FVS Modeling for the Devils Hens Nest Vegetation Management Project

Joseph Elliott[1,*]

[1]USDA Forest Service, George Washington and Jefferson National Forests,
*joseph.elliott@usda.gov

Overview:

- Timber harvesting operations often have high costs associated with them, especially when topography necessitates advanced harvesting systems for operating on steep slopes.
- For operations to be commercially viable, the timber harvest volume associated with the silvicultural prescription must be sufficient to offset costs and still produce a profit.
- FVS was used to assess commercial viability of each planning unit in the Devils Hens Nest Project by modeling the prescribed harvests and analyzing outputs of associated harvest volumes.
- This type of preliminary analysis has the potential to significantly reduce costs associated with project planning and implementation, as well as to better inform decision-makers, managers, and specialists.

Summary:

The lengthy process of planning and preparation that precedes the advertisement of a federal timber sale comes with significant costs in resources and time. After this process is complete, many proposed timber sales ultimately go “no bid” because the value of the prescribed harvest would be insufficient to offset the costs of operations. This problem demonstrates a need for preliminary analysis of the commercial viability of proposed silvicultural treatments prior to sale preparation and implementation. To conduct such an analysis for the Devils Hens Nest Vegetation Management Project, located on the Clinch Ranger District of the George Washington and Jefferson National Forests, FVS was used to model the prescribed treatments of 134 planning units over 97 stands (35 units proposed for coppice with reserves; 97 units proposed for thinning). FVS outputs of harvest volume were processed in Microsoft Excel to extrapolate values by unit acreages, make unit conversions, calculate weighted means, produce charts and graphs, calculate volumes and harvest percentages by product class, etc. Local guidelines were used as quantifiable thresholds for commercial viability: sawtimber harvest volume > 5 MBF/ac for conventional (ground-based) units; sawtimber harvest volume > 8 MBF/ac for units that require advanced harvesting systems. As expected, coppice with reserves treatments tended to have greater commercial viability; all conventional units met the criteria for viability, and only one advanced unit failed to meet the criteria. Of the units proposed for commercial thinning, 50 percent failed to meet the criteria for viability: 18 conventional and 31 advanced.

Key Concepts for FVS Users:

- By only changing the year of harvest, the same workflow can be used to determine when a silvicultural prescription would become commercially viable for a given stand.
- Similarly, commercial viability of different silvicultural prescriptions (alternatives) can be compared by having multiple runs in FVS for the same stands.

Management Applications/Future Directions:

- Preliminary analysis of commercial viability for proposed silvicultural treatments has the potential to significantly reduce planning and implementation costs associated with forest management.
- Additionally, this type of workflow can be used to compare commercial viability of alternative prescriptions or determine when a prescription will become commercially viable in the future (due to tree growth and subsequent increased harvest volume).

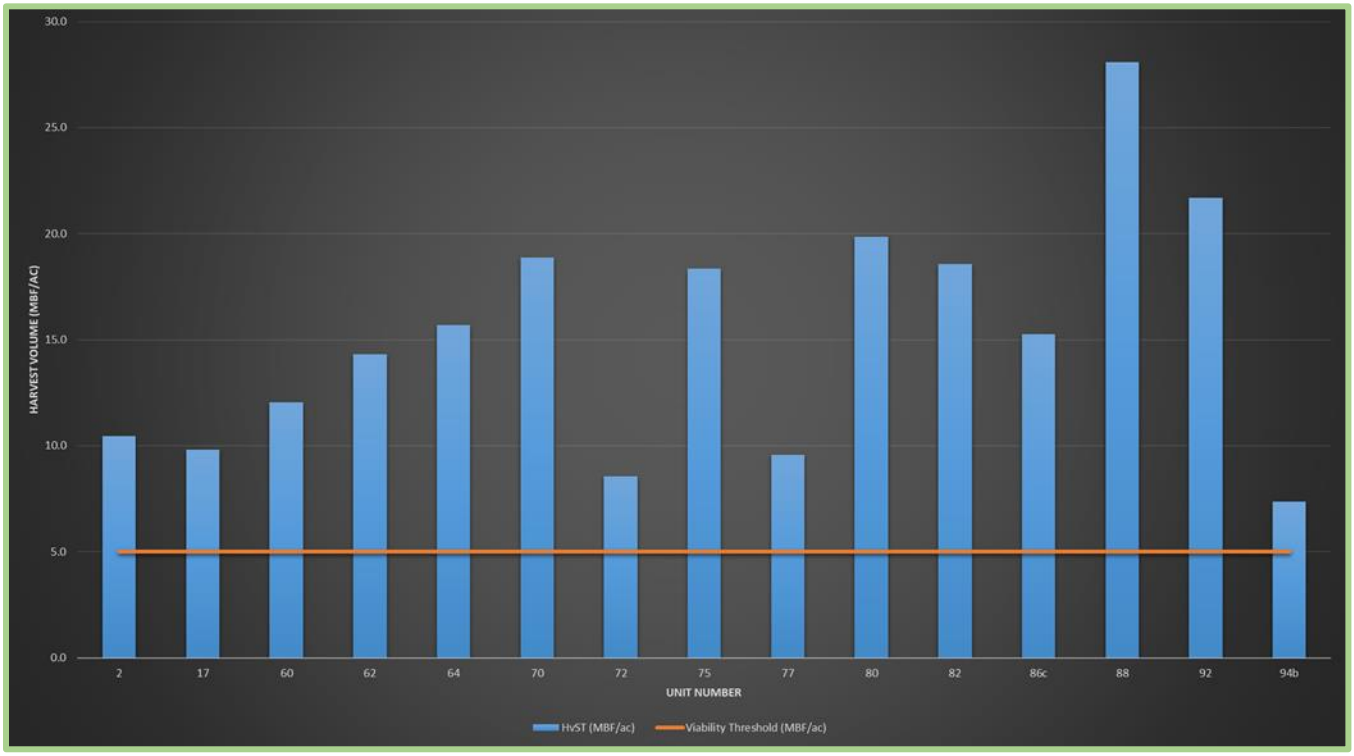

Figure 1—Sawtimber harvest volumes for coppice with reserves treatments (conventional logging).

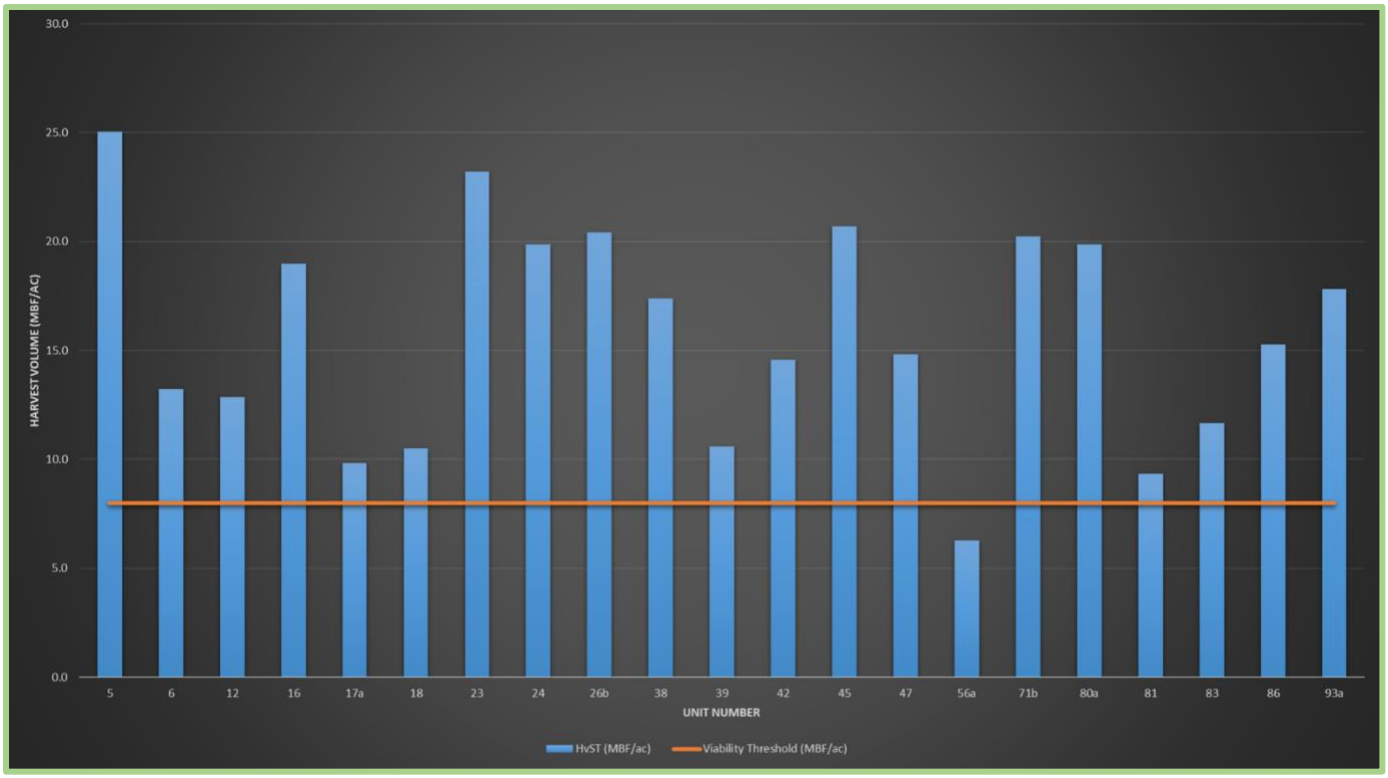

Figure 2—Sawtimber harvest volumes for coppice with reserves treatments (advanced logging).

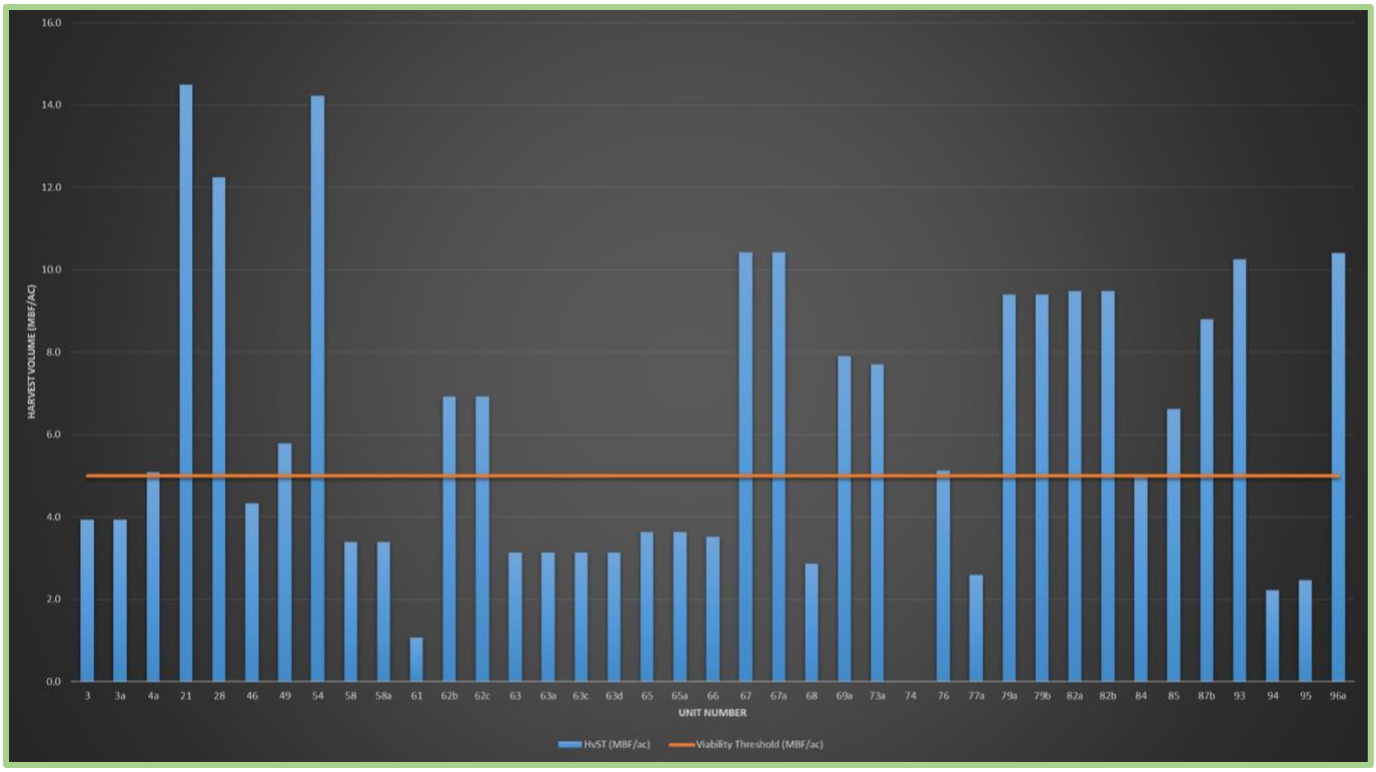

Figure 3—Sawtimber harvest volumes for thinning / establishment treatments (conventional logging).

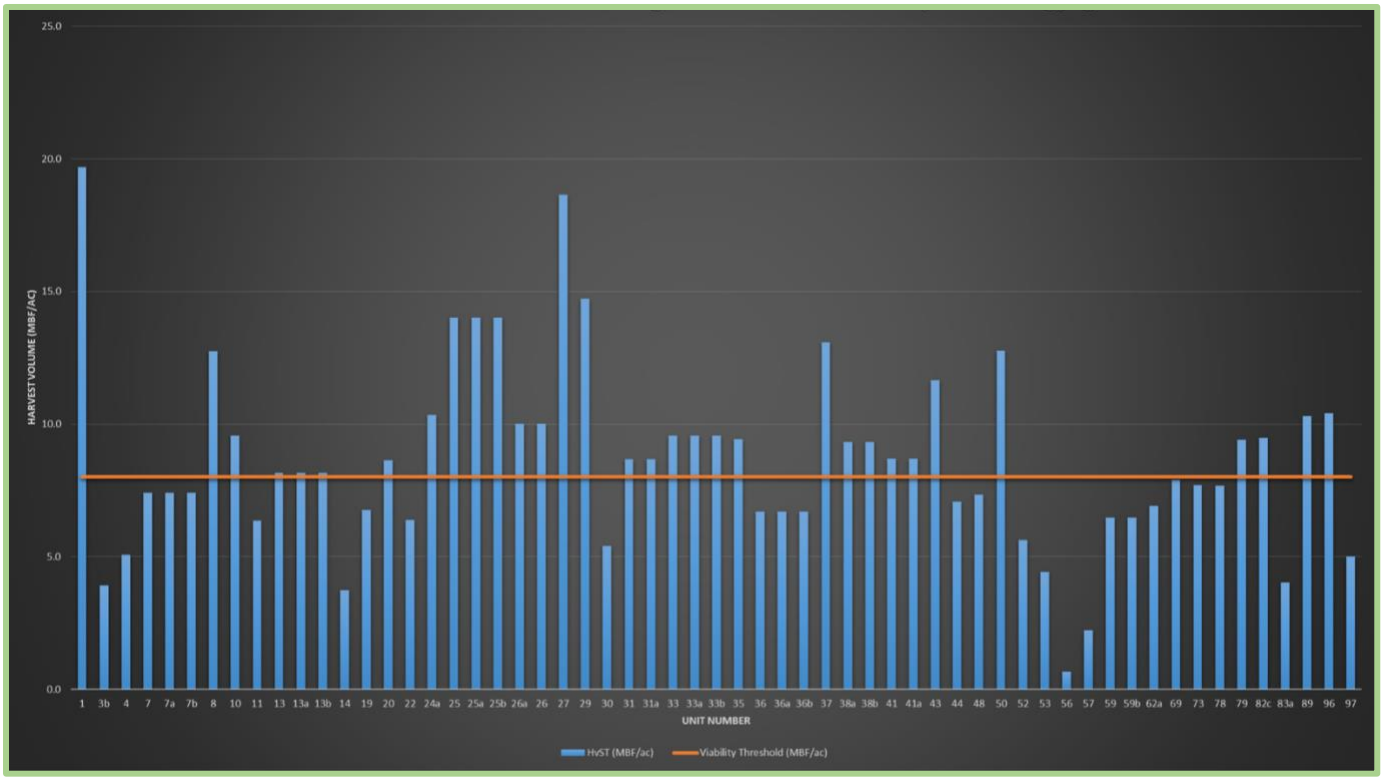

Figure 4—Sawtimber harvest volumes for thinning / establishment treatments (advanced logging).