

DEVELOPMENT OF FULL REGENERATION ESTABLISHMENT MODELS FOR THE FOREST VEGETATION SIMULATOR

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Abstract—For most simulation modeling efforts, the goal of model developers is to produce simulations that are the best representations of realism as possible. Achieving this goal commonly requires a considerable amount of data to set the initial parameters, followed by validation and model improvement – both of which require even more data. The Forest Vegetation Simulator (FVS) is a widely-used, distance-independent forest growth simulator that can be used to model a wide variety of forest conditions and silvicultural treatments. Extensions to FVS include modules for simulating fire effects and the impacts of insects and disease. Being an important silvicultural tool, the incorporation of realistic tree regeneration, with or without the occurrence of treatments, is a desirable component. Regeneration is implemented in FVS using two kinds of models – full establishment models, which are calibrated to automatically regenerate seedlings (including root and stump sprouts) in response to stand conditions and treatments, and partial establishment models, in which the establishment of new trees is largely under the control of the user. Although establishment models have been part of FVS since the 1980s in its predecessor, Prognosis, only a few of the 19 FVS variants currently in use have full establishment models. While user demand has been high for full establishment models to be added to more variants, the accessibility to sufficient regeneration data has been a barrier to implementation. As a wide-ranging data source, the Forest Inventory and Analysis (FIA) program has potential to assist with development of full establishment models in variants that are currently lacking them. FIA has formed a partnership with other parts of Forest Service Research and Development, National Forest Systems, and other researchers who have an interest in, or are currently working on forest regeneration modeling. The goal of the partnership will be universal implementation of full establishment models within FVS.

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