

## **Supporting Documentation for the Forest Vegetation Simulator (IFT-FVS)**

**Name of Software Tool:** Forest Vegetation Simulation (IFT-FVS)

**Current Version Description/Date:**

- Name: IE FVS Variant
- Version: 002
- Date: 05/22/12
  
- Name: EC FVS Variant
- Version: 002
- Date: 06/28/12
  
- Name: WS FVS Variant
- Version: 002
- Date: 06/28/12

**Software Code and History:** The software code for the Forest Vegetation Simulator was acquired from the OpenFVS website (<http://code.google.com/p/open-fvs/>) in 2011.

**Software Developer(s) Names, Organization, and Contact Information:** USDA Forest Service, Forest Management Service Center, Fort Collins, CO.

**Note to Users:** For questions specifically relating to the internal functional operations of this module, contact the developer(s) or help desk resources for this software tool. For questions regarding how this tool is used within IFTDSS, please contact the IFTDSS Team using the Feedback function available on every page of IFTDSS.

**Science Model Contact, Names, Organization, and Contact Information:** USDA Forest Service, Forest Management Service Center, Fort Collins, CO; Nick Crookston.

Help desk contact information:

- Email: [ncrookston.fs@gmail.com](mailto:ncrookston.fs@gmail.com)
- Website: <http://code.google.com/p/open-fvs/>

**Availability of the Version of Record:** The latest version of the software code for this surface fire behavior module resides with the USDA Forest Service, Forest Management Service Center, Fort Collins, CO.

**Primary Funding Sources:** Forestry Sciences Lab in Moscow, Idaho, and the Forest Management Service Center in Fort Collins, Colorado.

**Application Purpose (General):** The Forest Vegetation Simulation (IFT-FVS) module is used for predicting forest stand dynamics. IFT-FVS can summarize current stand conditions, and predict future stand conditions, taking into account different management alternatives. The model can also be used to estimate hazard ratings for wildfires. Model output is used as input to forest planning models and other analysis tools. The Fire and Fuels Extension (FFE) to IFT-FVS, which has been implemented in IFTDSS, is used to simulate fuel dynamics and potential fire behavior over time, in the context of stand development and management. The main use of FEE IFT-FVS is to support fuel management and post fire treatment decisions.

For more information, see <http://www.fs.fed.us/fmsc/ftp/fvs/docs/gtr/EssentialFVS.pdf> or <http://www.fs.fed.us/fmsc/ftp/fvs/docs/gtr/FFEguide.pdf>.

**Application Purpose (Fuel Treatment):** The IFT-FVS module can be used to simulate fuels treatments in landscapes or at a single point. The FFE is used to estimate changes in vegetation due to six specific fuels treatments including prescribed burn, thinning from below, thinning across a DBH range, thinning with piled fuel and burning, pile burning, and mastication. In the Landscape context, the IFT-FVS module will also be used produce the information needed to convert treelist data into lcp format for running IFT-FlamMap, IFT-FlamMap-MTT, and IFT-FlamMap-RANDIG before and after treatments are simulated.

For more information, see <http://www.fs.fed.us/fmsc/ftp/fvs/docs/gtr/EssentialFVS.pdf> or <http://www.fs.fed.us/fmsc/ftp/fvs/docs/gtr/FFEguide.pdf>

**User/Application Documentation:**

- <http://www.fs.fed.us/fmsc/fvs/documents/index.shtml>

**User Application Guidance:** Can be found at

<http://www.fs.fed.us/fmsc/fvs/documents/userguides.shtml>.

- Dixon, Gary E. comp. 2002. Essential FVS: A user's guide to the Forest Vegetation Simulator. Internal Rep. Fort Collins, CO: U. S. Department of Agriculture, Forest Service, Forest Management Service Center. 248p. (Revised: June 27, 2012)  
(<http://www.fs.fed.us/fmsc/ftp/fvs/docs/gtr/EssentialFVS.pdf>)
- Rebain, S. A., Reinhardt, E. D., Crookston, N. L., Beukema, S. J., Kurz, W. A., Greenough, J. A., Robinson, D. C. E., Lutes, D C., 2010. The fire and fuels extension to the Forest Vegetation Simulator: Updated model documentation. Fort Collins, CO: U. S. Department of Agriculture, Forest Service, Forest Management Service Center. 404p. (Revised: June 26, 2012)  
(<http://www.fs.fed.us/fmsc/ftp/fvs/docs/gtr/FFEguide.pdf>)

## Scientific Foundations of the Software Tool:

- Degree of validation/evaluation and availability of written results:
  - No information available at this time.
- Publication history:
  - Peer-reviewed publications
    - Canavan S. J. Ramm, C. W., 2000. Accuracy and precision of the 10 year predictions for Forest Vegetation Simulator – Lake States. Northern Journal of Applied Forestry 17: 62-70.
    - Crookston, N. L., Dixon, G. E., 2005. The forest vegetation simulator: A review of its structure, content, and applications. Computers and electronics in Agriculture 49: 60-80. [http://www.frames.gov/documents/catalog/spa/crookston\\_dixon\\_2005.pdf](http://www.frames.gov/documents/catalog/spa/crookston_dixon_2005.pdf)
    - Ray, D. G., Saunders, M. R., Seymour R. S., 2009. Recent changes to the northeast variant of the Forest Vegetation Simulation and some basic strategies for improving model outputs. Northern Journal of Applied Forestry 26: 31-34.
  - Non-peer-reviewed publications
    - Beukema, S. J., Greenough, J. A., Robinson, D. C. E., Kurz, W. A., Reinhardt, E. D., Crookston, N. L., Brown, J. K., Hardy, C. C., Stage, A. R., 1997. An introduction to the Fire and Fuels Extension to FVS. In: Teck, Richard; Moeur, Melinda; Adams, Judy, comps. 1997. Proceedings: Forest Vegetation Simulator conference; 1997 February 3-7; Fort Collins, CO. Gen. Tech. Rep. INT-GTR-373. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. <http://0000py8.dev.radiant.net/documents/fvs/ffe.pdf>
    - Beukema, S. J., Reinhardt, E. D., Kurz, W. A., Crookston, N. L., 2000. An overview of the fire and fuels extension to the forest vegetation simulator. In: Neuenschwander, L. F.; Ryan, K. C. (Eds). Proceedings from the Joint Fire Science Conference and Workshop: Crossing the millennium: integrating spatial technologies and ecological principles for a new age in fire management. Boise, ID, June 15-17, 1999. Moscow, Idaho: University of Idaho, 2000. 5 p. [http://www.fs.fed.us/rm/pubs\\_other/rmrs\\_2000\\_reinhardt\\_e001.pdf](http://www.fs.fed.us/rm/pubs_other/rmrs_2000_reinhardt_e001.pdf)
    - Johnson, M. C., Peterson, D. L., Raymond, C. L., 2007. Guide to fuel treatments in dry forests of the Western United States: assessing forest structure and fire hazard. General Technical Report PNW-GTR-686. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 322p. [http://www.fs.fed.us/pnw/publications/pnw\\_gtr686/](http://www.fs.fed.us/pnw/publications/pnw_gtr686/)
    - Reinhardt, E. D., Crookston, N. L., 2003. The fire and fuels extension to the Forest Vegetation Simulator. Ft. Collins, Co: US. Department of Agriculture, Forest Service,

Rocky Mountain Research Station. <http://fhm-server.lv-hrc.nevada.edu/fia/ab/teams/p2-dwm/referenceDocs/RMRS-GTR-116-FVSFireFuels.pdf>

- Seli, R. C., Ager, A. A., Crookston, N. L., Finney, M. A., Bahro, B., Agee, J. K., McHugh, C. W., 2007. Incorporating landscape fuel treatment modeling into the Forest Vegetation Simulator. In: Havis, R. N.; Crookston, N. L.(Eds.) 2008. Third Forest Vegetation Simulator Conference; 2007 February 13–15; Fort Collins, CO. Proceedings RMRS-P-00. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. [http://www.arcfuels.org/maggie/AGER%202011.Data/3%20Seli\\_FVSconf\\_2007-0432538635/3%20Seli\\_FVSconf\\_2007.pdf](http://www.arcfuels.org/maggie/AGER%202011.Data/3%20Seli_FVSconf_2007-0432538635/3%20Seli_FVSconf_2007.pdf)

**Training Availability:** Can be found at <http://www.fs.fed.us/fmrc/fvs/training/index.shtml>