

# 2004 Alaska State Highlights

Aerial detection mapping is conducted annually to document the location and extent of active forest insect and disease damage. These surveys (southeast Alaska, interior Alaska, and south-central Alaska) cover approximately one-fifth of the forested land in the State. Over 36 million acres throughout Alaska were surveyed in 2004. This marks an approximate 40 percent increase in acres surveyed over previous years. In 2004 forest damage, from insect, disease and select other abiotic factors, totaled 1,178,743 acres. Above average temperatures and below average precipitation in 2004 has contributed to stressed forest conditions, prime for many types of insect and disease damage.

## Insects:

There was a 40 percent increase in active spruce beetle *Dendroctonus rufipennis* (Kirby) infestations in 2004. The majority of this increase occurred in the Seward Peninsula where more than 80,000 acres of infested spruce were detected. This outbreak has been on-going for at least three to five years. Northern spruce engraver *Ips perturbatus* (Eichhoff) populations increased four-

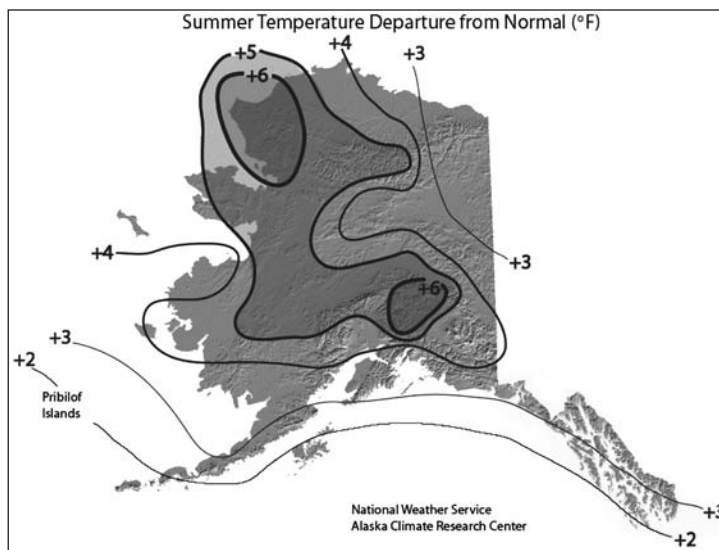
fold in 2004, especially in interior Alaska. Western balsam bark beetle *Dryocoetes confusus* Swaine is responsible for subalpine fir mortality in the Skagway river watershed, northeast of Skagway. Weather records show conditions have become more favorable for beetle development for this area in recent years.

Spruce budworm *Choristoneura fumiferana* (Clemens) defoliation as well as larch sawfly *Pristiphora erichsonii* (Hartig) defoliation increased in 2004 in interior Alaska. Further increases by both of these defoliators are expected in 2005. In 2004, there was an increase black-headed budworm *Acleris gloverana* (Wlsm.) activity in southeast Alaska.

Spruce aphid *Elatobium abietinum* (Walker) defoliation in southeast Alaska declined by 75 percent in southeast Alaska. Thirty-nine percent occurred on National Forest Lands and primarily on the western and southwestern beach fringe of Prince of Wales Island.

The largest outbreak of aspen leaf miner *Phyllocnistis populiella* Chambers on record in Alaska continues and has expanded in 2004. Activity on 584,405 acres was mapped state-wide in 2004. Leaf miner activity continues in the Yukon Flats National Wildlife Refuge, and has expanded in the Fairbanks and Upper Tanana River Valley. Birch leaf roller *Epinotia solandriana* (L.) infestations decreased by 80 percent over 2003 levels. The largest infestation continues north of Tyonek in south-central Alaska.

Due to continued mild weather conditions, insect defoliator populations increased around the Anchorage area with noticeable damage to alder species. Damage was noted from Palmer to Seward, but heaviest in the Anchorage Bowl. The primary defoliator of thin-leaf alder was the introduced alder wooly sawfly *Eriocampa ovata* (L.).



**Figure 1.** Alaska experienced record-breaking temperature throughout the state this summer.

Amber-marked birch leaf miner *Profenusa thomsoni* (Konow) populations once again exploded in south-central Alaska. More than 138,000 acres (vs. 32,000 acres in 2003) of heavily defoliated birch were detected this year. This introduced insect has now spread north and south of Anchorage to Soldotna, on the Kenai Peninsula. Ground surveys detected low levels of leaf miner activity in Fairbanks. Ground surveys have also detected leaf miner activity in Haines and Skagway in southeast Alaska. A biological control program, the release of a hymenopteran parasitoid, is underway.

Other 2004 introduced insects of interest are: (1) one male European gypsy moth *Lymantria dispar* (L.) was trapped near Fairbanks, (2) Western tent caterpillars *Malacosoma californicum* (Packard) were once again introduced, and hopefully eradicated, in Anchorage, and (3) the European pine shoot moth *Rhyacionia buoliana* (Denis & Schiff.), was introduced on ornamental Scotch pine, and hopefully eradicated, in the Anchorage Bowl.

### **Diseases:**

The most important chronic diseases and declines of Alaskan forests in 2004 were wood decay of live trees, root disease of white spruce, hemlock dwarf mistletoe, and yellow-cedar decline. Except for yellow-cedar decline, trees affected by these diseases are difficult to detect by aerial surveys. Nonetheless, all are chronic factors that significantly influence the commercial value of the timber resource and alter key ecological processes including forest structure, composition, and succession.

In southeast Alaska approximately one-third of the gross volume of forests is defective due to stem and butt rot fungi. Hemlock dwarf mistletoe continues to cause growth loss, top-kill, and mortality in old-growth forests.

Approximately 500,000 acres of yellow-cedar decline have been mapped across an extensive portion of southeast Alaska. In 2004, several areas of active decline, totaling 13,000 acres, were noted. Yellow-cedar decline was found at numerous locations in British Columbia during a reconnaissance survey in 2004, extending the southern limits of the distribution at least 100 miles south of the Alaska-British Columbia border.

A single ornamental white pine tree was found to be infected by white pine blister rust, *Cronartium ribicola*, in Ketchikan in 2004. Later in summer, infected gooseberry (*Ribes* spp.) bushes were found in the same area. The fungus is not native to North America and, while causing devastating mortality in native white pine in some areas of the U.S. and Canada, it does not pose a threat in Alaska because of no native trees are susceptible.

A stem/branch canker pathogen of alder, tentatively identified as belonging to the *Cytospora* group was reported for the first time in 2003 killing thin-leaf alder (*Alnus tenuifolia*) stems. In 2004, ground surveys indicated the pathogen was intensifying and that Sitka alder (*Alnus crispa*) was also a host. Although, to date few alder clumps have completely died, the canker continues to spread, killing individual stems across thousands of acres in south-central and interior Alaska. Stressed plants appear more readily infected by the canker. Stress factors, though presently poorly defined, likely include drought and insect defoliation.

Cone and other foliar diseases of conifers were generally at low levels throughout Alaska in 2004, with the exception of a large outbreak of spruce needle rust on the Kenai Peninsula and near Iliamna Lake. Canker fungi on conifers, particularly on Sitka spruce and sub-alpine fir occurred at higher than normal levels and caused branch dieback in southeast Alaska. Canker fungi, except for the alder canker, were at endemic levels in south-central and interior Alaska.

In south-central and interior Alaska, tomentosus root rot continues to cause growth loss and mortality of white spruce in all age classes. For the first time, tomentosus root rot was reportedly found in southeast Alaska, infecting Sitka spruce near Dyea. Since this is the first report, continued surveys and identification of conks will continue in 2005 to confirm the presence of tomentosus root rot in southeast Alaska. Various stem and butt rot fungi cause considerable defect in mature white spruce, paper birch and aspen stands. Saprophytic decay of spruce bark beetle-killed trees, primarily caused by the red belt fungus, rapidly develops on and degrades dead spruce trees.

**Table 1. 2004 forest insect and disease activity as detected during aerial surveys in Alaska by land ownership<sup>1</sup> and agent<sup>2</sup>.**

Damage Agent	National Forest	Native Corp.	Other Federal	State & Private	Total Acres 2004
Alder decline	251	1,807	919	6,377	9,354
Aspen leaf miner	0	94,092	144,709	345,605	584,406
Birch leaf miner	0	1,702	11,439	125,694	138,834
Birch leaf roller	0	11,798	3,059	2,992	17,849
Black-headed budworm	841	107	0	535	1,483
Cedar decline faders <sup>3</sup>	12,736	479	0	444	13,659
Cottonwood defoliation <sup>4</sup>	185	4,291	9,030	3,168	16,674
Ips engraver beetle	0	807	2,384	12,908	16,099
Larch beetle	0	0	4,907	6,924	11,831
Larch sawfly	0	338	4,723	9,154	14,215
Large aspen tortrix	0	348	1,524	4,445	6,317
Spruce aphid	3,431	2,512	1,177	638	7,758
Spruce beetle	1,101	99,641	15,423	12,898	129,063
Spruce broom rust	0	10	553	116	678
Spruce budworm	0	25,368	30,711	27,910	83,989
Spruce needle rust	0	87	646	236	969
Subalpine fir beetle	87	0	0	102	190
Willow defoliation <sup>5</sup>	0	48,874	57,658	4,667	111,199

<sup>1</sup> Ownership derived from 2004 version of Land Status GIS coverage, State of Alaska, DNR/Land records Information Section. State & private lands include: state patented, tentatively approved, or other state acquired lands, and of patented disposed federal lands, municipal, or other private parcels.

<sup>2</sup> Table entries do not include many of the most destructive diseases (e.g., wood decays and dwarf mistletoe), which are not detectable in aerial surveys. Some forest damage acres are not shown because a specific agent could not be identified. Damage acres from animals and abiotic agents are also not shown in this table.

<sup>3</sup> Acres represent only spots where current faders were noticed. Cumulative cedar decline acres can be found in Table 6.

<sup>4</sup> Significant contributors include cottonwood leaf beetle and leaf rollers. Acreage where both willow and cottonwood defoliation occurred concurrently is included in these totals.

<sup>5</sup> Significant contributors include leaf miners and leaf rollers for the respective host.

**Table 2. Affected area for each host group and damage type over the prior five years and a 10-year cumulative sum**

Host Group/ Damage Type <sup>1</sup>	1999	2000	2001	2002	2003	2004	Ten Year Cumulative <sup>2</sup>
Alder defoliation <sup>3</sup>	1.8	5.6	1.2	1.8	2.8	10.5	23.6
Aspen defoliation	13.4	12.6	9.4	301.9	351.4	591.5	1,287.0
Birch defoliation	2.8	2.8	3.2	83	217.5	163.9	667.6
Cottonwood defoliation	5.6	5.4	9.9	19.9	13.1	16.7	85.5
Hemlock defoliation	0.1	5.2	1.3	1.4	0.2	0.5	28.4
Hemlock mortality	0	0	0.1	0.2	0	0.0	0.6
Larch defoliation	159.5	64.9	17.8	0	0.6	14.2	1,569.8
Larch mortality	18.4	0	0	4.8	22.5	11.8	57.4
Spruce defoliation	5.1	84.7	61.1	11	61.5	93.4	777.4
Spruce mortality	258	120.9	104.2	53.6	92.8	145.2	3,353.1
Spruce/Hemlock defoliation	0.1	0	50.7	3.4	15.1	1.5	111.0
Spruce/Larch defoliation	0	0	0	0	0.3	0.0	2.3
Subalpine fir mortality	0	0	0.1	0.2	0	0.2	0.4
Willow defoliation	181.6	36.5	10.9	0.3	83.9	111.2	623.5
<b>Total damage acres</b>	<b>646.4</b>	<b>338.6</b>	<b>269.9</b>	<b>481.5</b>	<b>861.7</b>	<b>1160.5</b>	<b>8,587.7</b>
Total acres surveyed	31,346.0	27,185.0	22,296.0	24,001.0	25,588.0	36,343.0	88,988.0
Percent of acres surveyed showing damage	2.1	1.2	1.2	2.0	3.4	3.2	9.7

<sup>1</sup> Summaries identify damage, mostly from insect agents. Foliar disease agents contribute to the spruce defoliation and hemlock mortality totals. Damage agents such as fire, wind, flooding, slides, and animal damage are not included. Cedar mortality is summarized in Table 6.

<sup>2</sup> The same stand can have active infestation for several years. The cumulative total is a union of all areas from 1995 through 2004 and does not double count acres.

<sup>3</sup> This total includes defoliation on alder from alder canker, drought and insects.

<sup>4</sup> Acres in thousands.

## **Invasive Plants:**

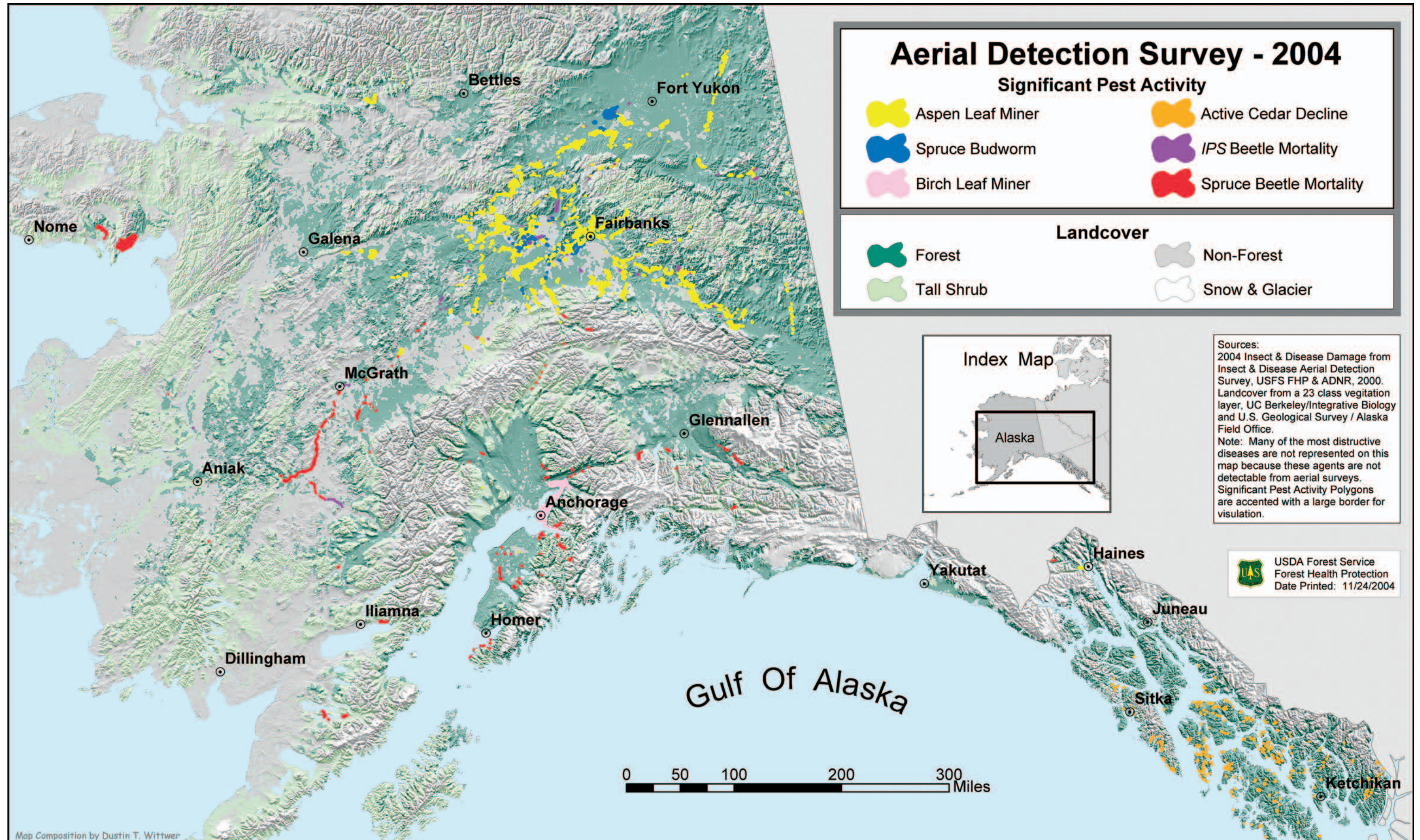
Several species continue to spread in the state. With the warmer summer, orange Hawkweed *Hieracium aurantiacum* has expanded tremendously. New infestations of spotted knapweed *Centaurea biebersteinii* were found and pulled in Anchorage and Haines, and the infestation in Valdez was pulled. A one-acre patch of ornamental jewelweed *Impatiens glandulifera* was found growing along a beach right in Haines. Bull thistle *Cirsium vulgare*, which was thought to be only at two locations across the state, has proven to be much more abundant, as additional surveys were conducted in Haines, Prince of Wales Island, Anchorage and the Matanuska Valley.

The garlic mustard, *Alliaria petiolata*, infestation in Juneau was pulled several times in the early spring, resulted in a notable reduction of new plants across the area of infestation. Unfortunately a new infestation was found on the Tongass National Forest north of town.

Many other species are being mapped across the State. Interagency and interest group inventories are coordinated for consistency and entered into a statewide GIS inventory base that FHP has helped create. As a result of these coordination efforts, Cooperative Weed Management Areas are being set up through the Soil and Water Conservation Districts to address these newly recognized forest health threats to Alaska resources.



Map 1. General Forest Pest Activity in 2004.





Map 2. 2004 Survey Flight Paths and General Ownership.

