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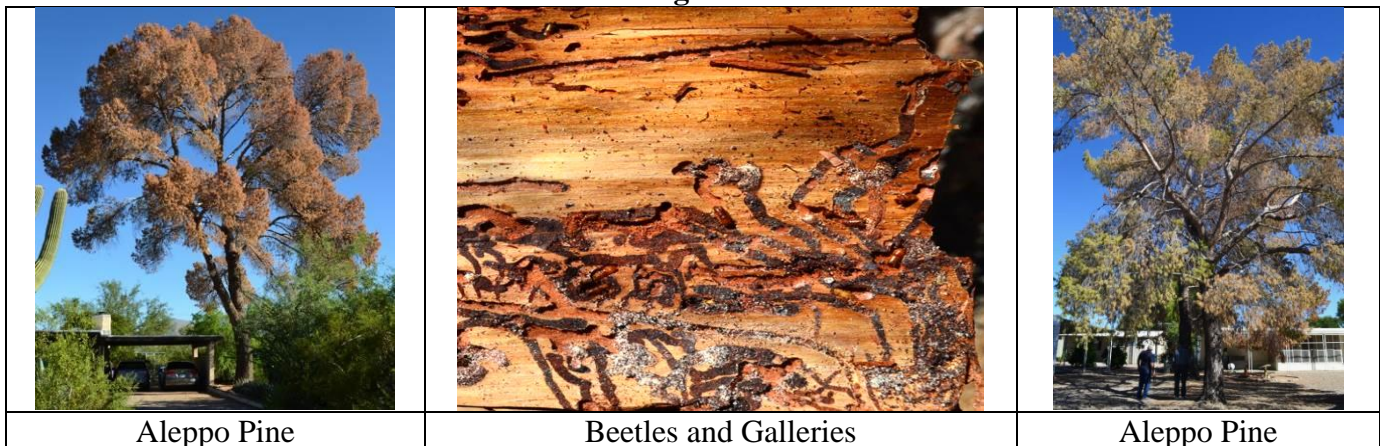
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2014 FOREST HEALTH CONDITIONS REPORT STATE AND PRIVATE LANDS

The discovery of a pine engraver beetle in the Tucson area, infesting mainly Aleppo pines, was easily the most dramatic detection in 2014. This is the first time these native bark beetles have ever been reported on a non-native pine in the Sonoran Desert, at around 2400 feet in elevation. Typically, they are found at higher elevations (4200 to 9000 feet) infesting mainly native pines. Most of the infested Aleppo pines that have been identified in the Tucson area were stressed by lack of moisture. However, many questions remain about the presence of this bark beetle in the desert.

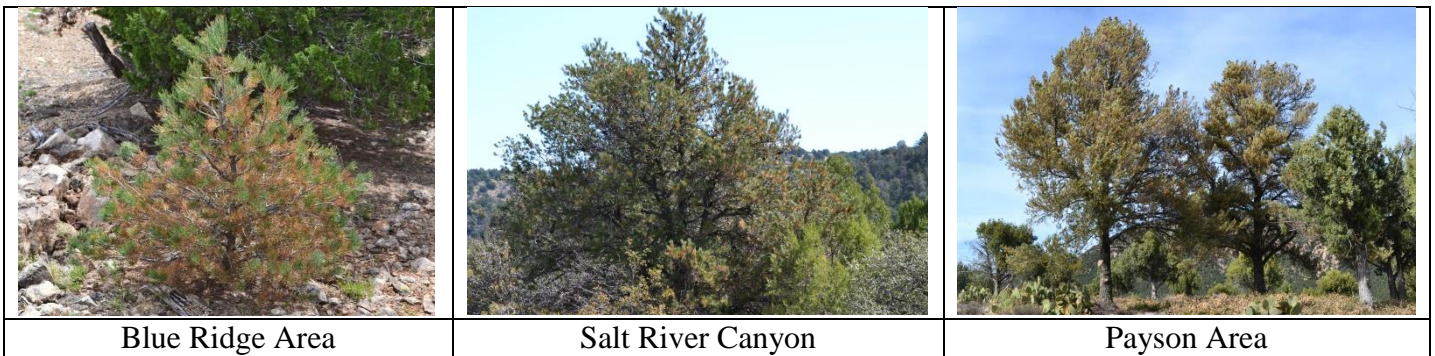
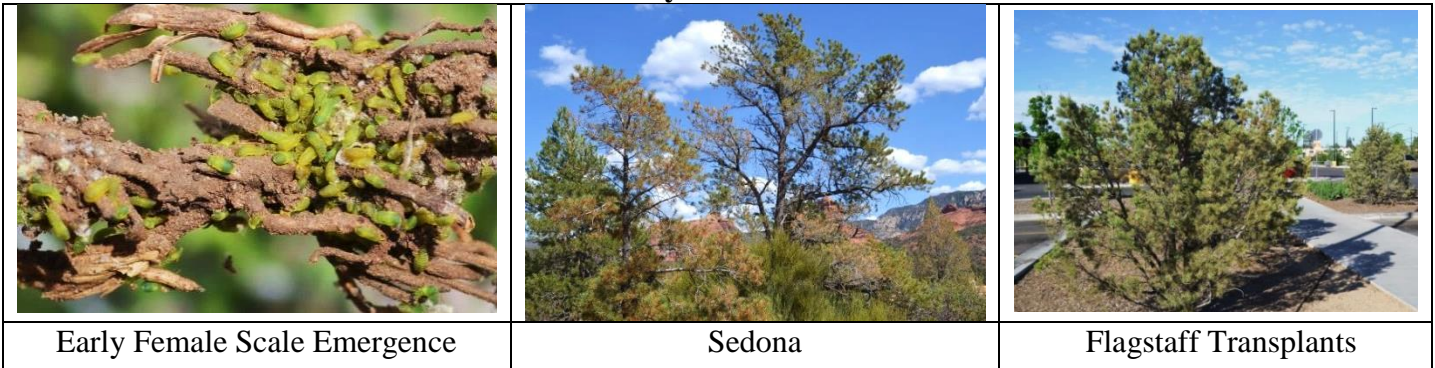
Pine Engraver Beetles



The spread of pinyon needle scale, a native defoliating insect in the pinyon-juniper woodlands, continued unabated in several areas of the state in 2014. In addition, due to the very warm temperatures experienced at the beginning of the year, the life cycle for this complex insect was about a month ahead of schedule. The infested pinyon pine transplant first detected in Sedona in 2012 was just the opening act for this scale insect. They have now been found in several areas in and around the community on both transplanted and native pinyon pines, and have the potential to spread widely. In June, these insects were also detected for the first time on transplanted pinyons at one site in Flagstaff. Scattered, small infested pinyons were also detected for the first time in a community in the Blue Ridge area northeast of Pine-Strawberry. A larger pocket of pinyon needle scale discoloration and defoliation was also noted north of the Salt River Canyon along Highway 60 in Gila County.




The chronic pinyon needle scale population found over thousands of acres in the Prescott area continued largely unchanged in 2014. While the pinyon needle scale infestation first noted in southeast Payson in 2007, covering about 100 acres, has spread widely into several new areas in and around town. An estimated 4000-5000 acres have been infested in this area as of 2014.

Pinyon Needle Scale



A pinyon needle cast disease was noted mainly on the north side of Nutrioso near a reservoir in June. Even though precipitation levels were down in this area the first half of the year, the higher humidity around the reservoir likely provided the right conditions for the spread of this disease. Banded and discolored needles were very visible on infected pinyons, along with extensive needle loss on some trees. Recovery of infected trees occurred quickly after new needles were produced by the trees later in summer.

Pinyon Needle Cast Disease

		
Needle Discoloration	Discolored	Pinyons

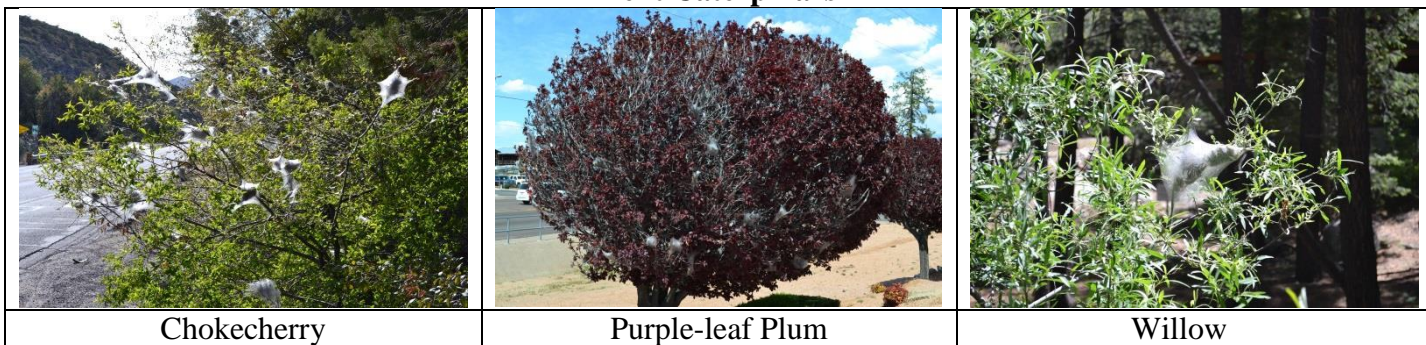
A number of aphid species were identified in spring mainly on pinyon and ponderosa pines in the Payson and Prescott areas. The clear resinous flows produced by the pines caused by the feeding activity of the insect, and secondary discharge of excess fluids by the aphids, could be clearly seen on the needles and twigs. The resinous fluids quickly became a medium for the development of a black sooty-mold fungus, covering the needles and twigs with a black patina. In addition, predatory lady beetle adults and their eggs, larvae and pupae were noted on the aphid-infested pines. In June, a colony of pinyon aphids was also noted in Nutrioso, protected by ants from predation.

Aphids

		
Honeydew & Resin	Lady Beetle Pupa	Pinyon Aphids & Ants

Tent caterpillars were active in 2014 in late March and April in Globe, and the Payson and Prescott areas mainly on chokecherry and cottonwood. In addition, at one site in Payson they thoroughly enveloped several purple-leaf plums with their webbing. Their tents were also very numerous on Emory and AZ White oaks, northbound on highway 87 just before entering Strawberry. Tent caterpillars were next detected on the Catalina Mountains on aspen and willows in late May. Most of their activity noted on the mountain started from just below Summerhaven to the Mt Lemmon Ski area.

Tent Caterpillars






The identification of *Elytroderma* needle cast disease in the Greer area in late March was prompted by the presence of several characteristic witches' brooms, in the lower half of the canopy of several ponderosa pines. Reddened, dead 1-year-old needles within the broom were also classic symptoms observed. The trees were growing along the edge of a meadow bordered by a stream, an ideal environment for wind and rain in late summer and fall to promote needle infection by the spores. The infected needles infect the twigs and become perennial on the tree, which is unusual for needle cast fungi. Recurring infection will also produce the characteristic broom due to the abnormal production of many small twigs.

Elytroderma Needle Cast Disease





Fall webworm populations were detected late in summer on a number of hosts, and were common in northern Gila County feeding mainly on AZ walnut. Heavily defoliated chokecherries were noted along highway 87 south of Pine. The webbing produced by the caterpillars was also found on coyote willow and white poplar in Strawberry. Fall webworm was again found on AZ alder in the community of Summerhaven in August, along with AZ Walnut near the Palisades visitor center. They were found for the third year in a row feeding on a blue elderberry west of the Blue Ridge area in Coconino County.

Fall Webworm

		
Chokecherry	Coyote Willow	AZ Alder

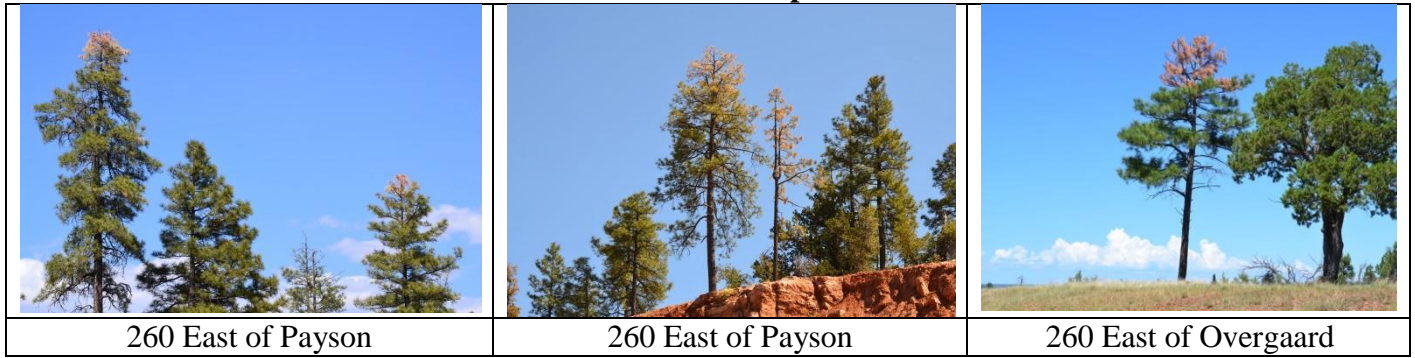
An oak twig pruner has been noted in several areas of the state for several years, killing mainly small twigs caused by the boring activity of the larval (immature) stage of a beetle. However in spring of 2014, larger dead Emory oak branches were noted on several trees in the Prescott area. Branches up to an inch in diameter were also found scattered on the ground near infested trees. The cut is made from the inside of the branch by the larva, which chews a smooth circular cut in the wood, leaving only the bark intact. The internally girdled branch breaks off with little effort. Although individual native oaks may be heavily pruned by the insect, entire stands of oaks are unlikely to suffer any serious damage. Efforts are underway to identify the species of branch pruner causing the damage.

Oak Twig and Branch Pruners

		
Flagging of Branches	Infested Branch	Girdled Oak Branch

A number of ponderosa pines were noted with dying tops along a several mile stretch of highway 260 east of Payson in spring. Most of the affected pines were along the highway or in the median, in an area which had recently undergone highway construction. Damage to the root system of pines by the construction activity, may have been the principal cause of the top dieback. A few of the dead tops also showed signs of bark beetle activity, which is not uncommon for pines with damaged roots. Similar mortality of a few ponderosa pines was also noted along about a mile stretch of highway 260 just east of Overgaard. No long term tree mortality is anticipated in the affected areas.

Ponderosa Pine Top Dieback






The ponderosa pine sawfly population first identified defoliating trees in 2012 in the Summerhaven area of the Catalina Mountains, dropped considerably in numbers in 2014. No pine mortality has been noted on the approximately 150 acres mapped in 2012. Eggs laid by the adult sawflies on pine needles were noted for the first time on a few trees in June. This may be the end of the localized eruption of these insects and populations may be returning to endemic levels.

Ponderosa Pine Sawflies






Pine engraver beetle populations in the forests and woodlands in the state have been generally low since 2011, and associated mainly with recent large forest fires. However, a localized eruption was detected in the Bear Canyon Recreation area at 6000' in elevation on the Catalina Mountains in 2014. A single infested ponderosa pine was first noted at the end June in this area, but by late August several hundred pines were dying from the effects of these bark beetles. The lack of winter snow and reported delay in the monsoons in 2014 may have triggered this beetle eruption. The typical pattern for these insects is to rapidly infest a large number of trees in one year, and then to return to normal levels the following year.

Pine Engraver Beetles

		
Pocket of Infested Pines	Bark Beetles and Galleries	Pine Mortality

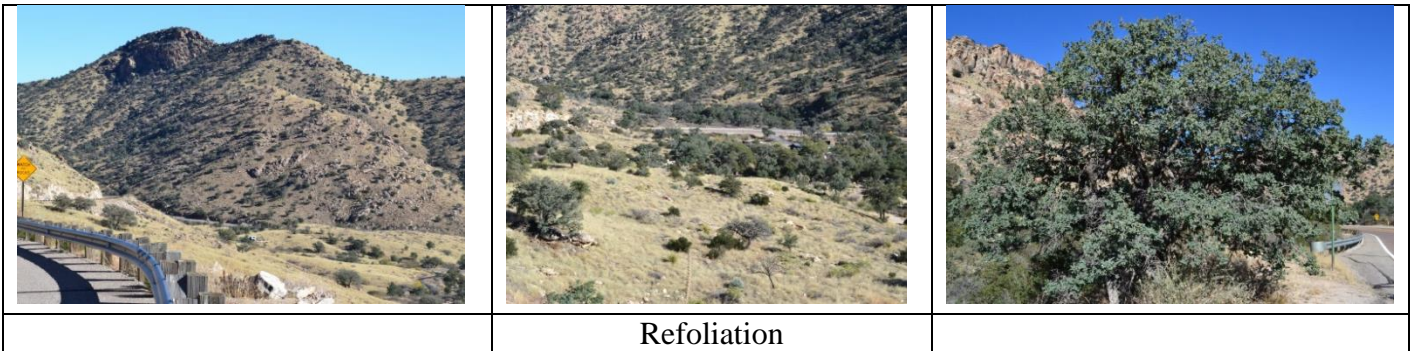
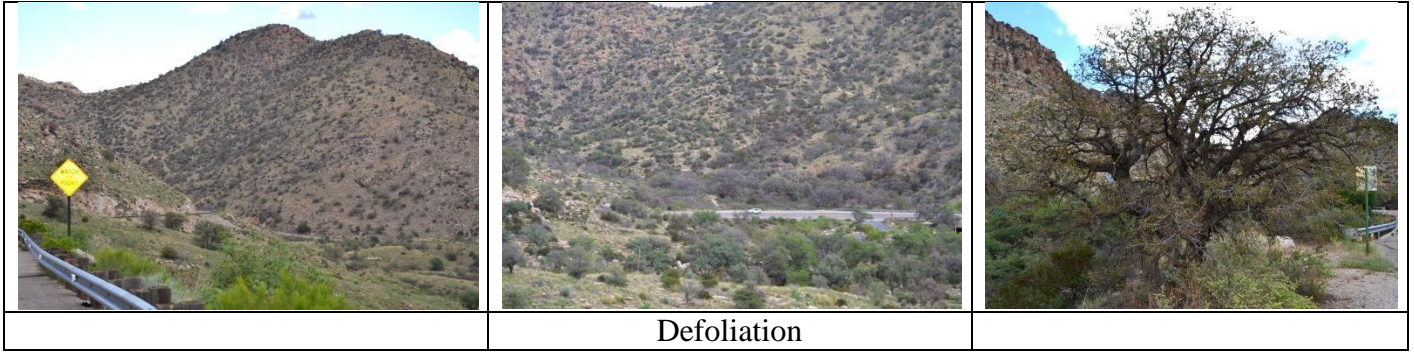
The native leafhopper which have been discoloring and defoliating Arizona walnuts in northern Gila County in late summer for several years was noted again in large numbers in the Pine-Strawberry area. The discolored leaves on large walnuts and the excess moisture secreted as honeydew by the insect were very noticeable on the leaves. Scattered populations were also found in other parts of the state in 2014.

Walnut Leafhoppers

		
Adult & Immature Leafhoppers	Honeydew	Discolored Walnut

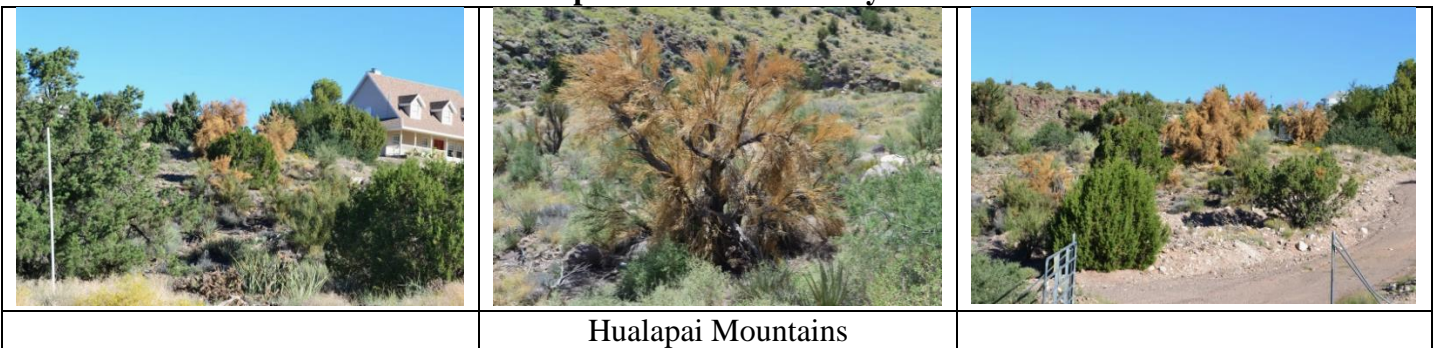
Very noticeable native oak leaf discoloration and defoliation was noted over a large area in the Molino Basin area on the Catalina Mountains in late August 2014. Unlike typical oaks which drop their leaves in fall, these oaks are classified as spring deciduous, dropping all their older leaves and replacing them by early summer. Apparently, due to the reported delay in the monsoons in the area, the oaks dropped their leaves a second time but re-foliated by the end of September.

Oak Discoloration and Defoliation



Scattered mortality of small ephedra trees has been observed on the northwest side of the Hualapai Mountains near Kingman, for a couple of years. Most of the mortality has occurred at the lower elevations on the slopes of the mountain. Drought may be the principal stressor triggering the mortality but the causal agent(s) is unknown.

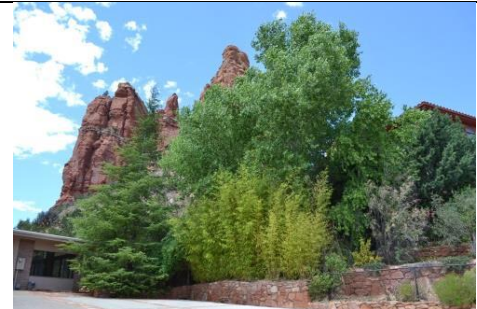


Ephedra Tree Mortality



A variety of non-native invasive plants, miscellaneous insects and pathogens were also encountered in 2014.

Yellow bamboo continues to be planted as an ornamental in spite of its ability to sprout profusely from the roots. Natal grass continued to climb up the Catalina Highway from the Gordon Hirabayashi Recreation Site in 2010, to the Seven Cataracts Vista area in 2014—a distance of about 1.5 miles.

Invasive Plants

		
Yellow Bamboo-Sedona	Yellow Bamboo-Payson	Natal Grass-Catalina Hwy

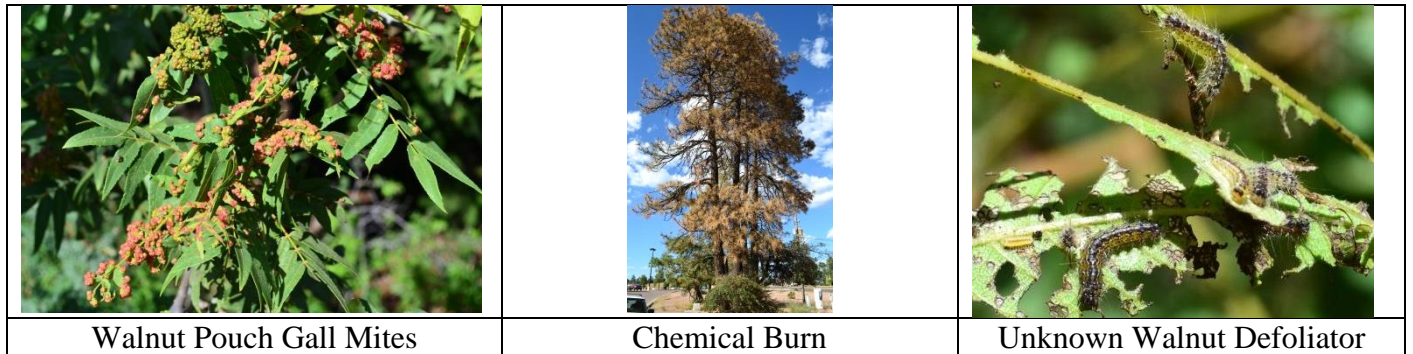
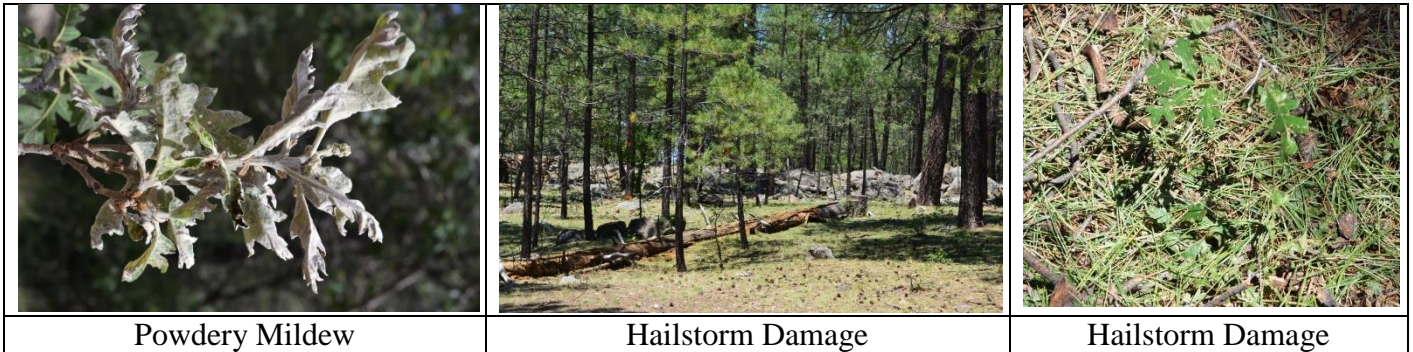
Two different types of juniper galls, produced by midges were seen for the first time in West Sedona and Highway 260 west of Clay Springs in spring. Colonies of spiny elm caterpillars were spotted defoliating a Siberian elm growing alongside the road leading to the community of Walker. Scattered flagging or branch dieback of Leyland cypress, possibly caused by Seiridium canker, was noted in the Village of Oak Creek community in early June. European elm scale was detected for the first time in Alpine in a group of American elms. Pinyon pitch nodule moth was detected for only the second time in the community of Nutrioso.

Miscellaneous Insects and Pathogens

		
Juniper Galls-Clay Springs	Juniper Galls-Sedona	Spiny Elm Caterpillar-Walker Rd

		
Possible Seiridium Canker	European Elm Scale	Pinyon Pitch-Nodule Moth Pupa

Powdery mildew on a Gambel oak was observed for the first time along the Catalina Highway in late June. Localized hailstorm damage to ponderosa pine and Gambel oak was visible along Highway 87 north of Pine-Strawberry in July. Walnut pouch gall mites were identified near the community of Portal and Williamson Valley area in summer. A second unknown defoliator of walnuts was seen in Cave Creek Canyon in the Chiricahua Mountains in late August. A group of ponderosa pines, oaks and junipers were severely damaged by an unknown chemical agent introduced into the soil in the Payson area.



The very wet monsoon experienced in 2014 in most areas of the state for the second year in a row, very likely contributed to the presence of many of the insects, pathogens and invasive plants seen during the year.

For further information about any of the detections in this report, contact Bob Celaya, Forest Health Specialist, Arizona State Forestry Division at 602-771-1415 or bobcelaya@azsf.gov

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