

Forests Pests of Alaska:

How Forest Health Protection and the LEO Network
can work together to monitor our forests.

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USDA Forest Service
Forest Health Protection



United States Department of Agriculture

Forest Health Conditions in Alaska - 2014

A Forest Health Protection Report



Forest Service
Alaska Region



State of Alaska
Department of
Natural Resources
Division of Forestry

R10-PR-32

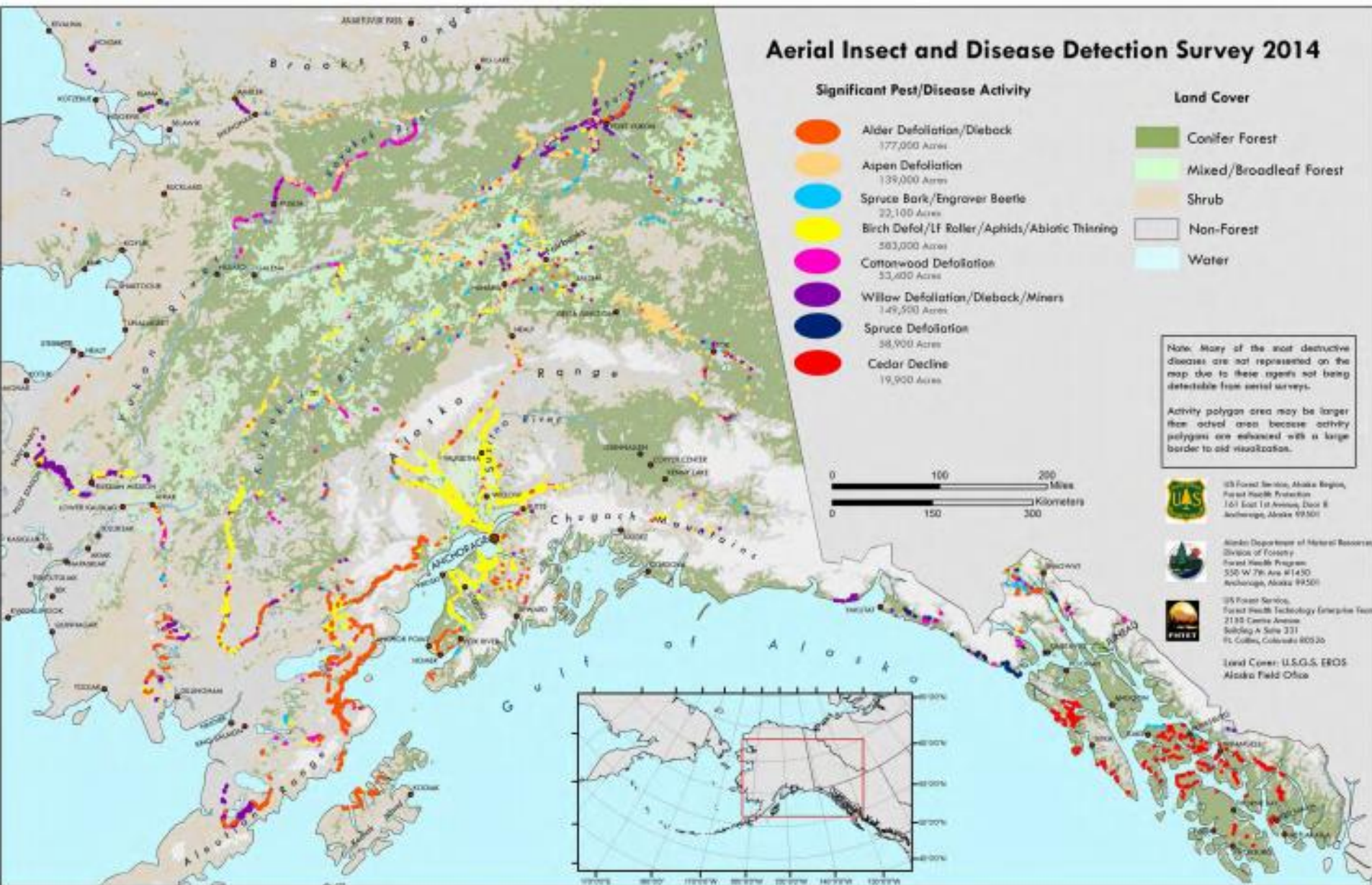
February 2015

<http://www.fs.usda.gov/main/r10/forest-grasslandhealth/>

Forest Health Protection

- Based in Juneau, Anchorage, Fairbanks
- Program is essentially divided into three parts:
 - Entomology
 - Pathology
 - Invasive weeds
- Provide survey and monitoring information, and technical and financial assistance, to Federal, State, Tribal and private land managers so they can prevent, suppress, and control outbreaks of forest pests.





Map 1. Aerial insect and disease detection survey 2014.

Partners

- State Agencies
 - Dept. of Forestry, Dept. Natural Resources
- Cooperative Extension Service- UAF
- Tribal Organizations
 - Tanana Chiefs Conference
 - Chugachmiut
 - Sealaska Corporation
- Universities
- Soil and Water Conservation Districts
- Forest Service
 - NFS
 - PNW, SRS Research
 - FIA
- LEO Network
- Others!!!

Bark Beetles



Spruce Beetle

- *Dendroctonus rufipennis*
- Hosts: Lutz, white, Sitka, occasionally black spruce.
- Two-year life cycle, however one-year with warm climate.
- One square foot of bark can hold more than 100 beetles
- Generally attack the mid- to lower bole of the tree resulting in discoloration of the full crown of the tree.
- Prefer the sides and bottoms of downed trees





UGA0758151

Spruce Beetle Activity 2014



Engraver Beetle

- *Ips* spp.
- Hosts: Spruce
- Prefer open grown, small-diameter trees
- Prefer sunnier and drier host material
- Attack mid-bole: damage appears in the top of the tree first
- Warm dry summers + mild winters = outbreak conditions







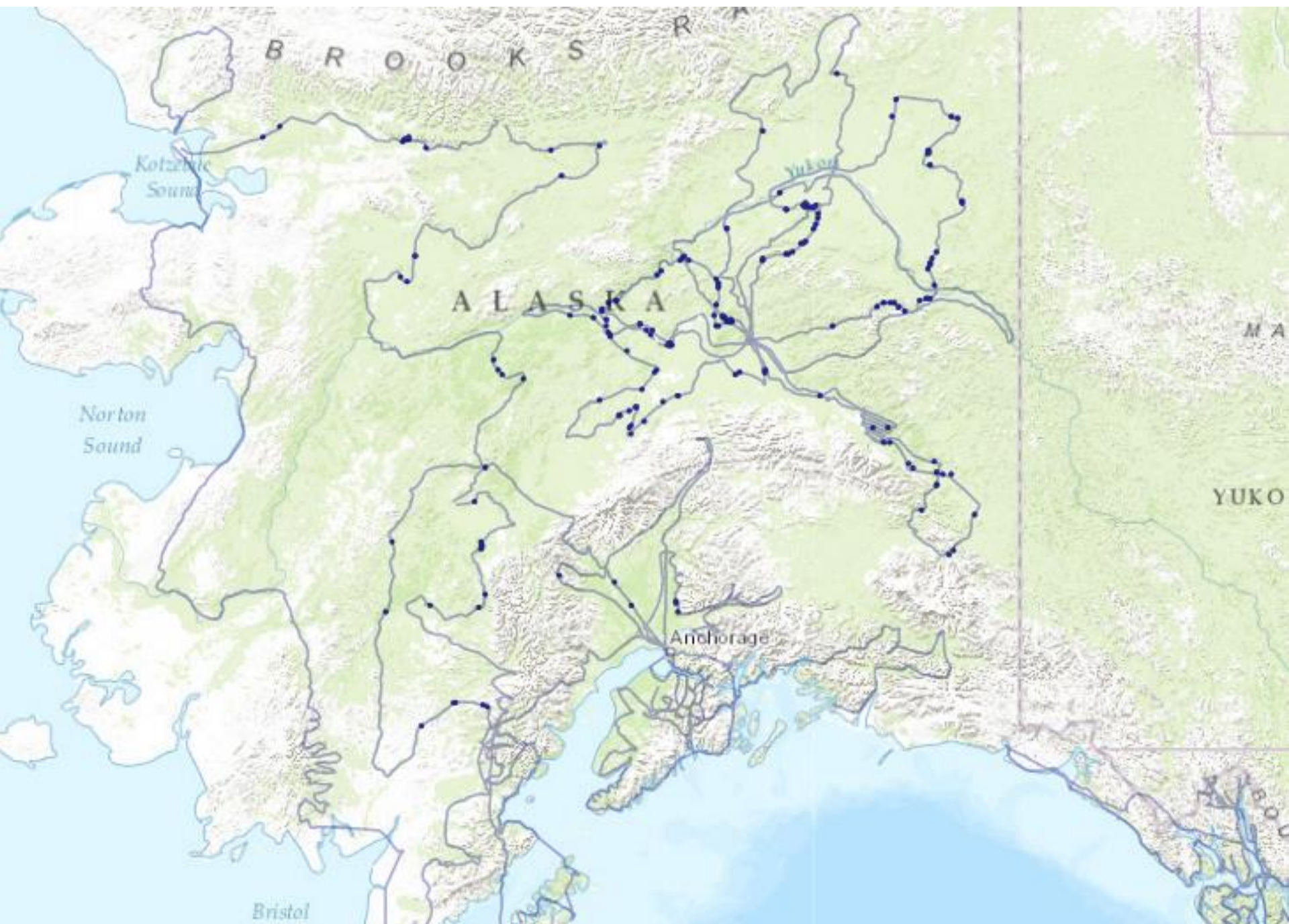


Fig. 10. Comparison of galleries



Spruce beetle



Ips

Beetles and Fire

- Wildfires are often preceded by outbreaks of bark and woodborers
- Spruce beetle and Engraver beetles will take advantage of weekend trees on the edge of the burned area
- Some respond specifically to burned material

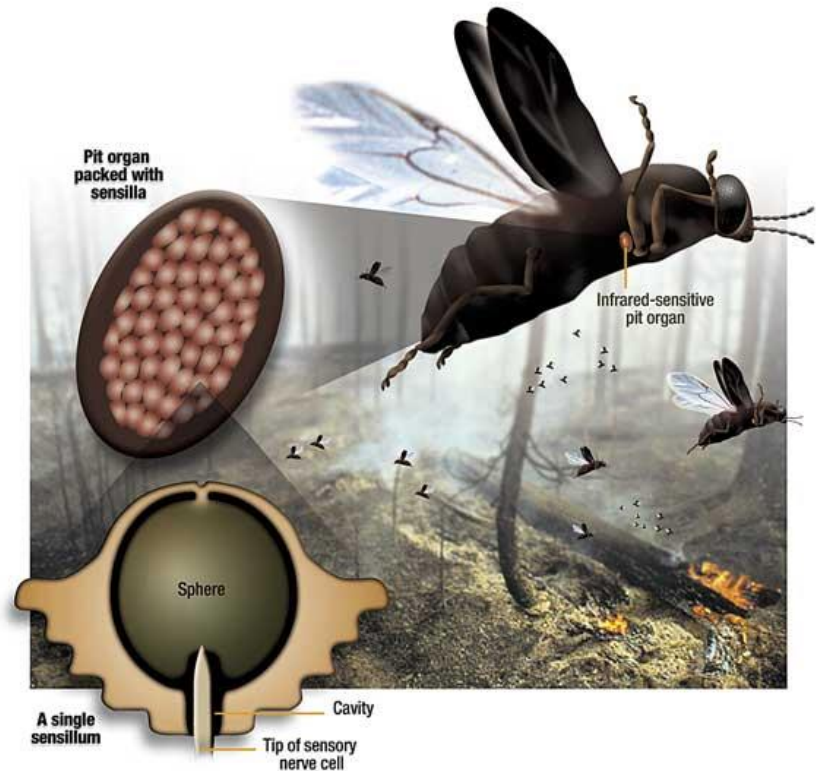


AWW!
A COZY BED
OF EMBERS
FOR US!



Melanophila

- Possess infrared receptors
- Can detect fires over a distance >5 km
- Lay eggs on burning material to give a competitive edge over other bark and woodborers



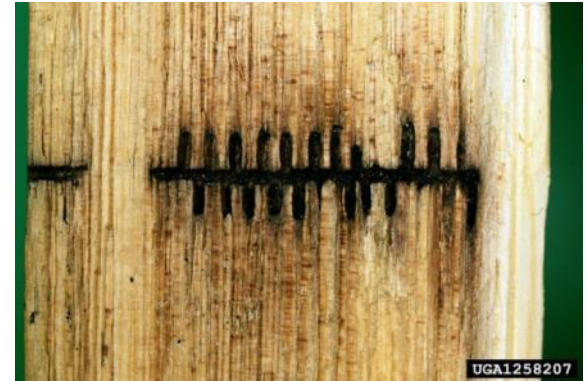
Sawyer Beetles

- Sawyer beetles are known to respond to heat, smoke, and charred materials
- Infest partially burned conifers immediately after a fire



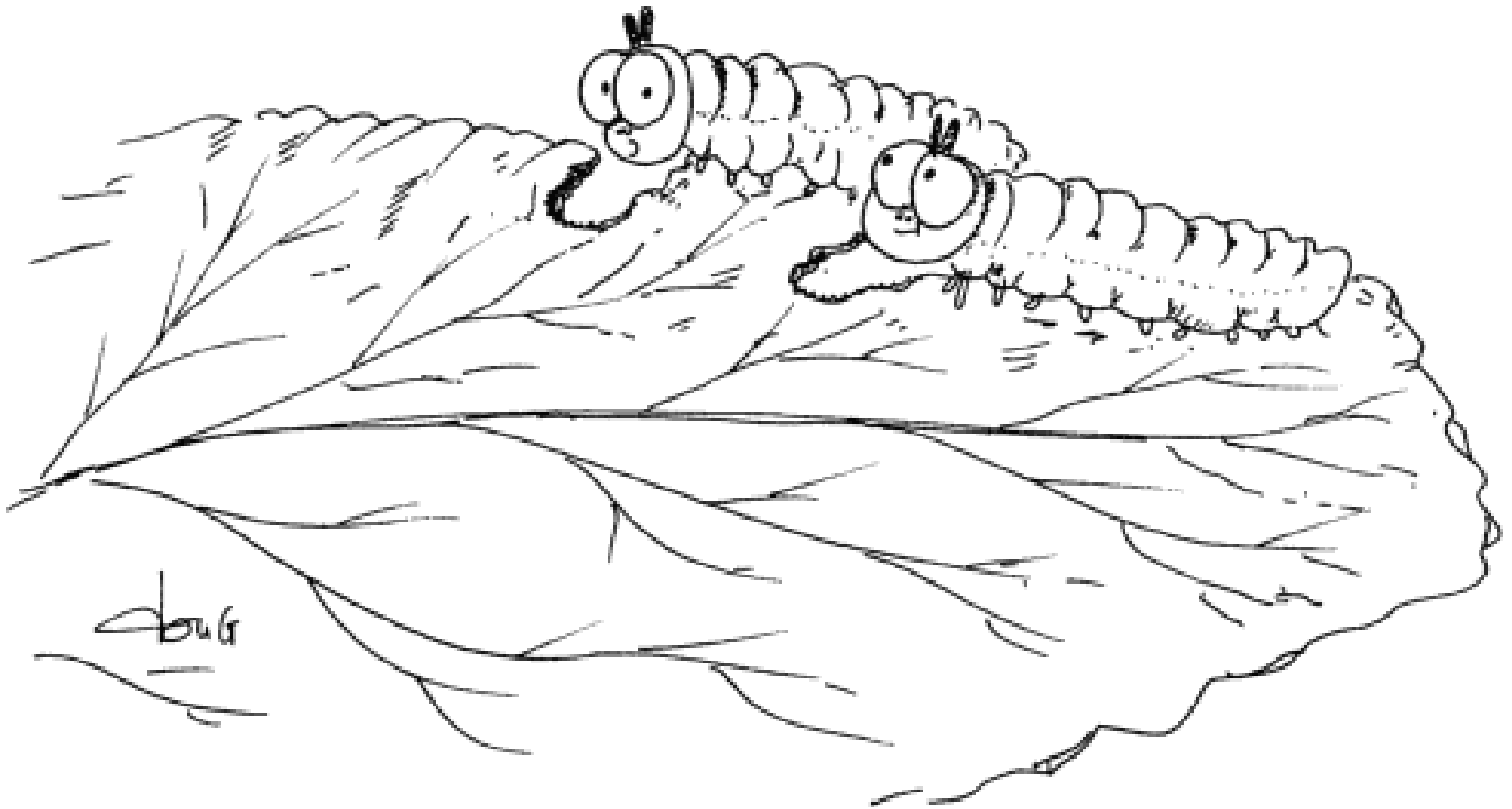
Ambrosia beetles

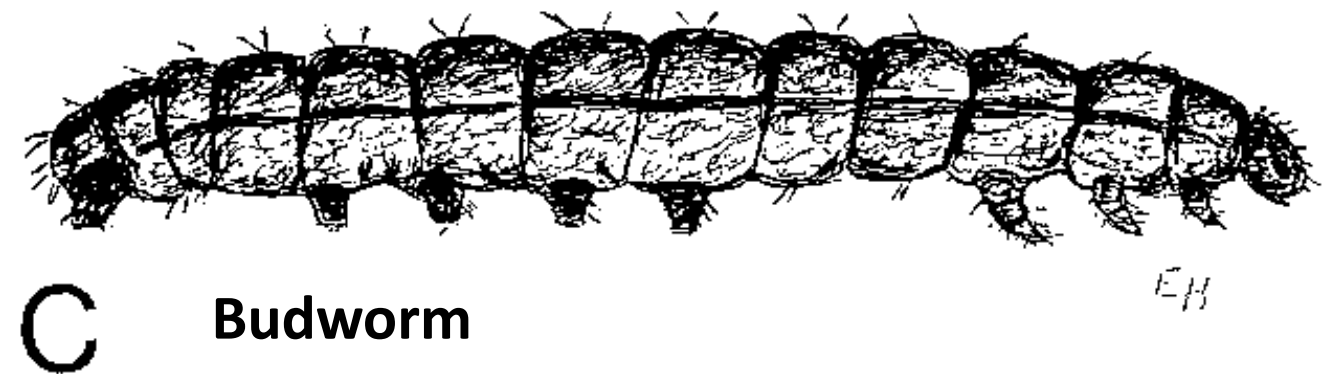
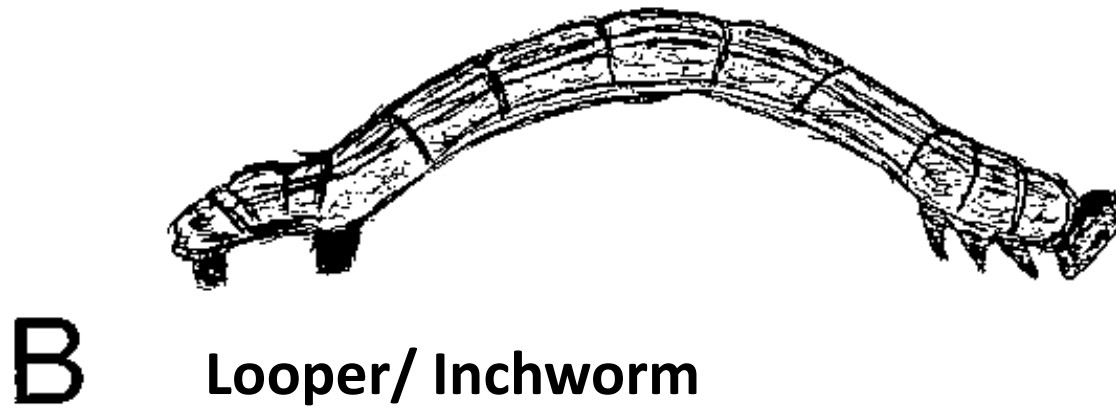
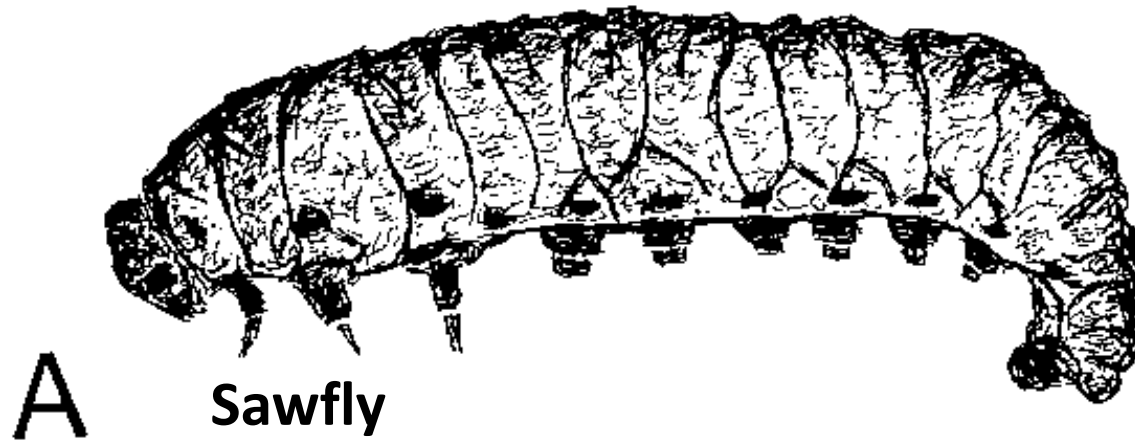
- Coleoptera: Curculionidae
- All ambrosia beetles have a symbiotic relationship with a specific wood staining fungus
 - Have specialized structures called mycangia to carry fungus
- Only infest dead trees
- Typically only a problem in salvage harvests or if logs are not harvested properly.





Defoliators





Western Black-headed Budworm

- Hosts: Hemlock, Sitka, Lutz, and white spruce
- Considered one of the most destructive forest pests in SE Alaska
- Larvae feed within the protected unopened hemlock buds, move on to new needles
- Create shelters with the needles to pupate
- Populations skyrocket then crash almost as quickly





Hemlock Sawfly

- Hosts: Western hemlock
secondary mountain hemlock
- Larvae feed on previous years foliage resulting in reduction in growth and possible topkill
- Earliest outbreak recorded 1952
- When outbreaks occurs with black-headed budworm mortality can occur





Budworm/sawfly history

- Infestation progressed through the entire Tongass and Chugach, similar to 1917 outbreak
- Between 1947 and 1955 over 100,000 acres of trees killed
- Stands varied from 10% trees killed to 50%
- Moths were so numerous between Juneau and Petersburg they created a flying nuisance
- Populations crashed almost as quickly as they appeared



Spruce Budworm

- Hosts: White and Sitka Spruce
- Feed on new foliage but can cause a reduction in growth, topkill, and in rare cases mortality



Western Hemlock Looper

- Hosts: Sitka spruce, western hemlock, western redcedar, and Alaska yellow-cedar
- “Inefficient feeders”



Other Loopers (inchworms)

- Green-striped forest looper
 - Western hemlock, western redcedar, Alaska yellow-cedar
- Saddle-backed looper
 - Western hemlock, western redcedar, Alaska yellow-cedar
 - Found in association with hemlock sawfly



Spruce Aphid

- *Elatobium abietinum*
- Introduced to US from Europe in the early 1910s
- First reported in Alaska in 1967
“seriously injuring 5 to 6 foot ornamental Sitka spruce adjacent to valuable forest stands in Sitka”
- Major problem for Sitka spruce along beach fringe and in urban settings
- Constrained by temperature
 - Cannot tolerate temperatures < 14F
- Coupled with spruce beetle attacks





Spruce adelgids



Cottonwood Leaf Beetle

- Coleoptera: Chrysomelidae
- Hosts: Balsam poplar, black cottonwood, aspen, birch, alder, and willow
- Skeletonize leaves





Green Alder Sawfly

- *Monsoma pulveratum*
- Native to Europe, northern Africa, and Near East
- First found in Alaska in 2007, infestation dates back to 2004
- Responsible for severe defoliation of thin-leafed alder in Southcentral AK, along with the two other sawflies and leaf miners
- Populations confirmed in Sitka, Ketchikan and Juneau



Alder Sawflies

- Hosts: alder
- Striped alder sawfly-group “window feed”
- Reduction in growth of alder only occurs with repeated defoliation



Large Aspen Tortrix

- *Choristoneura conflictana*
- Host: aspen
- 1967-1969
 - 10,000 square miles from Tok to Fairbanks with complete stripping of trees
- Began dying off due to parasitism and starvation







Leaf rollers

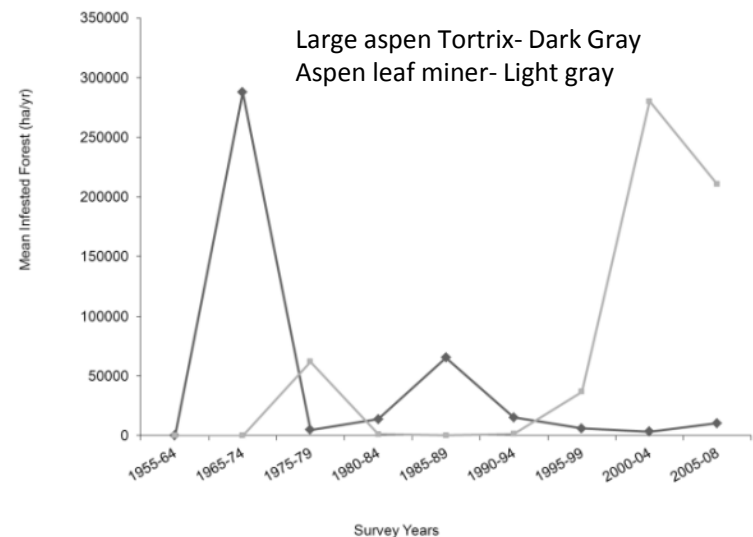
- *Epinotia solandriana*, other spp.
- Hosts: birch, alder, occasionally willow, aspen, and black cottonwood
- First reported near Anchorage in 1976
- Larvae roll leaves and feed inside the protected shelter
- Leaves drop prematurely and can result in branch dieback
- Recurring problem throughout the state

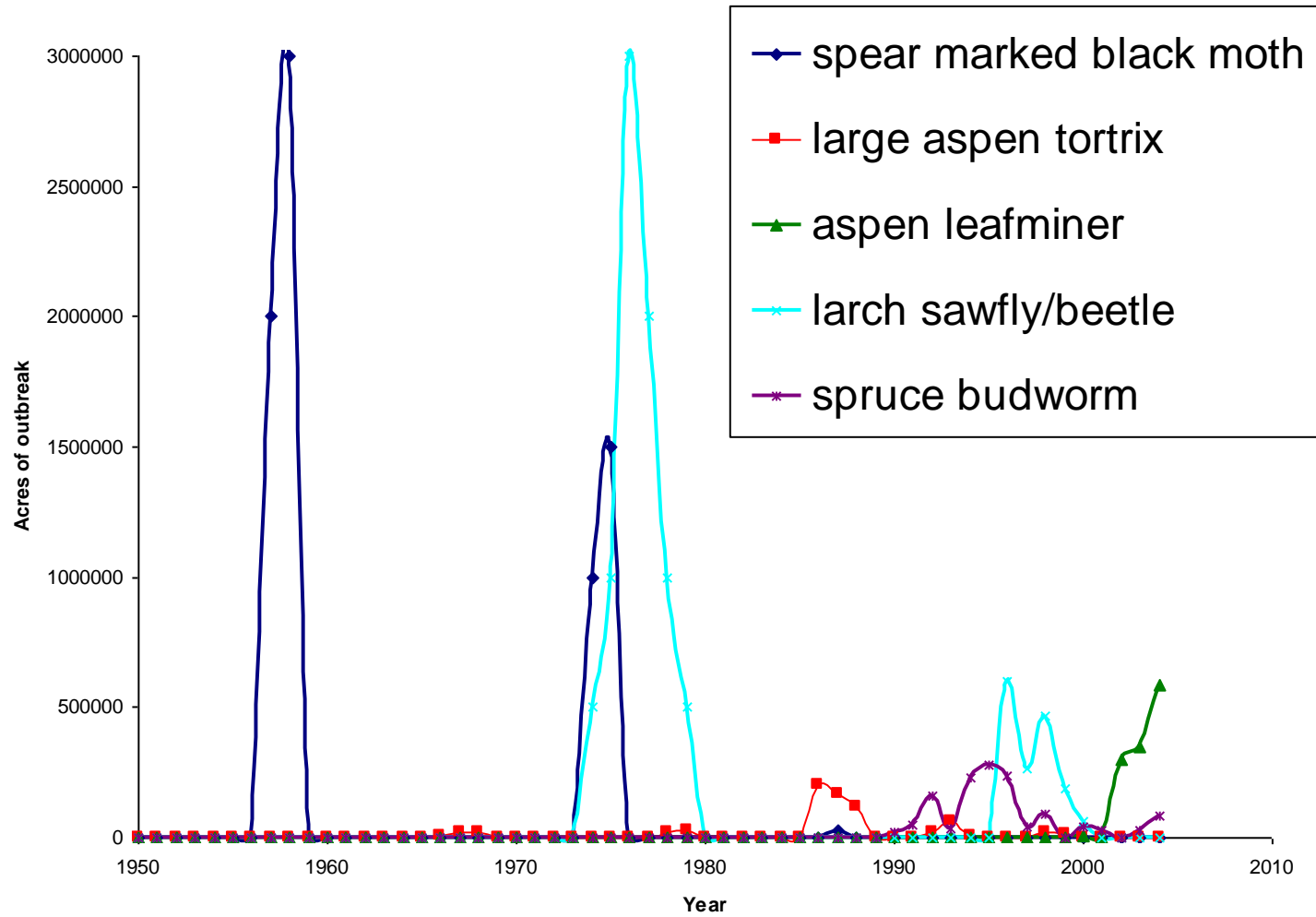




Aspen Leaf Miner

- *Phyllocnistis populiella*
- Small outbreak in 1979 then again in 2000





Birch Leafminers

- Introduced from Europe
- Host: birches, alder
- Biocontrol agents were released in 2004 and 2006, seem to be established





What to do when you find damage

- Photographs!
 - Close up of the feeding damage
 - Close up of the insect (if there)
 - Zoomed out picture of the entire tree
 - Picture of the area
 - Geotag pictures (if possible)
 - Record date and location (if not digital recorded)

What to do when you find damage

- Collections!
 - Always Record Date and Location (GPS preferred)
 - Place insects in container
 - Old prescription bottles work great
 - Baby food jars
 - Branch samples
 - Collect foliage with damage
 - Place in ziplock bag with moist paper towels
 - Store in refrigerator until able to ship
 - Notify us BEFORE shipping to ensure there is someone available to receive

Contact Information

- Insect-related



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Caring for the land and serving people

Insect and Disease Survey Methods

Tom Heutte Aerial Survey Manager
USFS Forest Health Protection,
Juneau AK

Two Types of Survey

Ground-Based



Aerial

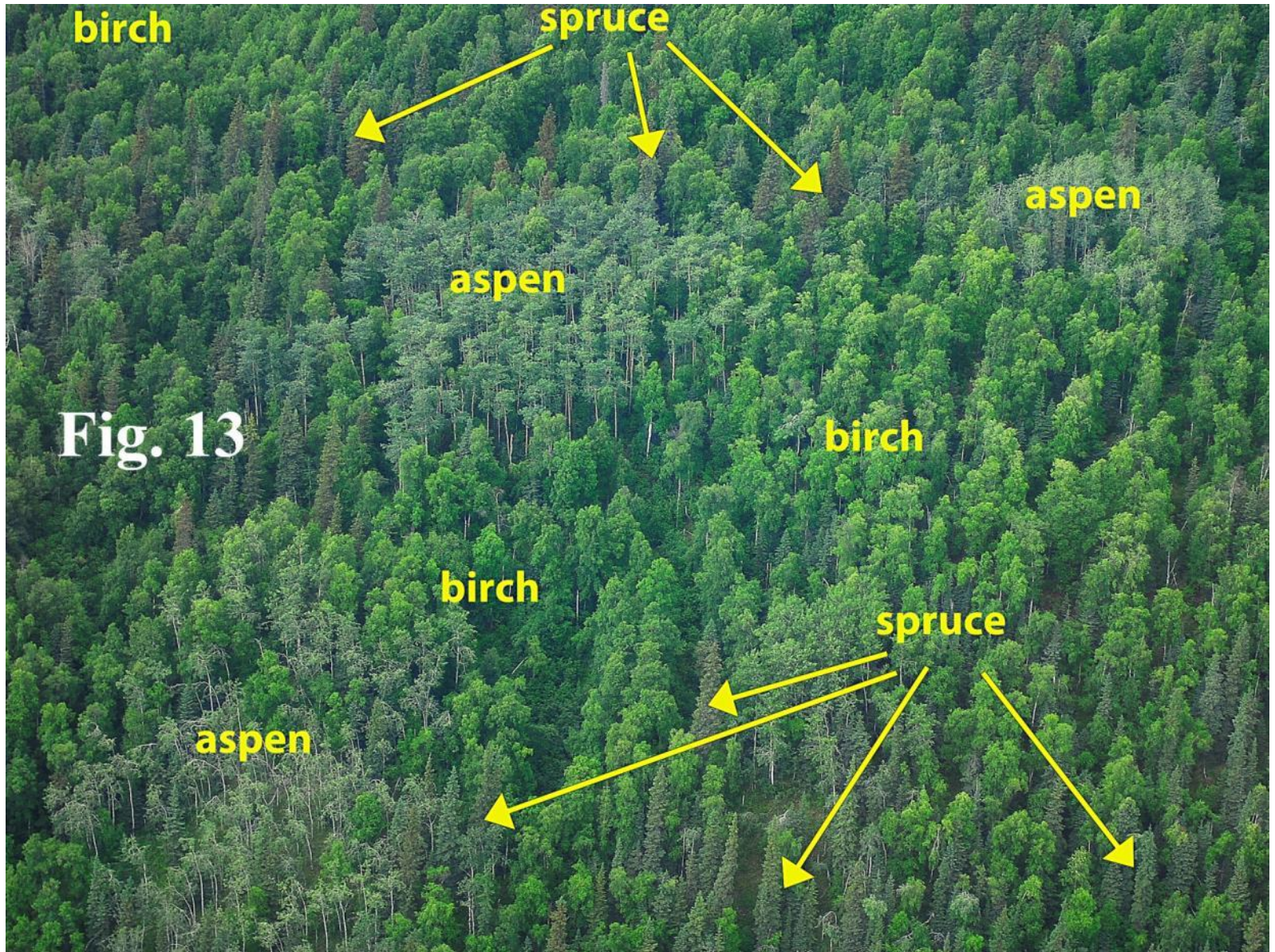


Ground

- Close-up picture
 - Can collect specimens
 - Specific agent ID possible
 - Cost per acre is high
-
- Small coverage areas
 - Limited to what we can see or walk to
 - Cost per day is low

Aerial

- Big picture-Large area
 - Rapid size-up of situation
 - Agent is often generalized
 - Cost per acre is low
-
- Weather
 - Visibility
 - Scheduling/Phenology
 - Aircraft Availability
 - Cost per day is high















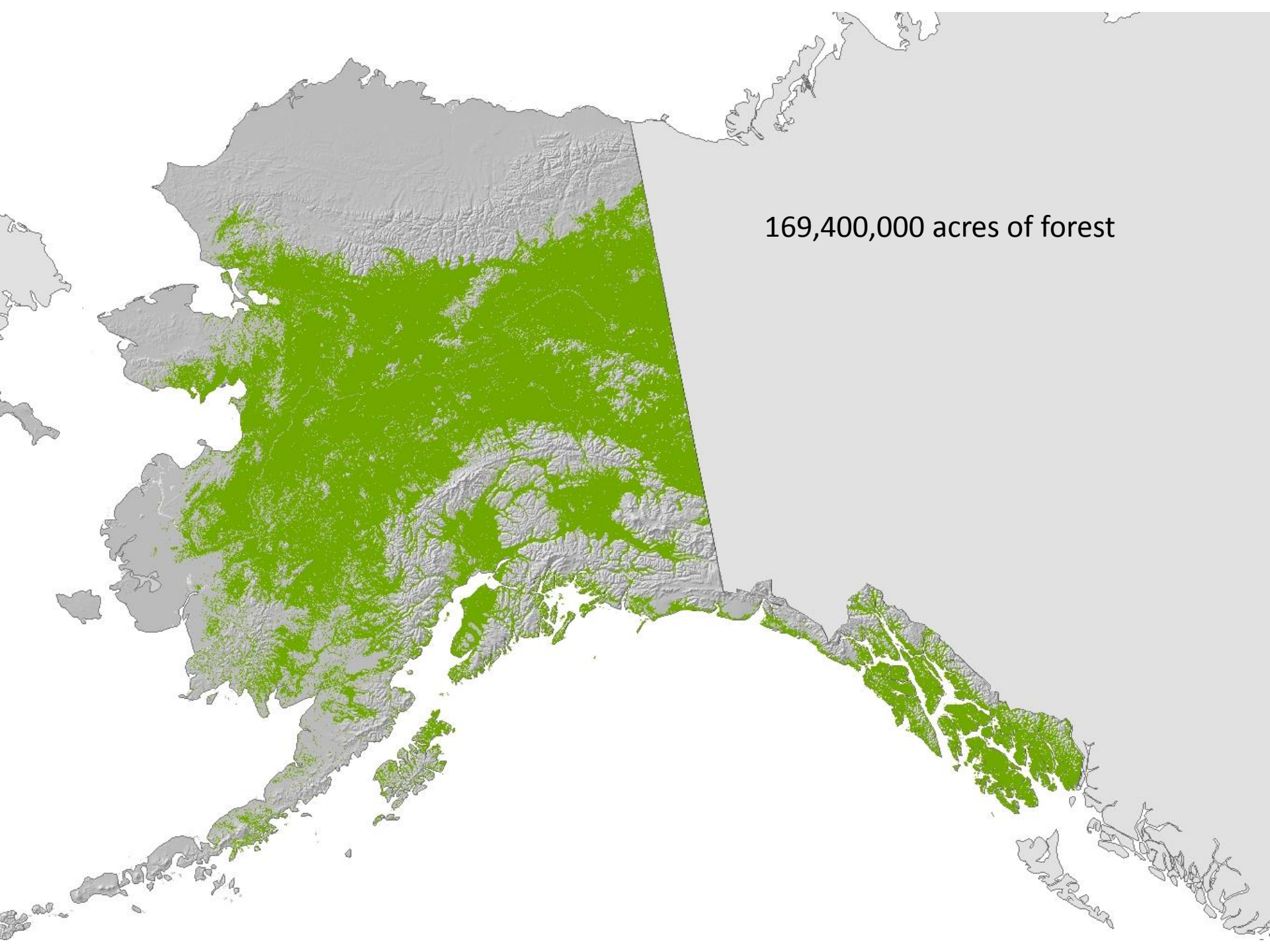




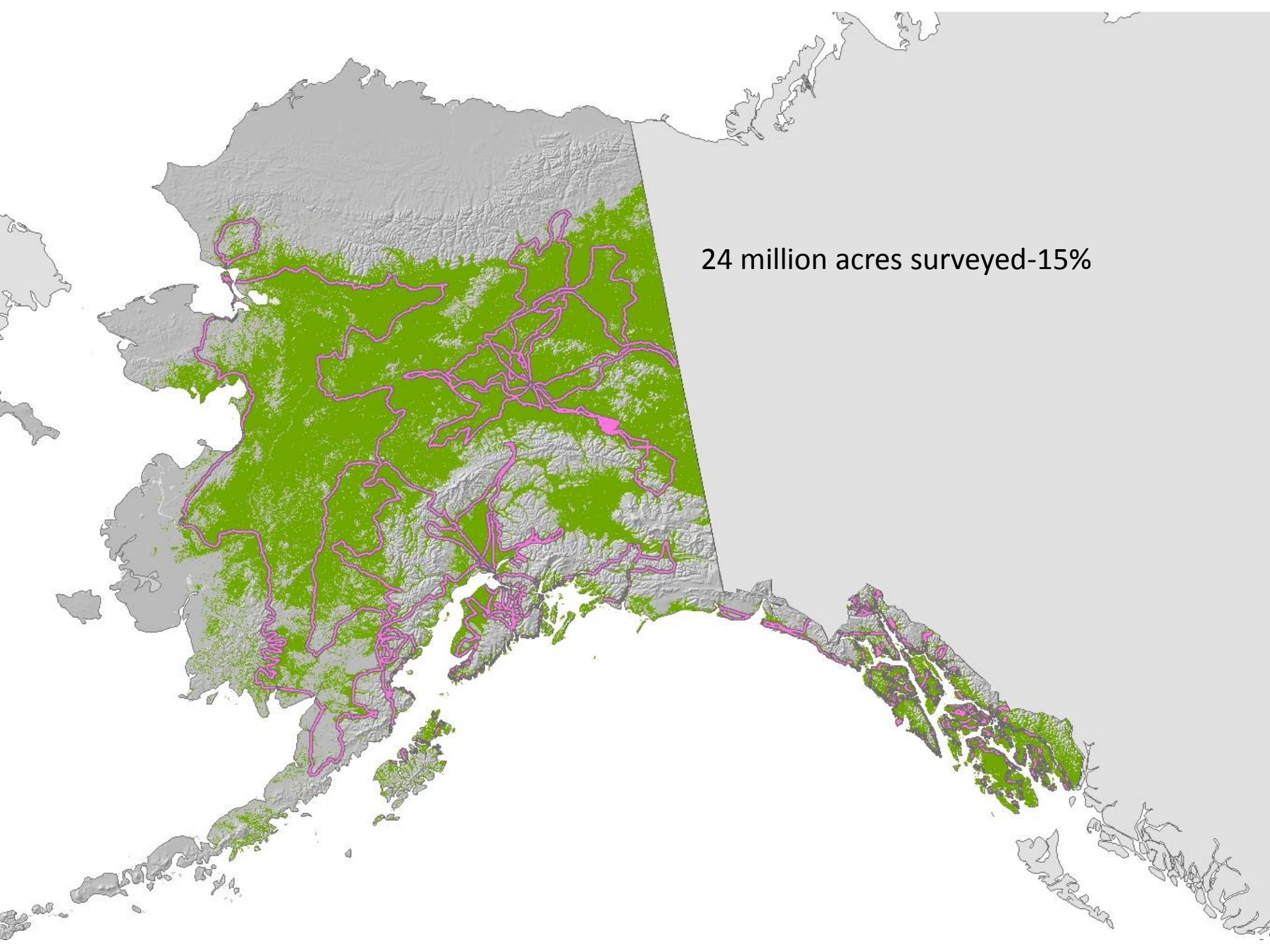








169,400,000 acres of forest



24 million acres surveyed-15%

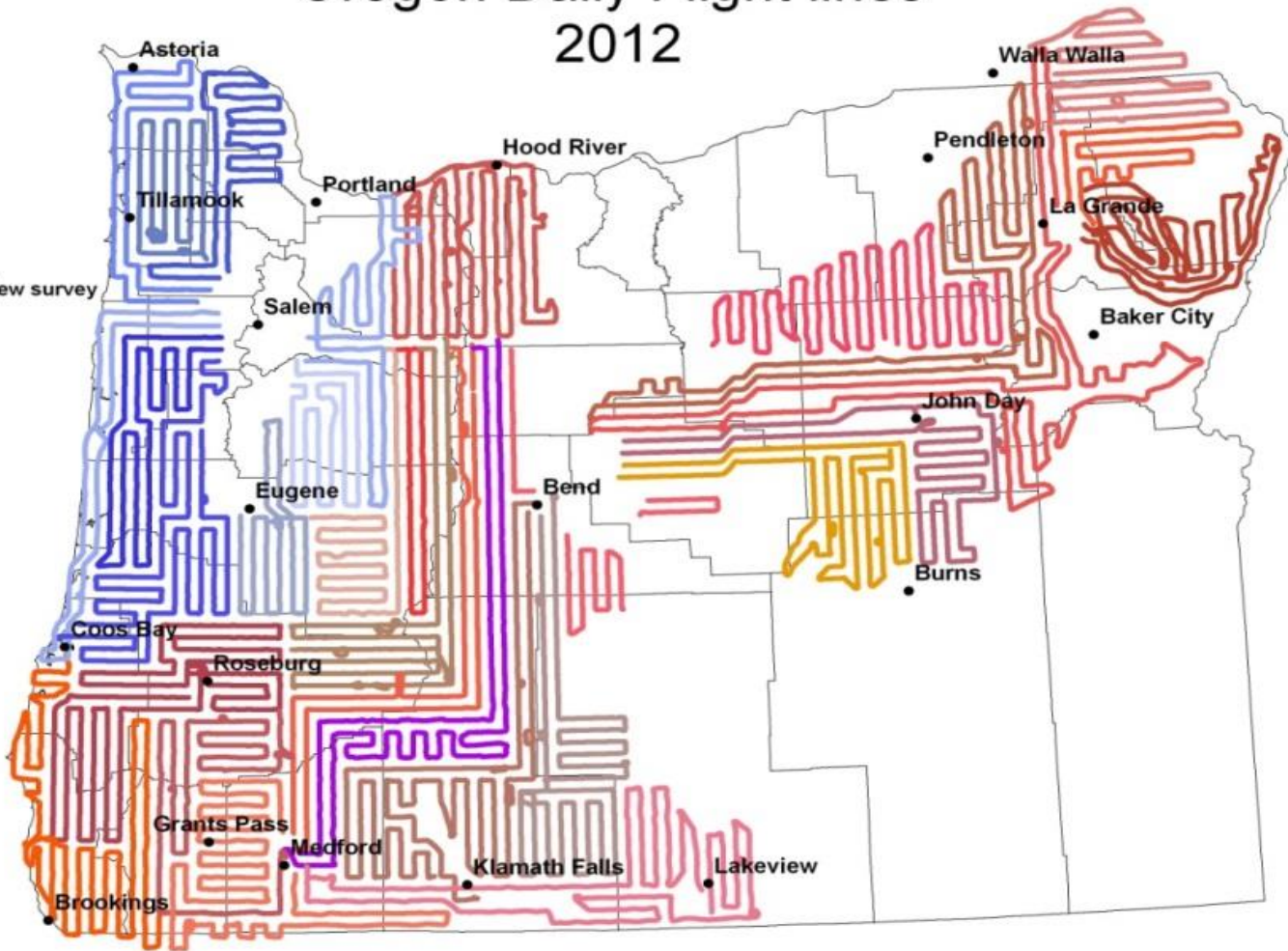
Oregon Daily Flight lines 2012

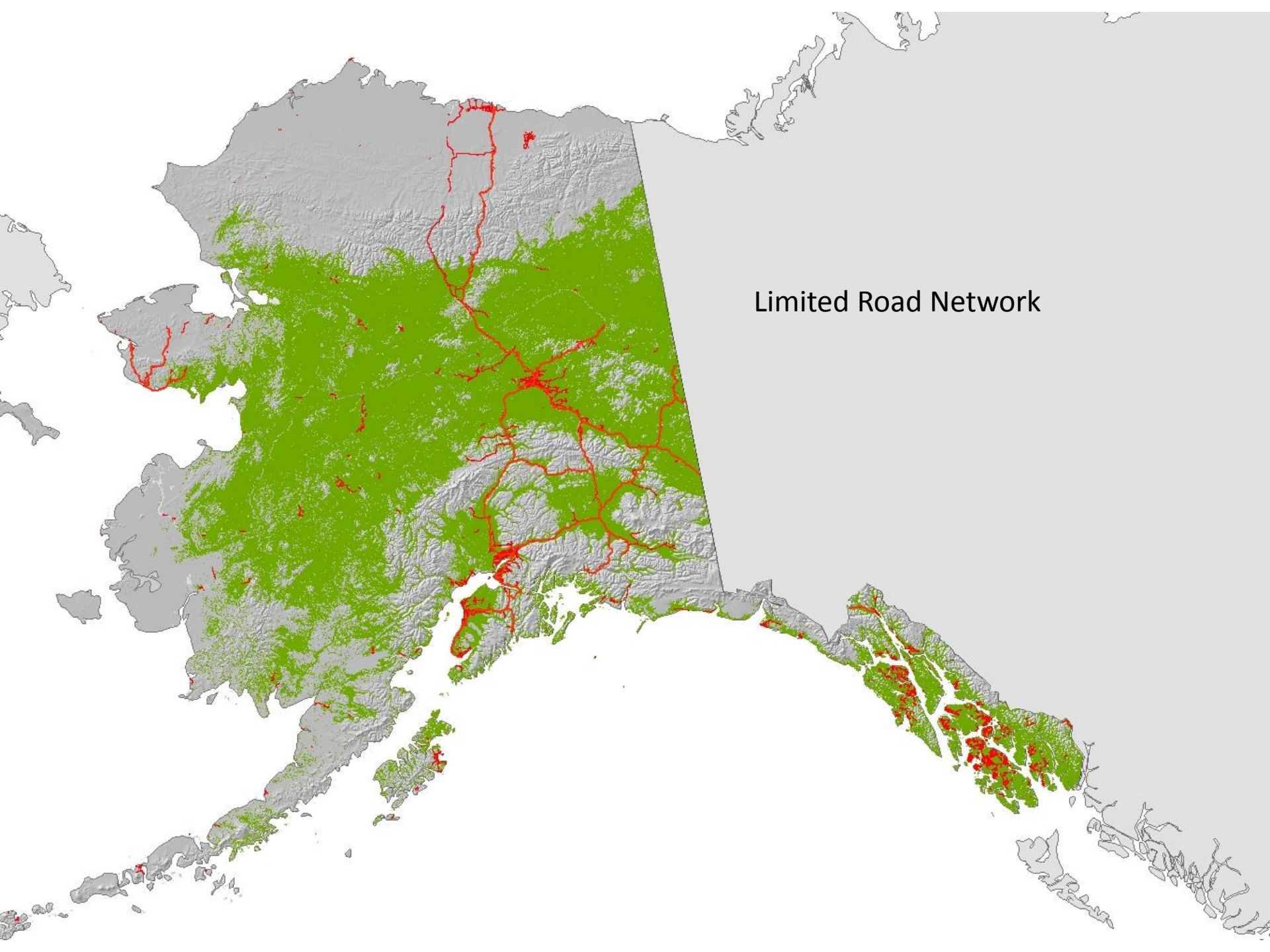
Bear survey

jun20
jul13
jul16
jul17
jul19
jul24
jul26
jul31

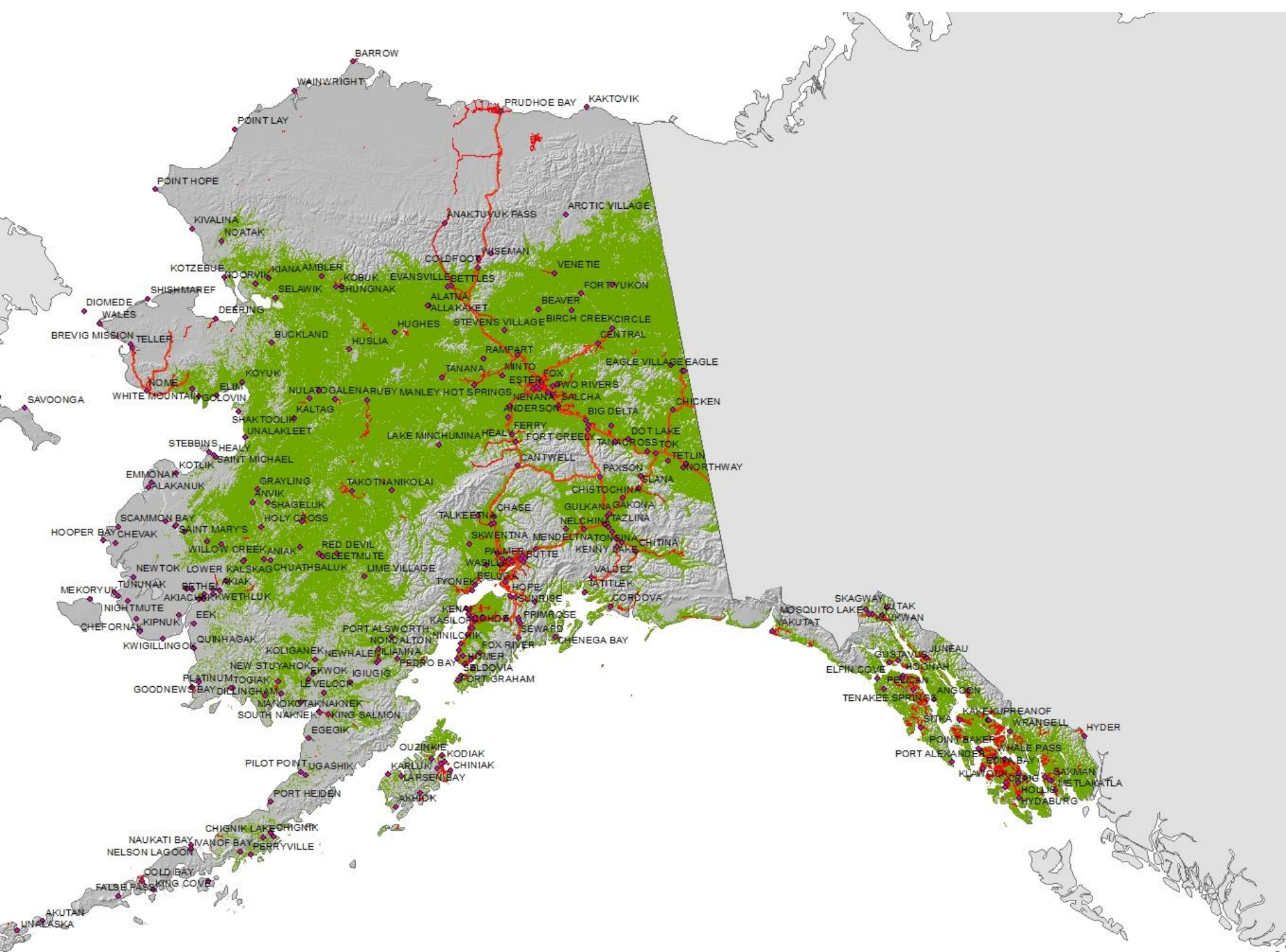
General overview survey

jul25
jul26
jul27
jul30
aug01
aug02
aug07
aug08
aug09
aug10
aug17
aug20
aug21
sep04
sep05
sep06
sep07
sep10
sep11
sep12
sep20
sep21





Limited Road Network



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Name, Organization: Contact Information:

General description of forest health concern (tree species affected, damage type, disease or insects observed).

The general location of damage. If possible, attach a marked map or provide GPS coordinates.

Please be as specific as possible, such as reference to island, river drainage, lake system, nearest locale/town/village.

Additional forest pest information information needed

Questions?

