Implementing and evaluating landscape fuel treatments – Sierra Nevada

Adaptive Management Project: Fire and Forest Ecosystem Health integration team meeting
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Primary focus is recent publication:

Outline

• Landscape fuel treatment design: theoretical v. actual
  o current approaches:
    ▪ strategically placed area treatments (SPLATs - Finney 2001)
    ▪ defensible fuel profile zones (DFPZs - Weatherspoon and Skinner 1996)
    ▪ treatment optimization module (TOM - Finney 2006)
  o constraints
    ▪ land allocation: wildlife, stream buffer
    ▪ appeals/litigation: time, avoidance
    ▪ funding: budgets, revenues

• Management decisions
  o define landscape: larger landscapes needed, match extent of current fires
  o stand treatment (thin, burn) and surface fuel treatment (pile, masticate, broadcast burn) types
  o individual treatment unit size: generally larger is better (500-4000 ac)
  o landscape design: strategic outperforms random placement
  o landscape proportion: 20-30%

• Modeling approaches and limitations for landscape fuel treatment evaluation
  o FlamMap (Finney 2006)
    ▪ use: generate ‘surfaces’ indicating landscape ‘flammability’, quantify treatment effects
    ▪ advantages: removes subjectivity associated with ignition locations and weather streams, computationally efficient
    ▪ limitations: constant weather, crown fire difficult to separate out
  o FARSITE (Finney 1998)
    ▪ use: individual fire growth and behavior based on detailed weather inputs
• **advantages**: more capable of approximating actual fires, crown fire more explicit
• **limitations**: ignition placement, weather stream, computationally intensive

  o Forest Vegetation Simulator (FVS - Dixon 2002), Fire and Fuels Extension (FFE - Reinhardt and Crookston 2003)
    • **use**: simulate treatments, grow treatments over time, uses actual plot data
    • **advantages**: tailor specific treatments, little parameterization
    • **limitations**: shrubs not modeled, user-defined regeneration, FUEL MODEL selection

  o ArcFuels (Ager et al. 2006)
    • **use**: integrated platform for evaluating landscape fire behavior and fuel treatment effects
    • **advantages**: too many to list
    • **limitations**: expertise to run FVS commands (kcp files), GIS manipulations, large dataset development and manipulation

References
Dixon GE (2002) 'Essential FVS: a user's guide to the Forest Vegetation Simulator.' U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. (Fort Collins, CO, USA)