

Learning to put fire on the ground

Sketching at the Plumas TREX, March 26-28, 2021

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In March I went to Quincy in northern California for a 3-day training in how to do prescribed burns. The **TREX** workshops (Prescribed Fire Training Exchanges) are a national program started by The Nature Conservancy, which has done more than 100 of them to date. I was hired, along with Marley Peifer, by the **Plumas County Fire Safe Council** to teach nature journaling as a way to develop and support observational skills. Here's the story in sketches.



Day 1

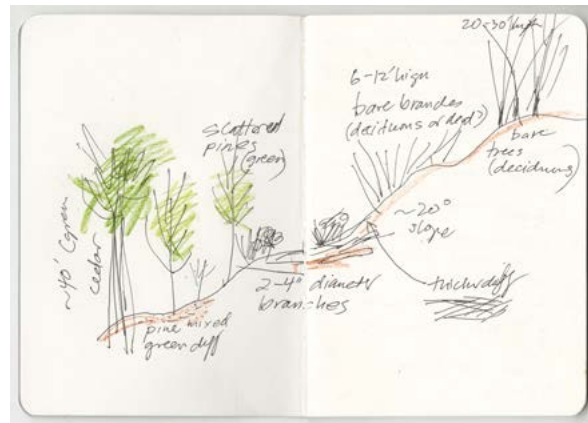
The opening briefing on the lawn at the Feather River College was a little strange, with 50 people wearing masks and trying to stay 6 feet apart. Plumas County has had very low COVID numbers and they were trying hard to keep it that way. One of the organizers said, only half joking, that if this event led to a COVID surge in the area his house would be stoned by all the merchants who had to close up shop again.

I hope I get to sit down and talk with all of them some day without masks, as what I picked up about the depth of experience

and range of backgrounds was amazing, even when shouted across the lawn. It looked to me like nearly half the participants were women, which also surprised me. I'd heard about TREX events organized for all women, but was glad to see that so many women were willing to mix it up with the men. Representatives of the local Mountain Maidu tribe participated too, and spoke about the cultural significance of burning, not just to avert catastrophic fire, but as an ancient tool of land management.

For the rest of the day we marched briskly through a complex schedule—I learned that firefighters are serious about punctuality.

During breakout sessions the five squads rotated through our Nature Journaling training, where I worked with Marley to help participants develop a personal visual language for factors that influence fire behavior. Here's a sketch I made, trying to record observations about fuels and topography in the campus forests (due for a controlled burn later this Spring).



Day 2

The day's activities started late because many of the participants were off in the athletic fields doing their "Pack Tests", which involve carrying a 45 lbs pack for 3 miles—in under 45 minutes. When I heard about that I decided to let go of any ideas I might have had about getting a serious firefighter certification in this lifetime.

However I later found out that was the "arduous" test for firefighters on the line, but there is also a moderate and light pack test for other incident management team positions, which involves the same distance and time but less weight. So maybe I won't give up on it yet.

While waiting for the Pack Testers to finish up I watched a group practice deploying a "Pee line" connected to a truck's water supply. (I gather that descriptive terms like that are easier to remember than hose dimensions.) Support trucks on prescribed burns carry a limited amount of water, used for controlling isolated flare ups.



The rest of the day Marley and I left the TREX event to teach a workshop for the community on using art to understand the post-fire landscape. We had some great locations on the edge of the North Complex burn in East Quincy and could see how the fire had skipped around, burning some areas severely and others hardly at all. We could see places where the fire had stopped or only burned lightly when underburning had previously been done in the area.

We also spent time drawing trees on the edge of the burn area, looking at which ones would likely survive, which "were dead but didn't know it yet" (thanks, Ryan Bauer) and which had been completely destroyed. Here's a sketch I made after the workshop.



Day 3: Live Fire!

Everybody caravanned up to an area northeast of Quincy where a local landowner has been doing controlled burns for many years, trying to restore an oak woodland to the way it had been a century ago, before we got serious about fire suppression.

Marley and I were attached to the FEMO team, following the trainee **Fire Effects Monitors** around as they used a small yellow device called

a Kestrel to take readings on temperature, moisture and the wind's speed and direction to determine if the burn will be within the prescription, and to assess its effects.

Every half hour they radio in a report to the burn boss and all the teams working the fire. The information needs to follow the expected format *exactly* with all the correct terminology so that everyone listening to the crackly radio transmission can follow it. The trainees were all pretty nervous about getting it right and ran through it until it was memorized before pushing the button to go live.

Getting the information right also turned out to be more complicated than I had imagined. All the FEMOs carried small purple notebooks called the "Incident Response Pocket Guide" full of charts with tiny, *tiny* type to calculate adjustments for altitude, slope and many other variables.

All Moans in "The Quiet Place"
Rx" steadily w/ 1300 weather
report. 13:00-14:30

Shade & sun
measurements

Kestrel

Altitude, wind speed

Time	Location	DEW Dry Bulb (trend ?)	Rh (trend)	Wind Direction, Speed, Gusts	RFMT Reference Fuel Moist
13:00	KP 13	69 (+10)	30 (-7)	1-4 mph gusts to 6	90 sun
15:00	Interior, East edge	74 (+3)	21 (-4)	SW 3-5 mph gusts up to 9	70 sun 50 shade

* 10 km/hr to 6

Correction factors
from Incident
Response
Pocket Guide.

MAX. PARAMETER FOR BURN
MAX Dry Bulb 90°
MAX Rh 15
Wind-sustained
at 8 mph
Mid-flame length (6-8")



I started out trying to take notes but quickly got lost. The general idea is that if any of the numbers get above the maximum parameters for the day's burn the burn boss can shut it down.

It's all about finding that sweet spot, where the stuff on the ground is moist enough that it doesn't burn too hot but dry enough to burn thoroughly. The people doing the burning have to understand the complex interactions of fuels (everything from pine needles on the ground to the biggest trees), topography (like the way a fire burns hotter going up a hill) and weather (all those things the FEMOs were monitoring) to predict when it's safe to start a fire. The burn needs to meet multiple objectives including amount of vegetation burned, the amount of smoke and keeping the burn within containment lines.

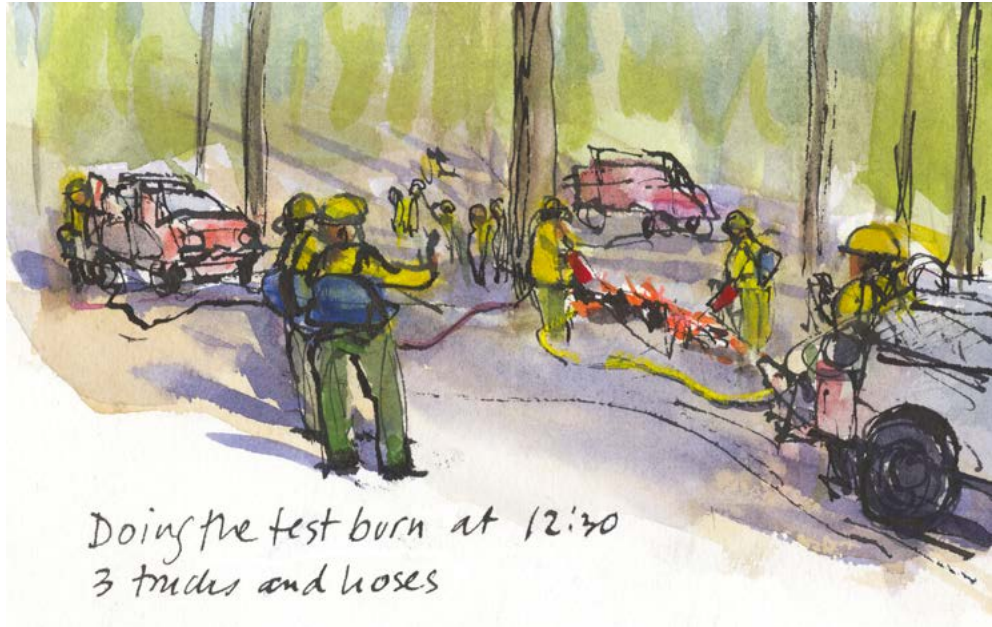
Burn Prep

The first step in preparing for the burn was to protect the things that aren't supposed to burn, like most of the oak trees and the snags that sheltered wildlife. Everyone on the crew has to carry a tool, so there were plenty of rakes, shovels and hoes to clear away the flammable materials. Some other things that might need to be protected are historic structures, Maidu cultural sites, springs and rare plants.



Test burn

A small area gets burned first, to see if the fuel moisture is right to carry the fire and if they'll be within prescription. Lots of people were standing around watching for this part, and I got a chance to eat my lunch.



Putting fire on the ground

Starting at the top of the hill and working down, lots of small fires are lit with drip torches, sprinkling a mixture of burning diesel and gasoline in a sort of calligraphy of fire.

This looked like the really fun part to me, and I got a sense that a lot of other people felt the same.

The trick is to put down enough fire to burn the flammable ground cover, but not so much that it gets too hot.



Sometimes "ladder fuels" will carry the fire up a tree, causing it to "torch". I learned to listen for the distinctive crackling, hissing, spitting sound it made, especially when I was absorbed in sketching and forgetting to watch what was happening with the fire.

When this tree was torching they brought in the water trucks to put it out.



I also learned some ways to “read” the smoke. White smoke means a hotter fire, with more complete combustion. Darker smoke means that some things are not being burned. The smoke was also a good indicator of wind direction and speed.



One old oak tree caught fire and I could see the flames running up the core, with smoke pouring out the top like a chimney. A truck was stationed nearby to make sure it didn't spread from embers or a falling tree igniting surface vegetation.

When the active burning phase is done, trucks and crews will go around doing mop up, cooling hot spots. Often there are follow-up visits to check that heavy fuel spots are fully extinguished.



After I got home I did one last sketch of the FEMOS. This was the only sketch done from a photo—all the others were done onsite with a few touchups afterwards.

The FEMO's hand tools had plastic ribbons tied to them for a quick visual check of wind strength and direction. I wasn't carrying any tools other than my art supplies but after a few hours I found myself checking those pink ribbons every time I felt the wind on my face. By the end of the day I felt like I was developing a new awareness, not just of the wind, but of everything around me. I wondered if that kind of connection is the foundation for all the ways that humans organize their environment, including fire.

