Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Forest Health Protection, State, Private, and Tribal Forestry, Region 10 | 2024

Forest Health Conditions in Alaska

2024 Species Updates

Cover image: Yellow-cedar mortality in Cedar Bay in Prince William Sound observed during aerial detection survey in July 2024. It is not yet known if tree mortality at this site is caused by root freezing injury (yellow-cedar decline) or other factors. Concentrated mortality has not been previously observed in this part of the yellow-cedar range. U.S. Forest Service photo by Steve Swenson.

Contributors:

Samantha Carroll, Christina Das, Dr. Kymberly Draeger, Garret Dubois, Dr. Elizabeth Graham, Dr. Karen Hutten, Joni Johnson, Jorda Kovash, Jason Moan, Jessie Moan, Kate Mohatt, Dr. Sydney Mullen, Robin Mulvey, Sayde Ridling, Dr. Ursel Schütte, Michael Shephard, Steve Swenson, Alexandria Wenninger, and Dr. Lori Winton.

Contents

Introduction

In 2024, Alaska reduced the size of the annual Forest Health Conditions report to highlight a smaller number of important damage-causing agents statewide. Updates on each of the agents that have typically been included in the Conditions Report are now included here as a standalone, supplemental document.

Each species update below includes the common and scientific name of the damage-causing agent (for biotic organisms), the known geographic distribution in Alaska, as well as the number and types of observations made through aerial and ground detection surveys throughout the year. For ground detection survey observations, within tree damage severity is broken down into six classes depending on the type of damage observed: trace to 5%, 6-35%, 36-50%, 51-67%, 68-75%, and 75-100%. The damage type identified dictates how severity is assessed. For example, defoliation severity represents the percentage of leaves affected, while stem canker severity or bole wounding corresponds to the percentage of the bole circumference affected. Research grade observations from iNaturalist, which have defined taxonomic specificity and identification requirements, are also included when applicable. Additional contextual information is provided (Status/Activity), as are links to our webpages, recent publications, or other resources (Additional Resources).

Publications, presentations, and public media outreach are summarized in an information delivery section at the end. The goals of the report formatting changes are to maintain complete annual records of forest health observations in Alaska, while increasing the efficiency and timeliness of reporting. Please see our USDA-FS Alaska Forest & Grassland Health website for detailed information about common forms of forest damage in Alaska, as well as aerial detection survey, ground detection survey, and remote sensing methodology and data. Our team welcomes your feedback on this change to our annual reporting.

Forest Insect Updates

Bark Beetles

Northern Spruce Engraver

Scientific Name(s): *Ips perturbatus* (Eichhoff)
Host(s) in Alaska: White spruce, Lutz spruce, rarely black spruce, and Sitka spruce.
General Distribution in Alaska: Southcentral, Interior, and western Alaska.
Ground Detection Survey Observations: None.
Aerial Detection Survey Observations: Approximately 900 acres of northern spruce engraver damage was observed during the 2024 aerial detection surveys, all of which was observed in the Interior. See the 2024 Status/Activity below for a detailed summary of the impacted areas.
iNaturalist Observations: None.
2024 Status/Activity: Though this bark beetle is present throughout the boreal forest in Alaska, white spruce mortality caused by the northern spruce engraver was observed exclusively in the Interior in 2024 (900 acres). The amount of damage attributed to this bark beetle in 2024 is a marked increase over that observed in 2023. Roughly 75% of these 2024 acres were contained in two relatively large polygons of activity along the Yukon River: one near Venetie Landing (300 acres) and one near the Kandik River (380 acres). The Yukon River was not flown in 2023. The remainder of the mapped damage was primarily observed in scattered small pockets of activity along several rivers and streams in the region, which is typical of this insect. Scattered bark beetle-killed black spruce continued to be observed in Southcentral (200 acres), mostly in the Susitna River valley and northwestern Kenai Peninsula, both areas that were heavily impacted by the spruce beetle early in the outbreak. Based on past field observations, this black spruce mortality is likely being caused by a combination of spruce beetle and northern spruce engraver activity.
Additional Resources: Link to northern spruce engraver webpage.

Spruce Beetle

Scientific Name(s): *Dendroctonus rufipennis* (Kirby)
Host(s) in Alaska: White spruce, Lutz spruce, Sitka spruce and at times black spruce.
General Distribution in Alaska: Throughout the range of spruce statewide.
Ground Detection Survey Observations: None.
Aerial Detection Survey Observations: Approximately 35,100 acres with spruce beetle damage were observed during the 2024 aerial detection surveys, more than 90% of which was associated with the ongoing outbreak. Additionally, scattered bark beetle-killed black spruce continues to be observed in Southcentral (200 acres). Based on past field observations, this black spruce mortality was mapped as a combination of spruce beetle and northern spruce engraver as causal agents.

iNaturalist Observations: 4 observations.
2024 Status/Activity: Spruce beetle activity was down considerably statewide in 2024. The 35,100 acres of damage mapped is the least observed in a given year since 2015, the year before the spruce beetle outbreak was initially detected. Despite this overall decline, the spruce beetle outbreak has now impacted a cumulative 2.25 million acres since 2016. Outbreak level activity continues to be observed within the Denali and Matanuska-Susitna Boroughs (14,640 and 14,915 acres respectively) and to a lesser extent in parts of the western Copper River Census Area (925 acres). Activity in the Kenai Peninsula Borough, however, dropped more than 90% from that observed in 2023 (2,025 acres). Spruce beetle activity within the Anchorage Municipality was negligible, with only 30 acres with damage mapped. The cumulative acres impacted by spruce beetle in each of these boroughs or census areas since 2016 is listed with their summaries below.

Denali Borough (78,500 cumulative acres impacted)
Activity within the Denali Borough decreased by roughly 55% from that mapped in 2023. While there was a slight decrease in the area flown in this borough in 2024 from 2023, the overall decrease in activity is not thought to be tied solely to the survey coverage. The areas affected were primarily within or adjacent to those impacted previously from Cantwell north to Healy Creek. Much of the activity near Cantwell, north along the Parks Highway, within Denali National Park and Preserve, and in Healy Creek was considered light activity. The Yanert Fork River valley, however, continues to have widespread and slightly higher severity activity.
A spring ground survey was conducted by DOF and FHP to assess the survival of overwintering spruce beetles. This effort was prompted by late January/early February temperatures of -30F to about -50F around McKinley Village and the surrounding area. Bark samples from trees with fading needles were collected in the Healy Creek drainage and near mile 230 of the Parks Highway. These samples were collected at roughly 4.5 feet above ground level, which was estimated to be above the winter snowline. All life stages of spruce beetle present were tallied and slowly warmed to assess their overwinter survival. A total of 66 adults (66% were callow adults), 10 larvae, and 3 pupae were collected, all of which were dead. An ad-hoc sample taken near ground level on a fallen beetle-killed spruce, however, revealed live adults and larvae present. These had likely been insulated from the extreme cold due to the snowpack. We thank Ahtna, Incorporated and the Alaska Mental Health Trust Land Office for permission to conduct this project on their respective lands.

Matanuska-Susitna Borough (1,780,250 cumulative acres impacted)
Spruce beetle activity in the Matanuska-Susitna Borough continued to decline, with observed activity being down 46% from 2023. Almost all the spruce beetle activity being observed was in the northern and eastern parts of the borough. Scattered damage continues along the upper Susitna River around the Denali Highway crossing and was also noted along Clearwater Creek, Coal creek, and along the McLaren River. Spruce beetle in multiple areas that had high levels of activity in 2023 have notably declined in 2024, including the hills north of Tyone River east to Monsoon Lake, the Susitna River near its confluence with the Tyone River, and Jay Creek. To

the south, widely scattered activity was mapped northeast of Lake Louise and along the Little Nelchina River near Slide Mountain.

Copper River Census Area (5,100 cumulative acres impacted)
Activity in this census area was roughly static from that observed in 2023. Light scattered spruce beetle activity continued to occur to the southwest and southeast of Lake Louise, the latter being along Tolsona creek. A small area of light activity was also present near upper Keg Creek.

Municipality of Anchorage (34,150 cumulative acres impacted)
The outbreak within the Municipality appears to have largely subsided, though some light beetle activity may persist. Roughly 66% of the limited 2024 damage was observed in the Chugach Mountain valleys of Ship Creek and Peters Creek.

Kenai Peninsula Borough (356,350 cumulative acres impacted)
Spruce beetle activity dropped to near endemic levels in the borough in 2024. Of the roughly 2,000 acres of damage mapped, around 200 acres were scattered in small pockets along the Beluga River. The remaining damage was scattered around the Peninsula in and near the areas previously affected, including around Kenai, Cooper, and Lower and Upper Trail Lakes, between Skilak and Tustumena Lakes, and around Kasilof.

Elsewhere in the state, about 2,500 acres of spruce beetle activity was mapped in the Interior, none of which is associated with the ongoing spruce beetle outbreak activity in the Denali Borough. More than half of this activity is scattered along Beaver and Preacher Creeks, northeast of the White Mountains. The bulk of the remainder was observed in two small pockets of spruce beetle activity along the Chena River near its confluence with the Middle Fork Chena River and along Minook Creek near Rampart.

In partnership with USFS Research, efforts continued in pursuit of a semiochemical repellant to protect trees from spruce beetle. The results of these trials through 2023 were summarized in the Audley et al 2024 paper listed under additional resources below and the 2024 efforts are in preparation for publication.

Additional Resources: Audley et al. 2024. Fettig et al. 2024. Zwieback et al. 2024. See Information Delivery for full citations. Links to the USFS spruce beetle webpage and the interagency Alaska spruce beetle webpage.

Western Balsam Bark Beetle

Scientific Name(s): *Dryocoetes confusus* (Swaine)
Host(s) in Alaska: Subalpine fir, other true firs, and very rarely, Engelmann spruce, and lodgepole pine.
General Distribution in Alaska: Southeast Alaska.

Ground Detection Survey Observations: None.
Aerial Detection Survey Observations: Western balsam bark beetle was observed on nearly 50 acres in 2024, all in scattered small pockets in the Skagway River Valley and on the mountainside east of the Taiya River near its confluence with Taiya Inlet.
iNaturalist Observations: None.
2024 Status/Activity: The roughly 50 acres of western balsam bark beetle (WBBB) mapped in 2024 was comprised of several scattered small pockets in the Skagway River Valley and on the mountainside east of the Taiya River near its confluence with Taiya Inlet. Additionally, the WBBB activity mapped in Haines along the Chilkat River in 2023 was ground checked in 2024 and determined to have been mapped in error. The 2023 WBBB polygons that could be assessed were determined to be porcupine-killed lodgepole pine and will be corrected in the 2023 aerial detection survey dataset.
Additional Resources: Link to the western balsam bark beetle webpage.

Conifer Defoliators

Balsam Woolly Adelgid

Scientific Name(s): *Adelges piceae* Ratzeburg
Host(s) in Alaska: Subalpine fir, Pacific silver fir, balsam fir, Fraser fir, and grand fir.
General Distribution in Alaska: Invasive species, as of 2024 it has only been found in Juneau.
Ground Detection Survey Observations: None.
Aerial Detection Survey Observations: None.
iNaturalist Observations: None.
2024 Status/Activity: No new observations in 2024; 4 of the infested trees identified on private property in Juneau in 2020 were recently removed.
Additional Resources: Link to the balsam woolly adelgid webpage.

Hemlock Sawfly

Scientific Name(s): *Neodiprion tsugae* Middleton

Host(s) in Alaska: Western hemlock and occasionally Sitka spruce, mountain hemlock, and Pacific silver fir.
General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 9 locations impacting up to 5 trees per plot with a damage severity rating no greater than 35% defoliation.
Aerial Detection Survey Observations: No active defoliation; 22,000 acres of morality associated with the defoliation event.
iNaturalist Observations: 1 observation along Edna Bay on Prince of Wales Island.
2024 Status/Activity: Hemlock sawfly activity was low throughout Southeast Alaska, with no damage recorded during aerial detection surveys and low amounts of defoliation noted in ground

detection surveys. Mortality associated with the defoliation event continues to be observed in western hemlock, but most of the forest is recovering. Moderate to severe mortality (11-50% trees killed) was observed on Wrangell, Kuiu, Admiralty, and Baranof Islands totaling 9,600 acres. Additionally, two areas of very severe mortality (>50% trees killed) were noted on Woronkofski and Etolin Islands, totaling 200 acres. Light mortality (<10% trees killed) was recorded on 6,600 acres from north of Juneau to the southern end of the Tongass National Forest.

Additional Resources: Howe et al. 2024 (see Information Delivery for full citation). Link to the Satellite-Based Change Detection Southeast Alaska Map. Link to the hemlock sawfly webpage.

Larch Sawfly

Scientific Name(s): *Pristiphora erichsonii* (Hartig)
Host(s) in Alaska: Tamarack/eastern larch and ornamental Siberian larch.
General Distribution in Alaska: Interior and Southcentral Alaska.
Ground Detection Survey Observations: None.
Aerial Detection Survey Observations: None.
iNaturalist Observations: 1 observation in Fairbanks, AK.
2024 Status/Activity: Larch sawfly activity was low throughout the state, with only 1 observation from iNaturalist.
Additional Resources: Link to the larch sawfly webpage.

Spruce Aphid

Scientific Name(s): *Elatobium abietinum* Walker
Host(s) in Alaska: Spruce species, especially Sitka spruce.
General Distribution in Alaska: Established throughout Southeast Alaska and Prince William Sound and parts of the Kenai Peninsula and Kodiak Island.
Ground Detection Survey Observations: 1 Sitka spruce tree with moderate damage was recorded in a permanent ground survey plot in Sitka.
iNaturalist Observations: None.
2024 Status/Activity: Spruce aphid activity was very low throughout the state.
Additional Resources: Link to the spruce aphid webpage.

Spruce Budworm

Scientific Name(s): *Choristoneura fumiferana* (Clemens) (eastern spruce budworm) and *Choristoneura orae* Freeman (spruce budworm)
Host(s) in Alaska: Lutz, Sitka, and white spruce; rarely found on black spruce, larch, and hemlock.
General Distribution in Alaska: Throughout the range of spruce, but activity is more common in Southcentral and Interior Alaska.
Ground Detection Survey Observations: None.

Aerial Detection Survey Observations: None.
iNaturalist Observations: None.
Additional Resources: Link to the spruce budworm webpage.

Spruce & Larch Bud Moth

Scientific Name(s): *Zeiraphera canadensis* Mutuura & Freeman, *Zeiraphera fortunana* (Kearfott), *Zeiraphera unfortunana* Ferris & Kruse, *Zeiraphera vancouverana* McDunnough, and *Zeiraphera improbana* (Walker)
Host(s) in Alaska: Spruce and larch are preferred hosts; true fir species are occasional hosts.
General Distribution in Alaska: Throughout the range of spruce and larch statewide.
Ground Detection Survey Observations: 13 observations of *Zeiraphera canadensis* were made during ground surveys across the state on white spruce (n=11) and Sitka spruce (n=2). Nearly all tree damage severity was rated as trace to 5%, with up to 15 trees impacted per site.
Aerial Detection Survey Observations: None.
iNaturalist Observations: None.
2024 Status/Activity: Bud moth activity on spruce was observed at mostly trace levels during ground surveys. No larch bud moth activity was recorded in 2024.
Additional Resources: Link to the spruce and large bud moth webpage.

Western Blackheaded Budworm

Scientific Name(s): *Acleris gloverana* Walsingham
Host(s) in Alaska: Western hemlock is the preferred host. Sitka spruce and mountain hemlock are secondary hosts.
General Distribution in Alaska: Throughout the range of western hemlock, especially Southeast Alaska.
Ground Detection Survey Observations: 33 observations across Southeast. Most of the defoliation was rated as trace (n=29) with up to 5 trees impacted per plot. Caterpillars were found on western hemlock (n=21), Sitka spruce (n=11), and mountain hemlock (n=1).
Aerial Detection Survey Observations: 2,700 acres of defoliation were recorded, entirely on northern Prince of Wales Island. 22,000 acres of mortality associated with the defoliation event observed in western hemlock, but most of the forest is recovering. Moderate to severe mortality (11-50% trees killed) was observed on Wrangell, Kuiu, Admiralty, and Baranof Islands totaling 9,600 acres. Additionally, two areas of very severe mortality (>50% trees killed) were noted on Woronkofski and Etolin Islands, totaling 200 acres. Light mortality (<10% trees killed) was recorded on 6,600 acres from north of Juneau to the southern end of the Tongass National Forest.
iNaturalist Observations: 1 observation of an adult moth in the Ninilchik area.
2024 Status/Activity: In 2024, defoliator populations were low and only one area of active defoliation was observed on northern Prince of Wales Island. Mortality associated with the defoliation event continues to be recorded in old growth western hemlock along western Admiralty Island and the central part of the Tongass National Forest; however, most of the forest

is recovering. Stands that appeared to have dense mortality when viewed from afar were often found to have recovering trees when ground checked.
Additional Resources: Howe et al. 2024 (see Information Delivery for full citation). Link to the Satellite-Based Change Detection Southeast Alaska Map. Link to the western blackheaded budworm webpage.

Hardwood Defoliators

Alder Defoliators

Scientific Name(s): *Acronicta dactylina* Grote (fingered dagger moth), *Biston betularia* L.(peppered moth), *Epinotia solandriana* (L.) (birch leafroller), *Eriocampa ovata* (L.) (woolly alder sawfly), Eriophyidae: Nalepa (Newkirk) (gall and rust mites), *Hemichroa crocea* (Geoffroy) (striped alder sawfly), *Lophocampa maculata* Harris (spotted tussock moth), *Monsoma pulveratum* (Retzius) (green alder sawfly), *Orthosia hibisci* (Guenee) (speckled green fruitworm), *Rheumaptera hastata* (L.), and *R. hastata gothicata* (Guenée) (spear-marked and white-banded black moths)
Host(s) in Alaska: All species of alder.
General Distribution in Alaska: Throughout the range of alder statewide.
Ground Detection Survey Observations: 107 records statewide; mostly birch leafroller (n=21), eriophyid mites (n=24), and green alder sawfly (n=14). Damage was low in most locations, typically impacting up to 5 trees per plot with a severity rating of trace to 35%. Areas of moderate (36-50%) to severe (68-75%) alder defoliation affecting up to 30 trees per plot were noted along the Parks Highway south of Fairbanks.
Aerial Detection Survey Observations: None.
iNaturalist Observations: 94 observations of alder defoliators across the state.
2024 Status/Activity: Alder defoliation was minimal throughout much of Alaska.
Additional Resources: Link to the alder defoliator webpage.

Aspen Leafminer

Scientific Name(s): *Phyllocnistis populiella* Chambers
Host(s) in Alaska: Trembling aspen, balsam poplar, black cottonwood.
General Distribution in Alaska: Throughout the range of aspen statewide.
Ground Detection Survey Observations: 59 records of aspen leafminer recorded in 2024 (42 permanent; 9 opportunistic). The majority of aspen leafminer defoliation occurred north of the Alaska Range (n=33), with most records, but especially those made late in the growing season, documenting moderate (36-50%) to severe (68%-100%) defoliation, with up to 30+ trees impacted per plot. The remaining records, occurring south of the Alaska Range, were rated as trace (≤5%, n=8) to minor (6-35%, n=10), even though all of these records were captured late in the growing season. Defoliation was observed on trembling aspen (n=33), balsam poplar (n=17), and black cottonwood (n=1).

Aerial Detection Survey Observations: Aspen leafminer defoliation was predominately observed across Interior Alaska with 182,880 acres mapped via aerial detection survey. The majority of the defoliation was observed southeast from Fairbanks to Tok along the Richardson Corridor (65,720 acres), around Manley Hot Springs and along the Yukon River from Tanana to Ruby (28,790 acres), as well as Minto Flats and along the Nenana Ridge corridor (45,980 acres).
iNaturalist Observations: 35 research grade observations, spanning Anchorage to Fairbanks.
2024 Status/Activity: Aspen leafminer was extremely active in 2024, with defoliation so intense in some stands that tree crowns turned nearly white due to dense larval activity (e.g., stands in the Bonanza Creek Experimental Forest, 30 miles South of Fairbanks, as well as in some stands along the Parks Highway north of the Alaska Range). At these heavily infested sites, mining was frequently observed on both sides of leaves.
Additional Resources: Link to the aspen leafminer webpage.

Birch Aphid

Scientific Name(s): *Euceraphis betulae* (Koch.)
Host(s) in Alaska: Birch species.
General Distribution in Alaska: Throughout most of Southcentral and Interior Alaska.
Ground Detection Survey Observations: None.
Aerial Detection Survey Observations: None.
iNaturalist Observations: None.

Birch Leafminers

Scientific Name(s): *Profenusa thomsoni* (Konow) (amber-marked birch leafminer), *Heterarthrus nemoratus* Fallen (late birch leaf edgeminer), and *Fenusa pumila* Leach (birch leafminer)
Host(s) in Alaska: Alaska paper birch, dwarf arctic birch, Kenai birch, paper birch, resin birch, and western paper birch, as well as horticultural varieties.
General Distribution in Alaska: Throughout the range of hosts statewide, especially in Southcentral and Interior Alaska.
Ground Detection Survey Observations: 13 observations were made with activity predominately observed in Interior Alaska. There were 5 observations of amber-marked birch leafminer (AMBLM) recorded North of the Alaska Range with as few as 2-5 trees affected to more than 30 trees affected per site, with defoliation rated as moderate (6-35%) to significant (36-50%). There were 9 records of late birch leaf edgeminer (LBLM) across mainland Alaska. North of the Alaska Range, 4 LBLM records documented defoliation present on Alaskan paper birch with moderate to significant defoliation on as many as >30 trees per site; 1 LBLM record documented on dwarf birch showed trace levels of defoliation (≤5%). 3 records of LBLM in Southcentral AK documented 2-5 affected trees per plot with trace levels of defoliation (≤5%). There was one observation of LBLM recorded in Bethel, documenting 2-5 Alaskan paper birch trees with moderate defoliation (6-35%)

Aerial Detection Survey Observations: Approximately 15,230 acres of birch leafminer defoliation were recorded in 2024. Recorded acreage might not be an accurate reflection of the true severity and distribution for these damage causing agents due to the timing of the aerial detection survey flight.
iNaturalist Observations: 1 research grade observation of late birch leaf edgeminer was recorded in Chugiak, AK.
2024 Status/Activity: Birch leafminer activity was observed at rates similar to those since 2021. The majority of active defoliation occurred in urban centers and along major roadways in the Interior, throughout Fairbanks, Fox, North Pole, and as far south as Nenana.
Additional Resources: Link to the birch leafminer webpage.

Birch Leafroller

Scientific Name(s): *Caloptilia strictella* (Walker), *Caloptilia alnivorella* (Chambers), and *Epinotia solandriana* (L.)
Host(s) in Alaska: Birch, alder, trembling aspen, cottonwood, and willow.
General Distribution in Alaska: Throughout the range of hosts statewide.
Ground Detection Survey Observations: Birch leafrollers were recorded at 50 sites during ground surveys; *Caloptilia* spp. was observed 32 times and *Epinotia solandriana* was recorded 18 times. Damage was primarily recorded in the trace to 5% and 6 to 35% categories. There were 21 observations made on alder (*Caloptilia* spp., n=11; *Epinotia solandriana*, n=10), 28 observations made on Alaska paper birch (*Caloptilia* spp., n=20; *Epinotia solandriana*, n=8), and 1 observation made on black cottonwood (*Caloptilia* spp.).
Aerial Detection Survey Observations: None.
iNaturalist Observations: 2 research grade observations of *Epinotia solandriana* in Anchor Point, AK.
2024 Status/Activity: Overall birch leafroller activity was low throughout its range.
Additional Resources: Link to the birch leafroller webpage.

Generalist Hardwood Defoliators

Scientific Name(s): *Epirrita undulata* (Harrison) (ghost looper), *Eurois astricta* Morrison (great brown dart), *Operophtera bruceata* (Hulst) (Bruce spanworm), *Orthosia hibisci* (Gueneé) (speckled green fruitworm), *Rheumaptera hastata* sensu lato (L.) (spear-marked and white-banded black moths), and *Sunira verberata* (Smith) (battered sallow moth)
Host(s) in Alaska: Multiple hosts, depending on species.
General Distribution in Alaska: Throughout the state depending on species.
Ground Detection Survey Observations: General defoliation on hardwoods (defoliation of hardwood hosts that could not be assigned to a specific damage causing agent) was recorded at 48 sites across the state during ground detection surveys, with most documented as “unknown defoliation” (n=46) and the remaining 2 records denoting spear-marked and white banded-black moth damage. 4 of 46 unknown defoliation records have since been identified as Eriocraniidae

(sparkling archaic sun moths, n=4) and *Phyllonorycter* spp. (aspen leafblotch miner, n=1). Within tree damage was low to moderate at most sites; however, a few areas in the Interior experienced defoliation rated as significant (51-67% damage severity rating; 1 *Phyllonorycter* sp. record on 2-5 trembling aspen saplings off of the Richardson Highway and 1 "unknown defoliation" record on 2-5 Alaska paper birch poletimber) to severe (68-75% damage rating on 1 "unknown defoliation" record on 2-5 Siberian alder shrubs).
Aerial Detection Survey Observations: General hardwood defoliation was recorded on 46,500 acres on alder, aspen, birch, cottonwood, willow, and hardwoods not identified to genus, primarily in Southcentral and Interior.
iNaturalist Observations: 83 research grade observations of these defoliators across the state. Spear-marked black moth had a noticeable presence across Alaska this year with 60 research grade observations.
2024 Status/Activity: General defoliation on hardwoods was observed throughout the state during ground surveys. Most damage recorded during ground surveys was low to moderate, though a few areas experienced more severe defoliation. During aerial surveys, several large polygons of aspen defoliation (950 acres) were recorded along the Sterling Highway and north of Kenai. Ground truthing efforts found multiple agents causing damage within trees and stands. No single agent was identified as being the primary cause of damage. Several areas of defoliation were observed in the Chugach Mountains near Cordova. Defoliation in black cottonwood (6,400 acres) and alder (1,200 acres) was observed along the lower Copper River and the Tasnuna River, and extensive defoliation in willow (1,200 acres) was observed in the Scott River valley. The willow defoliation was of public interest in the area, with trail users reporting large numbers of caterpillars to staff at the District Office in Cordova, but no specimens were obtained for identification. The defoliator outbreak along Kachemak Bay documented in 2022 and 2023 appears to have collapsed. No active damage was observed in 2024, though dieback was apparent in previously affected areas. Scattered hardwood defoliation was also recorded throughout the Interior on trembling aspen, balsam poplar, and willow.
Additional Resources: Link to the generalist hardwood defoliators webpage.

Large Aspen Tortrix

Scientific Name(s): *Choristoneura conflictana* (Walker)
Host(s) in Alaska: Trembling aspen. During outbreaks, defoliation can occur to understory plants such as birch and spruce.
General Distribution in Alaska: Southcentral and Interior Alaska
Ground Detection Survey Observations: None.
Aerial Detection Survey Observations: None.
iNaturalist Observations: None.
Additional Resources: Link to the large aspen tortrix webpage.

Leaf Beetles

Scientific Name(s): *Chrysomela spp.* L., *Phratora spp.* Chevrolat in Dejean, and *Altica spp.* Geoffroy
Host(s) in Alaska: Birch, willow, trembling aspen, balsam poplar, as well as many other hardwoods & shrubs.
General Distribution in Alaska: Throughout the range of hosts statewide.
Ground Detection Survey Observations: 13 observations were recorded during GDS. The number of trees damaged per plot varied from a single tree impacted to 30 trees impacted and severity was most commonly trace to 35% within tree damage. Leaf beetle damage was found on most hardwood hosts throughout the state.
Aerial Detection Survey Observations: None.
iNaturalist Observations: None.
2024 Status/Activity: Overall leaf beetle activity was low across the state.
Additional Resources: Link to the leaf beetle webpage.

Rusty Tussock Moth

Scientific Name(s): *Orgyia antiqua* (L.)
Host(s) in Alaska: Birch, willow, cherry, red alder, spruce, as well as many other conifers, hardwoods, and shrubs.
General Distribution in Alaska: Throughout the range of hosts statewide.
Ground Detection Survey Observations: There were 8 observations of rusty tussock moth defoliation recorded in Southeast AK. 7 observations were documented around Haines, with defoliation levels mostly ranging from trace (≤5%) to minor (6-35%) on red alder, coastal willows, and western hemlock. 1 observation of rusty tussock moth was recorded in Ketchikan, with moderate defoliation (6-35% within tree severity) of 2-5 red alder trees.
Aerial Detection Survey Observations: None.
iNaturalist Observations: 42 research grade observations were documented across Alaska, with most records occurring in Southeast Alaska around Sitka, Hyder, Ketchikan, Gustavus, and Wrangell. There was 1 research grade observation in Anchorage and 3 research grade observations in Fairbanks, Alaska.
2024 Status/Activity: Nearly all 2024 rusty tussock moth activity was observed in Southeast, AK, similar to 2023.
Additional Resources: Link to the rusty tussock moth webpage.

Western Tent Caterpillar

Scientific Name(s): *Malacosoma californica* (Packard)
Host(s) in Alaska: Red alder, cottonwood spp., willows, crabapple, and various fruit trees. Ash, birch, hazel, hawthorne, and Pacific madrone are also reported hosts.
General Distribution in Alaska: Reported in Southeast from Annette Island, Ketchikan, and Hyder.

Ground Detection Survey Observations: None.
iNaturalist Observations: None.
2024 Status/Activity: No new activity was observed in 2024. An area in Ketchikan with infested trees was brushed along the highway and may have removed a portion of the population.
Additional Resources: Link to the western tent caterpillar webpage.

Willow Leafblotch Miner

Scientific Name(s): *Micrurapteryx salicifoliella* (Chambers)
Host(s) in Alaska: Willow species (there are 37 species across Alaska).
General Distribution in Alaska: Predominately distributed in Interior and Western Alaska.
Ground Detection Survey Observations: There were 13 ground detection survey observations made in 2024 of willow leafblotch miner activity. The majority of the records were observed in Interior AK (n=10). Two records in the Yukon flats documented between 2-5 and >30 hosts per plot with 68-75% and 76-100% severity rating, respectively. Apart from one site near Healy, AK, late season surveys conducted in mid-August through September north of the Alaska Range documented moderate (36-50%) to severe defoliation (76-100%) (n=8); 1 early season survey recorded in early June documented trace to 5% within tree severity on 2-5 willow shrubs. The remaining 3 records were recorded in Southcentral AK, with trace (≤5%) to minor levels of defoliation (6-35%) across 2-5 willow species.
Aerial Detection Survey Observations: Willow leafblotch miner defoliation was recorded on approximately 68,520 acres, almost exclusively north of the Alaska Range in Interior AK, during aerial detection survey. Most of the damage, approximately 54,540 acres, was observed along the Yukon River, between Stevens Village and north of Fort Yukon.
iNaturalist Observations: 4 research grade observations observed around Fairbanks, AK.
2024 Status/Activity: Willow leafblotch miner has been a pervasive defoliator of willow in the Interior. In 2024, it was observed along every major roadway in the Interior during GDS and casual observation, with ADS documenting scattered defoliation across the Interior with the heaviest defoliation observed between the greater Fairbanks North Star Borough, the Yukon flats, and Galena. In Southcentral, scattered willow leafblotch miner damage was detected along the Parks Highway near Talkeetna.
Additional Resources: Link to the willow leafblotch miner webpage.

Urban Tree & Plant Pests

Poplar Budgall Mite

Scientific Name(s): *Aceria parapopuli* (Keifer)
Host: Trembling aspen.
General Distribution in Alaska: Southcentral Alaska.
2024 Status/Activity: In April 2024, cauliflower-like galls were collected from trembling aspen at McHugh Creek Trailhead in Anchorage. The galls were dissected and the presence of the gall-

forming poplar budgall mite was confirmed. Feeding by the mite causes leaf buds to develop into woody galls, which appear as reddish cauliflower-like growths on the branches of aspen. At the end of the season the growths turn brown to grey, but in many cases the mites resume their activity in the spring. Patches of new reddish growth may be seen again on or near the browned growth from the previous year. The microscopic mites are elongated in shape and orangish in color. The growths typically do not cause substantial harm to the tree**;** however, trees that have heavy or repeated damage may develop stunted or crooked branches and occasionally may cause branch dieback. These galls can be found on aspen throughout Southcentral Alaska, though the McHugh Creek Trailhead area is characterized by a remarkably high density of these galls.
Additional Resources: Gallformers website (informational page on poplar budgall mite).

Forest Disease Updates

Foliage Diseases

Cedar Leaf Blight

Scientific Name: *Didymascella thujina* (E. J. Durand) Marie
Host(s) in Alaska: Western redcedar.
General Distribution in Alaska: Throughout the host range in Southeast Alaska.
Ground Detection Survey Observations: 23 on Kupreanof, Wrangell, and Revillagigedo Islands in Southeast Alaska.
iNaturalist Observations: None.
2024 Status/Activity: Detection of this disease has increased the past few years and was common again in 2024. Prince of Wales and Zarembo Islands had the highest observed disease severity in 2023 but were not revisited this year. This pathogen thrives under wet, mild conditions and is expected to do increasingly well in Southeast Alaska.
Additional Resources: Link to the cedar leaf blight webpage.

Dothistroma Needle Blight

Scientific Name: *Dothistroma septosporum* (Dorog.) M. Morelet
Host(s) in Alaska: Shore pine (*Pinus contorta* ssp. *contorta*) and lodgepole pine (*Pinus contorta* ssp. *latifolia*).
General Distribution in Alaska: Throughout the natural range of pines in Southeast Alaska, and in some pine plantations in Southcentral Alaska.
Ground Detection Survey Observations: 18 statewide, 3 in Southcentral Alaska near Talkeetna on planted lodgepole pine; 2 on natural lodgepole pine near Haines, and 13 on shore pine in Southeast Alaska near Juneau and on Mitkof, Kupreanof, and Wrangell Islands.

Aerial Detection Survey Observations: Dothistroma needle blight was mapped on 280 acres around the northern Lynn Canal in Southeast Alaska along the Haines Highway, Chilkat River, Skagway River, and Dewey Lakes.
iNaturalist Observations: 3 near Sitka in Southeast Alaska.
2024 Status/Activity: Moderate to severe disease impacted clumps of pine in muskegs of central Southeast Alaska resulting in foliage discoloration and dieback in the lower and middle tree crown and limited tree mortality. Near Talkeetna, three years of crown symptoms and defoliation have caused planted pine mortality and *D. septosporum* conidia were present on foliage (among other fungi).
Additional Resources: Link to the Dothistroma needle blight webpage.

Hardwood Leaf Rusts

Scientific Name: *Melampsora epitea* Thuem., *Melampsora medusae* Thuem., *Melampsoridium betulinum* Kleb, and other related rusts
Host(s) in Alaska: Birch species, black cottonwood, and willow species with various conifer alternate hosts.
General Distribution in Alaska: Throughout the range of hardwood hosts statewide.
Ground Detection Survey Observations: 23 observations, from Fairbanks and the Alaska range south to Anchorage, Cordova, and Southeast on willow, birch, alder, and black cottonwood.
Aerial Detection Survey Observations: None.
iNaturalist Observations: None
2024 Status/Activity: Rust specimen collections from Alaska are important, as pathogen and host ranges continue to become clarified with molecular characterization. The DNA extracted from a rust on willow matched that of both *Melampsora paradoxa* and *Melampsora humboldtiana* with >99% identity in the rustHUBB database (Oregon State University Diagnostic Clinic). Further research and additional loci sequencing to differentiate between the two species will be conducted by the Cathie Aime Lab (Purdue University).
Additional Resources: Link to the hardwood leaf rust webpage.

Hemlock-Blueberry Rust

Scientific Name: *Naohidemyces vaccinii* (Jørst.) S. Sato, Katsuya & Y. Hirats.
Host(s) in Alaska: Western hemlock, blueberry species are alternate hosts
General Distribution in Alaska: Southeast Alaska
Ground Detection Survey Observations: 20 between Haines and Ketchikan in Southeast Alaska.
iNaturalist Observations: None.
2024 Status/Activity: This disease has been common the last several years and probably benefits from average to above average summer precipitation. This year we noticed that infected needles were cast from western hemlock soon after fruiting structures developed. Early needle

shed shortens the window for infection from hemlock to blueberry and could limit damage from this disease despite cooccurrence of both hosts across coastal Alaska. Disease may become more prevalent when precipitation aligns with spore dispersal from hemlock to blueberry. Hemlock-blueberry rust damage is usually not severe, nor does it cause lasting or significant damage to western hemlock.
Additional Resources: Link to the hemlock-blueberry rust webpage.

Spruce Needle Casts/Blights

Scientific Name: *Lirula macrospora* (Hartig) Darker, *Lophodermium piceae* (Fuckel) Höhn, *Rhizosphaera pini* (Corda) Maubl. or *Rhizosphaera kalkhoffii* Bubák
Host(s) in Alaska: Spruce species.
General Distribution in Alaska: Throughout the range of hosts statewide.
Ground Detection Survey Observations: 11 of *L. macrospora,* 1 near Anchorage, 1 near Cordova, 2 near Juneau, 3 near Wrangell, and 4 near Ketchikan. 4 of *L. piceae*, all near Wrangell. 5 observations of *Rhizosphaera*, all near Juneau.
Aerial Detection Survey Observations: None.
iNaturalist Observations: 1 of *L. macrospora* near Anchorage.
2024 Status/Activity: Elevated Rhizosphaera needle blight symptoms were noted again this fall in Southeast Alaska near Juneau and Wrangell. Disease caused discoloration and needle loss in the interior and lower crowns of affected trees. The Capitol Christmas tree was sourced from the Wrangell Ranger District in 2024, and an alternative tree was harvested because the original selection was symptomatic. Work continues to verify the species of *Rhizosphaera* on spruce in Alaska.
Additional Resources: Link to the spruce needle casts/blights webpage.

Spruce Needle Rusts

Scientific Name: *Chrysomyxa ledicola* (Peck) Lagerh. (spruce needle rust), *Ceropsora weirii* (H.S. Jacks.) Aime & McTaggart (=*Chrysomyxa weirii*) (spring spruce needle rust)
Host(s) in Alaska: Spruce species, Labrador tea is the alternate host.
General Distribution in Alaska: Throughout the range of hosts statewide.
Ground Detection Survey Observations: Of 28 *C. ledicola* observations, 7 were on white spruce between the Alaska Range and the Kenai Peninsula, while 21 were on Sitka spruce near Cordova, Juneau, Petersburg, and Ketchikan. 3 observations of *C. weirii* were found on Sitka spruce near Juneau and Wrangell.
Aerial Detection Survey Observations: Just under 300 acres of spruce needle rust, all in Southcentral (Kenai Peninsula east of Happy Valley) and Interior Alaska (Alaska Range south of Fort Greely).
iNaturalist Observations: 13 *C. ledicola* observations from north of Fairbanks to the Alaska Peninsula, and near Sitka and Petersburg in Southeast Alaska.

2024 Status/Activity: Elevated spruce needle rust disease levels were observed in some locations in Southcentral and Interior Alaska, especially areas mapped during aerial detection survey. Spring spruce needle rust was less common in Southeast Alaska than in 2023.
Additional Resources: Link to the spruce needle rusts webpage.

Viburnum Leaf & Stem Rust

Scientific Name: *Puccinia linkii* Klotzsch (=*Micropuccina linkii* (Klotzsch) Arthur & H.S. Jacks.)
Host(s) in Alaska: Highbush-cranberry.
General Distribution in Alaska: Southeast, Southcentral, and Interior Alaska.
Ground Detection Survey Observations: 1 observation of heavy infection near Juneau.
iNaturalist Observations: 10 records from Fairbanks, Anchorage, Kenai, Seward, and Juneau.
2024 Status/Activity: Disease levels were not elevated or remarkable in 2024.
Additional Resources: Link to the spruce needle rusts webpage.

Shoot, Twig, Cone & Bud Diseases

Sirococcus Shoot Blight

Scientific Name: *Sirococcus tsugae* Castl., D.F. Farr & Stanosz
Host(s) in Alaska: Mountain hemlock, western hemlock, and Sitka spruce.
General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 8 on western hemlock in Southeast Alaska from Haines, Juneau, and Mitkof and Revillagigedo Islands.
iNaturalist Observations: 6 on western hemlock, 1 from Juneau and 5 from Sitka.
2024 Status/Activity: Overall, shoot blight damage to hemlock was not severe or notable. Another related disease, Sirococcus blight of conifers (*Sirococcus* species), was detected on Sitka spruce cones on the ground near Sitka. Another superficially similar-looking saprophyte of spruce cones, *Phragmotrichum* sp., was identified from a different collection site in Sitka.
Additional Resources: Link to Sirococcus shoot blight webpage.

Spruce Bud Blights

Scientific Name: *Camarosporium strobilinum* E. Bommer, M. Rousseau & Sacc., *Dichomera gemmicola* A. Funk & B. Sutton, *Gemmamyces piceae* (Borthw.) Casagrande
Host(s) in Alaska: Spruce species.
General Distribution in Alaska: *C. stobilinum* and *D. gemmicola* occur broadly across the range of spruce, while *G. piceae* occurs in Southcentral and Interior Alaska but has not been detected in Southeast Alaska.

Ground Detection Survey Observations: 17 observations of unidentified spruce bud blight on white spruce near Fairbanks, Denali State Park, and Anchorage, and on Sitka spruce near Petersburg; 2 of *G. piceae* on white spruce near Anchorage; 1 of *D. gemmicola* near Ketchikan.
iNaturalist Observations: None.
2024 Status/Activity: Identification to species requires a microscope. Most observations were not identified to species this year.
Additional Resources: Link to spruce bud blights webpage.

Spruce Cone Rusts

Scientific Name: *Chrysomyxa pirolata* (Kőrn.) G. Wint, *Rossmanomyces monesis* (Ziller) Aime & McTaggart
Host(s) in Alaska: Spruce species, alternate hosts are wintergreen (*Pyrola* spp.) and single delight (*Moneses uniflora*).
General Distribution in Alaska: Statewide where hosts occur, though *R. monesis* may be present on *Moneses uniflora* even where spruce is absent.
Ground Detection Survey Observations: 2 on white spruce cones near Anchorage, 1 from wintergreen along the Portage Glacier Highway.
iNaturalist Observations: 7 observations of *R. pyrolae* on wintergreen near Healy, Denali National Park, Anchorage, Kodiak Island, McCarthy, and Juneau.
2024 Status/Activity: Rust on the cones is less frequently observed because of their position high in the tree crown, but some disease was detected on fallen cones this year.
Additional Resources: Link to the spruce cone rusts webpage.

Spruce Bud Rust

Scientific Name: *Chrysomyxa woroninii* Tranzschel
Host(s) in Alaska: Spruce species, Labrador tea is the alternate host
General Distribution in Alaska: Southcentral and Interior Alaska.
Ground Detection Survey Observations: 13 total observations on white spruce, 8 in the Interior and 5 in Southcentral in Anchorage and on the Kenai Peninsula.
iNaturalist Observations: 30 in Southcentral and Interior Alaska, with the greatest concentrations near Anchorage, the Kenai Peninsula, and Lake Clark National Park.
2024 Status/Activity: Spruce bud rust was recorded more than usual in Southcentral Alaska.
Additional Resources: Link to the spruce bud rust webpage.

Yellow-Cedar Shoot Blight

Scientific Name: *Kabatina thujae* Schneider & Arx
Host(s) in Alaska: Yellow-cedar
General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 20 on Mitkof, Kupreanof, Wrangell, and Revillagigedo Islands.

iNaturalist Observations: None.
2024 Status/Activity: Yellow-cedar shoot blight incidence and severity were elevated in natural forest and landscape settings throughout Southeast Alaska. In 2024, 1,600 yellow-cedar trees planted north of Juneau as part of a common garden trial in 2007 were remeasured and scored for shoot blight disease severity to evaluate the relationship between tree genetics and disease severity.
Additional Resources: Link to the yellow-cedar shoot blight webpage.

Stem & Branch Diseases

Alder Canker

Scientific Name: *Valsa melanodiscus* G.H. Otth, *Valsalnicola* spp. D. M. Walker & Rossman, *Melanconis* sp. Tul. & C. Tul., and other fungi
Host(s) in Alaska: Thin-leaf alder, Siberian alder, Sitka alder, and red alder
General Distribution in Alaska: Occurs throughout the range of hosts in Alaska but is considerably less common in Southeast Alaska.
Ground Detection Survey Observations: 5 observations, 4 on thin-leaf alder near Fairbanks, Chickaloon, and Anchorage, and 1 on red alder near Klukwan.
Aerial Detection Survey Observations: About 1,300 acres in Southcentral Alaska, with the most concentrated activity along the Copper River Delta and scattered damaged between the Susitna River and the Alaska Range.
iNaturalist Observations: None.
2024 Status/Activity: Damage acreage was somewhat elevated compared to recent years, but still far lower than in the early 2010s.
Additional Resources: Link to the alder canker webpage.

Aspen Running Canker

Scientific Name: *Neodothiora populina* Crous, G.C. Adams & Winton
Host(s) in Alaska: Trembling aspen
General Distribution in Alaska: Southcentral and Interior Alaska.
Ground Detection Survey Observations: 13 observations from near Fairbanks, Healy, Fort Greely, Tok, and Paxon Lake.
Aerial Detection Survey Observations: None.
iNaturalist Observations: 1 observation near Anchorage.
2024 Status/Activity: In 2024, we generated an annotated genome of *N. populina* and a descriptive paper has been published in the journal PhytoFrontiers. To assess whether canker disease is impacted by additional drought stress, we established six sites with varying soil moisture in Interior Alaska. Soil moisture measurements are being continuously logged at each site, and we sampled bark from diseased and neighboring healthy trees to determine the tree

molecular response to canker disease under varying soil moisture content. We have established a working group with forest managers and modelers from UAF, the National Park Service, the Bureau of Land Management, and the Bonanza Creek Long-Term Ecological Research site with the goal to assess whether canker incidence is associated with fuel load and forest succession.
Additional Resources: Link to the aspen running canker webpage.

Aspen Target Canker

Scientific Name: *Cytospora notastroma* Kepley & F.B. Reeves and other fungi
Host(s) in Alaska: Trembling aspen
General Distribution in Alaska: Southcentral and Interior Alaska.
Ground Detection Survey Observations: None.
iNaturalist Observations: None.
2024 Status/Activity: No notable activity.
Additional Resources: Link to the aspen target canker webpage.

Black Knot of Cherry

Scientific Name: *Apiosporina morbosa* (Schwein.) van Arx. (=*Dibotryon morbosum*)
Host(s) in Alaska: European bird cherry (*Prunus padus*) is especially susceptible, in addition to other ornamental cherries, plums, and apricots.
General Distribution in Alaska: The disease has been detected in Anchorage in plantings and nearby natural forests where bird cherry has spread.
Ground Detection Survey Observations: 2 observations were recorded on the University of Alaska Anchorage campus and adjacent forest.
iNaturalist Observations: 2 older observations from 2019 and 2020 were made on ornamental cherry plantings on the UAA campus and 7 miles southwest of campus near Campbell Lake.
2024 Status/Activity: Near the University of Alaska Anchorage campus, this disease is contributing to mortality of invasive bird cherry trees. The range of invasive *Prunus virginiana* and *Prunus padus* has spread statewide, including north of the Alaska Range; therefore, the disease could have a much wider distribution than currently observed.
Additional Resources: Link to black knot of cherry webpage.

Diplodia Gall

Scientific Name: *Diplodia tumefaciens* (Shear) Zalasky
Host(s) in Alaska: Trembling aspen, balsam poplar, and other *Populus* species
General Distribution in Alaska: Southcentral and Interior Alaska.
Ground Detection Survey Observations: 1 observation on balsam poplar near Anchorage.
iNaturalist Observations: 1 observation on balsam poplar near Eagle River.
2024 Status/Activity: No notable activity.
Additional Resources: Link to the Diplodia gall webpage.

Hemlock Canker

Scientific Name: Caused by an unknown fungus
Host(s) in Alaska: Western hemlock and rarely mountain hemlock
General Distribution in Alaska: Southeast Alaska, with one observation near Cordova.
Ground Detection Survey Observations: 3 in Sitka along Nelson Logging Road near Starrigavan Campground, each with many symptomatic western hemlocks.
Aerial Detection Survey Observations: None.
iNaturalist Observations: None.
2024 Status/Activity: Hemlock canker detected this year near Sitka appeared to have been active last year or in 2022, since most killed lower branches and small trees had shed needles. There was no sign of continued, active spread from these localized disease pockets. The last large outbreak was from 2012 to 2016, and outbreaks typically occur about once per decade.
Additional Resources: Link to the hemlock canker webpage.

Hemlock Dwarf Mistletoe

Scientific Name: *Arceuthobium tsugense* (Rosendahl) G.N. Jones
Host(s) in Alaska: Western hemlock is the primary host, while Sitka spruce, mountain hemlock, true firs, and shore pine are susceptible but rarely infected.
General Distribution in Alaska: Southeast Alaska as far north as Haines and up to 500 feet elevation.
Ground Detection Survey Observations: 30 total, 27 on western hemlock and 3 on Sitka spruce near Juneau, Sitka, and on Chichagof, Mitkof, Kupreanof, Wrangell, and Revillagigedo Islands.
iNaturalist Observations: 11 in Southeast, all near Sitka.
2024 Status/Activity: Incidence and severity does not change notably year to year. One of the most common and important diseases of western hemlock in Southeast Alaska, creating canopy structure for wildlife habitat and tree mortality canopy gaps where disease is severe. Forest management can dramatically influence disease levels.
Additional Resources: Link to the hemlock dwarf mistletoe webpage.

Huckleberry Broom Rust

Scientific Name: *Calyptospora goeppertiana* Kühn (=*Pucciniastrum goeppertianum* (Kühn) Kleb.)
Hosts in Alaska: Red huckleberry, other *Vaccinium* species hosts are unverified in Alaska.
General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 3 near Ketchikan on Revillagigedo Island.
iNaturalist Observations: None.
Additional Resources: Link to the huckleberry broom rust webpage.

Spruce Broom Rust

Scientific Name: *Chrysomyxa arctostaphyli* Dietel.
Host(s) in Alaska: Spruce species and the alternate host is bearberry/kinnikinnick.
General Distribution in Alaska: Common throughout Southcentral and Interior Alaska. Absent from most of Southeast aside from Glacier Bay, northern Lynn Canal, and Halleck Harbor on Kuiu Island.
Ground Detection Survey Observations: 29 observations, from Fairbanks and the Alaska Range, south through Copper Center and the Kenai Peninsula. Spruce broom rust was recorded on white, black, Lutz, and Colorado Blue Spruce.
Aerial Detection Survey Observations: Almost 500 acres were mapped as 146 points (representing 15 or fewer damaged trees) and 7 polygons. Of the points, 101 were in the Interior as far west as Innoko National Wildlife Refuge and concentrated east of the Ray Mountains and north of the White Mountains, while 45 were in Southcentral, especially near Tazlina and McCarthy. Polygons were most concentrated where the Susitna River meets Windy Creek (142 acres) and Jay Creek (310 acres).
iNaturalist Observations: 18 in the northern boreal forest as far north as Wiseman and as far west as Lake Clark National Park.
2024 Status/Activity: Incidence and severity does not change notably year to year.
Additional Resources: Link to the spruce broom rust webpage.

Western Gall Rust

Scientific Name: *Cronartium harknessii* (J.P. Moore) E. Meinecke
Host(s) in Alaska: Shore pine and lodgepole pine (both subspecies of lodgepole pine).
General Distribution in Alaska: Southeast Alaska. Throughout the range of pine.
Ground Detection Survey Observations: 14 observations in Southeast Alaska.
Aerial Detection Survey Observations: 44 points (representing 5 or fewer trees) in Southeast Alaska, most-concentrated on Revillagigedo, Gravina, and eastern Prince of Wales Islands.
iNaturalist Observations: 6 in Southeast Alaska near Skagway, Haines, Juneau, and Sitka (including Kruzof Island).
2024 Status/Activity: Western gall rust is ubiquitous with stable incidence over time. Branch mortality associated with secondary fungi and insects that invade galls was elevated again this year, detected on the ground on Mitkof and Chichagof Islands and broadly during aerial detection surveys. Gall rust is mapped from the air when galled branches are girdled and foliage turns bright red.
Additional Resources: Link to the western gall rust webpage.

Stem Decays

Artist's Conk

Scientific Name: *Ganoderma applanatum* (Pers.) Pat.
Host(s) in Alaska: Several hardwood and conifer species; common on western hemlock and red alder.
General Distribution in Alaska: Statewide where hosts occur.
Ground Detection Survey Observations: 21 statewide, 17 across Southeast Alaska mostly on western hemlock, and 4 near Anchorage on balsam poplar and black cottonwood.
iNaturalist Observations: 27 total, 15 in Southeast Alaska from Skagway to Ketchikan, 6 in the Interior, and 6 near Anchorage.
2024 Status/Activity: This common white rot of dead and down hardwoods and conifers across Alaska is considered a species complex that cannot be further distinguished in the field.
Additional Resources: Link to the conifer stem decays webpage and hardwood stem decays webpage.

Birch Conk/Polypore

Scientific Name: *Fomitopsis betulina* (Bull.) B.K. Cui, M.L. Han & Y.C. Dai (=*Piptoporus betulinum*)
Host(s) in Alaska: Birch species.
General Distribution in Alaska: Southcentral and Interior Alaska; northern Southeast Alaska near Haines and Skagway.
Ground Detection Survey Observations: 8 observations, from Fairbanks south to the Anchorage area.
iNaturalist Observations: 52 research grade observations, 30 from Southcentral, 17 from Interior, and 5 from northern Southeast.
2024 Status/Activity: Birch conks are normal decay organisms of dead and dying birch and are often found fruiting alongside conks of *Fomes fomentarius*.
Additional Resources: Link to the hardwood stem decays webpage.

Brown Crumbly Rot

Scientific Name: *Fomitopsis pinicola* sensu lato, *Fomitopsis mounceae* Haight & Nakasone, *Fomitopsis ochracea* Ryvarden & Stokland
Host(s) in Alaska: Spruce, hemlock, and pine; occasionally, western redcedar, birch, and aspen.
General Distribution in Alaska: Statewide where hosts occur.
Ground Detection Survey Observations: 21 sensu lato, 13 *F. mounceae*, and 35 *F. ochraceae*, observations were recorded statewide on white spruce, Sitka spruce, the hybrid Lutz spruce, and mountain and western hemlock.

iNaturalist Observations: 22 sensu lato, 49 *F. mounceae,* and 114 *F. ochraceae* observations were recorded statewide, the majority from coastal Southeast Alaska.
2024 Status/Activity: These are important decay organisms in Alaskan forests, recycling nutrients and leaving brown cubicle rot residues that become the next generation's soil/nurse-logs. While there are many observations, due to its perennial conk, disease presence or severity has not changed remarkably. *Fomitopsis* specimens from Interior Alaska and the western Kenai Peninsula have been sent to the Forest Service - Center for Forest Mycology Research to support ongoing studies of *Fomitopsis* diversity.
Additional Resources: Link to the conifer stem decays webpage.

Brown Cubical Butt Rot/Cow Pie Fungus

Scientific Name: *Phaeolus schweinitzii* (Fr.) Pat.
Host(s) in Alaska: Sitka spruce and white spruce, rarely on shore pine and western hemlock.
General Distribution in Alaska: Common in coastal forests, especially in Southeast Alaska. Occasionally found in boreal forests of the Interior.
Ground Detection Survey Observations: 14 total, 10 near Juneau, Sitka, and Ketchikan on Sitka spruce in Southeast Alaska, 3 along Turnagain Arm in Southcentral Alaska on white spruce, and 1 on white spruce near Fairbanks in the Interior.
iNaturalist Observations: 20 total, 17 in Southeast Alaska near Skagway, Haines, Juneau, and Sitka, and 3 in Southcentral Alaska from Hope and Moose Pass on the Kenai Peninsula, and Kodiak Island.
2024 Status/Activity: Bole snap caused by this pathogen remains common in some primary Sitka spruce forests near Juneau that are transitioning toward old-growth condition. The disease may be key to successional dynamics in young coastal forests dominated by Sitka spruce.
Additional Resources: Link to the conifer stem decays webpage.

Canker-Rot of Birch/Cinder Conk

Scientific Name: *Inonotus obliquus* (Fr.) Pilát
Host(s) in Alaska: Birch species.
General Distribution in Alaska: Southcentral and Interior Alaska.
Ground Detection Survey Observations: 5 observations along the road corridor from Denali State Park to Hope.
iNaturalist Observations: 13 observations scattered from Yukon-Charley Rivers National Preserve to Katmai National Park and Preserve, but clusters near Fairbanks and Anchorage.
2024 Status/Activity: No notable activity.
Additional Resources: Link to the hardwood stem decays webpage.

Hartig's Conk/Hemlock Trunk Rot

Scientific Name: *Fomitiporia tsugina* Murrill (=*Phellinus hartigii*)
Host(s) in Alaska: Western and mountain hemlock.

General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 6 on western hemlock near Haines, Juneau, Wrangell, and Ketchikan.
iNaturalist Observations: 4 near Sitka and on Mitkof Island.
2024 Status/Activity: In North America, this trunk rot on hemlock has been reclassified as *Fomitiporia tsugina* (Brazee 2013). This fungus is both a sap rot and heart rot of hemlock. We have observed it killing its host tree within a decade of fruiting body development due to invasion of the sapwood girdling the tree. A sequenced specimen from Juneau closely matched other species from western North America identified as *F. tsugina*.
Additional Resources: Link to the conifer stem decays webpage.

Paint Fungus

Scientific Name: *Echinodontium tinctorium* (Ellis & Everh.) Ellis & Everh.
Host(s) in Alaska: Western and mountain hemlock, occasionally spruce species.
General Distribution in Alaska: Southeast and Southcentral Alaska.
Ground Detection Survey Observations: 3 on Mitkof Island and 1 near Girdwood.
iNaturalist Observations: 1 near Girdwood.
2024 Status/Activity: Surveys were conducted on Mitkof Island near the 2012 detection location, prior to which it was unknown to occur in Alaska south of Haines.
Additional Resources: Link to the conifer stem decays webpage.

Quinine Conk

Scientific Name: *Laricifomes officinalis* (Batsch) (Vill.) Kotl. & Pouzar (=*Fomitopsis officinalis*)
Host(s) in Alaska: Spruce, especially Sitka spruce, occasionally western and mountain hemlock, larch, and shore pine.
General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 3 near Ketchikan on Sitka spruce.
iNaturalist Observations: 1 near Sitka.
2024 Status/Activity: This fungus is infrequently encountered, generally on very large Sitka spruce trees. One conk specimen was collected last year, and notable regrowth had occurred one year later. This fungus can have the typical stacked growth form, or be more hoof shaped.
Additional Resources: Link to the conifer stem decays webpage.

Red Ring Rot

Scientific Name: *Porodaedalea pini* (Brot.) Murrill (=*Phellinus pini*)
Host(s) in Alaska: Hemlock, spruce and shore pine; occasionally western redcedar.
General Distribution in Alaska: Most common on hemlocks in coastal forests but present throughout forested Alaska where hosts occur.

Ground Detection Survey Observations: 44 total, 11 from Anchorage, the Kenai Peninsula, and Cordova in Southcentral Alaska, and 33 from Haines to Ketchikan throughout Southeast Alaska. Host tree species included western hemlock (20), mountain hemlock (12), mountain hemlock (7), white spruce (2), Lutz spruce (1), black spruce (1), and shore pine (1).
iNaturalist Observations: 15 total, 10 from Skagway, Haines, Juneau, and Sitka in Southeast, 4 from the Kenai Peninsula, and 1 from Denali State Park.
2024 Status/Activity: Several hemlock failures were associated with *P. pini* near Girdwood this year. The snapped trees were also colonized by Armillaria root rot, common on stressed and recently killed trees.
Additional Resources: Link to the conifer stem decays webpage.

Sulfur Fungus

Scientific Name: *Laetiporus conifericola* Burds. & Banik
Host(s) in Alaska: Spruce and hemlock species, occasionally shore pine.
General Distribution in Alaska: Coastal forests of Southeast and Southcentral Alaska.
Ground Detection Survey Observations: 11 total, 9 scattered throughout Southeast Alaska from Haines to Ketchikan, and 2 near Cordova. Of these, 8 records came from western hemlock, 2 from Sitka spruce, and 1 from an unknown conifer.
iNaturalist Observations: 50 total, 37 from the Kenai Peninsula, Kodiak Island, and Katmai National Park, and 13 from Juneau, Sitka, Petersburg, and Prince of Whales Island in Southeast Alaska.
2024 Status/Activity: Prolific fruiting was observed in many parts of coastal Alaska in 2023 but returned to normal levels this year. The actual incidence of this fungus is similar from year to year, but conditions in some years support abundant fruiting.
Additional Resources: Link to the conifer stem decays webpage.

Tinder Conk/Hoof Fungus

Scientific Name: *Fomes fomentarius* (L.) Fr.
Host(s) in Alaska: Birch species; rarely alder, trembling aspen, balsam poplar, and cottonwood.
General Distribution in Alaska: Southcentral, Interior, and northern Southeast Alaska.
Ground Detection Survey Observations: 14 total, 8 between Fairbanks and Healy in Interior Alaska, 1 in Denali State Park and 4 near Anchorage in Southcentral Alaska, and 1 near Haines in Southeast Alaska.
iNaturalist Observations: 79 total, 34 in Interior Alaska near Fairbanks and 1 near Coal Creek on the Yukon River, 33 in Southcentral Alaska from Denali State Park to the Kenai Peninsula, and 11 in Southeast Alaska near Skagway.
2024 Status/Activity: The incidence of this common, perennial fungus does not change much from year to year. The presence of conks indicates significant internal decay.
Additional Resources: Link to the hardwood stem decays webpage.

Trunk Rot of Aspen/False Tinder Conk

Scientific Name: *Phellinus tremulae* (Bondartsev) Bondartsev & P.N. Borisov
Host(s) in Alaska: Trembling aspen and possibly balsam poplar.
General Distribution in Alaska: Southcentral and Interior Alaska.
Ground Detection Survey Observations: 1 observation near Nenana.
iNaturalist Observations: 1 observation near Fairbanks.
2024 Status/Activity: No notable activity.
Additional Resources: Link to the hardwood stem decays webpage.

Trunk Rot of Birch, Alder, and Willow/False Tinder Conk

Scientific Name: *Phellinus igniarius* (L.) Quél. sensu lato
Host(s) in Alaska: Alaska paper birch, red alder, Siberian alder, thinleaf alder, Sitka alder, and coastal willow species.
General Distribution in Alaska: Statewide where hosts occur.
Ground Detection Survey Observations: 21 total, 17 on Alaska paper birch in Southcentral and the Interior Alaska near Fairbanks, Denali State Park, Anchorage, the Kenai Peninsula, and the Wrangell Mountains, and 4 from Southeast on coastal willows near Juneau, paper birch near Haines, and red alder near Ketchikan.
iNaturalist Observations: 33 total, very widespread throughout the state, including near Nome, Bethel, Katmai National Park, Fairbanks, Denali National Park, Talkeetna, Palmer, Dry Creek, Anchorage, the Kenai Peninsula, and Juneau.
2024 Status/Activity: Although the *Phellinus igniarius* group most common on birch, there has been increased detection on willow and alder in Alaska, probably due to greater awareness of its presence on these hosts. Work is underway to understand the species diversity of *Phellinus* on these hardwoods. Sequenced specimens from red alder in Southeast Alaska have been identified as *P. lundellii.* More work is needed to determine whether host tree and geography can allow accurate field identification to species. There may be differences between these related species, for example, in their affinity for live or dead host material, which could influence their ecological roles.
Additional Resources: Link to the hardwood stem decays webpage.

Varnish Conk

Scientific Name: *Ganoderma oregonense* Murrill
Host(s) in Alaska: Western hemlock, occasionally other conifers.
General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 9 from Southeast Alaska near Juneau, on Mitkof Island, and near Ketchikan on Revillagigedo Island.
iNaturalist Observations: 18 from Juneau, Hoonah, Sitka, Revilla Island, and Metlakatla.
2024 Status/Activity: Based on spore size measurements, all specimens collected in Southeast Alaska have been identified as *Ganoderma oregonense,* rather than *G. tsugae*, which is now

thought to be restricted to hemlock hosts in eastern North America. Anecdotally, this fungus is more abundant in the southern half of Southeast Alaska. This year, the fungus fruited prolifically, especially near Ketchikan.
Additional Resources: Link to the conifer stem decays webpage.

Root Diseases

Annosus/Heterobasidion Root & Butt Rot

Scientific Name: *Heterobasidion occidentale* sp. nov. Otrosina & Garbelotto
Host(s) in Alaska: Western hemlock and Sitka spruce.
General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 1 near Ketchikan.
iNaturalist Observations: None.
2024 Status/Activity: Though this fungus is historically known to occur in coastal forests of Alaska, it is seldom identified, in part due to subtle fruiting structures hidden within tree stumps. This year, a large, live western hemlock with extensive stringy, white rot was detected in a Ketchikan campground managed by the US Forest Service. Fruiting structures were evident within the decay cavity and the tree was recommended for removal to protect visitors. This campground will be further evaluated for this root disease in 2025.
Additional Resources: Link to the Annosus/Heterobasidion root and butt rot webpage.

Armillaria Root Disease

Scientific Name: *Armillaria sinapina* Bérubé & Dessur. and *A. nabsnona* T.J.Volk & Burds. have been identified from Alaska
Host(s) in Alaska: Broad range of hardwood and conifer hosts.
General Distribution in Alaska: Throughout forested Alaska.
Ground Detection Survey Observations: 23 observations, with broad distribution from Denali south to the Kenai Peninsula, east to Cordova, and then along coastal Southeast Alaska. Host trees affected were equally as varied including birch, cottonwood, spruce, yellow- cedar, and hemlock.
iNaturalist Observations: 1 observation of *Armillaria sinapina* near Skagway.
2024 Status/Activity: Environmental conditions were conducive to copious fruiting body development this fall in Southcentral Alaska. Many observations of black rhizomorphs or mushrooms were recorded in rotted cottonwood, birch, and spruce tree snags after cutting, from Denali and the Alaska Range, south to the Kenai Peninsula, and near Cordova. Hemlock tree failures on Forest Service trails by Girdwood had signs of both Armillaria white rot and the red ring rot pathogen *Porodaedalea pini* sensu lato. *Armillaria* is commonly observed in stressed and recently killed trees in Alaska.

Additional Resources: Armillaria Root Disease in Conifers of Western North America, Forest Insect and Disease Leaflet 188, U.S.D.A. Forest Service, Revised July 2024. Link to the Armillaria root disease webpage.

Pholiota/Scalycap Fungus

Scientific Name: *Pholiota* (Fr.) P.Kumm.
Host(s) in Alaska: Aspen, birch, and cottonwood; less frequently, spruce and hemlock species.
General Distribution in Alaska: Throughout forested Alaska.
Ground Detection Survey Observations: 2 observations near Anchorage.
iNaturalist Observations: None.
2024 Status/Activity: No notable activity.
Additional Resources: Link to the Pholiota/scalycap fungus webpage.

Tomentosus Root Rot

Scientific Name: *Onnia tomentosa* (Fr.) P. Karst. (=*Inonotus tomentosus*)
Host(s) in Alaska: Primarily white and black spruce in Southcentral and Interior Alaska, but also Sitka spruce, lodgepole pine, and eastern larch.
General Distribution in Alaska: Most common in Southcentral and Interior Alaska.
Ground Detection Survey Observations: 7 observations on white and black spruce, most around Anchorage, and one south of Talkeetna.
iNaturalist Observations: 6 research grade observations, 2 from the coastal Southeast, and 4 in Southcentral.
2024 Status/Activity: *Onnia* was consistently observed in association with dead and dying spruce in Southcentral Alaska, often seen fruiting on the infected roots. Our specimens contributed to ongoing work to better understand the *Onnia* species and host diversity in North America, and were sent to Dr. Patrick Bennett (Rocky Mountain Research Station) and Dr. Jane Stewart's (Colorado State University) Lab. Southeast Alaska is on the lookout for another *Onnia* sp. on shore pine, recognizable by its curved hymenial setae, which contrast with the straight setae of *Onnia tomentosa*.
Additional Resources: Lee et al. 2024. Association of *Onnia subtriquetra* with living and dead bishop pine (*Pinus muricata*) and shore pine (*Pinus contorta* var. *contorta*) in California, USA. Forest Pathology. https://doi.org/10.1111/efp.12844. Link to the Tomentosus root rot webpage.

Noninfectious Disease & Disorder Updates

Abiotic Damage

Hemlock Fluting

Tree Species Impacted in Alaska: Western hemlock.
Cause: Unknown but related to wind firmness on exposed coastal sites.
General Distribution in Alaska: Southeast Alaska.
Ground Detection Survey Observations: 1 observation.
2024 Status/Activity: Incidence does not change appreciably year to year.
Additional Resources: Link to the hemlock fluting webpage.

Drought & Winter Drying Damage to Conifers

Tree Species Impacted in Alaska: Conifers (all vegetation can be affected by drought, but here we focus on conifers)
General Distribution in Alaska: Statewide.
Ground Detection Survey Observations: None
Aerial Detection Survey Observations: 1 acre.
2024 Status/Activity: Drought impacts were unremarkable in 2024.
Additional Resources: Link to the drought and winter drying damage to conifers webpage.

Flooding/Beaver Damage

Tree Species Impacted in Alaska: Hardwoods and conifers.
General Distribution in Alaska: Statewide, heaviest impacts in Interior Alaska in 2024.
Ground Detection Survey Observations: 2 records.
Aerial Detection Survey Observations: 51,008 acres.
2024 Status/Activity: Flood damage was widely scattered throughout the state and the acreage detected was elevated from recent years. The greatest impacts occurred in the Interior along the Yukon River near Ruby and southeast of Circle, where 45,000 acres of damage were mapped in three large patches, orders of magnitude greater than observed in a typical year. Scattered flooding also caused tree mortality along rivers and lakes in Southcentral Alaska.
Additional Resources: Link to the flooding/beaver damage webpage.

Western Redcedar Topkill

Tree Species Impacted in Alaska: Western redcedar.
Causes: The two distinct causes of topkill include (1) suspected drought injury, especially where trees are shallow-rooted on wet sites and (2) bole-girdling caused by small mammal feeding.

General Distribution in Alaska: Southeast Alaska, damage is concentrated on Prince of Wales Island.
Ground Detection Survey Observations: None.
Aerial Detection Survey Observations: None.
2024 Status/Activity: Prince of Wales Island, where both drought and animal feeding damage have been most prevalent in recent years, was not surveyed in 2024. Both types of damage were reduced in 2023 compared to the last several years.
Additional Resources: Link to the western redcedar topkill webpage.

Windthrow

Tree Species Impacted in Alaska: All tree species.
General Distribution in Alaska: Statewide.
Ground Detection Survey Observations: 1 area of windthrow was noted along northern Eyak Lake near Cordova.
Aerial Detection Survey Observations: Most of the 1,180 acres of mapped windthrow in Alaska was in Southeast, though there was one very large windthrow event in the Interior along the Richardson Highway near Dot Lake (500 acres). Remote sensing methods were also used to evaluate windthrow events on Admiralty Island in Southeast Alaska.
2024 Status/Activity: Already dead windthrown trees are not typically mapped during aerial detection survey; however, there were many notable areas of windthrown dead trees on western Admiralty Island, where trees had been killed during recent hemlock defoliator outbreaks. The trees appeared to have been killed several years ago, indicating that they were likely killed during the earlier hemlock sawfly outbreak rather than the western blackheaded budworm outbreak that followed, or a combination.

High-resolution satellite imagery, along with storm event data from the National Oceanic and Atmospheric Administration, were used to determine the location and timing of two different wind events mapped in 2024: 70 acres of forest along the northern coast of Admiralty were blown down during the fall of 2023 and 540 acres of forest along the west coast were blown down at the end of January 2024. The windthrow on the west coast had a high density of dead western hemlock killed several years earlier by heavy hemlock sawfly defoliation. In general, dead trees are the most susceptible to windthrow, followed by shallow-rooted and highly decayed live trees. Live defoliated trees without other defects are considered the least susceptible to windthrow, since defoliated trees provide a reduced sail area to catch wind.

Additional Resources: Link to the windthrow webpage.

Animal Damage

Black Bear Damage

Scientific Name: *Ursus americanus* Pallas

Tree Species Impacted in Alaska: All trees can be affected; the most significant wounding in Alaska has been observed on Sitka and Lutz spruce and planted lodgepole pine.

General Distribution in Alaska: Black bears occur throughout most of forested Alaska, excluding the Seward Peninsula, the Yukon-Kuskokwim Delta, and north of the Brooks Range.

Ground Detection Survey Observations: 2 near Hope on the northern Kenai Peninsula.

Aerial Detection Survey Observations: 16 acres in one lodgepole pine plantation east of Happy Valley on the Kenai Peninsula. The cause of damage was confirmed on the ground.

2024 Status/Activity: Extensive black bear wounding of tree boles from feeding on the sapwood is common in some parts of western North America, such as the Oregon Coast Range and parts of the Rocky Mountains but is not regularly observed in Alaska. This year, two areas of damage to spruce trees were noted during ground detection surveys and one during aerial detection surveys.

Additional Resources: Black bear species profile from Alaska Department of Fish and Game. Timber Damage by Black Bears leaflet by the USDA Forest Service, 2003, Missoula, MT.

Brown Bear Damage to Yellow-cedar

Scientific Name: *Ursus arctos* L.
Tree Species Impacted in Alaska: Yellow-cedar.
General Distribution in Alaska: Admiralty, Baranof, and Chichagof Islands of Southeast Alaska.
Ground Detection Survey Observations: None.
2024 Status/Activity: Incidence does not change appreciably year to year.
Additional Resources: Link to brown bear damage to yellow-cedar webpage.

Porcupine Damage

Scientific Name: *Erethizon dorsatum* L.
Tree Species Impacted in Alaska: Sitka spruce, western hemlock, birch, lodgepole pine, and sometimes other species.
General Distribution in Alaska: Porcupines are present throughout much of forested Alaska but absent from several islands along the Gulf of Alaska in Southeast due to historic migration patterns from mainland river drainages.
Ground Detection Survey Observations: 10 records of topkill and tree mortality on western hemlock and Sitka spruce near Juneau and on Kupreanof, Mitkof, and Wrangell Islands. Just 1 topkilled western redcedar was detected in a managed stand on Wrangell Island, a species

uncommonly targeted by porcupine. Recorded damage to spruce and hemlock generally affected many trees.
Aerial Detection Survey Observations: 33 acres from Haines to Chilkat in northern Southeast.
2024 Status/Activity: Concentrated girdling damage from porcupine was found to be the cause of lodgepole pine mortality mapped along the Chilkat River from Haines to northwest of Chilkat. Ground checks were conducted in August after the aerial detection survey to verify the cause. Porcupine damage is common in Southeast Alaska but was limited this year.
Additional Resources: Link to the porcupine damage webpage.

Forest Declines

Yellow-Cedar Decline

Tree Species Impacted in Alaska: Yellow-cedar
Cause: Trees are killed by fine root freezing injury where there is insufficient snowpack to insulate roots from lethal cold temperatures during early spring cold events. Root and foliar tissues of yellow-cedar prematurely deharden/activate in spring when air temperature increases.
General Distribution in Alaska: Yellow-cedar decline has been mapped across more than 700,00 acres in Southeast Alaska since the 1880s.
Ground Detection Survey Observations: 25 records.
Aerial Detection Survey Observations: 14,365 acres
2024 Status/Activity: Crown discoloration and mortality from yellow-cedar decline was elevated this year in both unmanaged old-growth forest and several young-growth stands on the central Tongass National Forest. In Prince William Sound, a few suspected dead yellow-cedars were mapped along Cedar and Granite Bays for the first time and will be monitored and ground-verified. Mortality has been observed along the Outer Coast of Glacier Bay National Park in recent years, but this area could not be flown in 2024 due to weather.
Additional Resources: Link to the yellow-cedar decline webpage.

Information Delivery

Media Articles and Interviews

A beautiful menace: invasive orange hawkweed spreads through Southeast Alaska. (July 29, 2024). Olivia Schmidt, KFSK - Petersburg. https://www.kfsk.org/2024/07/29/a-beautiful-menace-invasive-orange-hawkweed-spreads-through-southeast-alaska/

Tongass National Forest exits years-long insect outbreak with a 'bad haircut'. (July 18, 2024). Alaska Public Media. Shelby Herbert, KFSK - Petersburg. https://alaskapublic.org/environment/2024-07-19/tongass-national-forest-exits-years-long-insect-outbreak-with-a-bad-haircut

Publications

Audley, J. P., Fettig, C. J., Moan, J. E., Moan, J., Swenson, S., Munson, A. S., Mortenson, L. A., Blackford, D. C., Graham, E. E., & Mafra-Neto, A. (2024). Developing semiochemical repellents for protecting *Picea* from *Dendroctonus rufipennis* (Coleoptera: Curculionidae) in Alaska and Utah, USA. *Journal of Economic Entomology*, 117(3), 1022-1031. https://academic.oup.com/jee/article/117/3/1022/7655917

Fettig, C. J., Grosman, D. M., Munson, A. S., & Moan, J. E. (2024). Protecting conifers from bark beetles (Coleoptera: Curculionidae, Scolytinae) with insecticides in the western United States. *Journal of Entomological Science,* 60(2). https://meridian.allenpress.com/jes/article/doi/10.18474/JES24-31/502374/Protecting-Conifers-from-Bark-Beetles-Coleoptera

Howe, M., Graham, E. E., & Nelson, K. N. (2024). Defoliator outbreaks track with warming across the Pacific coastal temperate rainforest in North America. *Ecography*, 9. https://doi.org/10.1111/ecog.07370

Schüette, U. M. E., Wages, M., Buechlein, A., Kovash, J. P., Wrenn, D. C., Smrhova, T., Zubrova, A., Rusch, D. B., Winton, L. M., Adams, G. C., Ruess, R. W., Leigh, M. B., & Drown, D. M. (2024). Draft genome data including functional annotation of an emerging fungal pathogen *Neodothiora populina* causing a canker disease of trembling aspen in Interior Alaska. *PhytoFrontiers*. https://doi.org/10.1094/PHYTOFR-09-24-0101-A

S. Zwieback, J. Young-Robertson, M. Robertson, Y. Tian, Q. Chang, M. Morris, J. White, J. Moan, (2024). Low-severity spruce beetle infestation mapped from high-resolution satellite imagery with a convolutional network. ISPRS Journal of Photogrammetry and Remote Sensing, Volume 212, Pages 412-421, ISSN 0924-2716, https://doi.org/10.1016/j.isprsjprs.2024.05.013.

Presentations

Beauchamp, J., Leigh, M. B., Wagner, D., Winton, L. M., Ruess, R. W., & Schüette, U. M. E. (April 4, 2024). Safari 20SG insecticide inhibits the growth of the fungal pathogen *Neodothiora populina*, an emerging fungal pathogen in trembling aspen [Poster Presentation]. University of Alaska Fairbanks Undergraduate Research & Scholarly Activity annual meeting. Fairbanks, AK.

Cash, R., Johnson J., Reed, E., Dye, E., & Belisle, C. (July 15, 2024). Skagway invasive plant management: accomplishments and opportunities [Oral presentation]. Skagway Traditional Council community presentation. Skagway, AK.

Draeger, K. (May 16, 2024). Hazard tree management [Oral presentation]. Glacier Ranger District. Girdwood, AK.

Draeger, K. (August 26, 2024). Hazard tree management [Oral presentation]. Cordova Ranger District. Cordova, AK.

Draeger, K. (August 31, 2024). An exploration of fungal pathogens in Alaska's forests [Oral presentation]. Girdwood Fungus Fair. Girdwood, AK.

Gabriel-Peralta, S. M., Adams, G., Winton, L. M., Černý, K., & Everhart, S. E. (March 6-10, 2024). Deciphering the genetic diversity of *Gemmamyces piceae* in Alaska using SSR [Oral Presentation]. American Phytopathological Society Northeastern Division Meeting. Ithaca, NY.

Graham, E. E. (April 25, 2024). Southeast entomology update: monitoring a major defoliation event [Virtual presentation]. Alaska Chapter of the Society of American Foresters. Sitka, AK.

Graham, E. E. (May 10, 2024). Insect identification training for coastal Alaska FIA [Virtual presentation]. Coastal Alaska Forest Inventory and Analysis crew training. Anchorage, AK.

Graham, E. E. (June 17, 2024). Southeast entomology update: monitoring a major defoliation event and ice cream sandwiches! [Oral presentation]. Wrangell Ranger District Brown Bag Talk. Wrangell, AK.

Graham, E. E. (July 9, 2024). Southeast entomology update: monitoring a major defoliation event [Oral presentation]. Wrangell Ranger District Brown Bag Talk. Petersburg, AK.

Graham, E. E. (July 28, 2024). Western blackheaded budworm in Southeast Alaska: looking back and projecting forward a small caterpillar's large impact on the forest [Oral presentation]. Bearfest. Wrangell, AK.

Holloway, L. & Johnson, J. (July 14, 2024). Petersburg's invasive plants and statewide overview [Oral presentation]. Petersburg Science Series. Petersburg, AK.

Howe, M., Graham, E., & Nelson, K. (April 23, 2024). A shrinking envelope? Projecting the past & future climatic envelope of defoliator outbreaks across the Pacific temperate coastal rainforest [Oral presentation]. Western Forest Insect Work Conference. Missoula, MT.

Hutten, K. (October 30, 2024). Forest Health Protection objectives and context [Oral presentation]. Remote Sensing on the Forest 2024 Workshop. Virtual.

Hutten, K. (November 13, 2024). Forest health remote sensing needs [Oral presentation]. Alaska Forum on the Environment virtual technical session: remote sensing and forest health. Virtual.

Johnson, J. (March 8, 2024). State, Private and Tribal Forestry invasive plant program [Oral presentation]. Alaska Community Forest Council quarterly meeting. Virtual.

Johnson, J. (June 26, 2024). Ornamentals: On the move? [Oral presentation]. Alaska Chapter of the American Society of Landscape Architects quarterly meeting. Anchorage, AK.

Johnson, J. & Reed, E. (July 14, 2024). Invasive plants in Haines [Oral presentation]. Takshanuk Watershed Council community presentation. Haines, AK.

Johnson, J. (September 17, 2024). Community hotspots and opportunities: invasive plant management [Oral presentation]. Alaska Recreation and Parks Association Conference. Wrangell, AK.

Johnson, P. & Johnson, J. (August 9, 2024). Tour de plants [Oral presentation]. Copper River Watershed Project community field trip. Cordova, AK.

Kovash, J., Glesener, H., Engl, T., Winton, L., Ruess, R., Leigh, M. B., & Schütte, U. M. E. (September 10, 2024). A Bole Lotta Trouble: Changes in gene expression indicate aspen susceptibility to an emerging canker disease in Alaska [Oral Presentation]. Western International Forest Disease Work Conference. Santa Fe, NM.

Kovash, J., Glesener, H., Engl, T., Winton, L., Ruess, R., Leigh, M. B., & Schütte, U. M. E. (September 6, 2024). Catching Canker: Aspen susceptibility to an emerging fungal pathogen in the Interior [Oral Presentation]. American Society for Microbiology Alaska Branch Meeting. Fairbanks, AK.

Moan, J. & Moan, J. E. (March 14, 2024). Updates on the use of semiochemicals to manage spruce beetles [Oral presentation]. Alaska Certified Pesticide Applicators Workshop. Anchorage, AK.

Mullen, S. K. (November 13, 2024). Birch leafminers in Alaska [Oral presentation]. Alaska Invasive Species Partnership Annual Workshop. Fairbanks, AK.

Mullen, S. K. (April 17, 2024). 2024 Interior Alaska FIA & DOF crew training: guidance on recording and reporting insect-related forest damage [Virtual presentation]. Interior Alaska Forest Inventory Analysis training. Fairbanks, AK.

Mullen, S. K. (June 4-5, 2024). 2024 Interior Alaska LTER crew training: Guidance on identifying insect-related forest damage [Oral presentation]. Long Term Ecological Research crew training. Fairbanks, AK.

Mulvey, R. L. (April 15-16, 2024). Hazard tree assessment and management in developed recreation sites of Southeast Alaska [Oral presentation]. Petersburg and Prince of Wales Island Ranger Districts training. Petersburg, AK.

Mulvey, R. L. (April 18-19, 2024). Hazard tree assessment and management in developed recreation sites of Southeast Alaska [Oral presentation]. Ketchikan-Misty Fjords and Prince of Wales Island Ranger Districts training. Ketchikan, AK.

Mulvey, R. L. (April 25, 2024). The status of forest diseases and declines in Southeast Alaska [Virtual presentation]. Alaska Chapter of the Society of American Foresters. Sitka, AK.

Mulvey, R. L. & Draeger, K. (May 10, 2024). Disease identification training for coastal Alaska FIA [Virtual presentation]. Coastal Alaska Forest Inventory and Analysis crew training. Anchorage, AK.

Mulvey, R. L. (August 26-27, 2024). Hazard tree assessment and management in developed recreation sites of Southeast Alaska [Oral presentation]. Juneau Ranger District and Mendenhall Glacier Visitor Center training. Juneau, AK.

Mulvey, R. L. (October 3-4, 2024). Hazard tree assessment and management in developed recreation sites of Southeast Alaska [Oral presentation]. Juneau Ranger District and Mendenhall Glacier Visitor Center training. Juneau, AK.

Reid, S., Johnson, J., & Reed, E. (September 16, 2024). Invasive plants in Sitka and the knotweed issue [Oral presentation]. Sitka Tribe of Alaska Kayaaní Commission and Resource Protection Department community presentation. Sitka, AK.

Turner, K. & Draeger, K. (November 13, 2024). Padus Perishing Poop Fungus: *Apiosporina morbosa* is killing invasive bird cherry (*Prunus padus*) trees on the University of Alaska – Anchorage campus [Oral presentation]. Alaska Invasive Species Partnership Annual Workshop. Fairbanks, AK.

Winton, L. M. (April 17, 2024). The more important tree diseases in Interior Alaska [Oral presentation]. Interior Alaska Forest Inventory & Analysis crew training. Fairbanks, AK.

Winton, L. M. (May 1, 2024). Region 10 Ground Detection Survey (GDS) since 2015 [Oral presentation]. USFS Region 6 Forest Health Protection technical meeting. Astoria, OR.

Winton, L. M. (May 24, 2024). The more important tree diseases in Alaska [Oral Presentation]. Alaska Division of Forestry & Fire Protection crew training. Fairbanks, AK.

Winton, L. M. & Draeger, K. (May 29, 2024). The more important tree diseases in Southcentral Alaska [Oral Presentation]. Alaska Division of Forestry & Fire Protection insect and disease class. Anchorage, AK.

Winton, L. M. (June 4-5, 2024). The more important tree diseases in Interior Alaska [Oral presentation]. Long Term Ecological Research crew training. Fairbanks, AK.

Winton, L. M., Adams, G., Ruess, R. W., Kovash, J. P., & Schüette, U. M. E. (December 4, 2024). Detecting and monitoring boreal forest diseases: landscape pathology [Oral Presentation]. University of Alaska Fairbanks lecture for NRM 692. Fairbanks, AK.