Topic & Title of Project	*Upper Fraser Valley CWPP and LANDFIRE data: Northern Colorado October, 2008*

Background   The Anchor Point Group of Boulder, Colorado is a wildfire management consulting firm that provides services related to wildland-urban interface [WUI] issues. Recently, Anchor Point worked with the Upper Fraser Valley communities to meet the 2005 Healthy Forest Restoration Act (HFRA) mandate of completing a Community Wildfire Protection Plan (CWPP). This project used LANDFIRE data products to conduct the CWPP for the Upper Fraser Valley (in Grand County, CO, near the town of Winter Park). CWPPs, which assist in defining the WUI and establishing locally based strategic priorities for wildfire preparedness and hazardous fuels reduction work, are vital for communities applying for grants to support wildfire hazard risk mitigation around communities.

Key Points

Description of analysis   Anchor Point used LANDFIRE data (elevation, slope, aspect, fuel model, canopy cover, canopy base height, stand height, and canopy bulk density) as inputs to FlamMap to generate estimates of what fire behavior (flame length, potential crown fire activity, and rate of spread) may be like under a given set of weather conditions. Anchor Point's methodology combines field assessments of WUI communities with geospatially derived factors to estimate potential impact from wildfire to highlight values at risk. The intensive field analysis considers factors such as structure construction and type (for example, ignition resistant construction, roof type, and absence of defensible space) and accessibility (such as one way in / one way out and turnaround access for fire suppression apparatus).

Improved methodologies   LANDFIRE data allowed more accurate fire behavior modeling and therefore more informed mitigation recommendations because of the following improvements in methodology:

► LANDFIRE uses separate standardized methods for determining vegetation characteristics such as fuel model, canopy cover, canopy base height, stand height and canopy bulk density. Previously, fuel model values were crosswalked to these data sets.

► LANDFIRE uses nationally recognized methodologies with input and refinements by a large and diverse user base consisting of federal, state, county, and private users.

Data currency   LANDFIRE takes a unvarying approach to creating fire and fuel characteristics information in any area of the United States, which adds consistency and efficiency to the projects Anchor Point undertakes.

► LANDFIRE data products are based on relatively recent data. Without LANDFIRE, the fuel data used may be based on interpretation of aerial photos taken years before the LANDFIRE data were assembled.

► LANDFIRE provides for easy access (data download and delivery) of data products, saving significant amounts of time and thus money. Previous approaches included gathering products from multiple sources, of which collection methodologies were either inconsistent or unknown.

► Before using LANDFIRE data, the same types of data and inputs were necessary, but significant improvisation was required to produce usable data. The former process focused on aerial photo interpretation to generate fuel models with subsequent crosswalks for the other data. This process was far more assumption-laden and often less accurate than the current process, which focuses on refining LANDFIRE products.

► Although it's often necessary to refine and adjust the LANDFIRE inputs, the use of LANDFIRE data products definitely saved time (and therefore money) and also added consistency to Anchor Point products. It definitely improved both the workflow and quality of work – a very positive addition.

Key Points, continued...

Results / summary   Combined with field and community attributes, LANDIRE inputs and subsequent fire behavior model outputs were the primary derived factors for determining the WUI community hazard/risk ratings. Topographic and fuel-related factors in the vicinity of WUI communities paint a vital picture of the spatial context of these areas. As part of Anchor Point's CWPP methodology, wildfire behavior modeling is used to guide the recommendation for mitigation efforts, such as landscape-scale fuel breaks. Fuel treatment recommendations for CWPPs can take many forms, but the most common are landscape fuel treatment projects and evacuation routes. Fire behavior modeling plays a role in both of these scenarios because information on potential flame length, rate of spread and crown fire activity can affect the recommended treatments (see Figure 1). For instance, if large flame lengths are predicted along a major evacuation route, a more appropriate recommendation can be made to modify fuel loads along the road, since fuel mitigation (such as width, length, and degree of thinning) are dependent on the predicted fire behavior. The more accurate the fire behavior data, the more suitable are the recommended actions.

Although Anchor Point typically refines and adjusts the LANDFIRE inputs, such as fuel models, through ground-based operation and local knowledge, the fact that LANDFIRE represents a consistent methodology of generating base fuel characteristics and topographical information in any area of the United States adds uniformity and efficiency to the projects Anchor Point undertakes.

Recommendations   If using LANDFIRE data product as inputs to fire behavior modeling, be sure to follow LANDFIRE guidelines involving modifications to the products based on user inputs. These include changing projections, specifications of the proper crown fire model, and modifications to the crown base height and canopy cover. Where possible, these modifications should be incorporated into the downloadable data so that the user modifications are not necessary.
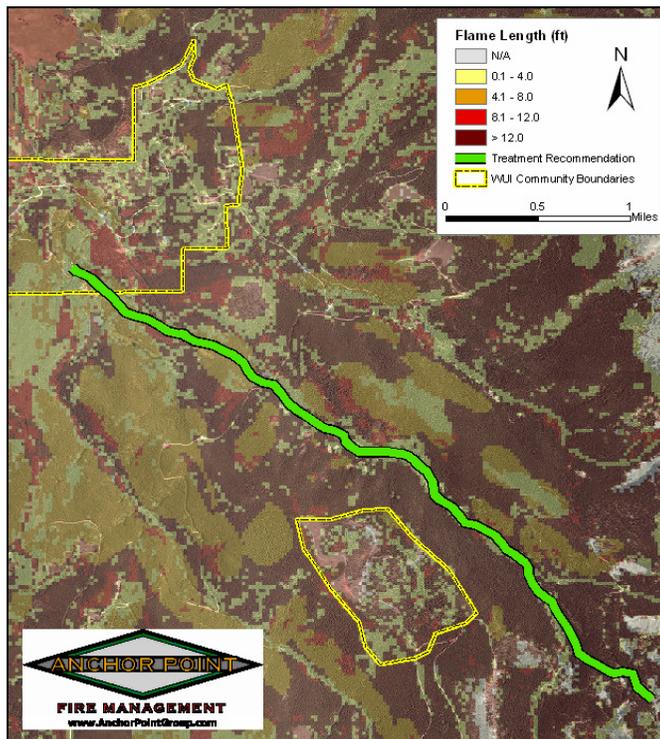
Figure 1. Upper Fraser Valley - Winter Park, CO. CWPP Analysis

Fire behavior analysis output (flame length) calculated using LANDFIRE inputs. Flame length provides another tool for decisions involving the placement of fuels treatment recommendations in areas such as wildland-urban interface communities. Given fire behavior predictions, our recommendation, as highlighted in Figure 1, is to modify fuel loads along the road that serves as the primary evacuation route for these communities.