NEVADA FOREST HEALTH HIGHLIGHTS 2019

The Forest Resource

Nevada is unique because its 11.1 million acres of forest and woodlands is found largely on 314 forested mountain "islands" separated by wide non-forested basins. Some of the non-forested valley bottoms have narrow, meandering ribbons of riparian forests along creeks and rivers. Additionally, the State has two significant urban forests, which include the cities of Reno and Las Vegas. There are many smaller community forests in widely spread cities and towns across the state. The area of forest land is small in comparison with other western states; however, they are very important natural ecosystems for Nevada. Traditional means of calculating the economic value of forest products, like commercial timber, would not account for very much. The value of the forest resource is disproportionately large in terms of non-extractive uses such as wildlife habitat, recreational use, human health, watershed, and aesthetic properties. Maintaining healthy wildland and urban forests through science-based management practices allows them to continue providing multiple uses and benefits to Nevada's diverse population. Nevada's forests include riparian hardwoods, pinyon and juniper woodlands, mixed conifer forests, and alpine forest cover types. Together with the urban forests in the state's communities, Nevada's forests are a critical resource in this arid and sparsely forested state.

The most extensive forest or woodland type is the pinyon-juniper woodlands that account for slightly more than 12% of the land area in the State and 76% of the total forested or woodland areas. The other four naturally forested types are high elevation alpine forest, mixed conifer, quaking aspen, and riparian floodplain woodlands and nearly equal at around 4% of state land cover and five to seven percent of the forest or woodland areas in the state. Urban areas account for the smallest area and the forested areas within those are much smaller than shown in Table 1.

Table 1. Acres and percentage of Nevada occupied by forest, woodland and other ecosystems in Nevada.

Ecosystem	Private/Local Acres	State Lands Acres	Tribal Acres (BIA/Trust)	Federal Acres	Total Acres	% of Total Land Area
Cold Desert Shrub and Grasslands	3,164,267	73,998	528,545	11,037,646	14,804,456	20.93%
High Elevation Forests	17,670	5,715	987	531,977	556,349	0.79%
Mixed Conifer Forests	91,841	6,057	16,249	611,477	725,623	1.03%
Other (Playas, Water, non-vegetated, irrigated Ag)	1,407,363	78,860	187,208	2,424,387	4,097,819	5.79%
Pinyon-Juniper Woodlands	376,336	11,912	61,574	8,078,068	8,527,889	12.06%
Quaking Aspen	94,798	1,873	9,268	575,389	681,328	0.96%
Riparian and Floodplain Forests and Woodlands	99,419	3,784	8,924	645,553	757,680	1.07%
Sagebrush Ecosystems	2,911,523	34,591	413,059	21,584,888	24,944,060	35.27%
Urban Environments	237,754	1,531	5,261	34,263	278,809	0.39%
Warm and Hot Desert	631,900	88,928	90,779	14,536,486	15,348,093	21.70%
					% TOTAL	100.0%

More detailed information is available from the Interior West FIA.

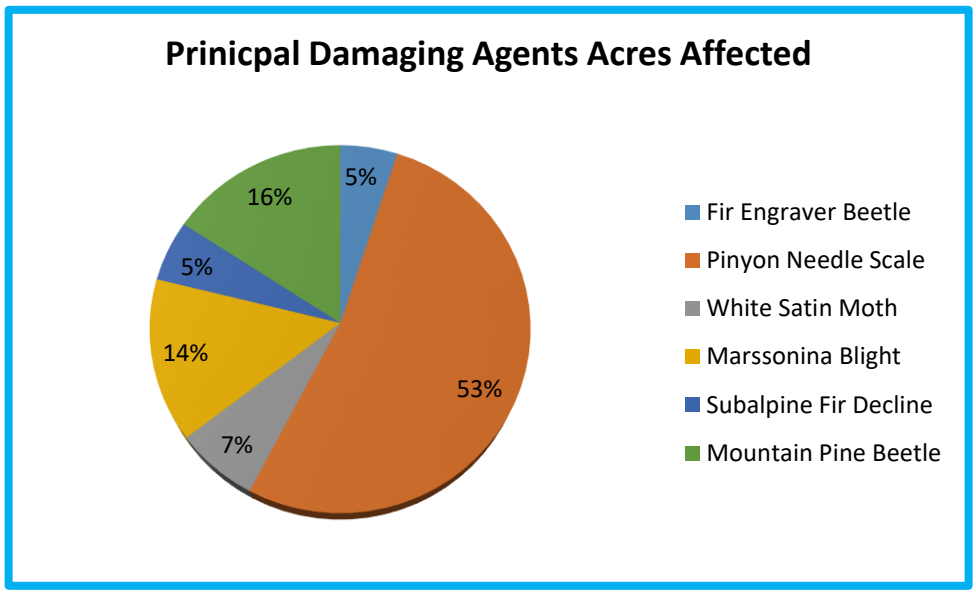
Forest Health Highlights

Nevada's forests are host to many common pests which damage western forests. Widespread stress to trees, brought on by drought is a concern most years in Nevada. For example, droughts weaken individual trees by reducing their vigor and ability to "pitch out" bark beetles when they attack trees. This creates favorable conditions for native and non-native pests as forest cover is reduced by insect related mortality.

Forest health issues occurred across the state with varying severities and were tied to specific host species. However, no large-scale outbreaks were recorded in 2019. Total recorded damage was approximately 40,500 acres. This is approximately 14,000 acres less than the damage recorded in 2018. Pinyon

Needle Scale caused the most damage statewide affecting approximately 18,344 acres. Marssonina blight in aspen was identified throughout the state with damaged recorded on 7,750 acres. Damage from Mountain Pine Beetle was recorded on 5,499 acres affecting lodgepole, limber, whitebark, western white, and bristlecone pine in high elevation forests across the state. This was almost twice as much MPB damage as occurred the previous year. Some areas affected were over 100 acres which is cause for some concern, as this may indicate a growing mountain pine beetle outbreak. Stands will be monitored via aerial survey methods during the 2020 field season.

Fir Engraver beetle damage in white fir, decreased in 2019 by more than 5,200 acres. Total damage recorded is approximately 1,746 acres in the mixed conifer forests statewide.



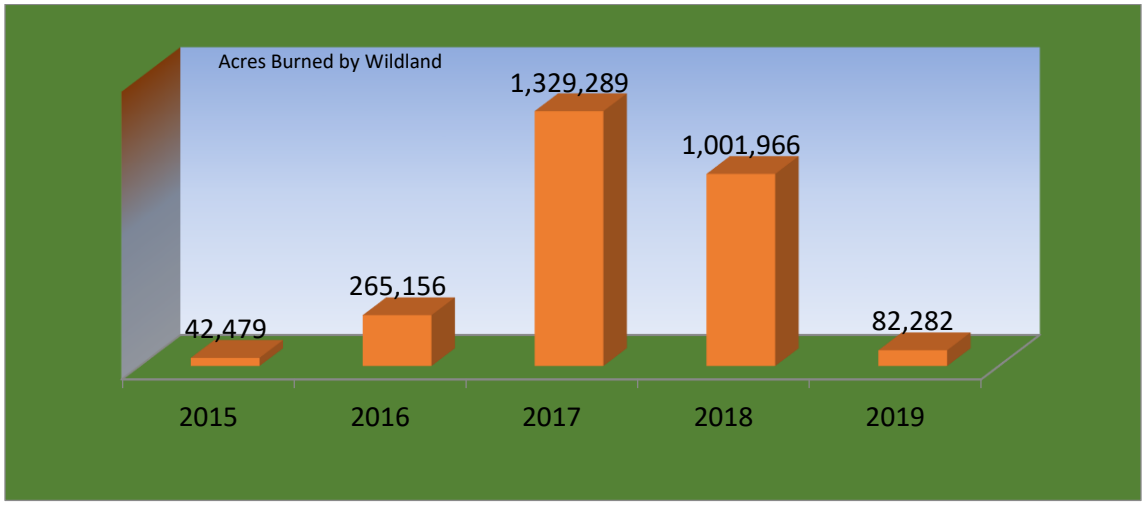
Subalpine fir decline is a root disease complex that damages sub-alpine fir and white fir, which increased slightly to 1,870 acres. This complex is mainly caused by Annosum root disease, western balsam bark beetle, and other wood borers. The majority of this damage was confined to the Jarbidge Mountains, in northeast Nevada.

White Satin Moth, a non-native defoliator of aspen, continues to be detected throughout Nevada with the greatest impacts being in Carson and Santa Rosa Ranges. Aerial surveys detected 2,399 acres statewide which is a 470 acre increase

from 2018. The primary significant change from 2018 to 2019 conditions was the decrease in the severity of defoliation. In 2019, defoliation rates were light to moderate with only 25%-50% of tree crowns being defoliated. This was likely due to the long, cold wet spring that extended into early summer. Even in early June, areas near Spooner Summit in the Carson Range showed very few active caterpillars with many larvae not even emerging as first instar caterpillars. In the previous two years, caterpillars were plentiful and very active by the end of May.

A cooperative study between the University of Nevada, Nevada Division of Forestry (NDF), and Nevada State Parks is ongoing to study the effects of the moth in Nevada's Lake Tahoe State Park. This study is investigating the effects of tree genetics, soils and water tables on levels of pest damage and will hopefully produce improved management guidelines. For additional information see the Nevada Division of Forestry web site.

Wildfire is a major change agent for Nevada's forest and rangelands. In 2019, Nevada experienced a very slow fire season. Approximately 82,282 acres were burned in 2019 as compared to 1,001,966 acres in 2018. Natural fire starts were down due to very few thunderstorms throughout the summer. Most of the fires occurred in sagebrush ecosystems, however some pinyon juniper woodlands burned, mainly in Elko County.



Forest Health Project Highlights

NDF worked cooperatively with Nevada State Parks on a pinyon/juniper sanitation thinning in Beaver Dam State Park. The project included the removal of pinyon blister rust and juniper pocket rot infected trees from a dense 17-acre stand adjacent to the park administrative site. This project had the added benefit of reducing fuel loads near park infrastructure, thereby reducing the risks of wildfire to the buildings and employees. Stand densities exceeded 200 trees per acre prior to thinning which reduced stands to a 30-35 foot spacing, while retaining 50-60 healthy trees per acre. The best formed, highest quality trees were left on site and created a park like stand. All slash was chipped and broadcast back onto the site. This helped retain site nutrient capital and prevent soil erosion. Firewood sized material was left for use by park staff and campground users. All work was completed by NDF Conservation Camp Crews.

Stand Density Prior to treatment in the background

Post Treatment At Park Administrative Site

Completed Treatment

NDF also completed 10 acres of Verbenone treatments on private lands southeast of Ely, Nevada. Verbenone pouches, a bag of pheromone permeated material designed to repel the mountain pine beetle, were distributed among the trees to protect high value landowner trees from bark beetle attacks that were occurring on adjacent federal land. Landowners assisted by stapling pouches to trees at a thirty-foot spacing on the perimeter of their property to provide a protective buffer zone. They also replaced the pouches as they lost efficacy. Additional verbenone pouches were installed mid-summer by the landowners. Monitoring in fall 2019, showed that the verbenone was successful in preventing attacks on lodgepole and

pinyon pines from Mountain pine beetle and pinyon engraver beetle. Additional treatment in 2020 may be carried out depending on bark beetle activity on adjacent federal lands.

NDF also completed a cooperative restoration project with the Southern Nevada Water Authority (SNWA) in Clark County Wetlands Park, located in Henderson, Nevada. This is a 2,000- acre urban park that has been converted into wetlands and forested areas due to the availability of water from the Las Vegas Wash. This project focused on removal of invasive salt cedar and restoration of native vegetation and trees. An NDF issued as subgrant to SNWA using USFS Forest Health funding, and the SNWA contracted the removal and restoration work. NDF inspected and provided quality control and to ensure prescriptions were met. All eradication work has been completed and the restoration effort is in progress. This phase of the project will be completed in the winter of 2020-2021. SNWA will monitor the site for any re-growth of salt cedar and treat with herbicide to prevent recolonization of the site.

Equipment in action

Statewide Trapping Program

NDF cooperates with the Nevada Department of Agriculture (NDA) to conduct trapping and monitoring of native and non-native insects. NDF primarily traps native bark beetles to monitor trends and populations. The focus is placed mainly on mountain pine beetle, pine engraver, western pine beetle, and fir engraver beetle. Three sites are selected statewide for the bark beetle survey. Sites are selected based on stand species composition, elevation, and risk of potential

outbreaks. Funnel lindgren traps are serviced every two weeks and samples sent to the NDA for insect identification and counts to track population trends. As observed in recent years, populations and trends have remained at endemic levels.

NDA conducts Asian defoliator, exotic wood borer surveys, gypsy moth, palm commodity survey, and pine shoot beetle surveys. Asian defoliator survey sites were selected based on host availability, use and/or risk of introduction. During the 2019 season, 320 traps were placed in 4 counties within Nevada. The traps were serviced three times, approximately once a month, and then were removed in the fall of 2019. All suspect specimens were negative for the species of concern. The exotic wood borer (EWB) survey had thirteen sites selected. Sites were selected based on high potential risk of introduction and/or observed damage conducive to target pests. Sites that had not been previously surveyed were included to provide good statewide coverage. Twenty-four 12 funnel lindgren traps, with appropriate lure(s), were placed at each EWB site, for a total of 20 traps. Each trap was serviced as close to every 30 days as possible. Samples have been processed and all were negative for target pests.

The Gypsy Moth survey was conducted with 212 delta traps with a lure for European and Asian gypsy moths and were placed in all 17 counties in Nevada. Traps were placed in May and June and removed in fall 2019. All traps were determined to be negative for either species.

The Palm Weevil Commodity Survey is very important in southern Nevada due to the number of palms used as decorative landscape and park trees. In 2019, 120 traps were placed in Clark County near Las Vegas. These traps included 40 bucket traps, 40 Jackson traps and 40 blue sticky traps. The traps were placed in areas not previously surveyed and near host trees or along likely pathways that include high use recreation areas, and ports of entry along state highways. Traps were serviced as close to every 30 days as possible. Samples were collected to determine suspect presence, and lures were replaced. All samples collected were confirmed negative for the target species.

The Pine Shoot Beetle Survey was conducted with the placement of 11 traps in seven Counties in Nevada. Sites that were previously not surveyed, had a high probability of introduction and/or had valuable resources to protect were targeted. Each trap was serviced as close to every 30 day as possible. At each service a sample was collected, and lures were changed if necessary. Samples were processed and all were negative for the target pest.

For More Information:

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