



**PLANNING AND DEVELOPMENT SERVICES
DEPARTMENT**

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TO: Town Council

FROM: Rodney Walters, Town Forester / GIS Assistant

FOR: Town Council Regular Meeting

DATE: February 15, 2024

RE: Community Forestry Program Update

Attachments: *Summer 2023 Mountain Village Forest Conditions report (Sibold)*

Mountain Village Community Forestry Program Update

Mountain Village Forestry Program Accomplishments, 2023:

1. The Mountain Village woodlot and tree removal permitting:

The **woodlot** program continues to be successful and is functioning well with contractors and other woodlot users who are demonstrating an excellent level of stewardship and respect.

During 2023, one hundred fifty-one (151) tree removal permits were issued. Tree removals for wildfire mitigation continues to be a very high priority for property owners due to insurability issues associated with wildfire concerns. Insect infestations continue to be a trend and high tree mortality rates continue, particularly among the subalpine fir trees.

Year	2017	2018	2019	2020	2021	2022	2023
Tree Permits Issued	137	104	97	84	101	167	151

Table 1. Tree permits

2. Wildfire Mitigation Defensive Space Incentive Program

The Defensive Space Incentive Program produced fifteen (15) Defensive Space Assessments. This resulted in the completion of 5 five (5) Defensive Space Program projects with wildfire mitigation work performed value over one hundred one thousand dollars (\$101,273). Wildfire defensive space projects and home hardening measures improve a structure’s likelihood of surviving a wildfire and advances the primary criterion for assigning firefighting assets to specific locations (Colorado State Forest Service 2012).

3. Cedar Shake Incentive Program

The single most effective step that can be taken to protect properties from wildfire is to ensure that cedar shake roofing is replaced with UL Class A fire rated roofing assemblies (Colorado State Forest Service 2012). During 2023, we processed forty (40) cedar shake building permits with a total waived permit value of \$185,345.04 that resulted in \$4,936,415.62 in cedar shake roof replacement work. The replacement of cedar shake roofs is helping properties to be insurable and provides our community with much needed protection from potential wildfire.

4. Regional Wildfire Mitigation Engagement

During 2023, Mountain Village staff and the forester participated in meetings and discussions with the Colorado State Forest Service (CSFS), the West Region Wildfire Council (WRWC), Telluride Fire Protection District, the San Miguel Watershed and Wildfire Collaborative (SMWWC), San Miguel County, The Town of Telluride, Ski Ranches, Telluride Ski and Golf, Genesee Properties, and others. The goal remains the facilitation of partnerships in mutually beneficial, meaningful, and effective planning efforts and field project collaborations that will help mitigate the effects of potential wildfires and keep our community healthy and safe.

5. Forest Health Projects and Activities

Generally, forest health and fire mitigation objectives can be achieved simultaneously. This is because regeneration and thinning projects both improve forest health and reduce negative effects of wildfire. During 2024, TMV forest health/wildfire mitigation related forest health management projects occurred on both public parcels and in partnership with large property holdings within the Town of Mountain Village. During 2023, seven (7) forestry related projects were conducted for assessment purposes and with fieldwork to improve forest health and reduce tree risks:

- 1200 MCH anti aggregation pheromone packets were set out late April, early May to prevent Douglas fir beetle attacks.
- 67 blue tubes were installed as an experimental test to monitor their effectiveness in protecting aspen saplings from elk browse.
- Dr. Sibold revisited Mountain Village to make field observations and produced a 2023 Mountain Village Forest Conditions report (attached) about TMVs forests (Sibold 2023). His most notable finding is that there is little to no Englemann spruce seed and seedlings production presently occurring in our Town. This implies that our forests are presently not regenerating Englemann spruce trees. He also noted that research has documented reduced or limited Englemann spruce seed production associated with spruce budworm infestations. He notes that the spruce budworm outbreak could continue in TMV until their primary food source (subalpine fir) has been depleted.
- 33 dead and dying hazard aspen trees located on the slope above the TMV shop were removed to keep TMV personnel safe and prevent damage to TMV buildings and equipment.

- In a joint project, Mountain Village removed 64 beetle infested Douglas fir trees and TSG removed 15 trees in a heavy lift helicopter operation to remove a total of 79 Douglas fir beetle infested trees near the TMV shop.
- A Community Forestry Questionnaire survey was designed and distributed to stakeholder groups for the purpose of receiving community and professional feedback about our community forest(s). Forty (40) surveys were completed by the Community Stakeholder Group and nineteen (19) surveys were completed by the Professional, Local and Regional Stakeholder Group. The survey results, which are still being tabulated, will help identify the forest benefits that our community most values and will serve as an important social data set for determining and setting strategic goals and objectives for the management of our community forest(s).
- The 2023 Voxel maps LiDAR flight data was delivered to TMV. This data included sub-meter resolution LiDAR data, 4-inch pixel orthoimagery with infrared spectrometry, an individual trees map showing tree heights, and a forest stand map showing the vegetation class types of TMV's vegetation.
- Town Forester reviewed all design review applications for new development and provided feedback on fire mitigation plans, landscaping plans and construction mitigation.

Mountain Village Forestry Program Activities Moving into 2024:

2024 Planned assessments:

To better understand our community forest(s) and make sound decisions, assessments will be performed to help define what we have regarding forest composition, structure, and function and to better help us determine what we want in terms of desired future conditions. The following assessments are planned for 2024:

- Colorado Risk Assessment Portal (COWRAP) analyses. This is a free online satellite imagery product that is made available by the Colorado State Forest Service. The COWRAP portion of forest atlas website (Colorado State Forest Service, 2023) allows users to generate wildfire risk assessments based on various factors including, slope, vegetation, topography, etc. Although the resolution of this product is coarse, the quality is improving, and the analyses are able to provide data-based perspectives about wildfire potentials in and around TMV.
- Tabulation and summary of the Community Forestry Questionnaire survey. The results of this survey will be made available, and a summary of the findings will be produced. This will serve as a valuable tool for discussions to determine strategic objectives and goals for the management of our community forest(s).

- Voxel Maps LiDAR data. We are currently upgrading our equipment to be able to effectively load this data. Once that has been accomplished, we will be able to examine the data and determine how it may best be utilized.

Planning is Underway to Accomplish Forestry Initiatives and Complete Forestry Field Projects:

- With the Town's support and initiative to enhance the management of our community forest(s), steps are being taken to equip and hire a seasonal forestry crew. The purpose of a seasonal forestry crew is to conduct field operations to improve forest health and protect our community by making it more resilient to the effects of wildfire and insects.
- MCH Packet distribution will help protect Douglas fir trees from beetles.
- Aspen sapling protection will reduce damage from elk browse and encourage aspen regeneration.
- Touch up/maintenance is planned for the TMV demonstration forest located between Double Eagle Drive and Lupine Lane on Adams Ranch Rd.
 - This area provides a visual representation and demonstration of how forestry related thinning improves the health and function of forested areas.
- A VCA wildfire mitigation and defensive space project will be conducted.
- Monitor areas near the shop area for Douglas fir beetle and assess potential need for further mitigation.
- Wildfire and hazard mitigation along TMV roadways will be implemented.
- Initial phases of a community scale shaded fuel break will be started to perform dead and down fuels reduction along the northern TMV boundary area (see image 1).

The above 2024 initiatives are in alignment with a strategic approach to establish and achieve the Town's forestry goals over time. An effective strategic process will:

1. Gather fact-based data to generate high-quality forest assessments.
2. Engage the community and its partners to formulate a vision and strategic objectives.
3. Apply resources to complete objectives through the completion of ongoing field work projects.
4. Engage in an ongoing program assessment process to facilitate the ability to adapt to inevitable changes.

The primary goal for the TMV's forestry program outlined in the Community Development Code provides the directive to "...preserve and maintain a healthy forest ecosystem and landscape while also protecting buildings from wildfire" (TMV 2020). To meet this goal, active management of TMV's forest is required to successfully maintain forest health, prevent wildfire, and help work with the inevitable transformation that always occurs within forest ecosystems. The Colorado State Forest Service affirms this on its Forest Health and Management webpage, "Forest management can fulfill an important role in how we help shape

Colorado’s future forests. Where lands allow for active management to occur, we can enhance forest resilience to fire, insects, and diseases. This approach will provide diverse forests for tomorrow, and ensure that we continue to receive the wide range of benefits our forests provide” (Colorado State Forest Service2023).



Image 1: Photo of GIS mapping imagery showing the planned North TMV Community Shaded Fuel Break (orange), area where Douglas fir beetle infested trees were removed (green & blue dots), area where blue tube sapling protectors were put out (dark blue dots) and fire mitigation project area for VCA (transparent light orange).

References

- Colorado State Forest Service. 2023. *Colorado Forest Atlas Information Portal*. [Colorado Forest Atlas](#)
- Colorado State Forest Service. 2023. Forest health and Management. [Forest Health & Management | Colorado State Forest Service | Colorado State University \(colostate.edu\)](#)
- Colorado State Forest Service. 2012. *Protecting Your Home from Wildfire: Creating Wildfire-Defensible Zones: Quick Guide Series*, Fire 2021-1. Fort Collins, CO
- Sibold, Jason S. 2023. Summer 2023 Mountain Village Forest Conditions

Attachment

Summer 2023 Mountain Village Forest Conditions

Dr. Jason S. Sibold

In summer 2023 I revisited all forest plots that I established in the Mountain Village landscape in summer 2022 to address the following forest-management related questions:

- 1) In aspen forests: Is there evidence of Shepherd's crook on aspen suckers and saplings? And, is there evidence of an aspen beetle outbreak?
- 2) In spruce-dominated stands: Is there any new spruce regeneration (seedlings established in 2023) and are spruce producing seeds?

Methods:

To accomplish these two goals, I revisited and resampled 15 forest plots in 13 Mountain Village Open Space parcels (Figure 1; for more details on these sites see "Forest Type and Conditions Report 2022"). To answer the aspen questions (Shepherd's crook and aspen beetle), in the ten aspen-dominated monitoring plots I checked all leading stems on all aspen suckers for evidence of Shepherd's crook, and all aspen trees (> 5 cm diameter at breast height, and > 2 meters height), for evidence of aspen beetle infestation. To evaluate the spruce regeneration question, I revisited all plots with spruce (five plots; two spruce-dominated (plots 9, and 10), and three with a spruce component (plots 4, 12, and 15) to check for new seedling establishment. In some spruce stands (plots 9, 10, and 12) I also collected the contents of seed traps that I deployed in summer 2022. I deployed a total of seven seed traps in summer 2022 before spruce seed dispersal in early fall, thus seeds in traps would represent dispersal in fall 2022.

I made seed traps following standard methods. Traps are 30 x 30 x 8 cm wire and mesh cages. The bottom of the trap is made from fine wire mesh and the top of the trap is made from coarse mesh (Figure 2). This design allows seeds to drop through the top of the trap and collect them in the mesh bottom of the trap. Wire mesh on top and bottom is intended to keep seed predators (rodents) out of the trap while allowing snowmelt and rain to pass through the trap, so moisture accumulation does not destroy seeds in the trap. Traps are secured to the ground with landscaping staples to keep them in place and secure the top and bottom portions of the trap to keep seed predators out.

I collected the contents of the seven seed traps in plastic bags (Figure 3) and replaced and resecured the tops of the seed traps so that they could collect seed in fall 2023. To quantify seed from traps, I sifted through the contents of traps, which includes all forest litter that can pass through the top of the seed traps, to identify any spruce seeds (Figure 3).

Results:

Aspen-dominated stands: I did not document any stems with Shepherd's crook in any of the forest monitoring plots that I established in summer 2022 (Figure 4). While I did not resample for ungulate browse, it continues to be the primary driver limiting aspen recruitment in these stands. While stems without evidence of ungulate browse on aspen suckers are rare, none of these stems had evidence of Shepherd's crook (Figure 4). Likewise, there was no evidence of aspen bark beetle in any of the forest plots.

Spruce-dominated stands: I did not find any new spruce establishment (seedlings) in the spruce-dominated plots or plots with a spruce component. Likewise, the seven seed traps that I installed in summer 2022 did not capture any spruce seed. The traps were all in excellent condition in August 2023, and there was no evidence that rodents had entered traps and consumed seeds. Thus, the lack of seed is not a result of disappearance of evidence. Note that spruce seed dispersal occurs in late-September to early-October, so seed in traps would have represented dispersal in fall 2022.

Implications:

Whereas the lack of Shepherd's crook and aspen bark beetle in aspen-dominated stands in Mountain Village is positive for aspen health, continued heavy ungulate browse damage on aspen is a continuing concern. Following on findings from my 2022 assessment ("Forest Type and Conditions Report 2022"), addressing the ungulate browse issue is a central management concern for the aspen forest type. The use of tubes to protect aspen in one stand (forest monitoring plot #5, Figure 1) is a potential solution. In my visit to this stand (plot 5) in 2023, most of the aspen suckers in tubes were doing well, although some suckers had signs of potential heat stress or damage from other issues associated with the tubes (Figure 5). It will be valuable to continue monitoring this stand to see if the tubes facilitate sucker recruitment above browse height and to the canopy. If tubes facilitate recruitment, expand use of tubes on the landscape could be valuable to facilitate more aspen recruitment, however, their success is likely contingent on a range of stand and site factors, and their use could exacerbate decline in some situations.

The lack of new spruce establishment is concerning and the absence of seeds in seed traps amplifies these concerns. More specifically, ongoing warming and regionally elevated spruce beetle populations suggests the continued potential for a high-severity spruce beetle outbreak that would likely kill all overstory spruce in the landscape. Limited spruce seedlings on the landscape (see "Forest Type and Conditions Report 2022") and the loss of overstory seed producing spruce trees from an outbreak would result in extremely prolonged forest recovery. Because spring, summer 2023 represented ideal weather for spruce establishment, lack of seed is the likely reason for no new spruce establishment. It is possible that there was a low-level of seed production in 2022 and the limited number of seed traps (seven) installed on the

landscape were not sufficient to capture any seed. However, because I strategically placed seed traps in locations that would be highly likely to capture seed (close to and under spruce trees, Figure 2), I find this explanation unlikely. My monitoring plots in the Bear Creek Preserve, just east of the Mountain Village landscape, tell a similar story of a lack of spruce seedlings and seed in recent years. The likely reason for limited Engelmann spruce cone/seed production, and seedlings is because spruce budworm damages early developing cones. Likewise, it is possible that spruce are not producing cones because of the stress of repeated annual defoliation by spruce budworm.

While mapping the extent and severity of the spruce budworm infestation in the Mountain Village landscape was beyond the scope of this project, the outbreak appears to be more severe and more extensive than in the past few years. Using remote sensing it would be possible to map and monitor the severity and extent of the outbreak (see “Forest Type and Conditions Report 2022”). This coupled with strategically placed seed traps in locations with little to no budworm infestation could help disentangle the role that budworm is playing in limiting seed production. Likewise, deploying many more seed traps would be another option to get a better sense of seed production on the landscape. Because traps are unesthetic, this would likely be done by deploying traps for a short (4-weeks) period centered on the limited weeks of seed dispersal in the fall.

It is not clear how much longer the spruce budworm outbreak will continue in Mountain Village. In the context of my annual assessment of Bear Creek, just south of the Mountain Village landscape, the spruce budworm outbreak in that landscape has significantly and suddenly slowed to very low population levels in 2023. This appears to be because nearly all subalpine fir, the primary host species, has been killed. If the spruce budworm outbreak in the Mountain Village landscape follows a similar pattern, this implies that the outbreak will continue for the foreseeable future as many subalpine fir trees are still alive in the landscape.

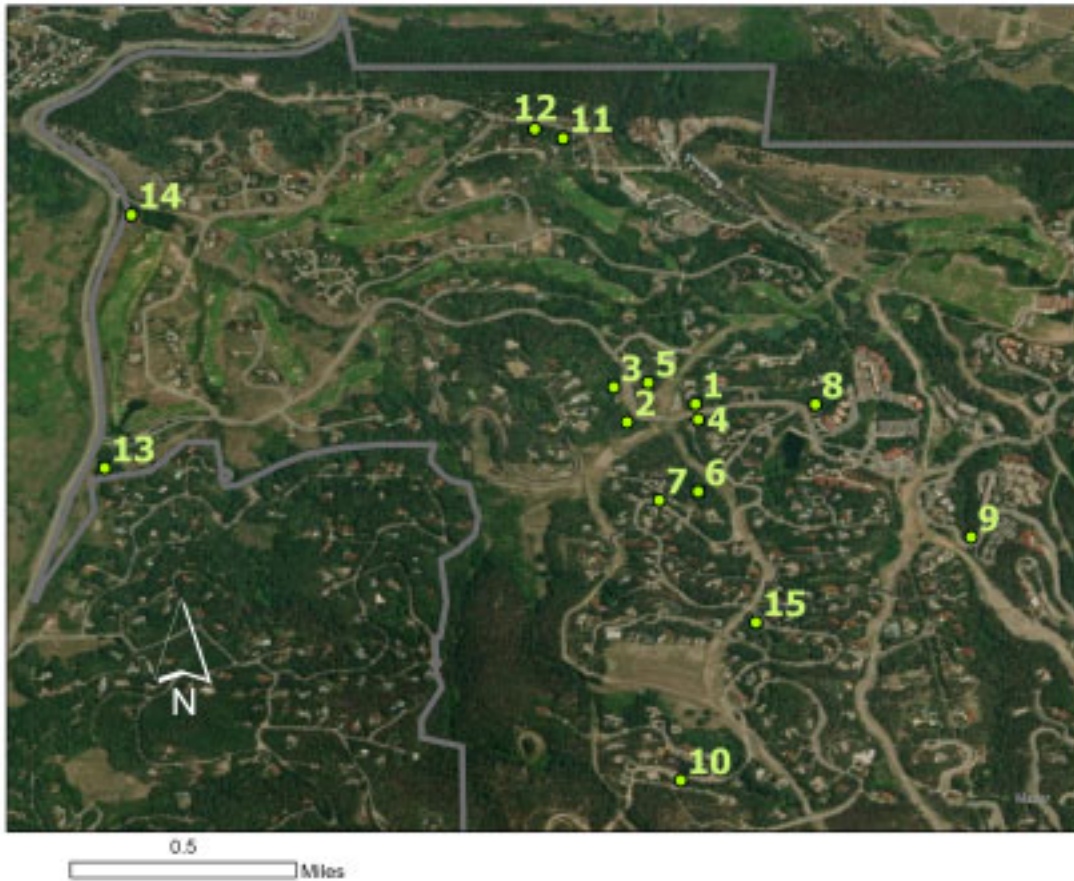


Figure 1. Location of the fifteen study stands that were established in Mountain Village in 2022 and resampled in summer 2023. Aspen dominated sites: 1, 2, 3, 5, 6, 7, 8, 11, 13, 14. Spruce-fir dominated stands: 9, 10. Aspen-conifer stands: 4, 12, 15. See 2022 “Forest Type and Conditions Report” for more details on these monitoring plots. Sites 9, 10 and 12 each have two seed traps.



Figure 2. Seed trap from forest monitoring plot #9 from August 2023. Leg: the bottom (fine mesh) and top (coarse mesh, and landscaping pins). Litter inside fine mesh was the collection of material between summer 2022 and summer 2023. Right: The seed trap shown in the leg photo deployed in plot #9 at the base of a spruce tree. Note: the silver box attached to the right side of the tree is a solar radiation shield with a temperature sensor, which is constantly recording temperature at the site and can be valuable to relate weather changes to forest dynamics (e.g., spruce seed production, seedling establishment, insect activity).



Figure 3. Left: Forest litter collected from one of the seed traps at forest monitoring site #10 in August 2023, which represents litter from the previous 12 months including any seeds dispersed in fall 2022. Right: Forest litter from the bagged seed trap contents from plot #10 (leg photo).



Figure 4. Photo of an aspen sucker with ungulate browse on the leading stem, and no browse of Shephard's crook on the other leaders.

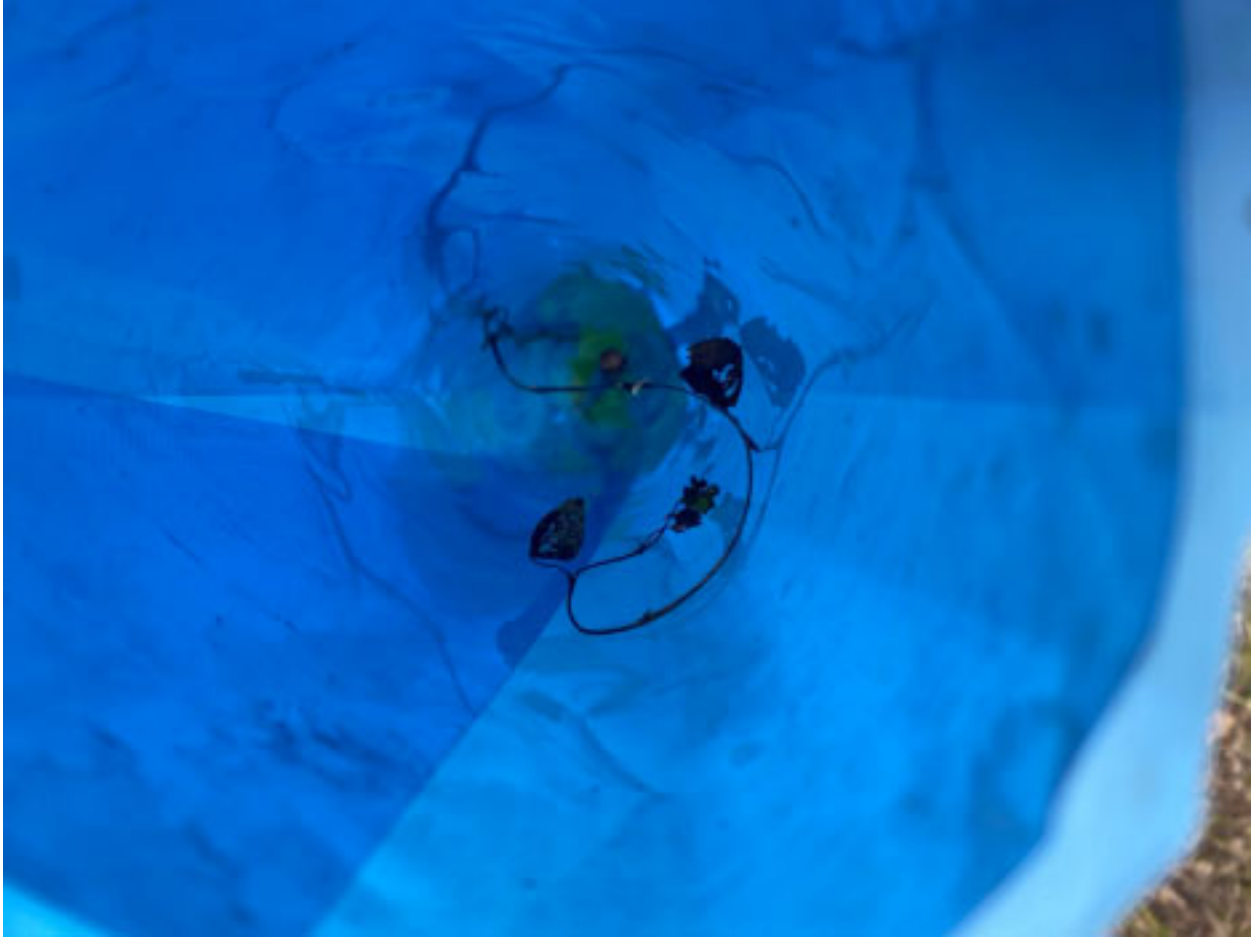


Figure 5. Dead aspen sucker in protective tube.