Operationalizing Adaptive Management for the Front Range CFLRP

Draft summary of the AM subteam's meeting on Jan 16th, 2014

The Front Range CFLRP has made great progress in describing an Adaptive Management (AM) process for Front Range forest restoration initiatives. An important step in the AM process is the analysis and evaluation of monitoring data to determine whether restoration treatments are contributing to desired conditions. While the CFLRP's AM document provides some guidance about the Analysis/Evaluation step of AM, it acknowledges that "many details remain to be worked out." Initial discussions of these details among the LR team in late 2013 led to the formation of an AM subteam[1], whose goal was to develop a process and schedule for "operationalizing" AM. Provided here is a summary of the subteam's discussions thus far, in an effort to facilitate continued discussion among the full LR team.

Key components of the Analysis/Evaluation step of AM identified by the subteam include:

- Monitoring data analysis and presentation[2] – At the conclusion of each field season, monitoring data must be prepared, analyzed, and reported. Analysis and presentation of the data should be done in a way that is understandable by a wide audience, using easy-to-interpret graphics and tables to relate key information. The information itself should be organized around the metrics described in the CFLRP monitoring plan so that CFLRP members can evaluate the data in the context of desired trends expressed in the monitoring plan. At this point, these metrics and desired trends include:

    - Tree density – decrease in basal area and trees per acre
    - Species composition – increase ratio of ponderosa pine to other conifers
    - Tree size distribution – decrease in proportion of smaller-diameter trees; increase in quadratic mean diameter
    - Tree age distribution – increase ratio of old to transitional and young trees
    - Spatial heterogeneity – increase number of tree clumps and openings
    - Surface fuels – decrease litter and duff depths
    - Fire behavior – reduced crown fire potential
    - Understory vegetation – increase cover of native grass, forbs and shrubs; increase richness/diversity (to be revised by the Understory Vegetation monitoring group)
    - Wildlife – (focal species and desired trends to be described by the Wildlife monitoring group)

    The overall goal of this part of the process is to initially present the data for more detailed review via a monitoring jam session.

- Monitoring "jam session" – Once the monitoring data have been analyzed and initially reported, a monitoring jam session should be held to enable interested individuals an opportunity to take a more detailed look at the data. A 1-2 day session would be held whereby participating individuals would dissect the initial data analyses and presentation. Field trip evaluations (see

[1] AM subteam members include: Rob Addington, Greg Aplet, Jenny Briggs, Peter Brown, Yvette Dickinson, Jonas Feinstein, Paige Lewis, Mark Martin, Kathie Mattor, Kristen Pelz, and Jeff Underhill

[2] In the AM diagram, the Analysis/Evaluation step follows Post-Treatment Monitoring and thus assumes that data and information is available for analysis and evaluation. We therefore begin the process here with a description of data analysis and presentation.

below) and actual treatment prescriptions may be included here as well to provide additional context for data interpretation. Jam session participants would make some determination about how best to package and present the information for further discussion among the LR team and Roundtable.

- Monitoring presentations to the LR team and the Roundtable – Following the jam session, monitoring data would be further prepared for reporting to the LR team and the Roundtable. "High-level" discussion of the data would accompany this part of the process.

- Multiparty field review – In parallel with the more quantitative assessment provided by field data, information from the CFLRP's annual field trips would be evaluated during the monitoring jam session and incorporated into the LR team and Roundtable presentations. Currently the CFLRP conducts at least two field trips per year and the discussions that occur in the field on these trips provide a valuable qualitative assessment of treatment effectiveness. Following the field trips this past year, the LR team engaged in an after action review exercise whereby team members described what they appreciated about the field trips, what they liked about treatment implementation practices, and what they would like to see done differently in the future. This was a useful exercise. Information such as this should be documented and incorporated into a final set of recommendations. Additional ways of capturing input from CFLRP members should be explored as well. Examples may include field forms or evaluation sheets that group members would fill out during the actual field trips. During the monitoring jam session CFLRP members should also identify what they might like to see during the field trips, especially if the monitoring data point to particular treatment design features that merit additional on-the-ground evaluation.

- Final recommendations – The results/proceedings of *all* of the components mentioned above should be synthesized into an annual report which would offer "final" recommendations from the year's assessment. These recommendations would come after the presentation to the Roundtable in order to give Roundtable members an opportunity to provide additional input. Delivery of the final recommendations to Front Range forest managers, however, would need to occur in time to influence the next year's contract and treatment cycle. Recommendations may apply both to treatment implementation practices and the monitoring program itself (i.e. the way in which data is collected).

- Other needs/considerations
    - Integration of data from multiple sources. Wildlife monitoring, understory monitoring, spatial heterogeneity, and landscape-scale monitoring are all expected to come online in the next 1-2 years. The Analysis/Evaluation step of the AM process needs to be capable of integrating data from a range of sources beyond the Common Stand Exam.
    - Integration of ecological and economic monitoring.
    - Database development and information storage. Where should data and reports reside so that they are accessible?
    - Roll-up of monitoring data and reporting to the national indicators.
    - Segue into eventual revision of the monitoring plan.

Table 1. Approximate annual schedule for analyzing and evaluating monitoring data and information as part of the Analysis/Evaluation step of the AM process.

Timeframe	**Activity**
June – September	Field data collection; multi-party field trips and review
October – January	Data compilation and preparation from both quantitative and qualitative assessments
January – February	Data analyses and initial reporting
March – April	Detailed data/information review via a "monitoring jam session" to prepare for higher-level discussions among LR team and the Roundtable
April – May	LR team and Roundtable presentations and higher-level discussions; final recommendations developed in time to influence next contract cycle beginning June 30th

Figure 1. A somewhat feeble attempt to depict the Analysis/Evaluation process within an inverted pyramid akin to the original AM diagram. Eventually this figure should more explicitly depict and describe linkages to the AM diagram.

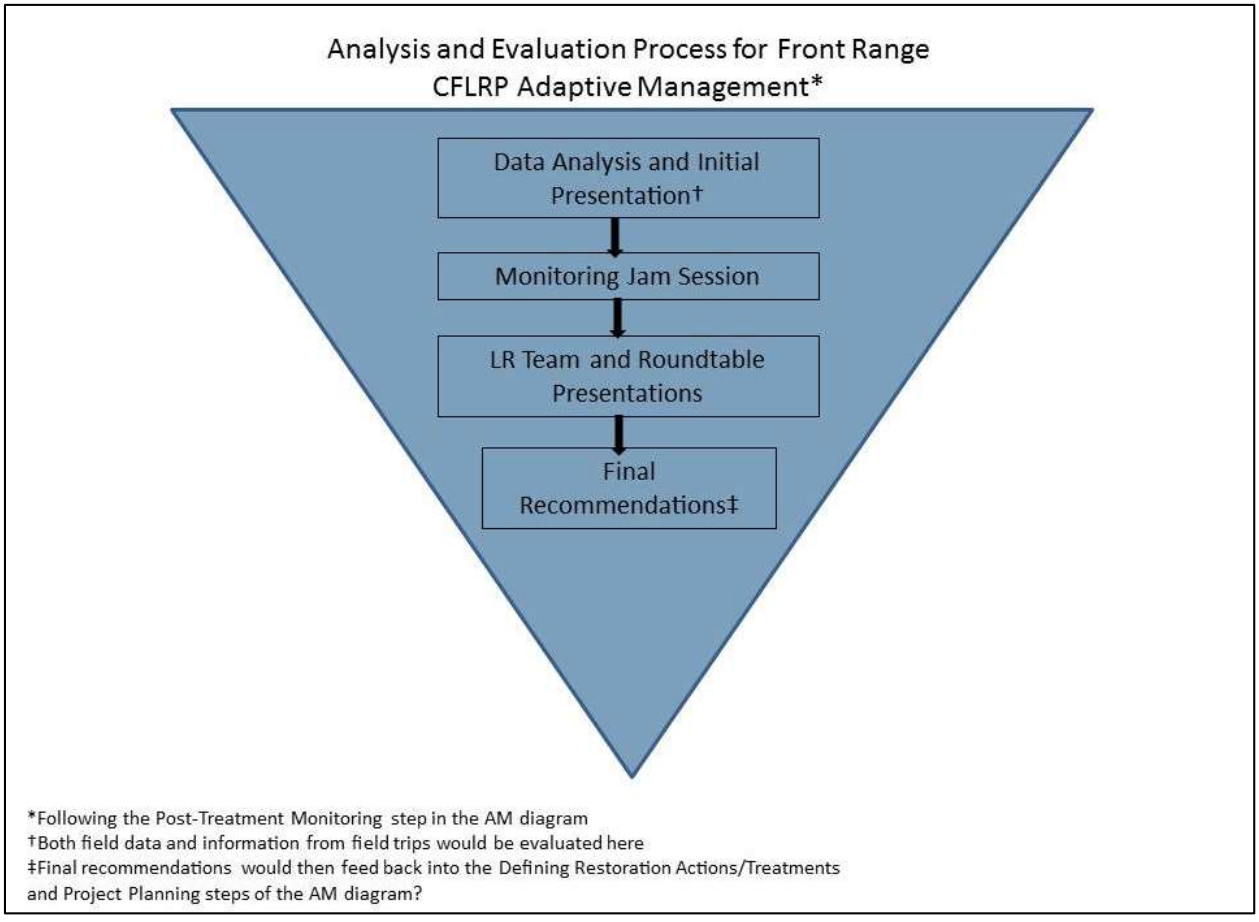

Figure 2. Whiteboard depiction of the Analysis/Evaluation process from the AM subteam's Jan 16th meeting, for reference and continued discussion.