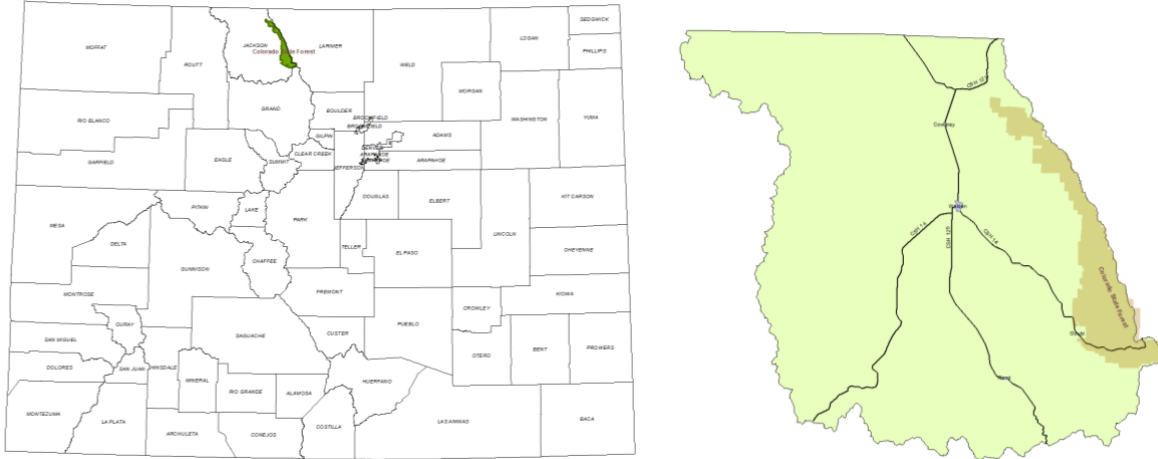


**Background:**

The Colorado State Forest was created in 1939 through a land exchange between the United States Forest Service (USFS) and the Colorado State Land Board (SLB). The initial intent was to provide the SLB with a contiguous chunk of productive forestland to generate timber revenue to fund schools and state infrastructure. It has evolved into a multi-use property, and management goals have been expanded to include a diverse group of users with interest in recreation, hunting, grazing, wildlife and water resource management.



**Location of State Forest within Colorado and Jackson County.**

**Goals:**

1. *Provide for a consistent flow of benefits and revenues to the State Trust Land beneficiaries.*
2. *Achieve and maintain a healthy and resilient forest capable of sustaining a flow of ecosystem services through a diversity of age classes, species mix and stand structure that approximate a natural disturbance mosaic.*
3. *Protect and enhance wildlife habitat while reducing wildlife-related conflicts on the Colorado State Forest and adjacent lands.*
4. *Manage for fire to achieve resource objectives and protect values at risk.*
5. *Identify and protect cultural resources.*
6. *Protect, enhance, and maintain critical ecosystem components and resources.*
7. *Encourage and provide for natural resource based education, research opportunities, and modeling of science-based forest management.*
8. *Maintain an appropriate level of transportation infrastructure*

**Desired Future Conditions Considerations:**

Current management is focused on treating stands with heavy overstory mortality resulting from the most recent outbreaks of mountain pine beetle and spruce bark beetle. This falls within the State Forest objective of increasing diversity in forest structure, age class and tree species. A forested landscape of stands differing in size, age and species composition will help to reduce the risk of insect and disease outbreak, and occurrence of catastrophic wildfire. It also ensures a diversity of habitat types, and juxtaposition that benefits wildlife. Implementing a mix of even and uneven-aged management will allow for continuous harvest that will provide revenue to the State Forest, local employment, and allow for implementation of adaptive management based on locally relevant research.

Given that mature lodgepole stands on the State Forest suffered heavy mortality from mountain pine beetle, spruce-fir will be the focus of revenue generating timber management for the next 30 to 50

years. Inventory data shows that stands harvested from the 1940's to the 1960's are overstocked. Management will focus on reducing the basal area to increase health of the residual stand. Openings will both encourage establishment of lodgepole and spruce, while releasing existing advanced regeneration. Logging to create openings in the canopy will encourage snow accumulation, both increasing water yield, and survival rates of spruce seedlings.

#### **Current Project Site Conditions:**

The ASCC project on the Colorado State Forest will focus on management of spruce-fir forest with a component of lodgepole. The study site is located between 9,200 and 10,000 feet in elevation and averages 31.6 inches of annual precipitation, with somewhat more moisture during the winter months (LOCA data set average for forest boundary 1976-2005). The area represents a range of topography from toe slopes to ridge lines, and encompasses aspects facing all cardinal directions. These forests were horse logged from the late 1940's to the 1960's, and merchantable trees >11" Dbh were harvested. Data from a preliminary cruise indicates that the overstory basal area is dominated by Engelmann spruce and subalpine fir. Stems per acre are dominated by smaller fir, while Engelmann spruce represent the largest percentage of overstory basal area. The highest level of overstory mortality is in the larger size classes of Engelmann spruce, most likely caused by spruce bark beetle. As compared with old growth stands of spruce-fir, size class distribution is skewed toward smaller trees with almost no representation of diameter class >18".

#### **Forest Health Considerations:**

Spruce bark beetle, mountain pine beetle, fir decline, lodgepole dwarf mistletoe, drought, wildfire

#### **Climate Change Considerations:**

- **Altered seasonality.** The CO State Forest is experiencing warmer temperatures, particularly hotter and drier summers, and longer growing seasons. Winter is becoming shorter and milder with less precipitation falling as snow, with earlier snowmelt.
- **Changes in precipitation patterns,** potentially less snow during the winter and/or less rain during the spring/summer that could impact regeneration and seeding survival.
- **Elevated drought risk.** Forest vegetation may face increased risk of moisture deficit and drought during the growing season.
- **Increased potential for fire.** Warmer and drier weather conditions may create conditions more suitable for uncharacteristic fire and decrease the fire return interval.
- **General increases in insect pests and forest pathogens.** Several pests, including spruce bark beetle, mountain pine beetle, and lodgepole dwarf mistletoe, currently affect many forests across the region.
- **Changes in tree species habitat.** The combination of warmer temperatures, drought, and frequent disturbance could shift the site-specific, suitable habitat for tree species across the State Forest. For example, tree species better suited to a cold climate could extend their range upward in elevation, occupying what is currently alpine habitat. Tree species that are better suited to a warmer climate and found in low density on the State Forest (Douglas-fir, aspen and ponderosa pine), could increase in their range.
- **Increases in disturbance and tree mortality** leading to changes in forest condition and composition. Many interacting stressors (weather, forests pests, invasive plants, deer herbivory, etc.) are already causing significant mortality in parts of the state.
- **Change in forest cover** is likely to affect wildlife habitat.