**St. Vrain Forest Health Project proposal comments**

1. I am happy to see the scoping documents for the St. Vrain Landscape. It is a unique landscape that deserves the investment of resources to change the current trajectory that the landscape is following to a resilient trajectory. The collaboration with St. Vrain Forest Health Partnership has provided an opportunity for a different approach to organize a watershed and associated communities to be better prepared for the NEPA process. I highlight this because it shows that the forest has adapted from the Forsythe planning process to be more inclusive and better prepared for planning more strategic actions with a wider range of perspectives being considered.

I am impressed with the exploration of the Conditions Based Management Approach, which will offer better ability to adapt to the wide range of sites that exist within each cover type in the project area. The planting strategies and actions are also impressive, I do appreciate having a NEPA decision that allows for planting post-fire, as that is an underutilized tool if we are trying to stave-off the conversion of our ponderosa dominate forests to grass and shrub

I am not supportive of utilizing the Veblen et al science for guidance in the mixed-conifer zone as the elevations provided that separated the lower and upper montane life zones have been dissolved with the publication of USFS RMRS-GTR-373. Other published documents highlight the more significant change in structure, composition and process frequency in our Dry and Wet Mixed-Conifer forest types than Veblen et al highlights. Please explore additional research as you develop the Mixed-Conifer details, especially the elevation of 7200’. GTR-373 supports restoration to much higher elevations depending on aspect. The Allenspark landscape does have ponderosa dominant forests to higher elevations than the southern part of the Boulder district, the Peet chart and associated map describes this well. The Peet chart is a great basis for developing your desired future conditions as you continue to develop the project. I would also incorporate concepts from USFS GTR-310, as that document has applicable concept as you debate goshawk habitat in the Mixed-Conifer forests. The lead author is the agency expert on goshawk and the habitats in ponderosa dominant systems. I would also include additional information in your development of desired future conditions from the work of the Rocky Mtn. Tree Ring Research Lab with Dr. Peter Brown. He is a part of the Front Range Reconstruction Network, and the group has published information that would inform the development of those metrics as you get down to basal area targets, old growth retention etc. ’

Lastly, I do want to see significant exploration and planning with flexibility to adjust to the invasive that are present in this landscape. Cheatgrass has been expanding above 8000’, Dalmation toadflax has potential for expansion, etc. There needs to be significant planning and funding secured to manage this issue.

1. A significant number of questions I had were answered by the District Silviculturalist who is on the NEPA team. This gave me confidence in a number of areas with good explanation and background for why certain things such as old growth do not have the flexibility to adapt to current knowledge due to the forest plan. The conversation was very informative on understanding history of the process, thinking and discussion about the landscape, consideration of techniques and road access, etc.
2. I do support the continuance and expansion of planting ponderosa pine in previous lodgepole pine clearcuts to facilitate the conversion to more ponderosa dominate systems up to 10,000’ on south slopes and 9500’ on north slopes.
3. The Old Growth section for ponderosa pine/douglas fir and lodgepole pine needs to be explored further. The typical way we look at ponderosa pine is to define categories that break at 150 years, and 200 years for individual trees that make up the appropriate range of structure for the cover type. The number of trees above a certain diameter from the forest plan in 1997 does not help to define old growth, as site productivity drives diameter and height more than age. A possible solution to consider is an amendment to the 1997 Forest Plan that would correct the definition and guidance for old growth.
4. Again, liked that you added recently burned areas, please do complete analysis for a wide range of potential even experimental actions here to ensure maximum flexibility to respond to recently burned areas and conversion of lodgepole cover types to ponderosa dominate systems.
5. Variable density thinning, I would like to see a significant emphasis on 2-5 acres openings, with consideration of openings of 5 acres or larger. There is a higher likelihood of achieving appropriate structure for dry-forest types with an emphasis on lots of openings by emphasizing these numbers.
6. Patch cut/clearcuts, I would like to see this tool expanded for areas not adjacent to WUI, for ecological work in lodegpole and aspen cover types. The East-Troublesome fire highlights the need to cover more scale in this cover type to develop opportunity under a wider range of conditions to engage fire both directly and indirectly.
7. I would like to see exploration of the Patch cut/clearcut tool for ponderosa pine to allow flexibility depending on site. Completing analysis now allows for better adaptation if monitoring trends show the need for an increase in opening size in ponderosa pine.
8. I would discourage chipping, as even with the depths prescribed for at 3” depth with allowance to 5”, there are observations from previous treatments in the landscape that chipping can facilitate Canada thistle expansion. Chipping discourage, and don’t like 3’ average with allowance to 5’
9. Transportation
	1. The temporary road standards are appropriate for that type of road, please do explore and expand the use of forwarding trails as those are easier to design, install and rehabilitate. There consideration opens up additional terrain to mechanized equipment to facilitate the removal of the larger diameter material from the ponderosa and dry-mixed conifer sites as well as the WUI zones.
10. Methods/Equipment
	1. Liked the innovative methods listed, I would like to see helicopter removal considered as an available option with analysis of effects to offer flexibility with the long life-span of up to 10-20 years with this document. This is an underutilized tool for high value/high risk sites especially within the WUI zones. Boulder County has explored this within the planning area with some success.
11. Again, I like the approach to Appendix D biophysical zones, with the Peet adaptation diagram as the basis. I am not sure why the two lines for Veblen et al, are included on this diagram. Again, due to GTR-373, with Tom Veblen as a reviewer, we have increased the elevations to consider restoration of structure, composition and process for the upper montane/mixed conifer zone. A goal of GTR-373 was to resolve uncertainty within the upper montane/mixed conifer zone by adapting the Peet diagram that highlights the variability due to many factors beyond elevation to define current and desired conditions. The data collected to inform that diagram was the north boundary of this landscape. Additional information has been published that highlights the significant changes in structure, composition and process in our upper montane/mixed conifer zone. I do like the inclusion of the biophysical map.
12. The Departure from historic conditions map is accurate, as to much departure is shown west of peak to peak highway and not enough departure is shown as you enter the ponderosa dominant systems. Again, recent research with the mixed conifer zone by Dr Peter Brown and others highlights more departure than previously known for the dry mixed conifer forests. There also is additional research with carbon and pollen dating at 9000’ to highlight ponderosa/douglas fir dominating for the last 9000 years in areas that are currently mixed with lodgepole pine. That informs a more aggressive set of design criteria to consider below 9,500’ on north aspects and 10,000’ on south aspects.
13. St. Vrain Forest Health Project Application Areas map highlights low-severity fire restoration <7200 ft. as all areas eligible, with lands between 7200-7800 feet having some areas eligible. For the mixed conifer/upper montane zone, I would increase the amount of lands eligible between 7200-7800 ft. and increase some available lands above 7800 ft. The work by the Front Range Reconstruction Network group has increased our knowledge about the fire maintained structures of the mixed conifer to higher elevations than previously thought.
14. Additional exploration into climate change and potential adaptations is warranted. Some unpublished and observational evidence supports a potential increase in winter precipitation in this landscape, which may need to be factored into future climate regimes. The effect of the February-June Great Plains Monsoon pattern is not clear with climate change. There is potential that the June-September North American Monsoon will increase the effect and strength in a warmer climate. There is certainty with temperature increases that will impact conditions needed for regeneration, I commend the proposal for consideration of planting strategies to prepare for future conditions. It has not been determined how climate change will affect the Southern El Nino Oscillation (ENSO), which is the major driver of fire regimes in our ponderosa and dry mixed conifer forests.
15. I would like to see linkage to the Fire Management Plan with Rocky Mtn National Park, as East Troublesome highlights, connections from both the USFS and NPS lands are more likely than previously observed. I would also like to see linkage to the Button Rock Plan as well as Boulder County interests at Hall Ranch/Riverside with fire planning to ensure policy and procedures ensure more successful outcomes managing fires that cross-jurisdictional boundaries.
16. I would like to see direct linkage with the Allenspark Community Wildfire Protection Plan Update that has potential to happen in the next year due to legislative funding and CSFS investment in programs for updating those older plans. The Allenspark Fire Protection District would be an excellent entity to help bring additional resources to assist in the effort to increase social engagement in the community corridor from Allenspark to Meeker Park. The Lyons and Lefthand Fire Protection Districts need opportunity for significant engagement as well. Connections from the public lands and ecological landscapes to the built environments of homes/communities needs to be understand from the connections to different scales under different conditions. Recent fire in California, Colorado, etc. have shown longer distances connecting and transferring fire and heat to communities than previously shown in the literature. 80% of the firebrands landing on a home/clump of trees is generated within 1000 ft. 20% of the firebrands connect out to 16,000 ft., so please explore the public land treatments to a higher consideration of connection to communities. Activity fuels and slash pile ignition needs to be a priority with budget and resources to allow goals to be accomplished on the fuel reduction targets. This allows constant attention to not allow backlogs of piles to build up, which increases risk. I would also like to see guidance about pile preference depending on aspect, as south aspects are difficult to find conditions to allow a wider range of windows for safe application of fire. North aspects are preferred in guidance for specific projects, with broadcast burning on other aspects Whole tree removal, some chipping and other methods considered for effects analysis in the WUI zones.
17. Prescribed Fire and Unplanned Ignitions Thoughts and Considerations
	1. Exploration is warranted for the Mixed-Conifer zone to develop different approaches to the dry-mixed-conifer versus wet mixed-conifer and the relationship between the two when adjacent as in the upper montane. You may have a south slope at 8500’ with a fire return interval of 30 years adjacent to a north facing lodgepole dominant stand with a return interval of 60-80 years. I would like to see details developed that address this complexity as it relates to the safe application of prescribed fire.
	2. I am not sure how to define windows that are appropriate for unplanned ignitions, except that there are some considerations to consider as details are develop for guidance.
		1. Research indicates that August is the safest month to burn during the “burn season” as it is the month with the least amount of wind each calendar year. Predictable diurnals are consistent then as well as being timed with the peak of the North American Monsoon. September is a month of change, as the Ouzel fire of 1978 highlights. That fire began in early August, and blew up in early September during a more typical fall wind event. Similar to Fourmile fire conditions in 2010. September may see 1-2 high wind events, with October seeing the frequency increase to 3-6, and November averaging 10 + with the frequency staying that high or higher in December to January. The window from mid-late September to mid- January is the highest risk window annually that allow extreme fire behavior under cooler air temps and higher humidity due to the wind’s effect on behavior and alignment with topography and fall conditions. February through April provide more consistent wind to factor into fire planning guidance, especially the predicable spring storm that bring gradient driven winds.
		2. Research that is published and is supported by unpublished and observational evidence indicates that the ENSO drives our fire regimes in our ponderosa and mixed conifer forests. The Great Plains Spring Monsoon that develops in Texas in February and works its way north and west through March-June, impacts the planning area is it is east of the continental divide and has a different moisture signature than forests further south for the March- June period, except during the La Nina phase of ENSO. Those typically are our dry March-June time periods followed by wetter than average monsoons in July. The North American monsoon does affect our fire regimes in the period from July to September.
		3. Due four recent prescribed burns that have escaped in Utah, Colorado and New Mexico during the La Nina phase of ENSO, additional guidance and metrics need to be developed beyond the standard prescription metrics for burn windows. Short, medium and long-term trends and observation in relation to fire climate need to be incorporated into guidance metrics for safe application of prescribed fire. There is published and unpublished information that can inform the development of those guidance metrics.
		4. Extreme fire behavior is possible from potentially 60%-99% percentile conditions for standard fire metrics. That is different from the majority of the west, and needs to be considered in the unplanned ignition planning, as well as for escaped fire planning for prescribed fire. Escaped fire planning for prescribed fire is crucial and the POD concept should be developed fully here to facilitate a predictable environment to apply fire within.
		5. I want to see extensive investment in time and resources in relation to escaped fire planning especially as it incorporates the POD concept. That involves a lot of pre-planning and agreement up front that should be identified in the proposed action details.
		6. Future climate scenarios may increase our snowfall in this project area in the January and February timeframes. That needs to be considered to apply aspect burning where you use the more predictable snowy north aspects to hold fire while burning the more open south, east and some west aspects.
		7. A more formal relationship with the National Weather Service needs to be explored with the possibility of the addition of RAWS or other weather related data stations to increase our data saturation within the landscape for more effective forecasts for safe application of fire. New Mexico recently has highlighted this with the misunderstanding about conditions and expected conditions with no connection to the NWS.
		8. The Missoula Fire Lab with the USFS-RMRS needs to be consulted on how to include software that they have developed to help with understanding current and future conditions at fines scales. Due to complexity with terrain and wind and chinook and bora wind events, software such as wind ninja needs to be incorporated into planning and operations to better understand current and expected conditions. New Mexico recently has highlighted the need for this.
		9. Resource needs need to be identified and funded to ensure appropriate and trained resources are available for both prescribed fire and unplanned ignitions.