RAMS
Risk Assessment and Mitigation Strategies
Overview

The purpose of RAMS is to provide a consistent process for developing prevention and fuels management programs. RAMS allows users to prioritize areas within their planning unit, consider various prevention and/or fuels treatment alternatives, and develop a budget.

RAMS is a replacement for previously released programs including:

- WPAP - Wildfire Prevention Assessment and Plan
- PWA/PWA2 - Prevention Workload Analysis
- BuildFBD - Build Fire Behavior Data
- FATE - Fuels Assessment and Treatment Evaluation

RAMS includes three components: Assessment, Prevention, and Fuels.

The assessment portion of RAMS is intended to identify the highest priority areas in which to consider fuels and/or prevention work. Users divide their planning unit into several "compartments". Each compartment is then inventoried in RAMS regarding its fire behavior, ignition potential, and resource values. The end result of the assessment is a prioritized list of compartments.

In the fire prevention module, users develop one or more fire prevention "options". Each option includes General Actions and Specific Actions. General Actions are those that apply to most or the entire planning unit. Examples include participation at county fairs or the development of an internet web site. Specific Actions are identifiable for each compartment. Examples include patrol and the posting of signs. Users of the National Fire Management Analysis System ("NFMAS") may use data from that system to calculate an economic benefit for the various prevention options. The benefit is based on changes in fire frequency expected from changes in fire prevention activities.

The RAMS fuels analysis is based on management objectives developed by the user at the site-specific level. Subdivisions of compartments called Fuels Treatment Zones (FTZs) are identified, and potential fuels treatment strategies identified. An analysis of management risk is completed, and detailed projects are developed with their costs. As with prevention, NFMAS users may view economic benefits expected to result from the various fuels projects. Finally, projects may be included in any fiscal year's fuels program, or may be dropped from further consideration.

A final report printed from RAMS can, at the user's option, show any or all of the Assessment, Prevention, or Fuels work.

The steps involved in using RAMS include:

- Designate “Compartments”, which are subdivisions of the planning unit that will be studied in depth. Compartments might be Representative Locations from the FMP process, or they might be the prevention compartments. In order for economic benefits of fuels treatments to be calculated, Compartments must reside within one Fire Management Zone (FMZ) and one Representative Location.

- Complete an assessment of each Compartment, considering:
    - Fuels Hazard
    - Ignition Risk
    - Historical Fire Ignition
    - Fire Return Interval
    - Values, and
    - Protection Capability

- Prepare a report, which summarizes the Compartment assessment process, and rates each Compartment as a “Low”, “Medium”, or “High” priority for fuels treatment consideration.

- Define historical, current, and/or potential future Prevention Program Options.

- Develop a list of General Actions and Specific Actions for each Prevention Option

- View reports showing costs and benefits for alternative prevention programs.

- For each Compartment, list existing management objectives, citing their source. Considering the prioritization from the assessment process and management objectives, develop Fuels Treatment Zones (FTZs) within which alternative fuels strategies will be considered.

- From a list of known fuels treatment strategies, pick those, which might be applicable for each FTZ. Evaluate each strategy according to its inherent management risk.

- Develop various specific fuels projects, focusing on high priority Compartments with applicable management objectives. Calculate financial benefit based on data within IIAA.

- Considering costs, benefits, Compartment priorities, and management objectives, select fuels projects for inclusion in the planning unit’s Fuels Management Plan.

Additional background information is provided below for Prevention and Fuels:

Prevention

The RAMS fire prevention element is designed to determine the number of personnel and program dollars needed to accomplish a fire prevention program level. The process consists of an inventory of the fire prevention activities that are implemented to mitigate damages resulting from unwanted fire occurrences. These activities include all the Education, Engineering, Enforcement and Administration approaches that wildland fire managers consider when developing a fire prevention plan.

In the workload analysis, fire prevention activities have been grouped into areas of general or specific actions. This grouping allows the activities to be inventoried by type and by where they occur and have effect.

General Actions include activities that affect the entire planning unit, i.e., National Forest, District, etc. Examples of these activities are public relations programs intended to create public awareness of prevention symbols and slogans, planning, training, etc. General Action activities are grouped into like categories in the areas of:

- Education
- Enforcement
- Engineering
- Administration

Specific Actions include activities that affect a specific geographical area. These activities are targeted programs developed for ignition problems identified in the assessment process. These programs are discretionary at the field level in that, of the ignition problems identified, implementation priority is established by the unit manager on the basis of the analysis, and personnel and/or budgetary constraints. Examples of Specific Action are cause specific signing, inspections, individual contacts, patrol, etc.

Specific Actions activities are grouped into like categories in the areas of:

- Patrol
- Signs
- Law Enforcement
- Hazards
- Public Contact
- Inspection
- Administration

Work Standards and Workload Factors have been developed to standardize the outputs for each of these prevention categories. The Work Standard is the activity to be performed and the Workload Factor is the average time that it would take to accomplish the activity. The Work Standards and the Workload Factors used were adapted from approximately ten years worth of field data from numerous units and field personnel.

Though some of the tasks in a specific location may require more or less time than is indicated by the Workload Factor, it is important not to worry about the exact amount of time. It should be assumed that the ending result will balance out. This is similar to the line production rates that have been established for suppression modeling purposes.

The workload analysis can be used to calculate the total prevention workload for various geographical areas including:

- Fire Prevention Compartment
- Fire Management Analysis Zone
- Ranger District/Resource Area
- Forest/District/Park
- Etc.

RAMS is a key in helping to determine fire prevention program levels. Program levels are determined by utilizing spreadsheets to inventory and translate the volume of work to be accomplished into the number of fire prevention personnel or increments for each of the programs evaluated. It is assumed that the Workload Analysis would be utilized to assist in developing alternative program budget options of fire prevention including:

Historical (Base) Level - the prevention program that best represents the average prevention organization for the period of years for which the fire occurrence data is being considered. This would basically be the organization that was used in the calibration of selected fire management planning processes.

Minimum Level - the prevention program necessary to accomplish the mandated and awareness activities. This level consists of all the prevention activities that a unit identifies as "must be done."

Current - the prevention program that is currently implemented. This could be similar to any of the other options.

Plan Level - this is the optimum level of prevention activities that have been described in the prevention planning process, which focuses on preventing large and damaging fires.

Fuels

The fuel on wildland landscapes are probably more continuous and hazardous than ever before. Wildland fuel continuity has increased since the exclusion of frequent fire. Higher fire frequencies prior to the 20th century are believed to have kept fuel loadings low and variable as a patchwork across the landscape. Evidence suggests this patchiness and low-load fuel structure would have limited the spread and extreme behavior of wildland fires. By excluding fire for at least a century, dead woody fuel and duff have accumulated, live shrubs and seedling trees have grown (often creating ladder fuel in forested areas), and forest crown fuel have become more dense. Together, these conditions constitute a hazard for larger fires of higher intensities that are difficult to control.

As natural resource values increase and human development intrudes further into wildland areas, high values are exhibiting increasing contact with the high hazards. This scenario results in the need for considering fuel management at landscape scales more urgent and economically justified because of potentially high damages and loss of life. Furthermore, forest health and ecological damages are greater because of the more extreme fire behavior.

It is well known that forest residue and fuel management practices can be effective at lowering fire hazard on particular sites. Effective fuel management treatments range from removing light surface fuel with prescribed fire to thinning crown fuel by mechanical means. While these treatments are temporarily effective, the overwhelming extent of the hazardous fuel buildup problem makes it unlikely that even emergency action can produce a broad remedy in the short term (i.e., 5 to 10 years). The constraints on project development, smoke and air quality impacts, personnel time for environmental assessments, and local political/economic concerns, probably prohibit treating vast blocks of land and huge annual acreage on a short rotation basis. Thus, a more measured approach is required if we are to see "significant" effects on fire spread, fire effects, and fire economics at a landscape scale. The ultimate objective and challenge is to design a fuel management planning process that will identify, analyze, evaluate and compare a range of fuel management strategies and treatment alternatives at a local scale so that it contributes to a collective benefit at a larger landscape scale.

The RAMS planning process is developed for fire managers to be a holistic approach to analyzing wildland fuel Hazard, Ignition risk, Value and Protection Capability across the wildland landscape. It considers the effects of fire on unit ecosystems by taking a coordinated approach to planning at a landscape or compartment level.

This approach recognizes that all facets of the Fire Management organization (prevention, suppression and fuel) are interdependent and must work toward a

common purpose and complement one another toward sustaining healthy and productive ecosystems and protecting human life and property.

The evaluation process will be used to identify priority areas where fire management actions, resources and budget should be focused to reduce costs and losses. Losses include undesirable changes in ecosystems as well as resource and property damage and injury to loss of life.

Once priority areas have been identified, various alternative fuels treatment projects are developed. Each project is analyzed with respect to its management risk and its anticipated benefits.

Finally, projects are either scheduled for implementation, or removed from consideration.