Planning Tools Link to National Policy Scenarios: Q & A with USFS Research Forester Alan Ager

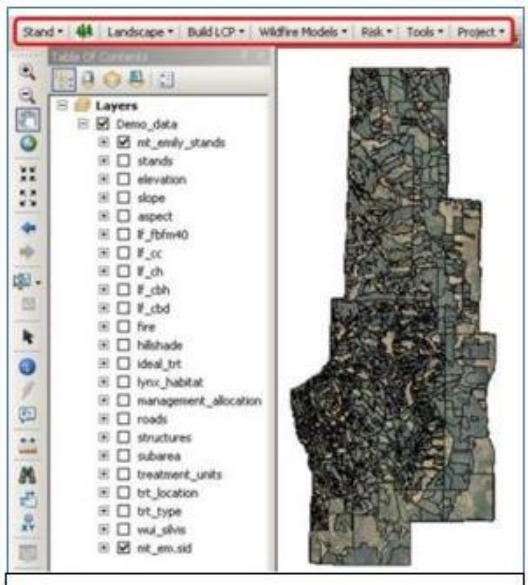
Alan Ager, PhD (Forest Genetics) joined the U.S. Forest Service in 1987 as a planning analyst and has spent the bulk of his career on landscape management issues related to fuels management and wildfire as part of Forest Service restoration and vegetation management programs. His recent focus has been on developing planning tools to simulate and explore national policy scenarios and predict investment outcomes in terms of economic and ecological conditions on national forests.

Alan's significant contribution to fire science and ecology includes the areas of wildfire risk governance, socioeconomic and ecological trade-offs in forest restoration programs, network analysis of wildfire risk transmission, and landscape scenario modeling. Research topics include Wildland Fire and Fuels, Invasive Species, Resource Management and Use, Water, Air, and Soil, and Inventory and Monitoring.

Alan has spent a great deal of time teaching short courses at universities and national forest field offices on methods and models for landscape management and risk analysis. He has used a number of national forests as learning laboratories working in parallel with NEPA teams to refine models and methods to support project planning with forest landscape tools like ArcFuels. He is based at the Umatilla National Forest where his most recent landscape modelling methods are being implemented to build a five-year action plan that prioritizes planning based on economic optimization.

What is your LANDFIRE connection?

In 1994, I was asked to work on the Interior Northwest Landscape Analysis System (INLAS) project team at the Pacific Northwest Research Station to help build a wildfire component to the project. With help from Mark Finney, Rob Seli, and Chuck McHugh I learned how to use FlamMap and build some realistic fire simulations for the study area in northeast Oregon. However, there was not a wall-to-wall fuels layer, so I turned to LANDFIRE. I downloaded the data and used it in FlamMap to see how simulated fuel treatments changed burn probability and fire intensity. I went on to use these methods to help fuels planners with a number of project analyses in the Blue Mountains and elsewhere.



*ArcFuels10 was built to accommodate both ArcGIS raster data (such as LANDFIRE data), **and/or** forest inventory data.*

I spent a lot of time comparing LANDFIRE to Forest Vegetation Simulator (FVS)-generated fuels data and was struck by the lack of integration among the different data sources and models needed to run landscape treatment scenarios. I turned that problem into a Joint Fire Science Program grant and was funded to develop ArcFuels. Since then, we have added all kinds of functionality to ingest and manipulate LANDFIRE data. Nicole Vaillant (LANDFIRE interview 2017) did a lot of the testing and wrote the user manuals. With

ArcFuels in hand I offered workshops in fuels treatment planning and led several projects where inventory and LANDFIRE data were mixed to build and test treatments designs. We added a complete risk assessment toolbox that was used for a number of research and NEPA projects.

You have used various LANDFIRE datasets in your work. Which are the most important to you? Why?

Lately I have scaled up my work as part of the National Fire Decision Support Center to look at national priorities and tradeoffs for fire and fuels investments. I use the national FSim outputs that in turn use LANDFIRE fuels data. We have completed a number of western U.S. assessments that looked at community exposure, cross boundary wildfire, and production trade-offs among and within forest and regions. We also used LANDFIRE fire regime data to estimate the fire deficit on national forests and compared the expected rate of burning with recent wildfire and treatment rates. That assessment was included in the Shared Stewardship report.

Have LANDFIRE data helped improve collaboration among the groups you work with?

The availability of LANDFIRE data jumpstarted a lot of conversations on districts and forests about the utility of fire simulation to ask questions and defend proposed actions in project planning. Not every fuel planner was convinced it was worth the effort, but I think things slowly changed and LANDFIRE was definitely one of the catalysts. I see solid fire modeling in a lot of NEPA documents these days, and the availability of LANDFIRE data is a major reason for this improvement in fire assessments.

What do you think is the most pressing question in fire science and ecology today? Can LANDFIRE help answer it?

Let's start with the second question. LANDFIRE will be part of many future large-scale assessments related to wildfire risk and fuel management. LANDFIRE data offer the only way we can take the pulse of the fuel conditions at large scales in the wide range of ecological settings on national forests. The products are also playing a key role in the cross-boundary assessments that are being used to prioritize investments as part of shared stewardship initiatives. However, we need to move from assessments to predicting outcomes from management investments, including managed fire, while factoring uncertainty and climate change. I think there are some landscape modeling products that Bob Keane and others have developed as part of LANDFIRE that could be trained on these latter questions. The current efforts to model landscape fire, fuels management, and climate change are all small-scale projects (relative to the national forest network) and the diversity of data and modelling methods make it difficult to translate to the management community. The LANDFIRE project could help bring some consistency into this important area of future research.

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Selected publications

Ager, A.A., R.M. Houtman, M.A. Day, C. Ringo, and P. Palaiologou. 2019. Tradeoffs between US national forest harvest targets and fuel management to reduce wildfire transmission to the wildland urban interface. **Forest Ecology and Management**. 434:99-109.

Ager, A.A., A. Barros, M.A. Day, H.K. Preisler, T. Spies, and J. Bolte. **2018**. Analyzing fine-scale spatiotemporal drivers of wildfire in a forest landscape model. **Ecological Modelling**. 384:87-102.

Barros, A., A.A. Ager, M.A. Day, M. Krawchuk, and T. Spies. **2018**. Wildfires managed for restoration enhance ecological resilience. **Ecosphere**. 9(3): e02161. doi: 10.1002/ecs2.2161.

Evers, C., A.A. Ager, M. Nielsen-Pincus, P. Palaiologou, and K. Bunzel. **2019**. Archetypes of community wildfire exposure from national forests of the western US. **Landscape and Urban Planning**. 182:55-66.

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