Topic & Title of Incident

Use of LANDFIRE Data in Wildland Fire Risk Assessment and Multi-Year Fuels Program Planning for Bureau of Indian Affairs, Spokane Agency, and Spokane Tribe – June 2008

Background

A wildland fire risk assessment was developed for the Spokane, Washington Agency/Tribe in 2007 and 2008. The assessment used LANDFIRE (LF) data as part of the analysis. This risk assessment was developed to aid management in fuels project planning in terms of locations and prioritization. The assessment can be used for the five-to-ten year plan as a validation tool to evaluate past treatments' effects in relationship to planned treatment effects in the future, and for updating the fire management plan. The assessment was conducted by the BIA/Tribal Spokane Agency and Northwest Region Fuels and GIS personnel who analyzed four elements: fire probability (including fire history, road access, and lightening), hazard (including slope, aspect, elevation, and fire behavior [crown fire potential, flame lengths, rates of spread and fire regime condition class]), values (wildland-urban interface, land class, wildlife, streams, and power lines), and protection capabilities (or response times). LANDFIRE products were used in this analysis because local data were insufficient to complete the analysis in a timely manner.

Key Points

LF data products played critical role LANDFIRE data products played a critical role in the analysis of hazard and fire probability. Data products used in this analysis included the following LANDFIRE layers: 30-meter Digital Elevation Models (DEMs) for slope, aspect, and elevation; Existing Vegetation Type (EVT); Fire Regime Groups; 13 Anderson Fire Behavior Fuel Models (FBFM 13); Canopy Base Height (CBH); Crown Bulk Densities (CBD); and Canopy Cover (CC). These data layers were processed using the National Interagency Fuels Technology Team (NIFTT) Fire Behavior Assessment Tool (FBAT). Crown fire potential, flame length, and rate of spread were used in the assessment to determine fire behavior ratings.

LF data modified to reflect local conditions LF data products are national to regional in scale, so the FBFM13 layer (fig. 1) showed some important differences when compared to data at the local level. The LANDFIRE national-scale EVT layer also did not correlate well with the more appropriate local EVT data layer assignments. A crosswalk was created to modify the LF EVT assignments in a global replacement. The modified data more appropriately reflected local conditions. Another step was also created in the crosswalk from the modified EVT layer to develop a new FBFM13 layer using the same approach. This resulted in a suitable local FBFM13 data layer for use in the FBAT tool (fig. 1).

FBAT was used to determine overall fire hazard by combining crown fire potential, flame lengths, and rates of spread, as mentioned above. Issues with crown fire potential predictions were noted; for example, FBAT seemed to under-predict crown fire predictions. This issue was later determined to result from the use of LF data for fire behavior predictions on ongoing large fires in 2007. Recommendations included changing the CBH, CBD, and CC parameters. For the Spokane analysis, only the CBH data were modified – being reduced by 50 percent. This research utilized the Data Notifications and Version Alerts listed on www.landfire.gov.

Timely analysis LF data products played a major role in the development of the Spokane Risk Assessment (fig. 2). The availability of LF data layers in wall-to-wall (reservation wide) format was critical in making this a timely analysis.

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Results / summary

- The Spokane Risk Assessment validates the placement and implementation of various fuels projects. Figure 2 below shows a close correlation between completed treatments and areas of the reservation previously identified as high risk.
- The Spokane Risk Assessment will help to focus the development of a prioritized multi-year fuels project plan that will help to stabilize fuels budgets and target accomplishments.
- The development of a prioritized multi-year fuels project plan will be aided greatly though the use of LANDFIRE's Fire Regime, FRCC, and FBFM13 layer data.

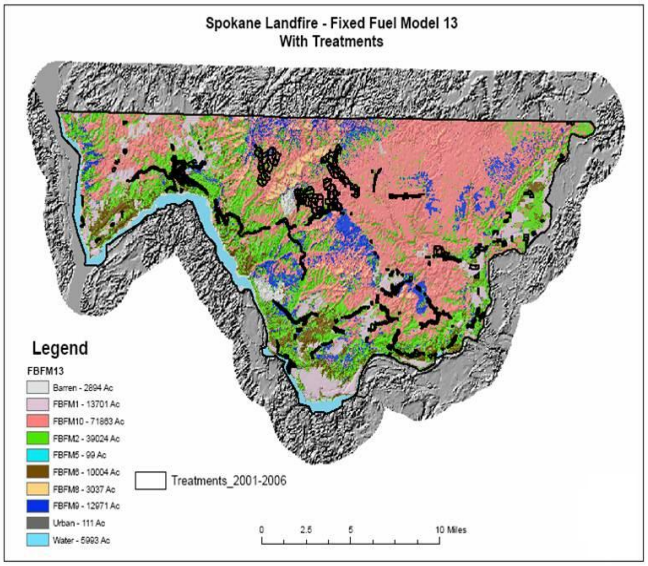

Figure 1 – Spokane Risk Assessment: Modified LANDFIRE Fire Behavior Fuel Model 13 layer overlaid with local fuels treatment area polygons.

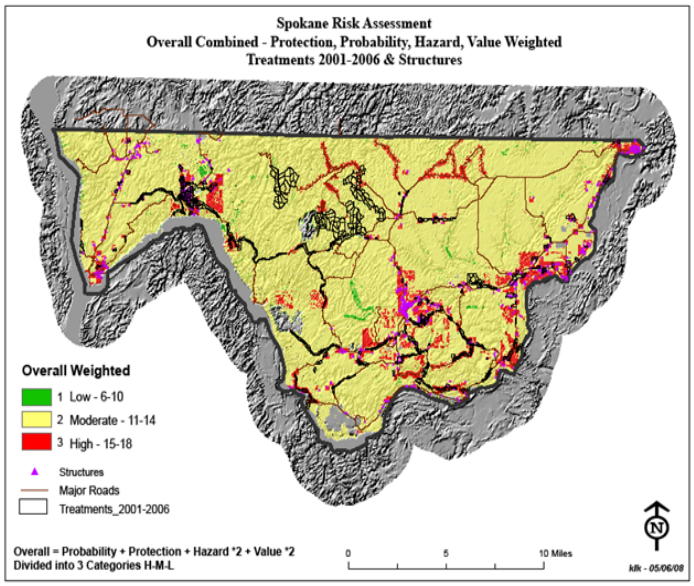

Figure 2 – Spokane Risk Assessment showing the overall risk once risk elements (fire potential, fire hazard, values at risk, and protection capabilities) were combined and weighted and then overlaid with local fuels treatment area polygons. This illustrates that many of the local treatments have correlated well with the Spokane Reservation's high risk areas.

Recommendations

- LF data are readily available and are wall-to-wall for use at the national and regional levels. The alternative to using LF data for completing any form of risk assessment is the collection of existing data and acquisition of missing, compatible format data, which can both be expensive and take a long time to acquire. By closely analyzing the LF input and output data, relatively quick and easy modifications can be made to the LF data to reflect more local-level specific predictions.
- LF data can also be used to aid in focused, prioritized local-level planning for project development. Projects can be developed to focus on higher risk areas according to National Fire Plan goals of targeting fire regimes I – III, restoring fire regime condition classes (FRCC) 2 and 3, and maintaining FRCC 1. LF data can also be used to make new fire behavior predictions based on fuel model changes, post treatment. The end result of these targeted analyses is the development of a multi-year (five to ten years out) fuels project plan.