

Birch Defoliation
Birch aphid
Birch crown thinning
Birch defoliation
Birch leafminer
Birch leafroller
Dwarf birch defoliation
Spear-marked black moth

Cottonwood Defoliation
Cottonwood defoliation
Cottonwood leaf beetle
Cottonwood leafminer
Cottonwood leafroller

Fir Mortality
Western balsam bark beetle

Hardwood Defoliation
Hardwood defoliation
Rusty tussock moth
Speckled green fruitworm

Hemlock Defoliation
Hemlock flagging
Hemlock looper
Hemlock sawfly
Western blackheaded budworm

Hemlock Mortality
Hemlock canker
Hemlock mortality
Hemlock defoliation

Shore Pine Damage
Dothistroma needle blight
Shore pine dieback
Western gall rust

Spruce Damage
Spruce aphid
Spruce broom rust
Spruce bud moth
Spruce budworm
Spruce defoliation
Spruce needle cast
Spruce needle rust

Spruce Mortality
Northern spruce engraver
Spruce beetle

Spruce/Hemlock Defoliation
Western blackheaded budworm
Conifer defoliation

Undetermined[2]
Sparsely leafed out aspen

Willow Defoliation
Willow defoliation
Willow leafblotch miner
Willow rust

Willow Dieback
Willow dieback

Yellow-Cedar Decline
Yellow-cedar decline

[1] Other than porcupine, animal-caused damages are not listed as stand-alone categories, when notable, they are listed under the host species they have affected.

[2] Undetermined category is used for damage observed on a large scale that has no specific damage agent currently identified.

TABLE 4 | Select ground observations of forest insects in Alaska in 2025. Ground survey protocols are described on our website on the Alaska Ground Detection Survey page. Ground observations by citizen scientists can be found in the Alaska Forest Health Observations project on iNaturalist. Observations of unidentied or noninfectious agents from our ground surveys and species not closely tied to forest health are excluded.

Scientific Name	Damage Causing Agent	Ground Detection Survey Observations[1]	iNaturalist Research Grade Observations[2]	Total
Acleris gloverana	Western blackheaded budworm	6	5[3]	11
Adelgidae spp.	Adelgidae, including gall inducers	46	20[4]	66
Caloptilia spp.	Birch leafroller spp.	28	0	28
Cecidomyiidae spp.	Gall midge	0	35	35
Choristoneura spp.	Spruce budworm	18	0	18
Chrysomela spp., *Phratora* spp., *Altica* spp.	Leaf beetle spp.	18	56[5]	74
Dasineura swainei	Spruce bud midge	9	7	16
Dendroctonus rufipennis	Spruce beetle	1	6	7
Epinotia solandriana	Birch leafroller spp.	65	1	66
Eriocampa ovata	Alder woolly sawfly	10	17	27
Eriophyidae	Gall and rust mites	66	0	66
Euceraphis betulae	Birch aphid	8	0	8
Euura megacephala	Leaf-folding sawfly (formerly Phyllocolpa excav	14	0	14
Fenusa Dohrnii	European alder leafminer	6	2	8
Hemichroa crocea	Striped alder sawfly	0	5	5
Heterarthrus nemoratus	Late birch leaf edgeminer	31	4	35
Lophocampa maculata	Spotted tussock moth	0	27	27
Malacosoma californicum	Western tent caterpillar	0	0	0
Micrurapteryx salicifoliella	Willow leafblotch miner	39	8	47
Monsoma pulveratum	Green alder sawfly	9	2	11
Neodiprion tsugae	Hemlock sawfly	0	1	1
Operophtera bruceata	Bruce spanworm	-	11	11
Operophtera occidentalis	Western Bruce spanworm	-	11	11
Orgyia antiqua	Rusty tussock moth	0	71	71
Phyllocnistis populiella	Aspen leafminer	113	67[6]	180
Profenusa thomsoni	Amber-marked birch leafminer	17	1	18
Rabdophaga spp.	Willow gall midges	-	64	64
Rheumaptera hastata (complex)	Spear-marked and white-banded black moths	21	81	102
Zeiraphera canadensis	Spruce bud moth	38	0	38

[1]Ground detection survey observations are made by Forest Health Protection professionals in the field via direct observation.

[2]iNaturalist Reserach Grade Observations are reported by citizen scientists on iNaturalist that are identified to species or genus and have two-thirds community agreement on the taxonomic identification. Species-level identifications are typically, but not always, needed to establish research-grade status.

[3]While there were five Research Grade Observations of western blackheaded budworm recorded in iNaturalist on the Kenai Peninsula and in Southcentral Alaska, the observations cannot be confirmed due to the lack of detail in some of the images.

[4]12 of the 20 Adelgidae observations on iNaturalist did not achieve research-grade status since they could only be identified to the family level. We include the recrods here because they achieved two-thirds community agreement are are known to belong to the family Adelgidae.

[5]Of the 56 observations of *Chysomela* spp., *Phratora* spp., and *Altica* spp., only 2 were Research-grade. However, we include the other 54 observations as they were verifiable observations identified to genus.

[6]Of the 67 iNaturalist observations of "*Phyllocnistis,*" 15 verifiable observations were not considered Research Grade due to species-level uncertainty of the agent based on host preference, resulting in a lack of community agreement. However, as the genus is easily identified via the agent's feeding damage, we include the 15 verifiable observations.

TABLE 5 | Select ground observations of forest pathogens in Alaska in 2025. Ground survey protocols are described on our website on the Alaska Ground Detection Survey page. Ground observations by citizen scientists can be found in the Alaska Forest Health Observations project on iNaturalist. Observations of unidentified or noninfectious agents from our ground surveys and species not closely tied to forest health are excluded.

Scientific Name	Damage Causing Agent	Ground Detection Survey Observations[1]	iNaturalist Research Grade Observations[2]	Total
Apiosporina morbosa	Black knot of cherry	9	1	10
Arceuthobium tsugense	Hemlock dwarf mistletoe	8	3	11
Armillaria spp.	Armillaria root disease	5	0	5
Calyptospora goeppertiana (=*Pucciniastrum goeppertianum*)	Huckleberry broom rust	0	0	0
Ceropsora weirii (=*Chrysomyxa weirii*)	Spring spruce needle rust	5	0	5
Chrysomyxa arctostaphyli	Spruce broom rust	19	29	48
Chrysomyxa ledicola	Spruce needle rust	18	7	25
Rossmanomyces pyrolae and *Rossmanomyces monesis*	Spruce cone rusts	0	7	7
Chrysomyxa woroninii	Spruce bud rust	1	3	4
Climacocystis borealis	Borealis conk	1	7	8
Cronartium harknessii	Western gall rust	3	4	7
Didymascella thujina	Cedar leaf blight	0	3	3
Diplodia tumefaciens	Diplodia gall	0	2	2
Dothistroma septosporum	Dothistroma needle blight	1	0	1
Echinodontium tinctorium	Paint fungus	1	1	2
Fomes fomentarius	Tinder conk/hoof fungus	4	92	96
Fomitiporia tsugina (=*Phellinus hartigii*)	Hartig's conk	0	1	1
Fomitopsis betulina	Birch polypore	3	80	83
Fomitopsis mounceae[3]	Brown crumbly rot	13	77	90
Fomitopsis ochracea[3]	Brown crumbly rot	6	213	219
Fomitopsis pinicola sensu lato[3]	Brown crumbly rot	4	18	22
Ganoderma applanatum	Artist's conk	2	19	21
Ganoderma oregonense	Lacquer/varnish conk	0	14	14
Hericium abietis	*Hericium abietis*	1	8	9
Hericium coralloides	Coral tooth fungus	0	31	31
Inonotus obliquus	Canker-rot of birch/chaga	2	16	18
Ischoderma resinosum	Resinous polypore	0	6	6
Kabatina thujae	Yellow-cedar shoot blight	0	0	0
Laetiporus conifericola	Sulfur fungus	7	163	170
Laricifomes officinalis	Quinine conk	1	1	2
Lirula macrospora	Lirula needle cast	6	0	6
Lophodermium juniperinum	Juniper split	0	2	2
Lophodermium piceae	Lophodermium needle cast	0	1	1
Melampsora and *Melampsoridium* spp.	Hardwood leaf rusts	24	4	28
Naohidemyces vaccinii	Hemlock-blueberry rust	7	2	9
Neodothiora populina	Aspen running canker	1	1	2
Onnia tomentosa	Tomentosus root rot	0	7	7
Phaeolus schweinitzii	Brown cubical butt rot	6	12	18
Phellinus igniarius sensu lato	Trunk rot of birch	7	26	33
Phellinus tremulae	Trunk rot of aspen	0	4	4
Pleurotus spp.	Oyster mushrooms	0	15	15
Porodaedalea pini	Red ring rot	15	14	29
Puccinia linkii	Viburnum leaf and stem rust	1	4	5
Rhizosphaera spp.	Rhizosphaera needle cast	0	0	0
Sirococcus tsugae	Sirococcus shoot blight	5	0	5
Sphaerulina spp.	Septoria/Poplar leaf spot	22	0	22
Spruce bud blights	Spruce bud blights	13	0	13
Taphrina spp.	Alder tongue gall	1	1	2
Valsa melanodiscus and *Valsalnicola* spp.	Alder canker dieback	5	0	5
Venturia moreletii (=*V. macularis*)	Aspen leaf and shoot blight	6	0	6

[1]Ground detection survey observations are made by Forest Health Protection professionals in the field via direct observation.

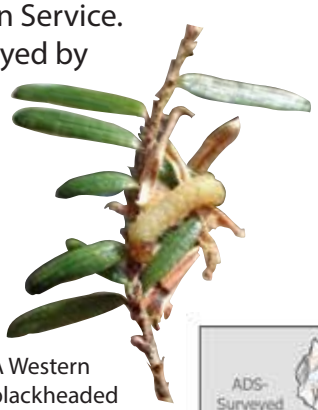
[2]iNaturalist Reserach Grade Observations are reported by citizen scientists on iNaturalist that are identified to species or genus and have two-thirds community agreement on the taxonomic identification. Species-level identifications are typically, but not always, needed to establish research-grade status.

[3]*Fomitopsis pinicola* sensu lato is a species complex that contains *F. mounceae* and *F. ochraceae.* Some identifications must remain at the species complex when key identifying characteristics are absent.

REMOTE SENSING — DETECTING DEFOLIATION ON THE

In 2025, for the first time, the Alaska Region Forest Health Protection team submitted automated satellite change detection data to the National Insect and Disease Detection Survey (IDS) database. Western blackheaded budworm defoliation of hemlock and spruce had been observed in the Kenai Ecoregion in July of 2025 by USFS Ground Detection Survey (GDS) and then mapped by the Alaska Division of Forestry & Fire Protection during Aerial Detection Survey (ADS).

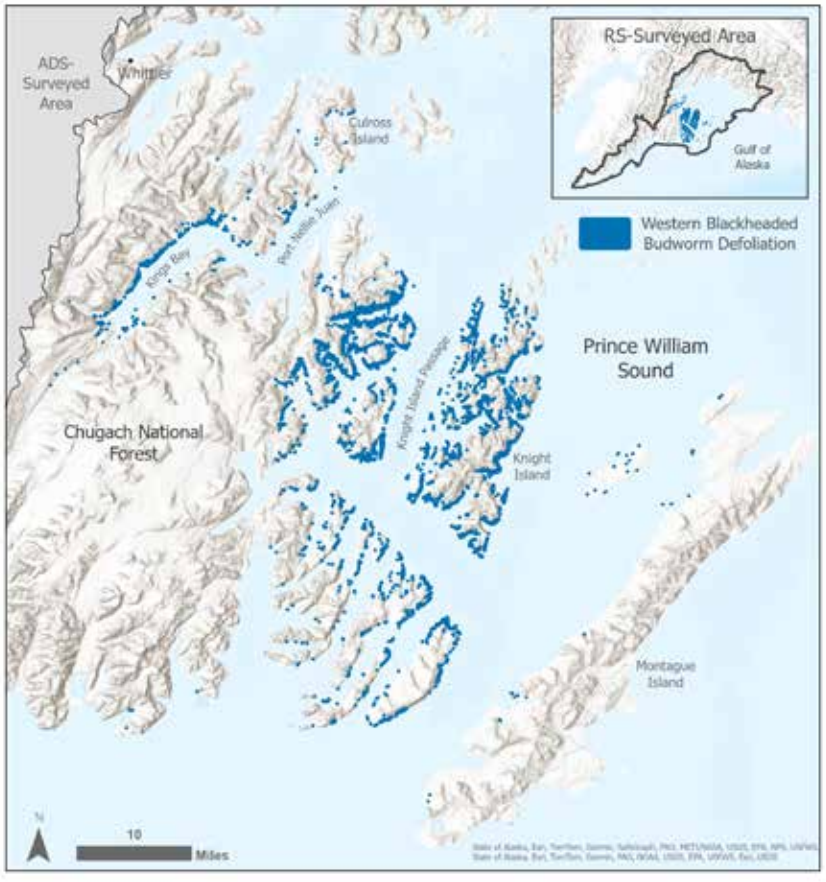
Western blackheaded budworm and defoliation were also observed on trees in the adjacent Prince William Sound Ecoregion by the University of Alaska Fairbanks Cooperative Extension Service. Because this area was not surveyed by ADS, we applied satellite-based remote sensing methods to map the extent of defoliation in the Prince William Sound Ecoregion. Fortunately, large conifer defoliation events are well detected by satellites when cloud-free skies allow the collection of clear imagery. We were able to conservatively map just over 16,700 acres of spectral decline on the west side of Prince William Sound (map 3) consistent with western blackheaded budworm defoliation. This contributes to a total of over 19,000 acres of western blackheaded budworm damage in Southcentral Alaska this year. Satellite data indicates that the onset of damage occurred in 2024 in Prince William Sound and continued to intensify and expand in 2025.



A Western blackheaded budworm feeds on a hemlock stem. USDA Forest Service photo by Dr. Elizabeth Graham.

We used Bugnet, a satellite-based change detection method developed by Peter Clary (Oregon State University, 2025), to detect western blackheaded budworm activity. Bugnet employs harmonized Landsat and Sentinel-2 satellite imagery (30 m resolution) with the LandTrendr algorithm (Kennedy et al. 2010) to detect locations with declining spectral values. Bugnet then sorts forest change into broad types using the Random Forest machine learning algorithm and training data of known tree damage. We selected the Bugnet version 2025 v3 with magnitude and size thresholds (50 dNBR and mmu 10) to remove subtle and small change that may not be insect-caused. Polygons were drawn around affected areas with a 30 m buffer to create a mapped unit similar to aerial detection survey data. The polygons were then inspected and verified using 2025 high-resolution (50 cm) imagery where available, as well as LandTrendr RGB change maps and time series graphs of spectral reflectance values created in the Google Earth Engine™ analytics platform (Gorelick et al., 2017) (fig. 6).

Spatial and temporal patterns distinguish insect-caused tree damage from other changes occurring in the area. Forest health specialists used the GEE Lasso tool by Peter Clary to attribute Bugnet



MAP 3 | Western blackheaded budworm defoliation mapped on the west side of Prince William Sound using satellite-based change detection applied across Prince William Sound. Spectral decline in forest vegetation began in 2024 and continued in 2025.

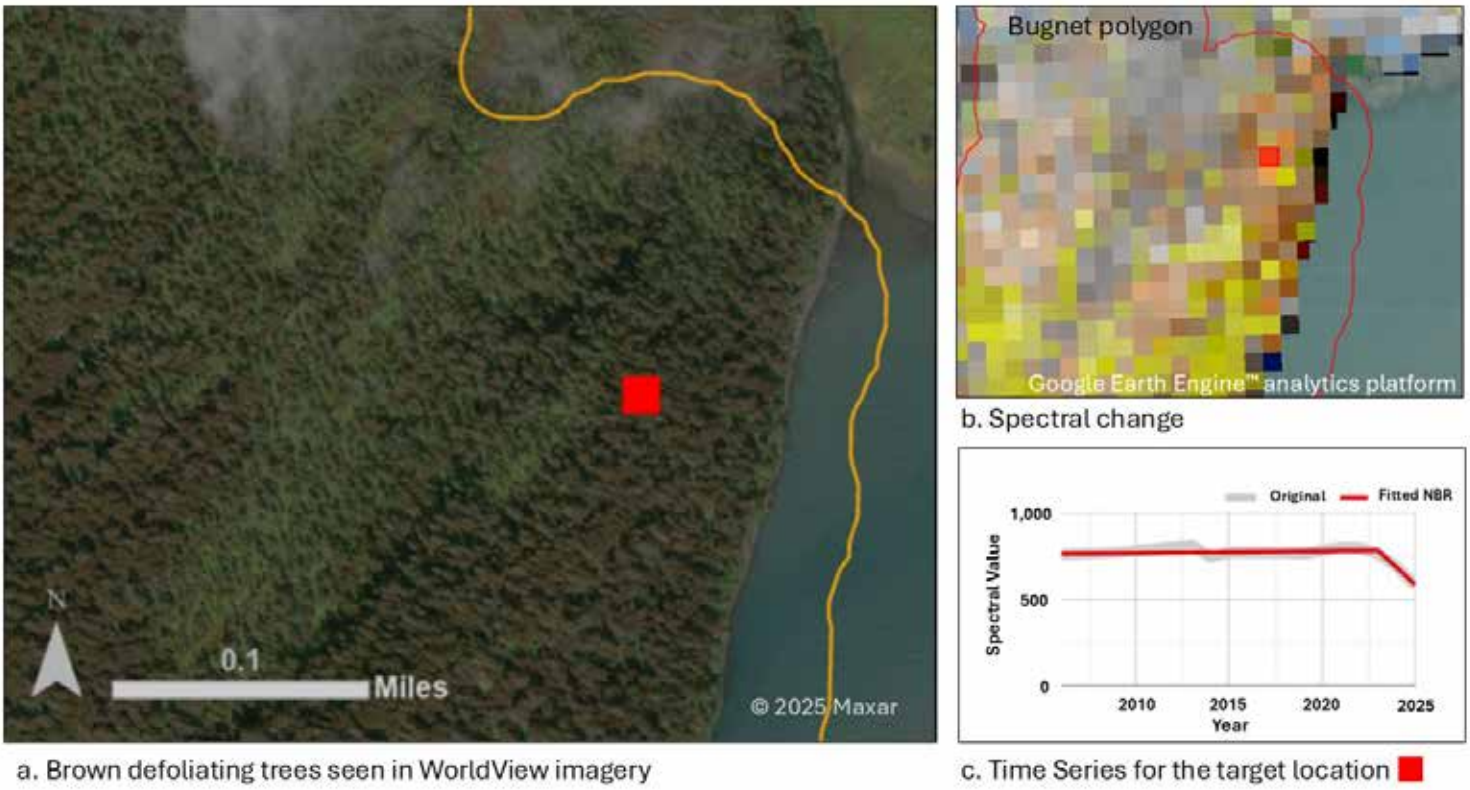


Figure 6. Verification of satellite-based change detection polygons using multiple data sources: (a) WorldView high-resolution (50 cm) imagery ©Maxar, late summer of 2025; (b) Google Earth Engine visualization showing mapped spectral change within the Prince William Sound HUC-6 drainage; and (c) pixel-level time series of Normalized Burn Ratio (NBR) values for the target pixel (red square). In (b), yellow pixels indicate 2025 change; orange pixels indicate change occurring in both 2024 & 2025. In the time series, the gray line represents observed NBR values, and the red line represents LakeTrendr fitted values derived from harmonized Landsat/Sentinel-2 imagery.

polygons with host, agent, and damage type in preparation for submittal to IDS.

Each forest health detection method, whether by ground, air or satellite, has assumptions, limitations, and compromises that affect accuracy, precision, and coverage. The quality of ADS data depends on the trained eyes, experience, and skill of the observer, as well as survey timing and flying conditions. The quality of satellite-based data depends on the availability, resolution, and quality of imagery, the computational algorithms that have been built to detect and differentiate change, date windows, spectral and sensitivity parameters selected to represent a particular change, and ability to verify the data. The quantity of tree damage that is mapped will vary depending on parameter selection. Less affected areas can be missed in efforts to avoid false detection of damage, nd one type of damage can be mistaken for another. However, the goal of all methods is the same: to monitor, detect, and map tree damage to the best of our ability so that we can inform forest managers and the public about insect and disease activity on forests in Alaska. Confidence in satellite- and aerial-based data is strengthened by ground visits and inspections of spatial and temporal patterns by local forest health experts. Ground, aerial, and satellite-based methods together provide us with a good assessment of significant forest damage events. Next year we plan to increase the resolution from 30 m to 10 m to improve small change detection abilities, and we will continue to test and apply new methods as they become available.

Literature Cited:

OregonState University (2025). *BugNet*. EMapR lab. https://emapr.ceoas.oregonstate.edu/projects.html

Gorelick, N., Hancher, M., Dixon, M., Ilyushchenko, S., Thau, D., & Moore, R. (2017). *Google Earth Engine: Planetary-scale geospatial analysis for everyone*. Remote Sensing of Environment, 202, 18-27. https://doi.org/10.1016/j.rse.2017.06.031

Kennedy, R. E., Yang, Z., & Cohen, W. B. (2010). *D*etecting trends in forest disturbance and recovery using yearly Landsat time series: 1. LandTrendr — Temporal segmentation algorithms. *Remote Sensing of Environment*, 114(12), 2897-2910. https://doi.org/10.1016/j.rse.2010.07.008

PATHOLOGY HIGHLIGHTS

YELLOW-CEDAR ROOT LESIONS

Forest Health Protection has partnered with Dr. Jared LeBoldus' Lab at Oregon State University, Dr. Sarah Green's Lab at Forest Research United Kingdom, and the Oregon Department of Forestry to evaluate yellow-cedar root lesions. Studies were conducted in forests with crown thinning and discoloration symptoms indicative of yellow-cedar decline (fig. 7).



Figure 7. A mix of dying, dead, and a few healthy yellow-cedar trees in an old-growth forest impacted by decline on Kupreanof Island. Root lesion tissue sampling occurred at this site in 2025. USDA Forest Service photo by Robin Mulvey.

Root lesions are stained, dead areas that expand upward from coarse roots, signifying serious root injury. Fine-root freezing injury is considered the best mechanistic explanation for widespread yellow-cedar decline. New tools are now available to evaluate root pathogens that may be present in symptomatic yellow-cedar trees, contributing to root lesion development.

Sampling occurred in old-growth and young managed forests on Kupreanof, Mitkof, Wrangell, and Zarembo Islands in Southeast Alaska (fig. 8). Several techniques were used to isolate and detect root pathogens in stained tissues, in soil around roots, and in nearby water courses. The invasive pathogen *Phytophthora austrocedri* was a focus of the sampling effort because the pathogen kills juniper and cypress species in Argentina and the United Kingdom, yellow-cedar is known to be susceptible, and lesions caused by this pathogen look like those observed on cedars with decline symptoms (fig. 9).



Figure 8. Dr. Jared LeBoldus excavates a yellow-cedar root on Zarembo Island. USDA Forest Service photo by Robin Mulvey.



Figure 9a & 9b. A lesion revealed by bark removal at the base of a symptomatic yellow-cedar tree on Zarembo Island (left) and a lesion caused by *Phytophthora austrocedri* on common juniper in Scotland (right). Photos courtesy of Sarah Green, Forest Research United Kingdom.

Work is still underway, but to date, no aggressive *Phytophthora* species have been confirmed from the efforts; however, some species of *Phytophthora* can be elusive even with advanced methods.

SEPTORIA/POPLAR LEAF SPOT

Septoria/Poplar leaf spot is considered a relatively minor foliage disease of cottonwood and balsam poplar in Alaska. The damage is not typically recorded during ground detection survey efforts in July and August because the angular, tan to brown leaf spots develop late in the growing season. However, leaf spot symptoms (fig. 10) were common during mid-season sampling efforts this year in Southcentral Alaska from Anchorage to the Knik River and from Valdez to Glennallen, as well as in the Interior between Fairbanks to the Brooks Range.

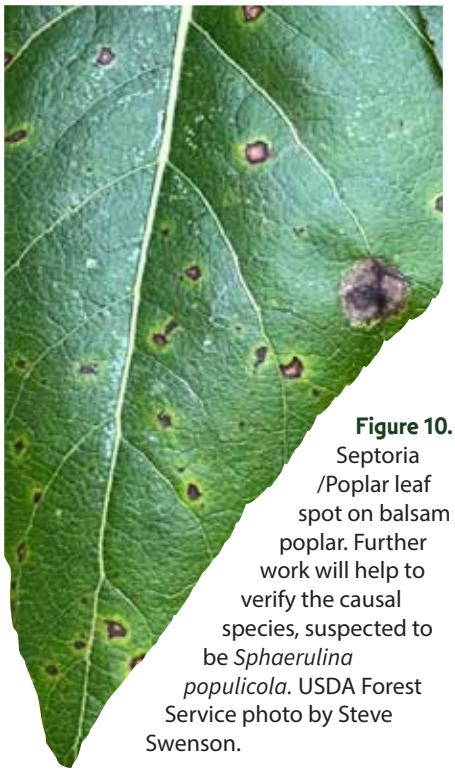


Figure 10. Septoria /Poplar leaf spot on balsam poplar. Further work will help to verify the causal species, suspected to be *Sphaerulina populicola.* USDA Forest Service photo by Steve Swenson.

Wet spring weather likely contributed to earlier foliar symptom development. *Sphaerulina populicola* is the most likely cause of damage observed since it is prevalent across western North America. The related pathogen, *Sphaerulina musiva*, can cause both foliage disease and cankers on poplars, but is more common in the east. Specimens collected from balsam poplar will be submitted for genetic sequencing to verify the pathogen species.

ASPEN LEAF AND SHOOT BLIGHT

Aspen leaf and shoot blight (*Venturia moreletii*), also called aspen shepherd's crook, is another poplar disease that was common in Southcentral Alaska following an atypically wet, mild spring. Disease activity was unusual in 2024 and 2025 in that symptom onset was noted earlier in the growing season and occurred at levels detectable from the air. In addition to the curved, dead shoots associated with the disease (fig. 11), foliage discoloration was also widespread.



Figure 11. Classic aspen shepherd's crook symptoms caused by the fungal pathogen *Venturia moreletii*. This disease was more severe and common than usual in Southcentral Alaska. Photo courtesy of Bruce Welkovich, iNaturalist contributor.

This disease typically causes greater impacts in small trees and saplings compared to mature aspen trees since a lower canopy position prolongs periods of leaf wetness required for infection. Heavy infection can stunt tree growth. In 2024, aspen defoliation, believed to be attributable to aspen leaf and shoot blight, was aerially mapped across almost 1,000 acres on the western Kenai Peninsula. A further 1,770 acres were mapped in 2025. Sample collection from upper and lower canopy positions is needed to clarify whether the observed symptoms have a uniform cause.

NONINFECTIOUS HIGHLIGHTS

YELLOW-CEDAR DECLINE

Yellow-cedar decline was mapped across 2,460 acres during aerial detection survey in 2025. Though yellow-cedar decline was the most pervasive form of forest damage aerially mapped in Southeast Alaska, the reduced survey area makes it complicated to compare to mapping efforts in other years. Damage continues to build in managed forest units impacted by yellow-cedar decline (fig. 12).



Figure 12. A managed young-growth stand with particularly severe decline impacts on Kupreanof Island where root lesions were sampled in 2025. USDA Forest Service photo by Robin Mulvey.

Ground-based surveys led to the detection of newly managed young-growth stands with decline symptoms on Mitkof and Kupreanof Islands this year. There was also one report of young-growth decline near Ward Cove on Revillagigedo Island, the first instance of decline in a managed stand on this island.

The extent of yellow-cedar decline may be expanding north and west of the main area of impact in Southeast Alaska. Forest Service ecologists from Chugach National Forest and Pacific Northwest Research Station visited historically healthy yellow-cedar forests in Prince William Sound in July 2025. Scattered dead cedars were noticed there for the first time last year, but no new mortality was observed in 2025. Factors other than root-freezing injury, the primary cause of yellow-cedar decline, may have led individual trees to die. Similarly, mortality has been observed from the air along the outer coast of Glacier Bay National Park since 2021, but this area has not been aerially surveyed since 2023, nor has it been visited on the ground due to difficult access.

Forest Health Protection and Region 10 produced new spatial layers of cumulative yellow-cedar decline in 2025. These layers are publicly available through an interactive web application. (fig. 13)

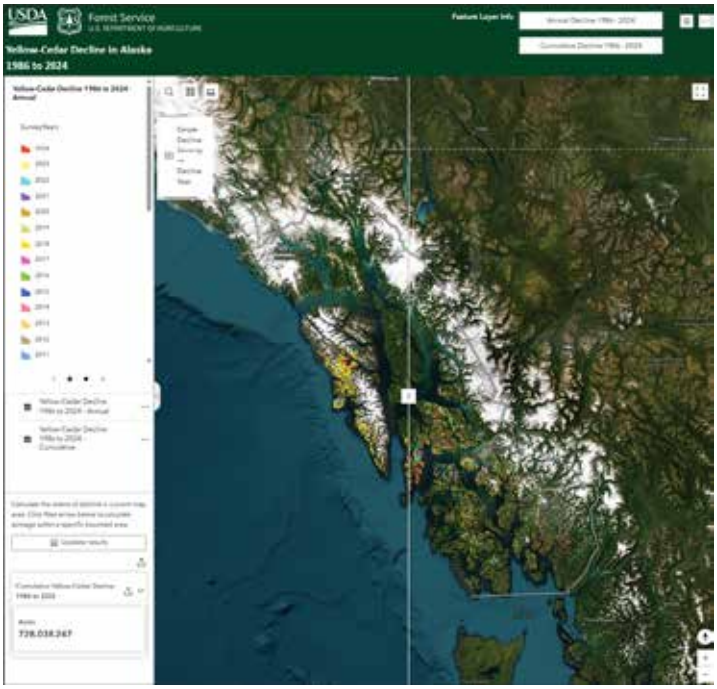
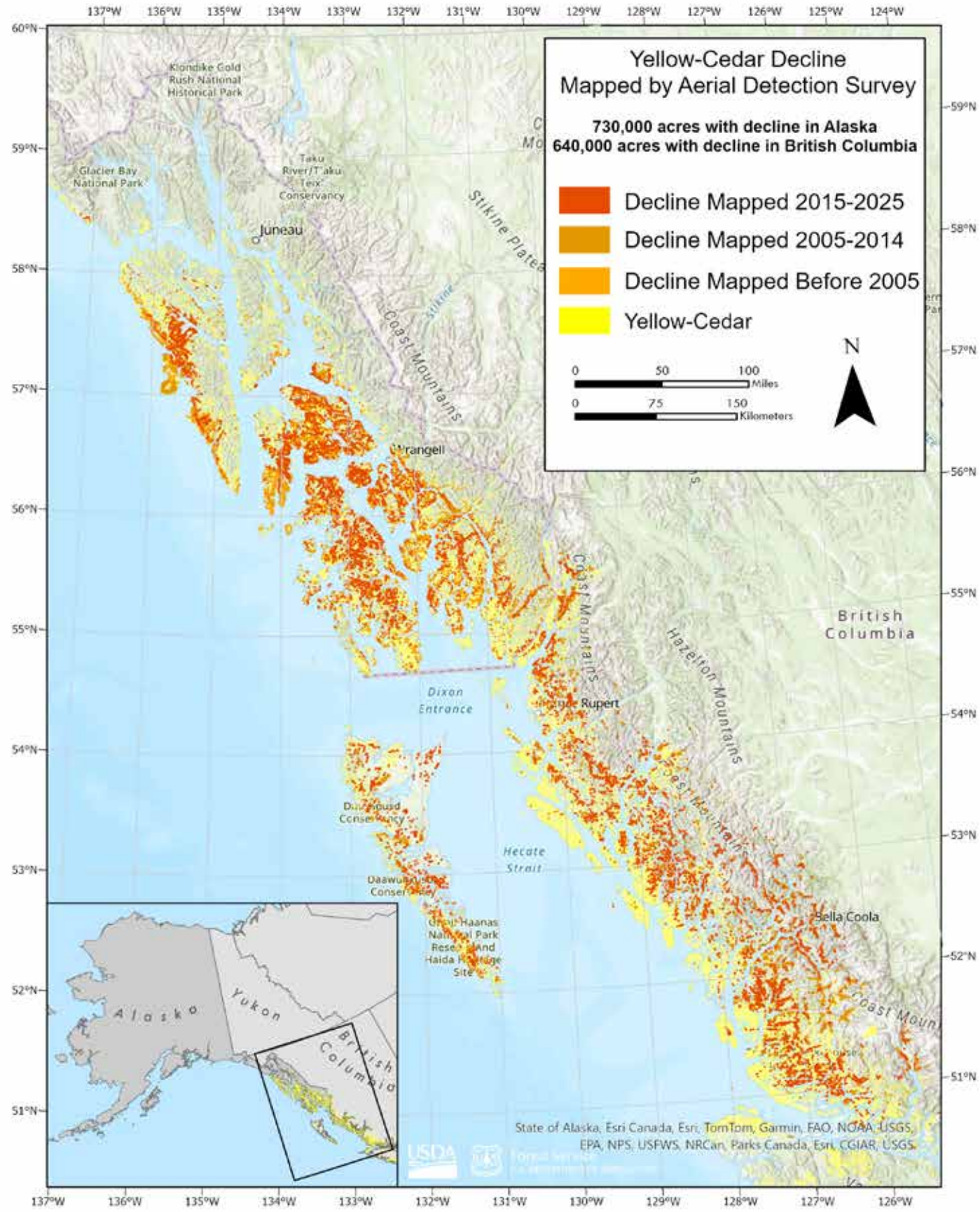


Figure 13. The interactive web application displays cumulative yellow-cedar decline data layers spanning 1986-2024 and will be regularly updated.

The same source data was used to create two decline datasets (cumulative and annual) in the webmap that occupy the same spatial extent but differ slightly in their structure and metadata to accommodate different end-user needs. The cumulative decline estimate is now just under 730,000 acres. (map 4.)

As described on page 14 (Yellow-Cedar Root Lesions), a significant sampling effort took place on the central Tongass National Forest to identify root pathogens from yellow-cedar trees with symptomatic tree crowns. This project may shed light on whether weak or aggressive root pathogens (other than Armillaria species, common on weakened trees) are associated with yellow-cedar decline.

MAP 4 | Cumulative Yellow Cedar Decline 2025



Map 4 | Yellow-cedar decline mapped in Alaska and British Columbia in three time periods (2015-2025, 2005-2014, and prior to 2005) with the distribution of yellow-cedar forest. The species occurs from Prince William Sound in Alaska to the Siskiyou Mountains of northwest California.

TABLE 6 | Cumulative acreage affected by yellow-cedar decline in Southeast Alaska as of 2025 by ownership[1] and Forest Service Ranger District. Estimates were limited to affected areas occurring within upland forest and forested wetlands[2]

Ownership[1]	Cumulative Acres
National Forest	**688,020**
Admiralty NM	6,041
Admiralty Is.	6,041
Craig RD	52,927
Dall and Long Is.	1,652
Prince of Wales Is.	51,275
Hoonah RD	1,165
Chichagof Is.	1,165
Juneau RD	1,383
Mainland	1,383
Ketchikan-Misty Fjords RD	94,482
Annette and Duke Is.	16
Gravina Is.	3,100
Mainland	49,540
Revillagigedo Is.	41,827
Petersburg RD	212,952
Kuiu Is.	85,412
Kupreanof Is.	101,215
Mainland	12,364
Mitkof Is.	10,808
Woewodski Is.	3,153
Sitka RD	141,713
Baranof Is.	65,547
Chichagof Is.	51,406
Kruzof Is.	24,761
Thorned Bay RD	91,563
Heceta Is.	1,741
Kosciusko Is.	15,364
Prince of Wales Is.	74,458
Wrangell RD	85,794
Etolin Is.	28,672
Mainland	24,211
Woronkofski Is.	1,492
Wrangell Is.	15,161
Zarembo Is.	16,258
Bureau of Indian Affairs	2,587
Annette and Duke Is.	2,587
National Park Service	102
Glacier Bay NP Mainland[3]	102

Ownership[1]	Cumulative Acres
Alaska Native	**23,380**
Baranof Is.	594
Chichagof Is.	185
Dall and Long Is.	1,287
Kosciusko Is.	389
Kruzof Is.	87
Kuiu Is.	1
Kupreanof Is.	4,431
Mainland	1,407
North Prince of Wales Is.	2,577
Revillagigedo Is.	963
South Prince of Wales Is.	11,457
Other Federal	208
Mainland	1
Revillagigedo Is.	207
State & Private	15,096
Admiralty NM	<1
Baranof Is.	2,916
Chichagof Is.	236
Dall and Long Is.	3
Etolin Is.	19
Gravina Is.	1,221
Heceta Is.	<1
Kosciusko Is.	189
Kruzof Is.	187
Kuiu Is.	210
Kupreanof Is.	1,167
Mainland	1,394
Mitkof Is.	1,154
North Prince of Wales Is.	2,883
Revillagigedo Is.	1,867
South Prince of Wales Is.	1,088
Woewodski Is.	3
Wrangell Is.	346
Zarembo Is.	213
CUMULATIVE TOTAL[4]	729,393

[1] The ownership layer used to process cumulative yellow-cedar decline is the Bureau of Land Management Administered Lands Feature Class, updated 04/23/2025 and accounts for land transfers.
[2] The cumulative yellow-cedar decline layer has been clipped/restricted to areas occurring within upland forest and forested wetland cover classes in the USGS National Land Cover Database-modified dataset (Frances Biles, USFS PNW Research Station), which reduces the cumulative acreage by almost 70,000 acres.
[3] Yellow-cedar mortality in GBNP has been detected since 2021 and remains to be verified on the ground.
[4] Cumulative yellow-cedar decline acreage was updated in 2024. The refined cumulative dataset (1986-2024) is available in the ArcGIS Web Experience.

INVASIVE PLANT HIGHLIGHTS

NOTEWORTHY NEW INFESTATIONS

CREEPING THISTLE
Cirsium arvense

U.S. Fish and Wildlife Service found two new creeping thistle infestations on two different islands in Izembek Lagoon in the Aleutian Islands (Map 5). The infestations, thought to have come in with plantings associated with waterfowl-banding efforts in the 1970's, cover roughly 3.5 acres and 0.8 acres (fig. 14). The new infestations are approximately 8 miles from known creeping thistle infestations at Cold Bay.





Figure 14. Field of creeping thistle, one of two new infestations on an island in Izembek Lagoon. US Fish and Wildlife Service Photo.

ORANGE HAWKWEED
Hieracium aurantiacum

Orange hawkweed was documented north of the Alaska Range for the first time in 2025 (map 6). The Salcha-Delta Soil and Water Conservation District learned of the occurrence and worked with the landowner to control the infestation, with plans to monitor the infestation in 2026 and re-treat as needed. Early Detection and Rapid Response (EDRR) in action!

YELLOW FLAG IRIS
Iris pseudacorus

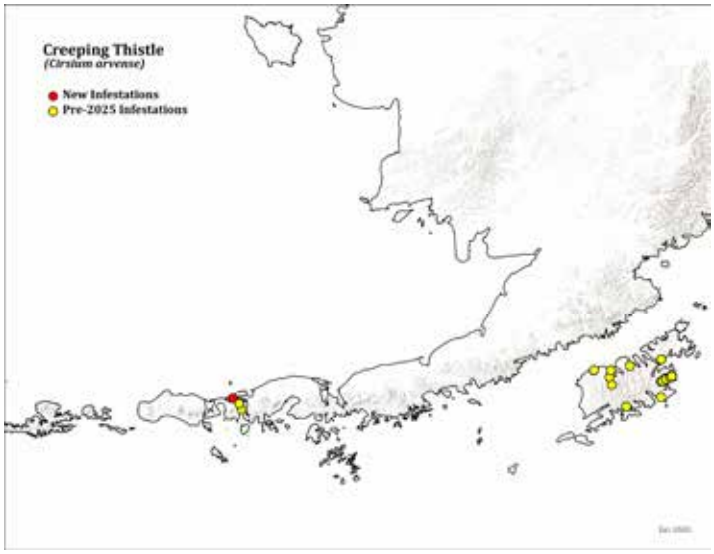
Coastal infestations are the theme (map 7). The US Forest Service documented and removed an infestation of five stems in a remote location on the west coast of Chichagof Island in southeastern Alaska. To the northwest, Alien Species Control, LLC followed up on reports of yellow flag iris on Kayak Island 60 miles southeast of Cordova in the Gulf of Alaska. Multiple infestations were found and controlled within the upper beach meadows and marshes along a 1.5-mile stretch of beach on the southeast side of the island (fig. 15). The Ocean Plastics Recovery crew reported an infestation location 5 miles north, yet to be revisited and documented. Interestingly, iNaturalist has two research grade infestations on Middleton Island documented as early as 2017 in the Gulf of Alaska. These occurrences may be associated with the Marine Biological Station or date back to the Air Force base active in the 1950's.



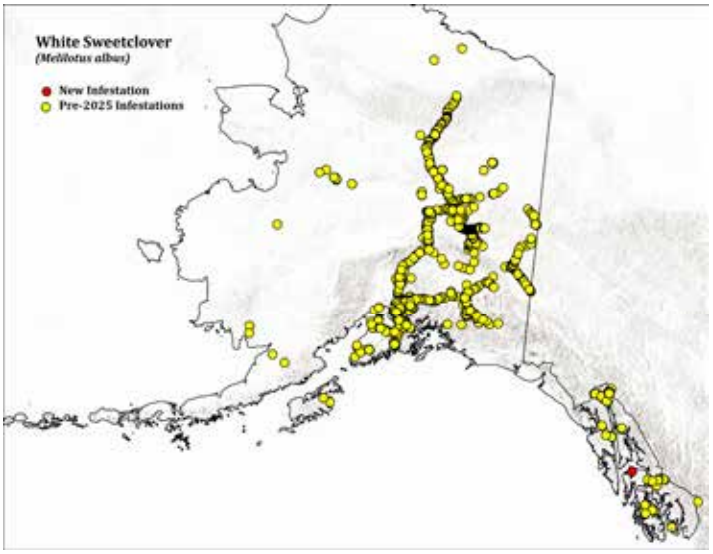
Figure 15. Alien Species Control, LLC staff with one of many yellow flag iris infestations along the Kayak Island shoreline. Photo courtesy of Tim Stallard, Alien Species Control, LLC.

WHITE SWEETCLOVER
Melilotus alba

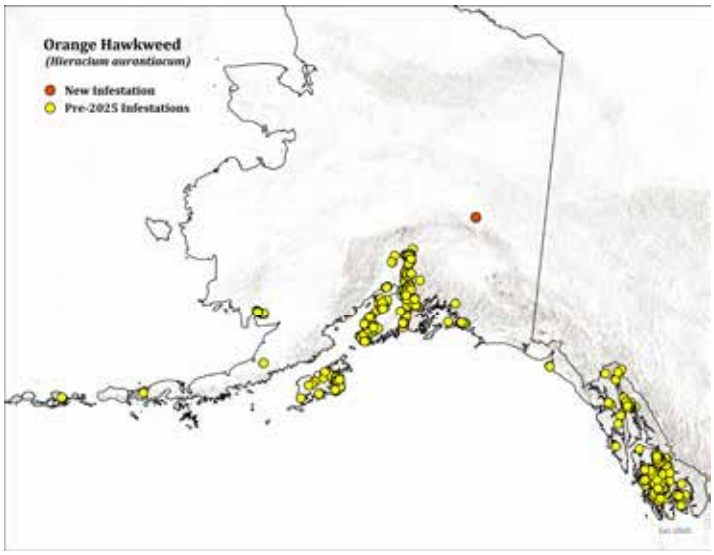
Working with the Keex' Kwáan Community Forest Partnership and Kake Alaska Youth Stewards (AYS), Southeast Alaska Watershed Coalition found and hand-pulled white sweetclover at the Kake airport (Map 8). The work is a great EDRR example, keeping white sweetclover off of Kupreanof Island.



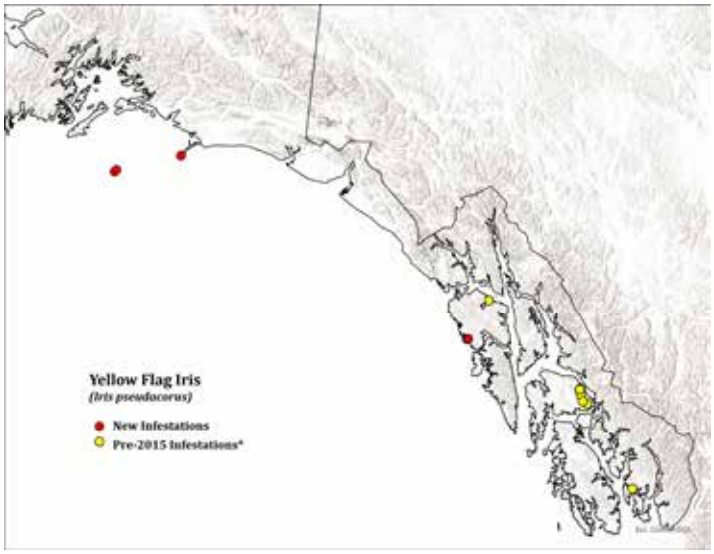
Map 5 | Creeping thistle infestations documented on islands within Izembek Lagoon by the US Fish and Wildlife Service.



Map 8 | White sweetclover infestation documented at Kake, Alaska.



Map 6 | Orange hawkweed infestations documented north of the Alaska Range by the Salcha-Delta Soil and Water Conservation District.



Map 7 | Yellow flag iris infestations documented in remote coastal Alaska locations.





Figure 17. Anchorage SWCD staff removing trees from a homeowner's land adjacent to the Anchorage Coastal Wildlife Refuge using the cut stump treatment method. Photo courtesy of Lizzie Bishop, Anchorage Soil and Water Conservation District.

EUROPEAN BIRD CHERRY/ CHOKECHERRY

European bird cherry (*Prunus padus*) and chokecherry (*Prunus virginiana*) trees continue to be high priority for prevention and control within the state. The Anchorage Cooperative Invasive Species Management Area (CISMA), led by the Anchorage Soil and Water Conservation District (SWCD), successfully engages community members through both reporting trees as well as removing trees in many municipal parks and along trails. Individuals reported invasive species directly to Anchorage SWCD and participated in surveys and tree pulls, which amounted to roughly 500 volunteer hours. Additionally, Anchorage SWCD initiated its Prunus removal assistance program to encourage homeowners to remove their large fruiting Prunus trees. Local arborists collaborated with Anchorage SWCD to provide additional monetary incentives to increase participation in the program — 111 homeowner requests for assistance were received. Funding for the removal assistance program comes from SP&TF Urban and Community Forestry through the Alaska Division of Forestry and the Anchorage Park Foundation.

Anchorage SWCD has a management strategy in place to prioritize control work: The highest priority areas are those that are managed for natural conditions (e.g., Chugach State Park and adjacent National Forest lands), followed by areas that function as vectors (fig. 16) and in locations with ecological value in the urban space such as greenbelts; and lastly, developed urban and residential lands. Because animal dispersal contributes significantly to finding trees in remote locations, engaging private landowners in the control work is critical to the success of limiting the spread of fruiting trees. In 2025, Anchorage SWCD expanded control work to the Anchorage Coastal Wildlife Refuge (fig. 17, p. 20) and collaborated with the Homer SWCD to begin control work in Hope. Community awareness is growing; action is essential to successful Prunus control.

STATEWIDE

- Alaska Division of Agriculture implemented a state-wide quarantine on both *P. padus* and *P. virginiana*, a measure that will help prevent the continued introduction that runs counter to the control work. The quarantine prohibits the import, transport, and sale of the trees or parts of trees within the state.



Figure 16. Removing Prunus at Portage Lake, one of the only known trees remaining in the Portage Valley. Photo courtesy of Hannah Thompson, Anchorage Soil and Water Conservation District.

- Southeast Alaska Watershed Coalition mapped roughly 2,700 Prunus trees and controlled close to 1,000 in the City and Borough of Juneau.
- Homer SWCD worked with the US Fish and Wildlife Service Conservation Office biologist to identify, treat, and plan for long-term management of several extensive Prunus infestations on private properties along the Kenai River. They removed more than 100 Prunus trees of various sizes and maturity from two properties along the Kenai River.
- The Prunus removal program continues to grow within the Kenai Peninsula CISMA, led by the Homer SWCD. Homer SWCD surveyed 18 acres and treated 1.3 acres, including the removal of more than 80 mature Prunus padus trees as well as many hundreds of seedlings and saplings.
- The Northern CISMA began outreach in the Fairbanks North Star Borough, controlling Prunus at the Alaska Department of Natural Resources Fairbanks campus and hosting a control demonstration at the University of Alaska Fairbanks. The Chokecherry Challenge and other outreach events raise awareness, document Prunus distribution, and relay methods for homeowners to control their trees.

ELODEA

On the heels of the Kenai Peninsula Cooperative Invasive Species Management Area's (KP-CISMA) 2022 announcement that all known infestations of Elodea, Alaska's only known invasive aquatic plant, had been eradicated from the Kenai Peninsula, Chugach National Forest staff detected Elodea in Crescent Lake, a large, remote alpine lake located within Chugach National Forest on the Kenai Peninsula, in September 2023. Follow-up surveys indicated three discrete populations in the lake proper and a fourth at the lake's outlet, totaling approximately 11 surface acres (about 0.8% of the total surface area of the lake). Rooted Elodea was later found in the upper portion of Crescent Creek. The infestations sparked concern about the ecological impacts to Crescent Lake as well as the risk of spread to other Kenai Peninsula waterbodies via floatplanes and possible invasion throughout the Kenai River watershed due to the potential for downstream spread of Elodea fragments. Crescent Lake serves as a reminder that continued surveys are important even after an area is thought to be weed-free.

A collaborative undertaking of the KP-CISMA, the Crescent Lake Elodea eradication project is largely supported by KP-CISMA partner contributions and primarily funded by a grant awarded to Homer SWCD through the Alaska Sustainable Salmon Fund. Three herbicide treatments were applied during the 2025 season to the three lake infestations, and an herbicide drip station was installed to treat the outlet infestation. Rooted Elodea and Elodea fragments were hand-removed from Crescent Creek. Throughout the summer, Elodea within all treatment areas showed increasing signs of herbicide damage (fig. 18, fig. 19). During post-treatment surveys, field crews did not find any Elodea in Crescent Creek or detect any new infestations in the western half of the lake; the eastern half of the lake remains Elodea-free.



Figure 18. Elodea with pink shoots, damage exhibited following the first Crescent Lake treatment. USDA Forest Service Photo.

STATEWIDE

- Over 100 waterbodies were surveyed in 2025, with Elodea detected in 25.
- 12 waterbodies, including Crescent Lake, were undergoing treatment in 2025.
- On the Chugach National Forest, Crescent Lake is the only infestation being treated; Cordova Ranger District has a complex infestation in the Copper River Delta.





Figure 19. Brown, or dead, Elodea following the third Crescent Lake treatment. USDA Forest Service Photo.

ENTOMOLOGY HIGHLIGHTS

WESTERN BLACKHEADED BUDWORM/HEMLOCK SAWFLY OUTBREAK

Populations of western blackheaded budworm and hemlock sawfly remain low in Southeast Alaska in 2025. The defoliation event of 2018-2024 impacted ~1.5 million acres of forest across Southeast Alaska. The impacts from the outbreak are still visible in areas, especially places with mortality of up to 50% of western hemlock.

In 2025, over 2,200 acres of western blackheaded budworm were mapped in Southcentral Alaska along the Seward Highway on the northeastern Kenai Peninsula. This year was the first time since 2009 that western blackheaded budworm has been mapped in Southcentral Alaska. Western blackheaded budworm was also observed in western portions of Prince William Sound (fig. 20) and reports of this damage were received from the public and partners.



Figure 20. Hemlock trees in Prince William Sound exhibit reddish-brown needle discoloration as a result of western blackheaded budworm feeding damage. Photo courtesy of Alex Wenninger, University of Alaska Fairbanks-Cooperative Extension Service.

This damage was visible in satellite imagery, and we were able to utilize remote sensing tools to document the outbreak in areas we could not access on the ground or via aerial survey. Over 16,700 acres of damage were attributed to western blackheaded budworm in Prince William Sound using remote sensing tools. More information about the tools and process used to gather this information can be found in the Remote Sensing Essay on page 12. We will continue to monitor this event in Southcentral Alaska with focused surveys to determine the extent and impacts to the spruce/hemlock forests of Prince William Sound and the Kenai Peninsula.

SPRUCE BEETLE

Spruce beetle activity continued to decline across the state in 2025, with roughly 7,800 acres of damage documented (35,100 acres in 2024). About 98% of the spruce beetle damage mapped statewide this year was tied to the ongoing outbreak (7,630 acres) (fig. 21, map 9), which has now impacted an estimated 2.26 million acres since 2016.

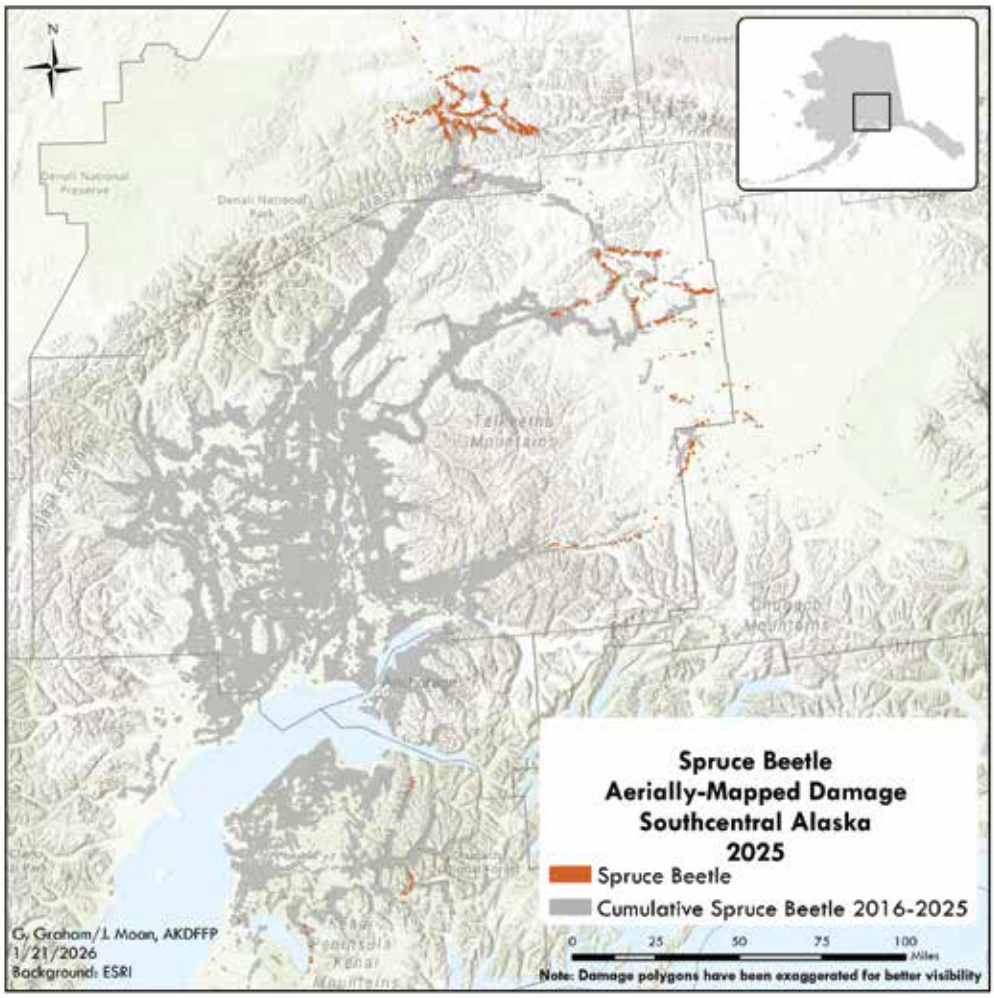


Figure 21. Spruce beetle-killed white spruce are visible across the landscape in Southcentral Alaska. Photo courtesy of Jason Moan, Alaska Division of Forestry & Fire Protection.

While outbreak-level spruce beetle activity persists within the portions of the Denali and Matanuska-Susitna Boroughs most heavily impacted in recent years, active damage within these boroughs declined by more than 60% and 80%, respectively, from that observed in 2024. After dropping to near endemic levels in 2024, spruce beetle activity in the Kenai Peninsula Borough

continued to decline in 2025. Outbreak activity in the Copper River Census Area also declined dramatically in 2025. Despite a decreased aerial survey footprint across the state in 2025, assessment of the outbreak was prioritized and the survey coverage of the impacted area was comparable between 2025 and 2024 (table 7).

Small pockets of endemic spruce beetle activity were also observed scattered within the Copper River Census Area. Elsewhere in the state, roughly 120 acres of spruce beetle activity was observed in Interior Alaska this year. This is a substantial decrease over that observed in 2024, when 2,500 acres were observed. However, aerial surveys were more limited in the Interior in 2025 compared to 2024. Aerial survey coverage in the Interior prioritized the Tanana Valley State Forest, which excluded previously observed areas of spruce beetle activity north of the White Mountains in the Beaver and Preacher Creek drainages. It is important to note that none of the spruce beetle damage reported for Interior Alaska in 2025 is associated with the ongoing spruce beetle outbreak. Additionally, roughly 50 acres of scattered light spruce beetle activity was documented in Southeast Alaska.



Map 9 | Spruce beetle 2025. Active and cumulative area impacted by the ongoing spruce beetle outbreak, as mapped through aerial detection survey 2016-2025.

TABLE 7 | Comparison of acres impacted by spruce beetle within the outbreak-affected Boroughs and Census Area for 2024 and 2025

Locations	2025 Acres Impacted	2024 Acres Impacted	Percent Change	Cumulative Acres Impacted
Denali Borough	**5,300**	14,650	-64%	83,825
Matanuska-Susitna Borough	**2,050**	14,900	-86%	1,780,000
Anchorage Municipality	**0**	30	-100%	34,150
Kenai Peninsula Borough	**120**	2,025	-94%	356,475
Copper River Census Area	**170**	925	-82%	5,275

Comparison of acres impacted by spruce beetle within the outbreak-affected Boroughs and Census Area for 2024 and 2025. Cumulative acres impacted includes data from 2016-2025.

BIRCH LEAFMINER

Alaska has been undergoing an outbreak of two species of invasive birch leafminers, amber-marked birch leafminer (*Profenusa thomsoni*) and late birch leaf edgeminer (*Heterarthrus nemoratus*), since the early 2000s. Both species continued to be active in Interior and Southcentral Alaska in 2025. During aerial detection surveys, approximately 123,000 acres of birch leafminer defoliation were recorded across Alaska. The majority of birch leafminer defoliation observed during aerial surveys occurred in Southcentral Alaska (94,000 acres), with the remaining 29,000 acres observed in Interior Alaska. The acreage in Interior Alaska may seem like a decrease from other years but is due to limited flight coverage and timing.

Ground Detection Surveys in 2025 documented both birch leafminer species in Interior and Southcentral Alaska. The majority of observations were recorded in Interior Alaska (62%), with the defoliation severity levels rated at 36% or greater (fig. 22).



Figure 22. Severe birch defoliation caused by larval mining of two birch leafminer species in Salcha, Alaska: *Profenusa thomsoni* and *Heterarthrus nemoratus*. USDA Forest Service photo courtesy of Dr. Sydney K. Mullen.

Conversely, all but two of the Southcentral observations rated the defoliation levels as trace, with the remaining two observations rated as 6-35% defoliation severity. In addition to state-wide ground detection surveys, Southcentral Alaska's FHP team conducted its annual birch defoliator survey and found birch leafminers at all 16 sites (P. thomsoni, 13 sites; H. nemoratus, 16 sites), with mean defoliation severity levels at these sites recorded as trace (≤5% defoliation).

A new birch leafminer-specific field survey was implemented in Interior Alaska at 17 sites along major thoroughfares. Yellow sticky traps were used to track the progression of adult birch leafminer populations over an 8-week period (fig. 23). These traps were also used to monitor for parasitoid wasps and determine if biocontrol agents of amber-marked birch leafminer are established in Interior Alaska. One of those species of parasitoid wasp, *Lathrolestes thomsoni*, is an introduced biocontrol agent that was released in the early 2000s. The other two parasitoid species are either adventive or possibly native to Alaska and were previously discovered attacking amber-marked birch leafminer in Anchorage (e.g., *Lathrolestes soperi* and *Aptesis segnis*). The results of this survey revealed that late birch leaf edgeminer populations peaked early in the field season while amber-marked birch leafminer populations climaxed during mid-July (fig. 24). The sites with the heaviest infestation levels of both leafminer species were situated in habitats with disturbed vegetation and/or adjacent to heavy traffic corridors, which is consistent for these species (map 10). Furthermore, *L. thomsoni* specimens were recovered from yellow sticky trap catches, suggesting that this parasitoid has established itself in Interior Alaska (see fig. 24). Work is ongoing to finalize the identification of other parasitoid wasps recovered from yellow sticky traps during the survey period.



Figure 23. A new birch leafminer and parasitoid wasp survey in Interior Alaska was established in 2025. A. Amber-marked birch leafminer (*Profenusa thomsoni*) and the characteristic mines created by the feeding of the larvae of this species; B. Late birch leaf edgeminer (*Heterarthrus nemoratus*) and the characteristic mines created by the feeding of the larvae of this species; C. A yellow sticky trap covered in birch leafminers at a heavily infested site in Fox, Alaska. USDA Forest Service photos courtesy of Dr. Sydney K. Mullen.

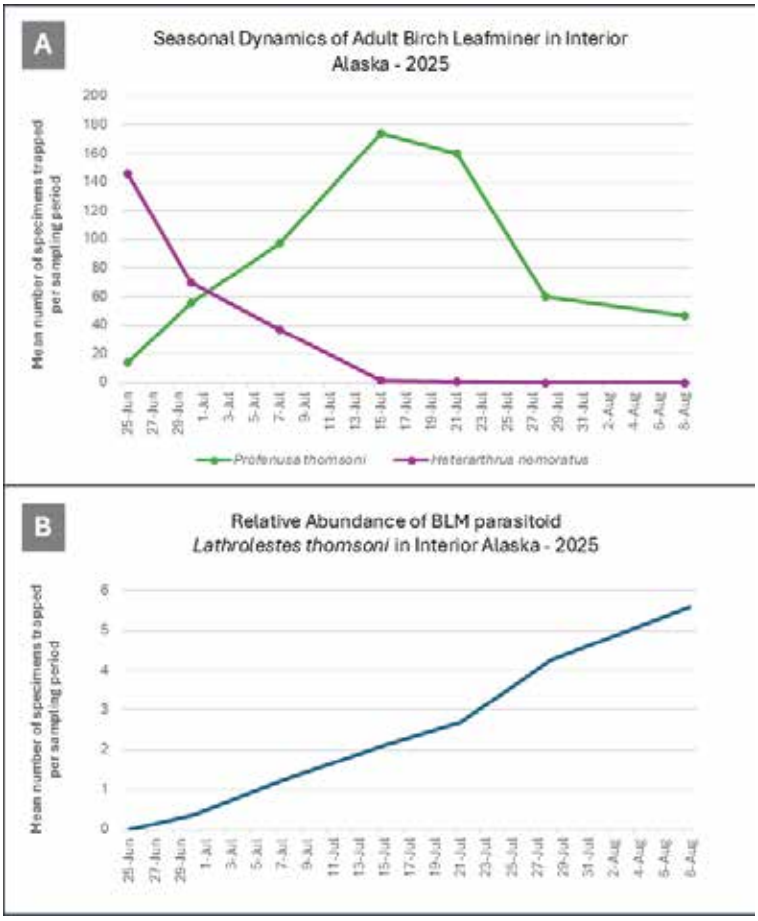
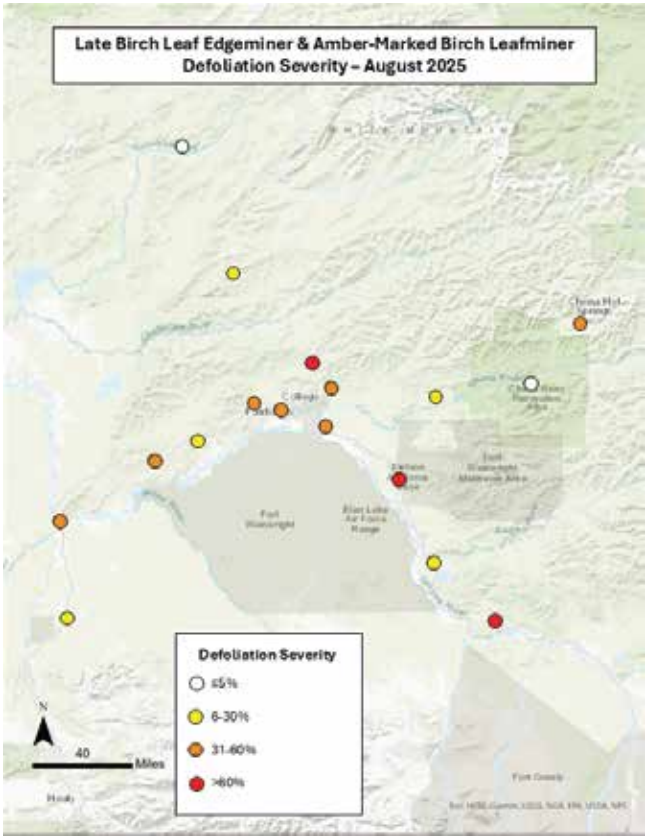


Figure 24 A and B. Seasonal dynamics of target insect species recovered during birch leafminer yellow sticky trap surveys across 17 sites in Interior Alaska over an 8-week period during the field season. A. Relative abundance of amber-marked birch leafminer (*Profenusa thomsoni*) and late birch leaf edgeminer (*Heterarthrus nemoratus*); B. Relative abundance of parasitoid wasp *Lathrolestes thomsoni*, which was introduced to Alaska in the early 2000s with the aim as serving as a biocontrol for the invasive amber-marked birch leafminer.



Map 10 | Birch leafminer defoliation severity levels recorded during the first week of August 2025 at yellow sticky trap plots in Interior Alaska. USDA Forest Service map created by Dr. Sydney K. Mullen.

ASPEN LEAFMINER

Interior Alaska has been experiencing an aspen leafminer (*Phyllocnistis populiella*) outbreak since 2002. This is the second recorded outbreak in Alaska exceeding 500,000 acres, with the first outbreak occurring during the late-1970s. In 2025, aspen leafminer defoliation was mapped during aerial detection surveys across 48,000 acres, entirely in Interior Alaska. The recorded acreage is significantly less than what was recorded in previous years, which might be due to the reduced aerial survey coverage in 2025. The majority of the defoliation was observed from Eielson Airforce Base southeast to Tok along the Richardson Highway corridor (21,800 acres), from Fairbanks North Star Borough southwest along the Nenana Ridge corridor (18,600 acres), as well as from Minto Flats to south of Manley Hot Springs (4,200 acres).

During 2025 ground detection surveys, aspen leafminer defoliation was observed across Alaska, with 82% of observations occurring north of the Alaska Range. Defoliation in Interior Alaska was observed along every major roadway, with the within-tree defoliation severity levels for most records rated at 6-35% or higher (fig. 25). Conversely, the damage severity of aspen leafminer defoliation in Southcentral Alaska was recorded as trace (≤5%) in all but two observations. On iNaturalist, citizen scientists documented 67 research grade observations of aspen leafminer in 2025, spanning from Anchorage to Fairbanks, with two records in Southeast Alaska.



Figure 25. Aspen defoliation caused by the larval feeding of aspen leafminer (*Phyllocnistis populiella*). USDA Forest Service photo courtesy of Dr. Sydney K. Mullen.

SPEAR-MARKED BLACK MOTH COMPLEX

Over the last few years there has been an uptick in observations of spear-marked black moths (Rheumaptera hastata complex) during FHP ground detection surveys, as well as via citizen scientist observations on iNaturalist. In 2025, spear-marked black moth observations were recorded across the state, with 21 observations recorded during ground surveys and 78 research grade observations were recorded on iNaturalist. In mid-June of this year, thousands of spear-marked black moths were seen puddling en masse along a roadside in Salcha, AK (fig. 26).



These moths have a circumpolar distribution and are widespread in North America; in Alaska, they have been found throughout the range of birch, from Tok west to Ruby, and from the greater Fairbanks North Star Borough area down to Southcentral Alaska. Larvae feed on the external layers of leaf tissue of leaves that have been webbed together, which results in the browning of leaves by early August. Tree mortality has not been reported from previous outbreaks of this agent; however, radial and terminal growth is significantly reduced from heavy defoliation.

The larvae of spear-marked black moths can be major defoliators of birch in Interior Alaska. While birch is the preferred host for this species complex, larvae also feed on alder, willow, and rose species. Outbreaks of this agent tend to be cyclical and crash after a few years. Previous recorded outbreaks of spear-marked black moth in Alaska include 1983-1987 with 474,620 acres of birch defoliated; 1974-1975 with 2.5 million acres; 1957-1958 with 5 million acres; and 1941 with impacted acreage unknown. There was also an outbreak of spear-marked black moth in Southcentral Alaska from 2009-2013 with at least 31,310 acres of defoliation observed on birch; however, between 2010-2012 there were 190,970 acres of birch defoliation attributed to several Geometridae caterpillars, which included spear-marked black moths, but total acreage for each outbreaking geometrid species was not distinguished during that time frame.



Figure 26. Aggregation of spear-marked black moths following pupation along a roadside in Salcha, June 2025. USDA Forest Service photo courtesy of Dr. Sydney K. Mullen.

LARCH CASEBEARER

The invasive larch casebearer (LCB; *Coleophora laricella*) was confirmed infesting ornamental larch trees in Anchorage in 2025. This marks the first known detection of LCB in Alaska and the northernmost detection in North America, though needle damage consistent with larch casebearer was noted in Anchorage as early as 2023. Larch casebearer larvae mine the needles of larch trees leading to needle discoloration (fig. 27).



Figure 27. Mated larch casebearer moths perch on Siberian larch needles damaged by previous larval feeding in Anchorage, Alaska. A larch casebearer pupa in its protective case made from a hallowed out larch needle hangs below the pair. Photo Courtesy of Grace Graham.

In response to the detection in Anchorage, Alaska Division of Forestry & Fire Protection Forest Health Program (DFFP FH) staff trapped LCB moths to confirm species identification and determine flight timing. Dr. Jean-Francois Landry, a Coleophora taxonomy specialist with the Canadian National Collection of Insects, Arachnids and Nematodes, confirmed identification. Additionally, DFFP FH surveyed more than 750 individual larch trees in partnership with FHP staff. The survey revealed that LCB is well established within the Anchorage Bowl on ornamental larch, however, and has likely been present for several years. Subsequent surveys in Southcentral Alaska found LCB present in urban areas just north of Anchorage, including Eagle River and Wasilla. Damage to trees was generally light or moderate with only a few hotspots of heavier damage in Anchorage. Surveys were also conducted in ornamental and native larch in Interior Alaska. LCB was not detected during surveys in Interior Alaska.

Larch casebearer is native to Europe and introduced to the northeastern United States in the late 1800s. LCB has become established on both planted and native larch in much of North America south of the 50th parallel. There are no native larch species in Southcentral Alaska and LCB is likely to be a nuisance pest of ornamental larch. LCB could be more problematic if introduced to urban areas of Interior Alaska within the native range of eastern larch (*Larix laricina*). In natural stands, consecutive years of heavy defoliation or concurrent outbreaks with larch sawfly (*Pristiphora erichsonii*) can make the affected trees more susceptible to other damage agents, such as the native eastern larch beetle (*Dendroctonus simplex*). Continued monitoring for LCB in Interior Alaska is a priority.

2025 FOREST HEALTH CONDITIONS -ALASKA-



Staff from Ketchikan-Misty Fjords and Prince of Wales Ranger Districts receive hazard tree training from Forest Pathologist, Robin Mulvey at Signal Creek Campground in Ketchikan. Note the brown fungal fruiting structure (Phaeolus schweinitzii) on the large Sitka spruce behind the group. USDA Forest Service photo by Robin Mulvey.

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