03.01 Walker Flats La Jicarita
2023 Post-Wildfire Immediate
Field Inventory Summary
New Mexico Forest and Watershed Restoration Institute

Photos by NMFWRI Field Crew

Submitted by

Emily Yannayon, *Ecological Monitoring Specialist*

Kathryn Mahan, *Monitoring Program Manager*

Carmen Melendez, *Crew Logistics Support*

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Introduction and Project Description

The Southwest Ecological Restoration Institutes (SWERI) includes three university-based restoration institutes: the New Mexico Forest and Watershed Restoration Institute (NMFWRI), the Colorado Forest Restoration Institute (CFRI), and the Ecological Restoration Institute (ERI) in Arizona. These institutes work together to develop a program of applied research and service to help create healthy forests, prevent wildfires, sustain the resiliency of water supplies to wildfires, and create jobs. NMFWRI is located at Highlands University (HU) in Las Vegas, NM. According to the Southwest Forest Health and Wildfire Prevention Act (P.L. 108-317), the authorizing legislation for the SWERI, the purpose of the institutes is to "promote the use of adaptive ecosystem management to reduce the risk of wildfires and restore the health of forest and woodland ecosystems in the Interior West." NMFWRI has partnered with the United States Forest Service (USFS) and other agencies to monitor more than 2,500 plots on Collaborative Forest Restoration Program (CFRP) and other restoration projects across the state since 2007. The NMFWRI's Ecological Monitoring Program maintains a professionally managed field crew to collect data on short and long-term ecosystem responses to restoration treatments. This data provides a critical scientific basis for adaptive management decisions and improved treatment effectiveness. The field crew also provides hands-on internship and training opportunities for students and recent graduates to help build New Mexico's forestry workforce.

During June through October 2010, March through June 2015, July through August 2020, and May through June 2023, the NMFWRI inventory and monitoring crews measured 34 plots across approximately 578 acres in the Walker Flats region of the Rio Mora watershed in the Pecos-Las Vegas Ranger District of the Santa Fe National Forest. The area called Walker Flats comprises three units: Corrales (198 acres) to the north and west, Walker Flats (240 acres) in the center, and Encinal (140 acres) to the south and east. These plots were established to monitor the CFRP project 03.01 entitled *"The Natural Resource Development Center Collaborative Forest Restoration Project,"* hereafter referred to as *"La Jicarita CFRP."* This project is accessible on foot on forest land via Encinal Road and NM Highway 518 northwest of Las Vegas, in Mora County, New Mexico. The site is mixed-conifer, including Douglas-fir, white fir, ponderosa pine, limber pine, and quaking aspen; and ranges in elevation between approximately 8800 - 9600 feet with gentle to moderate slopes.

La Jicarita CFRP said little about what was to happen in terms of forest restoration, only that La Jicarita and its collaborators would conduct environmentally sound forest restoration treatments in the upper Mora watershed on the Carson and Santa Fe National Forests. The grant language focused on economic and community development. A follow-on project, CFRP 03-06, proposed to restore 200 acres of forest in the Upper Mora Watershed within the Walker Flats area of the Santa Fe National Forest. Removed material was to be used for vigas, latillas, posts, chip material, and firewood.

Treatment History

The prescription written by the Las Vegas District of the USFS specified a diameter cap of 12 inches DBH; 20-foot spacing between residual trees, except where a clump or opening is left; species preference for individual trees in the residual stand in the descending order ponderosa pine, limber pine, aspen, Douglas-fir, and white fir; and 15% to 20% of the residual trees should be in clumps. Usable boles of trees were removed from the site, and slash was treated as lop-and-scatter.

Thinning work began in 2005 in the Walker Flats unit, and was completed late 2008. The Corrales unit was thinned more than 25 years ago, and additional thinning was done during Fiscal Year 2006 in the far

northern portion of the unit where NMFWRI plots are located (**Figure 4**). The Encinal unit was thinned between September 2005 and July 2006. The Encinal unit was not burned, but the remainder of the area was burned in the fall of 2008, with a prescribed fire in the Walker Flats unit and a lighter prescribed fire in the Corrales unit.

Since field work was completed, the Pecos/ Las Vegas Ranger District supplied us with a progression map of the work across the 578-acre Walker Flats area. This map indicated the following: In the Corrales unit, thinning was done in FY 2006 in the area where our plots were taken. In the Walker Flats unit, some thinning was carried out every year from FY 2005 through FY 2009. (Only one of our plots, 03.10_009, was possibly inside the FY 2009 area.) All of the thinning in the Encinal unit was carried out in FY 2005. Thus, for the purposes of a 5-year remeasure of a CFRP project, the Corrales and Encinal units are the most direct match.

The initial pre- and post-treatment monitoring was by New Mexico State University, under the direction of Dr Sam Fernald. The timber inventory protocol of that monitoring established a series of transects, with data collected at points along the transects. Data collected included slope, seedling density (on a fixed-radius mil-acre plot), and tree data (from a variable plot using a 10-factor prism, and recording species, height, and diameter breast height (DBH)). Initial measurements were made in 2003, then repeated in 2009. Other measurements (soils data, rainfall simulations, etc.) were collected over the entire area. In addition, a series of microplots that received different forest treatments and a series of range plots were intensively measured. This complete report was released as *Upper Mora Watershed Collaborative Forest Restoration Program Technical Report 2009 "Monitoring of Thinning Treatments on Forest Health"*.

The NMSU monitoring design and protocol for data collection on the microplots were different enough from our protocol that we established a new plot grid. Our remeasurement was done on a one-tenth acre, fixed-radius plots and consisted of our standard indicators: a plot description, including a 1/100th-acre plot for seedling density and ground cover estimation; tree species, heights, and diameter; fuels measurements; and photographs (see Monitoring Methods section below). NMSU did not report data by treatment unit. However, because NMFWRI is interested in the effects of forest restoration on forest health and fire effects, we present all data by treatment unit in this report.

In spring 2022, this project area burned in the Hermit's Peak Calf Canyon (HPCC) wildfire at low to moderate composite burn severity. The Hermit's Peak fire began as an escaped prescribed burn and later merged with the Calf Canyon fire which started as a winter pile burn. The Hermit's Peak Calf Canyon fire grew to become the largest and most destructive wildfire in New Mexico history at 341,471 acres. Of this footprint, 12.2% was classified as high soil burn severity, 20.6% was classified as moderate soil burn severity, 24.4% was classified as low soil burn severity, and 42.8% was classified as unburned (**Table 1**). More information about the HPCC wildfire is available here: https://storymaps.arcgis.com/stories/d48e2171175f4aa4b5613c2d11875653

Table 1. *Percent of treatment unit by Composite Burn Index (CBI).*

Treatment Unit	CBI	Percent
03.01 La Jicarita	Unchanged	42.8
	Low Severity	24.4
	Moderate Severity	20.6
	High Severity	12.2
Corrales	Unchanged	3.4
	Low Severity	2.8
	Moderate Severity	32.1
	High Severity	61.7
Encinal	Unchanged	45.1
	Low Severity	27.6
	Moderate Severity	20.9
	High Severity	6.5
Walker Flats	Unchanged	64.7
	Low Severity	19.7
	Moderate Severity	10.5
	High Severity	5.1

Monitoring Methods

The NMFWRI monitoring crew followed the protocols published in the their Field Monitoring Manual, linked here: https://nmfwri.org/resources/upland-forests-monitoring-field-manual/

These protocols are based on the Department of Interior's FEAT/FIREMON Integrated (FFI) sampling protocols. They used 1/10th acre fixed plots to assess tree size (diameter and height) and density (trees/acre). A nested sub-plot of 1/100th acre was used to estimate understory and ground cover in all years. Photo points were taken at each plot. Surface fuels were measured using Brown's transects. The location of the plots was based on a stratified random sampling design.

All raw data and photo points will be provided to the managers of the project area; the goal of this report is to summarize this information in a concise manner.

Disclaimer

NMFWRI provides this report and the data collected with the disclaimer that the information contained in these data is dynamic and may change over time. The data are not better than the original sources from which they were derived. It is the responsibility of the data user to use the data appropriately and within the limitations of monitoring data in general, and these data in particular. NMFWRI gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. This data and related graphics are not legal documents and are not intended to be used as such. This includes but is not limited to using these data as the primary basis for the development of thinning prescriptions or timber sales. NMFWRI shall not be held liable for improper or incorrect use of the data described and/or contained in this report.

Analysis was also done according to our standard protocols. Note that the values reported in the tables are expressed on a per acre basis, but represent only area actually sampled. We do not scale up these

values to calculate volume of wood over the project area, and warn readers of this report that they are not intended for that purpose. The accompanying tables show summaries of our data, and some differences are discussed below; however, differences that seem apparent here may not stand up to rigorous statistical tests. For some estimates, the standard deviation exceeds the mean (i.e., the coefficient of variation is greater than 100 percent), and sampling errors for some estimates exceed 100 percent. Therefore, data should be used and results interpreted with appropriate caution.

Summary

NMSU Monitoring

See Treatment History section above for more details regarding the monitoring conducted by New Mexico State University.

***Table 2**. Summary of NMSU Monitoring from 2003 pre-treatment and 2009 post-treatment.*

Metric	2003 Pre-Treatment	2009 Post-Treatment
Tree Species Prevalence	(1) White fir (ABCO) – 33%	(1) Ponderosa pine (PIPO) – 35%
	(2) Ponderosa pine (PIPO) – 29%	(2) Douglas-fir (PSME) – 31%
	(3) Douglas-fir (PSME) – 23%	(3) White fir (ABCO) – 17%
	(4) Quaking aspen (POTR5) – 14%	(4) Quaking aspen (POTR5) – 16%
Mean Height	38.3	46.4
Mean DBH	10.0	11.7
Average basal area (ft^2/acre)	135	107
Seedlings per acre	880	1400
Canopy cover (%)	43.6	38.4
	Surface Fuels (tons per acre)	
1-hour	0.27	0.09
10-hour	1.60	0.93
100-hour	2.81	1.75
1000-hour	12.97	1.7
Total Fuels	14.31	4.43

When NMSU remeasured the transects across the entire area in 2009, they found trends toward increased average height, increased average DBH, and decreased standard error. NMSU judged grass and forb production to be “less than highly productive” at 40 lbs per acre. Bare ground varied greatly, but was never more than 8% pre-treatment. Pre-treatment fuel loads (down woody debris) were 3.7 to 4.2 tons per acre.

NMSU’s post-treatment averages are always greater than NFMWRI’s for these same measurements, an artifact of using a 10-factor prism in their protocol versus taking a fixed-radius plot with our protocol; we measure many more small trees than they do. Unfortunately, this makes any direct comparison of pre- and post-treatment averages impossible.

NMSU also collected data on annual precipitation, soil texture and moisture content, sediment yield from silt fencing, on-site rainfall simulations, and wildlife surveys. NMFWRI does not conduct these types of monitoring, but the NMSU report containing a summary of this data is available upon request.

NMFWRI Monitoring Data Summary

The field crew observed a relatively high diversity of tree species in the Walker Flats La Jicarita CFRP project area, with dominant species including quaking aspen, Douglas-fir, and ponderosa pine (**Figure 8**). Tree health concerns for trees observed were primarily fire char and/or needle scorch (**Table 5-10**). This area lies within the footprint of the Hermit's Peak Calf Canyon fire; the composite burn index for the project area was primarily classified at low (39.3%) to moderate severity (33.3%) (**Figure 2**). The HPCC wildfire appears to have reduced occurrences of bark beetle, mistletoe, broom rust, and other tree diseases (**Table 5-10).**

The Corrales unit, which experienced 100% tree mortality, was thinned over 30 years ago, and experienced a low-intensity prescribed burn in 2008. The trees in this unit were the shortest of the three, and had the lowest crown heights (**Figure 6**). This can increase the likelihood of a crown fire and therefore tree mortality. Mean char and scorch heights were highest in this unit (**Figure 15**). Recruitment of young trees in this unit increased steadily, with the largest recruitment recorded in 2015, the majority being quaking aspen (**Figure 9**). Regeneration of woody plants was high in this unit, though densities were not as high as the other two units, likely in part due to having the highest pre-fire stand density (370 trees per acre, **Figure 9**, **Figure 16**). Quaking aspen was the dominant tree seedling every monitoring period, except for in 2020, when white fir was the most common seedling. White fir was also the most common tree sapling. Kinnikinnick was the most abundant shrub in each monitoring period (**Figure 44**).

The Encinal unit experienced 65% tree mortality post-HPCC wildfire. This unit was thinned between 2005 and 2006, and did not experience prescribed fire. The mean basal area of this unit was steadily decreasing pre-fire (**Figure 11**, **Figure 10**). This unit also experienced a larger recruitment event in 2020, primarily quaking aspen. An increase in the quadratic mean diameter of growing stock trees and a decrease in the QMD of snags immediately post-fire indicates a survivorship bias towards larger, more mature trees. Scorch height was highest in this unit, reflected by the increase in mean live crown base height (**Figure 15**). Regeneration and recruitment of tree species steadily increased pre-fire, and post-fire recruitment increased by approximately 60% (**Figure 18**). Across monitoring periods, Gambel oak and quaking aspen were the dominant tree seedlings. White fir and quaking aspen were the dominant tree saplings. The most common shrubs recorded were creeping barberry and mountain ninebark (**Figure 44**).

The Walker Flats unit experiences 68% tree mortality post-HPCC wildfire. This unit was thinned between 2005 and 2008, then experienced a moderate-intensity prescribed fire in 2008. Like the Encinal unit, the mean basal area of this unit was steadily decreasing pre-fire, and experienced a large recruitment event in 2020, primarily of quaking aspen (**Figure 13**). An increase in the quadratic mean diameter of growing stock trees and a decrease in the QMD of snags immediately post-fire indicates a survivorship bias towards larger, more mature trees. Tree seedling density was steadily decreasing pre-fire, but despite mortalities, densities of tree seedlings and saplings and shrub seedlings increased immediately post-fire (**Figure 20**). This may be due to multiple factors, such as light availability from an opened canopy, reduced competition for moisture, or another effect of fire. Quaking aspen and Gambel oak were the most common tree seedling and sapling species. Thus, the majority of regeneration for this species is made up of sprouts from existing rootstocks, not true germinants. The most abundant shrub species were creeping barberry, Fendler's ceanothus, and Woods' rose (**Figure 44**).

Ground and aerial cover of plant material on average, decreased across all three treatment units (**Figure 22**-**Figure 27**). Concurrently, cover of bare soil, rock, and gravel increased; the consumption of living and dead organic material by the wildfire exposed large amounts of mineral soil. Canopy cover also decreased across all plots immediately post-fire, due to tree mortality (**Figure 28**-**Figure 30**).

Total surface fuel loads declined across all treatment units following wildfire (**Table 11**). The Corrales unit decreased by the most, from 50 tons per acre to 8.3 tons per acre (83%). The Encinal and Walker Flats units decreased from 25 to 18 tons per acre (28%), and 35 to 18 tons per acre (49%), respectively. This is consistent with other metrics such as tree mortality, that show that the Corrales unit burned more severely than the Encinal or Walker Flats units. Ladder fuels in the Corrales and Encinal units decreased following wildfire (**Figure 31**,**Figure 33**, **Table 21**). Walker Flats, alternatively, more than doubled following wildfire, due to increased seedling and sapling densities contributing to woody fuels (**Figure 33**).

Access to all plots remained possible via driving and hiking for the 2023 measurement period; however, road conditions were highly dependent on weather.

Management Implications:

Due to low to moderate burn severities and high tree seedling densities, the initial fire recovery outlook for this unit is good, and the data does not suggest any immediate regeneration or post-wildfire state transition concerns. Quaking aspen dominated regeneration totals, with little conifer regeneration recorded. However, this can be explained by aspen's habit to readily sprout from underground rhizomes, while conifers require specific conditions for their seeds to germinate. Gambel oak also readily sprouts from underground rootstalks following fire.

An increase of bare soil ground cover immediately post-wildfire does indicate an increased risk of soil erosion post-wildfire. The field crew noted mullein on multiple plots immediately post-wildfire. While this is non-native species of potential concern for outcompeting native plants, it may also play a role in soil stabilization during the initial post-wildfire recovery period.

The reported substantial decrease in surface fuel loads, ladder fuel loads, growing stock basal area and density, and snag density following treatments and wildfire all indicate a decreased risk of high-severity wildfire based on fuel load and stand structure. The noted increase in snag basal area following wildfire may pose a concern for increasing surface fuel loads in the future as snags fall and become surface fuels. Additional monitoring is needed to determine ongoing adaptive management strategies as the post-wildfire ecosystem develops.

Table 3: *Summary statistics for 03.01 Walker Flats La Jicarita across all monitoring periods. Summary statistics tables by treatment unit are available in the supplementary figures (**Table 16**).*

Metric	2010 PostTreatment5yr	2015 PostTreatment10yr	2020 PostTreatment15yr	2023 PostFireImmediate
Dominant Growing Stock Species	PIPO	POTR5	POTR5	POTR5
Dominant Snag Species	POTR5	PSME	PSME	POTR5
Dominant Live Seedling	POTR5	POTR5	POTR5	POTR5
Dominant Live Sapling		ABCO	POTR5	POTR5
Dominant Live Shrub (Seedling Class)			ROWO	ROWO
Dominant Live Shrub (Sapling Class)			SYRO	SYRO
Average Slope (%)			13	13
Average Aspect (degrees)			117	118
Trees per Acre (growing stock)	121	134	246	101
Basal Area (growing stock, sqft/acre)	82.9	76.4	72.4	63.4
QMD (growing stock, inches)	12.1	11	8.45	11.5
Average Tree Height (ft)	38.3	31.5	22.7	31.5
Average Live Crown Base Height (ft)	20.6	18	7.46	14.6
Height of Tallest Tree (ft)	89	70	86.8	71.8
Live Tree Seedlings Per Acre	1200	2240	1840	6860
Live Tree Saplings Per Acre		32.4	342	388
Live Shrub Seedlings Per Acre			10600	9080
Live Shrub Saplings Per Acre			36.4	8.82
Tree Canopy Cover (%)	45	49	31	23
Grass & Forb Cover (%)			41	47
Total Tons Surface Fuels per Acre	16.3	33.5	31.9	16.5

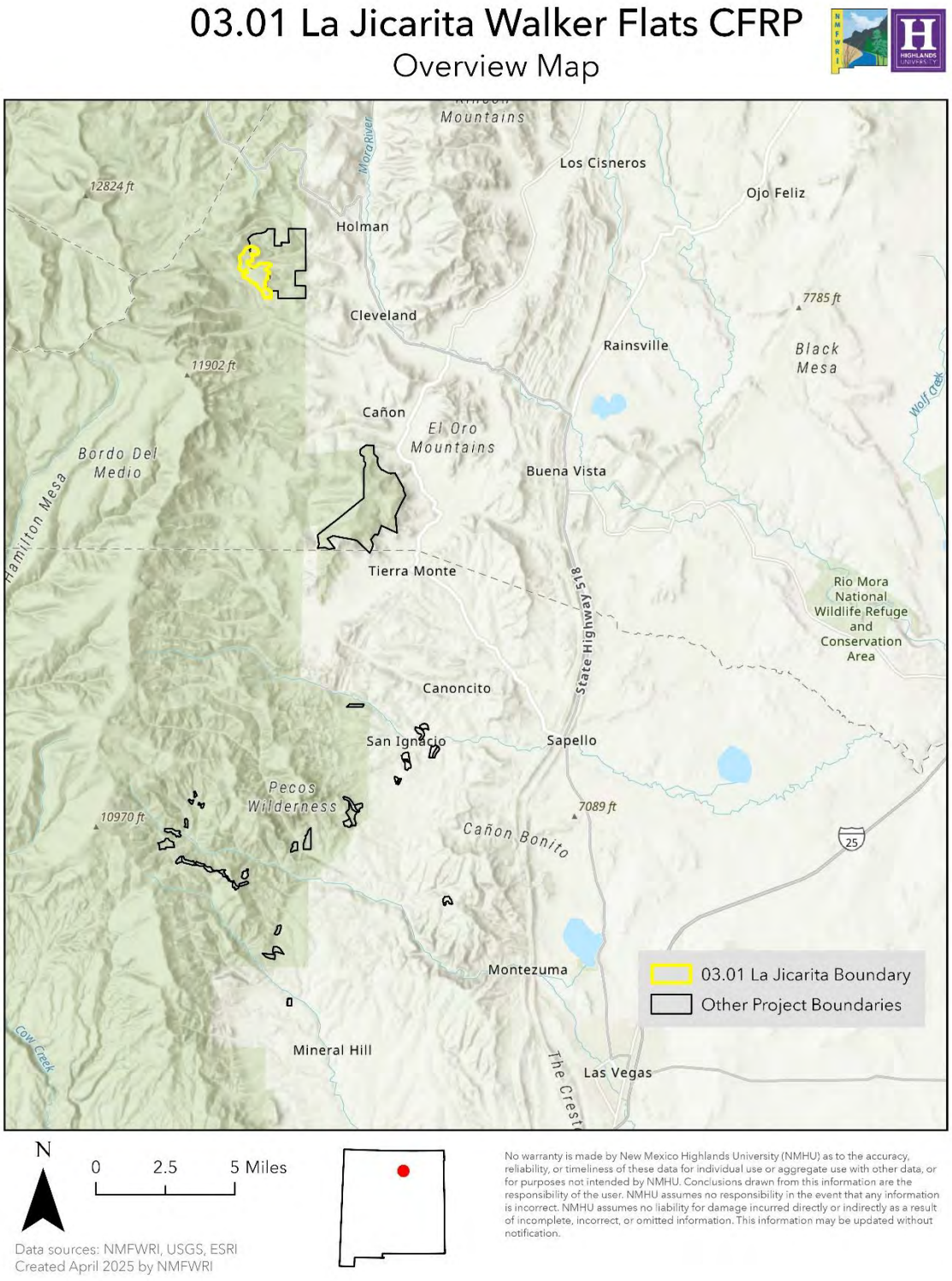


Figure 1. *Regional overview map of the 31.10 Walker Flats Final Phase Trujillo CFRP project*

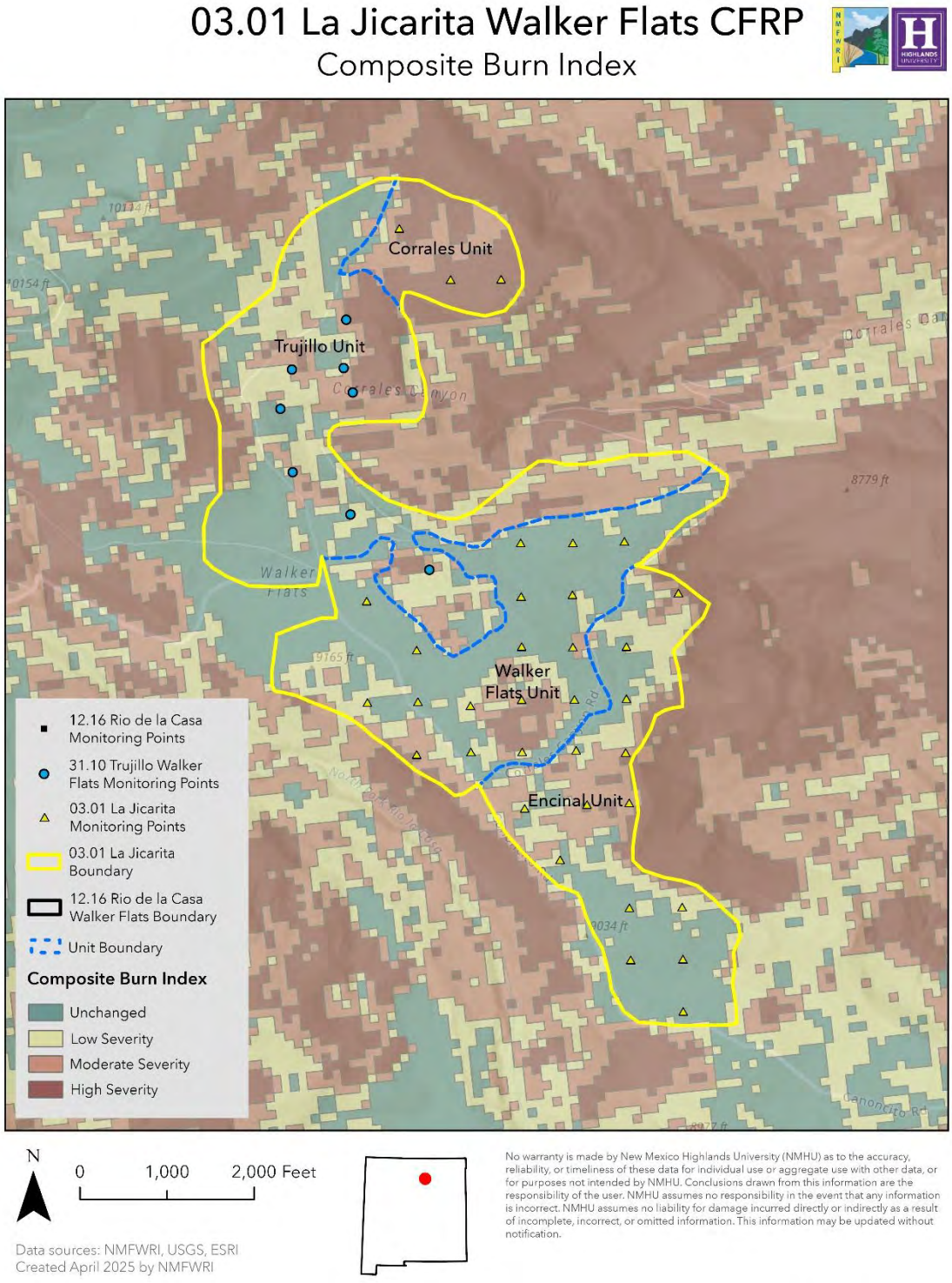


Figure 2. *Composite Burn Index of the 31.10 Walker Flats Final Phase Trujillo CFRP project following the 2022 Hermit's Peak Calf Canyon fire*

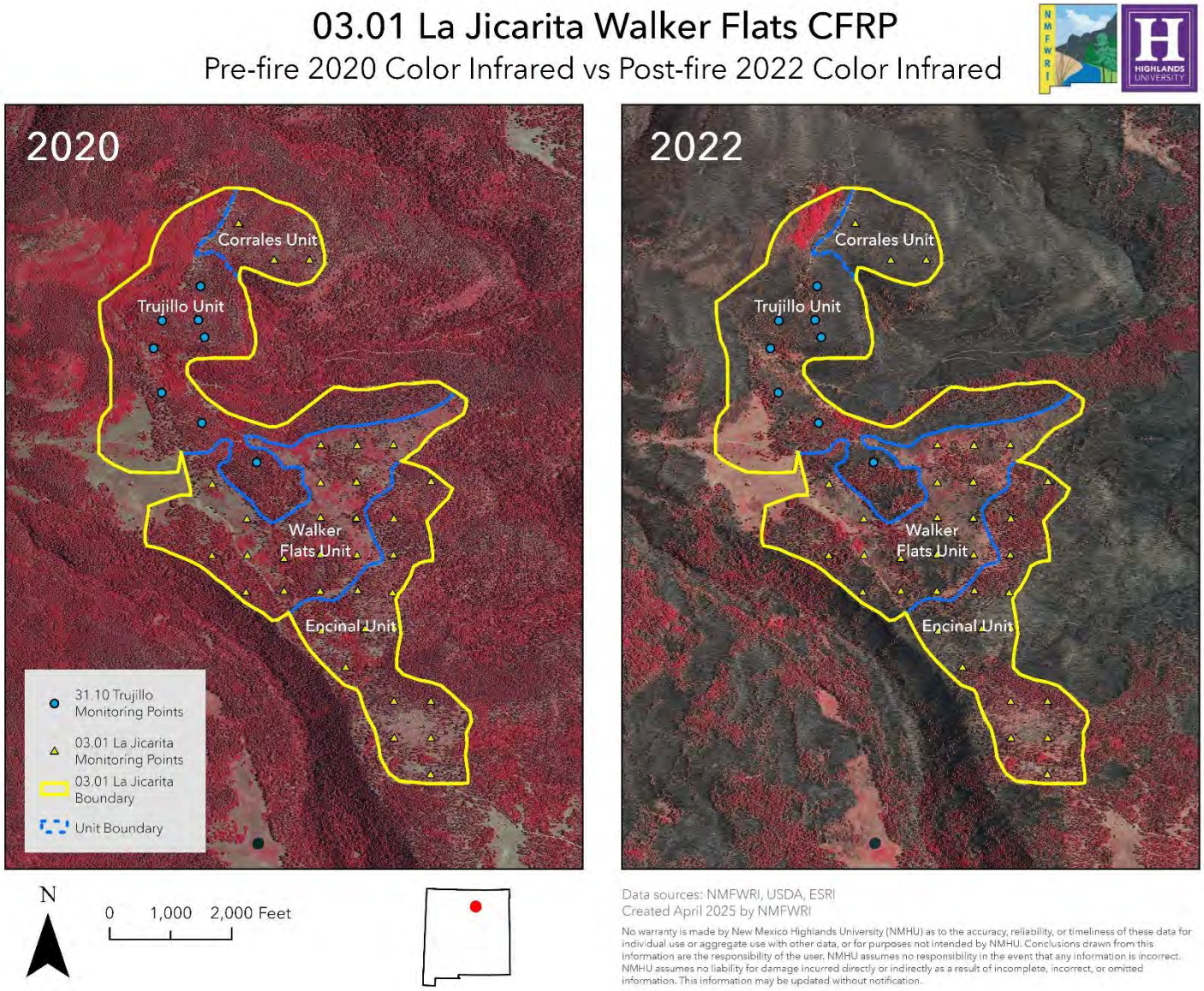


Figure 3. *Map of color infrared of 21.12 Calf Canyon CFRP project before and after the Hermit's Peak Calf Canyon fire*

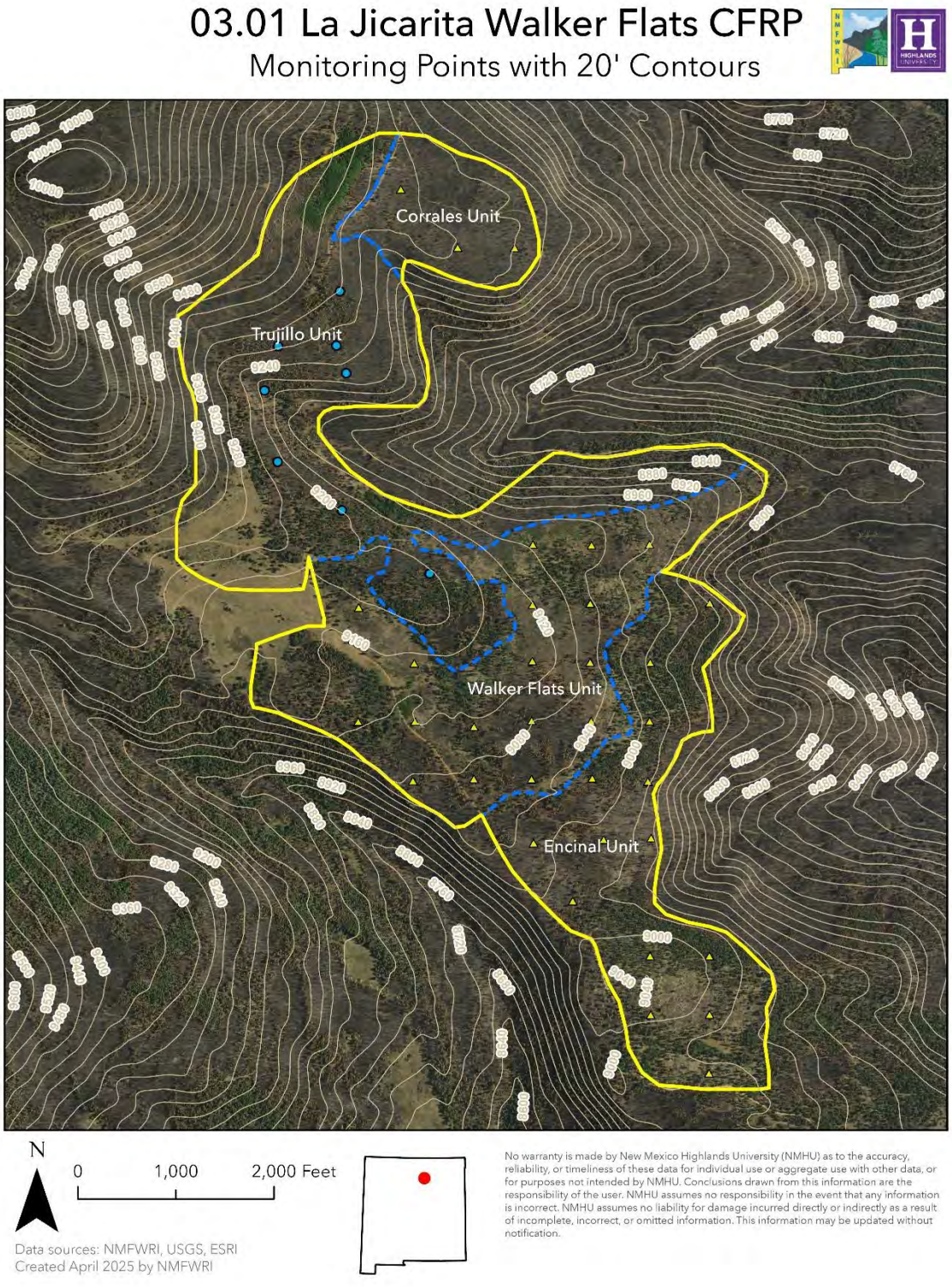


Figure 4. *31.10 Walker Flats Final Phase Trujillo CFRP project with monitoring plots and contour lines*

Monitoring Results

Overstory trees

The overstory (trees >1" DBH) showed high diversity with seven species represented across measurement periods (**Table 4**). In the Corrales treatment unit, quaking aspen and ponderosa pine were dominant in the growing stock 5 and 10 years post treatment. 15 years post-treatment, white fir was dominant. Snags in the Corrales unit were mostly made up of white fir (**Figure**). Immediately post-fire, most snags were unable to be reliably identified (2TREE). Ponderosa pine was the dominant growing stock for each monitoring period in the Encinal unit, except for 15 years post-treatment; where quaking aspen dominated, followed by Ponderosa pine (**Figure**). Snags in the Encinal unit were dominated by quaking aspen and Gambel oak across all monitoring periods. Quaking aspen made up the majority of the growing stock across all monitoring periods in the Walker Flats Unit (**Figure**). Douglas-fir was the dominant observed snag in all pre-fire monitoring periods, but the HPCC wildfire caused quaking aspen to become the dominant snag immediately post-fire.

***Table 4**. Species found in the overstory composition, by USDA species symbol, scientific name, and common name.*

Species Symbol	Scientific Name	Common Name
ABCO	*Abies concolor*	white fir
PIFL2	*Pinus flexilis*	limber pine
PIPO	*Pinus ponderosa*	ponderosa pine
PIPU	*Picea pungens*	Blue spruce
POTR5	*Populus tremuloides*	quaking aspen
PSME	*Psuedotsuga menziesii*	Douglas-fir
QUGA	*Quercus gambelii*	Gambel oak
2TREE		unknown tree*

*Dead/burned and lacking identifying characteristics

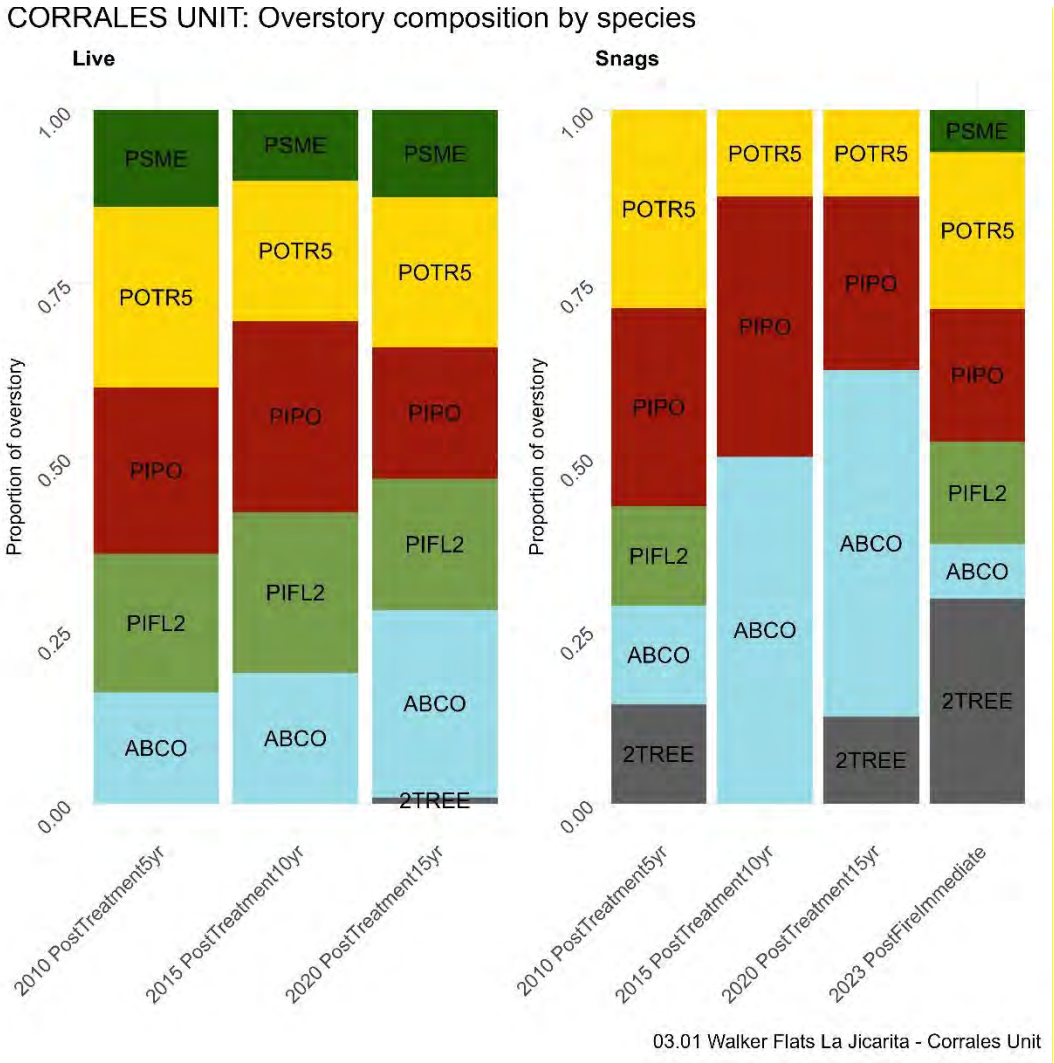


Figure 5. *Species composition by status across all measurement periods for all growing stock trees (>1" DBH), in the Corrales Treatment Unit.*

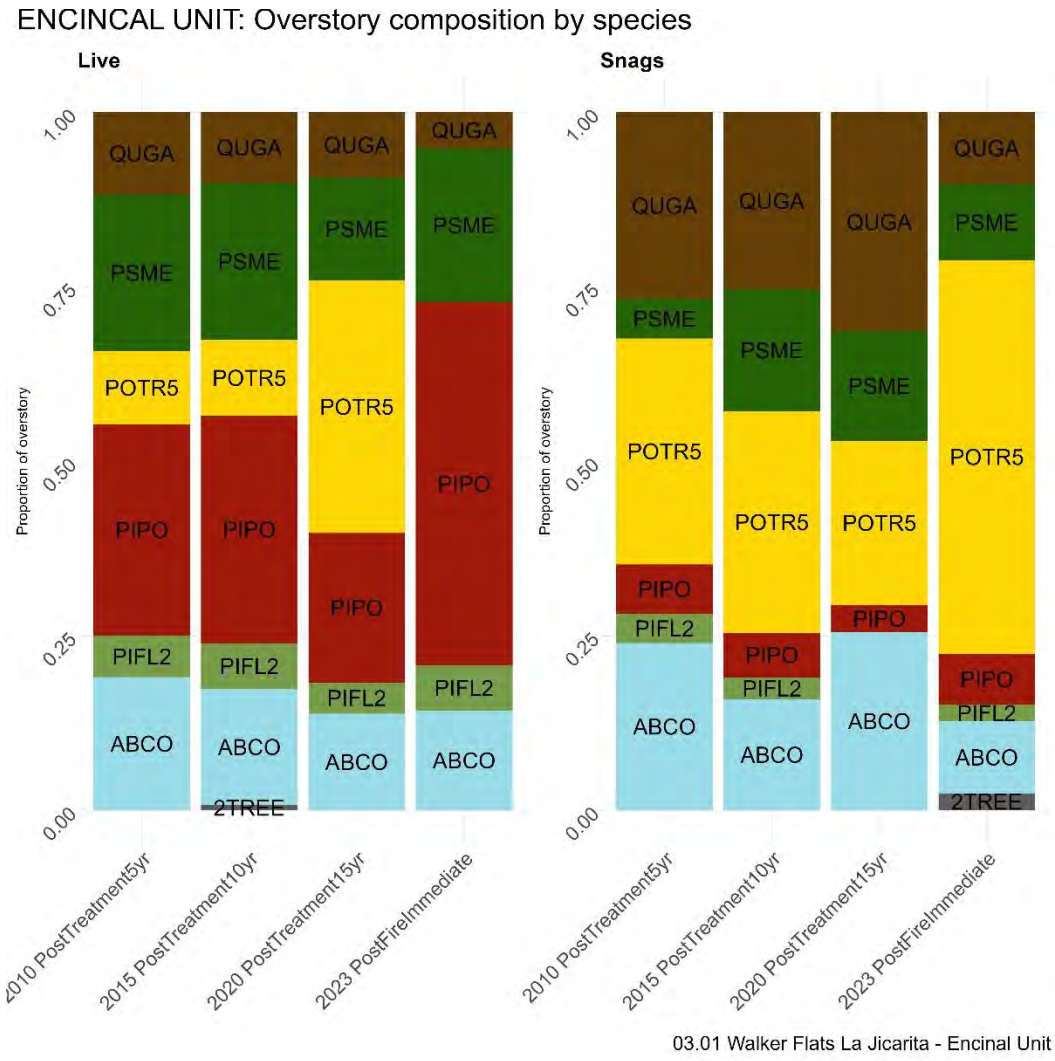


Figure 6. *Species composition by status across all measurement periods for all growing stock trees (>1" DBH), in the Encinal Treatment Unit.*

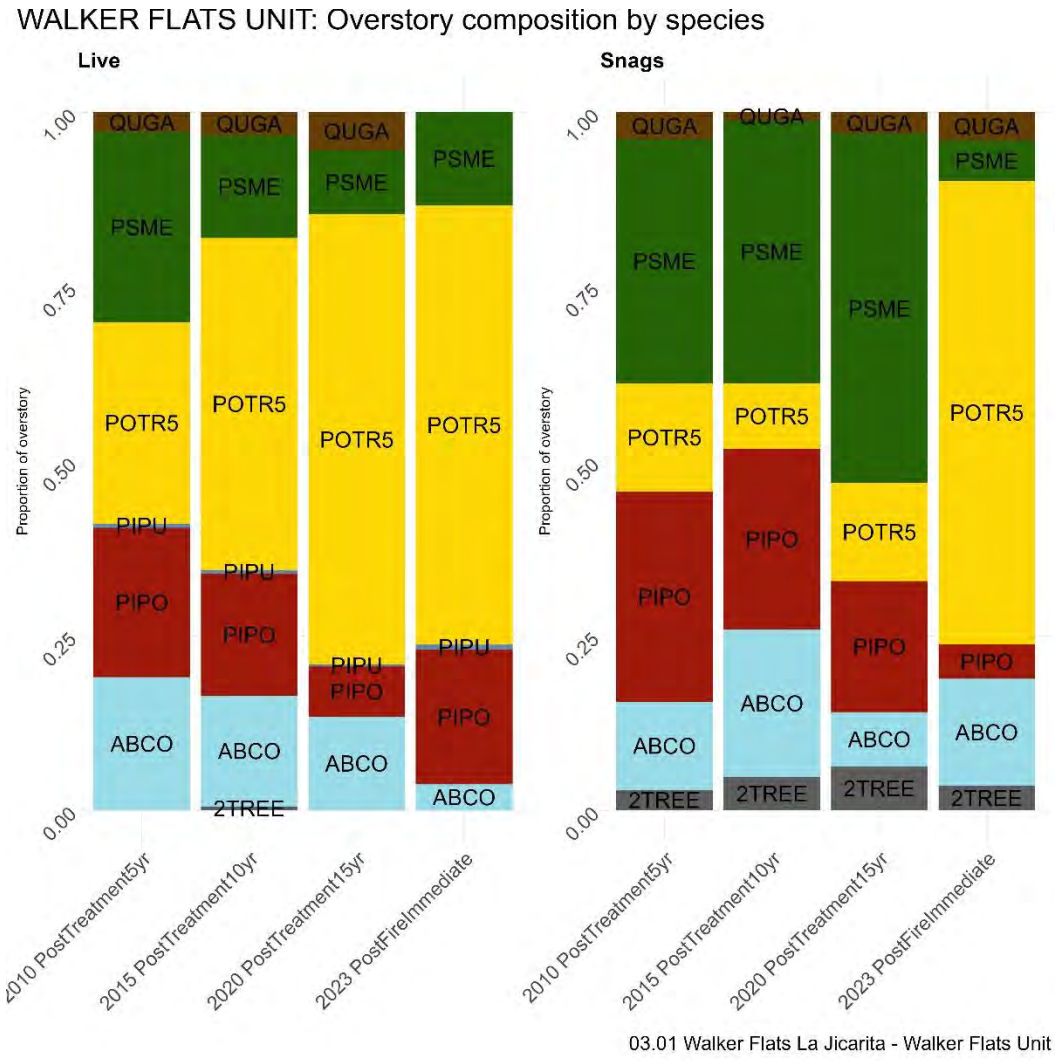


Figure 7. *Species composition by status across all measurement periods for all growing stock trees (>1" DBH), in the Walker Flats Treatment Unit.*

Growing Stock

Survival

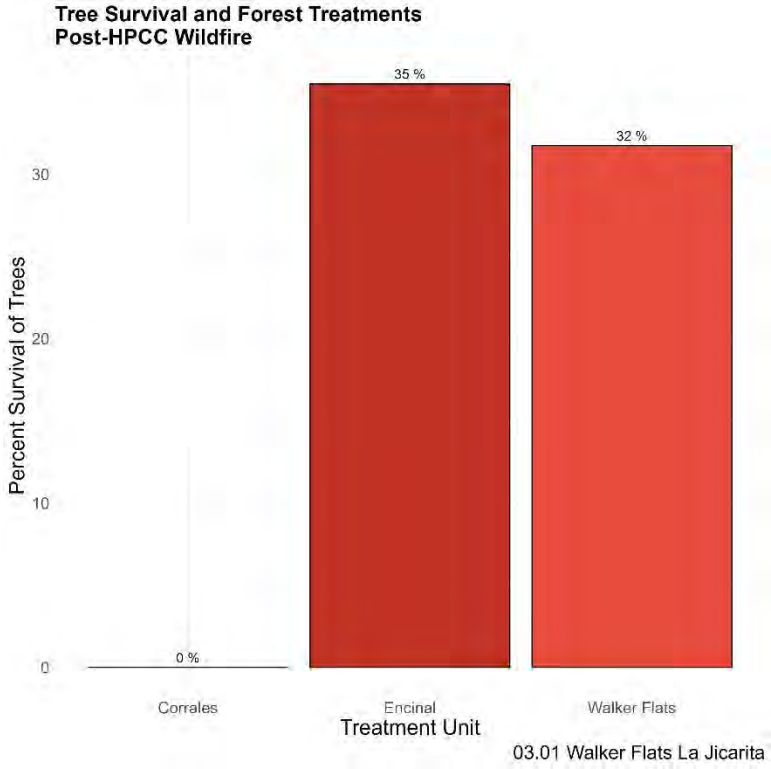


***Figure 5**. Percent growing stock tree survival across treatment units.*

Height and Live Crown Base Height

Heights from the 2020 PostTreatment15yr monitoring period, through NMFWRI's QC process, were proven to be artificially inflated and therefore an inaccurate representation of these stands of trees. There is a proven positive correlation between the DBH and height of a tree, although this is species- and site-specific. Using this relationship, we performed a linear regression on the existing data for other years of monitoring for this project. The equation derived from that regression was used to infer the heights of all trees for the 2020 monitoring period. For the same reasons expressed above, Live Crown Base Heights from the 2020 PostTreatment15yr monitoring period, may not be accurate. The LCBHs of individual trees are extremely site-dependent and have a relationship with several confounding variables. Therefore, we report these values as they were collected, but emphasize that LCBH measurements from 2020 may not be an accurate representation of tree stands.

In the Corrales unit, height and live crown base height remained relatively stable across all pre-fire monitoring periods (**Figure 6**). No growing stock trees were recorded immediately post-fire. In the Encinal unit, mean height was stable from 2010 to 2015, then decreased to 33 feet 15 years post-treatment in 2020 (**Figure 7**). This may be related to a recruitment of smaller quaking aspen trees, reflected in the increase in the proportion of that species in the growing stock trees (**Figure**). Mean live crown base height follows the same pattern, decreasing from 24 feet in 2015 to 11 feet in 2020. Mean height increased to 39 feet immediately post-fire, indicating that smaller trees were killed by the HPCC wildfire, while larger trees were more likely to survive. Live crown base height also increased, which

reflects that trend, as well as the possibility that the fire killed lower canopy branches on some trees. The Walker Flats unit reflects similar trends as in the Encinal treatment unit: recruitment of smaller trees across pre-fire monitoring periods, then die-off of smaller trees and raising of the canopy height (**Figure 8**).

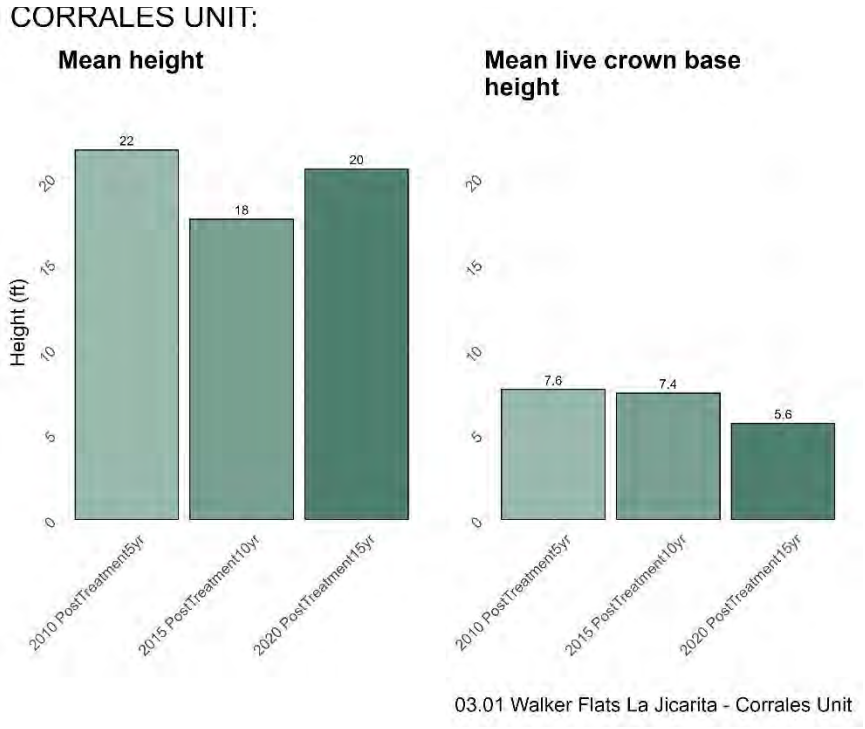


Figure 6. *Mean height and live crown base height for growing stock trees (>1" DBH, live + sick status) in the Corrales treatment unit. Mean values represent averages of plot means for each monitoring status.*

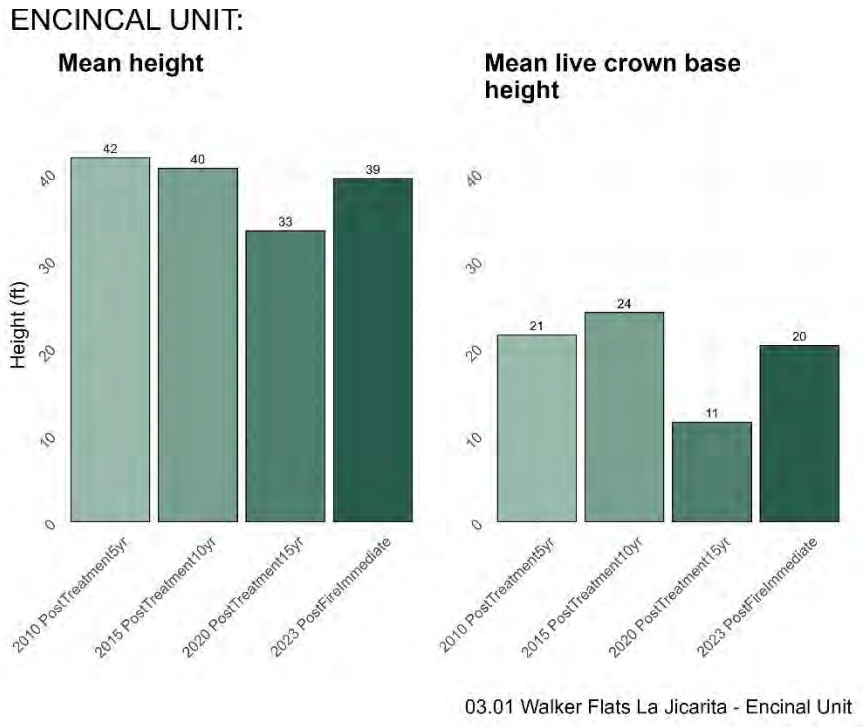


Figure 7. *Mean height and live crown base height for growing stock trees (>1" DBH, live + sick status) in the Encinal treatment unit. Mean values represent averages of plot means for each monitoring status.*

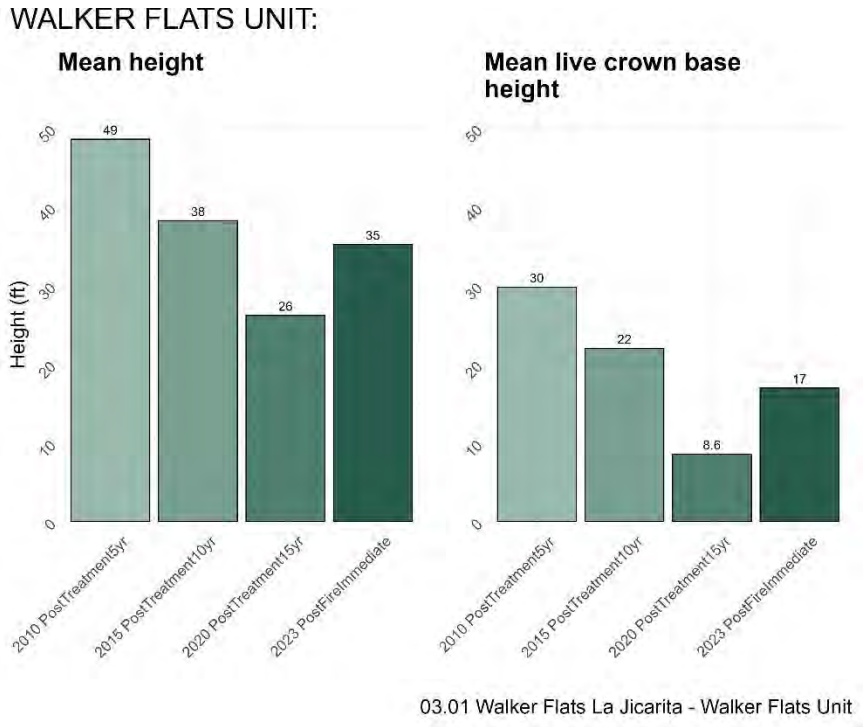


Figure 8*. Mean height and live crown base height for growing stock trees (>1" DBH, live + sick status) in the Walker Flats treatment unit. Mean values represent averages of plot means for each monitoring status.*

Basal Area, Trees per Acre, and Quadratic Mean Diameter

A breakdown of these metrics by tree species is available in the supplementary figures (**Figure 43**). In the Corrales unit, mean basal area steadily increased from 43 ft^2/acre 5 years post-treatment to 53 ft^2/acre 15 years post-treatment (**Figure 9**). Trees per acre also increased, from 170 5 years post-treatment to 370 15 years post-treatment. Concurrently, quadratic mean diameter decreased, reflecting the recruitment of smaller trees into the growing stock. No growing stock trees survived the HPCC wildfire, so mean basal area and mean trees per acre immediately post-fire are zero. This is also reflected in the stark increase in mean basal area and trees per acre of snags (**Figure 10**). The decrease in quadratic mean diameter of snags from 8.45 inches 15 years post-treatment to 4.9 inches immediately post-fire indicates a large proportion of small trees were killed by the fire.

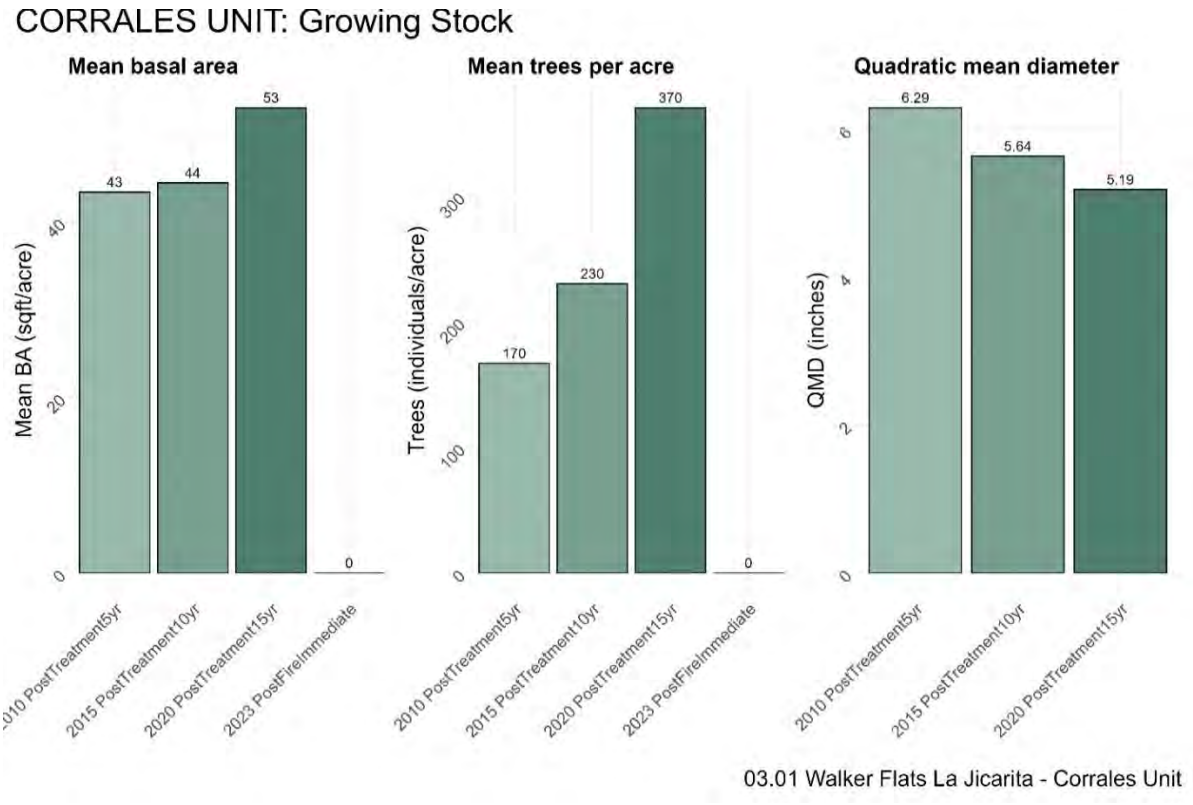


Figure 9. *Mean basal area, mean trees per acre, and quadratic mean diameter for growing stock trees across all measurement periods (>1" DBH, live + sick status) in the Corrales treatment unit.*

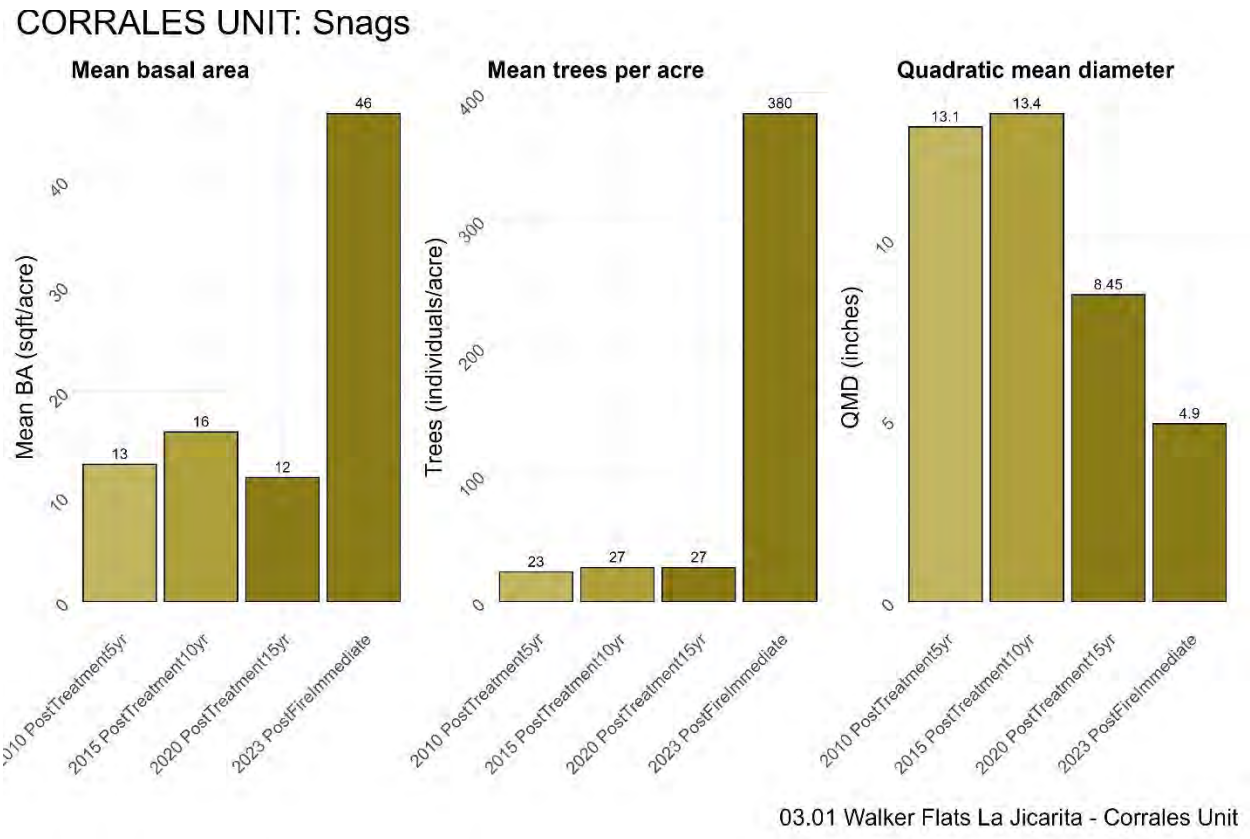


Figure 10. *Mean basal area, mean trees per acre, and quadratic mean diameter for snags across measurement periods (>1" DBH) for the Corrales treatment unit.*

Pre-fire monitoring in the Encinal unit shows a slow die-off of growing stock trees, concurrent with snags falling – seen in the decrease of mean basal area in the growing stock and the increase of mean basal area in snags, as well as the decrease of trees per acre in both growing stock trees and snags (**Figure 11**, **Figure 12**). In 2020, 15 years post-treatment, the Encinal unit experience a large recruitment event of young trees into the growing stock, reflected by the increase in mean trees per acre and the decrease in quadratic mean diameter. Immediately post-fire, growing stock trees per acre drastically decreased and quadratic mean diameter increased, while the trees per acre of snags increased and the quadratic mean diameter decreased. This indicates that many of these young, small trees were killed by the HPCC wildfire.

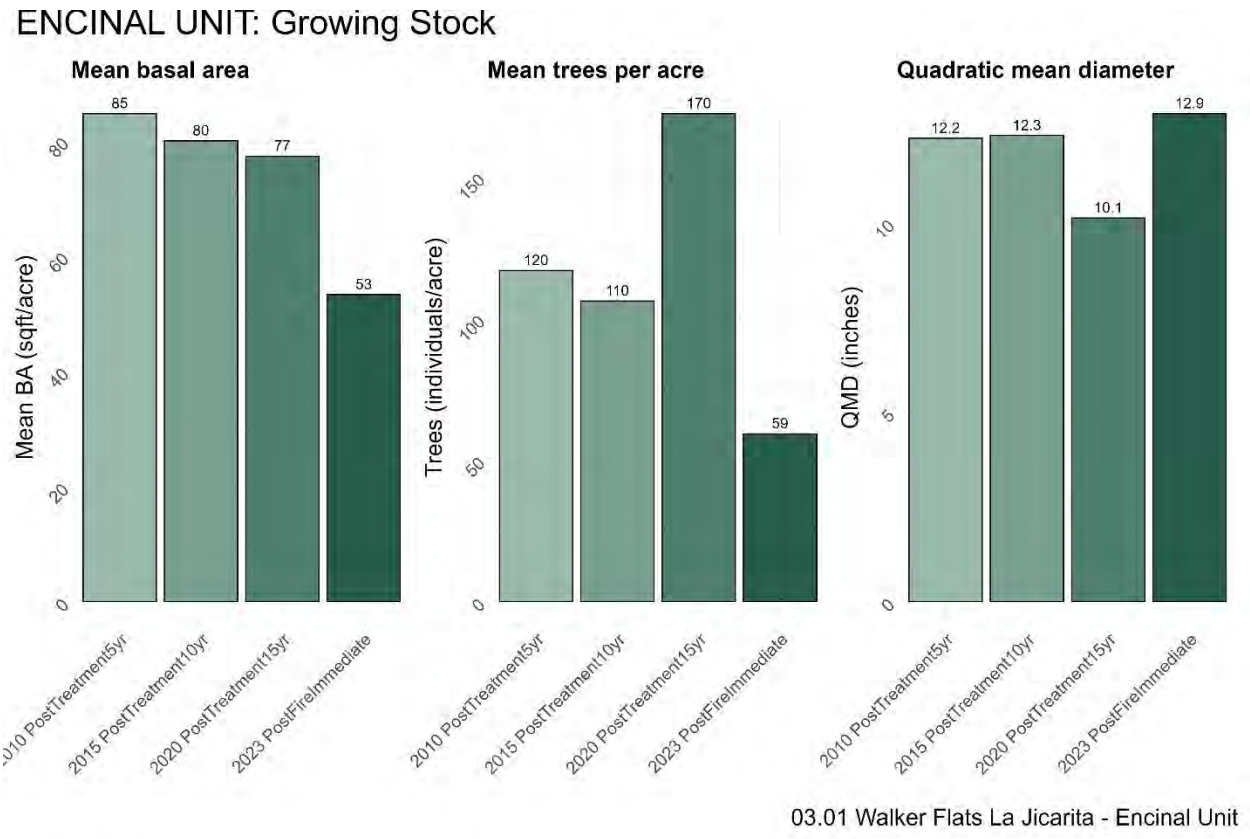


Figure 11. *Mean basal area, mean trees per acre, and quadratic mean diameter for growing stock trees across all measurement periods (>1" DBH, live + sick status) in the Encinal treatment unit.*

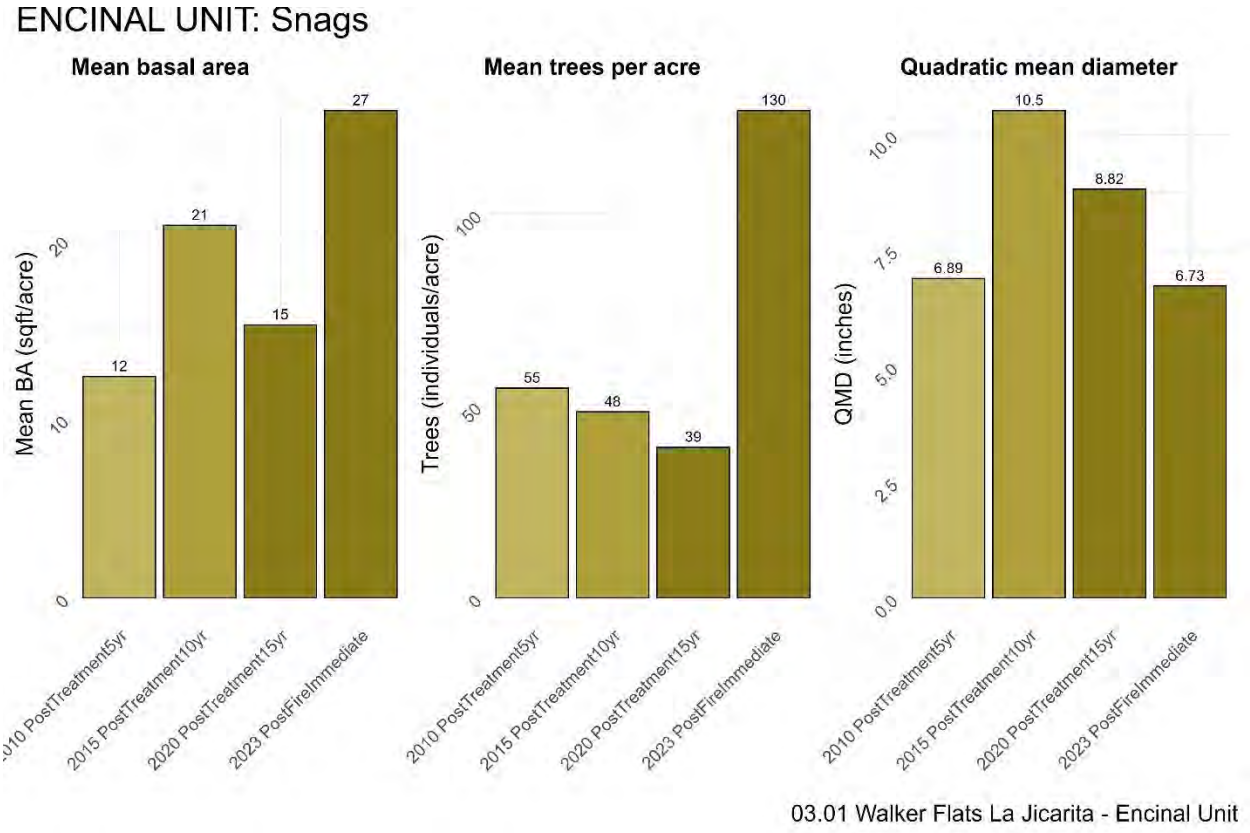


***Figure 12**. Mean basal area, mean trees per acre, and quadratic mean diameter for snags across measurement periods (>1" DBH) for the Encinal treatment unit.*

The Walker Flats unit saw trends in tree metrics very similar to that of the Encinal unit. Mean basal area of both growing stock trees and snags decreased, indicating die-off of trees and snags falling (**Figure 13**, **Figure 14**). A large recruitment of young trees occurred in 2020, shown by the increase in mean trees per acre from 110 ten years post-treatment to 250 fifteen years post-treatment, and the decrease in quadratic mean diameter. Immediately post-fire, the decrease in mean basal area and mean trees per acre in the growing stock, as well as an increase in the growing stock quadratic mean diameter, an increase in snags per acre, and the decrease in quadratic mean diameter of snags; indicates that many of those young, small trees were killed by the HPCC wildfire. There is likely a survivorship bias toward larger trees.

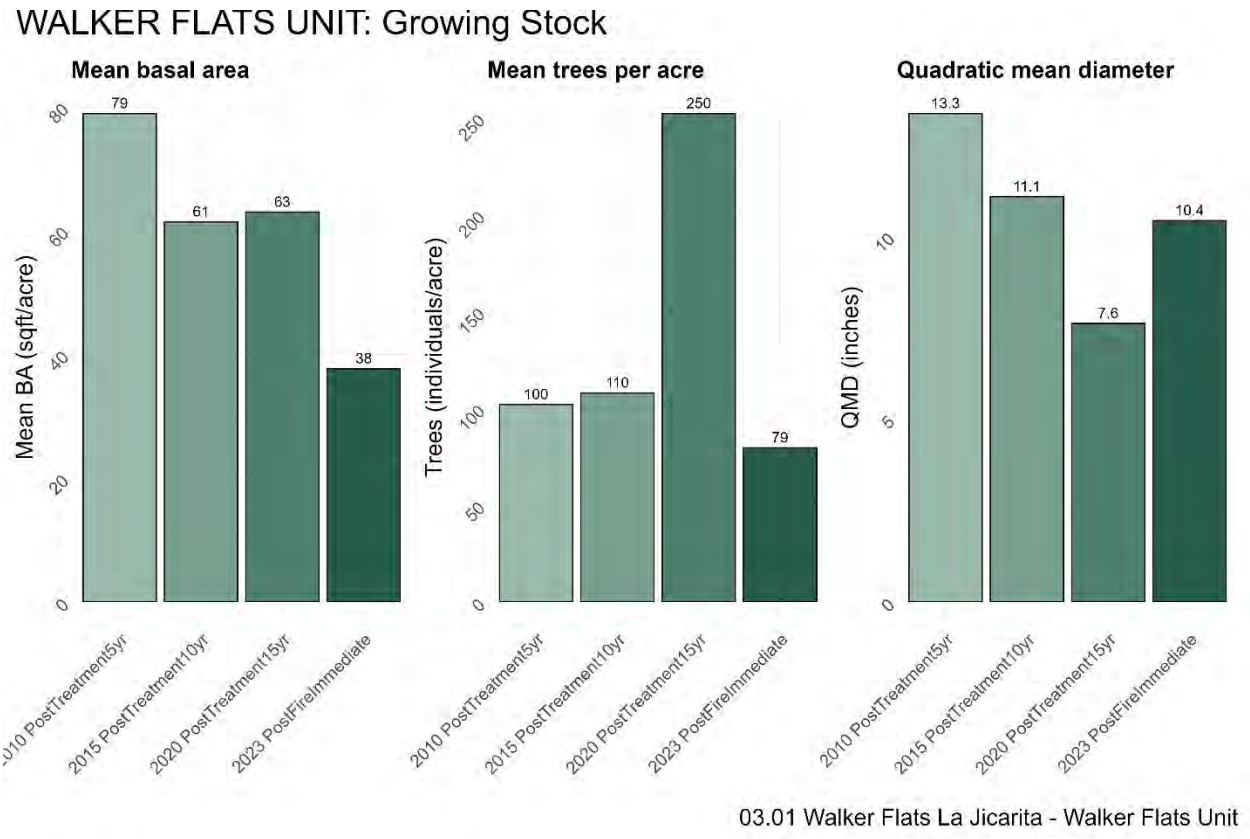


***Figure 13**. Mean basal area, mean trees per acre, and quadratic mean diameter for growing stock trees across all measurement periods (>1" DBH, live + sick status) in the Walker Flats treatment unit.*

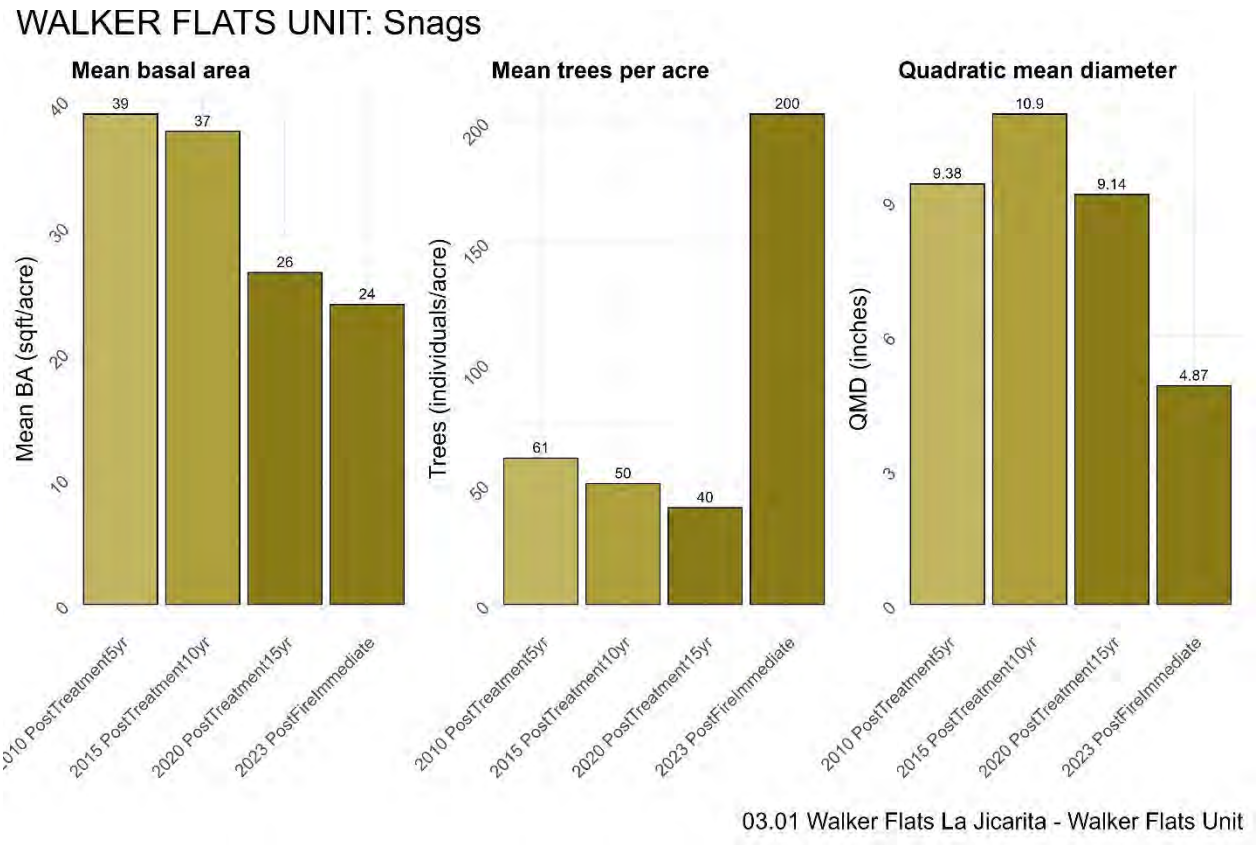


Figure 14. *Mean basal area, mean trees per acre, and quadratic mean diameter for snags across measurement periods (>1" DBH) for the Walker Flats treatment unit.*

Damages

Recording damages to trees was not a required part of NMFWRI protocol during the 2010 5-year post-treatment and 2015 10-year post-treatment monitoring periods. The damages shown here for those years were assigned based on comments recorded for individual trees. Low totals for damages to growing stock trees or snags in 2010 and 2015 does not indicate absence of damage or disease. Additionally, count represents the number of observations of each damage type; individual trees may have more than one damage recorded.

In the Corrales unit, damages to growing stock trees were reliably recorded only for the 2020 15-year post-treatment monitoring period. In this year, there were 2 observations of witches' broom and 1 occurrence of bark beetle (**Table 5**). Immediately post-fire, the monitoring crew recorded 115 trees with evidence of recent fire (char or scorch, ***Table 6***). The crew also observed bird damage, wounds or cracks, bark beetles, and unknown insect activity. Note that these observations are natural processes of tree decay, and are not necessarily the cause of death.

Table 5. *List of damages observed on growing stock trees across all measurement periods by code and description for the Corrales treatment unit.*

CORRALES UNIT: Growing Stock Trees by Damage Code			
Monitoring.Status	**Damage**	**Count**	**Description**
2020 PostTreatment15yr	25,000	2	Witches' broom
	11,000	1	Bark beetles
	99,001	1	Broken top
	99,037	1	Leaning bole

Table 6*. Counts of damages recorded to dead trees across monitoring periods for the Corrales treatment unit.*

CORRALES UNIT: Snags by Damage Code			
Monitoring.Status	**Damage**	**Count**	**Description**
2020 PostTreatment15yr	99,001	2	Broken top
	99,037	2	Leaning bole
	70,000	1	Human caused damage
2023 PostFireImmediate	30,000	115	Fire scar, char and/or scorch
	99,004	6	Uncharacteristic forked top, above or below DBH
	41,010	5	Bird damage
	99,026	4	Wounds or cracks
	99,036	4	Fire scar (catface)
	11,000	3	Bark beetles
	99,001	3	Broken top
	90,000	2	Unknown cause
	10,000	1	General insects

In the Encinal unit, observations of insect or bark beetle activity, as well as mistletoe, broom rust, witches' brooms, and conk fungi were common on growing stock trees (**Table 7**). This is consistent with overstocked forest conditions (Dahms & Geils, 1997). Though the provided treatment history says that this unit was not burned, 5 trees in the Encinal unit were observed to have a fire scar, or catface, in the 2020 PostTreatment15yr monitoring period, as well as 1 snag in the 2010 PostTreatment5yr monitoring period. The ages of these scars are uncertain, as well as whether the casual fire was prescribed or an unintentional ignition. Immediately post-fire, 64 trees were observed to have signs of char or scorch. Bark beetle was observed on 6 trees, and bird activity on 7 trees.

Snags in the Encinal unit pre-fire were observed to have a broken top or to be leaning, natural symptoms of decay (**Table 8**). Immediately post-fire, 157 snags had signs of char or scorch. There were 36 observations of fungal decay, insect or bird activity, and other wounds or damages to snags; these are also natural symptoms of decay in a forest ecosystem.

***Table 7**. List of damages observed on growing stock trees across all measurement periods by code and description for the Encinal treatment unit.*

ENCINAL UNIT: Growing Stock Trees by Damage Code			
Monitoring.Status	**Damage**	**Count**	**Description**
2010 PostTreatment5yr	10,000	4	General insects
	23,001	2	Mistletoe
	25,000	2	Witches' broom
	99,002	2	Dead top
	27,000	1	Broom rust
	99,037	1	Leaning bole
2020 PostTreatment15yr	11,000	34	Bark beetles
	23,001	12	Mistletoe
	27,000	10	Broom rust
	99,026	5	Wounds or cracks
	99,036	5	Fire scar (catface)
	99,037	4	Leaning bole
	22,000	3	Conk fungus
	70,000	3	Human caused damage
	99,001	2	Broken top
	10,000	1	General insects
	30,000	1	Fire scar, char and/or scorch
	90,000	1	Unknown cause
	99,000	1	Physical effects of damage
2023 PostFireImmediate	30,000	64	Fire scar, char and/or scorch
	41,010	7	Bird damage
	11,000	6	Bark beetles
	25,000	6	Witches' broom
	99,004	5	Uncharacteristic forked top, above or below DBH
	99,036	5	Fire scar (catface)
	99,026	4	Wounds or cracks
	23,001	3	Mistletoe
	50,008	3	Lightning scar
	99,001	3	Broken top
	27,000	2	Broom rust
	90,000	2	Unknown cause
	10,000	1	General insects
	40,000	1	Mammal damage

Table 8. *Counts of damages recorded to dead trees across monitoring periods for the Encinal treatment unit.*

ENCINAL UNIT: Snags by Damage Code			
Monitoring.Status	**Damage**	**Count**	**Description**
2010 PostTreatment5yr	30,000	1	Fire scar, char and/or scorch
2020 PostTreatment15yr	99,001	8	Broken top
	99,037	2	Leaning bole
	70,000	1	Human caused damage
	99,026	1	Wounds or cracks
	99,036	1	Fire scar (catface)
2023 PostFireImmediate	30,000	157	Fire scar, char and/or scorch
	99,001	14	Broken top
	41,010	6	Bird damage
	99,026	6	Wounds or cracks
	99,036	6	Fire scar (catface)
	10,000	5	General insects
	25,000	5	Witches' broom
	99,004	5	Uncharacteristic forked top, above or below DBH
	11,000	2	Bark beetles
	27,000	2	Broom rust
	99,037	2	Leaning bole
	22,000	1	Conk fungus

Fifteen years post-treatment, growing stock trees in the Walker Flats unit were recorded to have mistletoe, broom rust, and bark beetles (**Table 7**). As described above, this is consistent with overstocked forest conditions (Dahms & Geils, 1997). Immediately post-fire, 50 growing stock trees and 293 snags had signs of scorch or char (**Table 7**, **Table 8**). Also, post-fire, growing stock trees had 5 occurrences of unknown insect activity, 3 observations of bark beetles, and 3 observations of bird damage, indicating stress. Also, similar to above descriptions of the Corrales and Encinal units, snags had evidence of insect and bird activity and wounds or other physical damages – these are natural decay processes.

Table 9. *List of damages observed on growing stock trees across all measurement periods by code and description for the Walker Flats treatment unit.*

WALKER FLATS UNIT: Growing Stock Trees by Damage Code			
Monitoring.Status	**Damage**	**Count**	**Description**
2020 PostTreatment15yr	23,001	15	Mistletoe
	27,000	11	Broom rust
	11,000	3	Bark beetles
	99,026	3	Wounds or cracks
	99,037	3	Leaning bole
	70,000	2	Human caused damage
	30,000	1	Fire scar, char and/or scorch
	90,000	1	Unknown cause
	99,001	1	Broken top
2023 PostFireImmediate	30,000	50	Fire scar, char and/or scorch
	99,004	14	Uncharacteristic forked top, above or below DBH
	10,000	5	General insects
	99,026	5	Wounds or cracks
	11,000	3	Bark beetles
	40,000	3	Mammal damage
	41,010	3	Bird damage
	25,000	2	Witches' broom
	99,036	2	Fire scar (catface)
	17,000	1	Gall formed by pathogen/parasitic infection
	23,001	1	Mistletoe
	27,000	1	Broom rust
	99,001	1	Broken top
	99,016	1	Unusually sparse foliage

Table 10. *Counts of damages recorded to dead trees across monitoring periods for the Walker Flats treatment unit.*

WALKER FLATS UNIT: Snags by Damage Code			
Monitoring.Status	**Damage**	**Count**	**Description**
2010 PostTreatment5yr	30,000	1	Fire scar, char and/or scorch
2015 PostTreatment10yr	99,001	3	Broken top
2020 PostTreatment15yr	99,001	43	Broken top
	30,000	2	Fire scar, char and/or scorch
2023 PostFireImmediate	30,000	293	Fire scar, char and/or scorch
	99,004	41	Uncharacteristic forked top, above or below DBH
	99,001	23	Broken top
	99,036	14	Fire scar (catface)
	11,000	5	Bark beetles
	99,037	5	Leaning bole
	10,000	3	General insects
	90,000	3	Unknown cause
	99,026	3	Wounds or cracks
	41,010	2	Bird damage
	25,000	1	Witches' broom
	27,000	1	Broom rust

Char & Scorch

Immediately post-wildfire in the Corrales unit, mean char height (highest point of blackened bark) averaged 17 ft and scorch height (highest point of heat-killed needles) averaged 20 ft. Mean char height in the Corrales unit was 11 ft and mean scorch height was 25 ft. In the Walker Flats unit, mean char height was 13 ft; mean scorch height was 21ft. Based on these heights, flame heights in the HPCC wildfire were relatively consistent across the project areas.

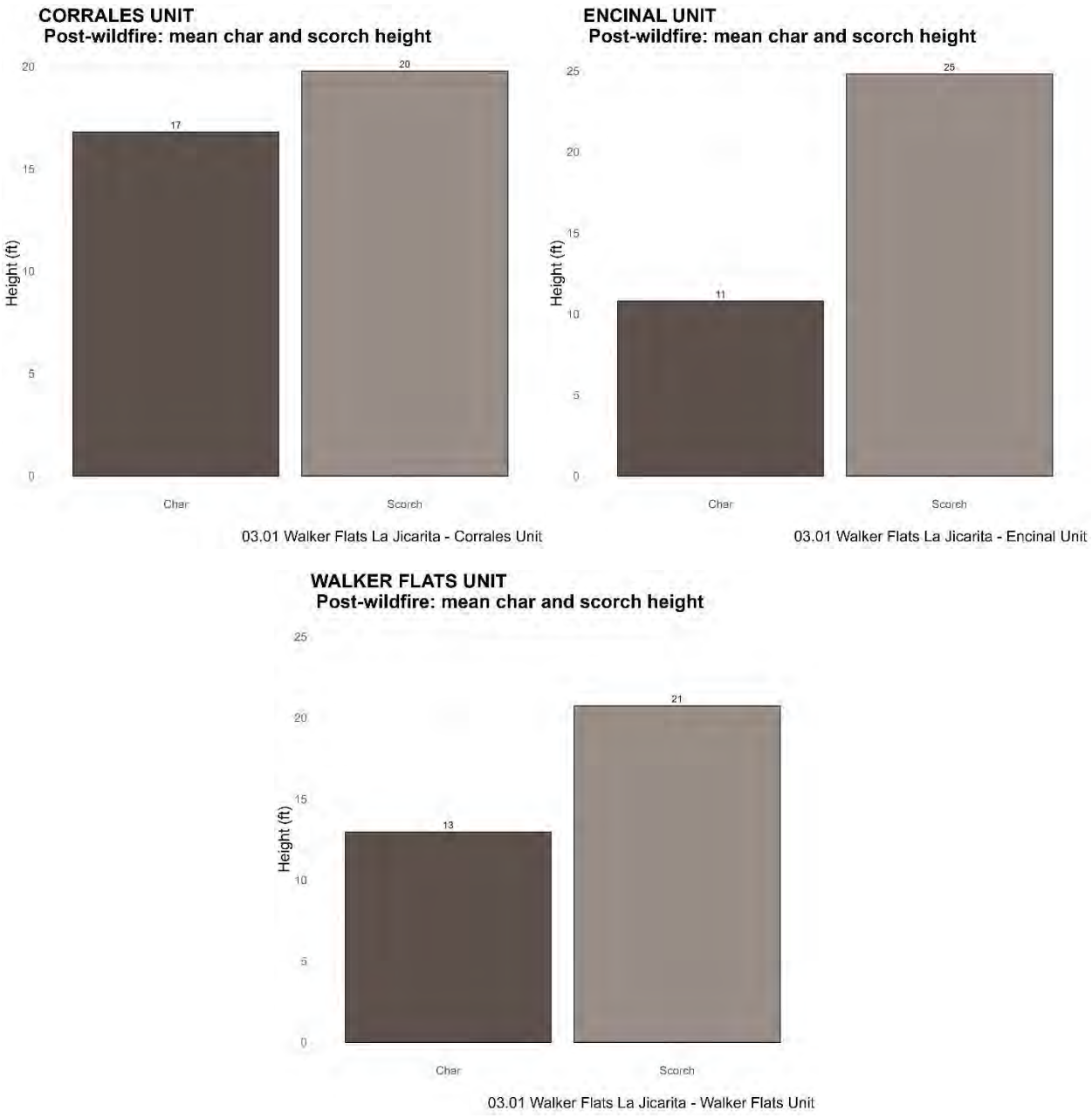


***Figure 15**. Mean char and scorch heights for trees measured immediately post-wildfire. Mean values represent averages of plot means for each monitoring status and each treatment unit.*

Regeneration: Trees & Shrubs

See Supplementary Figures for a breakdown of seedling and sapling densities by species (**Figure 44**). Note that shrub species, and any dead seedlings or saplings were not recorded 2010 PostTreatment5yr nor 2015 PostTreatment10yr. Saplings and seedlings were tallied together and not differentiated 2010 PostTreatment5yr.

Densities of tree seedlings and saplings in the Corrales unit increased steadily across all pre-fire monitoring periods (**Figure 16**). Immediately post-fire, tree seedling density remained relatively high (2400 individuals per acre), while sapling density was zero. Shrub seedling density also decreased post-fire, from 7900 individuals per acre 15 years post-treatment to 530 individuals per acre immediately post-fire. No shrubs of sapling stature were recorded in the Corrales unit in any monitoring period. The increase in dead tree saplings and dead shrub seedlings immediately post-fire indicates that many of these individuals were killed by the fire (**Figure 17**). Alternately, dead tree seedlings decreased slightly immediately post-fire. This indicates that some dead seedlings were consumed by the fire, and many tree seedlings likely survived, instead of being new germinants.

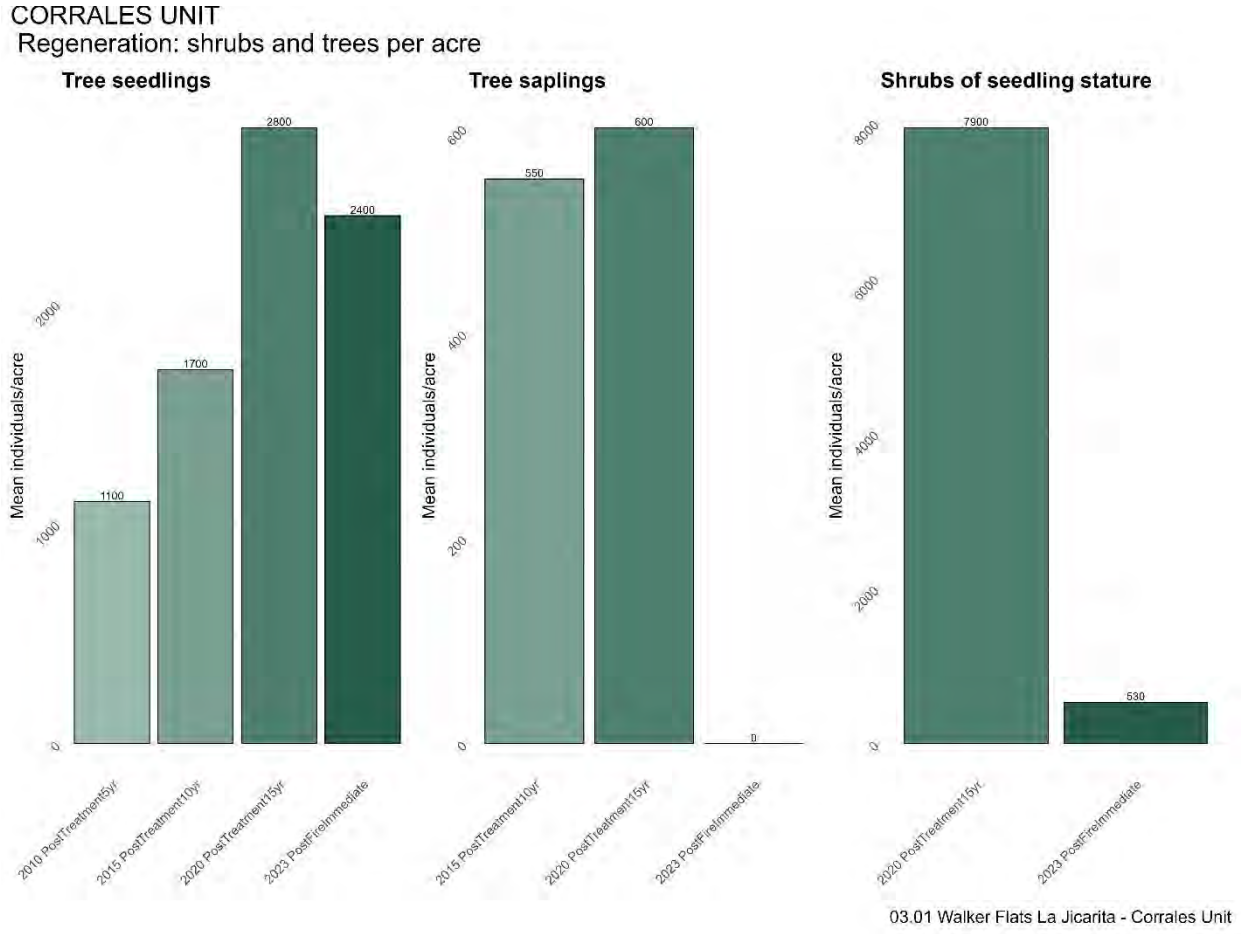


Figure 16. *Regeneration densities of trees and shrubs in the seedling and saplings classes across all measurement periods for the Corrales treatment unit. No shrubs of sapling stature were recorded during any monitoring period.*

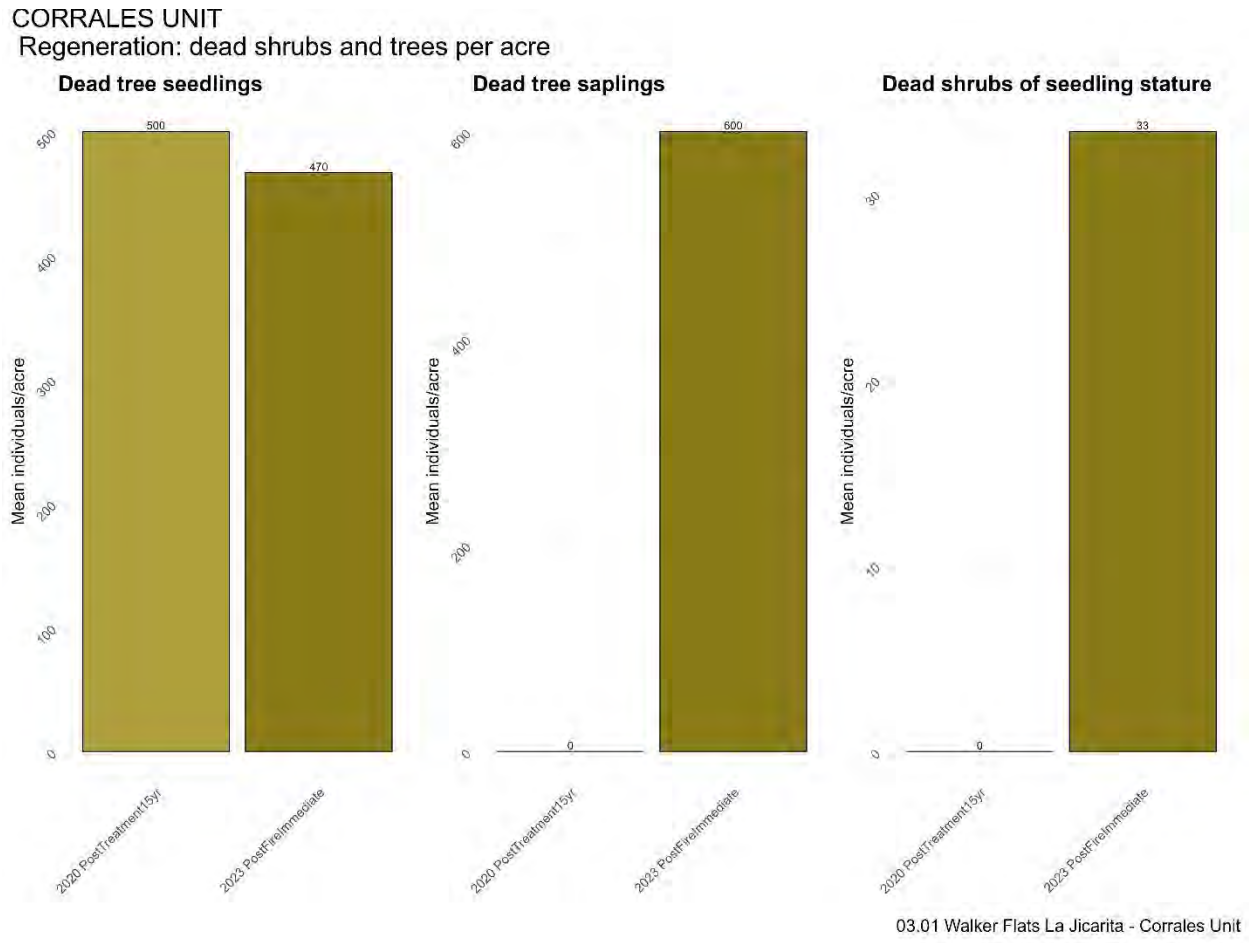


***Figure 17**. Regeneration densities of dead trees and shrubs in the seedling and sapling classes across all measurement periods for the Corrales treatment unit.*

Tree seedling densities in the Encinal unit steadily increased across all pre-fire monitoring periods (**Figure 18**). Immediately post-fire, dead tree seedlings increased from 150 individuals per acre to 520 individuals per acre, while living tree seedlings increased from 2100 individuals per acre to 6800 individuals per acre (**Figure 18**, **Figure 19**). This indicates that while many tree seedlings were killed or consumed by the HPCC wildfire, the fire may have also spurred a germination and recruitment event for tree species. No tree saplings were recorded 10 years post-treatment, but there were an estimated 620 individuals per acre 15 years post-treatment, followed by 220 individuals per acre immediately post fire. This, along with the increase in dead tree saplings from zero immediately post-fire shows that the majority of tree saplings were killed in the fire. Shrubs of seedlings stature decreased immediately post-fire, with a concurrent increase in dead shrubs of seedling stature. No shrubs of sapling stature were recorded in any monitoring period in this unit.

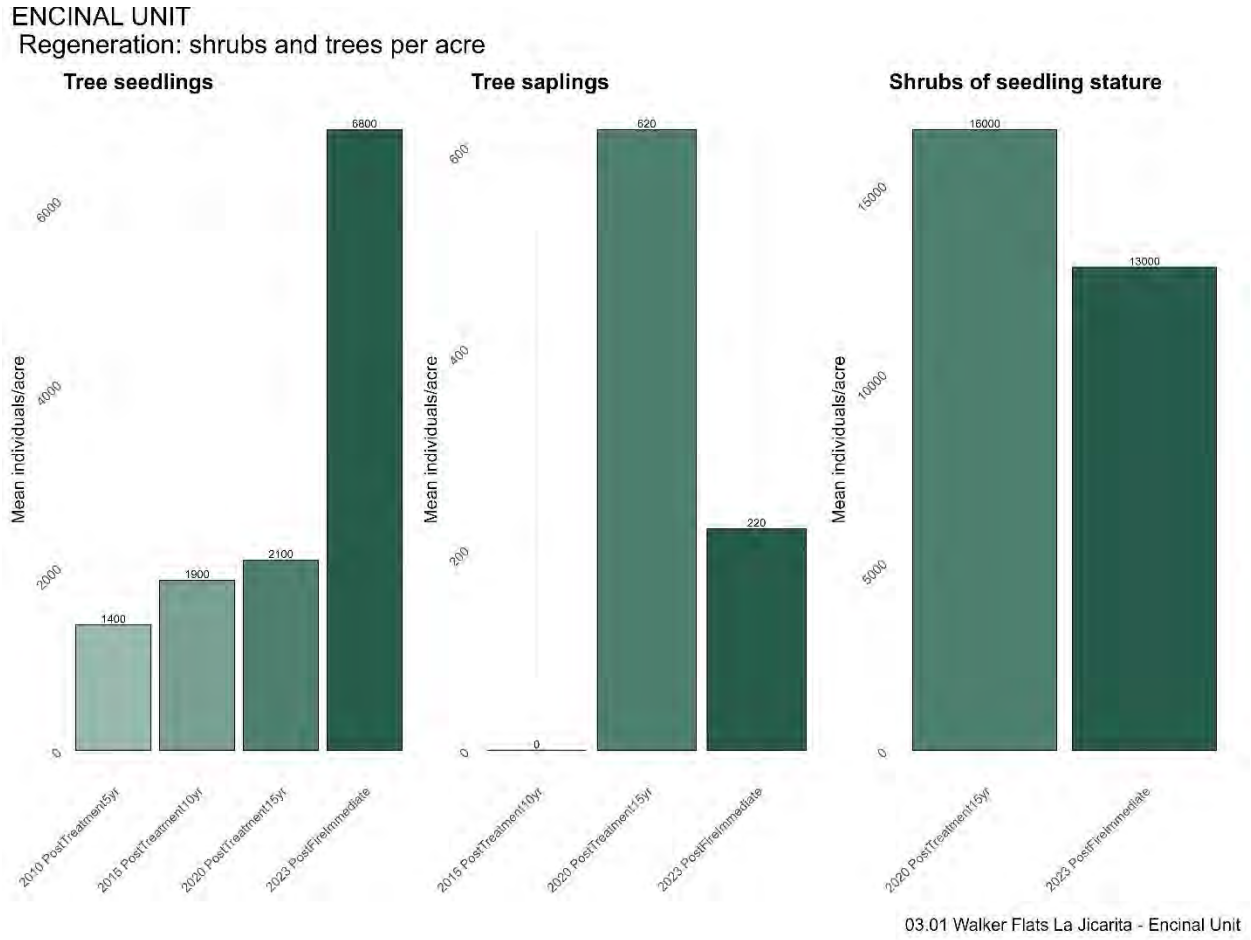


***Figure 18**. Regeneration densities of trees and shrubs in the seedling and saplings classes across all measurement periods for the Encinal treatment unit. No shrubs of sapling stature were recorded during any monitoring period.*

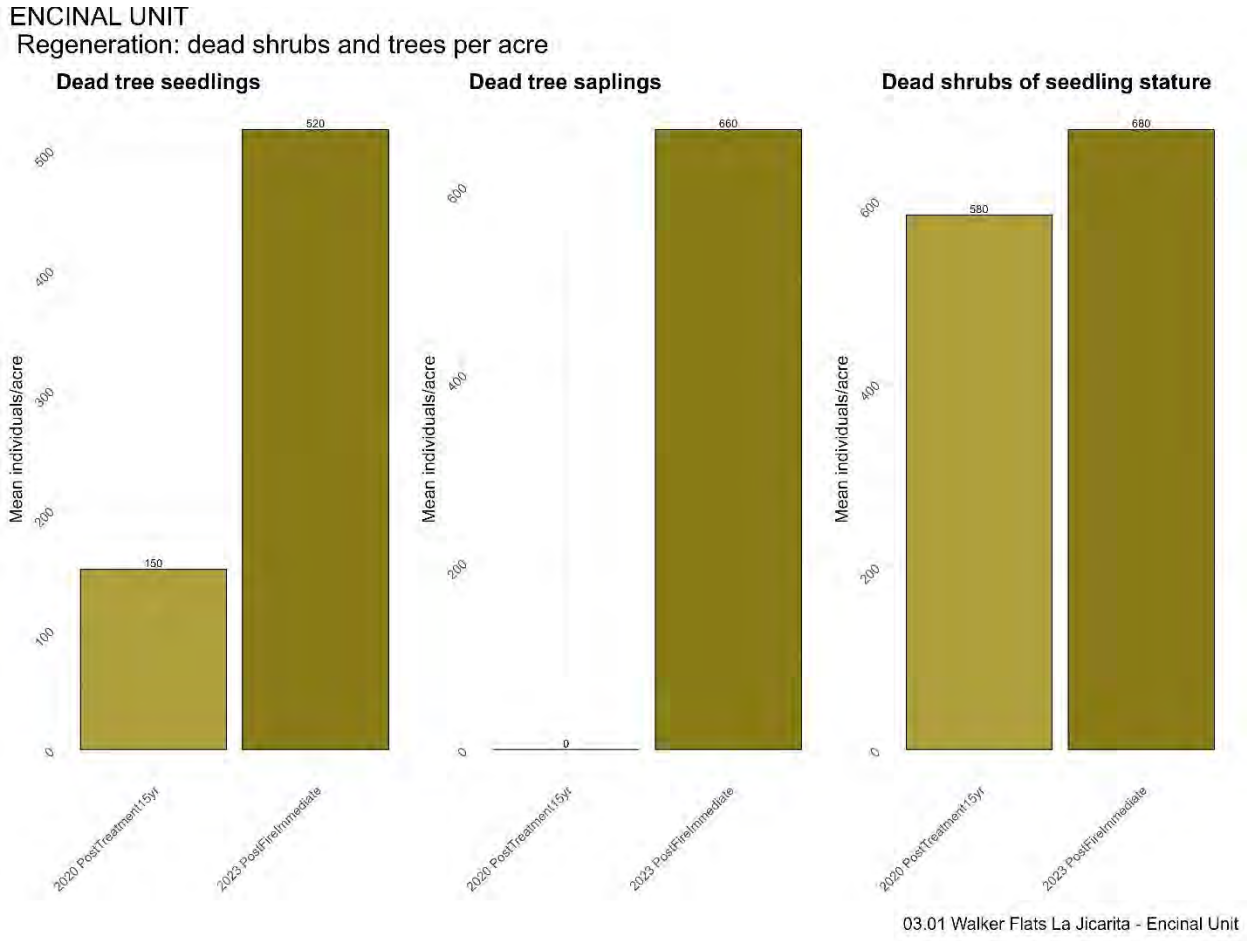


Figure 19. *Regeneration densities of dead trees and shrubs in the seedling and sapling classes across all measurement periods for the Encinal treatment unit.*

Unlike the Corrales and Encinal units, the density of tree seedlings steadily decreased across all pre-fire monitoring periods (**Figure 20**). Immediately post-fire, the density of tree seedlings increased from 1700 individuals per acre to 9000 individuals per acre. Tree saplings and shrub seedlings also increased in density immediately post-fire. Dead seedlings and saplings of both trees and shrubs increased as well post-fire (**Figure 21**). This shows that while the HPCC fire caused seedling and sapling mortality, it may have also have also spurred a germination and recruitment event for woody species. Shrub saplings, alternatively, decreased immediately post-fire.

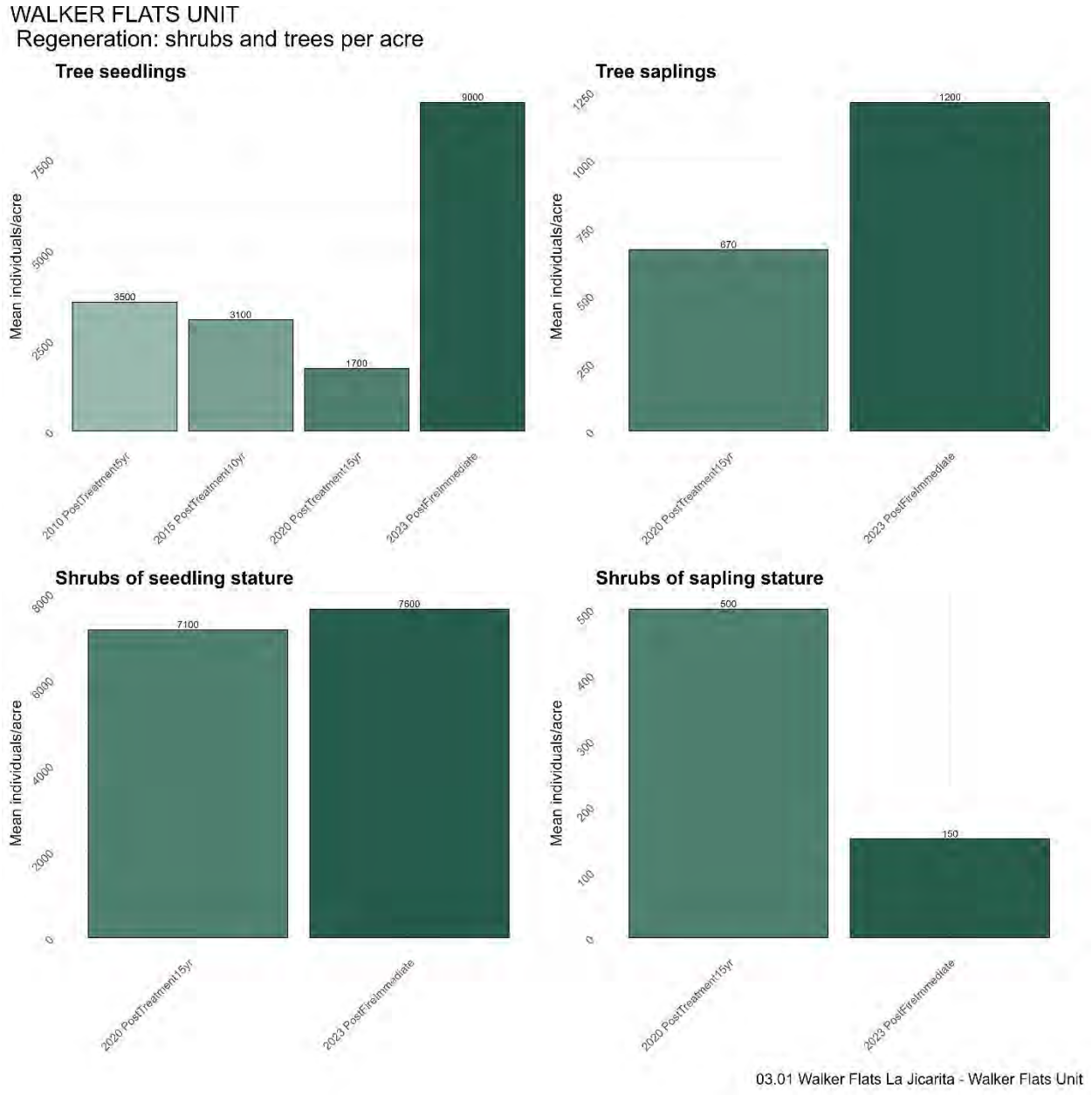


Figure 20. *Regeneration densities of trees and shrubs in the seedling and saplings classes across all measurement periods for the Walker Flats treatment unit.*

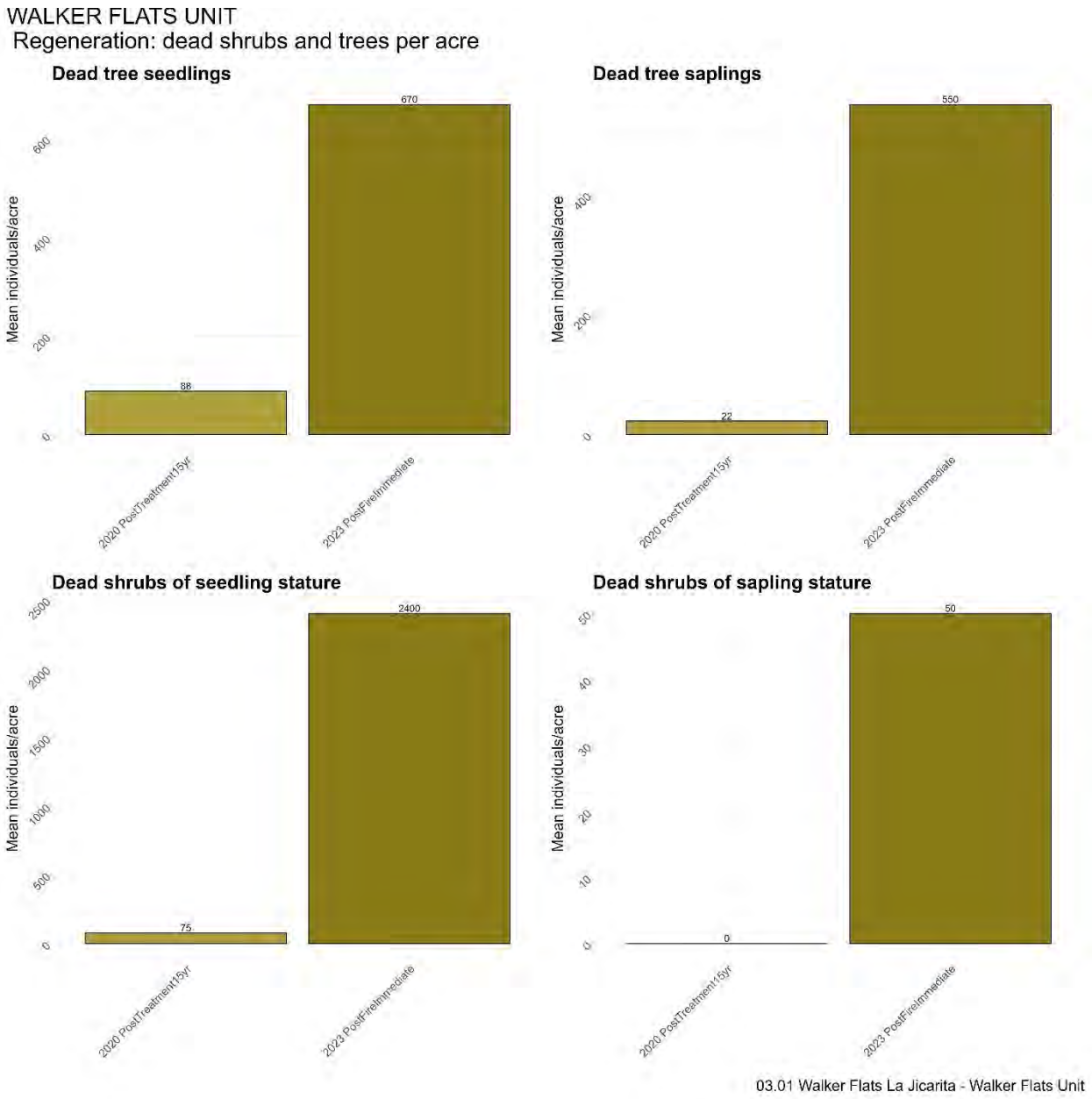


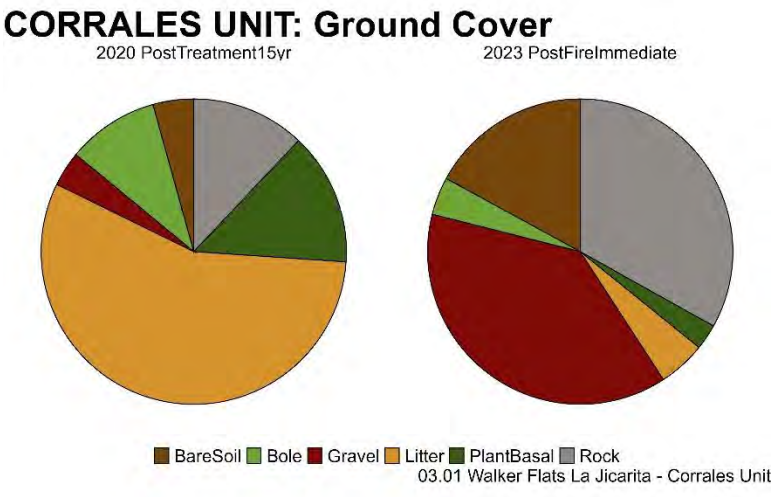
***Figure 21**. Regeneration densities of dead trees and shrubs in the seedling and sapling classes across all measurement periods for the Walker Flats treatment unit.*

Understory & Forest Floor Component

Ground Cover

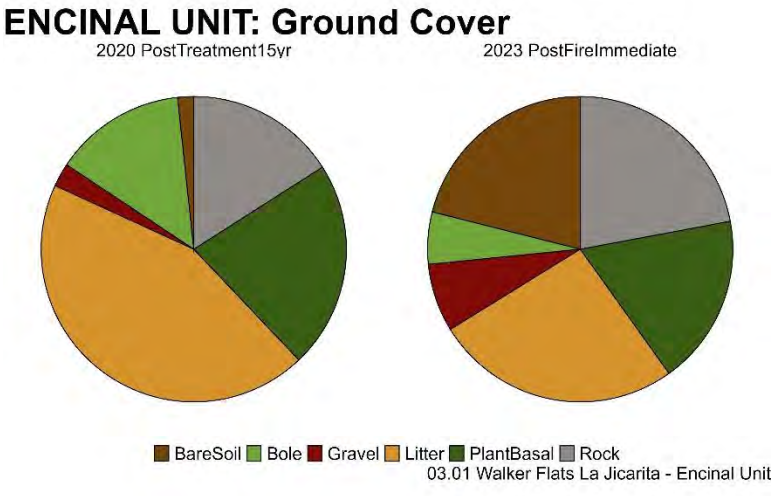
Ground and aerial cover was recorded in 2010 and 2015 using different protocols than in subsequent monitoring periods. These metrics are provided as supplementary tables (**Table 15**), but are not directly comparable to 2020 and 2023 metrics.

Across all three treatment units, cover of plant basal, litter, and bole decreased immediately post-fire; while cover of bare soil, rock, and gravel increased (**Figure 22**-**Figure 24**). This is consistent with the fact that fire consumes organic material and exposes mineral soils.



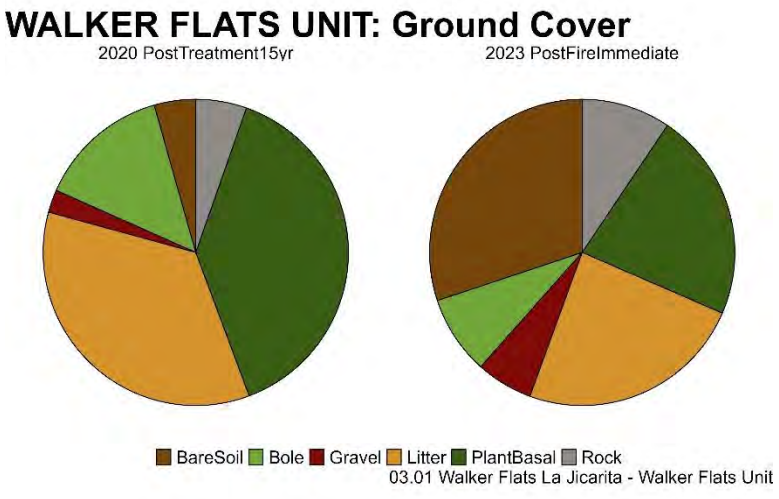
CORRALES UNIT: Ground Cover		
Monitoring Status	**Cover Class**	**% Cover**
2020 PostTreatment15yr	PlantBasal	14.0
	Bole	9.7
	Litter	56.0
	BareSoil	4.3
	Rock	12.0
	Gravel	3.7
2023 PostFireImmediate	PlantBasal	2.7
	Bole	4.0
	Litter	5.0
	BareSoil	17.0
	Rock	33.0
	Gravel	38.0

Figure 22. *Mean percent ground cover by monitoring status and cover class for the Corrales treatment unit.*



ENCINAL UNIT: Ground Cover		
Monitoring Status	**Cover Class**	**% Cover**
2020 PostTreatment15yr	PlantBasal	22.0
	Bole	14.0
	Litter	44.0
	BareSoil	1.7
	Rock	16.0
	Gravel	2.5
2023 PostFireImmediate	PlantBasal	18.0
	Bole	5.5
	Litter	26.0
	BareSoil	21.0
	Rock	22.0
	Gravel	7.2

Figure 23. *Mean percent ground cover by monitoring status and cover class for the Encinal treatment unit.*



WALKER FLATS UNIT: Ground Cover		
Monitoring Status	**Cover Class**	**% Cover**
2020 PostTreatment15yr	PlantBasal	39.0
	Bole	14.0
	Litter	35.0
	BareSoil	4.4
	Rock	5.4
	Gravel	2.4
2023 PostFireImmediate	PlantBasal	22.0
	Bole	8.3
	Litter	24.0
	BareSoil	30.0
	Rock	9.4
	Gravel	6.0

Figure 24. *Mean percent ground cover by monitoring status and cover class for the Walker Flats treatment unit.*

Aerial Cover

In the Corrales unit, aerial cover of shrub and tree regeneration decreased from 15 years post-treatment to immediately post-fire. Graminoid and forb cover was approximately the same post-fire.

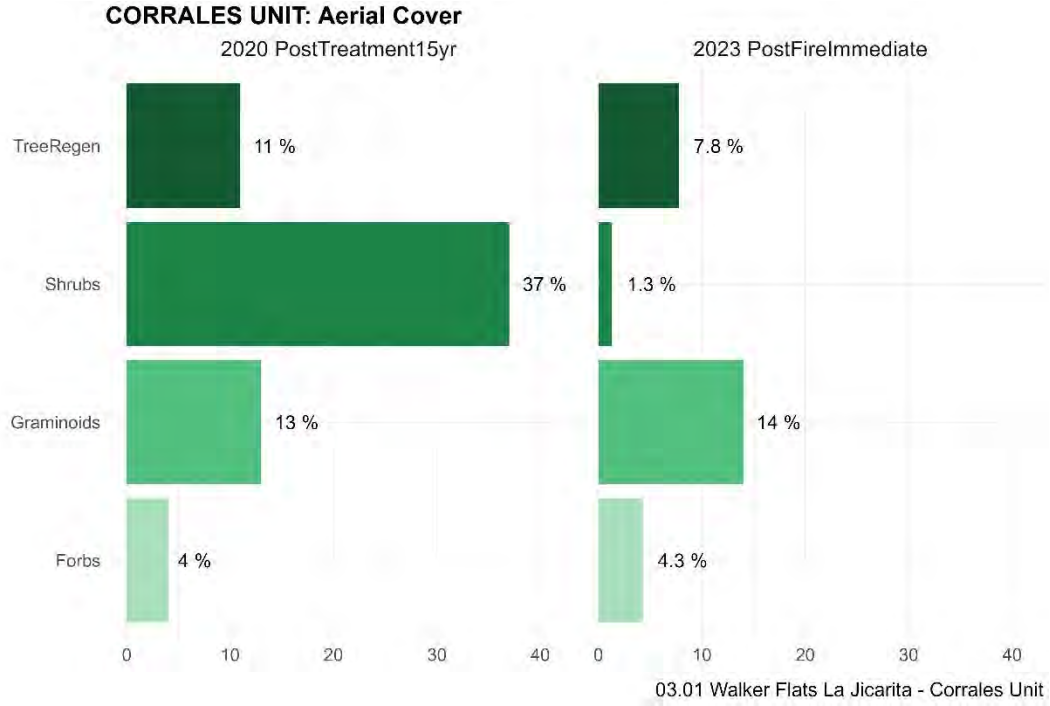


Figure 25. *Mean percent aerial cover by monitoring status for the Corrales treatment unit.*

Aerial cover of shrubs in the Encinal unit decreased post-fire, cover of tree regeneration remained the same, and the cover of graminoids and forbs increased.

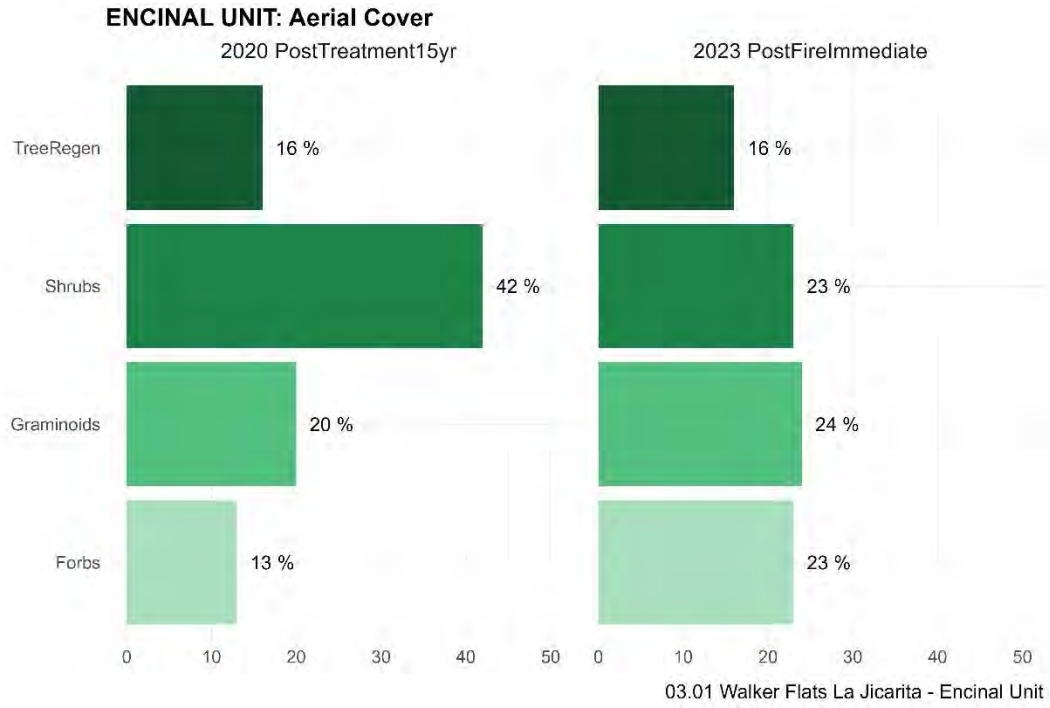


Figure 26. *Mean percent aerial cover by monitoring status for the Encinal treatment unit.*

Immediately post-fire in the Walker Flats unit, aerial cover of shrubs decreased, graminoid cover remained the same, and tree regeneration and forb cover increased.

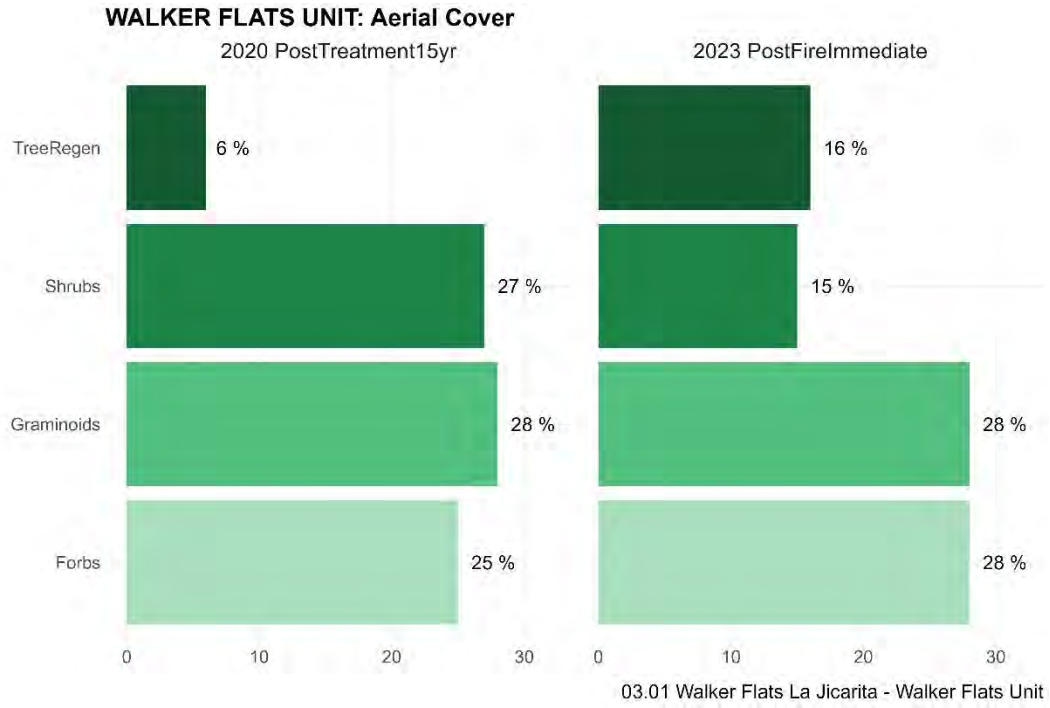


Figure 27. *Mean percent aerial cover by monitoring status for the Walker Flats treatment unit.*

Tree Canopy

Canopy cover was not recorded using consistent methodologies in 2010 and 2015, therefore NMFWRI recommends caution comparing these values to 2020 and 2023 values. Part of this has resulted in an uncertainty in 2015 canopy values, represented with a 4% error bar in the following figures.

The mean percentage of closed canopy as measured by a densiometer in the Corrales unit decreased from 27% 5 years post-treatment to 21% 10 years post-treatment (**Figure 28**). Canopy cover then increased to 32% before decreasing to 10% immediately post-fire. This is consistent with measured tree mortality. The inconsistent changes in canopy cover between the years of 2010, 2015, and 2020 may be due to mortality, fuelwood harvesting, and the growth of tree regeneration between these years. There are also observed differences in the reliability of monitoring crews and canopy measurement methodologies.

In the Encinal unit, the percent closed canopy increased from 41% 5 years post-treatment to 66% 10 years post treatment, before decreasing to 36% 15 years post-treatment (**Figure 29**). Finally, canopy decreased again immediately post-fire, to 27%: this is once again consistent with measured tree mortality.

The Walker Flats unit experienced a steady decreased in closed canopy cover, from 49% 5 years post-treatment, 48% 10 years post-treatment, 27% 15 years post-treatment, to 21% immediately post-fire (**Figure 30**).

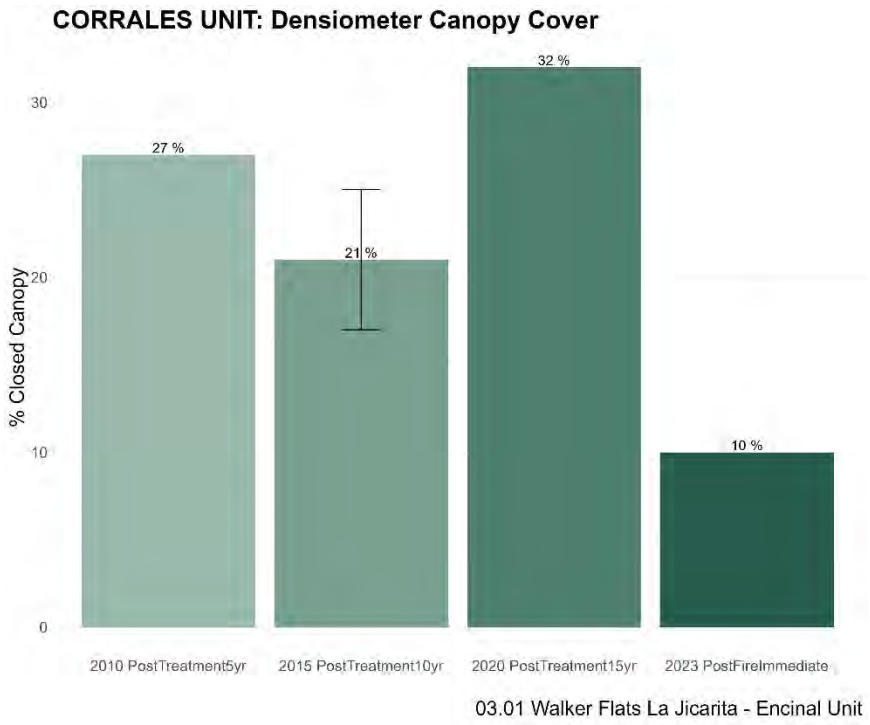


Figure 28. *Mean percent closed tree canopy by monitoring status for the Corrales treatment unit.*

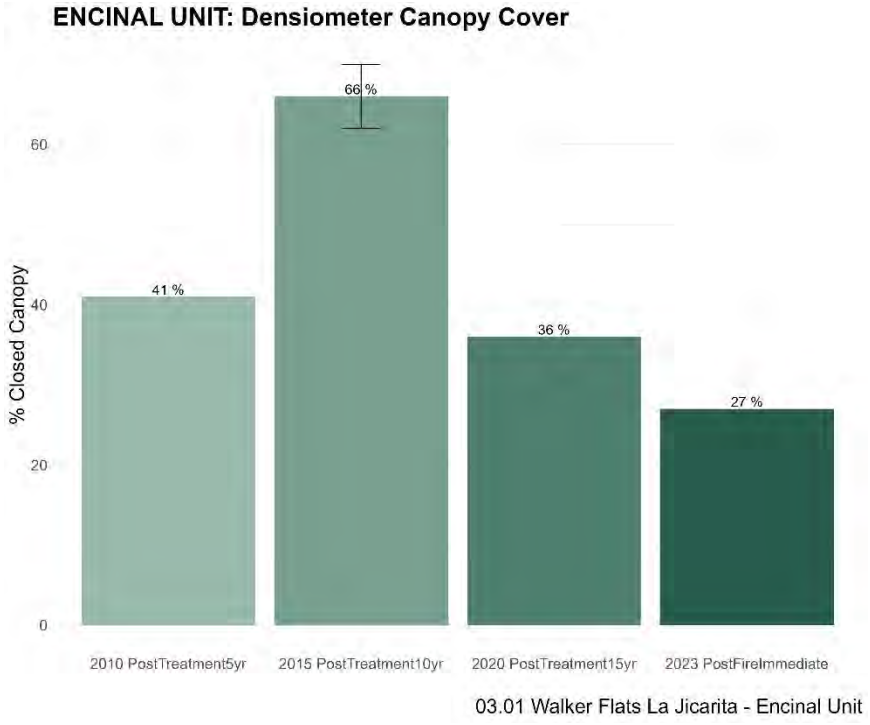


Figure 29. *Mean percent closed tree canopy by monitoring status for the Encinal treatment unit.*

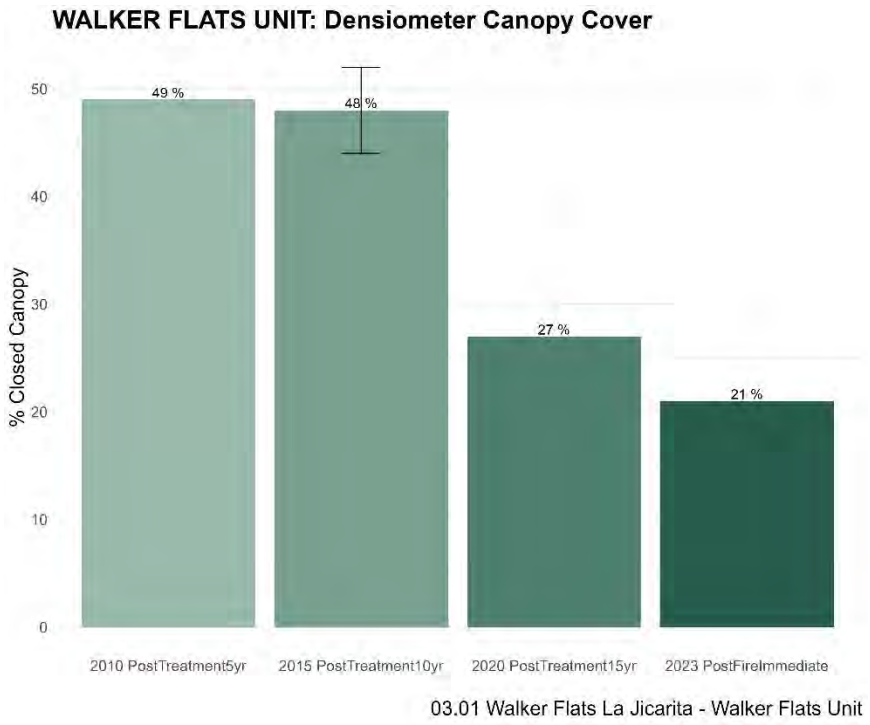


Figure 30. *Mean percent closed tree canopy by monitoring status for the Walker Flats treatment unit.*

Surface Fuels Vegetation (Ladder Fuels)

Mean percent cover, height, and biomass of all ladder fuels are included as tables in the Supplementary Figures (**Table 21**).

Average biomass of ladder fuels in the Corrales unit increased from 140 tons per acre 5 years post-treatment to 410 tons 10 years post-treatment (**Figure 31**). Ladder fuel biomass then decreased to 80 tons per acre 15 years post-treatment, then to 20 tons per acre immediately post-fire. This pattern is likely due to a surge in growth of shrubs or trees such as aspen, that then grew too large to be included as ladder fuels. The HPCC fire consumed approximately 75% of ladder fuels. Living woody fuels was the dominant component across all monitoring periods, except for in 2010, where it came second to living herbaceous fuels (66 tons per acre, 74 tons per acre, respectively).

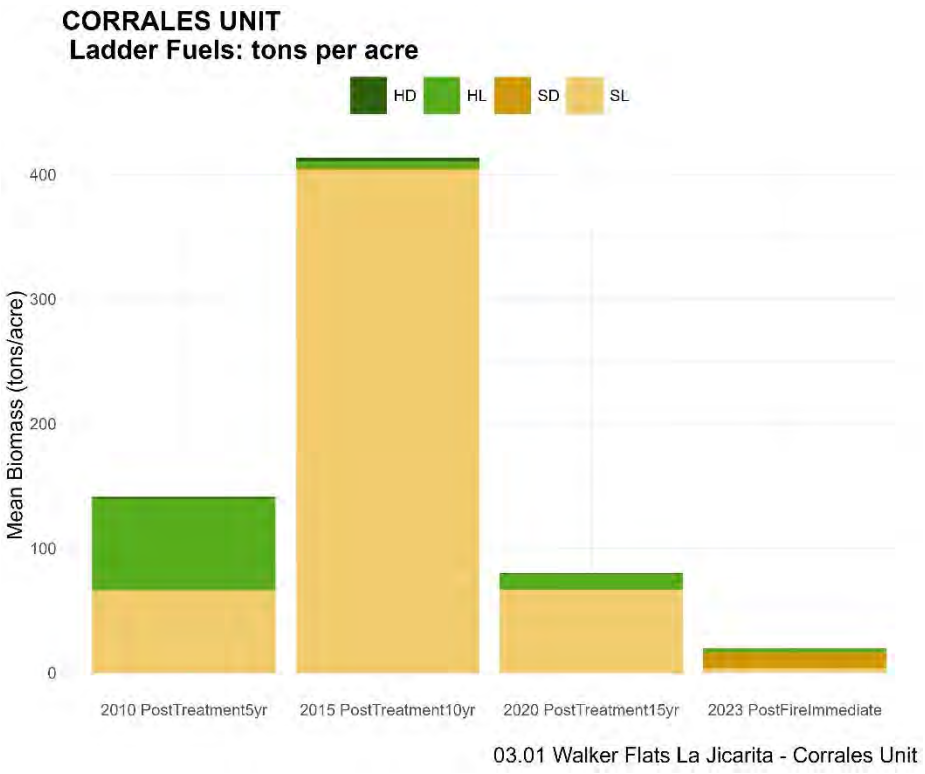


Figure 31. *Mean ladder fuel biomass by vegetation type across monitoring periods for the Corrales treatment unit.*

In the Encinal unit, average biomass of ladder fuels increased steadily across pre-fire monitoring periods, from 58 tons per acre 5 years post-treatment, to 120 tons per acre 10 years post-treatment, to 530 tons per acre 15 years post-treatment (**Figure 32**). This is likely due to a surge in growth of regenerating trees and shrubs such as aspen, which are prone to thinning themselves out when growing in such densities. The HPCC fire consumed approximately 82% of ladder fuel biomass, at 93 tons per acre immediately post-fire. Living woody fuels was the dominant component across all monitoring periods, except for in 2020, where it came second to dead woody fuels (370 tons per acre, 160 tons per acre, respectively).

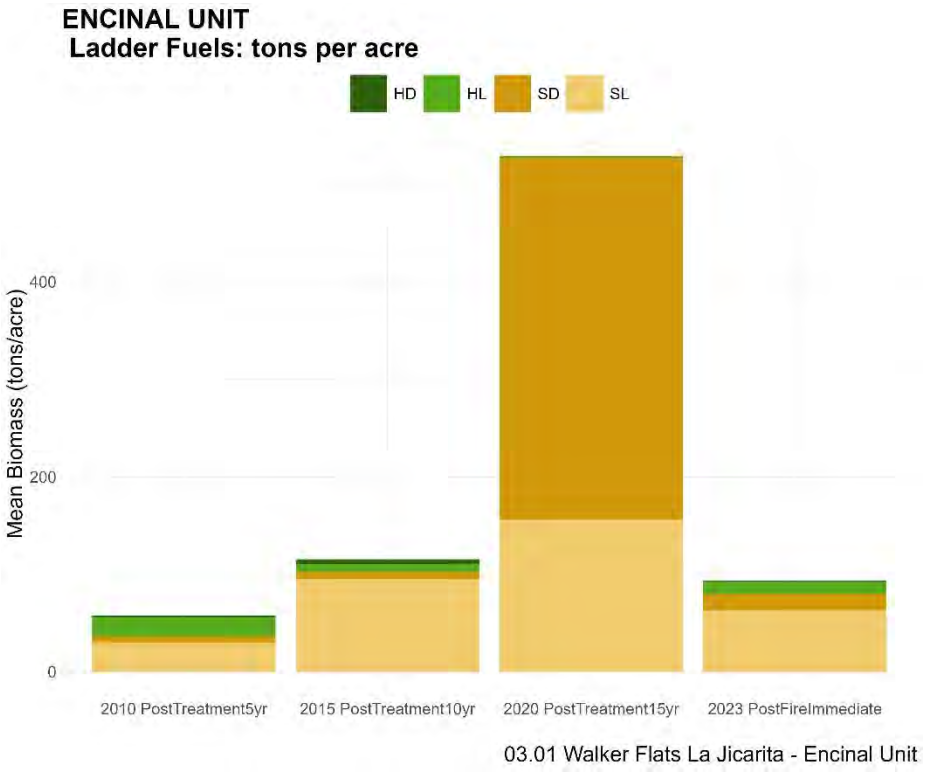


Figure 32. *Mean ladder fuel biomass by vegetation type across monitoring periods for the Encinal treatment unit.*

In the Walker Flats unit, average biomass of ladder fuels decreased steadily across pre-fire monitoring periods, from 340 tons per acre 5 years post-treatment, to 290 tons per acre 10 years post-treatment, to 97 tons per acre 15 years post-treatment (**Figure 33**). This decreasing pattern is likely due to the initial surge in woody regeneration self-thinning, or plants simply growing too large to be considered ladder fuels any longer. Immediately post-fire the biomass of ladder fuels had increased to 200 tons per acre. Living woody fuels was the dominant component across all monitoring periods.

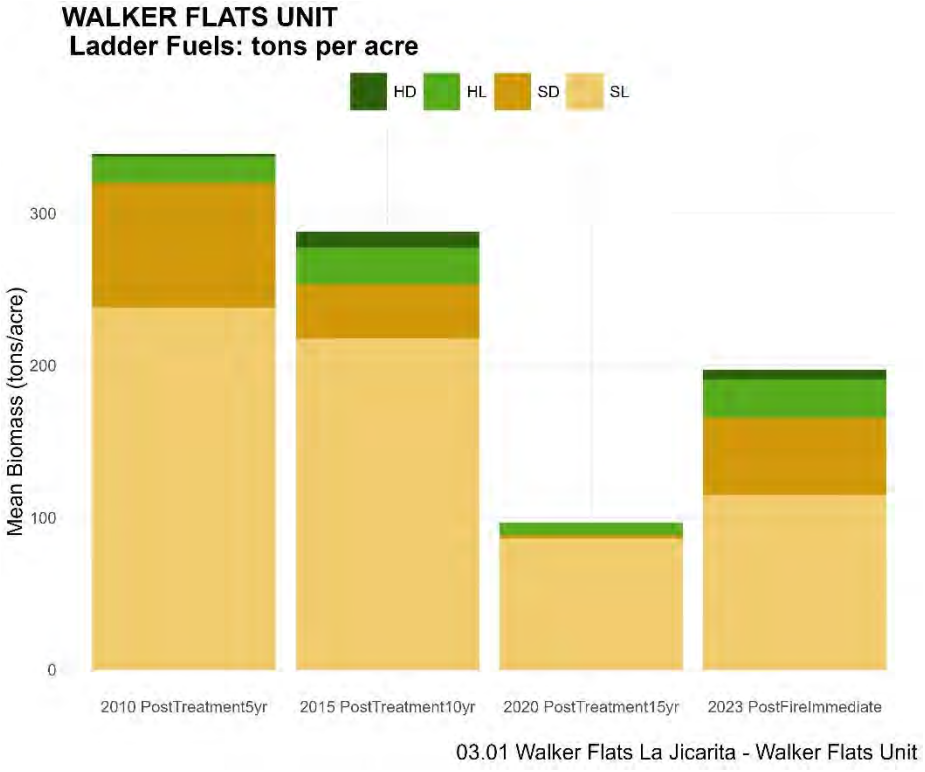


Figure 33. *Mean ladder fuel biomass by vegetation type across monitoring periods for the Walker Flats treatment unit.*

Surface Fuels

Trends in total surface fuels are fairly similar across the three treatment units. Surface fuels in tons per acre increase from 2010 to 2015, then either increase or decrease slightly in 2020, before ultimately decreasing immediately post-fire in 2023. This is consistent with the fact that litter, fine and woody fuels accumulate over time, and are consumed by wildfire.

Table 11. *Fuel loads by type, monitoring status, and treatment unit.*

CORRALES UNIT: Total Surface Fuels Table

Monitoring Status	1-hr (tons/acre)	10-hr (tons/acre)	100-hr (tons/acre)	1000-hr sound (tons/acre)	1000-hr rotten (tons/acre)	Litter (tons/acre)	Duff (tons/acre)	Total Fine Fuels (tons/acre)	Total Wood Fuels (tons/acre)	Total Surface Fuels (tons/acre)
2010 PostTreatment5yr	0.064	1	3.3	10	1	1.4	2.5	4.4	15	19
2015 PostTreatment10yr	0.074	1.6	0.69	2.4	43	8.9	8.3	2.4	47	64
2020 PostTreatment15yr	0.032	0.81	4.6	23	14	3.7	3.7	5.4	43	50
2023 PostFireImmediate	0.021	0.2	0.14	7.6		0.25	0.17	0.36	7.9	8.3

ENCINAL UNIT: Total Surface Fuels Table

Monitoring Status	1-hr (tons/acre)	10-hr (tons/acre)	100-hr (tons/acre)	1000-hr sound (tons/acre)	1000-hr rotten (tons/acre)	Litter (tons/acre)	Duff (tons/acre)	Total Fine Fuels (tons/acre)	Total Wood Fuels (tons/acre)	Total Surface Fuels (tons/acre)
2010 PostTreatment5yr	0.075	1.3	1.9	4.9	2.3	1.8	1.9	3.3	10	14
2015 PostTreatment10yr	0.11	0.74	0.94	9.9	2.8	5.5	8.8	1.8	15	29
2020 PostTreatment15yr	0.032	0.97	2.7	11	3.3	3.5	3.8	3.7	18	25
2023 PostFireImmediate	0.013	0.45	0.96	9.7	2.2	1.3	3.1	1.4	13	18

WALKER FLATS UNIT: Total Surface Fuels Table

Monitoring Status	1-hr (tons/acre)	10-hr (tons/acre)	100-hr (tons/acre)	1000-hr sound (tons/acre)	1000-hr rotten (tons/acre)	Litter (tons/acre)	Duff (tons/acre)	Total Fine Fuels (tons/acre)	Total Wood Fuels (tons/acre)	Total Surface Fuels (tons/acre)
2010 PostTreatment5yr	0.11	1.3	1.3	6.6	2.8	2.1	2.5	2.7	12	17
2015 PostTreatment10yr	0.14	0.86	0.56	10	12	4.1	4.1	1.6	24	32
2020 PostTreatment15yr	0.082	1.2	1.8	15	8.6	5.1	3.7	3.1	26	35
2023 PostFireImmediate	0.076	1.1	1.3	6.7	3	2.6	2.9	2.5	12	18

Litter and Duff

In the Corrales unit, litter and duff fuel loads more than quadrupled from 3.9 tons per acre 5 years post-treatment to 17.2 tons/acre 10 years post-treatment. Litter and duff then decreased to 7.4 tons/acre 15 years post-treatment, then to 0.42 tons/acre immediately post-wildfire (**Table 11**, **Figure 34**). Mean litter and duff depth in inches followed the same trend. The cause of the decrease in litter and duff from 2015 to 2020 is uncertain. However, we can observe how drastically the HPCC wildfire decreased litter and duff loads.

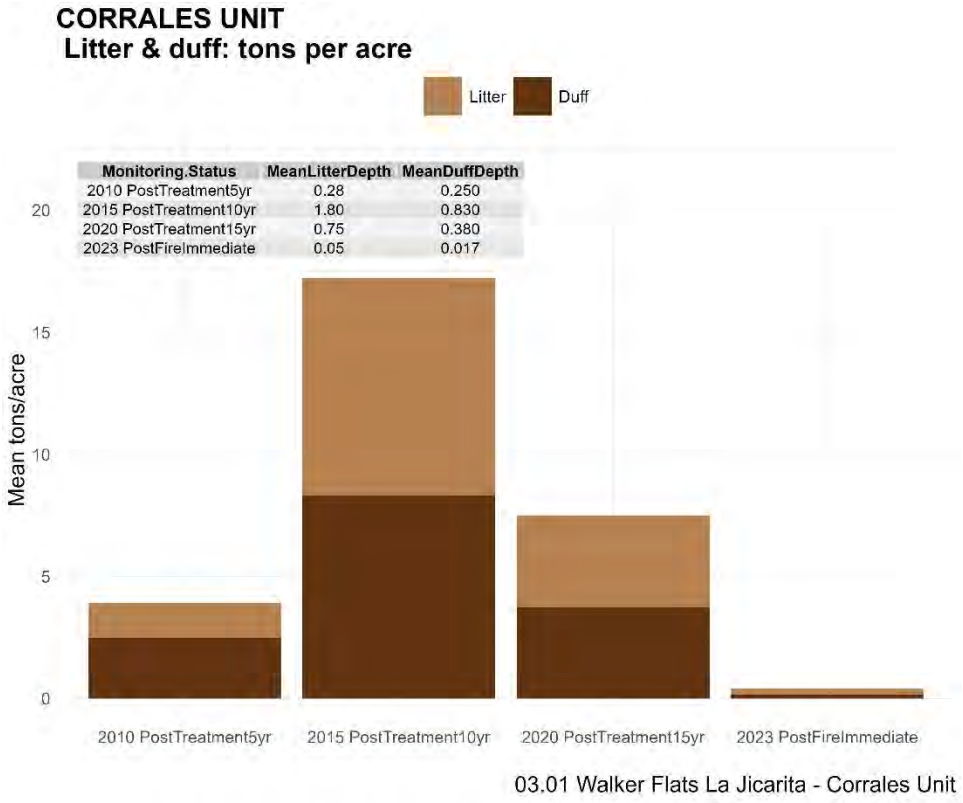


Figure 34. *Mean litter and duff loads by monitoring status for the Corrales treatment unit. The inset table displays mean litter and duff depths in inches.*

A very similar trend is seen in the Encinal unit, though the decrease in fuels caused by the HPCC wildfire is not as drastic (**Table 11**, **Figure 35**). Litter and duff loads increased from 3.7 tons per acre 5 years post-treatment to 14.3 tons per acre 10 years post-treatment. Loads then decreased to 7.8 tons per acre 15 years post-treatment, then to 4.4 tons per acre immediately post-wildfire. The load of litter decreased from 3.5 to 1.3 tons per acre, while duff only decreased from 3.8 to 3.1 tons per acre immediately post-fire. This indicates that the fire did not burn hot enough or move slowly enough to consume the lower, moister duff layer. Litter and duff depths followed the same trends. The cause of the decrease in litter and duff loads from 2015 to 2020 is also uncertain in this unit.

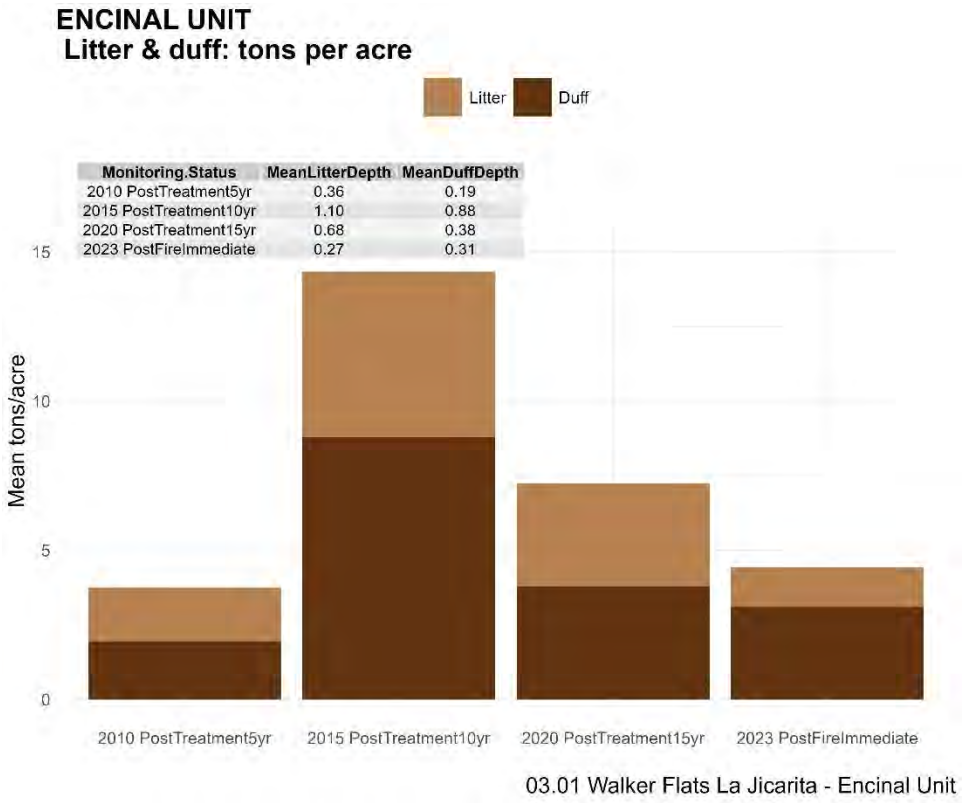


Figure 35. *Mean litter and duff loads by monitoring status for the Encinal treatment unit. The inset table displays mean litter and duff depths in inches.*

Litter and duff load in the Walker Flats unit steadily increased across all pre-fire monitoring periods, as is expected in a forest ecosystem sans disturbance (**Table 11**, **Figure 36**). Immediately post-wildfire, duff and litter decreased from 5.1 and 3.7 tons per acre to 2.6 and 2.9 tons per acre, respectively. Litter decreased in depth and biomass much more than duff, and far less drastically than the other 2 treatment units. This indicates the fire burned less hot or moved across the ground too quickly to burn the lower, moister duff later.

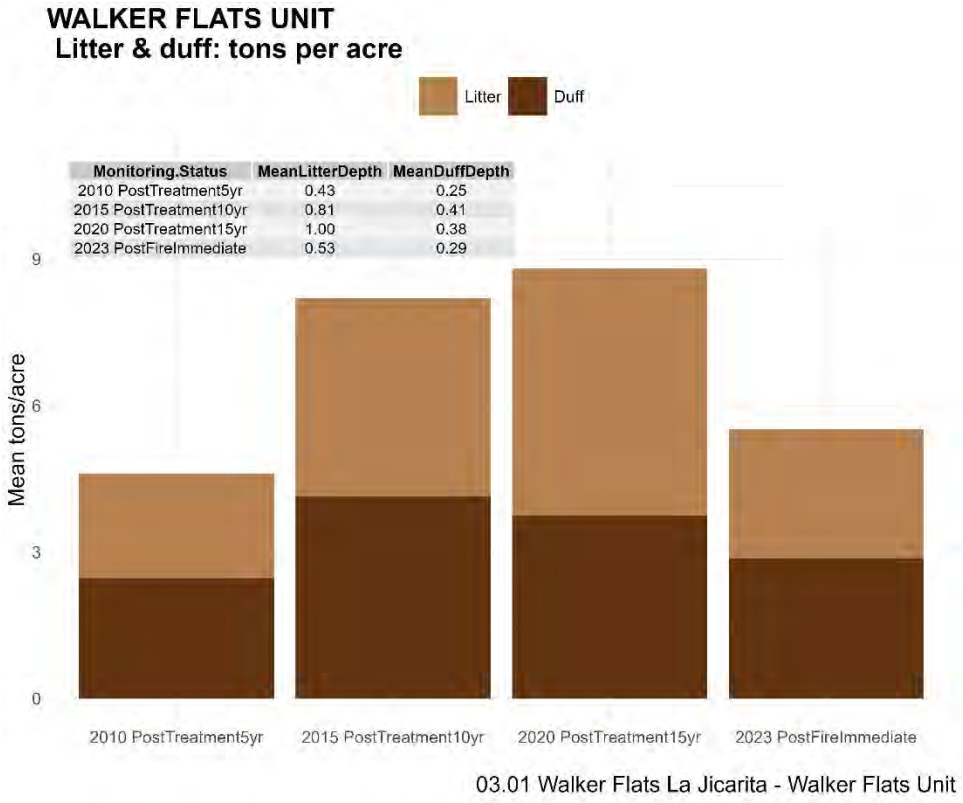


***Figure 36**. Mean litter and duff loads by monitoring status for the Walker Flats treatment unit. The inset table displays mean litter and duff depths in inches.*

Fine Fuels

Five years post-treatment in the Corrales unit, 100-hour fuels dominated fine fuels (**Table 11**, **Figure 37**). Total fine fuels decreased from 4.4 tons per acre to 2.4 tons per acre 10 years post-treatment, and 10-hour fuels were the dominant component. Fine fuel loads then increased substantially to 5.4 tons per acre 15 years post-treatment; 100-hour fuels once again dominating. Immediately after the HPCC wildfire, fine fuels decreased to 0.36 tons per acre, with 10-hour fuels as the dominant component.

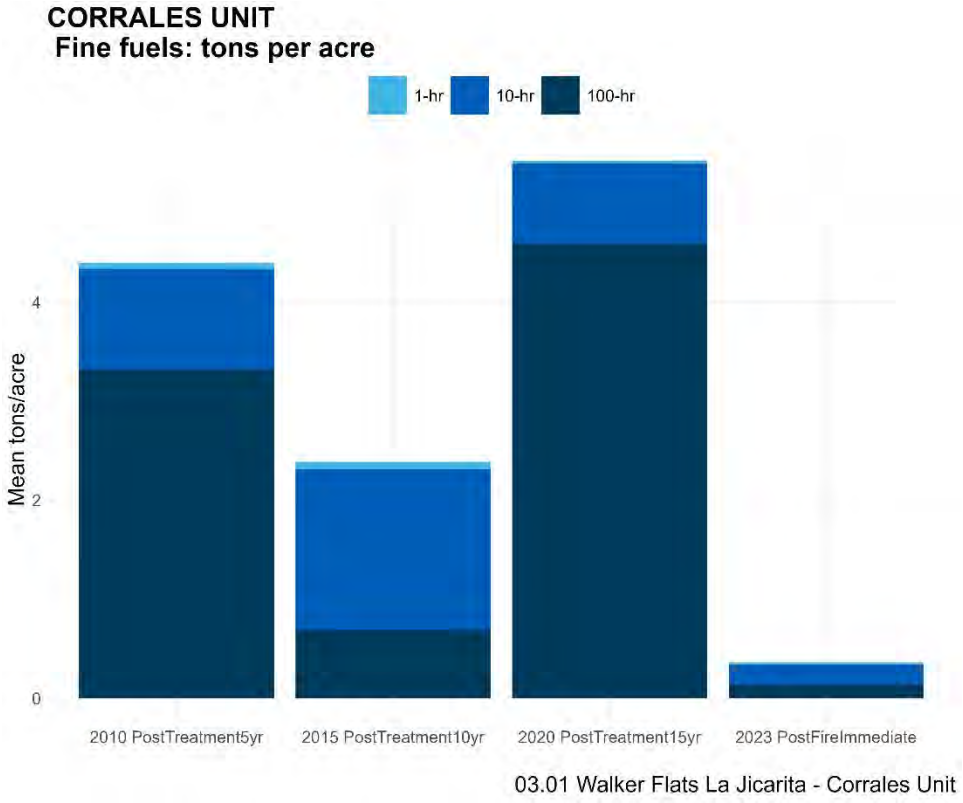


Figure 37. *Mean fine fuel loads across monitoring periods for the Corrales treatment unit.*

The Encinal unit follows a similar pattern to the Corrales unit (**Table 11**, **Figure 38**). Total fine fuels decreased from 3.3 tons per acre 5 years post-treatment to 1.8 tons per acre 10 years post-treatment. Fifteen years post-treatment, fine fuel load increased to 3.7 tons per acre, before decreasing to 1.4 tons per acre immediately post-fire. The dominant component across all monitoring periods was 100-hour fuels. The less drastic decrease in fine fuels post-fire, compared with the Corrales unit, indicates the fire did not burn as severely at these plots.

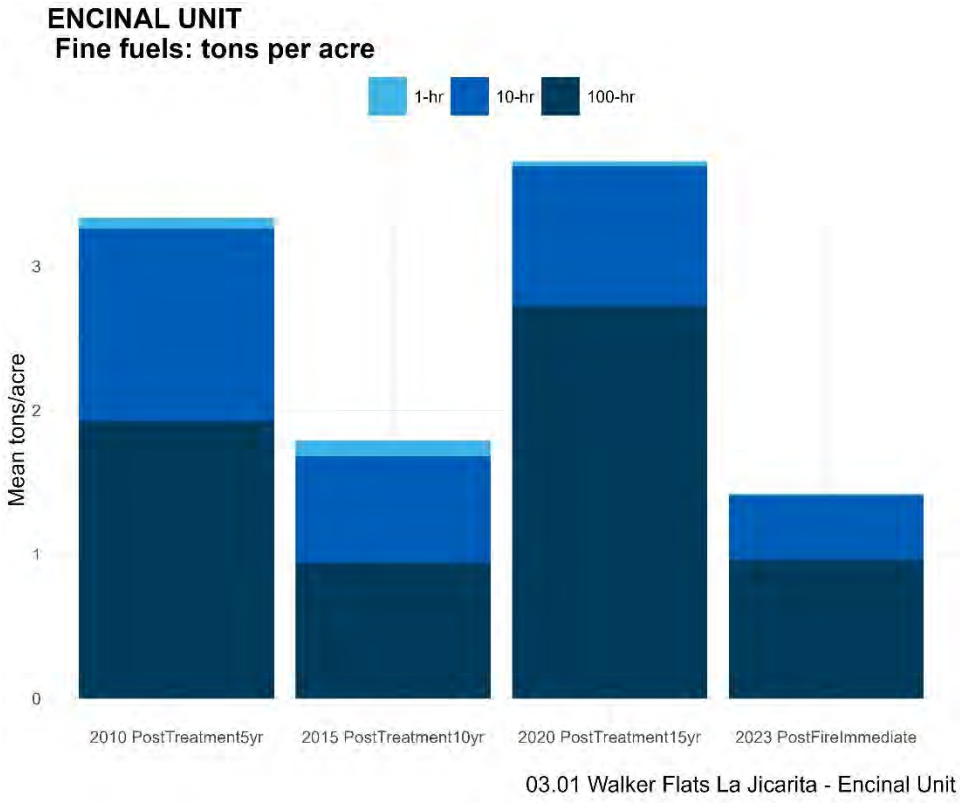


***Figure 38**. Mean fine fuel loads across monitoring periods for the Encinal treatment unit.*

The pattern of fine fuels in the Walker Flats unit is similar to that of the Corrales and Encinal units, though less severe changes in fuel loads between monitoring periods (**Table 11**, **Figure 39**). Fine fuels first decreased from 2.7 tons per acre 5 years post-treatment to 1.6 tons per acre 10 years post-treatment, then increased to 3.1 tons per acre 15 years post-treatment. Immediately post-fire, fine fuels dropped to 2.5 tons per acre. This indicates the HPCC wildfire did not burn as hot or severely in these plots.

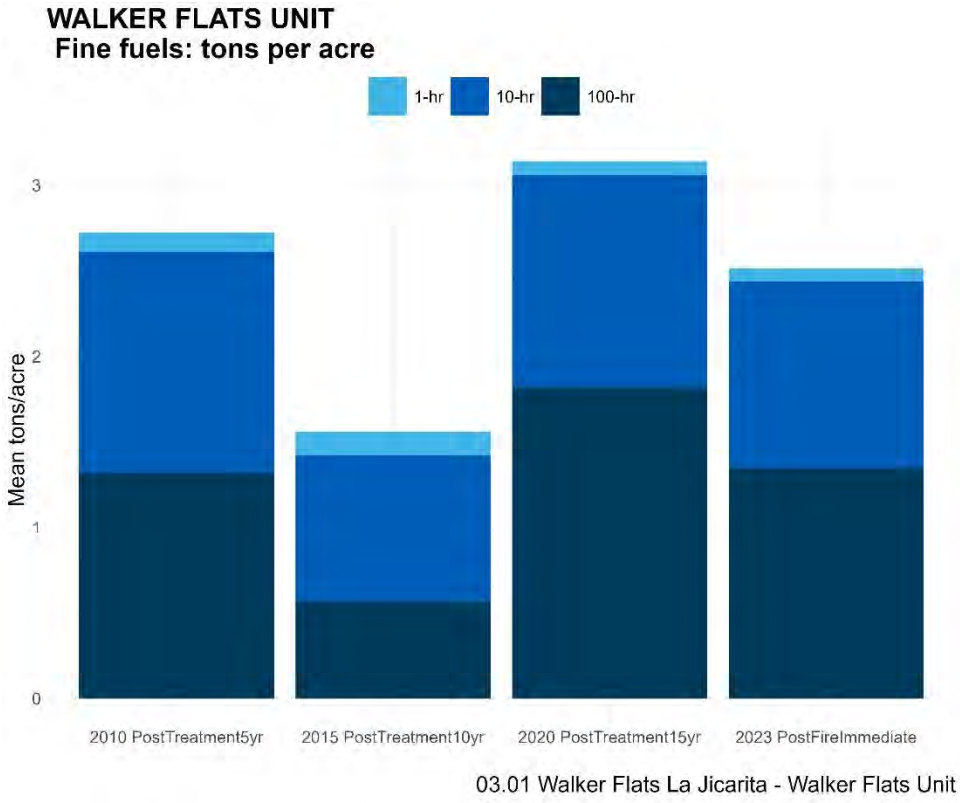


Figure 39. *Mean fine fuel loads across monitoring periods for the Walker Flats treatment unit.*

Thousand-Hour Fuels

A breakdown of proportion of thousand hour logs by decay class is available in the supplementary figures, as well as detailed descriptions of those decay classes (**Table 22**, Figure 45-**Figure 47**).

In the Corrales unit, sound logs made up the majority of thousand-hour fuels at 10 tons per acre 5 years post-treatment; rotten logs were present at 1 ton per acre (**Table 11**, **Figure 40**). Ten years post-treatment, sound logs decreased to 2.4 tons per acre and rotten logs increased to 43 tons per acre. Fifteen years post-treatment, sound logs increased to 23 tons per acre and rotten logs decreased to 14 tons per acre. Immediately post-fire, sound logs had decreased to 7.6 tons per acre, and there were no rotten logs recorded. The wildfire consumed all rotten logs and at least some sound logs. Sound logs in 2023 may have also consisted of fire killed snags that had recently fallen.

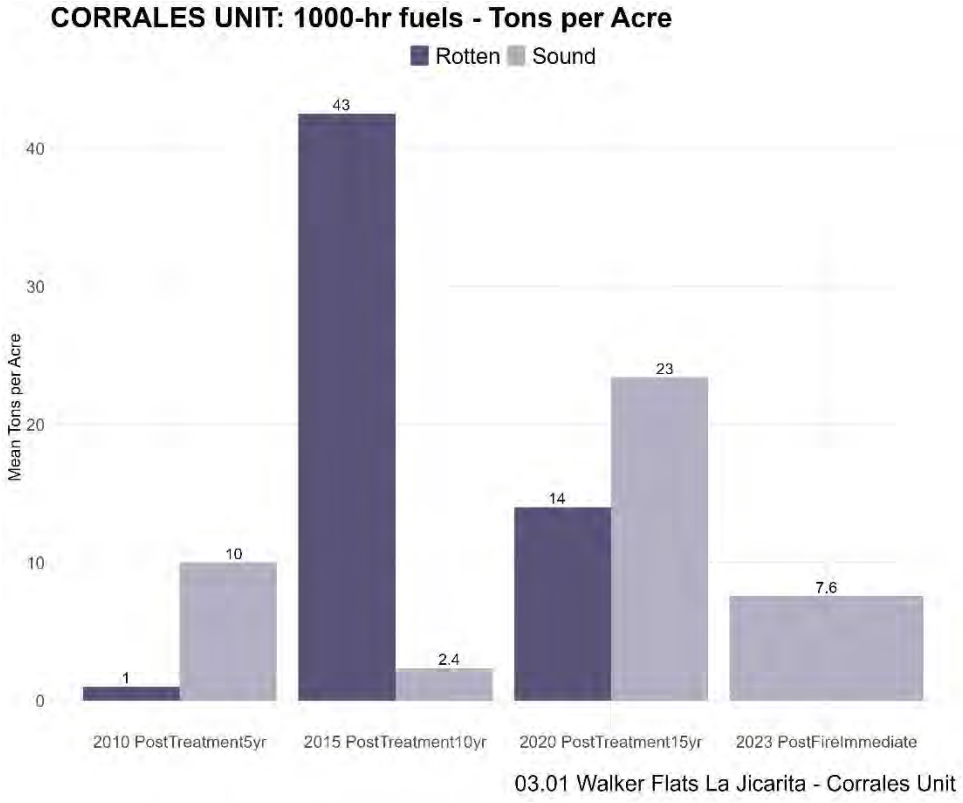


***Figure 40**. Mean thousand-hour fuel loads by monitoring status for the Corrales treatment unit.*

Rotten and sound thousand-hour logs in the Encinal unit steadily increased across each pre-fire monitoring period, with sound logs making up the vast majority of fuels (**Table 11**, **Figure 41**). These logs may be logs left over from thinning treatments as well as freshly fallen snags. Immediately post-fire, rotten and sound logs decreased slightly, to 2.2 tons per acre and 9.7 tons per acre, respectively. This indicates, along with other metrics, that the HPCC wildfire did not burn as severely in this unit.

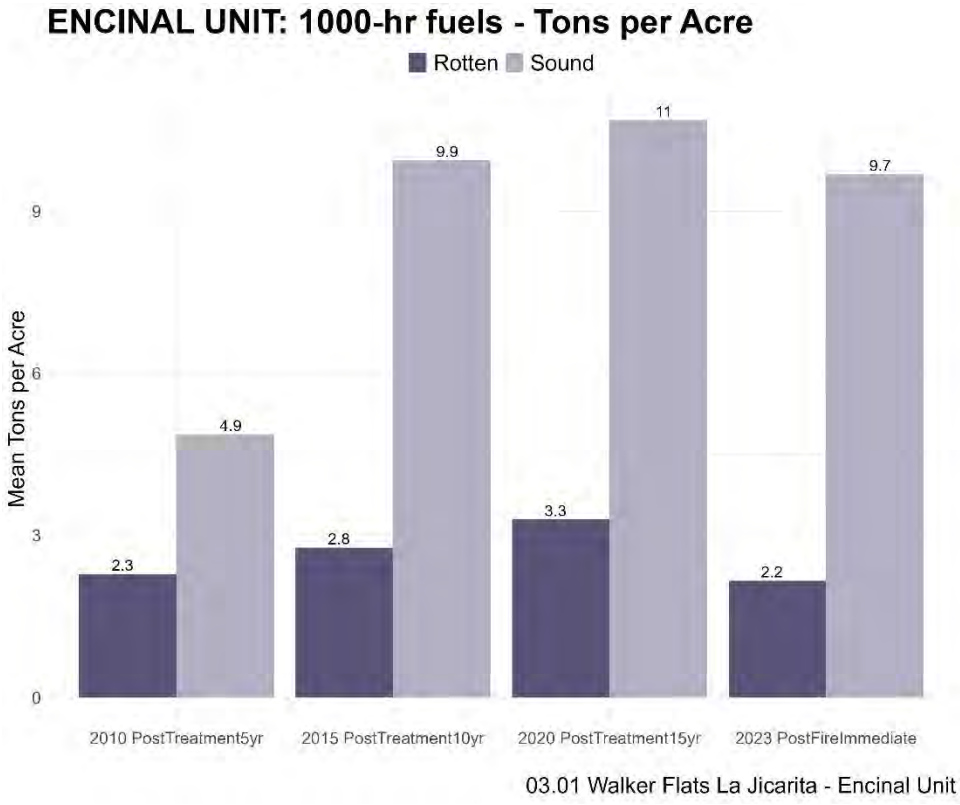


Figure 41. *Mean thousand-hour fuel loads by monitoring status for the Encinal treatment unit.*

In the Walker Flats unit, from 5 to 10 years post-treatment, rotten logs increased from 2.8 to 12 tons per acre, and sound logs increased from 6.6 to 10 tons per acre (**Table 11**, **Figure 42**). Fifteen years post-treatment, rotten logs decreased to 8.6 tons per acre and sound logs increased to 15 tons per acre. Immediately post-fire, thousand-hour fuels decreased substantially (3 tons per acre of rotten logs, 6.7 tons per acre of sound logs). This is likely due to multiple factors, like fuelwood harvest and windthrow of the tops of snags. Over time, rotten logs continue to decompose and the tops of other trees continue to fall.

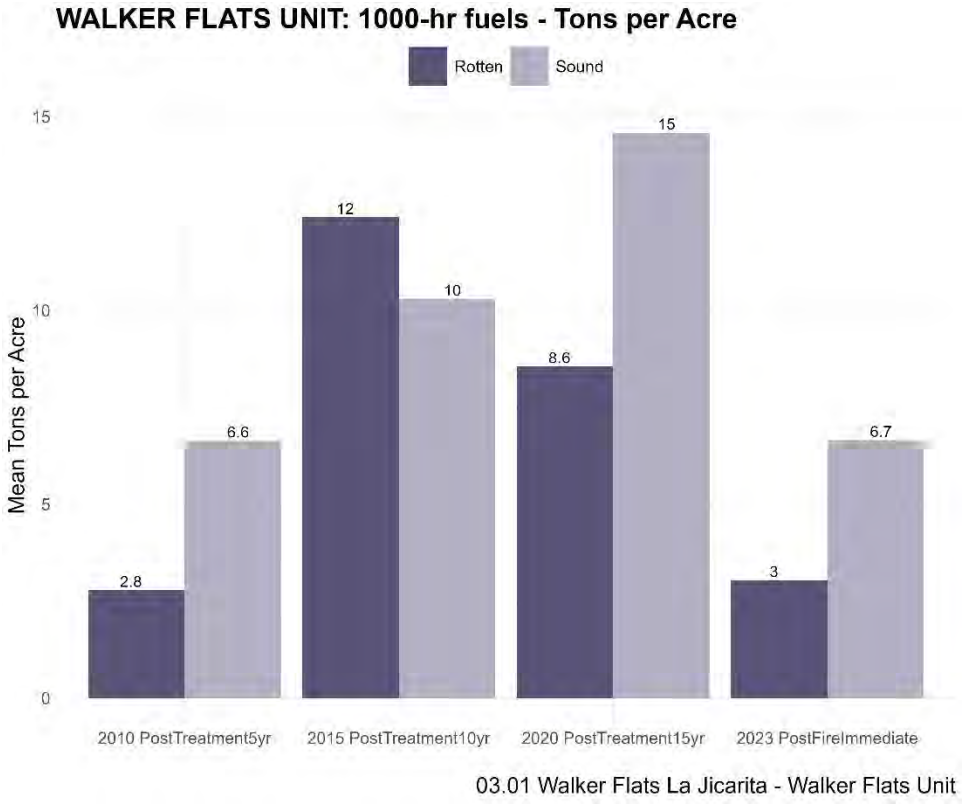
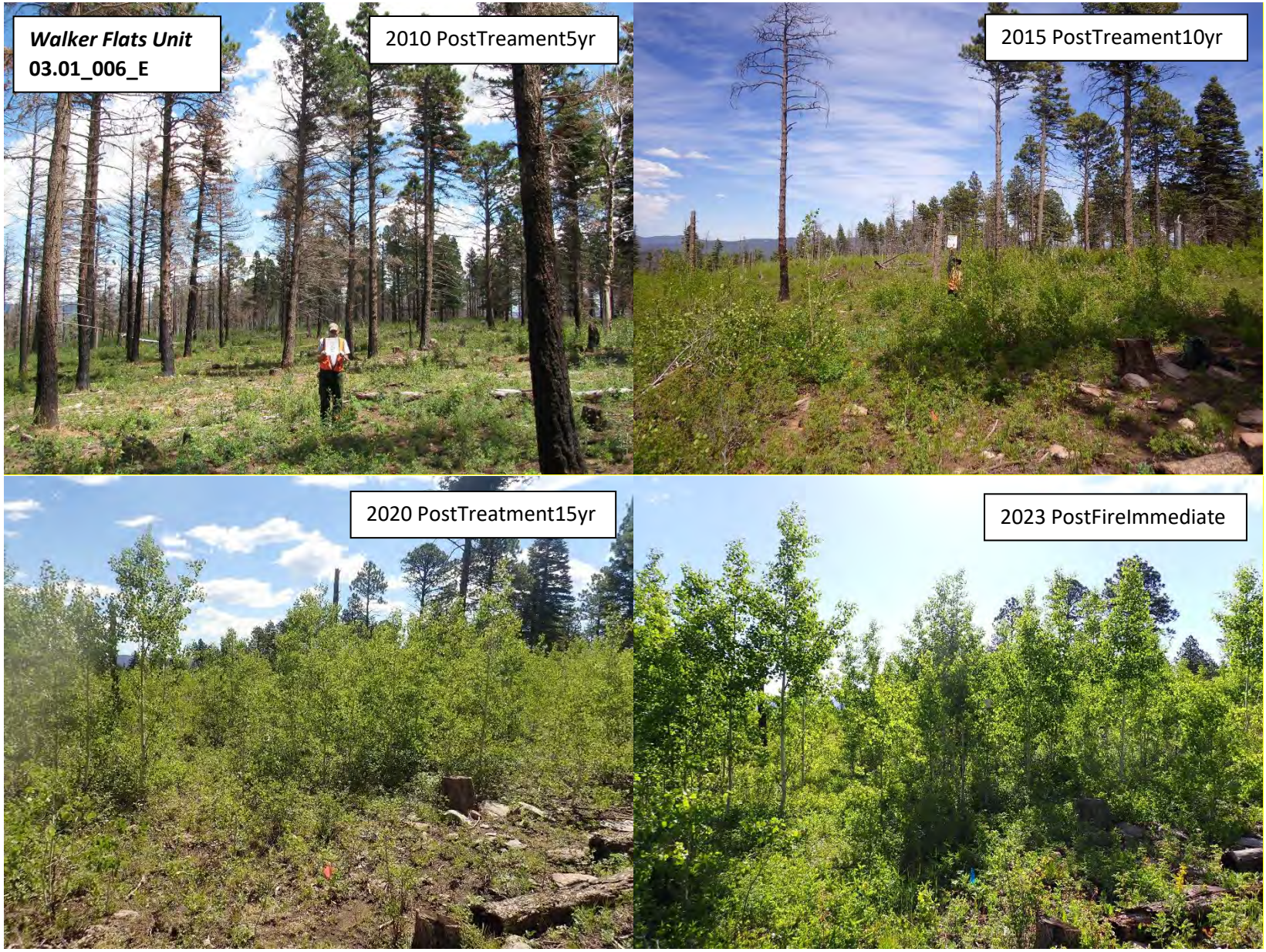


Figure 42. *Mean thousand-hour fuel loads by monitoring status for the Walker Flats treatment unit.*

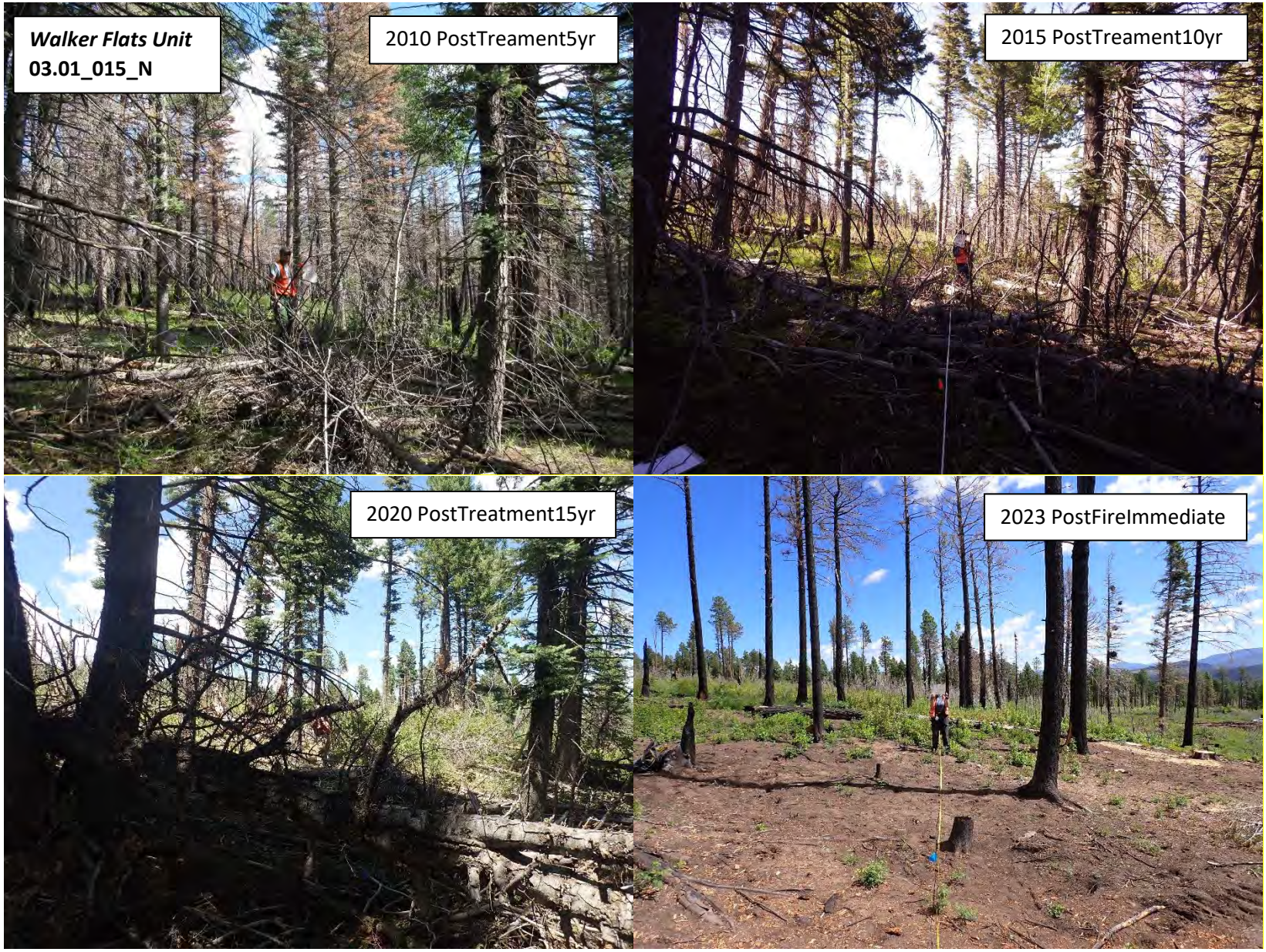
Photo Comparisons:

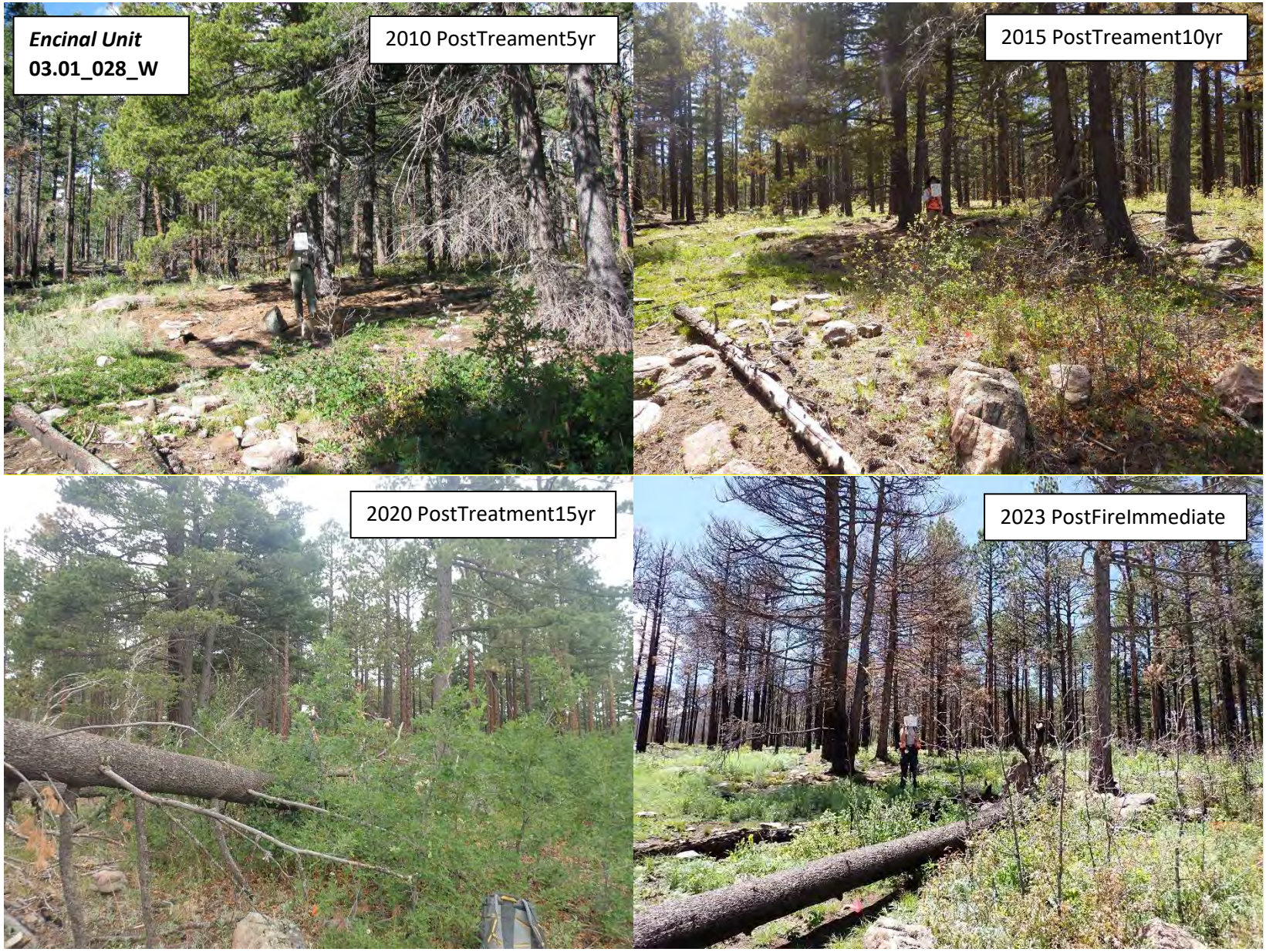
The following pages show photo comparisons from exemplary plots that display the types of changes the landscape has undergone since NMFWRI began monitoring this project in 2010.


Corrales Unit
03.01_001_N
2010 PostTreament5yr
2015 PostTreament10yr
2020 PostTreatment15yr
2023 PostFireImmediate


Walker Flats Unit
03.01_006_E
2010 PostTreament5yr
2015 PostTreament10yr
2020 PostTreatment15yr
2023 PostFireImmediate


Walker Flats Unit
03.01_010_S
2010 PostTreament5yr
2015 PostTreament10yr
2020 PostTreatment15yr
2023 PostFireImmediate


Walker Flats Unit
03.01_015_N
2010 PostTreament5yr
2015 PostTreament10yr
2020 PostTreatment15yr
2023 PostFireImmediate


Encinal Unit
03.01_028_W
2010 PostTreament5yr
2015 PostTreament10yr
2020 PostTreatment15yr
2023 PostFireImmediate

Additional Resources

In 2023, NMFWRI published their first version of a field manual: "Guidelines and Protocols for Monitoring Upland Forests – Field Manual." - https://nmfwri.org/resources/upland-forests-monitoring-field-manual/

For more information regarding monitoring criteria and methodology please contact NMFWRI or consult the 2008 document authored by Derr, et. al., *Monitoring the Long Term Ecological Impacts Of New Mexico's Collaborative Forest Restoration Program, New Mexico Forest Restoration Series Working Paper 5*, available on NMFWRI's website here: http://nmfwri.org/collaborative-forest-restoration-program/cfrp-long-term-monitoring.

For additional information on forest health, forest insects and disease, and non-native species management see resources from the New Mexico Forest and Watershed Health Office: https://www.emnrd.nm.gov/sfd/forest-and-watershed-health-office/

For additional information on post-wildfire community resources, events, and recovery action strategy see the Hermit's Peak/Calf Canyon Post-Fire Resource Hub: https://hermits-peak-calf-canyon-fire-resources-nmhu.hub.arcgis.com/

Works Cited

Dahms, Cathy W &, Geils, Brian W. (July 1997) *An assessment of forest ecosystem health in the Southwest.* General Technical Report RM-GTR-295. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.

Derr, T., McGrath, D., Estrada, V., Krasilovsky, E., & Evans, Z. (n.d.). *MONITORING THE LONG TERM ECOLOGICAL IMPACTS OF NEW MEXICO'S COLLABORATIVE FOREST RESTORATION PROGRAM*.

New Mexico Forest and Watershed Restoration Institute. (2024). *Guidelines and Protocols for Monitoring Upland Forests Field Manual, First Edition.*

New Mexico Forest and Watershed Restoration Institute. (2022, August 24). *Hermit's Peak and Calf Canyon Fire*. ArcGIS StoryMaps. https://storymaps.arcgis.com/stories/d48e2171175f4aa4b5613c2d11875653

Southwest Forest Health and Wildfire Prevention Act of 2004, no. 108–317, 108th Congress (2004). https://www.congress.gov/108/plaws/publ317/PLAW-108publ317.pdf

Supplementary Information

Species Lists

Table 12a-b. *List of observed tree and shrub species by species symbol, scientific name, and common name*

Tree Species

Species Symbol	Scientific Name	Common Name
ABCO	*Abies concolor*	white fir
JUCO6	*Juniperus communis*	common juniper
PIFL2	*Pinus flexilis*	Limber pine
PIPO	*Pinus ponderosa*	ponderosa pine
PIPU	*Picea pungens*	Blue spruce
POTR5	*Populus tremuloides*	Quaking aspen
PSME	*Psuedotsuga menziesii*	Douglas-fir
QUGA	*Quercus gambelii*	Gambel oak
SABE2	*Salix bebbiana*	Bebb willow
2TREE		Unknown species*

*Dead/burned and lacking identifying characteristics

Shrub Species

Species Symbol	Scientific Name	Common Name
ARUV	*Arctostaphylos uva-ursi*	kinnickinnick
CEFE	*Ceanothus fendleri*	Fendler's ceanothus
JAAM	*Jamesia Americana*	Fivepetal cliffbush
MARE11	*Mahonia repens*	creeping barberry
PHMO4	*Physocarpus monogynus*	Mountain ninebark
PAMY	*Paxistima myrsinites*	Oregon boxleaf
PRVI	*Prunus virginiana*	Chokecherry
RIBES	*Ribes sp.*	Currant species
ROWO	*Rosa woodsii*	Woods' rose

Species Symbol	Scientific Name	Common Name
RUID	*Rubus idaeus*	American red raspberry
RUPA	*Rubus parviflorus*	thimbleberry
SHCA	*Shepherdia canadensis*	Russet buffaloberry
SYRO	*Symphoricarpos rotundifolius*	Roundleaf snowberry
UNK_003		Unknown species*

*Species could not be identified by field crew

Plot Center Coordinates

Table 13. *List of plots coordinates by plot name, latitude, and longitude*

Unit	Plot Name*	Latitude	Longitude
Corrales	03.01_001	36.027583	-105.455685
	03.01_004	36.025957	-105.453711
	03.01_005	36.025954	-105.451742
Walker Flats	03.01_006	36.017642	-105.451066
	03.01_007	36.017629	-105.449044
	03.01_008	36.017663	-105.447043
	03.01_009	36.015854	-105.457069
	03.01_010	36.015956	-105.451066
	03.01_011	36.015992	-105.449080
	03.01_013	36.014296	-105.455144
	03.01_014	36.014375	-105.451067
	03.01_015	36.014347	-105.449074
	03.01_017	36.012654	-105.457067
	03.01_018	36.012668	-105.455108
	03.01_019	36.012527	-105.453070
	03.01_020	36.012700	-105.451082
	03.01_021	36.012700	-105.449029
	03.01_024	36.011002	-105.455171
	03.01_025	36.011064	-105.453068
	03.01_026	36.011063	-105.451076
Encinal	03.01_016	36.014349	-105.446999
	03.01_022	36.012708	-105.447013
	03.01_027	36.011094	-105.448981
	03.01_028	36.011015	-105.447060
	03.01_029	36.009276	-105.450995
	03.01_030	36.009380	-105.448577
	03.01_031	36.009428	-105.446939
	03.01_032	36.007653	-105.449635
	03.01_034	36.006124	-105.446959

	03.01_035	36.006132	-105.444911
	03.01_036	36.004477	-105.446927
	03.01_037	36.004491	-105.444897
	03.01_038	36.002844	-105.444906
Untreated, excluded from all analyses	03.01_012	36.016026	-105.444957

**Previous iterations and records of this project use the non-standardized plot names "LJ_01", etc.*

Abbreviations & Acronyms

Table 14. *List of abbreviated terms by abbreviation and definition*

Acronym/Abbreviation/Term	Definition as used by NMFWRI
1-hr fuel	Woody surface debris < 0.25 inches in diameter
10-hr fuel	Woody surface debris 0.25 – 1 inch in diameter
100-hr fuel	Woody surface debris 1.0 – 3.0 inches in diameter
1000-hr fuel	Woody surface debris > 3.0 inches in diameter
CFRP	Collaborative Forest Restoration Program
DBH	Diameter at breast height (4.5 feet)
FFI	FEAT/FIREMON Integrated
FEAT	Fire Ecology Assessment Tool
FIREMON	Fire Effects Monitoring and Inventory System
HD	Herbaceous dead (dead non-woody species)
HL	Herbaceous live (live non-woody species)
NMFWRI	New Mexico Forest and Watershed Restoration Institute
USFS	United States Forest Service
Sapling	Height > 4.5 feet & DBH < 1 inch
Seedling	Height < 4.5 feet
SD	Standing dead (dead woody species)
SL	Standing live (live woody species)
"Sick"	Attribute given to trees/shrubs not expected to survive long term
SWERI	Southwest Ecological Restoration Institute
TPA	Trees per acre (trees/acre)
Tree	Height > 4.5 feet & DBH > 1 inch

Mean Percent Cover

Table 15*: Mean percent cover data for plots across 2010 and 2015 monitoring periods. Different protocols were used these years.*

Monitoring Status	Shrub cover	Graminoids	Forbs	Litter	Bare Soil	Rock	Gravel
2010 PostTreatment5yr	9%	12%	14%	24%	29%	12%	NA
2015 PostTreatment10yr	24%	30%	20%	43%	4%	7%	1%

Summary Tables

Table 16a-c. *Summary statistics across all monitoring periods for each treatment unit.*

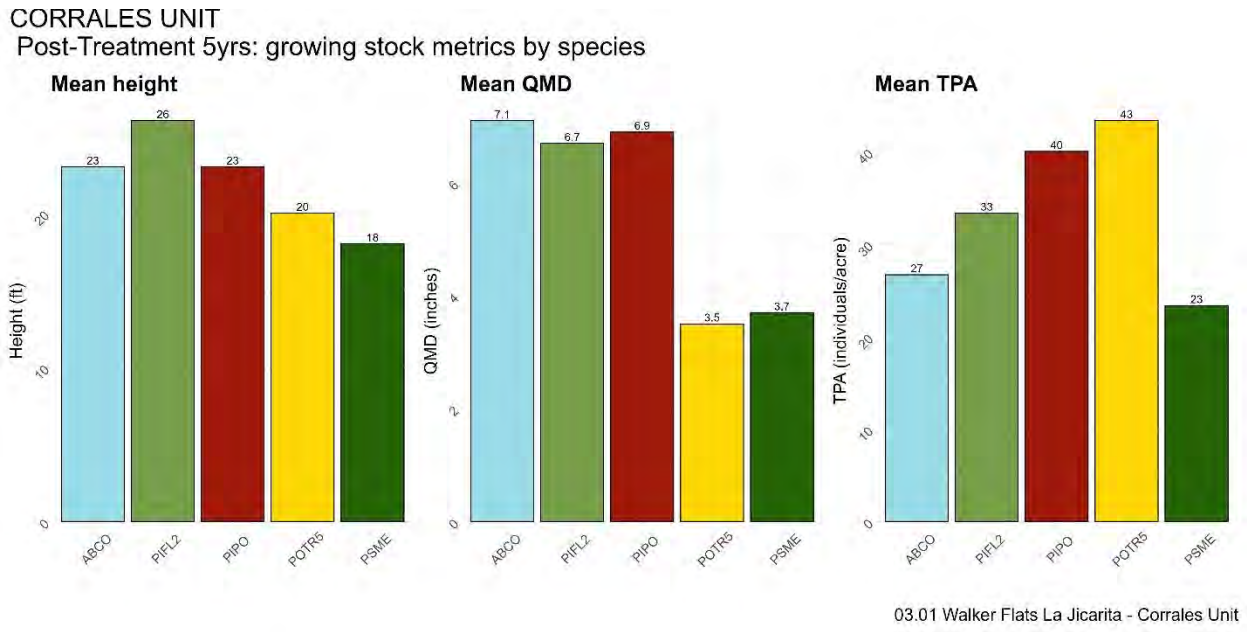
CORRALES UNIT: Summary Table				
Metric	**2010 PostTreatment5yr**	**2015 PostTreatment10yr**	**2020 PostTreatment15yr**	**2023 PostFireImmediate**
Dominant Growing Stock Species	POTR5	PIPO	PIFL2	
Dominant Snag Species	PIPO	PIPO	ABCO	2TREE
Dominant Live Seedling	POTR5	POTR5	ABCO	POTR5
Dominant Live Sapling		ABCO	ABCO	2TREE
Dominant Live Shrub (Seedling Class)			ARUV	ARUV
Average Slope (%)			8.3	8.3
Average Aspect (degrees)			122	88.7
Trees per Acre (growing stock)	167	230	370	
Basal Area (growing stock, sqft/acre)	43.4	44.4	53	
QMD (growing stock, inches)	6.29	5.64	5.19	
Average Tree Height (ft)	23.7	17.7	18.9	
Average Live Crown Base Height (ft)	9.27	7.4	4.71	
Height of Tallest Tree (ft)	50	45	48	
Live Tree Seedlings Per Acre	1100	1700	2800	2400
Live Tree Saplings Per Acre		550	600	0
Live Shrub Seedlings Per Acre			7930	533
Tree Canopy Cover (%)			32	10
Grass & Forb Cover (%)			17	18.3
Total Tons Surface Fuels per Acre	19.3	64.5	50.3	8.34

ENCINAL UNIT: Summary Table				
Metric	**2010 PostTreatment5yr**	**2015 PostTreatment10yr**	**2020 PostTreatment15yr**	**2023 PostFireImmediate**
Dominant Growing Stock Species	PIPO	PIPO	POTR5	PIPO
Dominant Snag Species	POTR5	POTR5	ABCO	POTR5
Dominant Live Seedling	POTR5	QUGA	POTR5	POTR5
Dominant Live Sapling		PIPO	POTR5	POTR5
Dominant Live Shrub (Seedling Class)			MARE11	ROWO
Dominant Live Shrub (Sapling Class)	UNK_001			
Average Slope (%)			16	14
Average Aspect (degrees)			120	135
Trees per Acre (growing stock)	117	106	172	85.6
Basal Area (growing stock, sqft/acre)	84.7	79.9	77.3	77
QMD (growing stock, inches)	12.2	12.3	10.1	12.9
Average Tree Height (ft)	40.1	38.8	28.3	38.5
Average Live Crown Base Height (ft)	20.7	22.8	8.93	18.7
Height of Tallest Tree (ft)	74	67	77.9	61.2
Live Tree Seedlings Per Acre	1370	1850	2080	6770
Live Tree Saplings Per Acre		0	617	220
Live Shrub Seedlings Per Acre			16400	12800
Tree Canopy Cover (%)	41	66	36	27
Grass & Forb Cover (%)			33	47
Total Tons Surface Fuels per Acre	14.2	28.8	24.9	17.7

WALKER FLATS UNIT: Summary Table				
Metric	**2010 PostTreatment5yr**	**2015 PostTreatment10yr**	**2020 PostTreatment15yr**	**2023 PostFireImmediate**
Dominant Growing Stock Species	POTR5	POTR5	POTR5	POTR5
Dominant Snag Species	PSME	PSME	PSME	POTR5
Dominant Live Seedling	POTR5	QUGA	QUGA	POTR5
Dominant Live Sapling			POTR5	POTR5
Dominant Live Shrub (Seedling Class)			MARE11	ROWO
Dominant Live Shrub (Sapling Class)			SYRO	SYRO
Average Slope (%)			9.9	11
Average Aspect (degrees)			120	115
Trees per Acre (growing stock)	115	141	288	112
Basal Area (growing stock, sqft/acre)	89.3	80.2	71.9	53.3
QMD (growing stock, inches)	13.3	11.1	7.6	10.4
Average Tree Height (ft)	40.9	31.4	20.7	27.5
Average Live Crown Base Height (ft)	23.9	18.3	7.4	12.3
Height of Tallest Tree (ft)	89	70	86.8	71.8
Live Tree Seedlings Per Acre	3540	3060	1710	9040
Live Tree Saplings Per Acre			667	1210
Live Shrub Seedlings Per Acre			10900	9080
Live Shrub Saplings Per Acre			500	150
Tree Canopy Cover (%)	49	48	27	21
Grass & Forb Cover (%)			53	56
Total Tons Surface Fuels per Acre	16.8	32.5	35.1	17.7

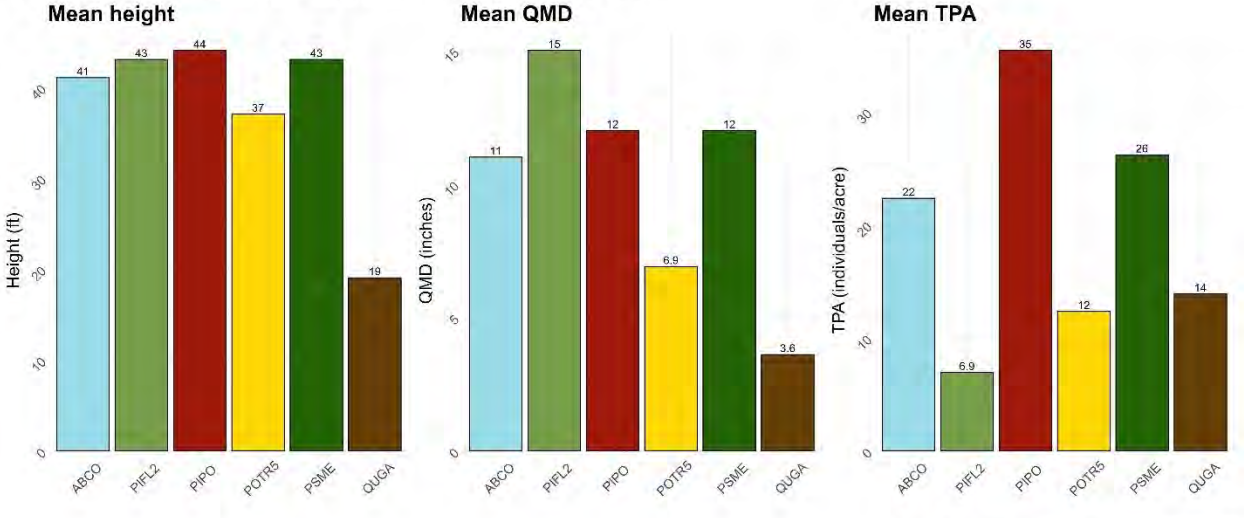
Tree Metrics

***Figure 43**. The following figures show tree (>1" DBH) metrics at the species level by status, measurement period, and treatment unit.*



ENCINAL UNIT

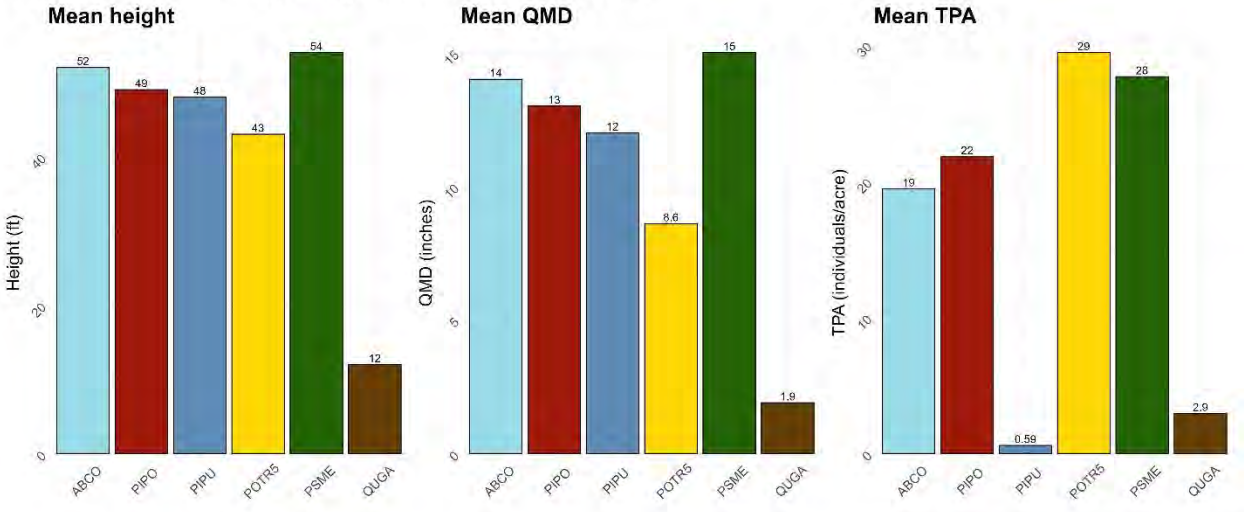
Post-Treatment 5yrs: growing stock metrics by species



03.01 Walker Flats La Jicarita - Encinal Unit

WALKER FLATS UNIT

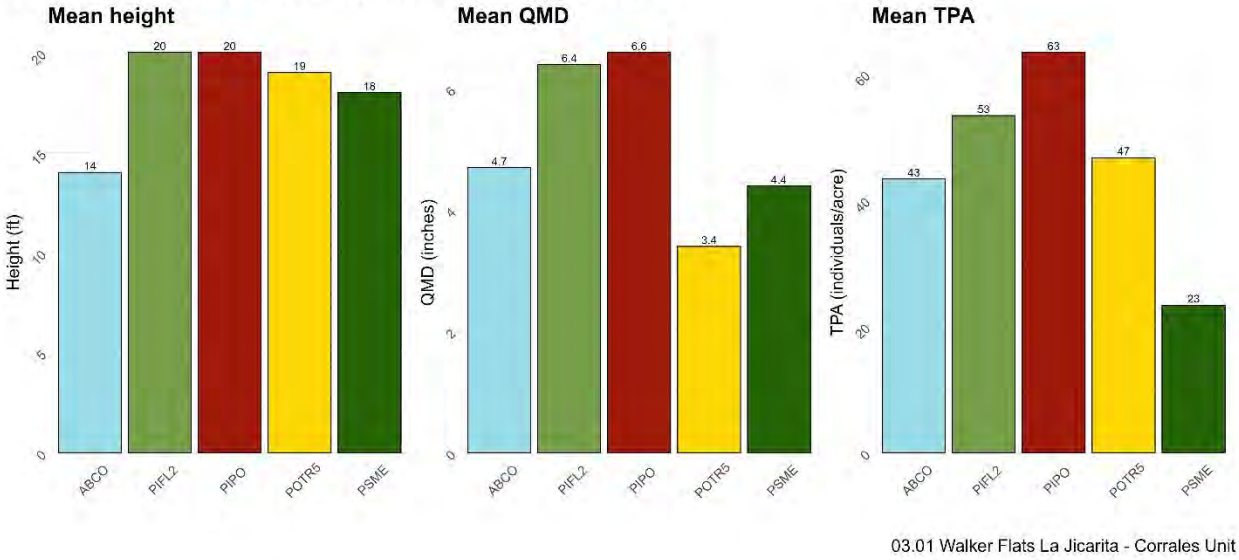
Post-Treatment 5yrs: growing stock metrics by species



03.01 Walker Flats La Jicarita - Walker Flats Unit

CORRALES UNIT

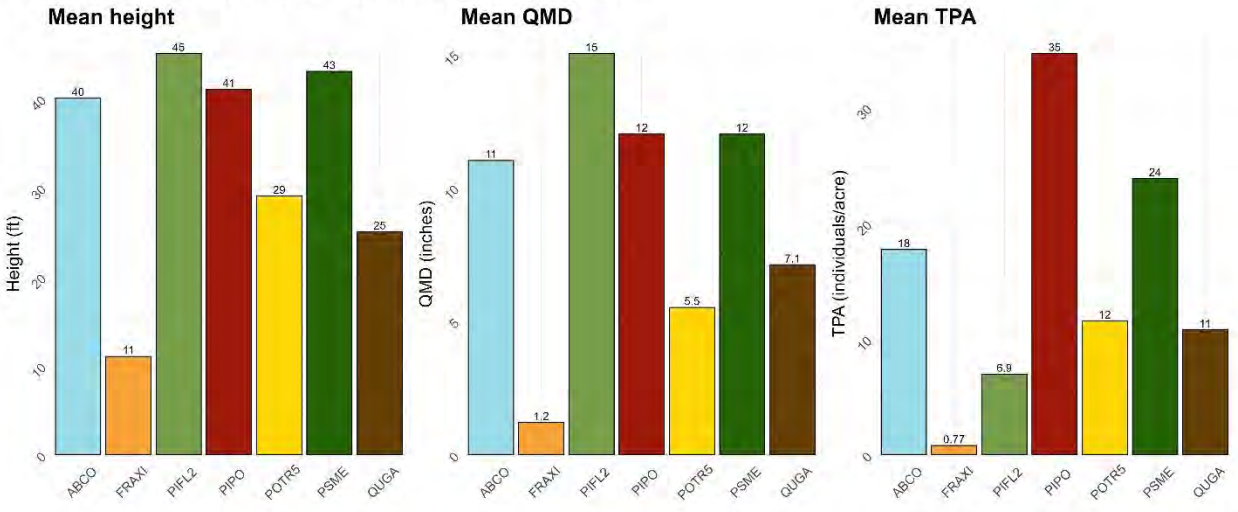
Post-Treatment 10yrs: growing stock metrics by species



03.01 Walker Flats La Jicarita - Corrales Unit

ENCINAL UNIT

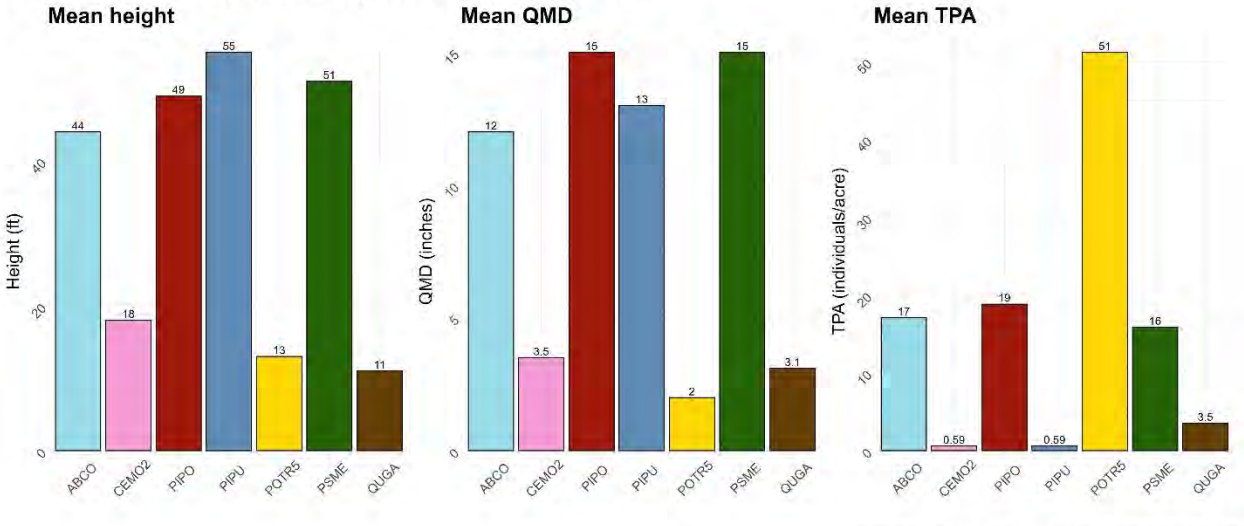
Post-Treatment 10yrs: growing stock metrics by species



03.01 Walker Flats La Jicarita - Encinal Unit

WALKER FLATS UNIT

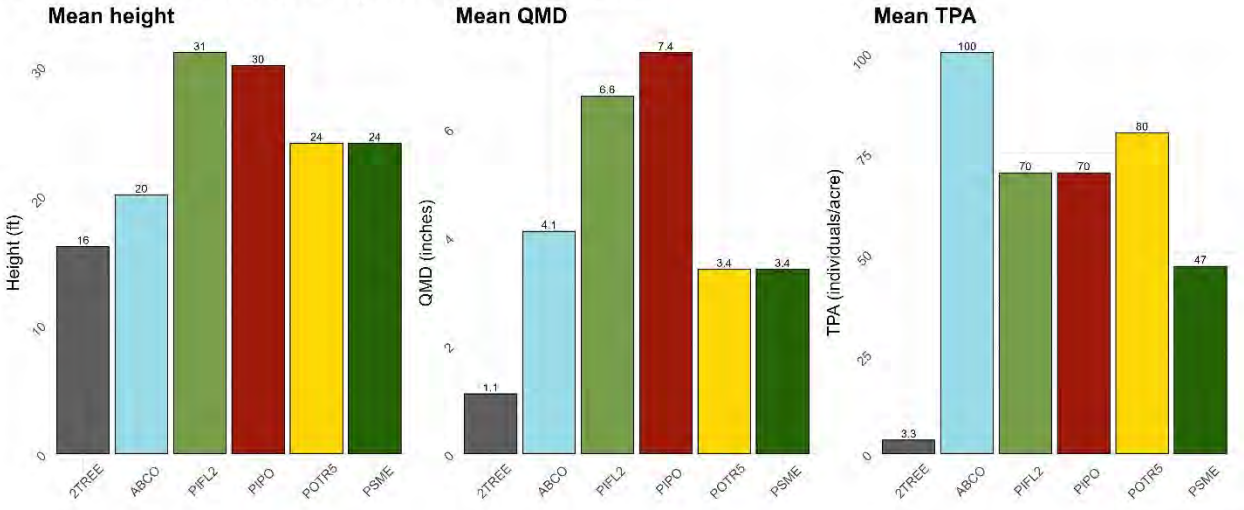
Post-Treatment 10yrs: growing stock metrics by species



03.01 Walker Flats La Jicarita - Walker Flats Unit

CORRALES UNIT

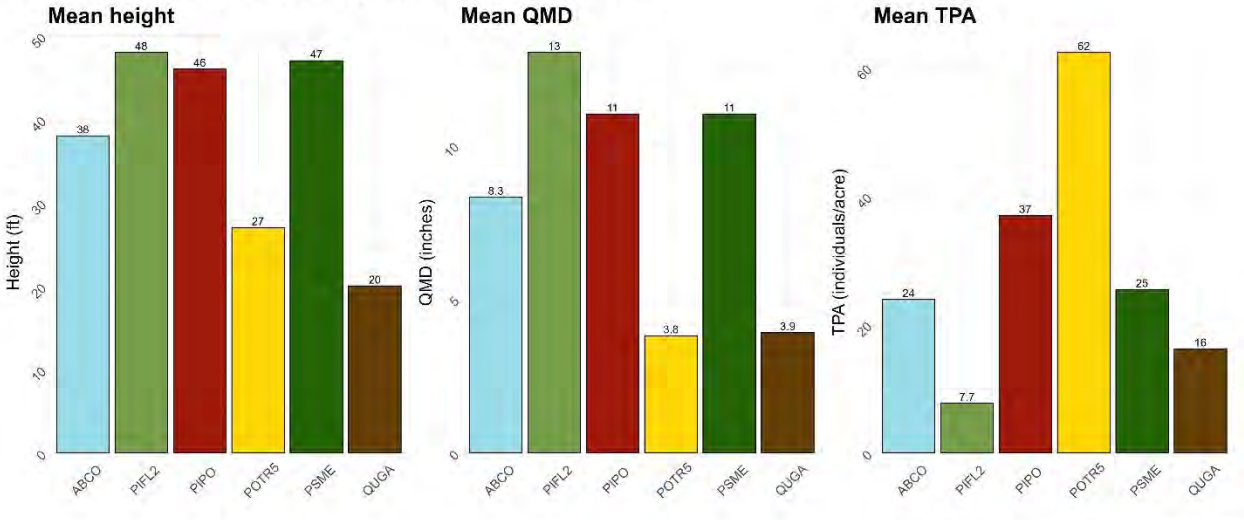
Post-Treatment 15yrs: growing stock metrics by species



03.01 Walker Flats La Jicarita - Corrales Unit

ENCINAL UNIT

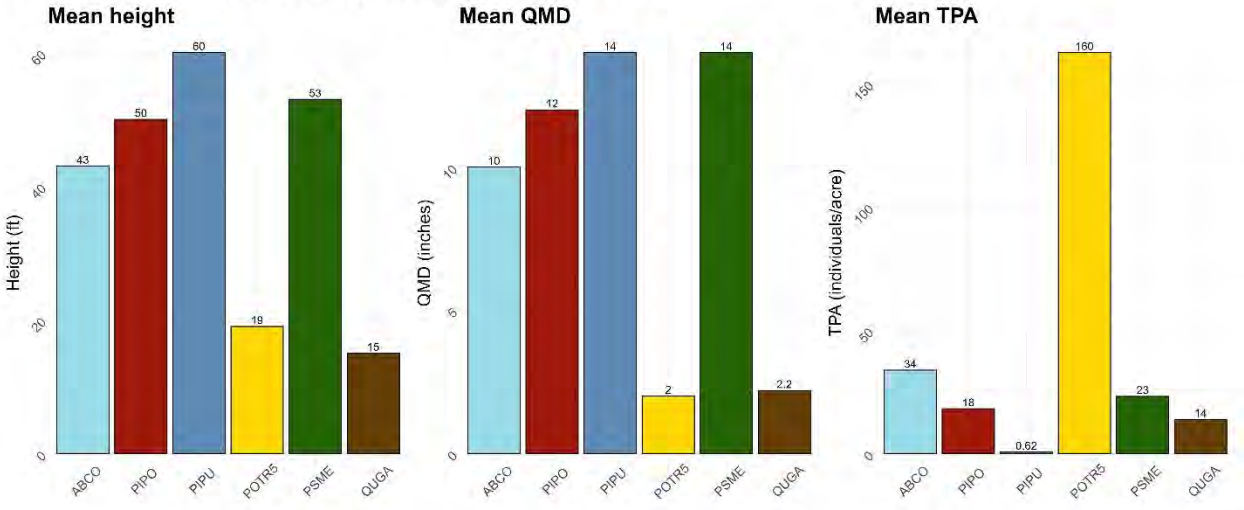
Post-Treatment 15yrs: growing stock metrics by species



03.01 Walker Flats La Jicarita - Encinal Unit

WALKER FLATS UNIT

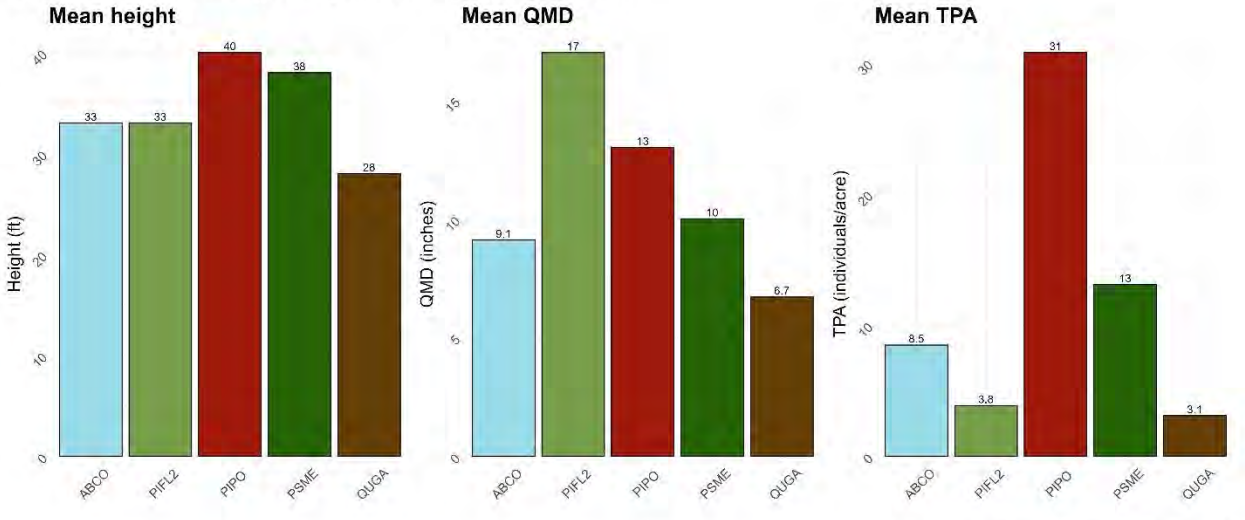
Post-Treatment 15yrs: growing stock metrics by species



03.01 Walker Flats La Jicarita - Walker Flats Unit

ENCINAL UNIT

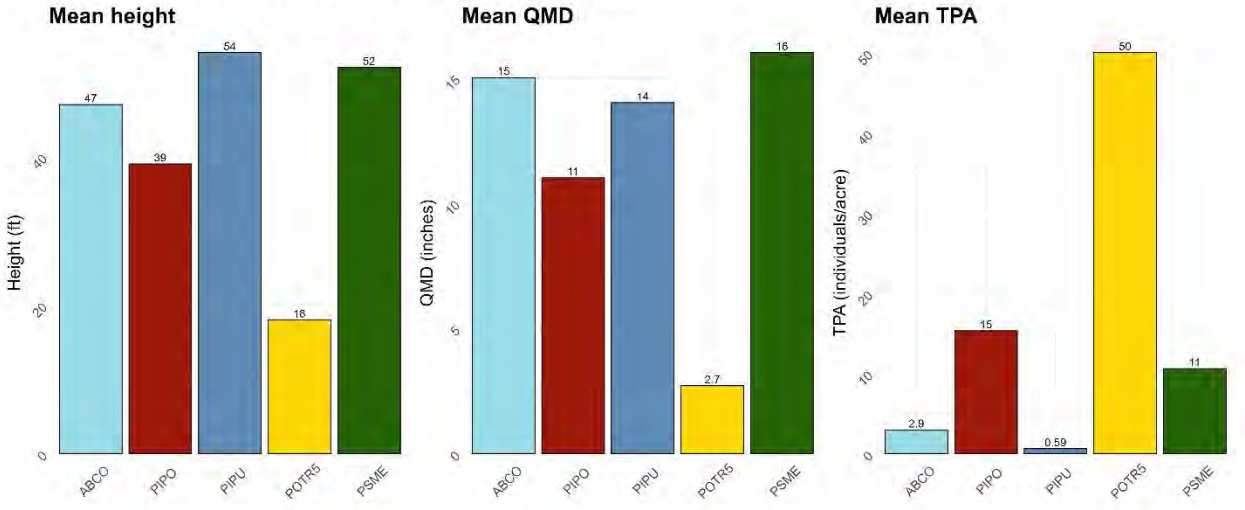
Post-fire immediate: growing stock metrics by species



03.01 Walker Flats La Jicarita - Encinal Unit

WALKER FLATS UNIT

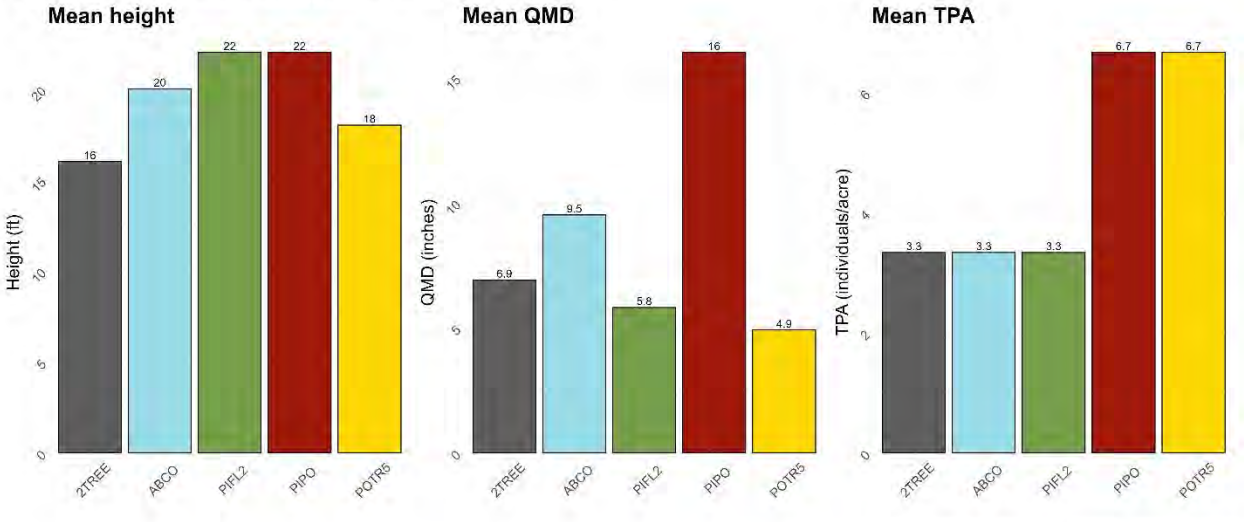
Post-fire immediate: growing stock metrics by species



03.01 Walker Flats La Jicarita - Walker Flats Unit

CORRALES UNIT

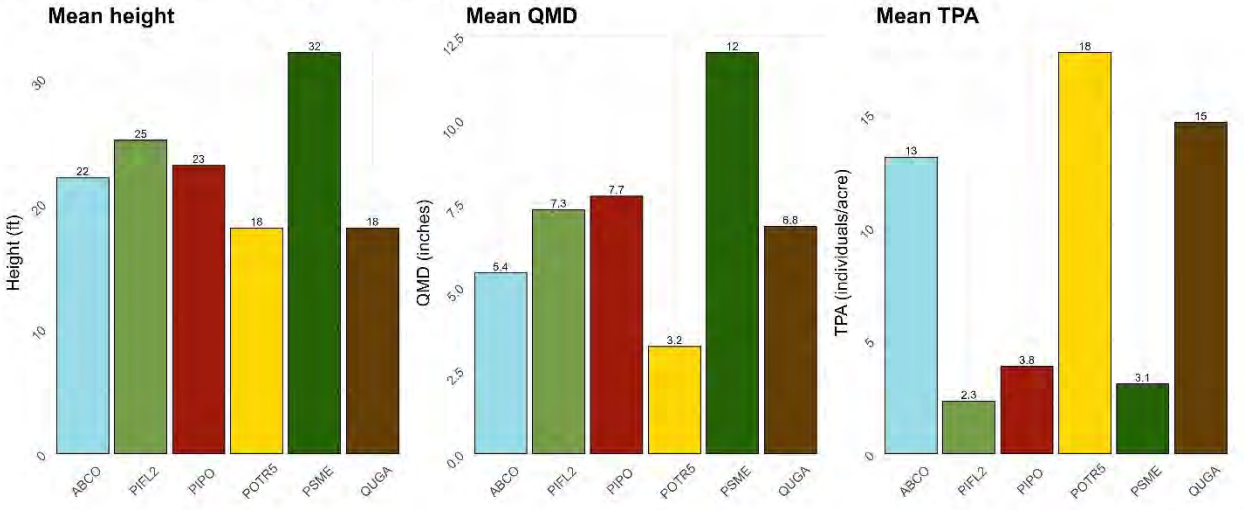
Post-Treatment 5yrs: snag metrics by species



03.01 Walker Flats La Jicarita - Corrales Unit

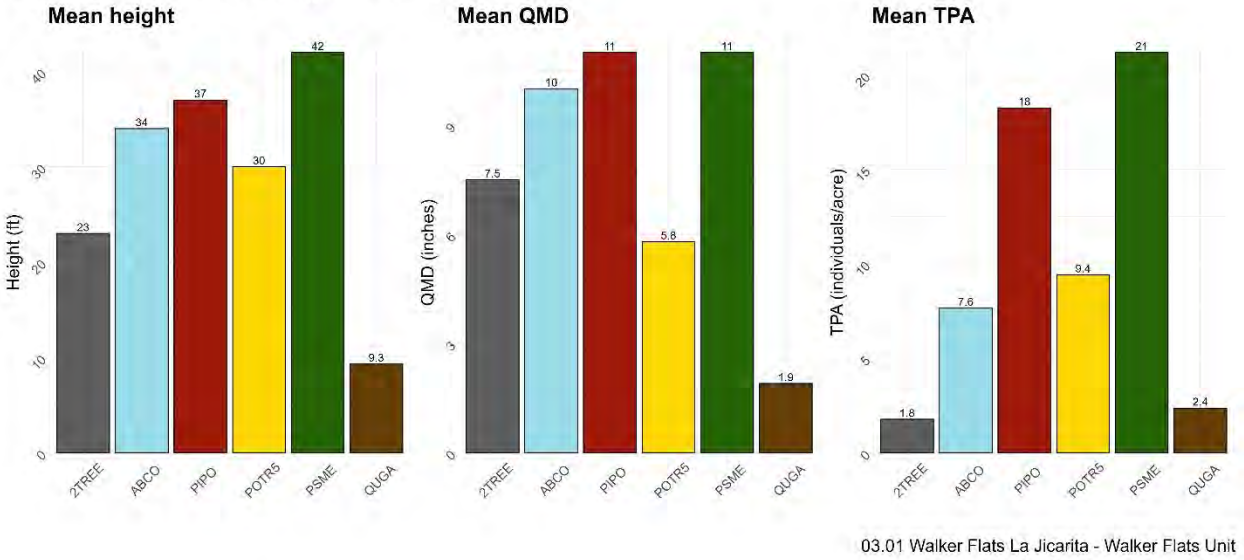
ENCINAL UNIT

Post-Treatment 5yrs: snag metrics by species



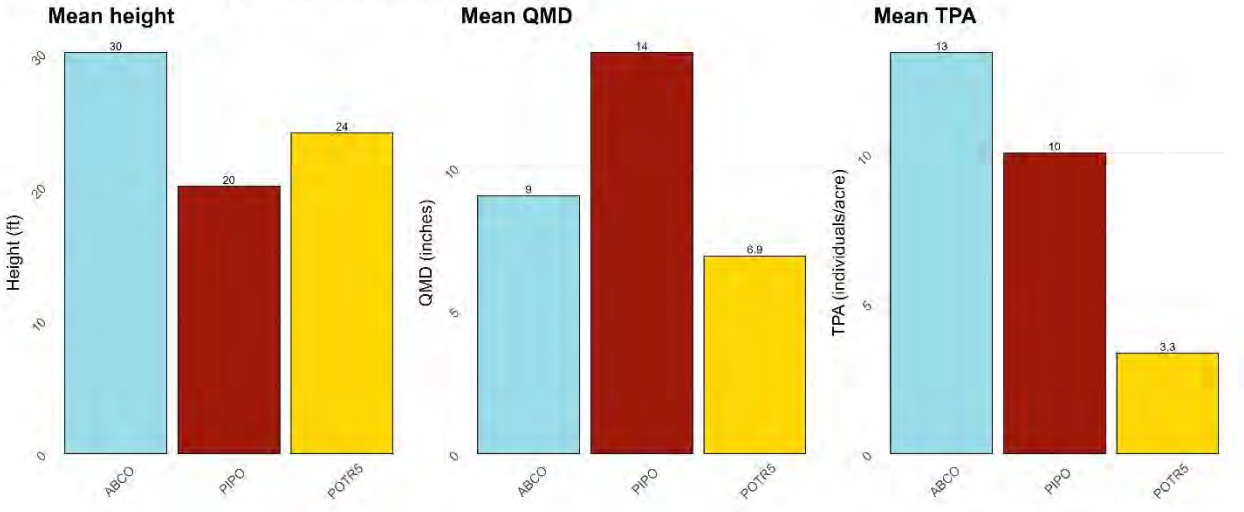
03.01 Walker Flats La Jicarita - Encinal Unit

WALKER FLATS UNIT
Post-Treatment 5yrs: snag metrics by species



03.01 Walker Flats La Jicarita - Walker Flats Unit

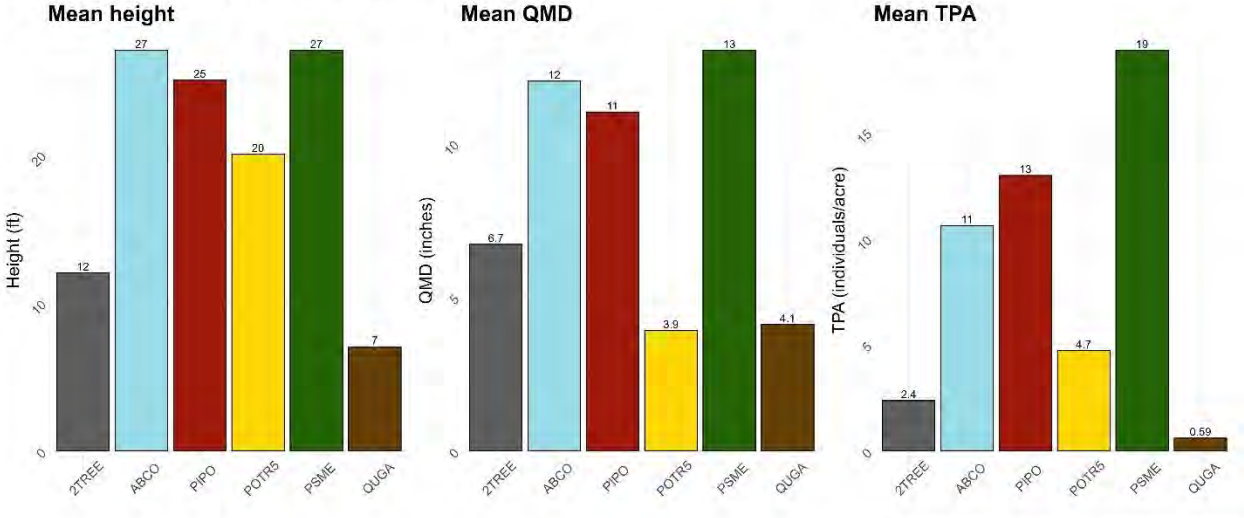
CORRALES UNIT
Post-Treatment 10yrs: snag metrics by species



03.01 Walker Flats La Jicarita - Corrales Unit

WALKER FLATS UNIT

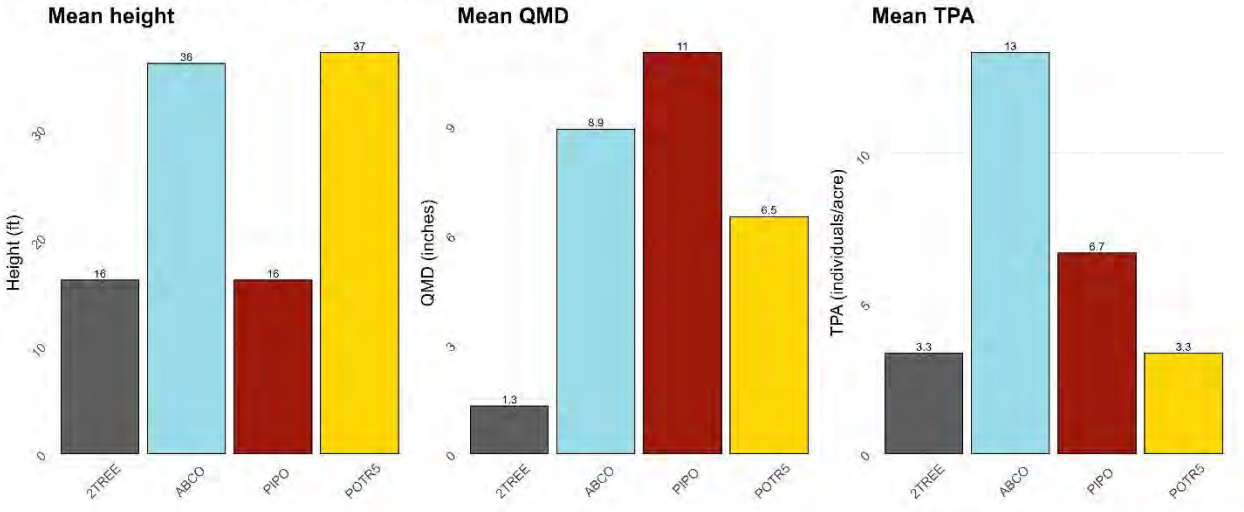
Post-Treatment 10yrs: snag metrics by species



03.01 Walker Flats La Jicarita - Walker Flats Unit

CORRALES UNIT

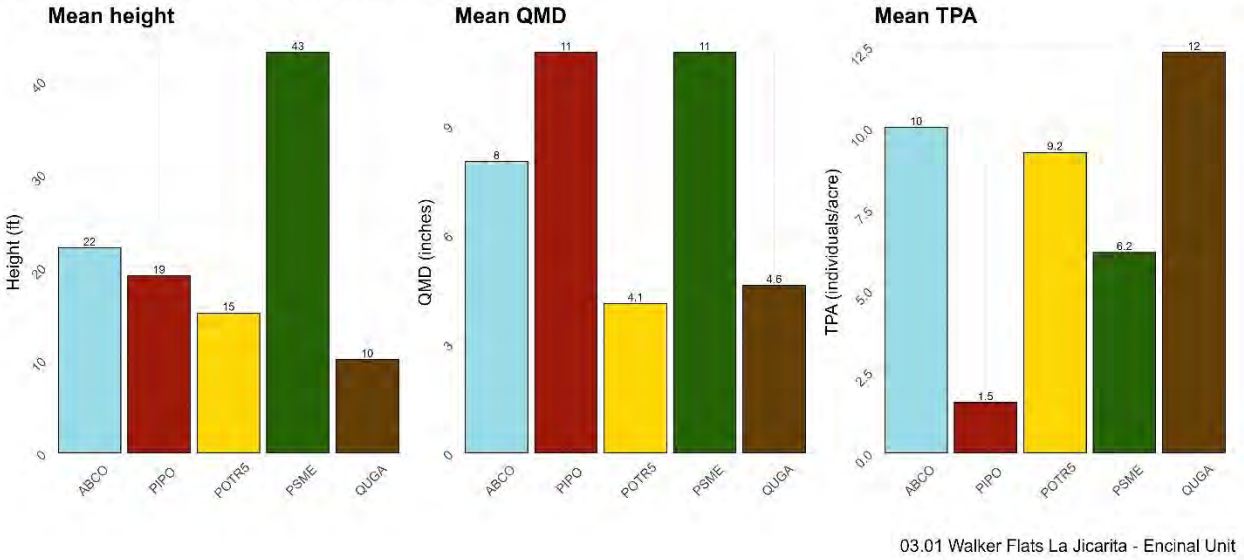
Post-Treatment 15yrs: snag metrics by species



03.01 Walker Flats La Jicarita - Corrales Unit

ENCINAL UNIT

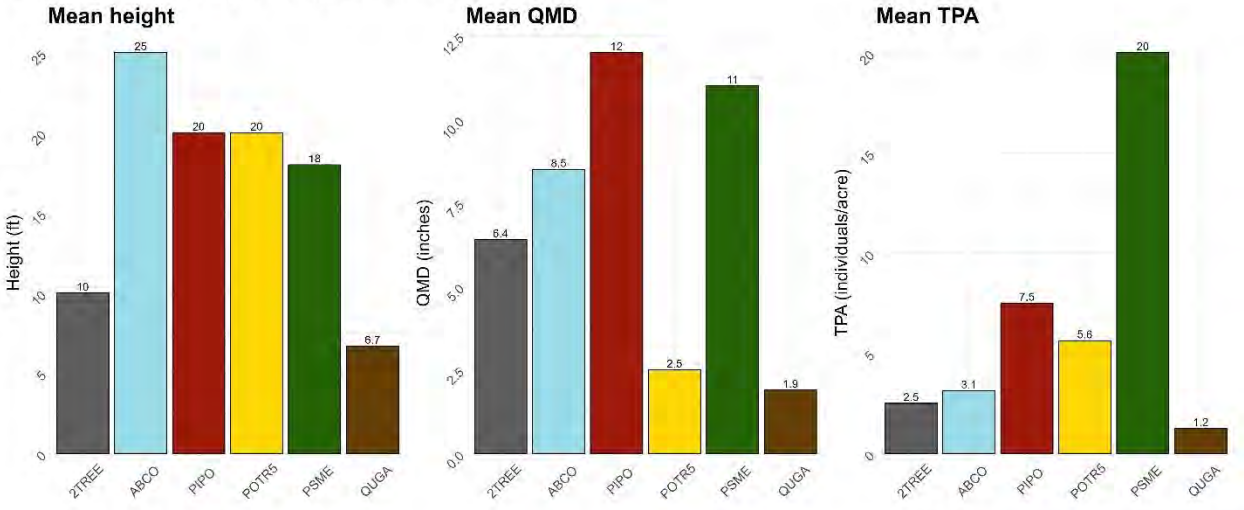
Post-Treatment 15yrs: snag metrics by species



03.01 Walker Flats La Jicarita - Encinal Unit

WALKER FLATS UNIT

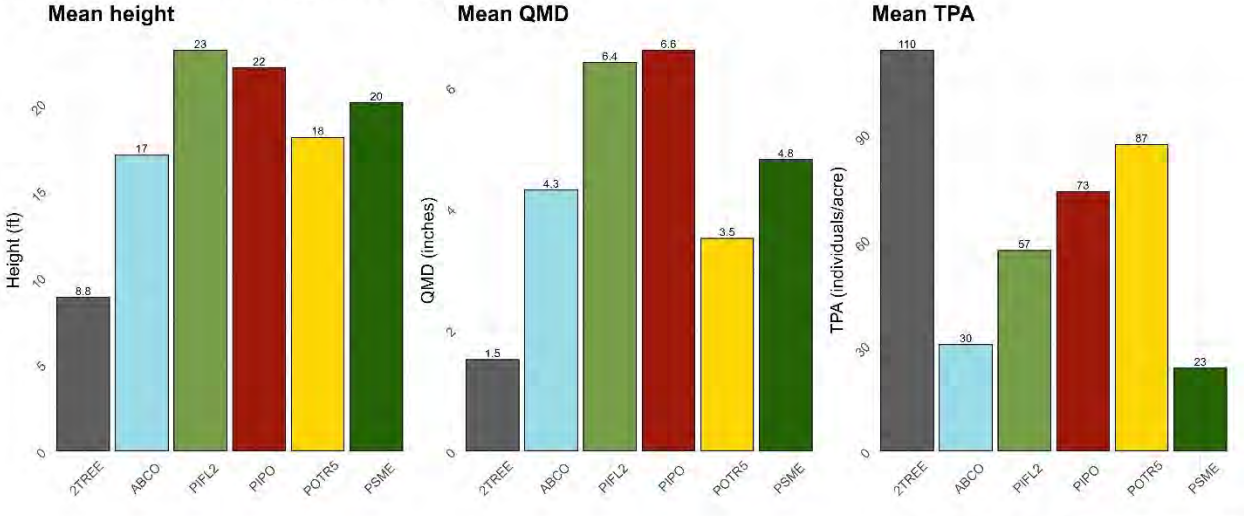
Post-Treatment 15yrs: snag metrics by species



03.01 Walker Flats La Jicarita - Walker Flats Unit

CORRALES UNIT

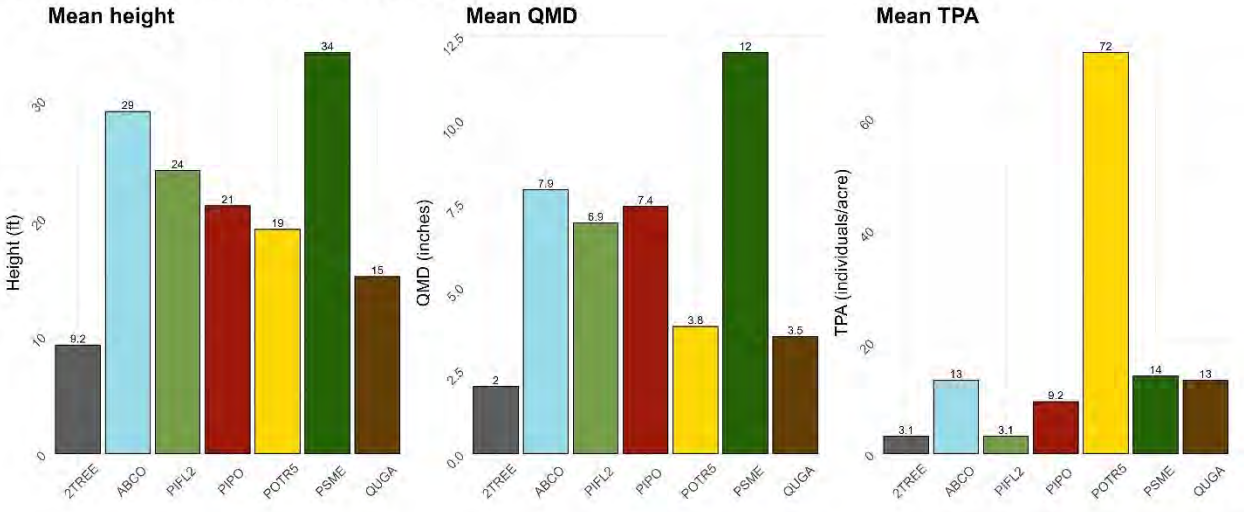
Post-fire immediate: snag metrics by species



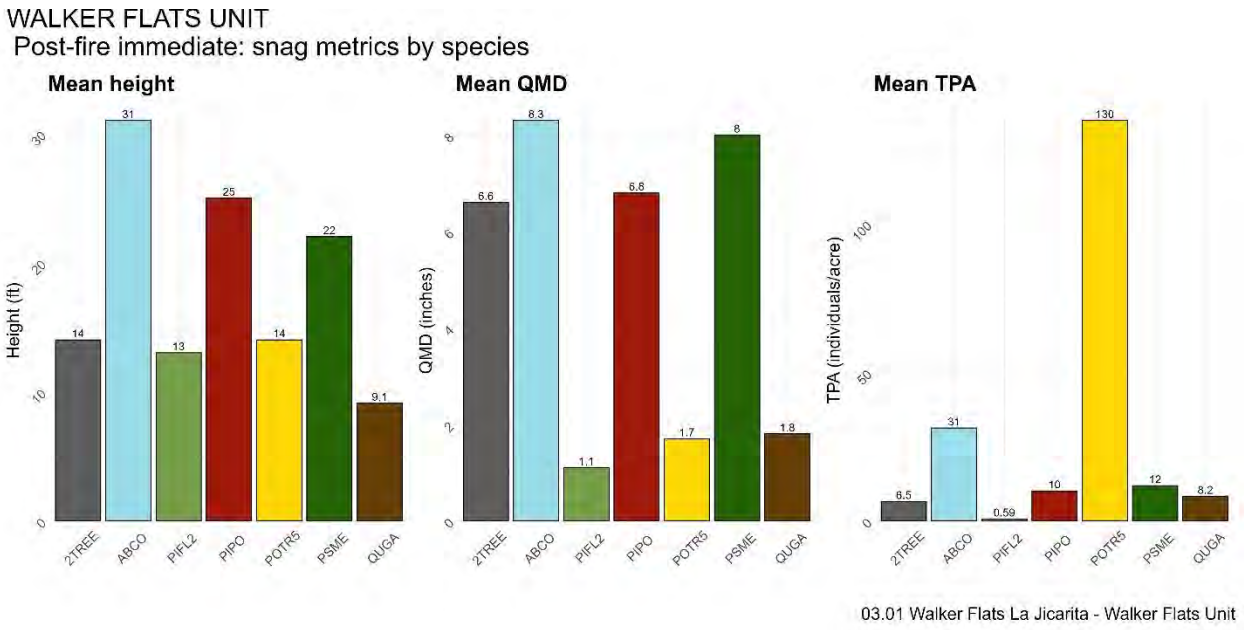
03.01 Walker Flats La Jicarita - Corrales Unit

ENCINAL UNIT

Post-fire immediate: snag metrics by species

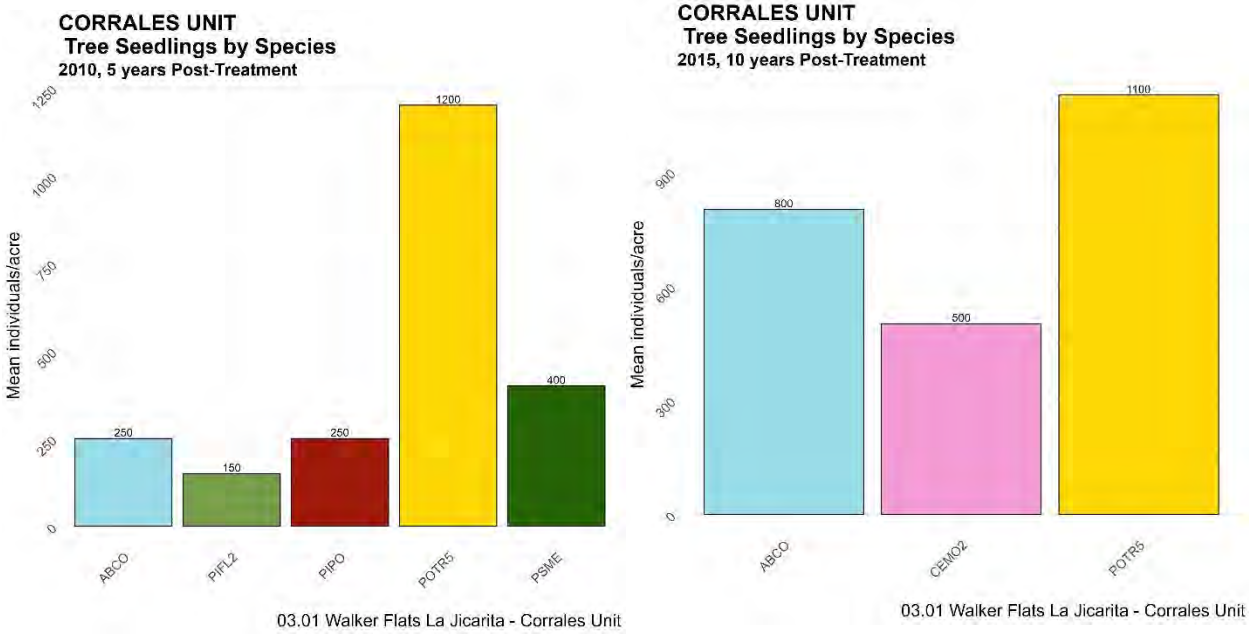


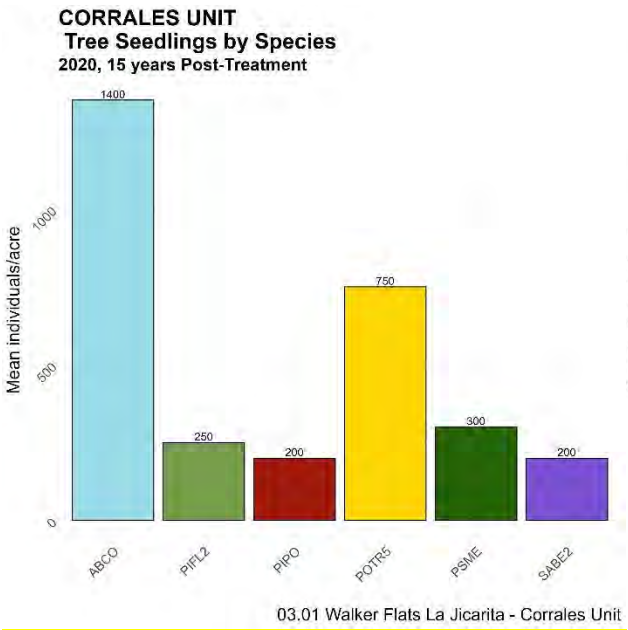
03.01 Walker Flats La Jicarita - Encinal Unit

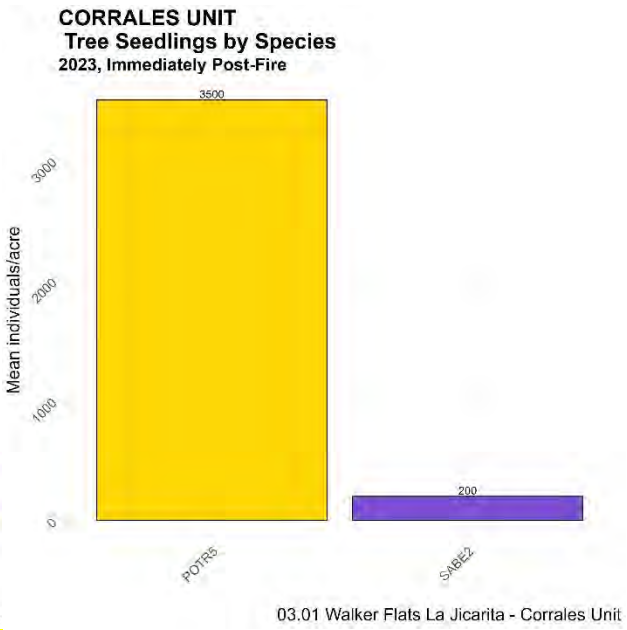


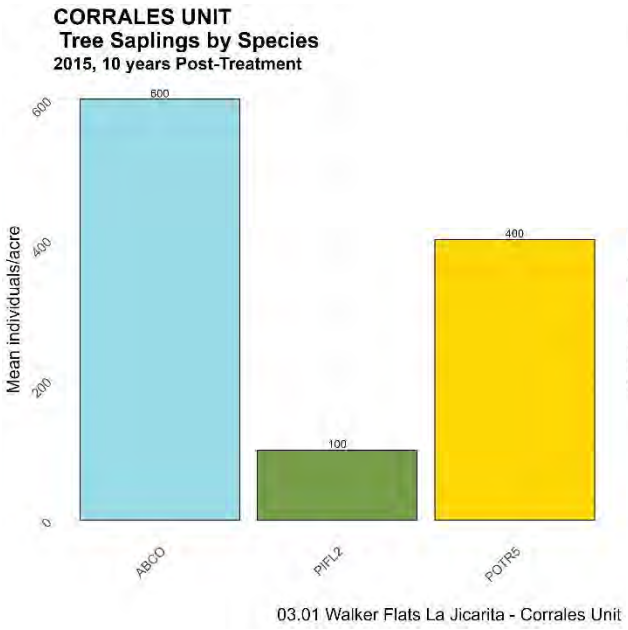
Regeneration: Seedlings and Saplings

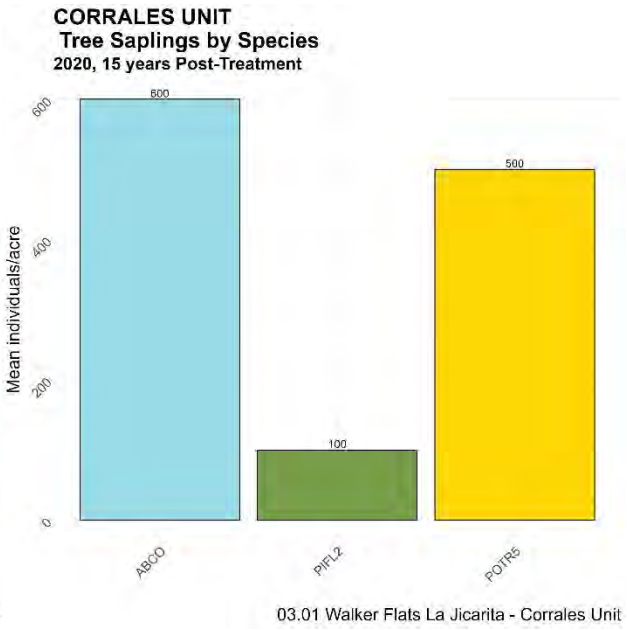
***Figure 44**. The following figures show seedling and sapling densities by status, measurement period, and treatment unit.*

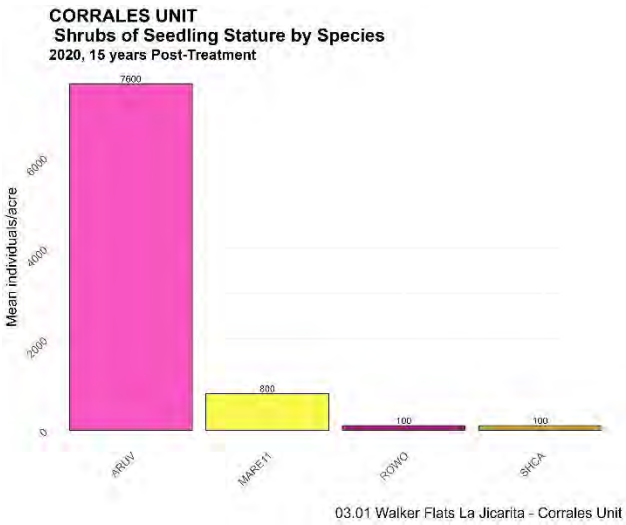



CORRALES UNIT
Tree Seedlings by Species
2020, 15 years Post-Treatment
Mean individuals/acre
0
500
1000
1400
250
200
750
300
200
ABCO
PIFL2
PIPO
POTR5
PSME
SABE2
03.01 Walker Flats La Jicarita - Corrales Unit

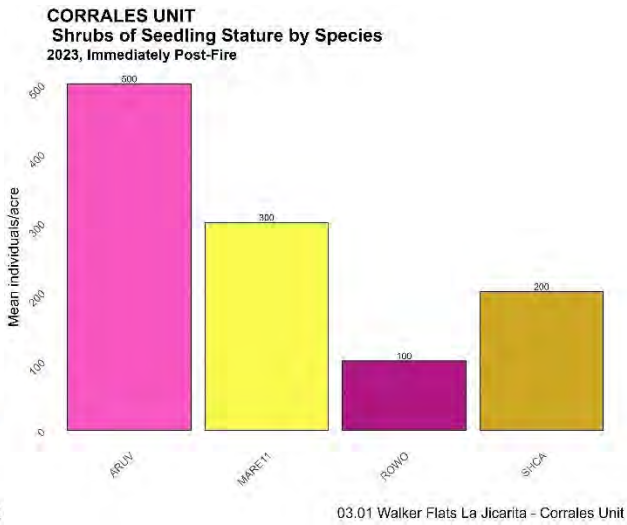

CORRALES UNIT
Tree Seedlings by Species
2023, Immediately Post-Fire
Mean individuals/acre
0
1000
2000
3000
3500
200
POTR5
SABE2
03.01 Walker Flats La Jicarita - Corrales Unit


CORRALES UNIT
Tree Saplings by Species
2015, 10 years Post-Treatment
Mean individuals/acre
0
200
400
600
600
100
400
ABCO
PIFL2
POTR5
03.01 Walker Flats La Jicarita - Corrales Unit

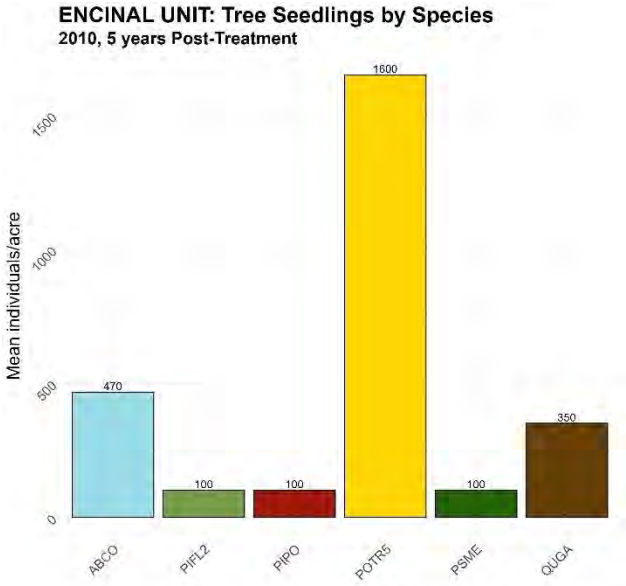

CORRALES UNIT
Tree Saplings by Species
2020, 15 years Post-Treatment
Mean individuals/acre
0
200
400
600
600
100
500
ABCO
PIFL2
POTR5
03.01 Walker Flats La Jicarita - Corrales Unit



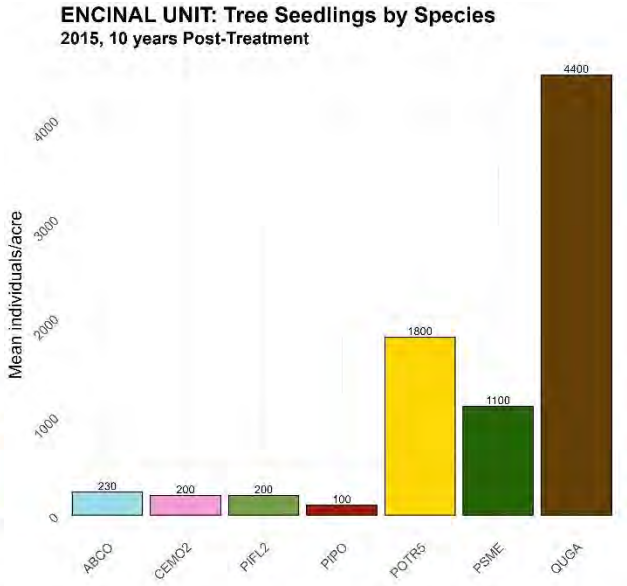
03.01 Walker Flats La Jicarita - Corrales Unit



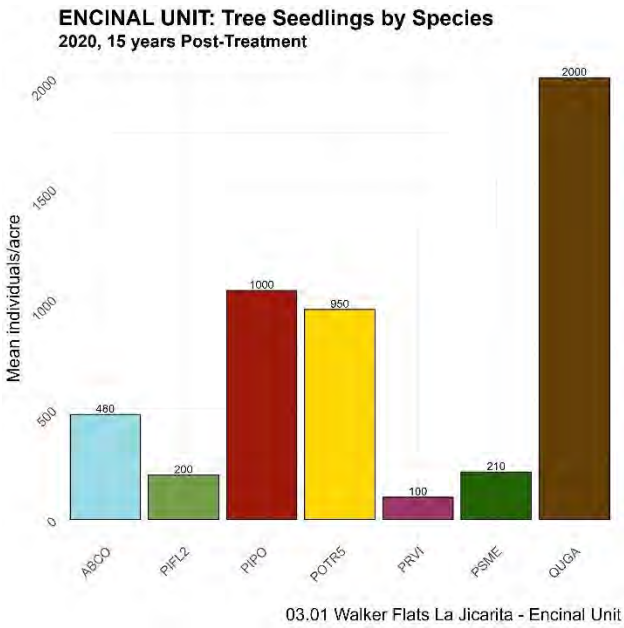
03.01 Walker Flats La Jicarita - Corrales Unit

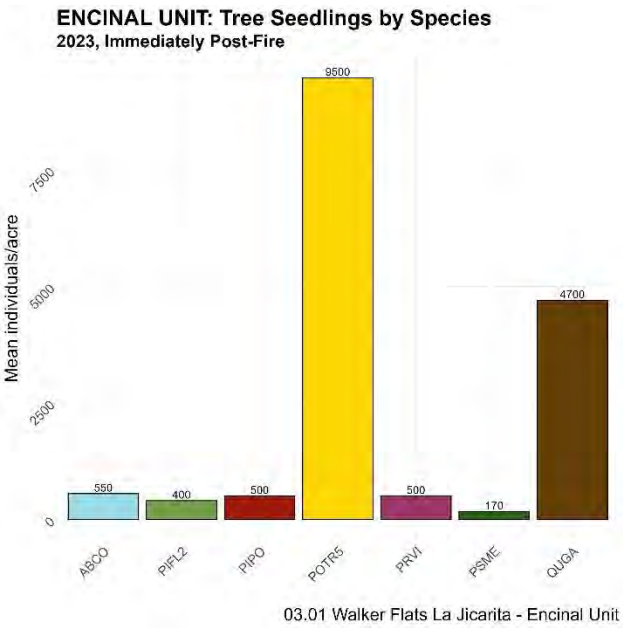


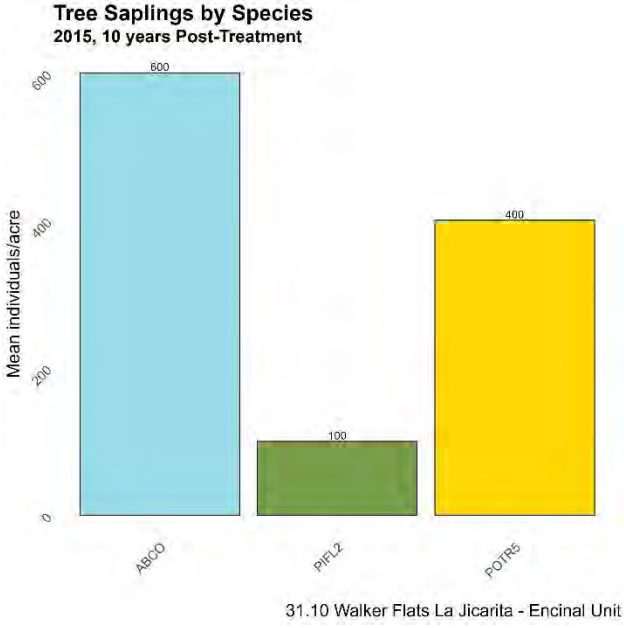
03.01 Walker Flats La Jicarita - Encinal Unit

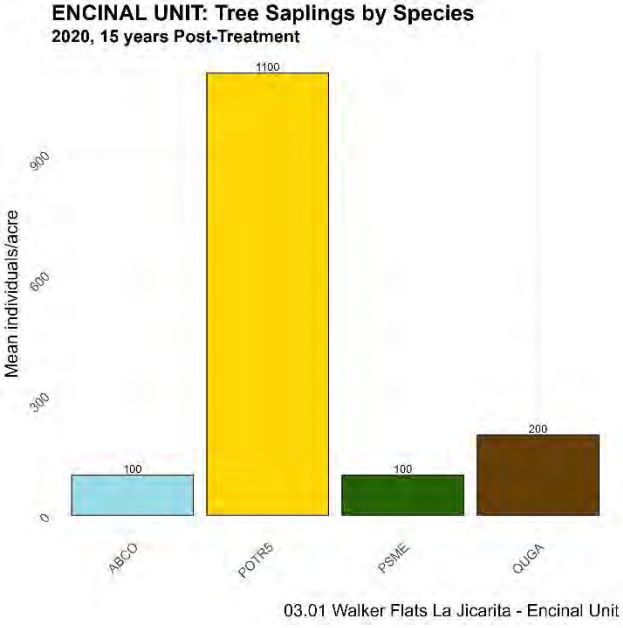


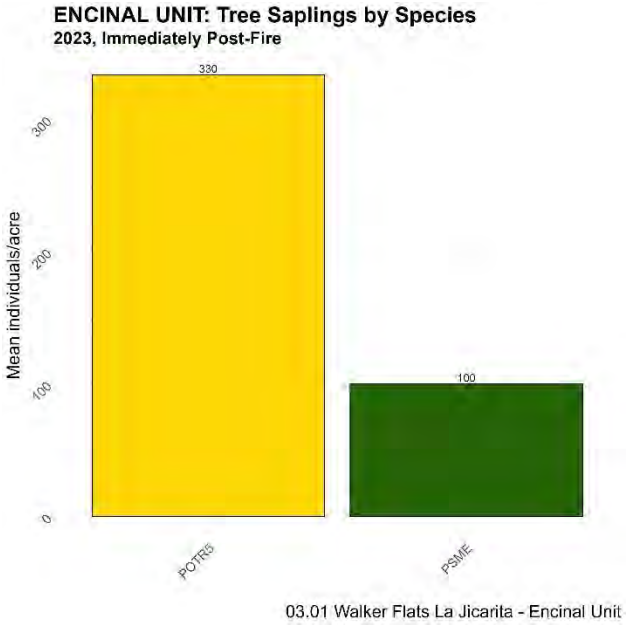
03.01 Walker Flats La Jicarita - Encinal Unit

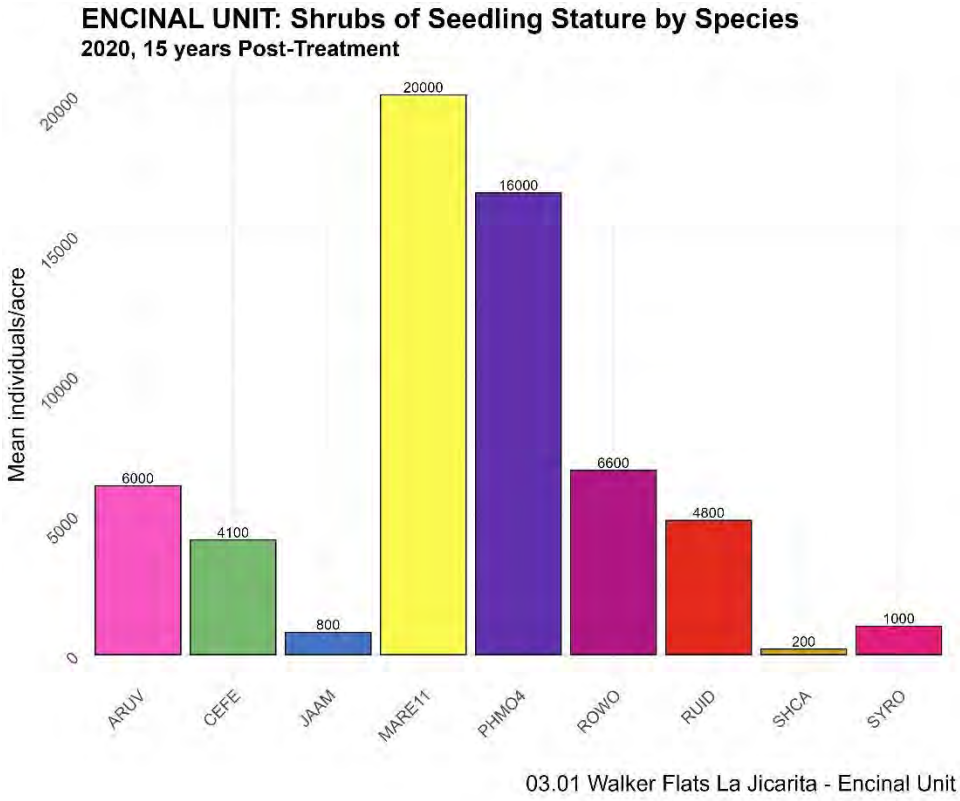

ENCINAL UNIT: Tree Seedlings by Species
2020, 15 years Post-Treatment
Mean individuals/acre
0
500
1000
1500
2000
480
200
1000
950
100
210
2000
ABCO
PIFL2
PIPO
POTR5
PRVI
PSME
QUGA
03.01 Walker Flats La Jicarita - Encinal Unit

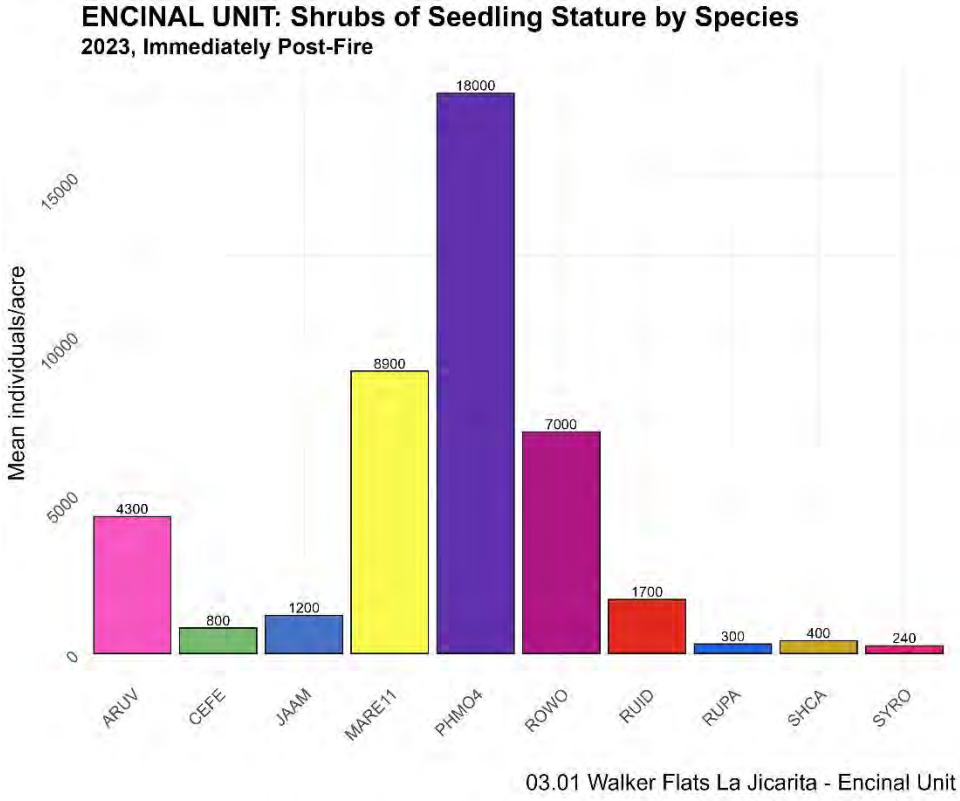

ENCINAL UNIT: Tree Seedlings by Species
2023, Immediately Post-Fire
Mean individuals/acre
0
2500
5000
7500
550
400
500
9500
500
170
4700
ABCO
PIFL2
PIPO
POTR5
PRVI
PSME
QUGA
03.01 Walker Flats La Jicarita - Encinal Unit

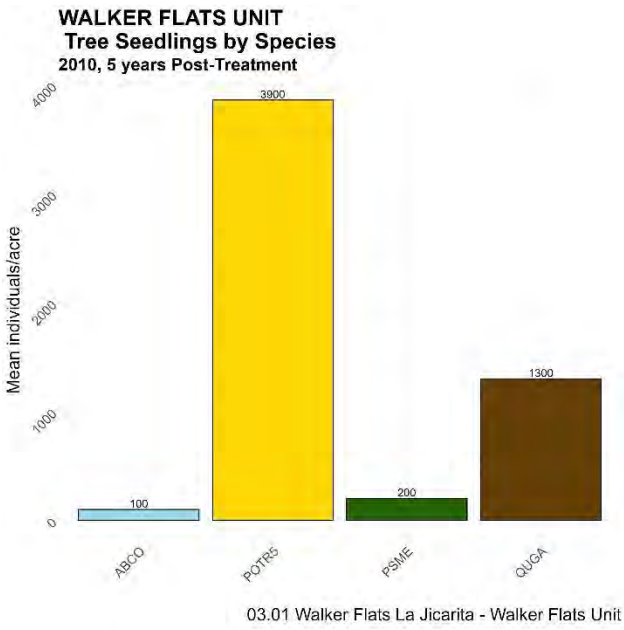

Tree Saplings by Species
2015, 10 years Post-Treatment
Mean individuals/acre
0
200
400
600
600
100
400
ABCO
PIFL2
POTR5
31.10 Walker Flats La Jicarita - Encinal Unit

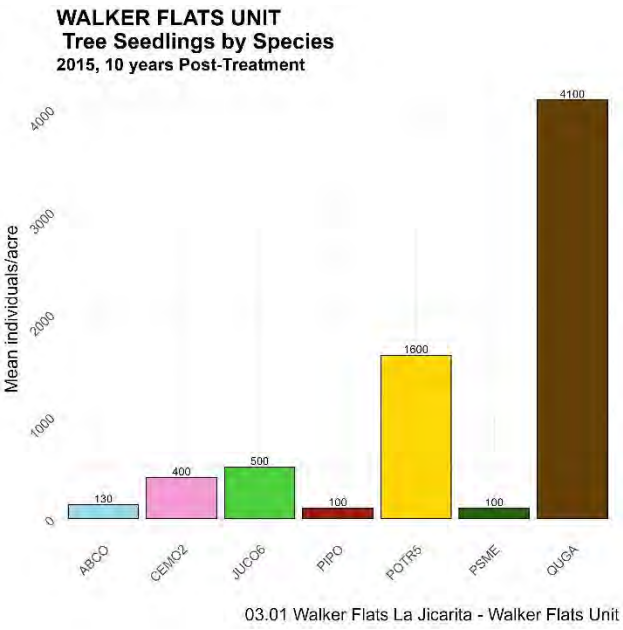

ENCINAL UNIT: Tree Saplings by Species
2020, 15 years Post-Treatment
Mean individuals/acre
0
300
600
900
1100
100
100
200
ABCO
POTR5
PSME
QUGA
03.01 Walker Flats La Jicarita - Encinal Unit

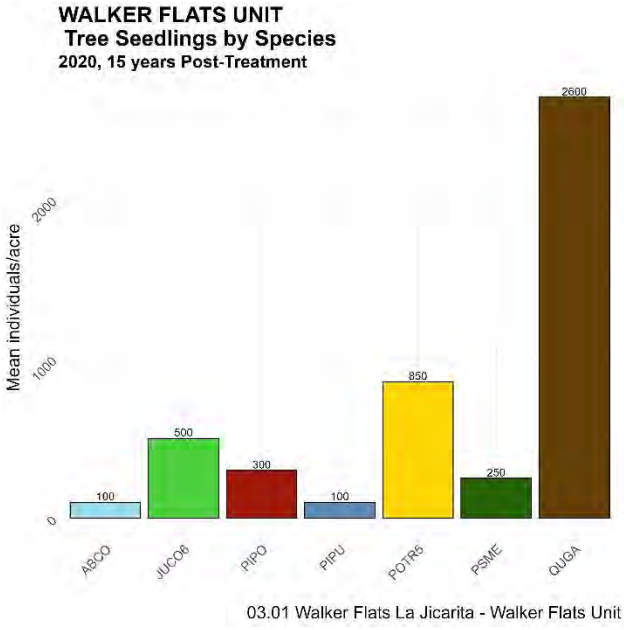

ENCINAL UNIT: Tree Saplings by Species
2023, Immediately Post-Fire
Mean individuals/acre
0
100
200
300
330
100
POTR5
PSME
03.01 Walker Flats La Jicarita - Encinal Unit

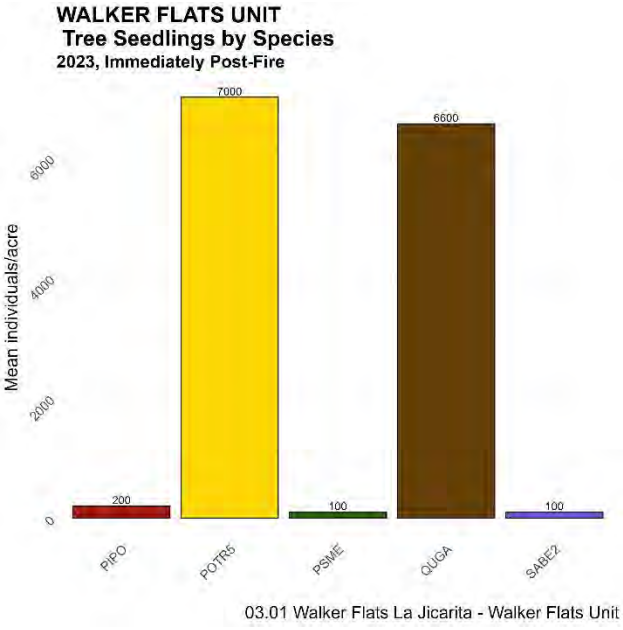

ENCINAL UNIT: Shrubs of Seedling Stature by Species
2020, 15 years Post-Treatment
Mean individuals/acre
0
5000
10000
15000
20000
6000
4100
800
20000
16000
6600
4800
200
1000
ARUV
CEFE
JAAM
MARE11
PHMO4
ROWO
RUID
SHCA
SYRO
03.01 Walker Flats La Jicarita - Encinal Unit

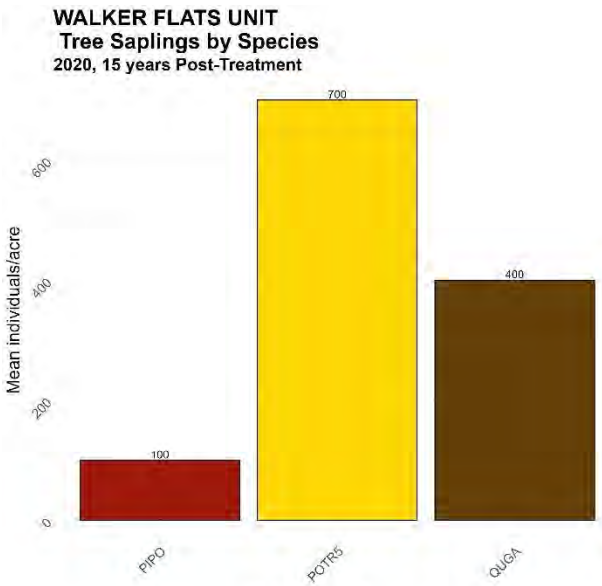

ENCINAL UNIT: Shrubs of Seedling Stature by Species
2023, Immediately Post-Fire
Mean individuals/acre
0
5000
10000
15000
4300
800
1200
8900
18000
7000
1700
300
400
240
ARUV
CEFE
JAAM
MARE11
PHMO4
ROWO
RUID
RUPA
SHCA
SYRO
03.01 Walker Flats La Jicarita - Encinal Unit


WALKER FLATS UNIT
Tree Seedlings by Species
2010, 5 years Post-Treatment
Mean individuals/acre
0
1000
2000
3000
4000
100
3900
200
1300
ABCO
POTR5
PSME
QUGA
03.01 Walker Flats La Jicarita - Walker Flats Unit

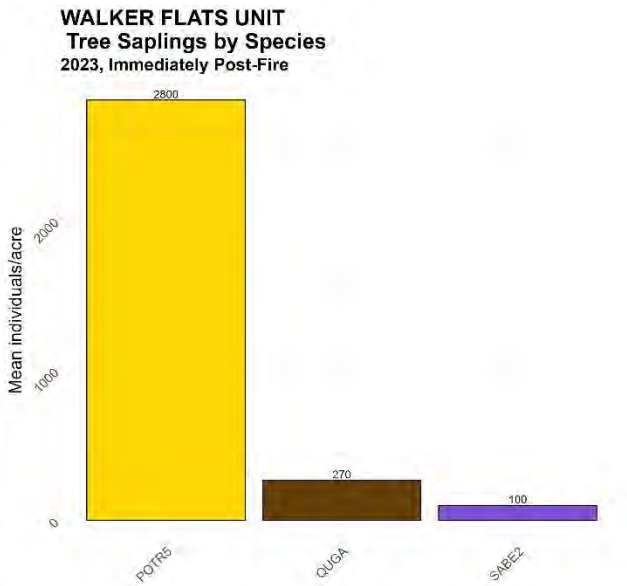

WALKER FLATS UNIT
Tree Seedlings by Species
2015, 10 years Post-Treatment
Mean individuals/acre
0
1000
2000
3000
4000
130
400
500
100
1600
100
4100
ABCO
CEMO2
JUCO6
PIPO
POTR5
PSME
QUGA
03.01 Walker Flats La Jicarita - Walker Flats Unit


WALKER FLATS UNIT
Tree Seedlings by Species
2020, 15 years Post-Treatment
Mean individuals/acre
0
1000
2000
100
500
300
100
850
250
2600
ABCO
JUCO6
PIPO
PIPU
POTR5
PSME
QUGA
03.01 Walker Flats La Jicarita - Walker Flats Unit

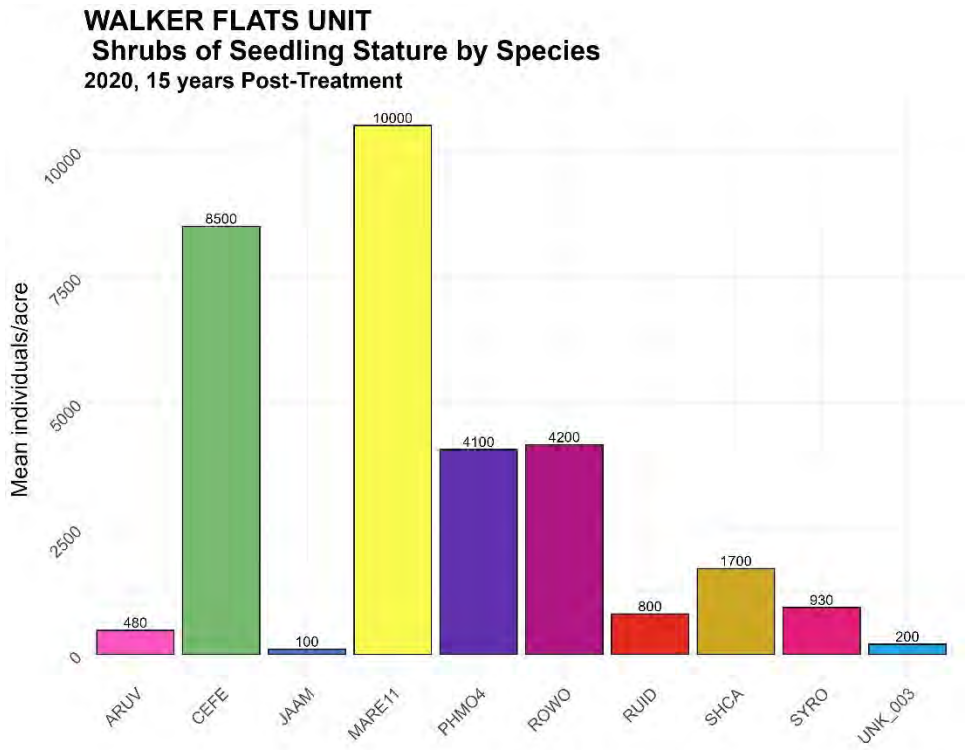

WALKER FLATS UNIT
Tree Seedlings by Species
2023, Immediately Post-Fire
Mean individuals/acre
0
2000
4000
6000
200
7000
100
6600
100
PIPO
POTR5
PSME
QUGA
SABE2
03.01 Walker Flats La Jicarita - Walker Flats Unit



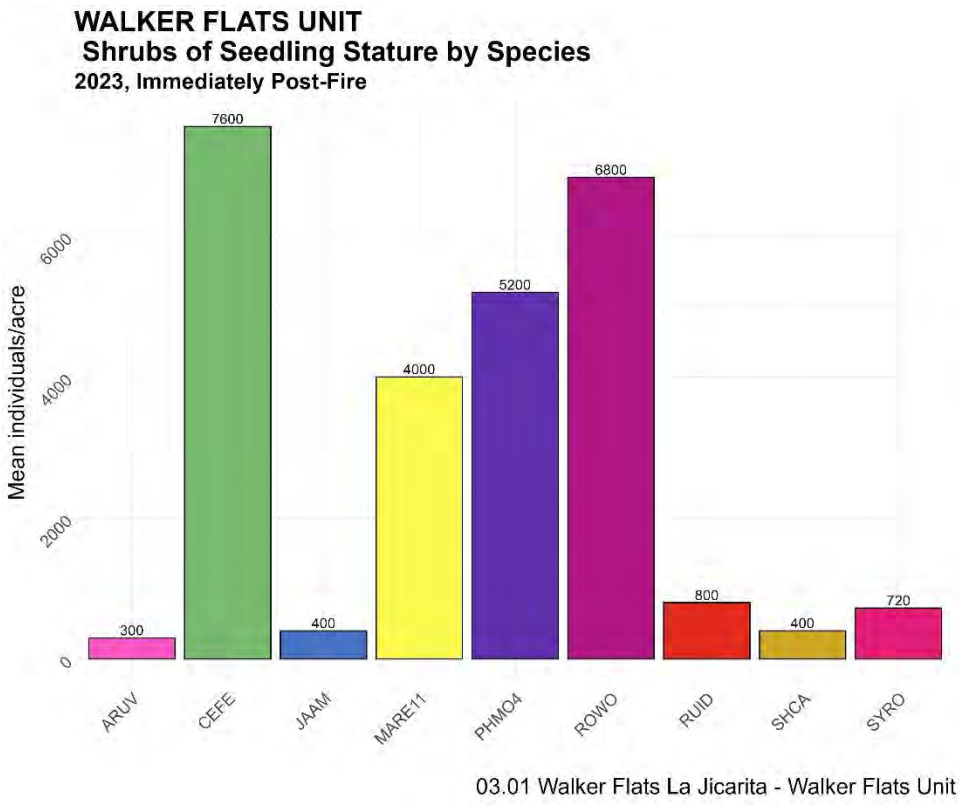
03.01 Walker Flats La Jicarita - Walker Flats Unit



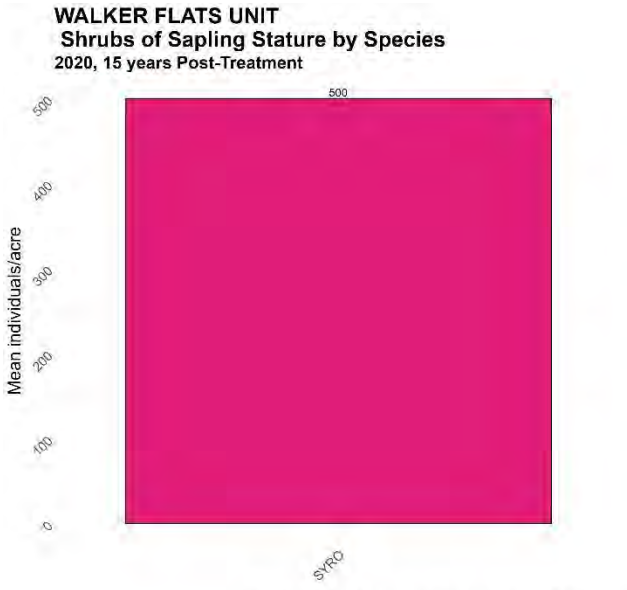
03.01 Walker Flats La Jicarita - Walker Flats Unit



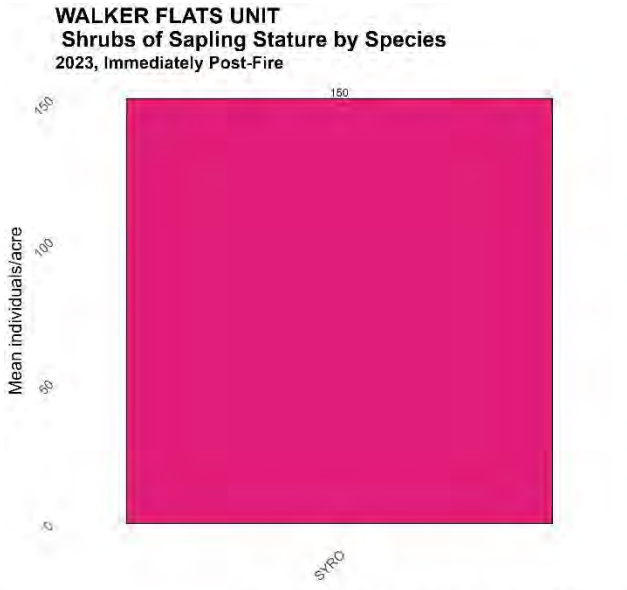
03.01 Walker Flats La Jicarita - Walker Flats Unit



03.01 Walker Flats La Jicarita - Walker Flats Unit



03.01 Walker Flats La Jicarita - Walker Flats Unit



03.01 Walker Flats La Jicarita - Walker Flats Unit

Stand Tables

Stand tables provide another way to visualize trees in an area. They represent the number of trees per acre in certain diameter classes and provide other summary values in a concise format. These are summarized across the entire project area. Stand tables for individual treatment units are available upon request.

Table 17. *Stand table of species metrics for the* ***2010 post-treatment 5yr*** *monitoring period.*

Stand Total	0	Saplings			Pole			Tree or Sawlog											Total by Class,Growing Stock & Dead	% by Class, Growing Stock vs Dead
Diameter Class	*0*	*0*	*2*	*4*	*6*	*8*	*10*	*12*	*14*	*16*	*18*	*20*	*22*	*24*	*26*	*28*	*30*	*32*		
Growing Stock (All living trees in woodland & forestland)	COUNT	0	109	30	31	34	51	62	45	45	20	6	4	2	0	0	0	0	*439*	*0%*
	TPA	0	32	8.8	9.1	10	15	18	13	13	5.9	1.8	1.2	0.59	0	0	0	0	*129*	*69%*
	BA/AC	0	0.54	0.73	1.8	3.4	8.3	14	14	18	10	3.8	3.1	1.8	0	0	0	0	*80*	*75%*
	AVE HT, HL	0	13	22	30	40	43	48	52	53	60	60	65	72	0	0	0	0	*0*	*0%*
Summary by Size Class (All living trees in woodland & forestland)	TPA		41			34							54						*129*	*0%*
	TPA %		32%			26%							42%						*100%*	*0%*
	BA/AC		1.3			13							65						*80*	*0%*
	BA/AC %		1.6%			17%							82%						*100%*	*0%*
	QMD MEAN DIA.		2.4			8.5							15						*11*	*0%*
	AVE HT, HL		18			40							54						*51*	*0*
0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0%*
Dead (All dead trees in woodland & forestland)	COUNT	0	37	31	29	20	20	27	24	6	5	0	0	0	0	0	0	0	*199*	*0%*
	TPA	0	11	9.1	8.5	5.9	5.9	7.9	7.1	1.8	1.5	0	0	0	0	0	0	0	*59*	*31%*
	BA/AC	0	0.19	0.80	1.7	2.0	3.2	6.2	7.1	2.4	2.5	0	0	0	0	0	0	0	*26*	*25%*
	AVE HT, HL	0	14	22	28	27	39	43	43	47	46	0	0	0	0	0	0	0	*40*	*0%*
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0%*
Total for all sample trees including Growing	COUNT	0	146	61	60	54	71	89	69	51	25	6	4	2	0	0	0	0	*638*	*0%*
	TPA	0	43	18	18	16	21	26	20	15	7.4	1.8	1.2	0.59	0	0	0	0	*188*	*100%*
	BA/AC	0	0.73	1.5	3.4	5.4	11	21	21	21	13	3.8	3.1	1.8	0	0	0	0	*106*	*100%*

Woodland Species		0	Saplings			Pole			Mature Trees											by Speci	%Species
Diameter Class		*0*	*0*	*2*	*4*	*6*	*8*	*10*	*12*	*14*	*16*	*18*	*20*	*22*	*24*	*26*	*28*	*30*	*32+*		
QUGA Gambel oak	COUNT		0	10	4	7	2	0	0	0	0	0	0	0	0	0	0	0	0	*23*	
	TPA		0	2.9	1.2	2.1	0.59	0	0	0	0	0	0	0	0	0	0	0	0	*6.8*	*5.2%*
0	BA/AC		0	0.06	0.11	0.40	0.19	0	0	0	0	0	0	0	0	0	0	0	0	*0.76*	*0.94%*
0	AVE HT. (HL)		0	11	30	34	36	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0*
Woodland Species Sub-total	*COUNT*		*0*	*10*	*4*	*7*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*23*	*0%*
	TPA		*0*	*2.9*	*1.2*	*2.1*	*0.59*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*6.8*	*5.2%*
	BA/AC		*0*	*0.06*	*0.11*	*0.40*	*0.19*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.76*	*0.94%*
	AVE HT. (HL)		*0*	*11*	*30*	*34*	*36*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Summary by Size Class for Woodland Species	*TPA*			*4.1*			*2.6*							*0*						*6.8*	*0%*
	TPA %			*61%*			*39%*							*0%*						*100%*	
	BA/AC			*0.17*			*0.59*							*0*						*0.76*	*0.0%*
	BA/AC %			*22%*			*78%*							*0%*						*100%*	
	QUADRATIC MEAN DIA.			*2.7*			*6.4*							*0*						*4.5*	*0%*
	AVE HT. (HL)			*24*			*34*							*0*						*32*	*0*

Forestland Species		0	Saplings			Pole			Mature Trees										Total by Species & Covertype	%Species for all G-Stock
Diameter Class		0	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	
ABCO	COUNT		0	26	3	7	10	13	16	11	7	2	2	1	0	0	0	0	0	98	0
White fir	TPA		0	7.6	0.88	2.1	2.9	3.8	4.7	3.2	2.1	0.59	0.59	0.29	0	0	0	0	0	29	22%
0	BA/AC		0	0.12	0.08	0.41	0.99	2.1	3.7	3.3	2.8	1.0	1.2	0.78	0	0	0	0	0	17	21%
0	AVE HT. (HL)		0	13	18	26	37	45	48	56	54	59	70	62	0	0	0	0	0	0	
PIPO	COUNT		0	7	0	6	9	18	21	14	17	5	3	2	0	0	0	0	0	102	
Ponderosa pine	TPA		0	2.1	0	1.8	2.6	5.3	6.2	4.1	5.0	1.5	0.88	0.59	0	0	0	0	0	30	23%
0	BA/AC		0	0.04	0	0.35	0.88	2.9	4.9	4.3	6.8	2.6	2.0	1.5	0	0	0	0	0	26	33%
0	AVE HT. (HL)		0	9.2	0	37	46	39	47	50	53	56	54	67	0	0	0	0	0	0	0%
PSME	COUNT		0	18	2	5	8	14	19	18	17	11	1	1	2	0	0	0	0	116	
Douglas-fir	TPA		0	5.3	0.59	1.5	2.4	4.1	5.6	5.3	5.0	3.2	0.29	0.29	0.59	0	0	0	0	34	26%
0	BA/AC		0	0.07	0.04	0.27	0.82	2.3	4.4	5.6	7.1	5.7	0.60	0.82	1.8	0	0	0	0	29	37%
0	AVE HT. (HL)		0	11	28	25	34	45	48	52	54	60	56	64	72	0	0	0	0	0	0%
PIFL2	COUNT		0	3	4	1	0	2	3	2	4	1	0	0	0	0	0	0	0	20	
Limber pine	TPA		0	0.88	1.2	0.29	0	0.59	0.88	0.59	1.2	0.29	0	0	0	0	0	0	0	5.9	4.6%
0	BA/AC		0	0.01	0.08	0.06	0	0.33	0.64	0.55	1.6	0.53	0	0	0	0	0	0	0	3.8	4.8%
0	AVE HT. (HL)		0	9.8	15	23	0	38	44	45	46	48	0	0	0	0	0	0	0	0	0%
PIPU	COUNT		0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1.0	
Colorado blue spruce	TPA		0	0	0	0	0	0	0.29	0	0	0	0	0	0	0	0	0	0	0.29	0.23%
0	BA/AC		0	0	0	0	0	0	0.24	0	0	0	0	0	0	0	0	0	0	0.24	0.30%
0	AVE HT. (HL)		0	0	0	0	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0%
POTR5	COUNT		0	45	17	5	5	4	2	0	0	1	0	0	0	0	0	0	0	79	
Aspen	TPA		0	13	5.0	1.5	1.5	1.2	0.59	0	0	0.29	0	0	0	0	0	0	0	23	18%
0	BA/AC		0	0.24	0.41	0.28	0.53	0.57	0.46	0	0	0.55	0	0	0	0	0	0	0	3.0	3.8%
0	AVE HT. (HL)		0	16	21	28	43	51	52	0	0	81	0	0	0	0	0	0	0	0	0%
Forestland Species Sub-total	COUNT		0	99	26	24	32	51	62	45	45	20	6	4	2	0	0	0	0	416	0%
	TPA		0	29	7.6	7.1	9.4	15	18	13	13	5.9	1.8	1.2	0.59	0	0	0	0	122	95%
	BA/AC		0	0.49	0.62	1.4	3.2	8.3	14	14	18	10	3.8	3.1	1.8	0	0	0	0	79	99%
	AVE HT. (HL)		0	14	20	29	40	43	48	52	53	60	60	65	72	0	0	0	0	0	0
Summary by Size Class for Forestland Species	TPA			37			31							54						122	0%
	TPA %			30%			26%							44%						100%	
	BA/AC			1.1			13							65						79	0%
	BA/AC %			1.4%			16%							82%						100%	
	QUADRATIC MEAN DIA.			2.3			8.7							15						11	0%
	AVE HT. (HL)			17			41							54						51	0

***Table 18**. Stand table of species metrics for the **2015 post-treatment 10yr** monitoring period.*

Stand Total	0	Saplings			Pole			Tree or Sawlog											Total by Class,Growing Stock & Dead	% by Class, Growing Stock vs Dead
Diameter Class	*0*	*0*	*2*	*4*	*6*	*8*	*10*	*12*	*14*	*16*	*18*	*20*	*22*	*24*	*26*	*28*	*30*	*32*		
Growing Stock (All living trees in woodland & forestland)	COUNT	0	153	29	25	31	40	54	38	37	20	6	5	1	0	0	0	0	*439*	*0%*
	TPA	0	45	8.5	7.4	9.1	12	16	11	11	5.9	1.8	1.5	0.29	0	0	0	0	*129*	*72%*
	BA/AC	0	0.66	0.66	1.4	3.0	6.4	12	12	15	10	3.7	3.9	0.86	0	0	0	0	*70*	*69%*
	AVE HT, HL	0	12	18	27	33	39	44	50	52	57	58	65	55	0	0	0	0	*0*	*0%*
Summary by Size Class (All living trees in woodland & forestland)	TPA		54			28							47						*129*	*0%*
	TPA %		41%			22%							37%						*100%*	*0%*
	BA/AC		1.3			11							58						*70*	*0%*
	BA/AC %		1.9%			16%							83%						*100%*	*0%*
	QMD MEAN DIA.		2.1			8.4							15						*9.9*	*0.0*
	AVE HT, HL		15			36							52						*49*	*0*
0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0%*
Dead (All dead trees in woodland & forestland)	COUNT	0	17	23	25	14	20	30	16	14	9	2	1	1	0	0	0	0	*172*	*0%*
	TPA	0	5.0	6.8	7.4	4.1	5.9	8.8	4.7	4.1	2.6	0.59	0.29	0.29	0	0	0	0	*51*	*28%*
	BA/AC	0	0.06	0.58	1.4	1.4	3.2	6.8	4.7	5.6	4.5	1.3	0.74	0.91	0	0	0	0	*31*	*31%*
	AVE HT, HL	0	14	16	23	30	25	26	27	27	40	36	13	13	0	0	0	0	*28*	*0%*
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0%*
Total for all sample trees including Growing	COUNT	0	170	52	50	45	60	84	54	51	29	8	6	2	0	0	0	0	*611*	*0%*
	TPA	0	50	15	15	13	18	25	16	15	8.5	2.4	1.8	0.59	0	0	0	0	*180*	*100%*
	BA/AC	0	0.73	1.2	2.8	4.4	9.6	19	16	21	14	5.0	4.6	1.8	0	0	0	0	*101*	*100%*

Woodland Species		0	Saplings			Pole			Mature Trees											Total by Species	%Species for all G-Stock
Diameter Class		*0*	*0*	*2*	*4*	*6*	*8*	*10*	*12*	*14*	*16*	*18*	*20*	*22*	*24*	*26*	*28*	*30*	*32+*		
QUGA Gambel oak	COUNT		0	3	3	6	7	1	0	0	0	0	0	0	0	0	0	0	0	*20*	
	TPA		0	0.88	0.88	1.8	2.1	0.29	0	0	0	0	0	0	0	0	0	0	0	*5.9*	*4.6%*
0	BA/AC		0	0.02	0.07	0.35	0.65	0.14	0	0	0	0	0	0	0	0	0	0	0	*1.2*	*1.8%*
0	AVE HT. (HL)		0.00	12	10	28	23	28	0	0	0	0	0	0	0	0	0	0	0	*0*	*0*
Woodland Species Sub-total	*COUNT*		*0*	*3*	*3*	*6*	*7*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*20*	*0%*
	TPA		*0*	*0.88*	*0.88*	*1.8*	*2.1*	*0.29*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*5.9*	*4.6%*
	BA/AC		*0*	*0.02*	*0.07*	*0.35*	*0.65*	*0.14*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1.2*	*1.8%*
	AVE HT. (HL)		*0*	*12*	*10*	*28*	*23*	*28*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Summary by Size Class for Woodland Species	*TPA*			*1.8*			*4.1*							*0*						*5.9*	*0%*
	TPA %			*30%*			*70%*							*0%*						*100%*	
	BA/AC			*0.09*			*1.1*							*0*						*1.2*	*0%*
	BA/AC %			*7%*			*93%*							*0%*						*100%*	
	QUADRATIC MEAN DIA.			*3.1*			*7.1*							*0*						*6.2*	*0%*
	AVE HT. (HL)			*11*			*25*													*24*	*0*

Forestland Species	0	Saplings			Pole			Mature Trees											Total by Species & Covertype	%Species for all G-Stock
Diameter Class	0	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32		
ABCO White fir	COUNT	0	39	2	6	10	10	16	6	8	6	2	2	0	0	0	0	0	107	0
	TPA	0	11	0.59	1.8	2.9	2.9	4.7	1.8	2.4	1.8	0.59	0.59	0	0	0	0	0	31	24%
0	BA/AC	0	0.21	0.05	0.33	1.01	1.6	3.7	1.9	3.2	3.05	1.2	1.5	0	0	0	0	0	18	26%
0	AVE HT. (HL)	0	11	20	20	35	41	45	55	53	59	55	58	0	0	0	0	0	0	
PIPO Ponderosa pine	COUNT	0	11	5	3	7	17	19	16	18	4	2	3	0	0	0	0	0	105	
	TPA	0	3.2	1.5	0.88	2.1	5.0	5.6	4.7	5.3	1.2	0.59	0.88	0	0	0	0	0	31	24%
0	BA/AC	0	0.04	0.11	0.18	0.66	2.7	4.3	4.9	7.3	2.1	1.3	2.3	0	0	0	0	0	26	37%
0	AVE HT. (HL)	0	5.9	11	31	33	37	44	50	51	62	59	69	0	0	0	0	0	0	0%
PSME Douglas-fir	COUNT	0	4	1	1	6	7	14	13	8	8	2	0	1	0	0	0	0	65	
	TPA	0	1.2	0.29	0.29	1.8	2.1	4.1	3.8	2.4	2.4	0.59	0	0.29	0	0	0	0	19	15%
0	BA/AC	0	0.04	0.02	0.05	0.61	1.10	3.2	4.1	3.3	3.9	1.2	0	0.86	0	0	0	0	18	26%
0	AVE HT. (HL)	0	13	13	25	33	39	45	50	55	55	61	0	55	0	0	0	0	0	0%
PIFL2 Limber pine	COUNT	0	7	4	2	0	1	4	2	3	2	0	0	0	0	0	0	0	25	
	TPA	0	2.1	1.2	0.59	0	0.29	1.2	0.59	0.88	0.59	0	0	0	0	0	0	0	7.4	5.7%
0	BA/AC	0	0.02	0.09	0.11	0	0.17	0.87	0.60	1.2	1.0	0	0	0	0	0	0	0	4.0	5.8%
0	AVE HT. (HL)	0	9.2	12	24	0	28	39	42	48	49	0	0	0	0	0	0	0	0	0%
PIPU Colorado blue spruce	COUNT	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1.0	
	TPA	0	0	0	0	0	0	0.29	0	0	0	0	0	0	0	0	0	0	0.29	0.23%
0	BA/AC	0	0	0	0	0	0	0.26	0	0	0	0	0	0	0	0	0	0	0.26	0.38%
0	AVE HT. (HL)	0	0	0	0	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0%
POTR5 Aspen	COUNT	0	89	14	7	1	4	0	1	0	0	0	0	0	0	0	0	0	116	
	TPA	0	26	4.1	2.1	0.29	1.2	0	0.29	0	0	0	0	0	0	0	0	0	34	26%
0	BA/AC	0	0.33	0.33	0.39	0.12	0.62	0	0.28	0	0	0	0	0	0	0	0	0	2.1	3.0%
0	AVE HT. (HL)	0	13	23	31	60	48	0	51	0	0	0	0	0	0	0	0	0	0	0%
Forestland Species Sub-total	*COUNT*	*0*	*150*	*26*	*19*	*24*	*39*	*54*	*38*	*37*	*20*	*6*	*5*	*1*	*0*	*0*	*0*	*0*	419	0%
	TPA	*0*	*44*	*7.6*	*5.6*	*7.1*	*11*	*16*	*11*	*11*	*5.9*	*1.8*	*1.5*	*0.29*	*0*	*0*	*0*	*0*	123	95%
	BA/AC	*0*	*0.64*	*0.59*	*1.1*	*2.4*	*6.2*	*12*	*12*	*15*	*10*	*3.7*	*3.9*	*0.86*	*0*	*0*	*0*	*0*	68	98%
	AVE HT. (HL)	*0*	*12*	*19*	*26*	*35*	*39*	*44*	*50*	*52*	*57*	*58*	*65*	*55*	*0*	*0*	*0*	*0*	0	0
Summary by Size Class for Forestland Species	*TPA*		*52*			*24*							*47*						123	0%
	TPA %		*42%*			*20%*							*38%*						100%	
	BA/AC		*1.2*			*9.7*							*58*						68	0%
	BA/AC %		*1.8%*			*14%*							*84%*						100%	
	QUADRATIC MEAN DIA.		*2.1*			*8.6*							*15*						10	0%
	AVE HT. (HL)		*15*			*37*							*52*						49	0

***Table 19**. Stand table of forestland species metrics for the **2020 post-treatment 15yr** measurement period*

Stand Total	0	Saplings			Pole			Tree or Sawlog											Total by Class, Growing Stock & Dead	% by Class, Growing Stock vs Dead
Diameter Class	*0*	*0*	*2*	*4*	*6*	*8*	*10*	*12*	*14*	*16*	*18*	*20*	*22*	*24*	*26*	*28*	*30*	*32*		
Growing Stock	COUNT	12	495	50	33	25	32	46	36	36	22	10	0	3	0	1	0	0	*801*	*0%*
(All living trees in	TPA	3.5	146	15	9.7	7.4	9.4	13.5	10.6	10.6	6.5	2.9	0	0.9	0	0.3	0	0	*236*	*86%*
woodland &	BA/AC	0.01	2.1	1.2	1.9	2.5	5.2	10.8	11.2	14.8	11.3	6.3	0	2.6	0	1.2	0	0	*71*	*77%*
forestland)	AVE HT, HL	16	18	26	34	43	51	55	56	65	66	72	0	65	0	80	0	0	*0*	*0%*
Summary by	TPA		164			26							45						*236*	*0%*
Size Class (All	TPA %		70%			11%							19%						*100%*	*0%*
living trees in	BA/AC		3.3			9.6							58						*71*	*0%*
woodland &	BA/AC %		4.6%			14%							82%						*100%*	*0%*
forestland)	QMD MEAN DIA.		1.9			8.2							15						*7.4*	*0%*
	AVE HT, HL		21			46							63						*59*	*0%*
0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0%*
Dead (All dead	COUNT	1	25	14	15	12	17	23	11	8	4	1	0	1	0	0	0	0	*132*	*0%*
trees in woodland	TPA	0.3	7.4	4.1	4.4	3.5	5.0	6.8	3.2	2.4	1.2	0.3	0	0.3	0	0	0	0	*39*	*14%*
& forestland)	BA/AC	0	0.2	0.4	0.8	1.3	2.8	5.2	3.3	3.3	2.0	0.6	0	0.9	0	0	0	0	*21*	*23%*
	AVE HT, HL	13	13	18	32	35	21	27	24	25	43	17	0	18	0	0	0	0	*27*	*0%*
0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0%*
Total for all	COUNT	13	520	64	48	37	49	69	47	44	26	11	0	4	0	1	0	0	*933*	*0%*
sample trees	TPA	4	153	19	14	11	14	20	14	13	7.6	3.2	0	1.2	0	0.3	0	0	*274*	*100%*
including Growing	BA/AC	0.01	2.3	1.6	2.7	3.8	7.9	16	15	18	13	7.0	0	3.5	0	1.2	0	0	*92*	*100%*

Woodland Species	0	Saplings			Pole			Mature Trees											by	%Spe
Diameter Class	0	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32+	Speci	cies
QUGA	COUNT	0	24	5	12	2	0	0	0	0	0	0	0	0	0	0	0	0	43	
Gambel oak	TPA	0	7.1	1.5	3.5	0.59	0	0	0	0	0	0	0	0	0	0	0	0	13	5.4%
0	BA/AC	0	0.12	0.10	0.66	0.20	0	0	0	0	0	0	0	0	0	0	0	0	1.1	1.5%
0	AVE HT. (HL)	0	14	21	33	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woodland Species Sub-total	*COUNT*	*0*	*24*	*5*	*12*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*43*	*0%*
	TPA	*0*	*7.1*	*1.5*	*3.5*	*0.59*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*13*	*5.4%*
	BA/AC	*0*	*0.12*	*0.10*	*0.66*	*0.20*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1.1*	*1.5%*
	AVE HT. (HL)	*0*	*14*	*21*	*33*	*38*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Summary by Size Class for Woodland Species	*TPA*		*8.5*			*4.1*							*0*						*13*	*0%*
	TPA %		*67%*			*33%*							*0%*						*100%*	
	BA/AC		*0.22*			*0.86*							*0*						*1.1*	*0%*
	BA/AC %		*20%*			*80%*							*0%*						*100%*	
	QUADRATIC MEAN DIA.		*2.2*			*6.2*							*0*						*4.0*	*0%*
	AVE HT. (HL)		*17*			*34*							*0*						*31*	*0*

Forestland Species	0	Saplings			Pole			Mature Trees											Total by Species & Covertype	%Species for all G-Stock
Diameter Class	0	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32		
ABCO	COUNT	0	95	2	2	8	9	12	5	2	4	2	0	1	0	0	0	0	142	0
White fir	TPA	0	28	0.59	0.59	2.4	2.6	3.5	1.5	0.59	1.2	0.59	0	0.29	0	0	0	0	42	18%
0	BA/AC	0	0.41	0.04	0.12	0.81	1.5	2.9	1.6	0.84	2.0	1.2	0	0.85	0	0	0	0	12	17%
0	AVE HT. (HL)	0	14	18	32	45	54	55	62	64	64	76	0	61	0	0	0	0	0	
PIPO	COUNT	0	19	4	7	9	12	16	16	18	6	4	0	1	0	1	0	0	113	
Ponderosa pine	TPA	0	5.6	1.2	2.1	2.6	3.5	4.7	4.7	5.3	1.8	1.2	0	0.29	0	0.29	0	0	33	14%
0	BA/AC	0	0.11	0.08	0.39	0.93	2.0	3.6	4.9	7.5	3.1	2.6	0	0.86	0	1.2	0	0	27	38%
0	AVE HT. (HL)	0	10	18	34	42	51	53	56	66	65	72	0	75	0	80	0	0	0	0%
PSME	COUNT	0	28	8	2	5	8	14	10	14	10	3	0	1	0	0	0	0	103	
Douglas-fir	TPA	0	8.2	2.4	0.59	1.5	2.4	4.1	2.9	4.1	2.9	0.88	0	0.29	0	0	0	0	30	13%
0	BA/AC	0	0.13	0.19	0.12	0.49	1.2	3.3	3.2	5.7	5.2	2.0	0	0.92	0	0	0	0	22	31%
0	AVE HT. (HL)	0	14	25	34	41	51	57	51	65	68	71	0	60	0	0	0	0	0	0%
PIFL2	COUNT	1	14	6	2	0	0	4	2	1	2	1	0	0	0	0	0	0	33	
Limber pine	TPA	0.29	4.1	1.8	0.59	0	0	1.2	0.59	0.29	0.59	0.29	0	0	0	0	0	0	9.7	4.1%
0	BA/AC	0	0.08	0.18	0.14	0	0	0.96	0.64	0.38	1.1	0.60	0	0	0	0	0	0	4.0	5.7%
0	AVE HT. (HL)	13	13	23	28	0	0	61	59	74	60	60	0	0	0	0	0	0	0	0%
PIPU	COUNT	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1.0	
Colorado blue spruce	TPA	0	0	0	0	0	0	0	0.29	0	0	0	0	0	0	0	0	0	0.29	0.12%
0	BA/AC	0	0	0	0	0	0	0	0.30	0	0	0	0	0	0	0	0	0	0.30	0.42%
0	AVE HT. (HL)	0	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0%
POTR5	COUNT	11	315	25	8	1	3	0	2	1	0	0	0	0	0	0	0	0	366	
Aspen	TPA	3.2	93	7.4	2.4	0.29	0.88	0	0.59	0.29	0	0	0	0	0	0	0	0	108	46%
0	BA/AC	0.01	1.3	0.56	0.47	0.13	0.49	0	0.57	0.43	0	0	0	0	0	0	0	0	3.9	5.5%
0	AVE HT. (HL)	17	21	30	40	57	50	0	47	57	0	0	0	0	0	0	0	0	0	0%
Forestland Species Sub-total	*COUNT*	*12*	*471*	*45*	*21*	*23*	*32*	*46*	*36*	*36*	*22*	*10*	*0*	*3*	*0*	*1*	*0*	*0*	*758*	*0%*
	TPA	*3.5*	*139*	*13*	*6.2*	*6.8*	*9.4*	*14*	*11*	*11*	*6.5*	*2.9*	*0*	*0.88*	*0*	*0.29*	*0*	*0*	*222.9*	*95%*
	BA/AC	*0.01*	*2.0*	*1.1*	*1.2*	*2.4*	*5.2*	*11*	*11*	*15*	*11*	*6.3*	*0*	*2.6*	*0*	*1.17*	*0*	*0*	*70*	*98%*
	AVE HT. (HL)	*16*	*18*	*26*	*35*	*44*	*51*	*55*	*56*	*65*	*66*	*72*	*0*	*65*	*0*	*80*	*0*	*0*	*0*	*0*
Summary by Size Class for Forestland Species	*TPA*		*155*			*22*							*45*						*223*	*0%*
	TPA %		*70%*			*10%*							*20%*						*100%*	
	BA/AC		*3.1*			*8.8*							*58*						*70*	*0%*
	BA/AC %		*4.4%*			*12%*							*83%*						*100%*	
	QUADRATIC MEAN DIA.		*1.9*			*8.5*							*15*						*7.6*	*0%*
	AVE HT. (HL)		*21*			*47*							*63*						*59*	*0*

***Table 20**. Stand table of forestland species metrics for the **2023 post-wildfire immediate** measurement period*

Stand Total	0	Saplings			Pole			Tree or Sawlog											Total by Class, Growing Stock & Dead	% by Class, Growing Stock vs Dead
Diameter Class	*0*	*0*	*2*	*4*	*6*	*8*	*10*	*12*	*14*	*16*	*18*	*20*	*22*	*24*	*26*	*28*	*30*	*32*		
Growing Stock (All living trees in woodland & forestland)	COUNT	3	94	3	6	6	6	24	24	20	12	12	2	0	0	0	0	0	*212*	*0%*
	TPA	0.88	28	0.88	1.8	1.8	1.8	7.1	7.1	5.9	3.5	3.5	0.59	0	0	0	0	0	*62*	*25%*
	BA/AC	0	0.42	0.06	0.38	0.63	0.97	5.6	7.4	8.5	6.2	7.4	1.6	0	0	0	0	0	*39*	*60%*
	AVE HT, HL	11	15	26	28	31	41	44	47	51	57	55	71	0	0	0	0	0	*0*	*0%*
Summary by Size Class (All living trees in woodland & forestland)	TPA		29			5.3							28						*62*	*0%*
	TPA %		47%			8.5%							44%						*100%*	*0%*
	BA/AC		0.48			2.0							37						*39*	*0%*
	BA/AC %		1.2%			5.1%							94%						*100%*	*0%*
	QMD MEAN DIA.		1.7			8.3							16						*11*	*0%*
	AVE HT, HL		16			35							52						*51*	*0*
0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0%*
Dead (All dead trees in woodland & forestland)	COUNT	9	458	37	29	17	29	17	15	7	5	0	1	1	0	0	0	0	*625*	*0%*
	TPA	2.6	135	11	8.5	5.0	8.5	5.0	4.4	2.1	1.5	0	0.29	0.29	0	0	0	0	*184*	*75%*
	BA/AC	0.01	1.9	0.92	1.5	1.7	4.7	3.9	4.8	2.7	2.5	0	0.76	0.96	0	0	0	0	*26*	*40%*
	AVE HT, HL	9	13	19	20	29	38	35	48	49	59	0	73	58	0	0	0	0	*40*	*0%*
0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0%*
Total for all sample trees including Growing	COUNT	12	552	40	35	23	35	41	39	27	17	12	3	1	0	0	0	0	*837*	*0%*
	TPA	3.5	162	12	10	6.8	10	12	11	7.9	5.0	3.5	0.88	0.29	0	0	0	0	*246*	*100%*
	BA/AC	0.01	2.3	0.98	1.8	2.3	5.7	9.5	12	11	8.7	7.4	2.3	0.96	0	0	0	0	*66*	*100%*

Woodland Species	0	Saplings			Pole			Mature Trees											by Speci	%Species
Diameter Class	*0*	*0*	*2*	*4*	*6*	*8*	*10*	*12*	*14*	*16*	*18*	*20*	*22*	*24*	*26*	*28*	*30*	*32+*		
QUGA Gambel oak	COUNT	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	*4.0*	
	TPA	0	0	0	0.88	0.29	0	0	0	0	0	0	0	0	0	0	0	0	*1.2*	*1.9%*
0	BA/AC	0	0	0	0.19	0.10	0	0	0	0	0	0	0	0	0	0	0	0	*0.29*	*0.74%*
0	AVE HT. (HL)	0	0	0	28	31	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0*
Woodland Species Sub-total	*COUNT*	*0*	*0*	*0*	*3*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*4.0*	*0%*
	TPA	*0*	*0*	*0*	*0.88*	*0.29*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1.2*	*1.9%*
	BA/AC	*0*	*0*	*0*	*0.19*	*0.10*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.29*	*0.74%*
	AVE HT. (HL)	*0*	*0*	*0*	*28*	*31*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Summary by Size Class for Woodland Species	*TPA*		*0*			*1.2*							*0*						*1.2*	*0%*
	TPA %		*0%*			*100%*							*0%*						*100%*	
	BA/AC		*0*			*0.29*							*0*						*0.29*	*0%*
	BA/AC %		*0%*			*100%*							*0%*						*100%*	
	QUADRATIC MEAN DIA.		*0*			*6.7*							*0*						*6.7*	*0%*
	AVE HT. (HL)		*0*			*29*							*0*						*29*	*0*

Forestland Species		0	Saplings			Pole			Mature Trees											Total by Species & Covertype	%Species for all G-Stock
Diameter Class		0	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32		
ABCO	COUNT		0	4	0	1	1	2	1	3	0	1	3	0	0	0	0	0	0	16	0
White fir	TPA		0	1.2	0	0.29	0.29	0.59	0.29	0.88	0	0.29	0.88	0	0	0	0	0	0	4.7	7.5%
	0 BA/AC		0	0.02	0	0.07	0.09	0.28	0.24	0.88	0	0.48	1.8	0	0	0	0	0	0	3.8	9.7%
	0 AVE HT. (HL)		0	10	0	25	37	35	44	47	0	55	58	0	0	0	0	0	0	0	
PIPO	COUNT		0	10	0	0	2	3	15	11	14	4	5	2	0	0	0	0	0	66	
Ponderosa pine	TPA		0	2.9	0	0	0.59	0.88	4.4	3.2	4.1	1.2	1.5	0.59	0	0	0	0	0	19	31%
	0 BA/AC		0	0.05	0	0	0.23	0.52	3.5	3.5	5.9	2.0	3.1	1.6	0	0	0	0	0	20	52%
	0 AVE HT. (HL)		0	7.4	0	0	27	46	42	50	50	61	56	71	0	0	0	0	0	0	0%
PSME	COUNT		0	1	0	1	2	1	8	9	5	5	3	0	0	0	0	0	0	35	
Douglas-fir	TPA		0	0.29	0	0.29	0.59	0.29	2.4	2.6	1.5	1.5	0.88	0	0	0	0	0	0	10	17%
	0 BA/AC		0	0.01	0	0.07	0.22	0.17	1.9	2.8	2.2	2.6	2.0	0	0	0	0	0	0	12	30%
	0 AVE HT. (HL)		0	12	0	28	33	38	46	44	55	60	61	0	0	0	0	0	0	0	0%
PIFL2	COUNT		0	1	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	5.0	
Limber pine	TPA		0	0.29	0	0	0	0	0	0	0.29	0.59	0.29	0	0	0	0	0	0	1.5	2.4%
	0 BA/AC		0	0	0	0	0	0	0	0	0.38	1.1	0.60	0	0	0	0	0	0	2.1	5.3%
	0 AVE HT. (HL)		0	7.0	0	0	0	0	0	0	43	44	21	0	0	0	0	0	0	0	0%
PIPU	COUNT		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1.0	
Colorado blue spruce	TPA		0	0	0	0	0	0	0	0.29	0	0	0	0	0	0	0	0	0	0.29	0.47%
	0 BA/AC		0	0	0	0	0	0	0	0.30	0	0	0	0	0	0	0	0	0	0.30	0.76%
	0 AVE HT. (HL)		0	0	0	0	0	0	0	54	0	0	0	0	0	0	0	0	0	0	0%
POTR5	COUNT		3	78	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	85	
Aspen	TPA		0.88	23	0.88	0.29	0	0	0	0	0	0	0	0	0	0	0	0	0	25	40%
	0 BA/AC		0	0.33	0.06	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0.46	1.2%
	0 AVE HT. (HL)		11	16	26	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Forestland Species Sub-total	*COUNT*		*3*	*94*	*3*	*3*	*5*	*6*	*24*	*24*	*20*	*12*	*12*	*2*	*0*	*0*	*0*	*0*	*0*	*208*	*0%*
	TPA		*0.88*	*28*	*0.88*	*0.88*	*1.47*	*1.8*	*7.1*	*7.1*	*5.9*	*3.5*	*3.5*	*0.59*	*0*	*0*	*0*	*0*	*0*	*61*	*98%*
	BA/AC		*0.0*	*0.42*	*0.06*	*0.19*	*0.54*	*0.97*	*5.6*	*7.4*	*8.5*	*6.2*	*7.4*	*1.6*	*0*	*0*	*0*	*0*	*0*	*39*	*99%*
	AVE HT. (HL)		*11*	*15*	*26*	*28*	*31*	*41*	*44*	*47*	*51*	*57*	*55*	*71*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Summary by Size Class for Forestland Species	*TPA*			*29*			*4.1*							*28*						*61*	*0%*
	TPA %			*48%*			*6.7%*							*45%*						*100%*	
	BA/AC			*0.48*			*1.7*							*37*						*39*	*0%*
	BA/AC %			*1.2%*			*4.4%*							*94%*						*100%*	
	QUADRATIC MEAN DIA.			*1.7*			*8.7*							*16*						*11*	*0%*
	AVE HT. (HL)			*16*			*37*							*52*						*51*	*0*

Ladder Fuels

Table 21a-c. *Mean percent cover, height, and biomass of ladder fuels by vegetation class, monitoring period, and treatment unit.*

CORRALES UNIT: Ladder Fuel Biomass					
Monitoring Status	**Vegetation**	**Mean % Cover**	**Mean Height (ft)**	**Mean Biomass (tons/acre)**	**Total Biomass (tons/acre)**
2010 PostTreatment5yr	HD	2.3	0.92	1.4	
	HL	30	1	74	
	SD	0			
	SL	6.9	3.2	66	
					140
2015 PostTreatment10yr	HD	7.5	0.21	2.6	
	HL	17	0.24	5.7	
	SD	0.17	1	1.2	
	SL	13	4.5	400	
					410
2020 PostTreatment15yr	HD	0.67	0.29	0.53	
	HL	20	0.24	13	
	SD	0			
	SL	3.8	3.7	67	
					80
2023 PostFireImmediate	HD	0.5	0.05	0.16	
	HL	4.5	0.33	3.5	
	SD	0.67	1.7	12	
	SL	0.58	1.7	3.9	
					20

ENCINAL UNIT: Ladder Fuels Biomass					
Monitoring Status	**Vegetation**	**Mean % Cover**	**Mean Height (ft)**	**Mean Biomass (tons/acre)**	**Total Biomass (tons/acre)**
2010 PostTreatment5yr	HD	1.1	0.6	2.1	
	HL	19	1.4	19	
	SD	0.25	1.3	6.2	
	SL	11	0.65	30	
					58
2015 PostTreatment10yr	HD	7.8	0.35	4.6	
	HL	25	0.35	8.2	
	SD	1.4	0.73	7.2	
	SL	9.2	2.4	95	
					120
2020 PostTreatment15yr	HD	0.36	0.19	0.11	
	HL	5.4	0.21	1.7	
	SD	3.6	2	370	
	SL	24	1.4	160	
					530
2023 PostFireImmediate	HD	1.1	0.17	0.4	
	HL	20	0.51	13	
	SD	1.9	1.7	16	
	SL	15	1.1	63	
					93

WALKER FLATS UNIT: Ladder Fuel Biomass					
Monitoring Status	**Vegetation**	**Mean % Cover**	**Mean Height (ft)**	**Mean Biomass (tons/acre)**	**Total Biomass (tons/acre)**
2010 PostTreatment5yr	HD	3.3	0.22	1.5	
	HL	22	0.52	17	
	SD	2.2	3.6	82	
	SL	12	2.5	240	
					340
2015 PostTreatment10yr	HD	24	0.32	10	
	HL	32	0.56	24	
	SD	0.79	3.3	36	
	SL	10	2.9	220	
					290
2020 PostTreatment15yr	HD	0.95	0.1	0.17	
	HL	22	0.26	8.1	
	SD	0.047	1.7	2	
	SL	8	2.2	86	
					97
2023 PostFireImmediate	HD	8.6	0.37	6.5	
	HL	27	0.77	25	
	SD	6.1	1.8	51	
	SL	19	1.6	110	
					200

1000-Hour Fuel Decay Class Descriptions

Table 22: *Descriptions of 1000-hour fuel decay classes.*

Decay Class	Description
1	All bark is intact and tight. All but the smallest twigs are attached. Old needles probably still present. Solid, freshly fallen, intact logs, hard when kicked.
2	Some bark is missing (especially on fine twigs), as are many of the smaller branches. No old needles still on branches. Hard when kicked.
3	Most of the bark is missing. Most of the branches less than 1 in. in diameter also missing, but branch stubs will not pull out. Still hard when kicked, still supports its own weight, and heartwood sound.
4	Looks like a class 3 log but the sapwood is rotten. Sounds hollow when kicked and you can probably remove wood from the outside with your boot. Pronounced sagging if suspended for even moderate distances. Branch stubs pull out.
5	Entire log is in contact with the ground. Easy to kick apart but most of the piece is above the general level of the adjacent ground. If the central axis of the piece lies in or below the duff layer then it should not be included in the CWD sampling as these pieces act more like duff than wood when burned. *Note: Decay class 5 pieces can be difficult to identify because they often blend into the duff and litter layers. They must still resemble a log; decomposed logs that are slightly elevation "humps" on the ground are not tallied.*

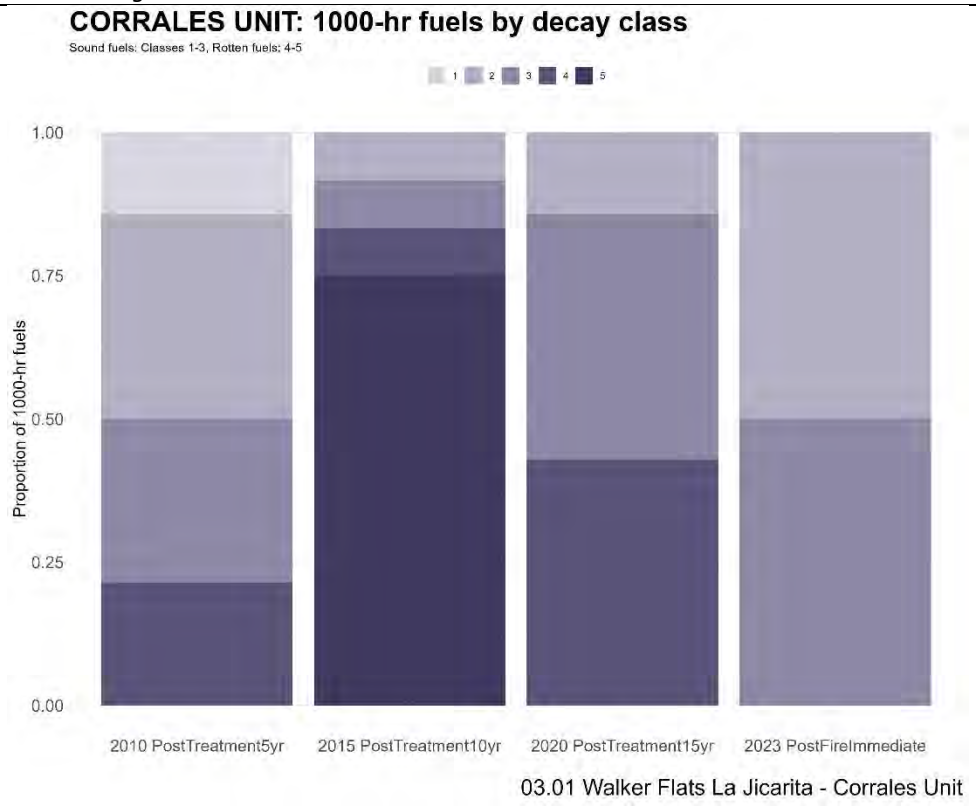


Figure 45. Proportion of total thousand-hour fuels by decay class and monitoring status for the Corrales treatment unit.

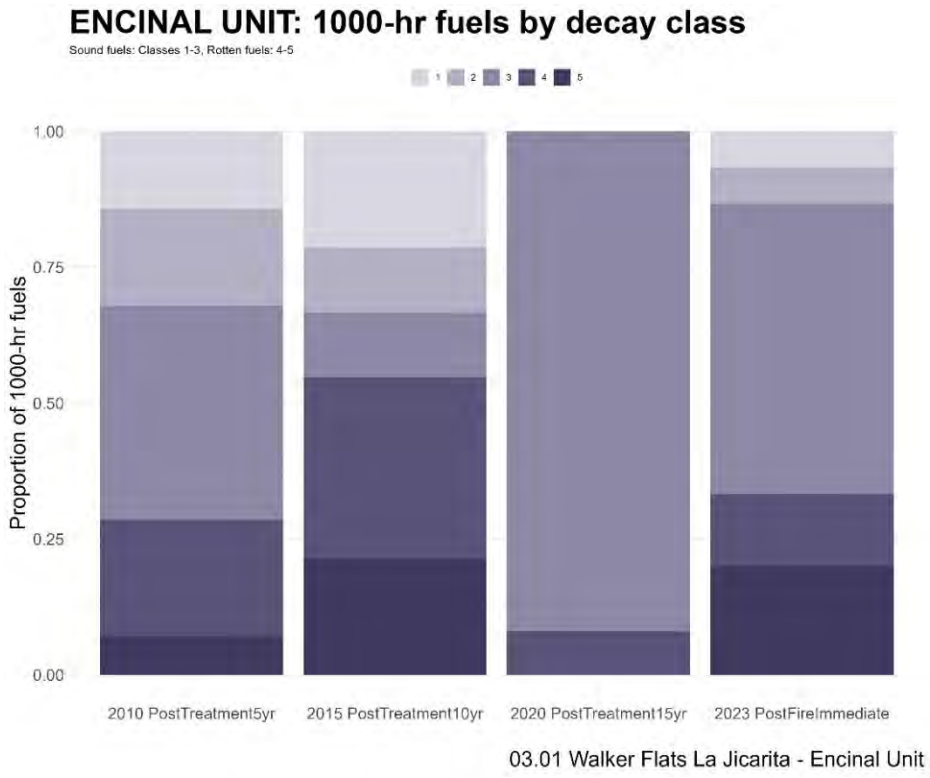


Figure 46. *Proportion of total thousand-hour fuels by decay class and monitoring status for the Encinal treatment unit.*

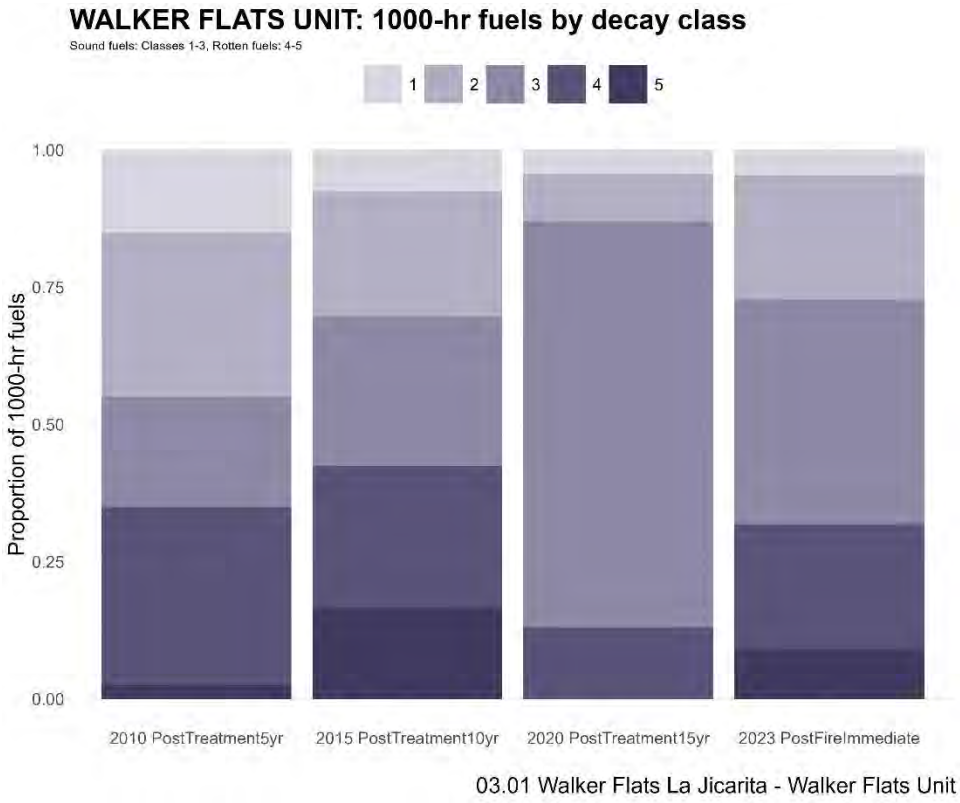


Figure 47. *Proportion of total thousand-hour fuels by decay class and monitoring status for the Walker Flats treatment unit.*