



National Wildland Fire Enterprise Architecture

# NWFEA Blueprint

PART II: Supporting Analysis

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NWFEA Project Team  
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## **PREFACE**

This section of the NWFEA Blueprint provides documentation created during the analysis of the as-is National Wildland Fire enterprise architecture. The recommendations in the NWFEA Blueprint were developed as a result of this analysis. Additional documentation is stored in the NWFEA Repository and is available upon request from the NWCG Program Management Office.

# The Business of Wildland Fire

## Wildland Fire Governance (how Wildland Fire operates)

Each federal and state land management agency has a Wildland Fire Program or equivalent. The various Agency Fire Programs are generally organized into three tiers: 1) National, 2) Regional, and 3) Local.

Three-Tiered Wildland Fire Land Management Organizations							
	Department of the Interior (DOI)				Department of Agriculture (USDA)	States	Tribes
	Bureau of Indian Affairs	Bureau of Land Management	Fish and Wildlife Service	National Park Service	Forest Service	States (50)	Tribes
Tier 1 – National	National Fire Leadership	National Fire Leadership	National Fire Leadership	National Fire Leadership	National Fire Leadership	State-wide Fire Leadership	
Tier 2 – Regional	Regional Office Fire Programs	State Office Fire Programs	Regional Office Fire Programs	Regional Office Fire Programs	Regional Office Fire Programs		
Tier 3 – Local	Field Fire Programs	Field Fire Programs	Field Fire Programs	Field Fire Programs	Field Fire Programs	Field Fire Programs	Tribe Fire Programs

Figure 1 - Three-tiered Wildland Fire Land Management Organizations

## Tier 1 - National Wildland Fire Governance

Two organizational structures exist at the national tier: 1) the agencies' national fire program management structures, and 2) the interagency fire management structure. These combine to make the interagency wildland fire governance framework. The national tier of the agency fire program organizations ensure that their fire programs align with their agency's missions, goals and objectives. The interagency fire management committees promote the creation of interagency standards and guidelines. The interagency wildland fire governance framework facilitates the consistent and coordinated elevation and adoption of these interagency standards through the issuance of policy in each of the individual agencies. Tier 1 also includes committees that provide support when the overall fire situation requires national prioritization and coordination. These interagency fire management committees are composed of agency fire program leaders and managers as depicted in Figure 2.

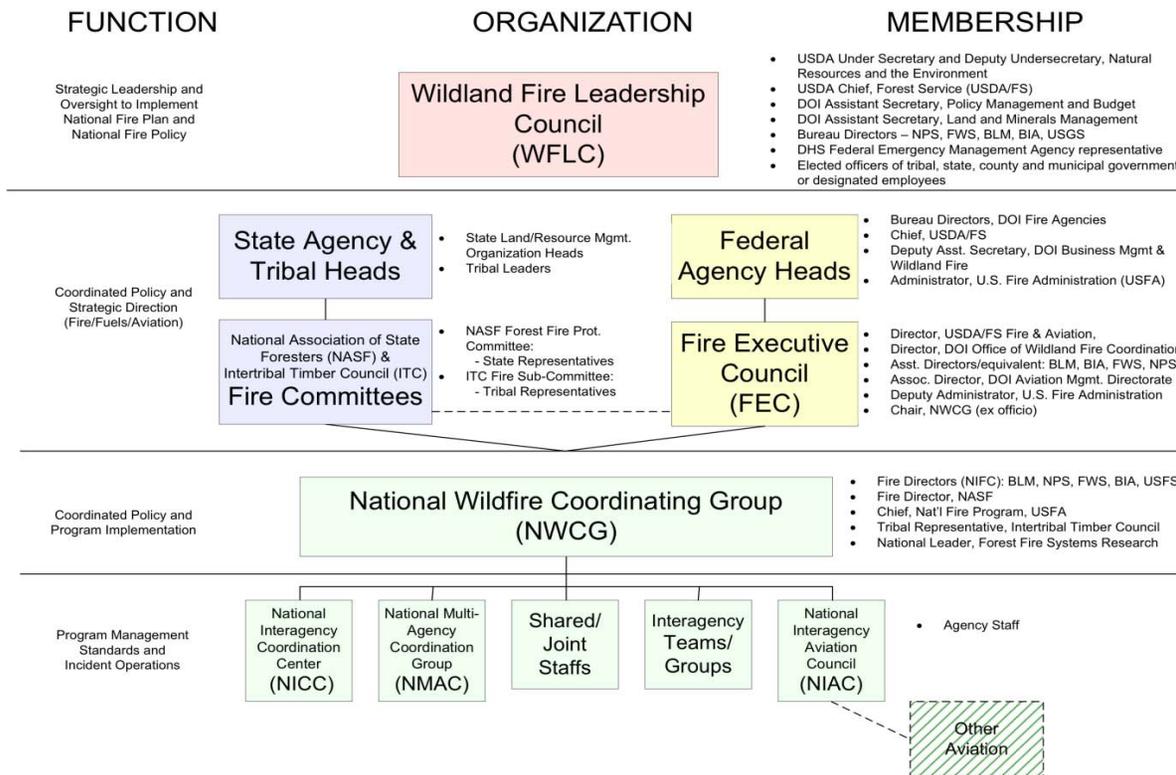


Figure 2 - Interagency governance structure of Wildland Fire

## Tier 2 - Regional Wildland Fire Governance

Two organizational structures exist at the regional tier: 1) the agency regional fire program organizations, and 2) the interagency Wildland Fire Geographic Area management structure. The regional boundaries of each of the partnering wildland fire agencies are different based on the needs of the agency. To ensure consistency in the response to wildland fires, the wildland fire community has agreed to operate within interagency boundaries called "Geographic Areas". A Geographic Area Coordination Center (GACC) has been established for each Geographic Area. A Geographic Area Multi-agency Coordination Group (GMAC), consisting of fire managers from all the partnering agencies guides the interagency decision-making processes. The map in Figure 3 shows the Wildland Fire Geographic Areas and the location of their associated GACCs.

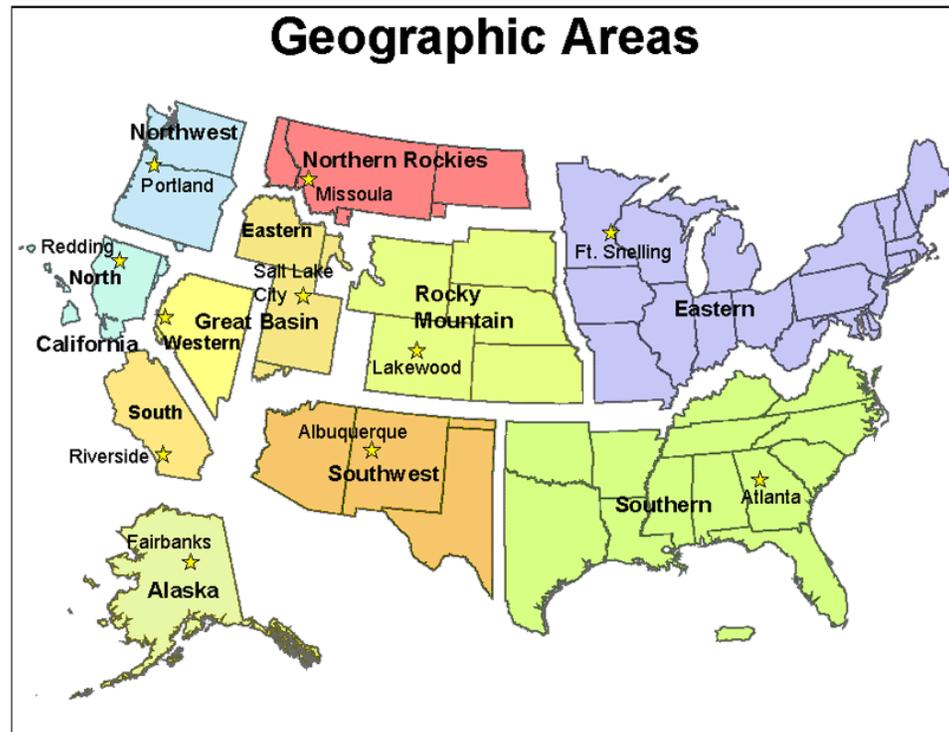


Figure 3 - Wildland Fire Geographic Areas and Coordination Centers

### Tier 3 - Local Wildland Fire Governance

At the local tier, the field-level wildland fire program managers perform operations based on their agency's land management objectives. This includes the implementation of fuels management and response to wildland fires. When a wildland fire occurs, the local organization responds with resources within its own agency or those resources provided through local cooperative agreements. If the fire response requires additional resources, the interagency operations are activated, which may include support from the GACC and interagency incident command teams.

### Wildland Fire Governance Discussion

The Wildland Fire governance structure provides an effective framework for interagency collaboration. Activities that will further improve the framework include:

- Definition and documentation of roles and responsibilities between the various interagency management groups (WFLC, OWFC, FEC, etc.)
- Development of formalized organization management processes and structures to:
  - interface with other department and agency programs such as Budget, Procurement, Contracting, Information Technology, Enterprise Architecture to establish effective working relationships to resolve issues related to Wildland Fire
  - manage and plan the deployment of new or changed policies and technologies across the wildland fire community
  - address the needed interfaces between Wildland Fire and the Department of Homeland Security in relation to national emergency services operations
  - improve the decision and oversight processes related to wildland fire investments, including business and IT investments
- Continuation of the re-structuring of NWCG teams and committees that includes clearly defined roles, objectives, and accountability
- Establishment of functions that ensure that local field issues are appropriately addressed at the national level:
  - formalize the process for escalating field issues to the appropriate agency or interagency executive bodies
  - ensure that national interagency committees include field-level representation
  - track, evaluate, act upon proposals and issues raised from the field via a "living" blueprint

- Development of decision support systems and processes that will help improve performance of interagency fire program management such as:
  - Establishment of an enterprise architecture function that coordinates the maintenance of the NWFEA Blueprint, documents the wildland fire enterprise architecture, and provides decision support services to fire leadership
  - Development of systems and reports that capture the management processes and knowledge of the wildland fire organization

## THE FUNCTIONS OF WILDLAND FIRE

### *The Functional Model*

The Wildland Fire Functional Model was developed by the Core Blueprint Team and enhanced through interviews with wildland fire subject matter experts. The purpose of the functional model is to provide a high-level view of the types of work performed by Wildland Fire. The functional model addresses the work performed at the national and field levels.

The model defines five major functional areas of Wildland Fire:

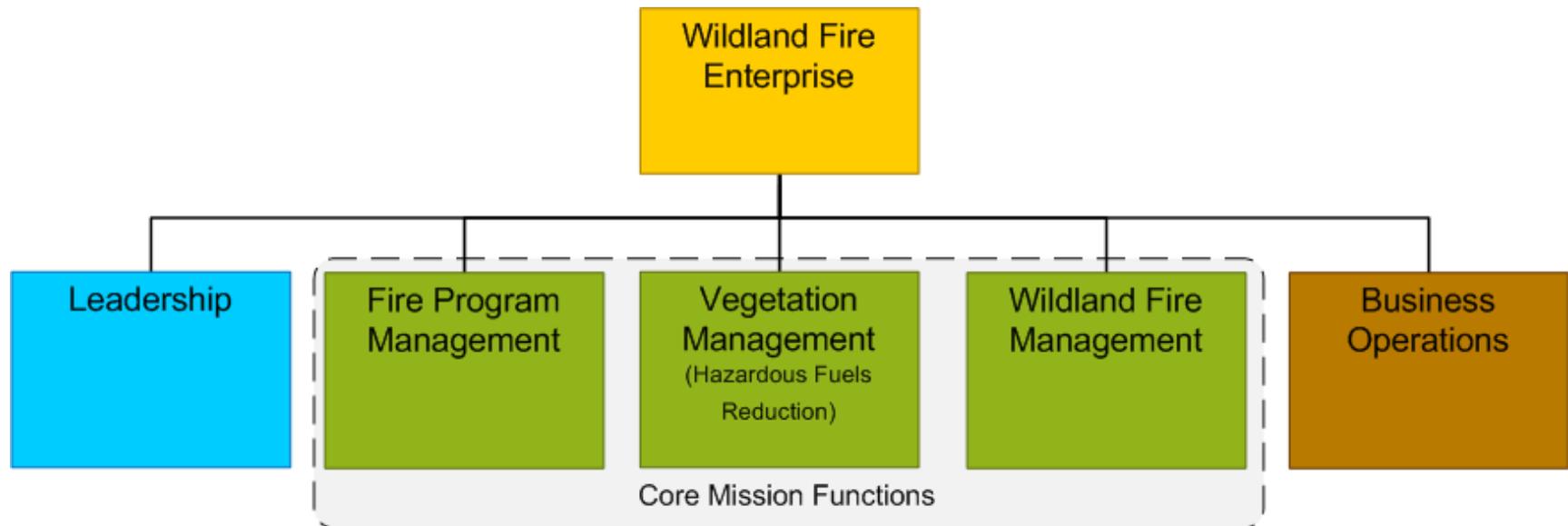


Figure 4 - National Wildland Fire Functions

## Leadership Functions

The leadership functions concern the interagency leadership of the enterprise – all aspects of the direction setting and decision making within the community.

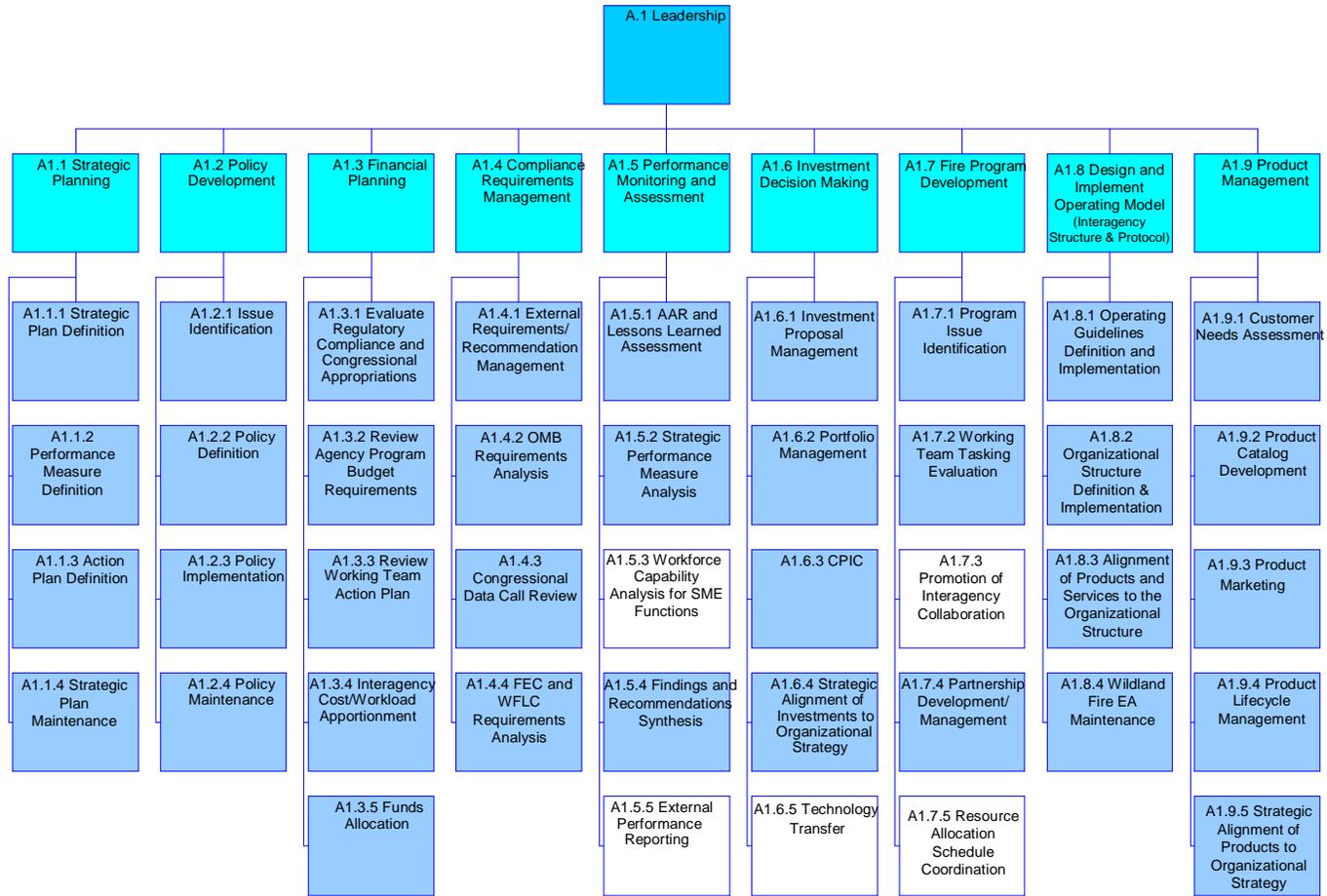


Figure 5 - Functional Model: Leadership (white boxes represent items still under discussion)

Nine major categories of function fall under Leadership:

Table 1- Functions and Sub-Functions of Leadership

Descriptions of Leadership Functions			
Function	Function Description	Sub-Function	Sub-Function Description
A1.1 Strategic Planning	Articulation of where leadership wants the organization to go, how best to get there, mechanisms for measuring the degree of success, and delegation of responsibilities	Strategic Plan Maintenance	
		Strategic Plan Definition	Goals are Implementation Outcomes, and Strategies are Implementation plans.
		Performance Measures Definition	Performance Measures are measures to Strategic Goals.
		Action Plan Definition	
A1.2 Policy Development	Creation of a common interpretation of existing policies and the national fire plan among the participating agencies. Formulation of policy recommendations for agency adoption.	Policy Implementation	
		Policy Definition	
		Issue Identification	Determining if there is a need for creation of new policy, or maintenance of existing policies...
		Policy Maintenance	The maintaining of existing policy, which may include decommissioning of policies.
A1.3 Financial	Planning, evaluation, and allocation	Evaluate Regulatory Compliance and Congressional Appropriations	

**Descriptions of Leadership Functions**

Function	Function Description	Sub-Function	Sub-Function Description
Planning		Review Agency Program Budget Requirements	
		Review Working Team Action Plans	Fire Directors review of working team budgetary information.
		Interagency Cost/Workload Apportionment	
		Funds Allocation	Fire Program Analysis Project...Analysis of current resources, needed resources, etc...to decide how to allocate funds.
A1.4 Compliance Requirements Management	Interagency compliance requirements coordination, reporting and analysis.	External Requirements/ Recommendation Management	
		OMB Requirements Analysis	
		Congressional Data Call Review	
		FEC and WFLC Requirements Analysis	
A1.5 Performance Monitoring and Assessment		AAR and Lessons Learned Assessment	After Action Review
		Strategic Performance Measure Analysis	The evaluation of objective measures to indicate the degree to which any given strategic goal has

Descriptions of Leadership Functions

Function	Function Description	Sub-Function	Sub-Function Description
			been reached.
		Workforce Capability Analysis for SME Functions	Is the analysis of the existing capability, capability required to meet goals, and the gap between the two?
		Findings and Recommendations Synthesis	
		External Performance Reporting	OMB, GAO, DHS, etc...
A1.6	Analysis of the business and environmental (infrastructure, technology, and products) fit of any proposed enhancement to the investment portfolio.	Investment Proposal Management	
Investment Decision Making	Determination of the criteria for evaluating investment proposals, and the development of a process for implementation.	Portfolio Management	
		CPIC	
		Strategic Alignment of Investments to Organizational Strategy	
		Technology Transfer	
A1.7	Development of the program to support and promote interagency	Resource Allocation Schedule Coordination	This should include schedule of planning activities, as well as resources etc...
Fire Program			

Descriptions of Leadership Functions

Function	Function Description	Sub-Function	Sub-Function Description
Development	collaborative participation to meet the NWCG mission.		This is both cross agency, as well as from national, to local coordination...
		Program Issue Identification	
		Working Team Tasking Evaluation	
		Promotion of Interagency Collaboration	
		Partnership Development/Management	Increase the number of qualified partners.
A1.8  Design and Implement Operating Model (Interagency Structure and Protocol)	Development of the interagency structures and protocols needed for effective program operation.	Operating Guidelines Definition and Implementation	
		Organizational Structure Definition and Implementation	
		Alignment of Products and Services to the Organizational Structure	
		Wildland Fire EA Maintenance	Blueprint (should define blueprint in context)...

Descriptions of Leadership Functions			
Function	Function Description	Sub-Function	Sub-Function Description
A1.9 Product Management	The design and lifecycle management of products and services to address stakeholder needs.	Customer Needs Assessment	Analysis of fire community service consumer's wants, and needs, and determination of need for product development.
		Product Catalog Development	
	Product Marketing		
	Product Lifecycle Management	Managing descriptions and properties of a product through its entire life. This would include the periodic evaluation of a product's effectiveness.	
	Strategic Alignment of Products to Organizational Strategy		
	Not the development, but the operations and maintenance of product management		

## Fire Program Management Functions

Fire Program Management concerns the creation and dissemination of the procedures, standards and guidelines for managing Wildland Fire events and resources – activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination.

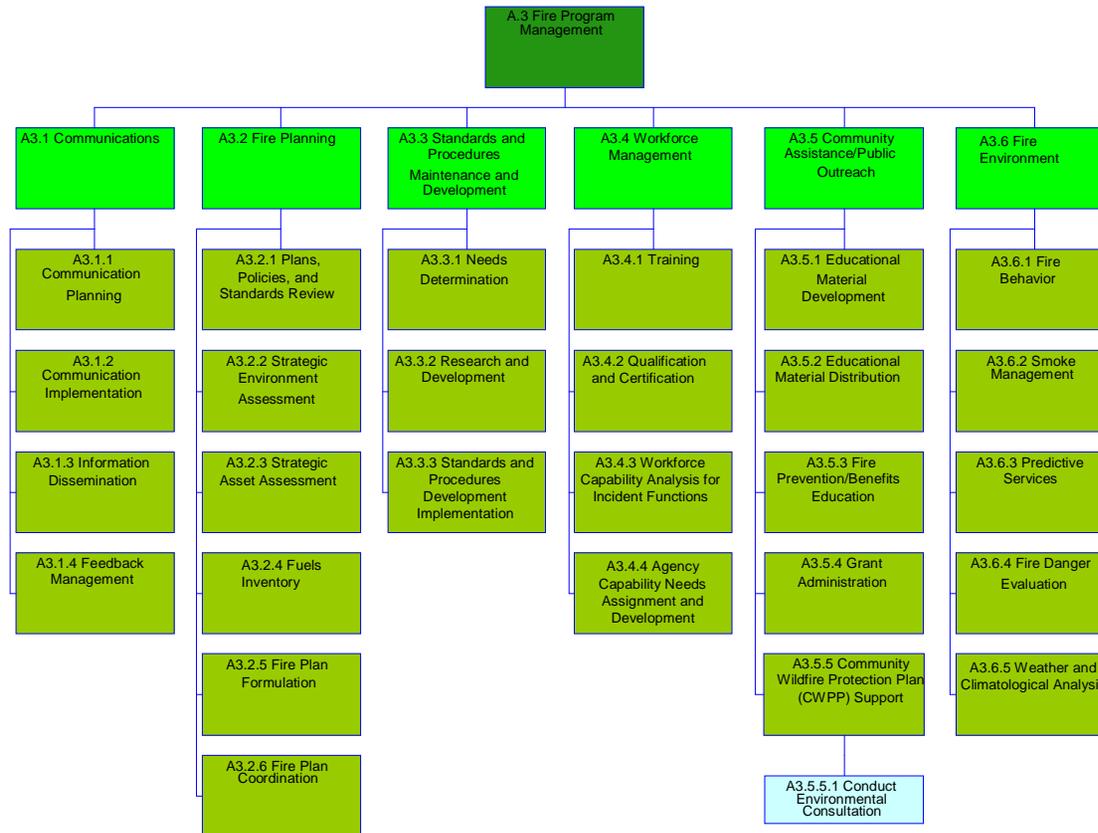


Figure 6 - Functional Model: Fire Program Management

Table 2 - Functions and Sub-Functions of Fire Program Management

Descriptions of Fire Program Management Functions			
Function	Function description	Sub-Function	Sub-Function description
A3.1 Communications	The planning, management, and development of communication based on priorities, methods, audience, strategies and program needs.	Communication Planning	Planning for communications. Determining the who, what, when, where, and why...Follows policies, standards, and protocols for a given type of communication depending on the above determination. This would include the strategic and operational planning for communications
		Information Dissemination	Providing the information to the appropriate audience using the selected methods, tools, and protocols.
		Communication Implementation	Formulation/Reformulation of a planned and unplanned communications...
		Feedback Management	Reviewing, analyzing, and providing appropriate response and or actions to anyone who has provided feedback to any relevant issues or communication.

Descriptions of Fire Program Management Functions

Function	Function description	Sub-Function	Sub-Function description
A3.2 Fire Planning	The systematic, technological, and administrative management process of designing organization, facilities, and procedure, including fire use, to protect wildland from fire. The processes include land and resource planning, fire management planning, and specific fire implementation action planning.	Plans, Policies, and Standards Review	This is done to determine the impacts on the existing plan and derive needed changes.
		Strategic Environment Assessment	Determining Values at Risk for environmental concerns and risk mitigation.
		Strategic Asset Assessment	Risk Value Assessment, Historical Resource Usage (what was used where and when, what will we need types, kinds and skills...)
		Fuels Inventory	Browns Planar Intercept Method...Calculating Mass by Size Class of the vegetation...  Fuel Veg Depth, Tons Per Acre, etc...  Ocular Estimate...A visual estimate of downed fuels...Photo Series Method...a series of photos (12 or so) to determine the downed fuels...
		Fire Plan Formulation	
		Fire Plan Coordination	Coordination of Fire Plans from local to national.
A3.3	The creation, modification, or withdrawal of standards	Needs Determination	The determination of the need for a standard etc...

Descriptions of Fire Program Management Functions

Function	Function description	Sub-Function	Sub-Function description
		Standards and Procedures Development Implementation	
		Research and Development	
A3.4 Workforce Management	Identification, training, and enhancement of the Wildland Fire militia, the Interagency Fire Position Management (IFPM) core, and the general Wildland Fire workforce.	Training	Training the existing workforce to extend or enhance their existing capabilities.
		Qualification and Certification	
		Workforce Capability Analysis for Incident Functions	
		Agency Capability Needs Assignment and Development	Developing people not for their individual careers, but to fill agency needs.

Descriptions of Fire Program Management Functions

Function	Function description	Sub-Function	Sub-Function description
A3.5 Community Assistance/Public Outreach	Training, information sharing, and assistance to Wildland Fire service consumers.  Educating and communicating with the general public about fire prevention, safety and risk mitigation. Includes education and support for restoration of Fire Adapted Ecosystems, and Public Health/Safety and Property Protection.	Educational Material Development	
		Educational Material Distribution	Physical distribution of material such as pamphlets, flyers, posters, videos, psa's, etc....
		Fire Prevention/Benefits Education	Delivery of Education to the Public through workshops, conferences, and other public forums...
		Grant Administration	From evaluation, to award, to follow up and monitoring. Examples: Rural Fire Assistance, Volunteer Fire Assistance, State Fire Assistance, Ready Reserve, etc. Assistance to local fire departments, through grants. Includes rural and volunteer fire assistance programs, to ultimately increase the capacity of local fire departments to respond to wildland fires. Providing technical, financial, and other assistance to rural communities.
		Community Wildfire Protection Plan (CWPP) Support	Community Wildfire Protection Plan or Equivalent  Funding, advice, technical assistance, etc....
A3.6	The terrestrial and atmospheric fire influences	Fire Behavior	The analysis and assessment of the behavior of a given fire, or the potential of a fire that has not yet happened...

Descriptions of Fire Program Management Functions

Function	Function description	Sub-Function	Sub-Function description
Fire Environment	<p>modeled by applications of fuels, weather, and topography at low to high resolution temporal and spatial scales.</p> <p>Includes activities for Fire Behavior, Fire Danger, and Fire Weather.....</p> <p>Predictive Services, Smoke Management, and Fuels Management are generally related.</p>	Smoke Management	Development and implementation of policies and practices put into effect by air and natural resource managers directed at minimizing the amount of smoke entering populated areas or impacting sensitive sites, avoiding significant deterioration of air quality and violations of Nation Ambient Air Quality Standards, and mitigating human-cause visibility impacts in Class I areas.
		Predictive Services	Includes Fuels, Intelligence, and Meteorology....data collection, evaluation, and reporting...
		Fire Danger Evaluation	Fire Danger rating describes the potential for initiation, spread, and difficulty of control of wildland fires in an area, includes climatological and weather analysis.
		Weather and Climatological Analysis	

## Vegetation Management Functions

Vegetation Management concerns the manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage from and resistance to control of wildland fires, including ecosystem evaluation and balance. Lopping, chipping, crushing, piling, and burning are examples of fuels treatment.

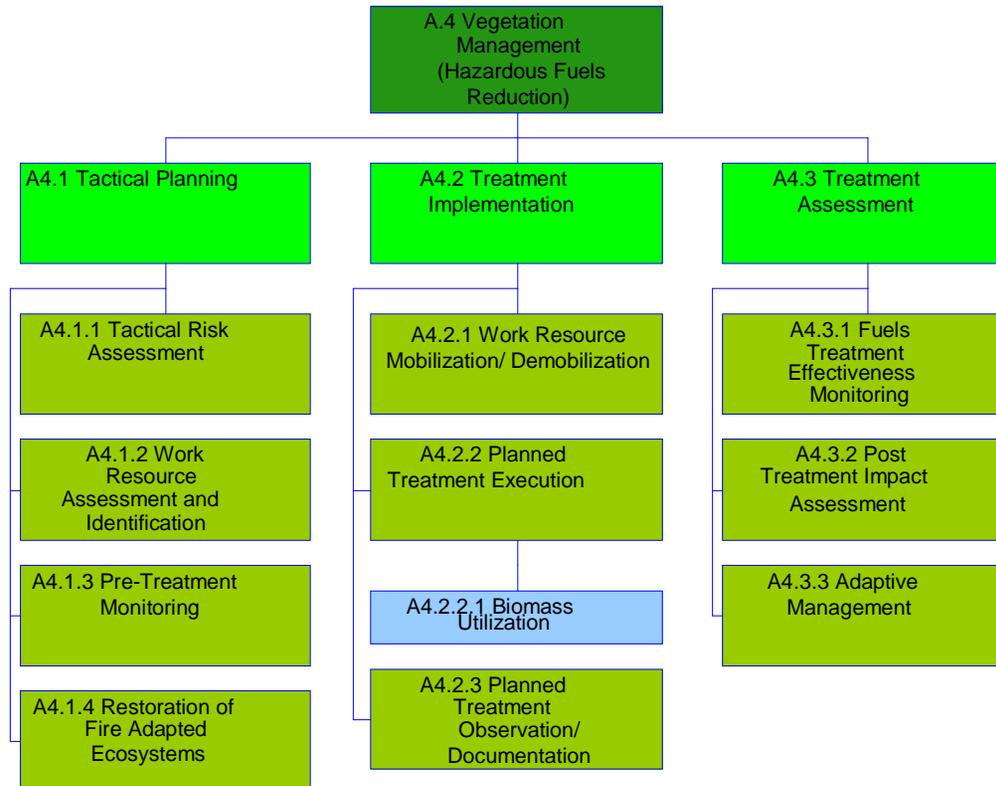


Figure 7 - Functional Model: Vegetation Management

## Vegetation Management (Hazardous Fuels Reduction) Functions

Vegetation Management concerns the manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage from and resistance to control of wildland fires, including ecosystem evaluation and balance. Lopping, chipping, crushing, piling, and burning are examples of fuels treatment.

Table 3 - Functions and Sub-Functions of Vegetation Management

Descriptions of Vegetation Management Functions			
Function	Function definition	Sub-Function	Sub-Function definition
A4.1 Tactical Planning	Development of a plan of action to achieve goals based on pre-existing plans and current conditions. This will include weather analysis, logistics, personnel, equipment, etc...	Tactical Risk Assessment	<p>Assessing the levels of hazardous fuels and determining risks and feasibility of treatment.</p> <p>Complexity Analysis (H M L)</p> <p>Fire Behavior, Fuels, Social/Political Concerns.</p> <p>For Prescribed Burns...</p> <p>Type 1, 2, or 3</p> <p>This will help determine the skills and qualifications needed to manage the burn.</p> <p>Also used to determine the particular treatment method to use...</p>
		Work Resource Assessment and Identification	<p>Determine resources (personnel, equipment, etc...) needed to accomplish the goals, as well as the availability of such resources.</p> <p>Contracting, agreements, and Task Orders...</p>

**Descriptions of Vegetation Management Functions**

Function	Function definition	Sub-Function	Sub-Function definition
		Pre-Treatment Monitoring	Measure the current state of the treatment area based on the objectives defined.  Species Composition, Population, Structure, and Distribution....
		Restoration of Fire Adapted Ecosystems	Providing technical expertise, funding, advice, etc...
A4.2 Treatment Implementation	The setup, monitoring, and application of either mechanical, chemical, biological, manual, or fire to reduce the flammability and resistance to control of wildland fuels, and when applicable, biomass utilization.	Work Resource Mobilization/Demobilization	Mobilizing and Demobilizing resources for the planned treatment.  Would include contingent resources containing/suppression etc...
		Planned Treatment Execution	Application Mechanical, Manual, Chemical, biological, or Fire.
		Planned Treatment Observation/Documentation	Fire Effects Monitoring, Contracting Officer Representative (COR or COTR (tactical)) Daily Diaries (SF?), etc...
A4.3 Treatment Assessment	The evaluation and interpretation of the degree of effectiveness of the treatment, and identifying any follow on action required.	Fuels Treatment Effectiveness Monitoring	Assessing the results of the treatment. This could be anywhere from 1 day to a year depending on the goals. Short-Term
		Post Treatment Impact Assessment	Looking for unwanted impacts, and or side effects of the treatment. Long Term effects from a year out...

Descriptions of Vegetation Management Functions

Function	Function definition	Sub-Function	Sub-Function definition
		Adaptive Management	<p>Any activity to mitigate unwanted impacts or side effects of the treatment. For example press releases, property repair, livestock replacement, etc....</p> <p>Will also include identifying additional or alternate treatments if needed.</p> <p>Could be for a single treatment or for multiple treatments either over time or within a given area.</p>

## Wildland Fire Management Functions

Wildland Fire Management refers to the planning, preparedness, dispatch, coordination, on-scene management of any unplanned event, investigation of an unplanned wildland fire event, and post-wildfire recovery.

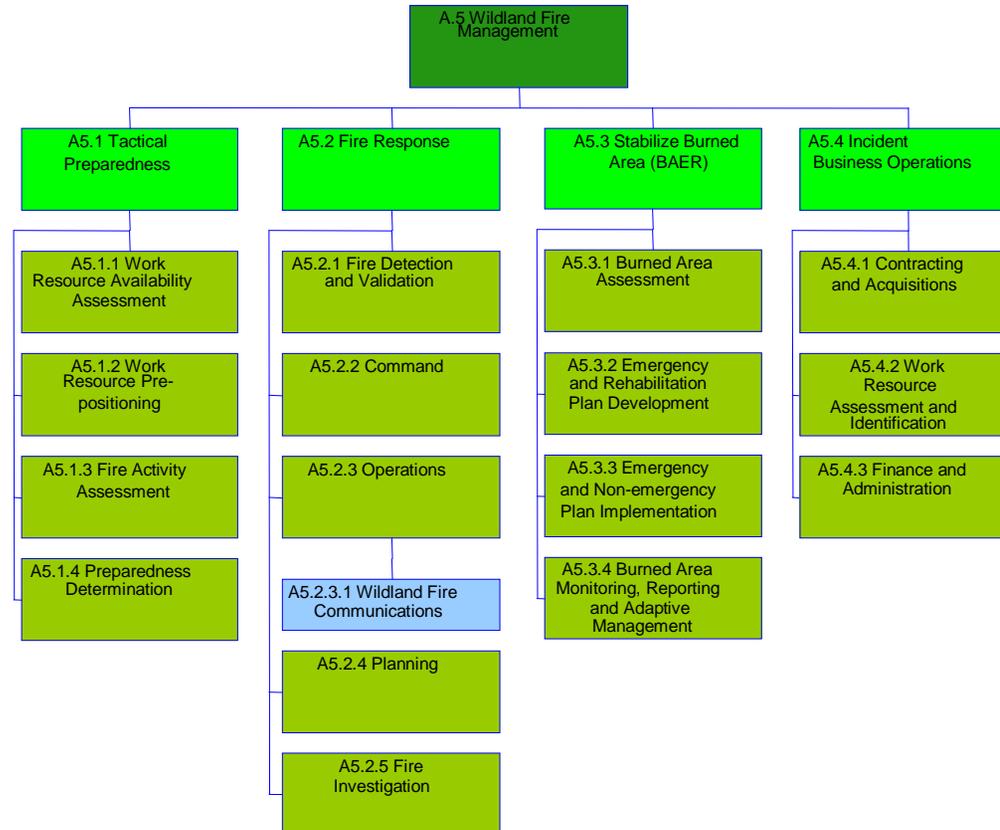


Figure 8 - Functional Model: Wildland Fire Management

## Wildland Fire Management Functions

Wildland Fire Management refers to the planning, preparedness, dispatch, coordination, on-scene management of any unplanned event, investigation of an unplanned wildland fire event, and post-wildfire recovery.

Table 4 - Functions and Sub-Functions of Wildland Fire Management

Descriptions of Wildland Fire Management Functions			
Function	Function description	Sub-Function	Sub-Function description
A5.1 Tactical Preparedness	Managing for the current preparedness level. The range of critical tasks and activities necessary to build, sustain, and improve the capability to protect against, respond to, and recover from wildland fire incidents.	Work Resource Pre-positioning	
		Work Resource Availability Assessment	The availability of all resources (personnel, equipment, supplies, and aircraft).
		Fire Activity Assessment	Intelligence Service
		Preparedness Determination	Determined at the Geographic Area, as well as the National level...
A5.2 Fire Response	Specific tactical actions taken in response a wildland fire. This includes following policy and procedures for command and control, operations, planning, resources, and recovery.	Fire Detection and Validation	Act or system of discovering and locating fires.
		Command	
		Operations	
		Planning	

Descriptions of Wildland Fire Management Functions			
Function	Function description	Sub-Function	Sub-Function description
		Fire Investigation	The process of determining the ignition source, materials first ignited, ignition factors, and party responsible for a wildland fire.
A5.3 Stabilize Burned Area (BAER)	Assessing burned area damages and developing emergency plans to stabilize and prevent further degradation to the post wildfire environment. Implementing approved emergency and non-emergency post wildfire recovery plans with available funding.	Burned Area Assessment	
		Emergency and Rehabilitation Plan Development	
		Emergency and Non-emergency Plan Implementation	Resource Acquisition, Public Safety Notifications, and Treatments...
		Burned Area Monitoring, Reporting and Adaptive Management	Treatment effectiveness monitoring, and reporting that information for things such as lessons learned, etc...

**Descriptions of Wildland Fire Management Functions**

Function	Function description	Sub-Function	Sub-Function description
A5.4 Incident Business Operations	The management of personnel, acquisitions, property, claims, cost accounting, and reporting.	Contracting and Acquisitions	National or local contracts, and or acquisition for equipment, services, and crews. Both for stand-by availability and or cache and equipment stocking. These come from preparedness dollars, not billed to incident.
		Work Resource Assessment and Identification	Determine resources (personnel, equipment, etc...) needed to accomplish the goals, as well as the availability of such resources.  Contracting, agreements, and Task Orders...
		Finance and Administration	

## Business Operations Functions

Business Operations refers to the daily operations required for running the Wildland Fire organization.

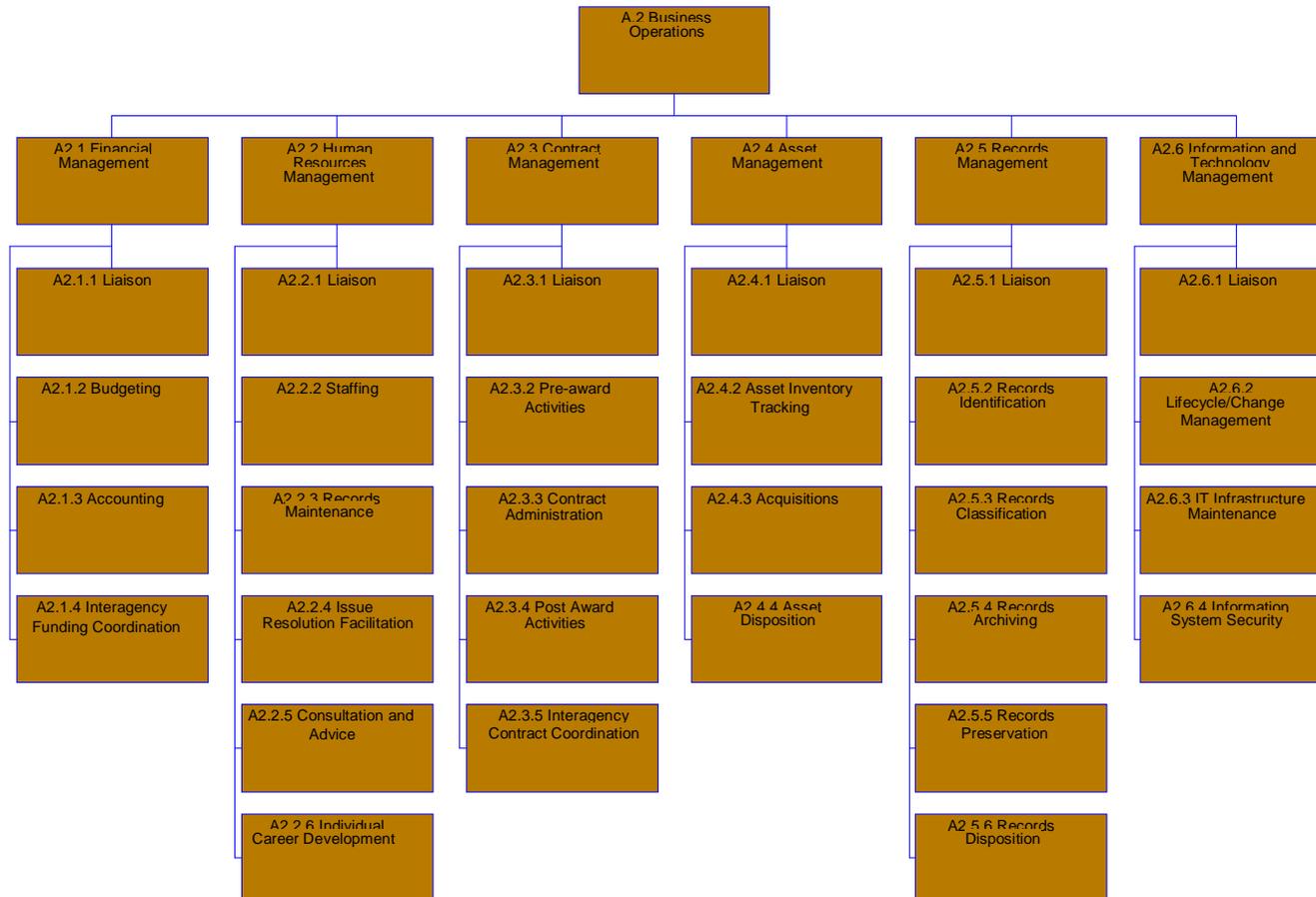


Figure 9 - Functional Model: Business Operations

Table 5 - Descriptions of Business Operations Functions and Sub-Functions

Descriptions of Business Operations Functions			
Function	Function description	Sub-Function	Sub-Function description
A5.1 Financial Management	Budgeting, and Accounting activities conducted in the day to day, and year to year operation of Wildland Fire.	Liaison	
		Budgeting	Re-Negotiation and Re-Allocation of the budget throughout the year...  Tracking, Execution, Maintenance, etc...
		Accounting	
		Interagency Funding Coordination	This is applying the interagency algorithm and distribution of appropriations...
A5.2 Human Resources Management	The policies and procedures involved in managing people within the Wildfire community.	Liaison	
		Staffing	
	Records Maintenance		
	Issue Resolution Facilitation		
	Consultation and Advice		
	The theoretical and practical techniques of managing a workforce.	Individual Career Development	

**Descriptions of Business Operations Functions**

<b>Function</b>	<b>Function description</b>	<b>Sub-Function</b>	<b>Sub-Function description</b>
A5.3 Contract Management	The maintenance and management of contracts required for day to day operations and preparedness of the Wildland Fire program.	Liaison	
		Pre-award Activities	Requirements Preparation
	Contract Administration		
	Post Award Activities	Orientation, Administration of Property, Monitoring of Performance, Inspection and Acceptance, Payment, and Close out.	
	Interagency Contract Coordination		
A5.4 Asset Management	The management of items, objects and property used to support the activities required to keep the organization functional. Types of assets are Fixed, Intangible, personal property and equipment.	Liaison	
		Asset Inventory Tracking	
		Acquisitions	
		Asset Disposition	
A5.5 Records Management	The practice of identifying, classifying, archiving, preserving, and destroying records.	Liaison	
		Records Identification	
	ISO 15489 (2001) - The field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use and disposition of records, including the processes for capturing and maintaining	Records Classification	
	Records Archiving		
	Records Preservation		

**Descriptions of Business Operations Functions**

<b>Function</b>	<b>Function description</b>	<b>Sub-Function</b>	<b>Sub-Function description</b>
	evidence of and information about activities and transactions in the form of records.	Records Disposition	
A5.6 Information and Technology Management		Liaison	
		Lifecycle/Change Management	
		IT Infrastructure Maintenance	
		Information System Security	

## Relationship of Wildland Fire Functions to the OMB Business Reference Model

The following model demonstrates the relationship that Wildland Fire core business functions have to the OMB Federal Enterprise Architecture reference models:

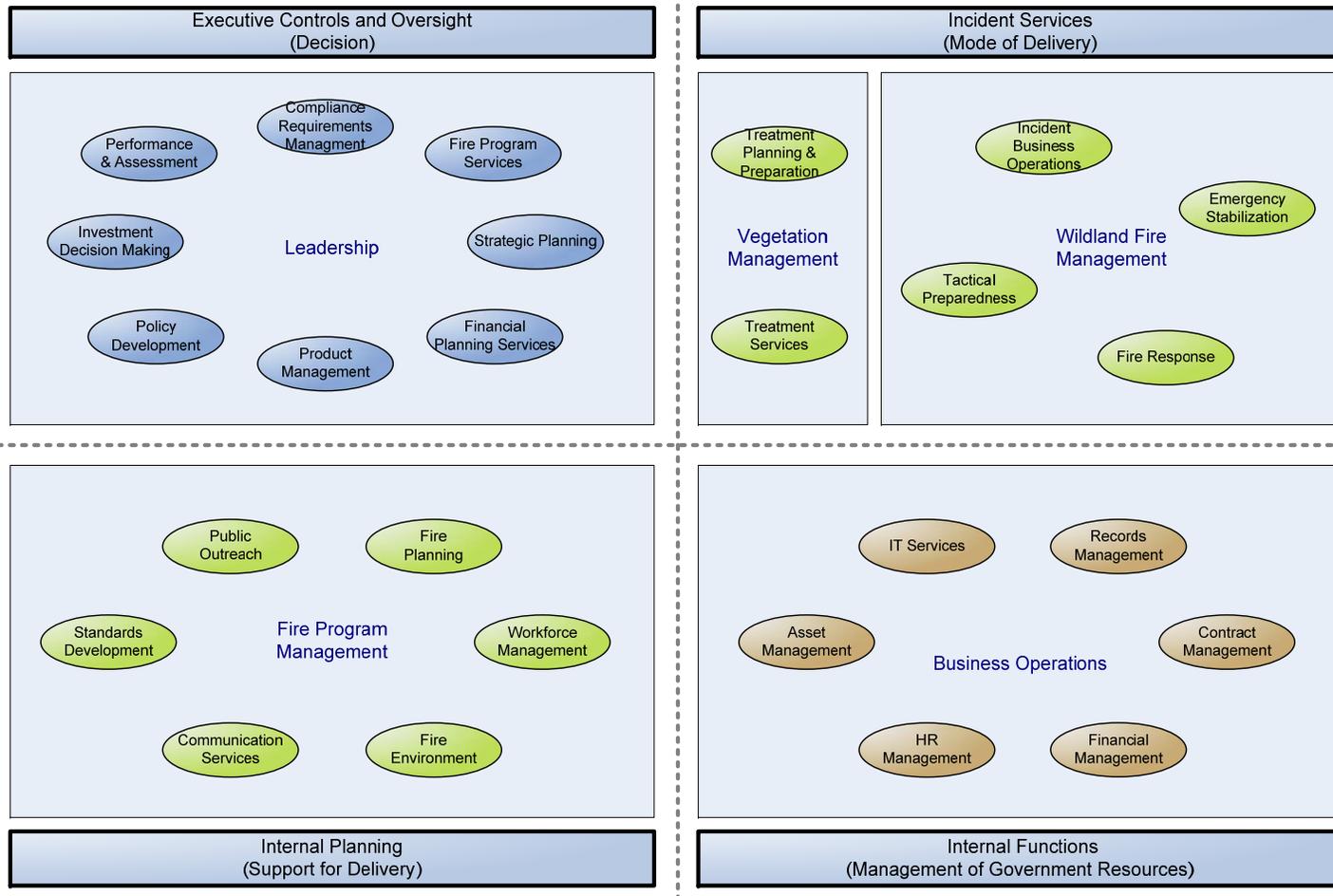


Figure 10 - Relationship of Wildland Fire Functions to the OMB Business Reference Model

# STAKEHOLDER ANALYSES

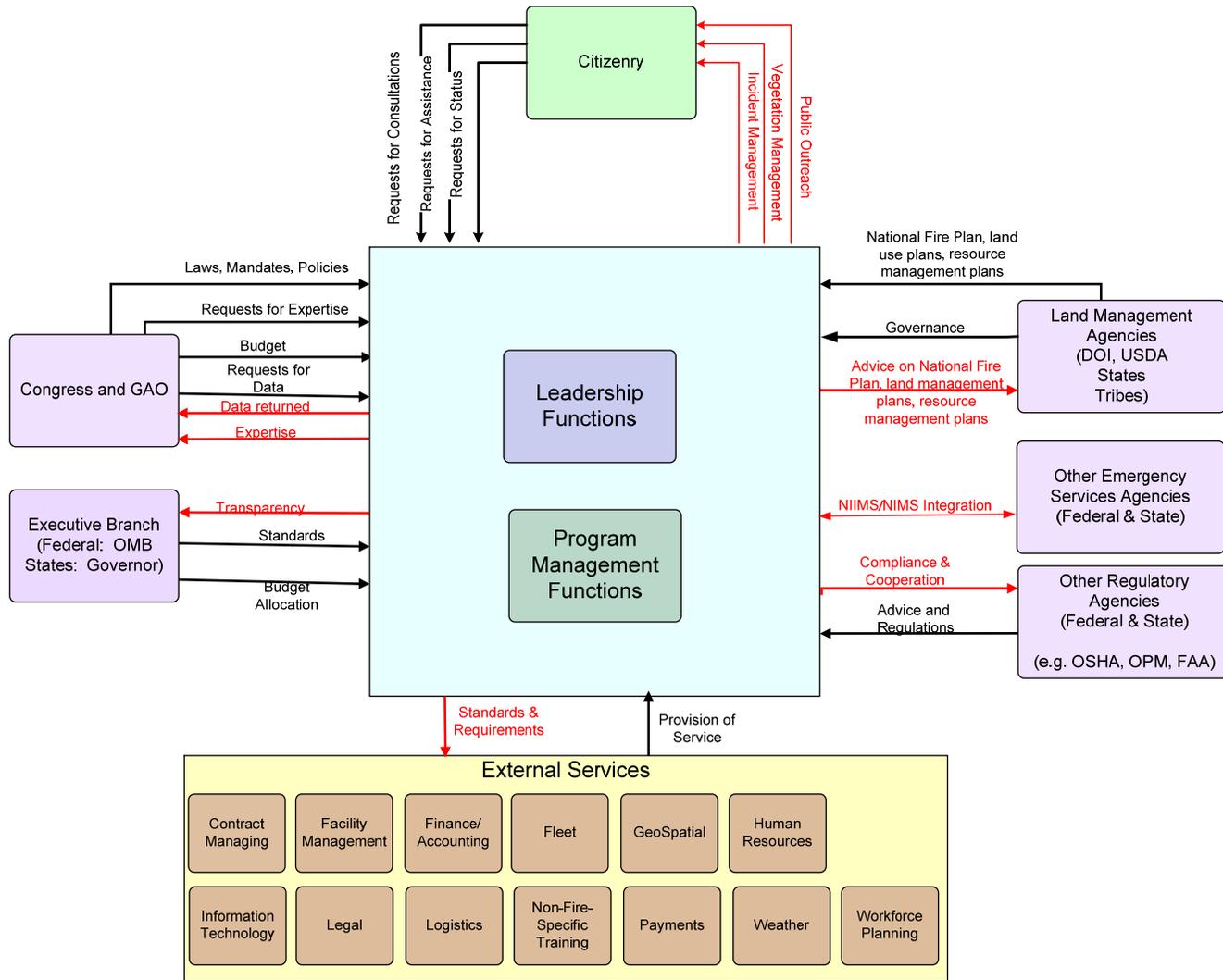


Figure 11 - Combined Strategic Exchanges of Wildland Fire

DRAFT

## ***Stakeholder Analysis 1: Strategic Exchanges***

There are two main groups of functions; 1) Leadership, and 2) Program Management (Fire Program Management, Vegetation Management, and Wildland Fire Management) that participate in a number of Strategic Exchanges with stakeholders. These exchanges together form a value network. In the commercial world, value networks are considered to consist of groups of companies working together to produce and transport a product to the customer. In the government world, the value networks consist of groups of agencies, service providers, and others that work together to deliver results. Relationships among customers of a single agency are examples of how value networks can be found in any organization. Organizations can link their customers together by direct methods like the telephone or indirect methods like combining customer's resources together.

The purpose of value networks is to create the most benefit for the people involved in the network. The intangible value of knowledge within these networks is just as important as a monetary value. In order to succeed, knowledge must be shared to create the best situations or opportunities. Value networks are how ideas flow into the market and to the people that need to hear them.

### **Strategic Exchanges inside the Wildland Fire Community**

The two groups of functions within Wildland Fire, the Leadership Functions and the Program Management Functions, stand in mutual stakeholder relationship. Together they form Wildland Fire as it is seen from the outside. Wildland Fire as a whole interacts with three major classes of stakeholder: the various branches of government, the citizenry, and its external service providers.

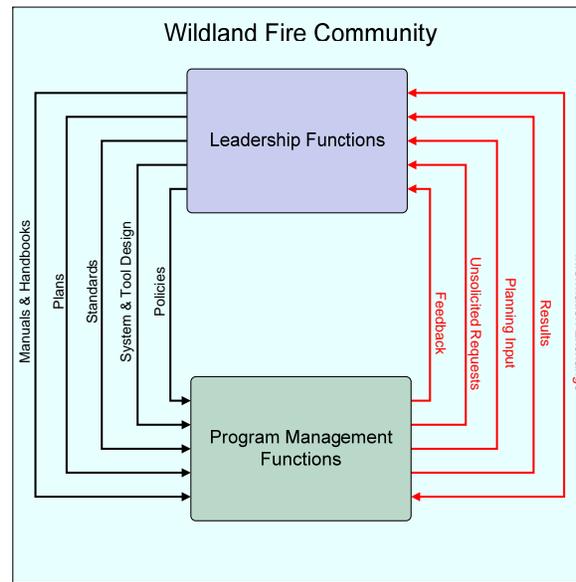


Figure 12 - Internal Exchanges between Leadership and Program Management Functions

The strategic interchanges seen in Figure 12 describe the relationships between the Business and the Program Management Functions. The Leadership Functions provide the Program Management Functions with Manuals and Handbooks, Plans, Standards, System and Tool Design, and Policies. In other words, it provides management and leadership services to the Fire Program Management Functions.

- *Manuals and Handbooks* describe how those dealing with operational issues, whether proactive or reactive, should carry out their responsibilities
- *Standards* bind the community together, ensuring that all operational teams are working within the same set of presuppositions. While some standards go across agency boundaries, some remain only within the single agency or Department – for example, qualifications for being allowed to drive rolling stock
- *System and Tool Design* are also forms of standard, laying out the kinds of equipment or software the operations teams should use in their work
- *Policies* about training, qualifications, AMR, on-site management, and so forth, result from decisions made in the Leadership Functions
- In return, the Program Operations provides Feedback, Unsolicited Requests, Planning Input, and Results to the Leadership Functions

- *Feedback* allows change to occur in reaction to policies, designs, or standards that the Leadership Functions has provided, giving insight into how effective those instructions are, and whether they need to be refined
- *Unsolicited Requests* are innovations arising from operational experience where there is no standard or design, but those with operational responsibilities believe there should be
- *Planning Input* is the information the Program Management Functions provides to setting the annual fire plan based on its own field and research experiences
- *Results* are the direct outcomes of the demands made on the Program Management Functions by the Leadership Functions.
- Finally, there is a reciprocal *Exchange of Information* between the Business and Program Management Functions concerning operations, methods, and other matters of mutual interest

## Strategic Exchanges Between Wildland Fire and Government Bodies

The wildland fire community as a whole interacts strategically with other governmental bodies, as seen in Figure 13.

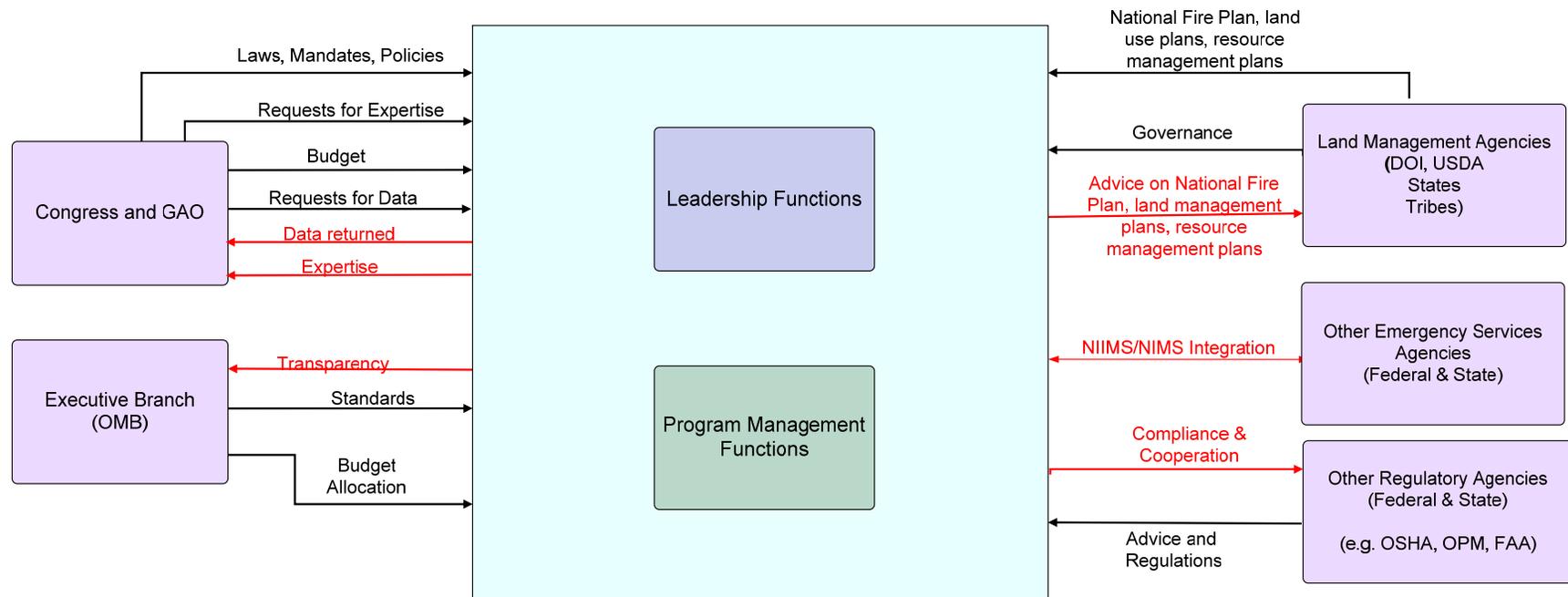


Figure 13 - Exchanges between the Fire community and Governmental Bodies

In turn these are:

- Congress and the GAO. Congress enacts laws, policies and mandates; it requests expertise in its decision making; it provides budget; and it requests data to understand issues concerning Fire. In return, Wildland Fire provides the needed expertise, and the data needed to inform Congress about Fire
- Executive Branch. The OMB arranges for allocation of the federal government budget that the Congress has enacted; and sets standards (such as Enterprise Architecture) that foster compliance to such laws as the Clinger-Cohen Act. Each state has some form of Executive

Branch that performs the same functions. The interface with the Executive Branches provides transparency of how Government Agencies, including the wildland fire community, operate, and how they spend the money allocated to them

Government-owned land is primarily managed by the USDA, the DOI, the 50 states and U.S. Territories, and individual Native American tribes. The DHS also partners with Wildland Fire in emergency response services.

Other agencies (such as Environmental Protection Agency, Occupational Safety and Health Agency, Office of Personnel Management, the Federal Aviation Administration, and state agencies) provide advice and regulations. Wildland Fire returns compliance and cooperation. Universities are another stakeholder in this area (though not agencies), providing research in return for earmarked funds.

## Strategic Exchanges between Wildland Fire and the Citizenry

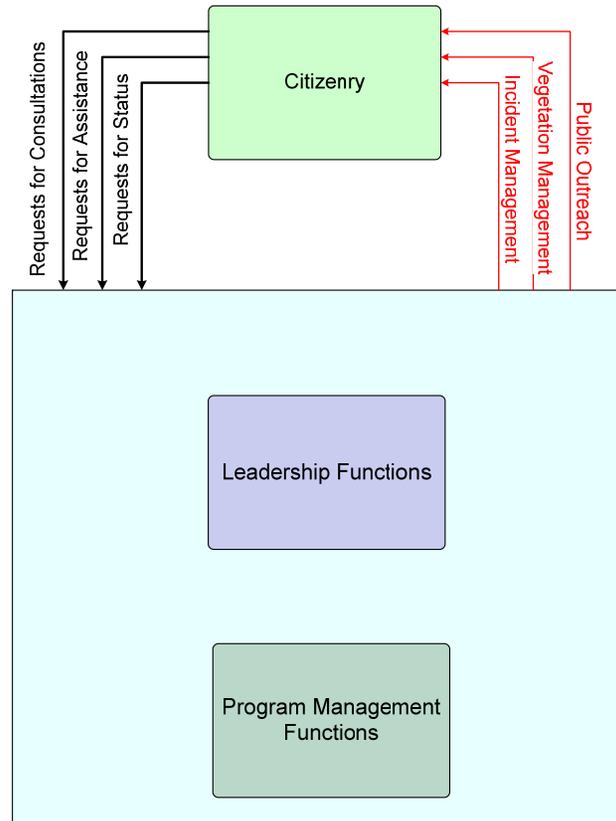


Figure 14 - Exchanges between the Fire community and Citizenry

In its interactions with the Citizenry, this figure illustrates the ways in which Wildland Fire is a service provider. (The Citizenry includes the general public, media, professional organizations, and contractors). Wildland Fire provides the Citizenry with

- Public outreach (proactive campaigns, news briefings, assistance in dealing with WUI issues);
- Vegetation Management (including biomass reduction); and

- Incident management, both to manage publicly held lands and to protect private property on the WUI

In return, the Citizenry

- Requests consultations on fire prevention, awareness, and preparedness;
- Requests assistance for fires on Federally-owned property, or fires covering over 5000 acres; and
- Requests status, either for general knowledge (such as news reports), or for specific danger (for people whose property is directly threatened)

## Strategic Exchanges between Wildland Fire and its External Service Providers

The relationship between Wildland Fire and its external service providers is quite straightforward: Wildland Fire requests service through requirements that specify its standards; the service providers provide it.

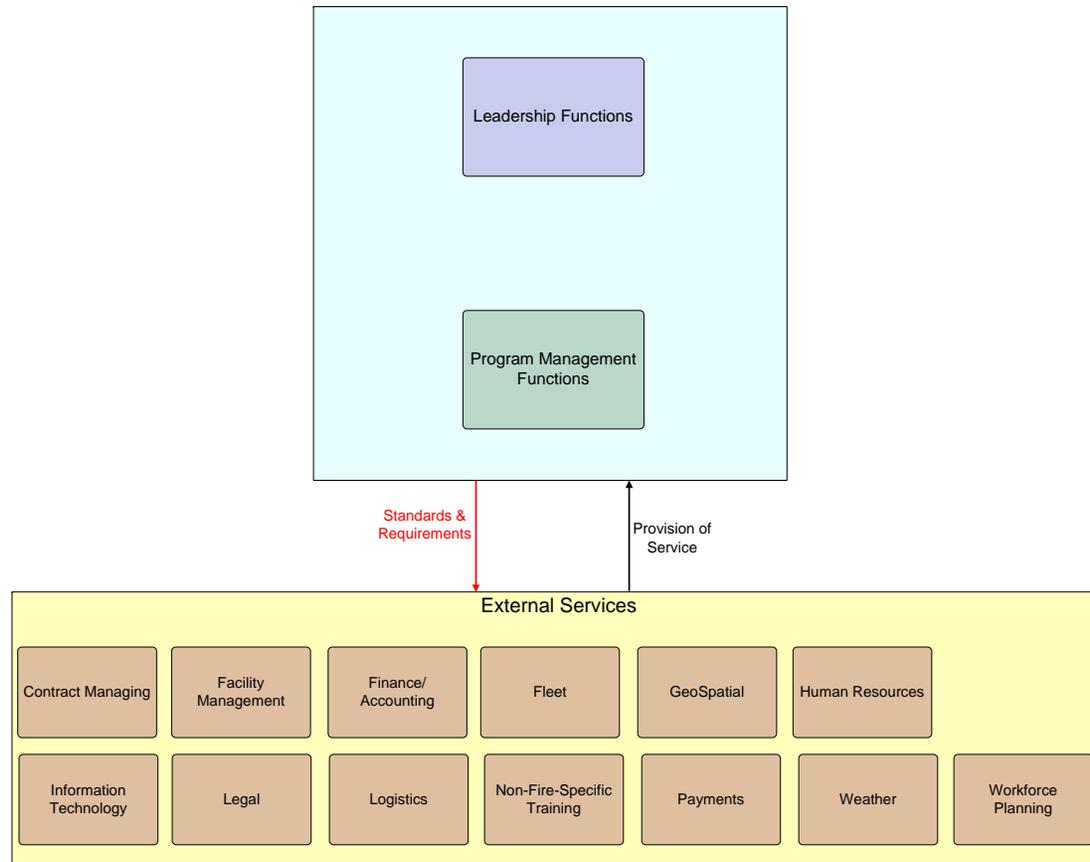


Figure 15 - Exchanges between the Fire community and its External Service Providers

**Stakeholder Analysis 2: Hierarchy of Stakeholders**

The Stakeholder Analysis identifies the bonds between the various stakeholders and Wildland Fire. If there is competition for resources, it designates whose demands are met first. The Stakeholder Hierarchy diagram in Table 6 shows the strength of the relationship between Wildland Fire and each stakeholder based on the function being performed. Within Wildland Fire Leadership functions, high-level government officials are the primary stakeholders, while the primary stakeholders of the operational functions are Citizenry and the internal wildland fire community. In wildland fire management, the safety of the firefighter always takes precedence over the needs of other stakeholders.

**Table 6 - Stakeholder Hierarchy Based on Functions (High, Medium, Low)**

Stakeholder		Function(s)				
		Leadership	Fire Program Management	Vegetation Management	Wildland Fire	Business Operations
Primary Stakeholders	Congress & GAO	H	M	L	L	L
	Executive Branch	H	M	L	L	L
	Citizenry	L	L	M	H	L
	Land Management Department/Agency Leaders	H	H	M	M	M
	Other Emergency Services Partners	L	L	L	M	L
	Other Regulatory Agencies	M	H	M	L	M
	External Services	L	L	L	M	H
	Internal wildland fire leadership	H	H	H	H	M
	Internal wildland fire community (including field operations and firefighters)	M	H	H	H	H

## THE PROCESS VIEW OF WILDLAND FIRE

While the Functional Model describes the primary activities performed by Wildland Fire, a Process Diagram adds context by describing the sequence, inputs, and outputs of Wildland Fire processes.

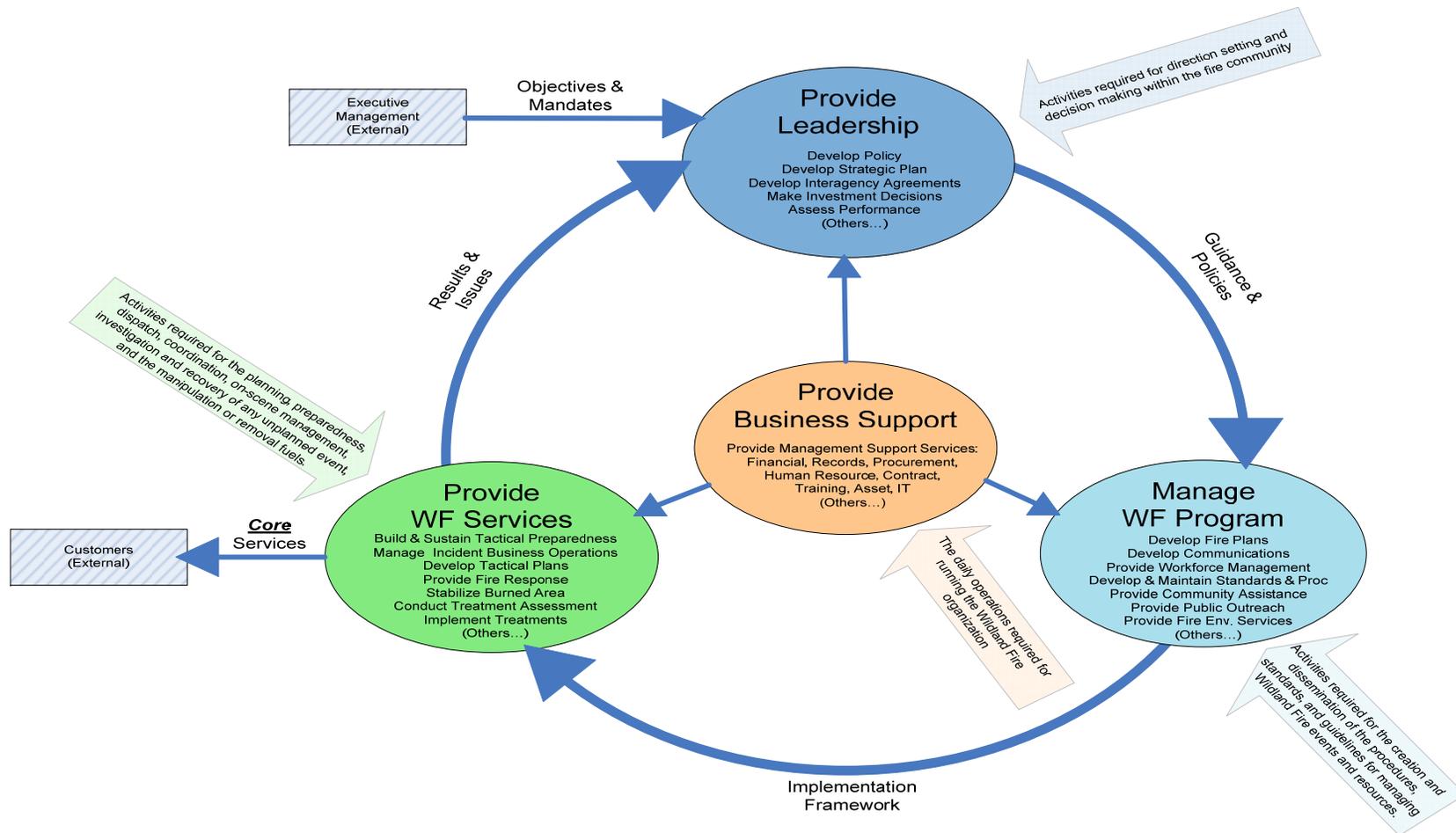


Figure 16 - Process View of Wildland Fire

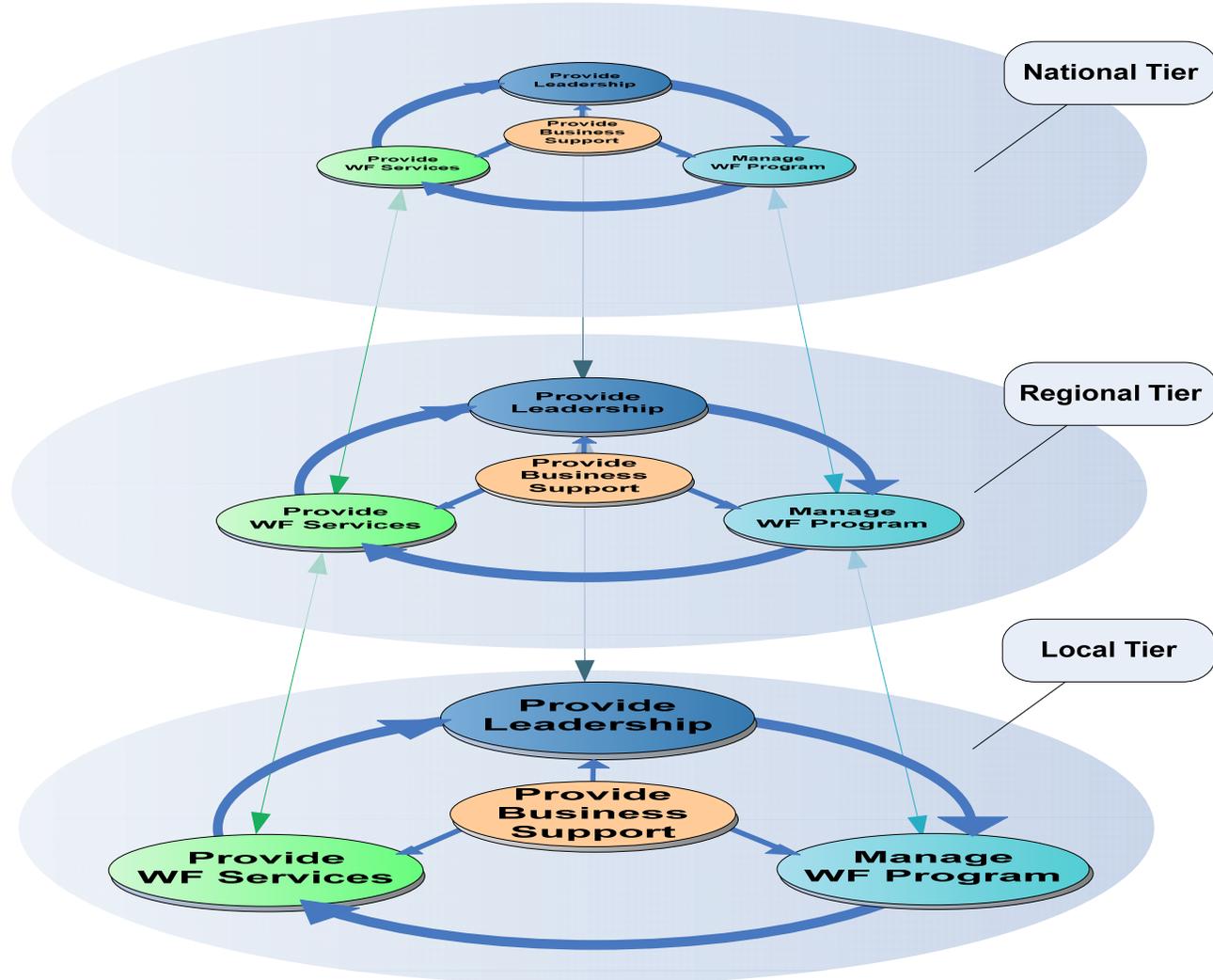
Within Wildland Fire, there are three tiers: 1) National, 2) Regional, and 4) Local. At each tier, there are distinct functions that support the other tiers. The following diagram illustrates these tiers.

Example activities at that occur at each level:

Develop National Strategic Plans, Develop National Standards, Perform National Outreach, Develop National Contracts, Deliver Reports to Congress, Develop National Training courses, Assess National Fire Situation and Set National Priorities, Provide Support for National Applications, etc.

Provide Regional Detail to National Goals, Develop Regional Budget Requests, Perform Regional Outreach, Develop Regional Contracts, Deliver Reports to the National Level, Geographic Area Coordination, Set Regional Fire Priorities Based on National Priorities, Provide Zone Forecasts, etc.

Establish Co-Op Agreements, Perform Public Outreach, Hire & Train Personnel, Perform Fuels Reduction, Provide Spot Forecasts, Assess Individual Fires and Set Priorities, Manage Local Assets, Perform Incident Support, Develop Local Contracts, etc.



## THE DATA THAT DESCRIBE WILDLAND FIRE

This section shows how Wildland Fire data maps to the functions of the enterprise described above.

Data is one of the top assets of an organization. Many decision-makers require only "data and fact" to solve problems their organizations face. However, these decision-makers cannot easily make decisions when there are inconsistencies in data. Therefore, a goal of data architecture is to provide a framework within which data quality is improved by managing the data as an asset.

Data management is a shared responsibility between the business data stewards serving as trustees of enterprise data assets and technical data stewards serving as the expert custodians and curators for these assets. Governance of the data management function coordinates this collaboration between the IT and business portions of the enterprise.

The Wildland Fire Data Architecture Program is intended to support a seamless data environment for the wildland fire community by facilitating and supporting the creation of effective and efficient data management techniques.

### ***Wildland Fire Data – Logical Data Modeling***

Data deemed most critical for a business function was identified during interviews with business function SMEs. The SMEs, most of who work at NIFC, typically are most familiar with the data as used at the national level. Further interviews with regional and field-level SMEs will be needed to gain a complete picture of the data in use at all levels of Wildland Fire.

The NWFEA project team developed the following model that shows the critical information classes and their relationships.

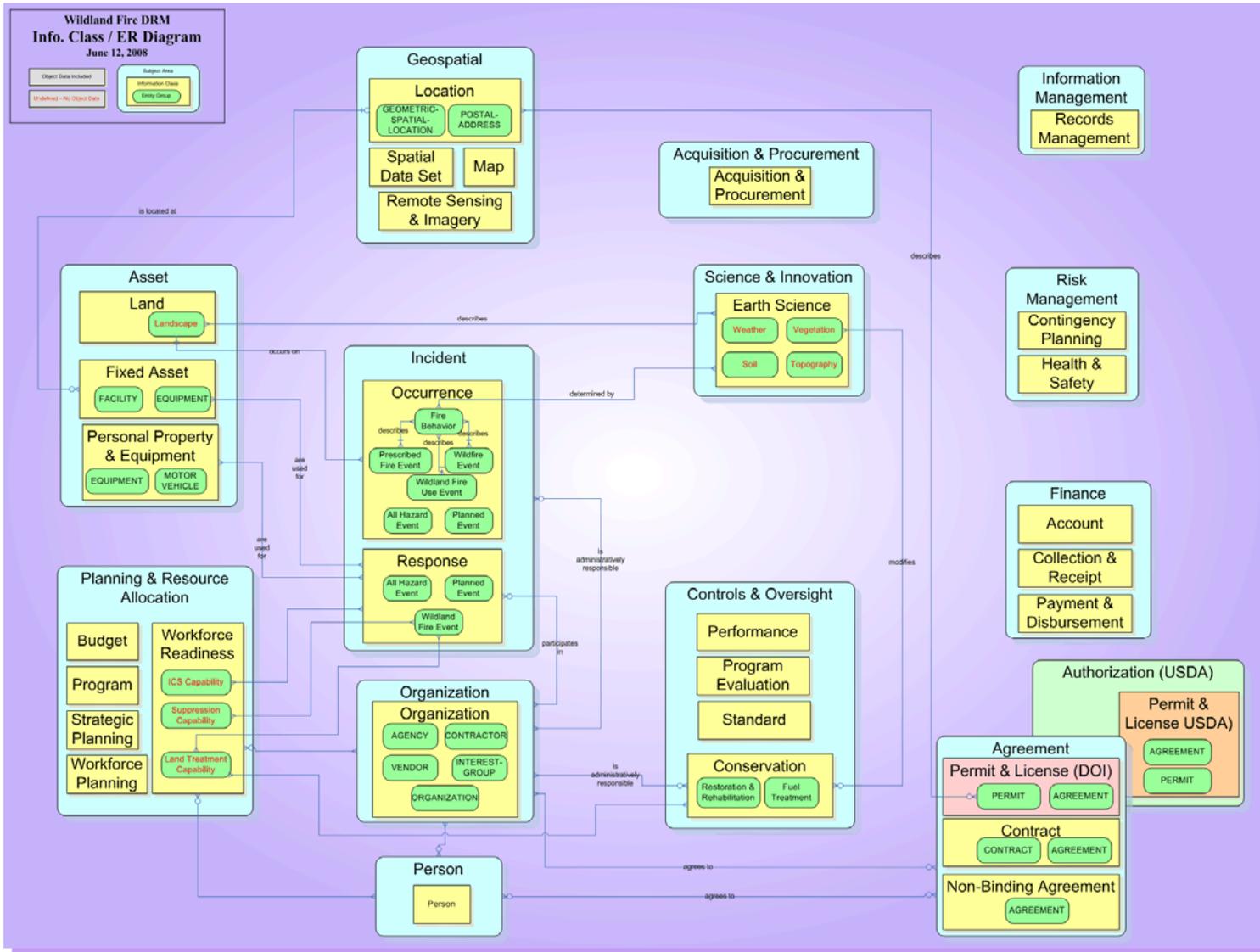


Figure 17 - Wildland Fire Information Class Diagram

Additional logical data modeling is being performed to provide more detailed data entities, attributes, and relationships and is available upon request from the NWCG Program Management Office.

While reviewing the logical data models, the SMEs were asked to identify the data created, updated, or simply read within their respective functions. This information was then documented in a Create, Read, Update, and Delete (CRUD) Matrix for each logical data model. This review process and CRUD matrix formulation is an ongoing activity as the work continues on developing and refining the logical data model. Table 7 shows a draft composite matrix for the data models reviewed to date.

When complete, an analysis of the matrix will reveal functional origins of data, as well as cross-functional use of data. Determining functional origins of data enables alignment of data stewardship to appropriate organizational units and helps determine authoritative data sources. Identifying heavy cross-functional use of data will be useful in prioritizing data standardization and system interconnectivity targets.

**Table 7 - Composite CRUD Matrix for Wildland Fire Data (Draft version)**

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
ACCIDENT								R	R	
ACTION ITEM		All		C						
ACTION PLAN		R	TBD							
AGENT TRADE NAME					TBD					
AGREEMENT								All	R	

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
AIR ANALYSIS MODEL							R			
AIRCRAFT PROBLEM								R	All	
ALERT						All				
ANNUAL INITIAL ATTACK PLAN									TBD	
ASSESSED VALUE AT RISK										R
ASSESSMENT				C						
ASSESSMENT ISSUE				TBD						
ASSIGNED WORK RESOURCE ACTIVITY								U	TBD	
ASSIGNMENT TYPE REF								R	R	
AVAILABLE RESOURCE LOCATION										All
BUDGET		All								
BUDGET ALLOCATION		All								

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
BUSINESS DRIVER				R						
CHEMICAL AGENT COMMON NAME REF					TBD					
CHEMICAL CONTROL ACTIVE INGREDIENT					TBD					
CHEMICAL CONTROL AGENT TYPE REF					TBD					
CHEMICAL ELEMENT							R			
CLIMATE OUTLOOK							R			
COLLECTION							All			
COMMUNICATION						All				
COMMUNICATION MECHANISM						All				
COMMUNICATION PLAN						All				
COMMUNICATION SENT PARTY						All				

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
COMPOUND							R			
COMPOUND CHEMICAL							R			
COMPUTER SYSTEM										
COOPERATOR								All	All	
DATA STANDARD	?									
DEAD FUEL MOISTURE MODEL							R			
DOI WILDLAND FIRE ACTIVITY REF		All								
EQUIPMENT					TBD			R	All	
EQUIPMENT CAPABILITY								R	All	
EQUIPMENT PARTY ROLE								R	All	
EQUIPMENT PROBLEM								R	All	
FEEDBACK						All				

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
FEEDBACK RESPONSE						All				
FIRE BEHAVIOR							R		R	
FIRE DANGER AREA							C			TBD
FIRE DANGER FORECAST REF							R			
FIRE DANGER RATING							R			All
FIRE FUEL TYPE REF									R	
FIRE INCIDENT							R	R	R	R
FIRE INCIDENT ACTIVE LOCATION									R	
FIRE INCIDENT ASSIGNED RESOURCE							R	R	R	
FIRE INCIDENT LOCATION							R		R	R
FIRE INCIDENT LOCATION PERIMETER									R	

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
FIRE INCIDENT OPERATION LOCATION							TBD	R	R	
FIRE INCIDENT ORIGINATION LOCATION									R	
FIRE INCIDENT PHASE REF									R	
FIRE INCIDENT PROJECTED LOCATION									R	
FIRE INCIDENT PUBLIC NOTICE							R			
FIRE INCIDENT RESOURCE ASSIGNMENT										All
FIRE INCIDENT RESOURCE EVALUATION								All	R	
FIRE INCIDENT RESPONSE STRATEGY									R	

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
FIRE POTENTIAL LOCATION							All			All
FIRE POTENTIAL REF							All			
FIRE TREATMENT COMPONENT									R	
FUEL LOADING REF									R	
FUEL MODEL							R			
FUEL MOISTURE REF							R			
GOAL BUSINESS DRIVER				?						
GUIDANCE		R								
INCIDENT						R			R	
INCIDENT ALERT						All				
INCIDENT CAUSE REF									R	
INCIDENT LESSON LEARNED									R	

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
INCIDENT NEEDED RESOURCE								R	R	
INCIDENT ORGANIZATION INVOLVEMENT										All
INCIDENT TYPE CAUSE REF									R	
INCIDENT TYPE REF									R	
INCIDENT WEATHER OBSERVATION									R	
INJURY/FATALITY INFO								U	U	
INTERAGENCY AGREEMENT		R								
INTERAGENCY AGREEMENT ORGANIZATION		R								
INTERNAL ORGANIZATION										All
INVESTMENT	C	R								

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
INVESTMENT CRITERIA REF	R									
INVESTMENT CRITERIA RESULT	?									
INVESTMENT ISSUE	R									
INVESTMENT PROPOSAL	C									
INVESTMENT TECHNOLOGY	?									
ISSUE	U				All		All			
LESSON LEARNED									R	
LIVE FUEL MOISTURE MODEL							R			
LOCATION							R		R	R
ORGANIZATION	TBD	R	R		R	R	R	R	R	R
ORGANIZATION COMPUTER SYSTEM										

<div style="text-align: center;"> <b>Business Function</b> </div> <div style="text-align: center;"> <b>Data Entity</b> </div>	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
ORGANIZATION INVESTMENT REQUIREMENT	R									
ORGANIZATION INVESTMENT ROLE	TBD									
ORGANIZATION PERSON								R	R	
ORGANIZATION POLICY ROLE					R					
ORGANIZATION PRACTICE ROLE					All					
PARTICULATE							R			
PARTY		R	R	R	R	R				
PARTY BUDGET NEGOTIATION ROLE		R								
PARTY BUDGET NEGOTIATION		All								
PERSON		R	R		R	R		R	R	

Business Function  Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
PLAN		R			R	All				R
PLANNED COMMUNICATION						All				
PLANNED COMMUNICATION AUDIENCE						All				
PLANNED COMMUNICATION FEEDBACK						All				
PLANNED COMMUNICATION MESSAGE						All				
PLANNED COMMUNICATION PRACTICE						All				
PLANNED COMMUNICATION PRIORITY						All				
PLANNED COMMUNICATION SENDING ROLE						All				

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
POLICY	R				R	R				
PRACTICE					All	All				
PRACTICE COMPONENT					All					
PRACTICE ISSUE					All					
PREDICTED SMOKE BEHAVIOR							R			
PREPAREDNESS LEVEL REF							All			All
PROCEDURE					All	All				
PRODUCT			All							
PRODUCT CATALOG			All							
PRODUCT DELIVERY MODE			All							
PRODUCT ELECTRONIC DELIVERY			All							
PRODUCT MEDIA			All							

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
PRODUCT PHYSICAL DELIVERY			All							
PRODUCT PUBLICATION			All							
PRODUCT ROLE			All							
PROPOSAL EVALUATION	C									
PROPOSAL WORK PROCESS	?									
PUBLIC NOTICE							R			R
RELATED INCIDENT									R	
RELATED PRACTICE					All					
RELEVANT RESEARCH					All					
REMOTE AUTOMATED WEATHER STATION							All			
RESOURCE FIRE INCIDENT LOCATION							R	R	R	

Business Function  Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
RISK ASSESSMENT						?				R
RISK IMPACT LOCATION										R
RISKED VALUE KIND REF								TBD	R	R
RISKED VALUE PUBLIC NOTICE										R
ROLE TYPE REF		R	R							
SECURITY POLICY	?									
SITUATION ANALYSIS				C						
SMOKE IMPACT ISSUE							R			
SMOKE IMPACT LOCATION							R			
SMOKE IMPACT LOCATON SUBSTANCE							R			
SOIL COLLECTION							R			

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
SOIL MOISTURE TYPE REF							R			
SPECIFIC COLLECTION SITE							All			
STANDARD					All	All				
STRATEGIC ACTION ITEM		All								
STRATEGIC ACTION ITEM ACTIVITY		All								
STRATEGIC BARRIER				All						
STRATEGIC INTENT					R					
STRATEGIC PLAN	R		R	C	R					
SUBSTANCE REF							R			
SUPPLY TYPE REF					TBD					
TRAINING COURSE			R		TBD					
TRAINING COURSE COMPONENT			U							

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
USDA WILDLANDFIRE ACTIVITY REF		R								
WEATHER CONDITION							All			
WEATHER FORECAST							R			
WEATHER OBSERVATION							All			
WILDLAND FIRE ACTIVITY BUDGET		All								
WILDLAND FIRE IMPLEMENTATION PLAN										TBD
WILDLAND FIRE INCIDENT RESPONSE PLAN										TBD
WILDLAND FIRE INITIAL RESPONSE PLAN										TBD
WILDLAND FIRE SITUATIONAL ANALYSIS										TBD

Business Function Data Entity	Investment Decision Making	Financial Planning	Product Management	Strategic Planning	Stds. and Proc. Maint. & Dev.	Communications	Fire Environment	Incident Business Operations	Fire Response	Tactical Preparedness
WORK ACTIVITY REF		All								
WORK RESOURCE							R	R	All	All
WORK RESOURCE AIRCRAFT								R	All	All
WORK RESOURCE AVAILABILITY										All
WORK RESOURCE CREW								R	All	R
WORK RESOURCE EQUIPMENT								R	All	All
WORK RESOURCE KIND REF								R	R	
WORK RESOURCE OVERHEAD								R	All	All
WORK RESOURCE SUPPLY								All	All	All
WORK RESOURCE TYPE REF								R	R	

**Information Model – the Virtual Data Warehouse of Managed Assets**

The structured collection of information needed by the wildland fire community to manage the tasks for which it is responsible revolves around land assets. Each asset has an exact location, is subject to weather patterns, and possibly has fuel vegetation growing on it.

Assume it were possible to represent the managed lands of the United States as a set of managed assets (MA). Each MA corresponds to a cell on a grid of the United States:

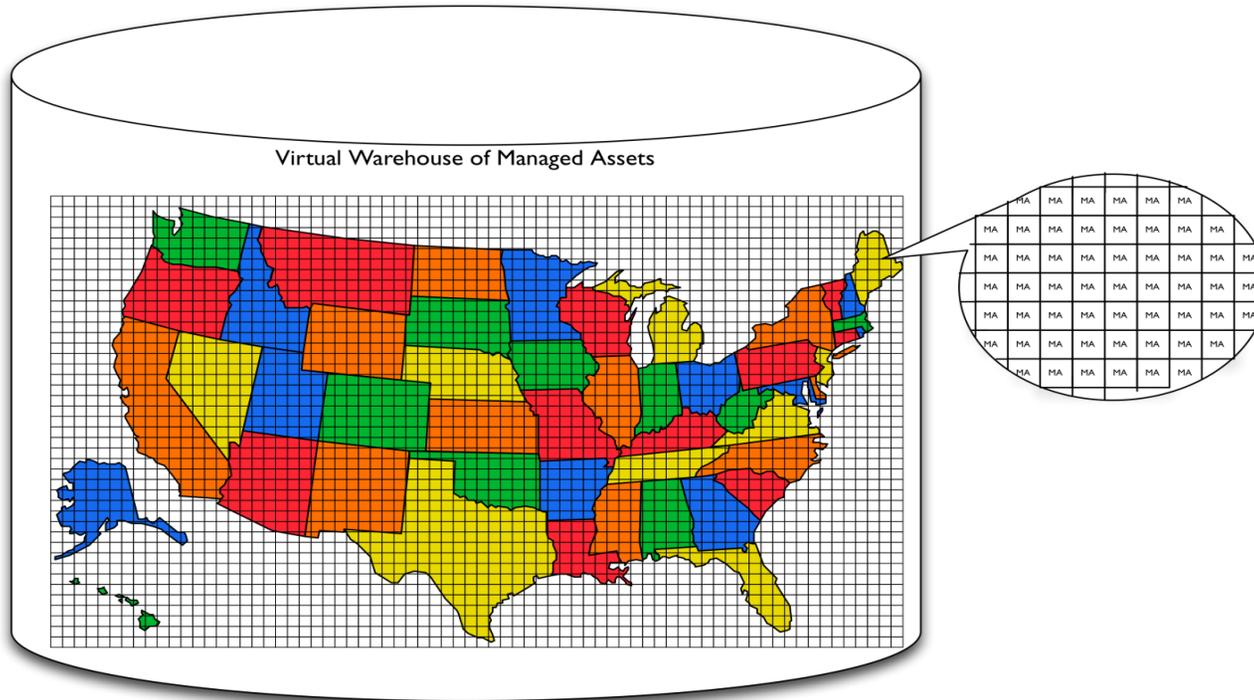


Figure 18 - Wildland Fire Information as a Virtual Data Warehouse

Like any collection of information, the Virtual Warehouse needs to be supplied with fresh observations, and it needs to be able to supply the correct data to fill the needs of the different people who want to view it. Many data collection mechanisms are available to the wildland fire community. A small sampling includes:

- RAWs (Remote Automated Weather Station – responsible for housing environmental, weather and other sensors)
- ASCADS (Automated Sorting, Conversion, and Distribution System – aggregates RAWs information from multiple stations)
- LANDFIRE (vegetation input)
- Active Fire (human observation)
- Geospatial (GPS locator of people, equipment)
- Satellite imagery – showing roads, houses, erosion
- Human sensory perception
- Wildlife demography studies

Views on the database correspond to the kinds of roles played by those involved in Wildland Fire. For example, those who work on the annual fire plan need historical information combined with weather forecasts, vegetation, topology, and current habitation patterns. Those involved in dispatching resources need to know where resources are deployed at the moment, and whether they can be moved to a new location. Typically, these views are realized as Wildland Fire applications.

Conceiving of Wildland Fire's information in this way provides a single backdrop against which one can compare the functions of the various computer applications different constituent members bring to the table. Where do they fit in the overall plan? How do they compare to one another? What kinds of data collection, data storage, or data presentation are missing? What kinds are over-represented? A number of dimensions describe each asset (on some appropriate scale such as acre-by-acre):

Table 8 - Examples of dimensions of Wildland Fire Information

<b>Real-Time</b> (data that change moment by moment, e.g., weather)	<b>Current</b> (data that change more gradually, e.g., roadways)	<b>Static</b> (data that are fixed, e.g., geographic coordinates)	<b>Historical</b> (record of previous readings of Real-Time and Current data)
Temperature	Topology	Location	Temperature
Humidity	Fuels	Elevation	Fuels
Smoke density	AMR	Archeological sites	Smoke density
Fire line	WUI line	Wildlife habitat	WUI line
Location and disposition of qualified resources	Inventory of qualified resources	Terrain	Inventory of qualified resources

No single warehouse of data actually exists to hold all this information. Rather, this model represents that the information critical to delivering the services of Wildland Fire must comprise real-time, current, static, and historical records about the conditions of the environment where the fire is occurring or could occur.

In fact, the databases that house most of the information are not well coordinated, inasmuch as they duplicate each other's data, and do not follow a single consistent data model. Of all the findings related to this lack of coordination, three critical issues facing the wildland fire community today come to the fore:

- shared geospatial standards and data (standardized data conventions, standard GIS qualifications, shared databases);
- consistent weather information, both in terms of how and where it is collected, as well as how it is represented; and
- consistent active fire reporting, which would provide a single authoritative source for viewing the lifecycle of a given fire

Shared use of geospatial standards and data are critical to the ability to give common reference to the location of a fire and its current status.

Incompatible GIS conventions, GIS experts with different training and assumed knowledge, and dislocated databases hinder this ability.

Multiple weather systems that collect information differently, from different perspectives, and represented in incompatible ways stand in the way of understanding the conditions surrounding either a current or past incident. Multiple weather systems that collect identical information beg the question of why it is worth maintaining and operating essentially duplicate systems.

Many audiences – e.g., news media, citizens, Congress, state and local governments, incident commanders – need a single authoritative voice that tells the current state of a given wildfire. They may each need somewhat different views of the information, but the information must be consistent.

### ***Data Discussion***

Data architecture is based on business goals and objectives, technical goals and objectives, and the desired state definitions of the other technical (e.g., platform) and functional architectures (i.e., applications). It is the organization's expression of strategy for creating and managing the use of data in order to transform data into information.

Recognizing that data is a strategic asset that is expensive to handle and easy to waste, the data architecture must support:

- Standardization of data structures (logical and physical)
- Definition and protection of the data resource
- Consistency and quality of the data resource
- Judicious use of corporate resources (e.g., personnel) in managing the data asset
- Credible and timely data delivery throughout the enterprise at a reasonable cost

The data architecture must also ensure that it can be:

- Driven by the needs of business and can adapt to changes in the business
- Implemented in any technical environment

## THE SYSTEMS THAT SUPPORT WILDLAND FIRE

### *The Wildland Fire Systems*

The purpose of this section is to provide a high-level view of the systems and the governance structures utilized by Wildland Fire. This section also provides preliminary assessments of how well these systems support the needs of the wildland fire community.

#### IT System Governance

Due to the critical response needs of the fire environment, many of the agency wildland fire programs have an internal national fire IT program. These fire IT programs report to their agency's fire leadership, and provide agency and interagency fire IT services. They also work closely with the agency Office of the Chief Information Officer (OCIO). The OCIO creates IT policies and standards that meet the needs of the agency, and the fire IT program is expected to comply. The fire IT programs provide an interface between the wildland fire community and the OCIO to ensure that the agency and interagency Wildland Fire needs are considered in the policy- and standard-making processes. The fire IT programs provides national oversight over the agency's wildland fire IT portfolio.

The National Wildfire Coordinating Group (NWCG), which coordinates the development of interagency standards and guidelines, has created an Information Resource Management (IRM) group consisting of fire information technology (IT) managers from all of the Wildland Fire cooperating agencies. This group facilitates the development of fire systems from an interagency perspective and facilitates the resolution and/or escalation of interagency IT issues. The NWCG has also created a Program Management Office that develops project management standards and guidelines for interagency Wildland Fire system development projects.

The development and use of Wildland Fire systems is complicated by the need to operate the systems in an interagency environment which includes both office and fire incident settings. While Wildland Fire systems have been developed and are maintained by single-agency managing partners, the use and funding of many of these systems is interagency.

Issues regarding IT governance cause problems in the overall management of Wildland Fire systems. The interagency wildland fire community faces continual challenges in setting priorities and funding the plethora of proposed and existing systems. Since many of these systems are funded out of the overall Wildland Fire budget, the dollars directed toward development and maintenance of IT systems directly competes with providing other emergency resources to the field. Interagency fire leadership would like more collaboration with agency Investment Review

Boards to ensure that IT funding decisions consider interagency needs and priorities in addition their own agency-specific needs. Likewise, fire leadership needs to have input in the decisions regarding the continued support and maintenance of fire systems.

Issues related to the role and authority of agency managing partners in interagency Wildland Fire system development projects also provide challenges. When a project is chartered by NWCG, these fire leaders expect to be involved in the decision process at key milestone (go/no-go) points. NWCG has developed project management guidelines that outline the key deliverables required from interagency projects as well as their required reporting structure. These guidelines include go/no-go approval by the NWCG, yet project managers, (who work for the managing partner), are sometimes allowed to proceed through the agency system development life cycle process and by-pass go/no-go concurrence from the chartering interagency body.

### Business Stewardship for Fire IT Systems

The NWCG organization includes interagency committees that focus on specific Wildland Fire business subject areas. For each NWCG-sponsored interagency system, one or more of these interagency committees are designated to provide business stewardship over the system. Examples of business stewardship for currently deployed Wildland Fire systems include:

Table 9 - Wildland Fire Business Stewardship for Interagency Fire Systems

System Name	Business Stewardship Group(s)
Resource Ordering and Status System (ROSS)	National Coordinators Group
Interagency Qualifications and Certification System (IQCS)	NWCG Incident Operations Working Team & NWCG Training Working Team
Interagency Cache Business System (ICBS)	National Cache Managers

The designation of a business stewardship group is critical to the successful implementation of Wildland Fire systems. The wildland fire community faces frustration with systems that are mandated by government executives without validation from the wildland fire business community or designation of a business stewardship group. These top-down driven systems are typically developed without appropriate business stewardship, face difficulties in acceptance at the time of deployment, and do not follow existing NWCG guidelines.

## INVENTORY AND ASSESSMENT OF SYSTEMS

One initial expectation of this Blueprint was for it to provide some solid recommendations for reducing the number of systems (and therefore cost) of the overall interagency Wildland Fire IT portfolio. However, a cursory impact analysis showed that the Wildland Fire portfolio, with all its links to multiple federal and state business processes, cannot be easily dissected into a “keep” or “toss” pile. Because of the various missions, goals, and performance measures of federal and state wildland fire agencies, the current redundancy in systems cannot be resolved without first analyzing and reconciling the differing policies, standards, and business rules of each individual agency. Further, it does not make sense for a single agency to try to independently manage their wildland fire IT portfolio, because any change may have an impact on other agencies’ fire systems. To work toward a solution to these issues, NWCG enterprise architects will continue their efforts to identify the links and dependencies existent among the various Wildland Fire systems. Because of the interagency cooperative efforts championed by the NWCG, the wildland fire community is beginning to achieve enterprise system coordination by sponsoring and implementing systems that have collapsed multiple distinct systems into single national interagency systems, such as:

- Resource Ordering and Status System (ROSS)
- Interagency Qualifications and Certification System (IQCS)
- Fire Program Analysis (FPA)
- Interagency Cache Business System (ICBS)
- ISuite (Incident Business)
- ICS-209 and Situation Reporting

The implementation of these systems has reduced costs by eliminating redundant development, support, and maintenance costs. Even though Wildland Fire has achieved success in reducing costs, these systems are still being developed from a monolithic, single business area perspective. A more strategic approach to support data integration and interoperability is recommended.

The following pages provide some of the detail from the Wildland Fire functional system assessment performed by the NWFEA Project Team which was used to develop NWFEA Blueprint findings and recommendations.

## Wildland Fire Systems Scattergram of Business and Technology Fit

Figure 19 represents a preliminary graphic depiction of the results of the NWFEA system assessment effort. The assessment questions were divided into areas relating to "business" or "technology" fit. Averages were taken which resulted in a pair of numbers that could be placed on an X-Y coordinate system. This assessment was based on information gathered from the various system owners. An assessment from the user community is needed before any decisions are made regarding the future application architecture.

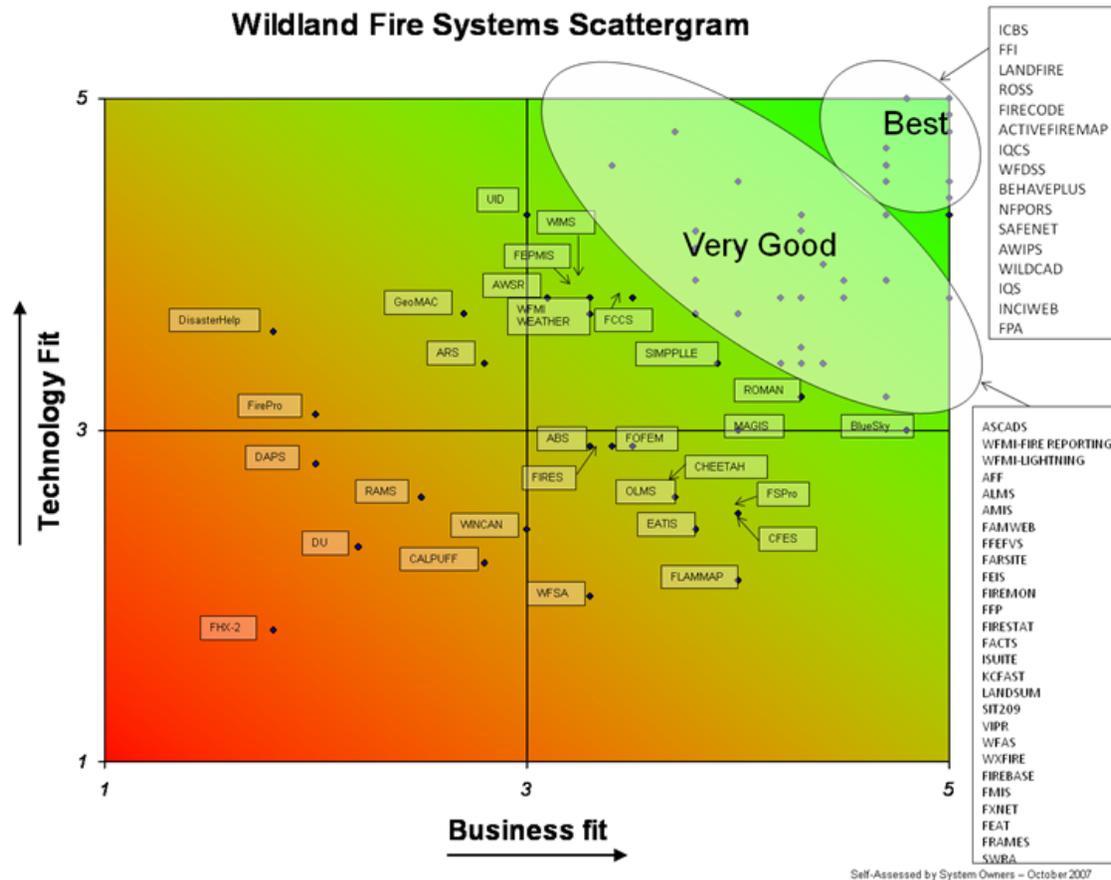


Figure 19 - Wildland Fire Systems Scattergram of Business and Technology Fit - Self-assessed by System Owners, 10/2007)

In interpreting the Wildland Fire Systems Scattergram graphic it is necessary to bear in mind that:

1. This "self-assessment" was almost entirely from the system owner/manager/maintainer point of view. A user perspective is critical because it will represent the degree to which SMEs feel the systems provide value, and such analysis may provide strikingly different results.
2. Assessments were done by many different people. There was no enforced consistency of the rating criteria, and also no statistical balancing of the possible errors introduced by lack of consistency.
3. The graphic was developed from the raw scoring results received, with no in-depth interpretation of the rater's perspective or adjustment because of it. Detailed analytical review and tempered adjustment of scores may also provide very different results

Hence only very high-level observations are meaningful. Systems in the lower left-hand quadrant are not automatic candidates for retirement, only candidates for further analysis.

It appears, nonetheless, that overall the Wildland Fire systems have a solid business and technology fit (at least from a system owner perspective). In addition, investment appears to be correctly focused because all of the systems that score best on both technology and business fit correspond to national, interagency shared systems, matching the "future state".

## System to Business Function Matrix

To begin a more complete analysis, it is necessary to consider the matrix of systems against functions (Table 10), since that matrix will show where there is overlap in function and where there are unique service providers. A system that has a low business and technology fit that shares no business functions with any other system is ripe for new development, but cannot be retired out of hand; those that have multiply redundant functional overlaps may be excellent candidates for retirement.

Table 10 - System to Business Function Matrix (sorted by counts)

System to Business Function Matrix (sorted by counts)	Fire Planning	Fire Response	Tactical Preparedness	Vegetation Management	Safety & Health	Financial Management	Public Outreach	Smoke Management	Asset Management	Workforce Management	Records Mgmt (Incident)	Fire Program Communications	Contract Management	BAER	Incident Communications	NIMS & other Fire Systems Mgmt	IT Management	HR Management	Security	Count
AWIPS	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X				15
Bluesky	X	X	X		X		X	X	X			X			X	X				10
WildCAD		X	X		X	X			X	X	X	X	X					X		10
MODIS AFMP	X	X		X	X		X	X	X					X		X				9
ROSS		X	X		X				X		X		X		X	X	X		X	9
SWRA	X		X	X		X	X	X		X		X								8
Behave PLUS	X	X	X	X	X			X							X					7
FRAMES	X			X			X			X		X					X		X	7

<b>System to Business Function Matrix (sorted by counts)</b>	<b>Fire Planning</b>	<b>Fire Response</b>	<b>Tactical Preparedness</b>	<b>Vegetation Management</b>	<b>Safety &amp; Health</b>	<b>Financial Management</b>	<b>Public Outreach</b>	<b>Smoke Management</b>	<b>Asset Management</b>	<b>Workforce Management</b>	<b>Records Mgmt (Incident)</b>	<b>Fire Program Communications</b>	<b>Contract Management</b>	<b>BAER</b>	<b>Incident Communications</b>	<b>NIMS &amp; other Fire Systems Mgmt</b>	<b>IT Management</b>	<b>HR Management</b>	<b>Security</b>	<b>Count</b>
<b>I-Suite</b>		X			X	X				X	X		X				X			7
<b>WFSA</b>	X	X	X		X	X					X				X					7
<b>AFF</b>			X		X	X			X	X									X	6
<b>DAPS</b>			X	X	X			X	X					X						6
<b>FFP</b>	X	X	X		X		X	X												6
<b>Fire Reporting - (WFMI)</b>	X	X	X			X			X	X										6
<b>FX-NET</b>	X	X			X			X				X				X				6
<b>RAMS</b>	X	X		X		X	X		X											6
<b>AWSR</b>	X				X	X				X	X									5
<b>CFES</b>	X	X	X	X		X														5
<b>FACTS</b>				X		X			X				X	X						5
<b>FEAT</b>	X			X			X	X				X								5
<b>FEIS</b>	X			X			X					X		X						5

<b>System to Business Function Matrix (sorted by counts)</b>	<b>Fire Planning</b>	<b>Fire Response</b>	<b>Tactical Preparedness</b>	<b>Vegetation Management</b>	<b>Safety &amp; Health</b>	<b>Financial Management</b>	<b>Public Outreach</b>	<b>Smoke Management</b>	<b>Asset Management</b>	<b>Workforce Management</b>	<b>Records Mgmt (Incident)</b>	<b>Fire Program Communications</b>	<b>Contract Management</b>	<b>BAER</b>	<b>Incident Communications</b>	<b>NIMS &amp; other Fire Systems Mgmt</b>	<b>IT Management</b>	<b>HR Management</b>	<b>Security</b>	<b>Count</b>
<b>FFI</b>	X			X			X	X				X								5
<b>FireBase</b>	X	X	X	X						X										5
<b>FMIS</b>	X			X			X				X					X				5
<b>FIRE WEATHER SYSTEMS</b>	X	X	X		X									X						5
<b>WFAS</b>		X	X		X		X								X					5
<b>IQS</b>			X							X	X							X		4
<b>KCFAST</b>	X	X										X		X						4
<b>Landfire</b>	X	X		X				X												4
<b>NFPORS</b>	X			X			X							X						4
<b>Weather - (WFMI)</b>			X		X			X			X									4
<b>ABS</b>		X				X							X							3
<b>CHEETAH</b>	X		X							X										3
<b>Dispatch Utilities</b>	X	X				X														3

<b>System to Business Function Matrix (sorted by counts)</b>	<b>Fire Planning</b>	<b>Fire Response</b>	<b>Tactical Preparedness</b>	<b>Vegetation Management</b>	<b>Safety &amp; Health</b>	<b>Financial Management</b>	<b>Public Outreach</b>	<b>Smoke Management</b>	<b>Asset Management</b>	<b>Workforce Management</b>	<b>Records Mgmt (Incident)</b>	<b>Fire Program Communications</b>	<b>Contract Management</b>	<b>BAER</b>	<b>Incident Communications</b>	<b>NIMS &amp; other Fire Systems Mgmt</b>	<b>IT Management</b>	<b>HR Management</b>	<b>Security</b>	<b>Count</b>
<b>FamWeb</b>	X	X	X																	3
<b>FEPMIS</b>	X					X			X											3
<b>FCCS</b>	X			X				X												3
<b>ICBS-R</b>		X							X								X			3
<b>SIMPPLLE</b>	X			X				X												3
<b>SIT 209</b>							X				X				X					3
<b>UNIT ID</b>	X					X					X									3
<b>VIPR</b>			X										X				X			3
<b>ALMS</b>		X	X																	2
<b>AMIS</b>						X							X							2
<b>ARS</b>									X				X							2
<b>ASCADS</b>		X	X																	2
<b>EaTIS</b>						X							X							2
<b>Farsite</b>	X	X																		2

<b>System to Business Function Matrix (sorted by counts)</b>	<b>Fire Planning</b>	<b>Fire Response</b>	<b>Tactical Preparedness</b>	<b>Vegetation Management</b>	<b>Safety &amp; Health</b>	<b>Financial Management</b>	<b>Public Outreach</b>	<b>Smoke Management</b>	<b>Asset Management</b>	<b>Workforce Management</b>	<b>Records Mgmt (Incident)</b>	<b>Fire Program Communications</b>	<b>Contract Management</b>	<b>BAER</b>	<b>Incident Communications</b>	<b>NIMS &amp; other Fire Systems Mgmt</b>	<b>IT Management</b>	<b>HR Management</b>	<b>Security</b>	<b>Count</b>
<b>FFE-FVS</b>				X										X						2
<b>FHX-2</b>				X			X													2
<b>FIREMON</b>		X		X																2
<b>Firestat</b>	X		X																	2
<b>FOFEM</b>	X	X																		2
<b>FSPRO</b>	X	X																		2
<b>Inciweb</b>							X								X					2
<b>IQCS</b>					X					X										2
<b>LandSum</b>	X			X																2
<b>Lightning - (WFMI)</b>		X	X																	2
<b>MAGIS</b>	X			X																2
<b>WIMS</b>	X		X																	2
<b>WFDSS</b>		X	X																	2
<b>GeoMAC</b>							X													1

<b>System to Business Function Matrix (sorted by counts)</b>	<b>Fire Planning</b>	<b>Fire Response</b>	<b>Tactical Preparedness</b>	<b>Vegetation Management</b>	<b>Safety &amp; Health</b>	<b>Financial Management</b>	<b>Public Outreach</b>	<b>Smoke Management</b>	<b>Asset Management</b>	<b>Workforce Management</b>	<b>Records Mgmt (Incident)</b>	<b>Fire Program Communications</b>	<b>Contract Management</b>	<b>BAER</b>	<b>Incident Communications</b>	<b>NIMS &amp; other Fire Systems Mgmt</b>	<b>IT Management</b>	<b>HR Management</b>	<b>Security</b>	<b>Count</b>
<b>CALPUFF</b>								x												1
<b>FireCode</b>											x									1
<b>FirePRO</b>						x														1
<b>FIRES</b>																		x		1
<b>FLAMMAP</b>	x																			1
<b>FPA2</b>	x																			1
<b>OLMS</b>					x															1
<b>SafeNET</b>					x															1
<b>VCIS</b>				x																1
<b>WINCAN</b>		x																		1
<b>WXFIRE</b>		x																		1
<b>Disasterhelp</b>																				0
<b>Count</b>	38	31	26	24	19	18	17	15	13	12	12	10	9	9	8	6	5	3	3	

## System-to-Business Functions

Comparing the system-to-business function (Table 10) to the lower left quadrant (systems that appear to have low business and technology fit) of the Scattergram of Business and Technology Fit (Figure 19), the functional areas affected by the systems are identified as shown in Table 11. In all cases, there are multiple other systems identified in other parts of the scatter gram that are already supporting those functions. Thus, each of these seven systems may be worth analyzing for its merit. The Blueprint recommendations suggest continuing with the system assessment process to include the perspective of the application users and SMEs. This additional assessment should take place prior to making any decisions about potential retirement of systems.

Table 11 - System to Business Function Matrix

System to Business Function Matrix of systems from the lower left quadrant of the scattergram above	Fire Planning	Fire Response	Tactical Preparedness	Vegetation Management	Safety & Health	Financial Management	Public Outreach	Smoke Management	Asset Management	Workforce Management	Records Mgmt (Incident)	Fire Program Communications	Contract Management	BAER	Incident Communications	NIMS & other Fire Systems Mgmt	IT Management	HR Management	Security	Count
WFSA	x	x	x		x	x					x				x					7
DAPS			x	x	x			x	x					x						6
RAMS	x	x		x		x	x		x											6
FHX-2				x			x													2
CALPUFF								x												1
FirePRO						x														1
WINCAN		x																		1
Count	38	31	26	24	19	18	17	15	13	12	12	10	9	9	8	6	5	3	3	

(The systems from the lower left quadrant of the scattergram above)

- WFSA, RAMS, DAPS are used in many different functions
- FHX-2 is used in two functions
- CALPUFF, FirePRO and WINCAN each perform only one function

### Determination of Systems to Control, Evaluate, or Retire

The following table provides results from the evaluation of applications to the lifecycle phase they are currently in and the functional area of wildland fire which they support. Some of the applications which are found in the lower left quadrant of the Scattergram are already identified as in the retirement phase of their lifecycle. Many functional areas have multiple systems which support their business. This table also identifies areas of redundancy and also functional areas which have no reported systems supporting them.

<b>Control</b>	C	11	Monitoring of on-going IT initiatives during the planning, acquisition, deployment and maintenance / operational phases of the IT investment life cycle
<b>Evaluate</b>	E	55	Evaluate a system’s ability to effectively meet the organization’s mission needs, both functionally and economically
<b>Retire</b>	R	7	Good candidate for replacing – cease investments

Table 12 - Determination of systems to control, evaluate, or retire

Determination of systems to control, evaluate, or retire	HR Management	Security	IT Management	Business & other Fire Systems Mgmt Incident Communications	Contract Management	Fire Program Communications	BAER	Asset Management	Workforce Management	Records Mgmt (Incident)	Public Outreach	Smoke Management	Financial Management	Safety & Health	Vegetation Management	Tactical Preparedness	Fire Response	Fire Planning
ABS					E								E				E	
AFF		E						E	E				E	E		E		
ALMS																E	E	
AMIS					E								E					
ARS					R			R										
ASCADS																E	E	
AWIPS				E	E		E	E	E	E	E	E	E	E	E	E	E	E
AWSR									E	E			E	E				E
Behave PLUS					E							E		E	E	E	E	E
Bluesky					E	E		E			E	E		E		E	E	E
CALPUFF												E						
CFES													E		E	E	E	E
CHEETAH									E							E		E

Determination of systems to control, evaluate, or retire	HR Management	Security	IT Management	Wildfire & other Fire Systems Mgmt Incident Communications	Contract Management	Fire Program Communications	BAER	Asset Management	Workforce Management	Records Mgmt (Incident)	Public Outreach	Smoke Management	Financial Management	Safety & Health	Vegetation Management	Tactical Preparedness	Fire Response	Fire Planning
DAPS							R	R				R		R	R	R		
Disasterhelp																		
Dispatch Utilities													E				E	E
EaTIS					E								E					
FACTS					E		E	E					E		E			
FamWeb																E	E	E
Farsite																	E	E
FCCS												C			C			C
FEAT						R					R	R			R			R
FEIS						E	E				E				E			E
FEPMIS								E					E					E
FFE-FVS							E								E			
FFI						C					C	C			C			C
FFP											E	E		E		E	E	E
FHX-2											E				E			

Determination of systems to control, evaluate, or retire	HR Management	Security	IT Management	Wildfire & other Fire Systems Mgmt Incident Communications	Contract Management	Fire Program Communications	BAER	Asset Management	Workforce Management	Records Mgmt (Incident)	Public Outreach	Smoke Management	Financial Management	Safety & Health	Vegetation Management	Tactical Preparedness	Fire Response	Fire Planning
Fire Reporting - (WFMI)								E	E				E			E	E	E
FIRE WEATHER SYSTEMS							E							E		E	E	E
FireBase									E						E	E	E	E
FireCode										E								
FIREMON															R		R	
FirePRO													R					
FIRES	E																	
FIRESTAT	E															E		E
FLAMMAP																		E
FMIS				E						E	E				E			E
FOFEM																	E	E
FPA2																		C
FRAMES		C	C			C			C		C				C			C
FSPRO																	C	C
FX-NET				E		E						E		E			E	E

Determination of systems to control, evaluate, or retire	HR Management	Security	IT Management	Wildfire & Fire Systems Mgmt	Incident Communications	Contract Management	Fire Program Communications	BAER	Asset Management	Workforce Management	Records Mgmt (Incident)	Public Outreach	Smoke Management	Financial Management	Safety & Health	Vegetation Management	Tactical Preparedness	Fire Response	Fire Planning
GEOMAC												E							
ICBS-R			C						C									C	
INCIWEB					C							C							
IQCS										E					E				
IQS	E									E	E						E		
I-Suite			C			C				C	C			C	C			C	
KCFAST							E	E										E	E
Landfire													C			C		C	C
LandSum																E			E
Lightning - (WFMI)																	E	E	
MAGIS																E			E
MODIS AFMP				E				E	E			E	E		E	E		E	E
NFPORS								E				E				E			E
OLMS															E				
RAMS									E			E		E		E		E	E

Determination of systems to control, evaluate, or retire	HR Management	Security	IT Management	AVIS & other Fire Systems Mgmt Incident Communications	Contract Management	Fire Program Communications	BAER	Asset Management	Workforce Management	Records Mgmt (Incident)	Public Outreach	Smoke Management	Financial Management	Safety & Health	Vegetation Management	Tactical Preparedness	Fire Response	Fire Planning
ROSS		E	E	E	E	E		E		E				E		E	E	
SafeNET														E				
SIMPPLLE												E			E			E
SIT 209					E					E	E							
SWRA						E			E		E	E	E		E	E		E
UNIT ID										E			E					E
VIPR			C			C										C		
Weather - (WFMI)										E		E		E		E		
WFAS					E						E			E		E	E	
WFDSS																C	C	
WFSA					R					R			R	R		R	R	R
WildCAD	E					E	E	E	E	E			E	E		E	E	
WIMS																E		E
WINCAN																	R	
WXFIRE																	E	

### **Requested Budget for Major Wildland Fire Systems**

The following table illustrates the FY 07 approved budget for major Wildland Fire systems. This data was compiled from the preliminary Exhibit 53 information dated March 2006.

Table 13 - FY07 Approved Budget for Major Wildland Fire Systems (figures from 03/2006 Exhibit 53)

<b>System</b>	<b>Acronym</b>	<b>FY07 Cost - FS</b>	<b>FY07 Cost - DOI</b>	<b>FY07 Total Application Cost</b>
<b>WFMI Lightning</b>	LIGHTNING (WFMI)		\$66,000.00	\$66,000.00
<b>WFMI Weather</b>	WEATHER (WFMI)		\$66,500.00	\$66,500.00
<b>WFMI Fire Reporting</b>	FIRE REPORTING (WFMI)		\$67,000.00	\$67,000.00
<b>Aviation Resource System</b>	ARS	\$100,000.00		\$100,000.00
<b>Automated Sorting Conversion and Distribution System</b>	ASCADS		\$100,000.00	\$100,000.00
<b>Automated Flight Following System</b>	AFF	\$200,000.00		\$200,000.00
<b>Aviation Management Information System</b>	AMIS	\$200,000.00		\$200,000.00
<b>BehavePlus</b>	BEHAVEPLUS	\$200,000.00		\$200,000.00
<b>Fire Area Simulator</b>	FARSITE	\$200,000.00		\$200,000.00
<b>FireFamilyPlus</b>	FFP	\$200,000.00		\$200,000.00

System	Acronym	FY07 Cost - FS	FY07 Cost - DOI	FY07 Total Application Cost
FireCode	FIRECODE		\$200,000.00	\$200,000.00
SIT-209	SIT-209	\$200,000.00		\$200,000.00
Wildland Fire Assessment System	WFAS	\$200,000.00		\$200,000.00
Federal Excess Property Management Information System	FEPMIS	\$300,000.00		\$300,000.00
Wildland Fire Situation Analysis	WFSA	\$300,000.00		\$300,000.00
Weather Information Management System	WIMS	\$300,000.00		\$300,000.00
Fire Effects Information System	FEIS	\$400,000.00		\$400,000.00
Fire Integrated Recruitment Employment System	FIRES	\$400,000.00		\$400,000.00
Fire Statistics System	FIRESTAT	\$400,000.00		\$400,000.00
Aviation Business System	ABS	\$500,000.00		\$500,000.00
Incident Qualifications and Certification System	IQCS	\$0.00	\$1,100,000.00	\$1,100,000.00
Interagency Cache Business System - Reengineered	ICBS-R	\$1,300,000.00		\$1,300,000.00
National Fire Plan Operations and Reporting System	NFPORS	\$800,000.00	\$700,000.00	\$1,500,000.00
FAMWEB	FAMWEB	\$2,700,000.00		\$2,700,000.00
Landfire	LANDFIRE		\$5,400,000.00	\$5,400,000.00

System	Acronym	FY07 Cost - FS	FY07 Cost - DOI	FY07 Total Application Cost
Resource Ordering and Status System	ROSS	\$8,000,000.00		\$8,000,000.00
Fire Program Analysis	FPA	\$4,200,000.00	\$4,500,000.00	\$8,700,000.00
Forest Service Activity Tracking System	FACTS	\$14,300,000.00		\$14,300,000.00
<b>TOTALS:</b>		\$35,400,000.00	\$12,199,500.00	\$47,599,500.00

### System Discussion

While Wildland Fire has made major advances in consolidating and streamlining the systems that support several business areas, other business areas and their supporting systems should be evaluated for potential consolidation. Two obvious areas that should be considered are:

1. Fire Weather

Multiple systems are in place that gather, relay, and display weather and weather-related products. While each seems to fill a specific “niche” this business area is ripe for cost-reducing system consolidations.

2. Wildland Fire Reporting

Multiple systems are in place which support the management, public information display, upward reporting, and historic recording of individual fires. A single, national, interagency, end-to-end system for fire information would not only provide large cost savings, but would lead toward adoption of interagency standards, reduce public confusion, and allow for vastly more accurate fire trend and occurrence analyses.

An IT governance framework needs to be organized, documented, and accepted by agency IT and Wildland Fire leadership. Work has begun on an Interagency Wildland Fire IT Investment Process. The development of this process must include involvement from the agency CIOs to ensure

buy-in and support. To be successful, this process must also develop standards for the various IT roles and responsibilities (such as managing partner, chartering body, interagency portfolio manager, etc.).

## THE TECHNOLOGY THAT SUPPORTS WILDLAND FIRE

The goal of the Wildland Fire Technical Architecture Program is to create a seamless IT environment for interagency wildland fire personnel to accomplish their mission.

The NWFEA Technical Architecture Program is different from agency Technical Architecture programs because Wildland Fire does not own any of the technical infrastructures. To be effective, the wildland fire technical architecture must leverage the common denominators between the various fire agencies' technical architectures. Technical infrastructure assets typically consist of hardware, software, and networks. Currently, these assets are owned and managed by each agency. NWFEA will provide a consolidated view of the agencies' infrastructure. Wildland Fire needs to be able to interface with agency CIO organizations to ensure the needs of wildland fire are included in their architectures.

Wildland Fire should identify their needs as an interagency emergency response organization and the IT communities should work toward collaborative interagency solutions. Recommendation: Interagency CIO Council.

### ***Preliminary Findings***

The preliminary finding supports the concept of integrating agency IT assets into a virtual wildland fire infrastructure, provide common services within this infrastructure, and ensure the protection of information assets in accordance with Federal laws and regulations. Collaborative efforts within the wildland fire community support standardization and are fiscally efficient.

Several activities are underway that demonstrate this collaborative approach.

### **Computer Technical Specialist Task Group Activities**

The NWCG-IRMWT has chartered the Computer Technical Specialist Task Group (CTSPTG) to provide quality information and recommendations concerning coordinated information technology (IT) resources in support of interagency wildland fire management and all risk incidents at the incident site. The primary objective is to ensure the protection of information assets, including data and the IT infrastructure. Current tasks are: 1) the Thin Client Pilot project, and 2) development of a white paper on Incident Computer Security Procedures. Both of these efforts lend themselves to the whole of the interagency wildland fire community by ensuring the protection of information assets, including data and the IT infrastructure.

The following supports the recommendation to create and implement an interagency Wildland Fire security policy accepted by all agencies:

- The CTSPGTG white paper on minimal best practices security policy identifies some of the current problems with IT automation of incident base camps:
  - Ensuring hard drives are cleansed of all incident data at end of the incident
  - Inconsistent password and locking procedures
  - Missing or incorrectly configured anti-virus software
  
- Problems that need to be addressed:
  - No reliable standardized information technology infrastructure
  - Incident Management Team (IMT) IT kits presently cannot always support the differing software and data investments
  - Must be able to provide IMTs with IT technology at any location, regardless of infrastructure (computers, phone, internet)
  - IT technology currently leaves the incident with the team, so new equipment is deployed as the team rotates out

### Interagency CIO Wildland Fire IT/Radio Collaborative Sojourn

The Interagency CIO Wildland Fire IT/Radio Collaborative Sojourn was convened in August of 2007. Attendees included department and agency CIOs, executive level management, project managers, radio program managers, security managers, fire directors, and IT specialists. This meeting occurred during the height of the 2007 wildland fire season, and the group attended meetings at the National Interagency Fire Center, at an Area Command Center in Cascade, Idaho, and a fire complex near Cascade, Idaho. During this time the IT leaders and managers attended information-sharing sessions with various national, regional, and local level wildland fire managers who discussed their IT needs and issues.

Notes from that meeting indicate the following issues:

- IT Security
  - Inconsistencies and constraints between and within the various federal agencies
  - Dependence on a variety of hardware, software, procedures, batch files, scripts, and databases
  - Issues related to IT security are frequent and common place
  - Without interagency solutions, people will disregard or work around IT security
  
- Security/Accessibility – The inconsistent implementation of security measures between the Departments & Bureau/Agencies have hampered the wildland fire community’s ability to perform its business
  
- Communications interoperability between radios is paramount to perform common missions and share facilities

- Radio repeater frequencies are in short supply
- A standard type of radio would reduce confusion and training
- Interagency CIO Council – the group discussed the creation of an Interagency Fire CIO Council made up of the CIOs from DOI, USDA, FS, BLM, NPS, BISA, and FWS to deal with interagency wildland fire IT issues
- Issue escalation – the CIOs were advised to utilize the existing interagency structure for dealing with IT issues. IT issues should follow the existing process that routes the issue to the NWCG IRM Working Team for resolution. Issues that cannot be resolved at the IRM Working Team level require escalation. The escalation process beyond the IRM Working Team has not been fully documented
- Current network support structures are not always available for 7/24 support of field and incident operations, directly impacting the capability of IT to further the mission of fire.

### The Interagency IT Environment

Figure 24 (Oversize Documents) - Wildland Fire Systems to Host Mapping shows that the wildland fire IT systems are hosted at many different sites, most often determined by the Managing Partner agency. Security requirements, capabilities and support vary between these different sites. The FS is creating an Enterprise Service Bus environment at the USDA National Information Technology Center which houses the majority of FS fire applications and some interagency applications managed by the BLM. The concept of an Enterprise Service Bus environment directly supports Service Oriented Architecture and needs to be shared across the wildland fire agencies.

## Technology Discussion

### IT Governance

The wildland fire community is a customer of the services provided by the Information Technology community. Individual agencies have created their own IT infrastructure and policies that, when applied to interagency operations, often conflict with those of other agencies. In providing emergency services in an interagency environment, Wildland Fire must devise ways to work with agency IT community to resolve issues that cause problems in operations.

Wildland Fire should:

- Encourage the creation of the Interagency Fire CIO Council to resolve issues such as:

- Security/Accessibility – the inconsistent implementation of security measures between the Departments and Bureau/Agencies have hampered the wildland fire community’s ability to perform its business
- System Administration & Support Capability – Mission critical business functions are not receiving adequate support from IT organizations for 7/24 operations for resolving system and security issues

### **Interagency Incident Base IT Infrastructure**

To create and implement interagency incident base infrastructure standards and procedures that are accepted by all agencies, the following should be done:

- Support the Thin Client Pilot Project, which is currently underway by the CTSPG, and other technologies that will provide for a standard incident IT kit with less security risks and support issues
- Develop an interagency wildland fire Incident Base Security Policy that establishes common controls accepted by all agencies

## WILDLAND FIRE ISSUES AND ANALYSIS

This section provides a summary of analysis sessions, meetings, and reports, and studies that were used to identify issues and concerns that may prevent Wildland Fire from achieving its goal of functioning as a Virtual Single Agency, based on the description presented earlier in this document.

### *Wildland Fire Analysis*

#### Internal business sources: the CBT Straw Poll

A straw poll of the CBT during the 12/18-19/2006 meeting asked what the members felt Enterprise Architecture could provide for them. It produced opportunities for improvement in the following areas: breakdown in communications, or inadequate or malfunctioning capabilities.

<ul style="list-style-type: none"> <li>• Contract Management               <ul style="list-style-type: none"> <li>○ Duplication of services</li> <li>○ Lack of standard specifications</li> <li>○ Complexity of contract administration</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Radio Communications               <ul style="list-style-type: none"> <li>○ Fed vs. State frequencies at field level</li> <li>○ Dept. Policy &amp; Direction not aligned</li> <li>○ Lack of infrastructure investment</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Interagency IT               <ul style="list-style-type: none"> <li>○ System interoperability</li> <li>○ Systems of Record</li> <li>○ Shared Services</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Aviation               <ul style="list-style-type: none"> <li>○ Standards (State vs. Feds)</li> <li>○ Costs -- where to invest</li> <li>○ Aging equipment</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Weather Services               <ul style="list-style-type: none"> <li>○ Duplication of services</li> <li>○ Rogue systems</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Safety</li> </ul>

<ul style="list-style-type: none"> <li>• Reporting Services <ul style="list-style-type: none"> <li>○ Effort to assess field needs (FORS)</li> <li>○ System of Record for Reporting</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• IT Investment <ul style="list-style-type: none"> <li>○ Ability to prioritize Interagency WF IT \$\$ spending</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Fuel modeling <ul style="list-style-type: none"> <li>○ Too many competing models -- need to select one</li> </ul> </li> </ul>

The overarching themes abstracted from these topics are:

- Capital Investment Strategy
  - Aging equipment
  - Capacity
  - Sustainment
- Standards implementation
  - States / Feds
  - Interagency
  - Reduction of choices
  - Systems of Record
- Coordination of decisions
  - IT
  - Departments & Agencies
  - Complexity

Capital Investment Strategy concerns having adequate funds available to maintain the existing investments. Aging aircraft, inadequate capacity, and insufficient investment in the infrastructure were all examples of this concern.

There was general agreement that one of the major outputs from the Leadership Functions was standards and interagency handbooks. In addition, there were many anecdotes of problematic roll-outs of new standards, leading to compromised safety of teams on incidents. The examples of multiple radio standards on a single fire, and differing implementations of the Prescribed Fire Reference Guide, particularly resonate with the participants.

Coordination issues covered a number of themes. Different and competing instructions from Departments and Agencies were, not surprisingly, of major concern. Some of the particular results of these competing requirements were the inability to coordinate interagency IT planning; and the overly complex nature of contract management, where the same piece of equipment, contracted from the same supplier, could be billed out at different rates depending on which contract was used.

### **Internal business sources: the CBT SWOT**

Discussion among the CBT members in response to the question “What makes the wildland fire community the poster child of interagency cooperation, and what could it do to improve?” produced a list of the main strengths, weaknesses, opportunities, and threats (“SWOT”) to Wildland Fire Participants voted on which of the identified issues they felt were most critical to the success of the venture. Topics that received votes are marked in red along with the number of participants who felt that was a critical issue.

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Standardization, common expectations, common form of reference</li> <li>• Common mission focus</li> <li>• Leveling effect of ops – both of management levels and agencies</li> <li>• Resource sharing</li> <li>• Public does not distinguish</li> <li>• Equal voice of all (fed) voices</li> <li>• Buy In for interagency</li> <li>• Can-Do Attitude</li> <li>• Co-located</li> <li>• Ease of interagency personnel moves leading to better understanding among agencies</li> <li>• Incident Ops all in Yellow shirts</li> <li>• NICC</li> <li>• Co-ordinated activities and facilities</li> <li>• Broad expertise</li> <li>• Field experience of managers</li> <li>• Training</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Lack of Succession Planning</li> <li>• Under-emphasis on Career Development</li> <li>• Can't share data easily</li> <li>• Lack of Interagency IT planning</li> <li>• Ignoring group decisions because of agency agendas</li> <li>• Imbalance of representation on committees</li> <li>• Collaboration takes too much time and energy</li> <li>• Lack of coordination of research capabilities</li> <li>• Ill-managed portfolio</li> <li>• Challenge to roll out changes owing to differing agency agendas</li> <li>• People move from Field right to National, not Field to Region to National</li> <li>• Overuse of training as a panacea</li> </ul>
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Get global buy-in for collaborative decisions</li> <li>• FEC will be able to run interference in DC</li> <li>• Research capabilities</li> <li>• Fresh recruits from military post war</li> <li>• More state participation</li> <li>• Capitalize on ripple effects</li> <li>• Product Mgt approach to data</li> <li>• Capitalize on existing technology (Dept. of Defense?)</li> <li>• Skepticism of change – through review</li> <li>• Fluidity – nimbleness of implementation</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Resistance to change</li> <li>• Glacial pace of decision making</li> <li>• Links to agency resources are too weak</li> <li>• Retention of talent and expertise -- aging workforce</li> <li>• Ripple affect of adversity</li> <li>• Slowness of collaboration</li> <li>• FEC adds political influences and bureaucracy</li> <li>• Executive Conflicts/Turf wars</li> <li>• Incoming Managers with lack of fire experience</li> <li>• Insufficient capitalization on new technology</li> <li>• Difficulty in answering congressional inquiries</li> </ul>

Figure 20 - Results of the CBT SWOT analysis

Some recurring themes indicate areas of concern:

- Workforce planning
- Interagency IT, Information/Data sharing, new technologies
- Breakdown of decision-making processes and resistance to making decisions
- Poor integration with external services

Table 14 - NWCG SWOT 2006

<b>STRENGTHS</b>	
<b>Diverse Leadership and Experience</b>	
✓	Participants are involved/members of other fire program groups/committees/associations and are able to bring those perspectives/issues/etc. to the table
✓	Group represents a variety of missions relating to fire program use
✓	Has a broad cross section of national and State representation relative to fire management
✓	Broad representation covering the major wildland players
✓	Membership: NWCG members are experienced, intelligent, energetic, thoughtful and cooperative
✓	Leaders in wildland fire and agency they represent
✓	Variety of experience and perspectives contained within group
✓	Diverse Backgrounds
✓	Diverse experience and background in the fire community
✓	Expansive internal/external network
✓	Interagency federal, state and local coordination
✓	Interagency guidelines and strategies in incident management
✓	Agency representation and support

- ✓ Varying viewpoints
- ✓ Expertise in wildland fire arena
- ✓ Strong skills in a variety of specialties
- ✓ Ability to draw upon experts within discipline
- ✓ Diverse experiences and backgrounds
- ✓ Experience
- ✓ Depth of experience
- ✓ Respect for diverse interests and perspectives

### **Group Dynamics**

- ✓ Humor
- ✓ Open to suggestions
- ✓ Has a very deliberative decision process
- ✓ Ability to adjust decision after implementation if input received warrants it
- ✓ Results driven
- ✓ Ability to step back even after a decision
- ✓ Ability to have open discussion and recognize need to understand impact of decision

- ✓ Commitment to participate
- ✓ Open mind
- ✓ Is a consensus building and decision making group
- ✓ Dedicated to service for/to customer
- ✓ Ability to interact as a group – “group dynamics”
- ✓ Camaraderie
- ✓ Willingness to work together

### **Values and Principles**

- ✓ Shared focus on fire
- ✓ Commitment to make it better
- ✓ Willingness to participate and share workload
- ✓ Safety 1<sup>st</sup>
- ✓ Respectful interactions among group members and with outside entities
- ✓ Common goals

### **History of Accomplishments and Success**

- ✓ ICS
- ✓ NIIMS and ICS
- ✓ Standard curriculums to implement ICS

- ✓ History: NWCG has a proven track record and presumed credibility as an authoritative decision body
- ✓ Stability: NWCG is presumed to be “Permanent” not transitory. It is assumed that NWCG will be here in the future.
- ✓ NWCG has a 30 year history of being very successful
- ✓ A long history of success
- ✓ Acceptance: NWCG is accepted by the “totality” of the wildland fire community as the legitimate coordinating body
- ✓ Tangible benefits to fire community and the general public
- ✓ NWCG has brought credibility to US fire fighting community
- ✓ Leading people
- ✓ Influence and input to other agencies

## WEAKNESSES

### Organization Size

- ✓ A group whose organization has become too large to manage effectively and efficiently
- ✓ Tendency to create too many WT, AG, Sub-committees
- ✓ Complex organization that is difficult to direct and coordinate

### Establishing Priorities/Direction

- ✓ Priorities not clearly established
- ✓ Failure to prioritize and fund specific tasks (vs. funding all working teams)
- ✓ Commitment to priorities
- ✓ The time it takes to get things done
- ✓ Lack of clear roles and responsibilities of NWCG vs. other organized groups. NFAEB, NMAC, WFLC
- ✓ Insular: NWCG is limited in the “filed of ideas” Available for consideration – a “closed” society
- ✓ Making decisions without proper input from SME’s
- ✓ Slow progress when might be a critical time element
- ✓ As a group does not meet often enough to be timely when decisions need to be made
- ✓ Leading Change
- ✓ Not focused at this time trying to get there.

### **Agency Policies (Different)**

- ✓ Confusion regarding roles/authority to develop agency policy
- ✓ Agency specific needs/requirements
- ✓ A relatively large interagency group that represents numerous agencies with sometimes competing or conflicting interests
- ✓ Agency constraints on free thinking – politics
- ✓ Agency politics
- ✓ Agency specific policies/laws/regs
- ✓ Different policies for each agency

### **Workload**

- ✓ External influences on members detract from ability to contribute to NWCG
- ✓ Challenged to devote time to NWCG work
- ✓ A group whose membership is a collateral duty workforce
- ✓ Attention: NWCG Members have “Day Jobs” that require their attention elsewhere. Too much to do by too few
- ✓ Member of commitments and workload to be successful
- ✓ Lack of formal admin staff that can be dedicated to NWCG
- ✓ Continued turn over with replacement not up to speed
- ✓ Accountability with working team accomplishments – collateral duty and work
- ✓ Insufficient time to fully focus on NWCG

- ✓ Time to do this and other duties to a level of excellence.

### **Lack of Communication**

- ✓ Inefficient Communications
- ✓ Lack of communication when critical need
- ✓ Don't sell ability well to field – interagency input and decision making
- ✓ Lack of substantive communication between meetings

### **Budget**

- ✓ Funding support
- ✓ Lack of budget to carry out and fulfill taskings
- ✓ Constrained budgets that members bring to table limit contributions/development of NWCG
- ✓ Budgets: NWCG does not have nearly enough \$s to meet the needs

### **Other Weaknesses**

- ✓ Over discussing, over reviewing and non-closure
- ✓ Always wanting to accommodate to the point we don't adhere to our guidelines
- ✓ Special interests

## OPPORTUNITIES

### Reorganization

- ✓ External staff turnover due to administration changes/retirements also a threat
- ✓ Consolidate efforts
- ✓ Eliminate redundancy
- ✓ Application (systems) common to all the players
- ✓ Currently groups/individuals are questioning NWCG's role. Timing is right to provide strategic plan/roles/responsibilities. (They are looking for an answer, so let's give them same)
- ✓ Feasibility studies to determine most efficient method to accomplish mission (embrace and learn rather than run away from)
- ✓ Improving organizational focus
- ✓ Reduce WTs/Projects
- ✓ To reorganize structure for efficiency

### All Risk/NRP/Transition

- ✓ Mission may be defined to address actual functional roles as a result of all hazard requirements
- ✓ To streamline and normalize federal fire service
- ✓ National Response Plan: NWCG could be a key leader in NRP development and implementation, e.g. accept and lead wildland fire role in NRP activities
- ✓ To train non-federal, non-typical wildland fire fighters

- ✓ Influence future of interagency/partner blend for accomplishing all aspects of Fire and Aviation Management
- ✓ Assisting other government agencies with understanding ICS and strength it provides (structure)
- ✓ I-Chiefs interest in improving wildland fire training for locals
- ✓ Homeland Security funding improved fire/ICS training for locals
- ✓ NIMS transition by all responders
- ✓ Transition to local type III organizations or teams

### **Leadership/Influence**

- ✓ To define NWCG role in relation to other admin levels
- ✓ To influence the direction of interagency policy for wildland fire
- ✓ Outside groups and organizations looking for leadership in wildland fire
- ✓ To provide leadership for the interagency fire community
- ✓ Agency leadership support
- ✓ Other efforts within fire program have recently looked at strategic issues we may gain from these efforts.
- ✓ Recognized as experts in incident management
- ✓ To standardize federal policies, procedures and authorities as they affect operations

### **Budget and Funding**

- ✓ As a result of reduced budgets – looking at opportunities to become more efficient
- ✓ Reduce national/regional cost and increase flow of \$s to field/firefighters

- ✓ Could be an opportunity to strengthen budget/resources for NWCG by understanding impending changes from policy
- ✓ To influence federal budget process in establishing effective, stable programs

### **Influencing Political Leaders**

- ✓ To do outreach to congress, stakeholders, and the public to better inform about our mission
- ✓ High level of interest from administration and congress
- ✓ WGA interest and influence on congressional delegation for wildland fire
- ✓ Influence WFLC mission direction
- ✓ Influence WFLC strategy and priorities

### **Identify/Communicate Success**

- ✓ Political Attention: NWCG could be the perceived “solution” to mitigating the political divisions, e.g. the non-biased technical expert/WFLCs/WGAs, technical experts, go-to group for tech (not policy) issues
- ✓ Can leverage recommendations from outside groups (GAO, NAPA, etc.) into needed change
- ✓ Embrace the fast changing world within resource management to assist us with working with communities at risk and reducing fuel hazards
- ✓ To educate the public at all levels of what fire can do for good and structure of disaster response/support
- ✓ Large measure of public support for fire suppression activities
- ✓ To identify our successes to external audiences

### **Communications with Partners**

- ✓ Improve communication with line managers in resources

- ✓ Improved plan of communications
- ✓ Build partnerships that improve fire management
- ✓ To engage and interact with international partners and to share technology and information
- ✓ Utilizing public and international technologies to move into the future

## THREATS

### Agency Centric Action

- ✓ Agency Imperatives: Individual agencies may feel the need for unilateral action at the expense of cooperative interagency collaboration
- ✓ Consistent and consolidated approach to business
- ✓ Other federal or state laws – requirements or lack there of that inhibit performing missions
- ✓ Personal Agendas: internal and external
- ✓ When an agency goes unilateral (own way) on a fire program undertaking

### Budget

- ✓ Reduced opportunities and flexibility to help across agencies as budgets tank
- ✓ Budgets
- ✓ Declining budgets
- ✓ Funding reductions watering down our reaction to issues
- ✓ Volatile cyclic fire budgets
- ✓ Budget Deficits: Lack of funding could preclude implementation of high priority activities
- ✓ Limited/No funding support
- ✓ Constrained budgets may limit our ability to address all of our priorities

### Module versus Systems Approach

- ✓ Proliferation of work related to performance measures and data requests for external audiences within and outside government
- ✓ Targets are too narrow in focus. Success in one area leads to issues in another
- ✓ Narrow fire focus leads to inefficiencies in resource management
- ✓ Workload may constrain the ability of parent group and working team members to fully function for NWCG due to the collateral nature of the work

### **Personnel and Staffing**

- ✓ Staff turnover
- ✓ Inability to recruit and train future fire force
- ✓ Aging fire force

### **Communications**

- ✓ Not having all the players at the table
- ✓ Too many levels of bureaucracy
- ✓ Not being able to provide input to upper levels when they discuss operational Fire Management issues/business
- ✓ Communications in general

### **Upper Level Politics**

- ✓ Politics
- ✓ Influence upper level accepts from lobbyists/vendors

- ✓ External governmental officials making decision about how, when and what we should do based on poor or lacking understanding of fire
- ✓ WFLC – making poor decisions based on lack of understanding about NWCG
- ✓ Inability to address NWCG requirements due to time sensitive policy mandates
- ✓ Stupid decisions made at political level that take us a different direction and wastes \$.
- ✓ Top down direction without sound bases, background, communication that its coming
- ✓ Power struggles above fire directors
- ✓ Abrupt shifts in commander's intent by changes in political leadership
- ✓ Tactical management from department level
- ✓ Too much political dabbling in wildfire issues/arena

### **External**

- ✓ Other influences which may dictate issues/direction for NWCG with little or no input from NWCG: WFLC/Bureau Directors
- ✓ Outside involvement impacting quality and safety of wildland fire response
- ✓ Interest groups that want to participate in NWCG that do not clearly line up with our mission
- ✓ Too many outside agencies or groups attempting to run wildland fire business
- ✓ Change in mission or scope, i.e. all hazard response
- ✓ Creating outside organizational layers that confuse roles/responsibilities of NWCG
- ✓ Enhanced mission requirements
- ✓ Crisis of the day management

- ✓ Misunderstanding of role/responsibility, capability, especially with regard to all hazard also to fuels/ecosystem management
- ✓ Natural disasters: National emergency response may overwhelm thoughtful planning processes
- ✓ All risk involvement driving wildland fire response

### **Liability**

- ✓ Liability issues associated with pending or finalized law suits

## Internal sources: Fire IT Community management SWOT

Two earlier SWOT analyses drew on the opinions and expertise of the Fire IT community. The first of these sessions (Figure 21) asked about IT Management issues, the second about IT Applications and Data. IT Management produced the following (see Figure 22).

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Extensive interagency communication and collaboration</li> <li>• Abundant proactive/passionate/engaged/dedicated employees</li> <li>• Ability to collaborate on common objectives</li> <li>• Common focus point (Fire)</li> <li>• Co-location of wildland fire organizations at NIFC</li> <li>• Wide pool of resources (multi-agency)</li> <li>• Depth of subject matter expertise</li> <li>• Incident Command System (common training and understanding of roles and responsibilities)</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Stall at hard decisions (political pressure causes interagency bodies to want consensus)</li> <li>• Agency-centric views to fulfill OMB requirements create inconsistent or redundant requirements for projects/programs</li> <li>• Agency policies conflict with interagency fire objectives which splits the loyalty of employees</li> <li>• Agency agendas can prevent cooperation</li> <li>• Project funding request process can set up a project to fall short</li> <li>• Interaction between fire organizations is foggy</li> <li>• No IC at strategic level (no single "bottom line" authority)</li> <li>• Collateral duties (employees are stretched too thin)</li> <li>• Spending difficult to track, costs difficult to assess</li> <li>• Corporate knowledge walking out the door</li> <li>• Still building stove-piped IT Projects</li> </ul>
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• NWFEA outcomes / recommendations</li> <li>• Reducing redundancies / consolidation (coming up with better answers!)</li> <li>• OMB requirements lead toward effective portfolio management</li> <li>• Let the business people drive the business</li> <li>• Use of contractors to perform specific tasks, especially with a diminishing federal workforce</li> <li>• Thinking "out of the box" is usually recognized and rewarded</li> <li>• New leadership on the Forest Service IT / PMO, renewed enthusiasm</li> <li>• Create a Fire CIO?</li> <li>• NWCG Strategic Plan</li> <li>• Make life better for people on the ground</li> <li>• Single record management (interagency)</li> <li>• IT savvy workforce, training the end-user is getting easier</li> <li>• DHS</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Missed opportunities for training (keeping employee skill sets current and appropriate)</li> <li>• Aging workforce – knowledgebase not being replenished</li> <li>• A perception that the higher you go in the interagency arena – the less collaboration you find</li> <li>• Burden of administrative requirements, BPR has resulted in a definite burden shift</li> <li>• Diminishing funding / resources reallocated</li> <li>• Legislative policy</li> <li>• Legal issues (BLM / especially at field level)</li> <li>• Lack of good acquisition management</li> <li>• Resistance to cultural change, end-users feel "over-automated"</li> <li>• More natural disasters draining funding / over-tasking existing resources</li> <li>• Losing Internet paralyzes all web-based applications</li> <li>• How to choose HPSD 12 implementation (?)</li> <li>• New OMB mandates</li> <li>• DHS</li> </ul>

Figure 21 - SWOT about IT management from Fire IT

The themes of workforce retention, continued investment in the existing workforce, and hiring of new blood rise to prominence, along with differences between Departments, or Agencies within a Department. Corresponding to the straw poll's issues of Capital Investment, this SWOT raises the issues of diminished funding and reallocation of resources, as well as dooming a project to failure owing to inadequate funding. The CBT highlighted the following items from this SWOT as particularly on point for the blueprint:

- “Agency-centric views to fulfill OMB requirements create inconsistent or redundant requirements for projects or programs.” To the CBT, this is a clear recognition of the pains of interagency cooperation, and is a topic that Wildland Fire must address.
- “Agency agendas can prevent cooperation” delivers much the same message.
- “Collateral duties (employees are stretched too thin)” corresponds to the CBT’s feeling that many of the problems that Wildland Fire runs into come about from inconsistent membership on key committees; this, in turn, arises because of an overload of collateral duties.
- “Corporate knowledge walking out the door?” echoes the CBT’s sentiments.
- On the other side, the CBT disagreed with the SWOT participants’ observation that the “Higher you go in the interagency arena – the less collaboration you find.” They believe this is a common perception, but is incorrect.

#### Internal sources: Fire IT Community data and applications SWOT

The analysis of Applications and Data produced the data shown in Figure 22.

The CBT highlighted several of these issues:

- The “disparate and unused data interfaces” seems to be another way of recognizing that there are inadequate integration strategies in place. The number of differing unique interfaces guarantees that integration will be point-to-point, leading to brittle “spaghetti” patterns of systems. Therefore, Service-Oriented Architecture (SOA) along with Systems of Record would be a valuable approach to explore.
- The comment that “very few interagency systems of record and no agency direction to use them” is harmonious with the call for SOA above.
- “Lack of money to implement a recommended Enterprise Architecture” seems both likely and problematic.
- “Stranded functionality” fits with the issues of roll-out brought up in the CBT SWOT, the “out-of-the-box” thinking mentioned in the IT Management SWOT, and discussions of the role of Research in the Fire community.

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Starting to integrate across agency boundaries (technically / politically / financially)</li> <li>• Applications are forward-looking (strategic)</li> <li>• NWCG applications have business stewardship</li> <li>• Fire-centric issues are financially supported</li> <li>• Interagency issues are high priority and funded</li> <li>• Providing helpdesk support for many applications</li> <li>• Applications share a common platform (windows-based)</li> <li>• Good involvement of SME's in application development (SME's become trainers)</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• SDLC is too long</li> <li>• Stove-piped applications</li> <li>• Fire season issues are often "knee-jerk" supported (throwing money at the problem)</li> <li>• Planning of projects does not consider cost, time, skills all the way through O &amp; M</li> <li>• Inability to deliver applications in a timely manner</li> <li>• Disparate and unused data interfaces</li> <li>• Few national standards for data and metadata</li> <li>• Limited involvement from records management (Privacy Information Act), difficult to find guidance for interagency documentary materials</li> <li>• Ground level applications have limited scalability</li> <li>• Very few interagency systems of record and no agency direction to use them</li> <li>• Underestimates of applications' scope</li> <li>• Not enough server support to deliver good response time for applications</li> </ul>
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Leverage data from different applications</li> <li>• Standardized data / policies will allow fire to interact with multiple agencies (write once, read many)</li> <li>• Identification and implementation of business rules</li> <li>• Provide support to planning and security requirements as well as project management</li> <li>• Forest Service Project Management Office in Denver developing re-usable organizational documents and repeatable processes.</li> <li>• Opportunity to mature processes</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Interagency applications still need to reside on single agency servers, security issue</li> <li>• Agency-centric walls</li> <li>• Project teams don't put a high priority on enterprise solutions (PM's focus on their own projects)</li> <li>• Lack of money to implement recommended changes from the EA</li> <li>• Stranded functionality (home-grown applications that work well don't get support for maturity)</li> </ul>

Figure 22 - SWOT of IT applications and data from Fire IT

### ***Patterns in the data***

Although the consequences of these issues lie within the Fire Program Management Functions, the themes themselves fall squarely in the Leadership Functions. In particular, they represent issues of Governing Processes (decision making), Coordinating Processes (bringing together multiple sources), and Implementing Processes (establishment of plans, policies, tool and system designs, and other standards – but also roll-outs and deployments).

Additionally, these issues center on the notion of change management; specifically on the implementation and coordination of change. Setting new standards, for instance, is a strategic decision; arranging for coordinated implementation of the new standard involves allocation of budget, time, and testing across agencies to ensure lock-step change. Failure to implement with coordination leads to operational breakdowns.

## The Auditors' Perspective

A 2006 USDA Audit Report on Forest Service Large Fire Suppression costs<sup>1</sup> remarked that:

*“Forest Service’s (FS) wildfire suppression costs have exceeded \$1 billion in 3 of the past 6 years. FS’ escalating cost to fight fires is largely due to its efforts to protect private property in the wildland urban interface (WUI) bordering FS lands. ...The Office of Management and Budget (OMB) assessed FS’ wildland fire management program in 2002 and 2006 and concluded that the agency did not regularly collect timely and credible performance information, that Federal managers were not held accountable for suppression costs and performance, and that the program did not demonstrate improved efficiencies and cost effectiveness in achieving program goals.”*

The auditors went on to recommend that the FS

*“Develop a reporting mechanism to gather and summarize more meaningful wildfire suppression information to adequately evaluate wildland fire suppression activity cost effectiveness.*

*Increase the financial accountability of line officers and incident commanders by incorporating into their evaluations an assessment of strategic and tactical cost effectiveness.*

*Formalize newly developed wildfire cost assessment review procedures in FS directives and provide audit training to FS staff that perform the reviews.”*

The General Accountability Office report from January 2007, made comparable recommendations<sup>2</sup>:

*“[F]ederal wildland fire management agencies need to take a number of actions to strengthen their overall management of the wildland fire program, actions that could lead to more effective and efficient use of scarce resources and help the agencies to better contain costs. While we have made a number of recommendations over the last 7 years to improve wildland fire management—and agencies have largely concurred with these recommendations—the agencies have made limited progress in implementing the needed changes. Further, our preliminary work on federal agencies’ efforts to contain wildland fire preparedness and suppression costs has also identified other actions that may be needed. Specifically, we believe that the agencies need to:*

*Develop a cohesive strategy that identifies the options and associated funding to reduce fuels and address wildland fire problems.*

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<sup>1</sup> <http://www.usda.gov/oig/webdocs/08601-44-SF.pdf> -- emphasis added

<sup>2</sup> <http://www.gao.gov/new.items/d07427t.pdf> -- emphasis added

*Clarify their guidance for sharing wildland fire suppression costs with nonfederal entities.*

*Establish clear goals, strategies, and performance measures to help contain wildland fire costs.”*

The report concludes that

*“The federal government is expending substantial effort and billions of dollars in attempting to address our nation’s wildland fire problems. Yet despite promises to do so, the agencies still cannot articulate how the steps they are taking fit together to form a comprehensive and cohesive strategy to contain costs or to address the many wildland fire management problems we and others have reported over the last 7 years. Given the interrelated nature of wildland fire issues, they cannot be addressed in isolation but must be viewed from and addressed within a broader perspective. Agencies need to understand how each issue affects the others and determine the trade-offs required to effectively meet program goals while containing program costs.”*

These recommendations are reflected also in the OMB’s Detailed Information on the USDA Wildland Fire Management Assessment<sup>3</sup>. The program improvement plans include:

- Refine program delivery by basing allocations of program resource on the basis of risk mitigation, emphasizing accountability for firefighting costs, improving management oversight, and ensuring fair sharing of costs.
- Improve procedures for allocating hazardous fuels reduction funds by assessing the risks from wildland fires and determining the benefits of fuels treatment and restoration projects by priority.
- Improve performance data reliability to fully evaluate progress in reducing risk of catastrophic fire.

The comparable program improvement plans for the DOI Wildland Fire Management Assessment<sup>4</sup> are:

- Prioritize the timely implementation of the preparedness and fuels reduction systems to ensure that institutional barriers are overcome.
- Implement new performance measures and strengthen hazardous fuels project criteria to ensure that funds are more effectively targeted.
- Emphasize accountability for firefighting costs, improving management oversight, and ensuring that states are paying their fair share of such costs.

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<sup>3</sup> <http://www.whitehouse.gov/omb/expectmore/detail/10000448.2006.html>

<sup>4</sup> <http://www.whitehouse.gov/omb/expectmore/detail/10000134.2005.html>

In the overall assessment, both USDA and DOI areas of Wildland Fire scored poorly in their Strategic Planning capabilities (USDA: 50%, DOI: 50%); program management capabilities (USDA: 29%, DOI: 57%); and Accountability capabilities (USDA: 40%, DOI: 33%).

### Correlation with Audit Reports

A persistent comment found in the various audit reports from various sources is that there has been general agreement with the auditors’ recommendations, but little to show in the way of concomitant action. The issues the CBT raised in the matrix above correspond closely to findings of the audit reports.

Implementation of the recommendations in this blueprint offers another opportunity for addressing the auditors’ findings.

Table 15 - Correlation of Audit Findings to Matrix Goals

Audit Finding	Matrix Goal
The agency did not regularly collect timely and credible performance information and should develop a reporting mechanism to gather and summarize more meaningful wildfire suppression information to adequately evaluate wildland fire suppression activity cost effectiveness	Efficient reporting structure with Systems of Record, no more applications than needed, shared data (single data entry), and seamless integration.
Federal managers were not held accountable for suppression costs and performance, and thus the agencies should increase the financial accountability of line officers and incident commanders by incorporating into their evaluations an assessment of strategic and tactical cost effectiveness	Start looking at individual pieces of fire for their own AMR, rather than considering the fire as a single AMR; AMR must contain cost as well as environment as a factor. Responses are as cost-effective as it is possible to make them
The program did not demonstrate improved efficiencies and cost effectiveness in achieving program goals. Therefore, formalize newly developed wildfire cost assessment review procedures in FS directives and provide audit training to FS staff that perform the reviews	Performance measures address response issues in ways that promote improved performance
Develop a cohesive strategy that identifies the options and associated	Measure of success in terms other than acres — shared criteria of

Audit Finding	Matrix Goal
funding to reduce fuels and address wildland fire problems	<p>success based on reduced risk.</p> <p>Treat more areas -- effects of naturally occurring fires should have less impact. Fire plays a role in ways similar to pre-settlement conditions.</p> <p>Vegetation can be controlled by a variety of techniques other than fire -- add those results into measures.</p>
Clarify their guidance for sharing wildland fire suppression costs with nonfederal entities	<p>A greater share of responsibility for explaining fire management taken on by local community services</p> <p>Established joint programs between Fire and local government entities for providing information</p>
Establish clear goals, strategies, and performance measures to help contain wildland fire costs	<p>Responses are as cost-effective as it is possible to make them</p> <p>Treat more areas -- effects of naturally occurring fires should have less impact. Fire plays a role in ways similar to pre-settlement conditions</p>
The agencies still cannot articulate how the steps they are taking fit together to form a comprehensive and cohesive strategy to contain costs or to address the many wildland fire management problems we and others have reported over the last 7 years	<p>AMR is implemented consistently and across the board</p> <p>Land and resource management plans enable AMR</p> <p>Service catalog of incident responses tied to preparedness conditions with common vocabulary and reference.</p>
Refine program delivery by basing allocations of program resource on the basis of risk mitigation, emphasizing accountability for firefighting costs, improving management oversight, and ensuring fair sharing of costs	<p>Performance measures address response issues in ways that promote improved performance</p>
Improve procedures for allocating hazardous fuels reduction funds by assessing the risks from wildland fires and determining the benefits of fuels treatment and restoration projects by priority	<p>Post-wildfire recovery decisions made on the basis of accurate cost risk analysis</p> <p>All vegetation managed according to collaborative plans that meet regulatory constraints.</p>

Audit Finding	Matrix Goal
	<p>Widely shared vision of how the ecosystem should be, based in part on history.</p> <p>Environmental laws seen a part of normal business of Vegetation Management, and taken into full consideration</p> <p>Vegetation can be controlled by a variety of techniques other than fire -- add those results into measures.</p>
<p>Improve performance data reliability to fully evaluate progress in reducing risk of catastrophic fire</p>	<p>Performance measures address response issues in ways that promote improved performance</p> <p>Measure of success in terms other than acres — shared criteria of success based on reduced risk.</p>
<p>Prioritize the timely implementation of the preparedness and fuels reduction systems to ensure that institutional barriers are overcome</p>	<p>Adequate availability of resources for wildland fire, prescribed fire, and all-hazard</p> <p>Environmental laws seen a part of normal business of Vegetation Management, and taken into full consideration</p>
<p>Implement new performance measures and strengthen hazardous fuels project criteria to ensure that funds are more effectively targeted</p>	<p>Measure of success in terms other than acres — shared criteria of success based on reduced risk</p>
<p>Emphasize accountability for firefighting costs, improving management oversight, and ensuring that states are paying their fair share of such costs</p>	<p>Public understanding of the Fire Program with realistic expectations of what it provides</p> <p>A greater share of responsibility for explaining fire management taken on by local community services</p> <p>Establishing joint programs between Fire and local government entities for providing information.</p>

**Recommendations from the NWCG IRM Strategy Project: Wildland Fire Business Model (1996)**

Table 16 - Recommendations from the NWCG IRM Strategy Project: Wildland Fire Business Model (1996)

Recommendation Text	Interpretation	Source	Type
☑ National Interagency Information Systems Repository -- Establish a national interagency information systems repository for business models and data dictionary.	☑ Models included would be: current logical, current physical, future logical, and future physical.	YB p: 159	EA Program Function
☑ Computer Assisted Software Engineering Tool (CASE) -- Select a CASE Repository for the NWCG business model and data dictionary.	☑ Provide a method to easily create and access process and data models. ☑ Provide a method to overlay process and data models to create an enterprise view.	YB p: 159	EA Program Function
☑ Model Transition -- Transition the NWCG business model over to the final CASE Repository (NIISR)		YB p: 159	EA Program Function
☑ Change Management Procedures -- Development of change management procedures with subsequent field review process for changes/modifications to the NWCG business model.	☑ Ensure the business community is actively involved in maintaining and using the architecture.	YB p: 159	Management Process
☑ Maintenance of the Models -- Formalize and designate responsibilities for maintenance of the NWCG business model, including funding mechanisms.	☑ Establish a program to provide continual update and maintenance of the models so that they can benefit future efforts.	YB p: 159	EA Program Function
☑ Resource Status and Tracking business area could benefit from a more detailed analysis	☑ Develop the capability to determine and display the status of resources.	YB p: 160	Fire Operations and Resource Status Reporting

Recommendation Text	Interpretation	Source	Type
☑ Wildland Fire Intelligence business area could benefit from a more detailed analysis	☑ Analyze and design a process or application to improve the timeliness of incident statistics and other information, by at least 50%.	YB p: 160	Fire Operations and Resource Status Reporting
☑ Analysis of Business Needs vs. Current Applications	☑ Conduct a review of business needs and current applications used by the national interagency wildland fire management community.	YB p: 160	Conceptual - DOI BP, eDM
☑ Interagency Information Resources Management Strategy -- Establish and maintain an IRM infrastructure and framework.	☑ The infrastructure should consist of: 1) personnel, including analysts, designers, project managers, operations and maintenance (O&M) support, etc; 2) hardware and software used for design, development, support, and maintenance; 3) a repository of business rules and data.	YB p: 161	Conceptual
☑ Availability of the Wildland Fire Business Model -- Make the models and data dictionary available in the Internet, possibly via an NWCG Home Page on the World Wide Web.		YB p: 161	EA Program Function
☑ Coordination of Regional and State Systems -- Support national coordination for regional and state information systems.	☑ Ensure system analysis includes the needs of all levels of the organization: national, regional, state, and local.	YB p: 161	Conceptual
☑ Standard Naming Conventions -- Gain interagency concurrence on standard naming conventions in information systems.		YB p: 161	Management Process
☑ Training in a Structured Methodology -- Conduct training necessary to support decision making and use of the Wildland Fire Business Model to determine the scope of future projects and to develop project charters.		YB p: 161	EA Program Function

Recommendation Text	Interpretation	Source	Type
<p>☑ Automated Resource Database -- Implement a national, interagency automated system to determine and display the status of resources.</p>		YB p: 163	Fire Operations and Resource Status Reporting
<p>☑ System Integration -- Integrate existing systems* with resource availability/status information, to create a system that can accurately predict resource needs, with a high degree of probability, 7-10 days in advance.</p>	<p>☑ These projections should be accessible to line managers who control essential non-fire resource availability, to alert them of upcoming resource needs and anticipated scarcity of available resources. e.g., Rare Event Risk Assessment Process (RERAP).</p>	YB p: 163	
<p>☑ Personal Commitment -- Solicit the personal commitment of all fire personnel and line managers to share accident information, in order to learn from our own and others' mistakes.</p>		YB p: 164	Accident Management
<p>☑ Standard Reporting -- Implement a standard reporting format and a common tracking system for accidents and near-misses among all NWCG agencies.</p>		YB p: 164	Accident Management
<p>☑ Integrated Database -- Integrate the existing accident report</p>		YB p: 164	Accident

## Recommendations from the eGovernment Disaster Management Report

Table 17 - Recommendations from the eGovernment Disaster Management Report

Recommendation Text	Interpretation	Source	Type
☑ Conduct a demonstration or pilot application of CAP messaging in wildland fire	☑ In order to better determine the benefits and appropriate use of CAP messaging in the wildland fire business environment, a demonstration or pilot should be conducted.	eDM §6 p:31, #1	Incident / Event Management
☑ Adopt appropriate EDXL standards and incorporate those standards into existing and new applications	☑ The EDXL standards, as part of the Disaster Management Standards Initiative, facilitate the development of public data exchange standards for incident management so that data are able to be seamlessly and easily shared across disparate information systems	eDM §6 p:33, #4	Incident / Event Management
☑ Create an “end-to-end” fire reporting system that would provide an integrated and coordinated process for collecting Incident / Event data	☑ The existing environment of wildland fire reporting was created by various wildland fire business functions with differing objectives and requirements. Each system, on its own, meets the needs of its target audience; however, when the data is consolidated it results in inconsistent information.	eDM §6 p:31, #3	Fire Operations and Resource Status Reporting

Recommendation Text	Interpretation	Source	Type
<p>☐ Create one national wildland fire (incident) computer aided dispatch (CAD) application based on a thorough analysis of the business needs of the dispatch and fire management communities.</p>	<p>☐ Components of this application would be:</p> <p>☐ Interoperable with other incident management and incident support systems such as ROSS and InciWeb</p> <p>☐ Incorporate the functions of the stand-alone FireCode System</p> <p>☐ Interoperable with state, local, and other cooperators</p>	<p>eDM §6 p:31, #2</p>	<p>Incident / Event Management</p>
<p>☐ Update or revise the ICS-209 to better capture non-fire incident information requirements.</p>	<p>☐ As noted above the data elements and reporting formats for wildland fire are sometimes inadequate for capturing information about non-fire events (such as hurricanes) to which wildland fire resources often respond.</p>	<p>eDM §6 p:33, #5</p>	<p>Incident / Event Management</p>

**Recommendations from the DOI Wildland Fire Blueprint (2005)**

Table 18 - Recommendations from the DOI Wildland Fire Blueprint (2005)

Recommendation Text	Interpretation	Source	Type
<p>☑ Develop Sharing Plan for Reusable Data</p>	<p>☑ Develop a System of Record policy for key Wildland Fire Management information.</p> <p>☑ Develop a plan to communicate to the other programs, the “shareable” data for which the Wildland Fire Management organization is the System of Record Use this plan</p>	<p>DOIBP §6.1.4, p: 35</p>	<p>ALL</p>
<p>☑ Monitor all services related activities</p>	<p>☑ Develop a Wildland Fire Management plan to monitor the DOI horizontal services activities inclusive of FBMS and the 5 infrastructure projects (on p: 2, items 1-5)</p> <p>☑ Use this plan to facilitate the ongoing investment process and system development efforts.</p>	<p>DOIBP §6.1.4, p: 36</p>	<p>Conceptual</p>
<p>☑ Start the Change Management Process</p>	<p>☑ The OCIO program will be developing a Services Oriented Architecture Guidance and Best Practices during the coming fiscal year. Request to be on distribution.</p>	<p>DOIBP §6.1.4, p: 36</p>	<p>Conceptual</p>

Recommendation Text	Interpretation	Source	Type
<p>☑ DOI and FS Integrated Investment Structure</p>	<p>☑ It is recommended that the FS and all the DOI agencies join an integrated Wildland Fire Management Investment Management Process. A Business Process Re-engineering (BPR) activity would be required to establish optimal way to address the issues.</p>	<p>DOIBP §6.2.6, p: 38</p>	<p>E2E IT Investment Process</p>
<p>☑ Manages the cross-agency evolution of all IT systems within CPIC cycle.</p>	<p>☑ Identify systems without business cases – generate business cases (Exhibit 300, 300-1)</p>	<p>DOIBP §6.2.6, p: 38</p>	<p>E2E IT Investment Process</p>
<p>☑ Investment Prioritization process with business-driven priorities</p>	<p>☑ Development of prioritization criteria and a means to rank investments.</p>	<p>DOIBP §6.2.6, p: 38</p>	<p>E2E IT Investment Process</p>
<p>☑ Full IT system portfolio review as a part of Investment cycle</p>	<p>☑ All new investments should be required to investigate, identify and document the IT portfolio as a part of its submission to the investment process:</p>	<p>DOIBP §6.2.6, p: 38</p>	<p>E2E IT Investment Process</p>
<p>☑ Horizontal (common needs) Investment Strategy</p>	<p>☑ Development of investment model where charges can be assigned to participating development efforts to help achieve standardization of technology costs and breakdown stove pipe developments and achieve services oriented architectures.</p>	<p>DOIBP §6.2.6, p: 38</p>	<p>E2E IT Investment Process</p>

Recommendation Text	Interpretation	Source	Type
<p>☑ Manage the evolution of system lifecycles LOB/wide and support the investment process for LOB system inventory and investments.</p>	<p>☑ Responsibilities would include: Identify systems without business cases – generate business cases</p> <p>☑ Support the CM process, provide risk analysis and mitigation</p> <p>☑ Each investment detailed to the level of hardware, software development, COTS procurement</p>	<p>DOIBP §6.3.7, p: 41</p>	<p>E2E IT Investment Process</p>
<p>☑ Establish a LOB-wide requirements library.</p>	<p>☑ Assign content ownership to the appropriate business stewards Assign LOB library maintenance to the NWCG PMO Implement cross-agency LOB change processes Facilitate the outreach of the available requirements and supporting mappings to systems.</p>	<p>DOIBP §6.3.7, p: 41</p>	<p>Management Process</p>
<p>☑ Establish a LOB DOI-wide Configuration Management Board supported by Systems Engineering.</p>	<p>☑ Manage the release process for baseline technologies Manage the interface standards and methods for the systems Manage the requirements and system designs to ensure design alignment with requirements allocation and target states.</p>	<p>DOIBP §6.3.7, p: 41</p>	<p>Management Process</p>
<p>☑ Consolidate Help Desks</p>	<p>☑ Complete the evaluation of existing help desks Develop a strategy and plan to normalize the service throughout the LOB Introduce performance metrics to support the overall effectiveness of the IT system deployment Use as a channel into the LOB.</p>	<p>DOIBP §6.3.7, p: 42</p>	<p>Infrastructure</p>

Recommendation Text	Interpretation	Source	Type
<p>☑ Desktop interoperability</p>	<p>☑ Investigate, develop and test a Wildfire standard image that reflects the tools required for the wildfire community. Continue to move to a server based computing model which will mitigate the dependencies on Desktop integration.</p>	<p>DOIBP §6.3.7, p: 42</p>	<p>Infrastructure</p>
<p>☑ Establish Fire Mobile Computing Security Policy</p>	<p>☑ Evaluate the DOI policy on Security for Mobile computing <a href="http://web.blm.gov/internal/wo-500/directives/dir-04/im2004-169.html">http://web.blm.gov/internal/wo-500/directives/dir-04/im2004-169.html</a> Identify barriers to implementation and improvements Articulate exceptions based strategy and justification.</p>	<p>DOIBP §6.3.7, p: 42</p>	<p>Management Process</p>
<p>☑ Develop an Enterprise Application Integration (EAI) strategy to address the burden of interface maintenance, lack of primary identifier for fire use, treatments, permits and incidents, and supporting data exchange requirements over a 5-year life cycle.</p>	<p>☑ The strategy needs to be: a) based on Service Oriented Architecture (SOA) using web services, b) XML based fire schema for exchange and transfer, (similar to the EM-XML being developed for emergency management). c) An in-depth understanding of the legacy systems.</p>	<p>DOIBP §6.4.2, p: 46</p>	<p>Incident / Event Management</p>
<p>☑ Assign a representative to the EM-XML working teams to keep abreast of standards development. Adopt the CAP standard.</p>	<p>☑ An example of interface simplification could be the publication and exchange of Wildland Fire Management Incident status (text and geo-spatial) information through Fire-ML. By leveraging industry standards and best practices from GML (Geographic Markup Language)</p>	<p>DOIBP §6.4.2, p: 47</p>	<p>Incident / Event Management</p>

Recommendation Text	Interpretation	Source	Type
<p>☑ Establish via the NWCG Geospatial Task Group to do the following: A) Evaluate the existing interface design standards – reconcile to one.</p>		<p>DOIBP §6.5.1, p: 52</p>	<p>Fire Operations and Resource Status Reporting</p>
<p>☑ Establish via the NWCG Geospatial Task Group to do the following: B) Establish in Requirements library the standard for future application development effort,</p>		<p>DOIBP §6.5.1, p: 52</p>	<p>Management Process</p>
<p>☑ Establish via the NWCG Geospatial Task Group to do the following: C) Establish OGC services as the spatial access method for future development efforts,</p>		<p>DOIBP §6.5.1, p: 52</p>	<p>Fire Operations and Resource Status Reporting</p>
<p>☑ Establish via the NWCG Geospatial Task Group to do the following: D) Ensure that future development and technology procurements conform to OGC standards – provide boiler plate language in support of contracts,</p>		<p>DOIBP §6.5.1, p: 52</p>	<p>Management Process</p>

Recommendation Text	Interpretation	Source	Type
<p>☐ Establish via the NWCG Geospatial Task Group to do the following: E) Assign a participant to the EM-XML working group (<a href="http://xml.coverpages.org/emergencyManagement.html">http://xml.coverpages.org/emergencyManagement.html</a>)</p>		DOIBP §6.5.1, p: 52	Management Process
<p>☐ Establish via the NWCG Geospatial Task Group to do the following: F) Apply newly adopted interface standards and access standards during next major O&amp;M release or new development release.</p>		DOIBP §6.5.1, p: 52	ALL
<p>☐ [An investment] must be a known commodity and integrated into the development schedules of the respective activities. This will require the support of the System Engineering team that has been recommended earlier in the report.</p>		DOIBP §6.5.1, p: 52	ALL
<p>☐ Once the SLAs are in place and the LOB business requirements are mapped to the DOI's horizontal investments in Geo-spatial technologies and services, the re-engineering of the target applications can be done.</p>	<p>☐ Once the DOI level service is tested and proven, those systems that are going through redevelopment should be targeting the support service as a system development dependency.</p>	DOIBP §6.5.1, p: 56	Management Process

Recommendation Text	Interpretation	Source	Type
<p>☑ Take advantage of the DOI-level investment for a Federal Geographic Data Clearing (FGDC) meta-data clearing house tool that is a part of Geo-Spatial One Stop.</p>	<p>☑ Commit to publishing all Fire owned datasets via the clearing house tool to centralize the meta-data. Assign clear lines of ownership for Fire unique data like WUI and Fire Planning Units. Ownership should not be established on organizational lines.</p>	<p>DOIBP §6.5.1, p: 56</p>	<p>Management Process</p>
<p>☑ Develop an SLA between the Wildland Fire Management business community, users of the LandFire work products, and the team providing the processing of the Landsat data.</p>	<p>☑ The initial key concern, is a perceived disconnect between the capability to process the imagery to produce a “Wildland Fire” product that is useable. The Exhibit 300 states that the burden to import or to receive this information is on the end user.</p>	<p>DOIBP §6.5.1, p: 56</p>	<p>Management Process</p>
<p>☑ Investigate the generic reuse concept of a system like Maximo to support project based initiatives that are structured around planned activities like mechanical treatments.</p>	<p>☑ These types of projects lend themselves very well to the planned maintenance concepts. The advantages are coordinated schedules, integration with spatial representation, integration with facilities information database and resource use and tracking.</p>	<p>DOIBP §6.6, p: 57</p>	
<p>☑ Develop a plan to build a permitting capability to support the citizen focused requests for authorization or resources.</p>	<p>☑ The customer may be the citizenry, Wildland Fire Management partners or other Federal Agencies who would be requiring use of DOI’s Wildland Fire Management resources.</p>	<p>DOIBP §6.6, p: 57</p>	<p>Incident / Event Management</p>

Recommendation Text	Interpretation	Source	Type
<p>☑ Develop an investment activity to explore the priority and value of the integrating the DOI facilities data and other special condition data with the Wildland Fire Management needs.</p>	<p>☑ The data needs to be spatially enabled and available through a service such that the Wildland Fire Management program does not need to maintain any knowledge of the information's currency.</p>	<p>DOIBP §6.7, p: 60</p>	<p>All</p>
<p>☑ Investigate the best source for identification of geo-coded address information</p>	<p>☑ It is recommended that with the increasing occurrence of Wildland Fire Management in the Wildland Urban Interface (WUI) and the corresponding risk of life and property damage, the program investigate through a combination of commercial vendors or government.</p>	<p>DOIBP §6.7, p: 60</p>	<p>Incident / Event Management</p>
<p>☑ Develop a strategy to leverage the online rulemaking (<a href="http://www.regulation.gov">http://www.regulation.gov</a>) and review capabilities for policy that requires public or industry comment.</p>	<p>☑ Currently Wildland Fire Management partners FS, FEMA and Homeland Security are actively using the service. Investigate the SLA around the existing service the existing agreement.</p>	<p>DOIBP §6.8, p: 61</p>	<p>Management Process</p>
<p>☑ Monitor the development of Human Resources (HR) aspect of the E-gov initiatives with a formally established project.</p>	<p>☑ OMB has recently released models that are designed to be delivered by six service centers and will support the entire federal government. The final set of services is still being developed.</p>	<p>DOIBP §6.8, p: 61</p>	<p>EA Tracking</p>

Recommendation Text	Interpretation	Source	Type
<p>☑ All bureaus (all levels) and centers should migrate their business content and supporting infrastructure to centralized servers and develop quality assurance and maintenance strategies along with the supporting procedures.</p>	<p>☑ This activity should remove all redundant information. Presentation models should be designed around the types of services the program is required to manage and its user community access models as laid out in Figure 6 14 [refer to figure 6-14, section 6.</p>	<p>DOIBP §6.9, p: 65</p>	<p>Management Process</p>
<p>Develop a plan to channel the required public outreach and Wildland Fire Management status information, training awareness, prevention information to a portal implementation that represents the Wildland Fire Management from a citizen focused perspective.</p>	<p>☑ There should be no required knowledge of any organizational or technical information on behalf of the citizenry. This investment could easily be extended to the FS and State level organizations.</p>	<p>DOIBP §6.9, p: 65</p>	<p>Fire Communications</p>
<p>☑ Develop a strategy for collaboration and communication with the state and local level governments using the collaborative tools of a portal.</p>	<p>☑ Start with non-critical communications. For example: collaborative work groups for standards, research or outreach.</p>	<p>DOIBP §6.9, p: 65</p>	<p>Fire Communications</p>
<p>☑ Develop a strategy to standardize on the key development technologies (middleware, application servers, portal technology) for the Wildland Fire Management program.</p>	<p>☑ Thought should be given to in-house skills, licensing agreements, lifecycle remaining of deployed applications, open standards, market place support as well as the DOI TRM.</p>	<p>DOIBP §6.9, p: 67</p>	<p>Infrastructure</p>
<p>☑ Develop a transition plan with the development community to eliminate redundancies.</p>	<p>☑ Redundancy to eliminate, when practical, include: 1) application servers, 2) web servers, 3) development tools, 4) portal technologies.</p>	<p>DOIBP §6.9, p: 67</p>	<p>Infrastructure</p>

Recommendation Text	Interpretation	Source	Type
<p>☐ Develop a plan to acquire key missing technologies and services with the appropriate enterprise licensing agreement.</p>	<p>☐ Given that many of the missing technology pieces will be of benefit to numerous organizations a strategy for cross organization purchasing will need to be established. Ensure that the procured technologies and standards are managed as a part of the baseline</p>	<p>DOIBP §6.9, p: 67</p>	<p>Infrastructure</p>

## **Themes of Issues**

A number of themes emerge from both the observations recorded in the audit findings and the Level 0 column of Table 19.

### **Consistency**

- Active participation with EPA and States in regulations and its implementation
- Approach to AMR across agencies
- Capital Investment Strategy (including IT)
- Computer security
- Contracts
- Interpretations of regulations
- Methods for evaluating programs (especially joint programs)
- Organizational structures across agencies
- Outreach policies and terminologies
- Payments and Allocations
- Policy decisions
- Qualifications
- Requirements for programs and projects
- Roll-outs (deployments)
- Standard templates for written and graphic materials
- Standards implementation
- Strategies joining Research and practical areas
- Systems of Record and Authoritative Sources
- Training
- Vocabulary and meaning of response types across agencies (outside Wildland Fire as well)
- Workforce Development

### **Lack of Coordination**

- Deployments and releases of new technologies and other innovations
- Duplication of services and efforts
- Evaluation mechanisms for Research
- Handling of all-hazard responses
- Hiring procedures for similar positions across agencies
- Interaction between Research and practical areas
- Inter-agency networks prohibited from interacting owing to
- Overall coordination of products, projects, and services
- Pooled monies and spending decisions
- Releases of research products to field.
- Setting up and maintaining contracts — same piece of equipment from same contractor can be covered by multiple contracts with multiple terms at multiple rates
- Smoke suppression competing with mandates to perform more prescribed fires

- uncoordinated security measures.
- On-demand report creation is poorly coordinated mix of automated and manual processes.

### *Needed Shift of Emphasis*

- Blueprint creation is viewed as an ad hoc, one-shot deal rather than on-going and fully institutionalized
  - True managed service relationships with external providers that address interagency concerns are needed.
  - Inadequate performance measures to address effectiveness of programs.
  - Not enough emphasis on AMR, but rather continuation of the approach that any fire has one objective.
  - Performance measure of acres treated is off base — not all acres are equal
- Too much information coming from different “authoritative sources,” and with conflicting or inconsistent information.
  - Workforce and succession planning
- Product management discipline is lacking yet sorely needed at the strategic level
  - Program management discipline is lacking yet sorely needed at the strategic level
  - Reporting is primarily geared to analysis at end-of-fire, rather than requests from outside the community for near-instantaneous reports
  - Research not clearly melded with practical requirements

## Product and Service Maturity Matrix

The Product and Service Maturity Matrix provides a view of the current state of Wildland Fire’s management of its products and services, plus targets that will help the organization achieve full maturity.

In the following table, the NWFEA Project Team, including the CBT, looked at each “capability area,” corresponding to the kinds of services that the wildland fire community offered. For each, they characterized the current state of affairs, a target state they felt the community should aim for 4–6 years from the time of writing, and the various stages of maturation through which the capability should pass to reach the desired state.

Table 19 - Product and Service Maturity Matrix

Product and Service Maturity Matrix		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Organization</b>	<ul style="list-style-type: none"> <li>Organizational structures are not parallel across agencies</li> <li>Workforce planning is a back-burner issue</li> <li>Blueprint Creation is an ad hoc committee run jointly with NWFEA group</li> <li>No alignment of interagency and agency strategic plans</li> <li>Roles of WFLC, FEC, OWFC, NWCG not fully agreed upon or documented</li> </ul>	<ul style="list-style-type: none"> <li>Map out organizational differences and flesh out areas that are best suited to, and would provide simpler, more cost-effective, efficient service, through parallel structure</li> <li>Establish common terminology and structure to organization</li> <li>Formulate plan that will take into account demographics of potential workforce, as well as skill sets needed for the next years.</li> <li>Gain understanding of technological advances (from Defense, commercial applications) that can allow Fire to capitalize on existing skill sets of new recruits</li> <li>Devise succession planning approach</li> <li>Develop ongoing Blueprint program in conjunction with NWFEA</li> <li>Document the roles and responsibilities of interagency groups and subcommittees</li> </ul>	<ul style="list-style-type: none"> <li>Implement organizational changes to establish parallel structure across agencies</li> <li>Put plan into effect and begin hiring process</li> <li>Invest in Fire applications of new technologies</li> <li>Put succession planning into effect</li> <li>Implement ongoing Blueprint program</li> <li>Streamline the interagency organizations to eliminate redundancies between interagency and agency functions</li> </ul>	<ul style="list-style-type: none"> <li>Organizational structures are parallel in terms of Fire (as much as possible)</li> <li>Successful hiring plan in place; agencies attract and retain appropriate recruits</li> <li>Organization capitalizing on prior experience of incoming recruits</li> <li>Organization has smooth turnovers as employees retire or move to other jobs</li> <li>Blueprint refreshing and maintenance is part of normal operations</li> <li>The roles of agency and interagency organizations is understood by all stakeholders</li> <li>The interagency and agency wildland fire organizations’ operations are streamlined and efficient.</li> </ul>

<b>Product and Service Maturity Matrix</b>		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Creating Policies, Standards, System &amp; Tool Design, and Handbooks</b>	<ul style="list-style-type: none"> <li>• Uncoordinated policy decisions</li> <li>• Current roll-out of designs and plans is inconsistent and leads to loss of capability (e.g., multiple radio standards, qualification and training standards, HRM, differing pay grades for the same job).</li> <li>• Current decision-making process is slow, cumbersome, and somewhat ad hoc. Difficulty in managing external uncontrollable factors</li> <li>• Much of the training in fire safety and techniques is valuable and solid; some non-Fire-specific training yields questionable cost benefit. Inadequate root cause analysis leads to using training as a panacea.</li> <li>• Most training is suppression and operations-oriented; less in vegetation manipulation and other areas.</li> <li>• Lack of consistence in terminology use across products</li> <li>• Strategic Plan and Functional Model are not aligned</li> <li>• Sub-Groups establish their own priorities</li> <li>• Decisions about IT systems and tools are made within agency governance structure only</li> <li>• Wildland Fire Product Portfolio is not centrally managed</li> </ul>	<ul style="list-style-type: none"> <li>• Establish Release and Deployment Management systems that will govern the way new standards are rolled out. Start with a single innovation.</li> <li>• Establish structured Decision-Making process to sit in permanent committee and review joint proposals</li> <li>• Validate update schedule and course development process for a few key courses. Identify those which are most in need of update.</li> <li>• Establish strategy for a single wildland fire glossary</li> <li>• Align Strategic Plan, and Functional Model</li> <li>• Establish Sub-Group Guidelines</li> <li>• Develop <i>NWCG Interagency Fire IT Investment Process</i></li> <li>• Establish Product Business Stewardship Concepts</li> <li>• Establish Product Portfolio function</li> </ul>	<ul style="list-style-type: none"> <li>• Add more innovations to the Release and Deployment Management so that it becomes the standard roll-out method.</li> <li>• Add a greater variety of Decision-Making tasks to the committee</li> <li>• This Release and Deployment Management committee should be permanent, and its members should have no collateral duties.</li> <li>• Update schedule and course development for remaining courses.</li> <li>• Design and implement wildland fire glossary</li> <li>• Align Strategic Plan and Blueprint</li> <li>• Implement <i>NWCG Interagency Fire IT Investment Process</i></li> <li>• Design Product Management processes and functions</li> </ul>	<ul style="list-style-type: none"> <li>• Completely structured method controlling all rollouts, ensuring smooth adoption.</li> <li>• Mature (well-defined, consistently applied) governance process that controls all joint policy decisions across Wildland Fire</li> <li>• Consistency of manuals and handbooks (both inter- and intra-agency on the Federal level, and Federal vs. States) wherever possible.</li> <li>• Consistency of qualifications, reporting requirements, training and improvements, and data collection and representation</li> <li>• Maintain currency of training courses on a continuous update and development schedule.</li> <li>• All wildland fire publications share the same glossary terms</li> <li>• Interagency team efforts are aligned with strategic plan and quality products are being developed</li> <li>• Wildland Fire Product Portfolio is well managed and meets business strategies and needs</li> </ul>

<b>Product and Service Maturity Matrix</b>		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Information Sharing</b>	<ul style="list-style-type: none"> <li>Stringent computer security policies restrict information sharing among agencies, increasing pre-existing incompatibilities</li> <li>Face-to-face and telephone communications limited owing to time and culture -- giving way to e-mail and other indirect communications.</li> <li>Plethora of Web sites for all groups, working teams, sub-groups, etc. in Fire community. Conflicting or inconsistent information on those Web sites. All shared information should be correct.</li> <li>So many sources of information -- how to keep up with all of it.</li> <li>Handbooks, Web sites, and other written and graphic sources don't follow any standard template</li> <li>Few data standards; data standards have not been adhered to by all systems. Projects do not deliver data standard proposals</li> <li>The structure of wildland fire data has been documented at a high-level, but a formal program to manage data from an enterprise perspective is still at a conceptual stage</li> </ul>	<ul style="list-style-type: none"> <li>Create collaborative abilities on master Web sites (e.g., allow NWCG working groups to make use of a collaborative area of NWCG Web site).</li> <li>Allow for easier customization of portals to create specialized or appropriate information without mass duplication.</li> <li>Set up initiative to create standards that will help reduce the spread of Web sites, but be flexible enough to address the needs for customization. Must be capable of allowing sandbox innovation, but using standard mechanisms.</li> <li>Set up standardized templates for handbooks, Web sites, and other written and graphic source.</li> <li>Plan for consolidation of duplicative sources of data</li> <li>Develop proactive collaboration to resolve the issues related to data standard development and implementation</li> <li>Develop a strategy for managing data at the enterprise level</li> </ul>	<ul style="list-style-type: none"> <li>Investigate the need to provide oversight of standards; if needed, set up such oversight.</li> <li>Develop standardized templates for handbooks, Web sites, and other written and graphic sources.</li> <li>Begin to combine duplicative sources and create Systems of Record.</li> <li>Integrate and share wildland fire planning, budgeting, implementation, monitoring, and maintenance data on an interagency basis.</li> <li>Convert existing systems' data to adhere to data standards</li> <li>Implement Data Enterprise Architecture Plan</li> </ul>	<ul style="list-style-type: none"> <li>Simple sharing of information for online access -- both in collaborative mode and in getting access to common information.</li> <li>Simple sharing of information for programmatic access</li> <li>Systems of Record that ensure consistency of information</li> <li>Reduced number of "authoritative" Web sites, replaced by linking to single agreed System of Record</li> <li>All new written and graphic materials follow standard templates.</li> <li>All Wildland Fire systems use common data standards</li> <li>All Wildland Fire data is mapped to a common enterprise data model and information from wildland fire systems is consistent.</li> </ul>

<b>Product and Service Maturity Matrix</b>		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Reporting</b>	<ul style="list-style-type: none"> <li>• Poorly-coordinated mix of automated and manual processes.</li> <li>• Duplication of data entry owing to numerous systems with conflicting data structures</li> <li>• Networks that do not communicate owing to security settings.</li> <li>• Inability to offer fast turn-around on report requests.</li> <li>• Preliminary and interim data provided and misinterpreted</li> </ul>	<ul style="list-style-type: none"> <li>• Move towards Systems of Record, Authoritative Data Sources, and the ability for programmatic access to cross-agency data; reduce the number of applications recording the same information.</li> <li>• In addition, continue development of tool set with Data Warehouse and Business Intelligence.</li> <li>• Gather requirements for fast reporting, and begin setting up data to allow for it. Increase scope of existing Warehouse and Business Intelligence work.</li> <li>• Establish data quality practice area; gather requirements from FEMA, States and other internal and external sources.</li> </ul>	<ul style="list-style-type: none"> <li>• Service-oriented architecture would set up a central set of data adapters, and would allow for seamless interaction of all applications. Continue reducing the number of applications needed.</li> <li>• Create data structures and sources that would allow for fast report requests for non-expert (public, political) use. Still highly manual process.</li> <li>• Improve data quality on most egregious problem areas -- e.g., acreage. Solidify and standardize business rules. Agree on standards with FEMA, States and other internal and external sources.</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient reporting structure with Systems of Record, no more applications than needed, shared data (single data entry), and seamless integration.</li> <li>• Automated report construction (e.g., Business Intelligence tools) that would free up any Fire personnel to work on real issues of Fire, not report generation.</li> <li>• High standards of data quality across the board with enhanced tools. Either consistency of quality, or at least ability to translate.</li> </ul>

<b>Product and Service Maturity Matrix</b>		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Research</b>	<ul style="list-style-type: none"> <li>• Lack of understanding between Research and practical areas of the Fire community — some good partnerships, some at arm's length.</li> <li>• No high-level, consistent strategy joining Research and practical areas</li> <li>• Program priorities, though agreed to, have no joint mechanisms for evaluation</li> <li>• Proximity-based relationships rather than national relationships</li> <li>• New research products released to user community when not yet at software release grade. Integration into existing suites not taken into consideration. Multiple competing models available.</li> </ul>	<ul style="list-style-type: none"> <li>• JFSP will recommend which models and applications best suit the needs of the community, and will draw up recommendations of what to keep, what to discard.</li> <li>• Establish joint Research strategic priorities and their measures</li> <li>• Establish relations with academic and other external research institutions</li> <li>• Bring the Research product offerings under Release and Deployment management to ensure high-quality product releases.</li> <li>• Establish agreed-to means of testing correctness and usefulness of research results</li> <li>• Define relationship that will promote a technology transfer process and setting of priorities.</li> </ul>	<ul style="list-style-type: none"> <li>• Managed, consistent, and standardized set of models and applications</li> <li>• Establish process to tie funding to agreed-to research projects</li> <li>• Better integration of research products into overall technical architecture</li> <li>• Better integration of research management into overall wildland fire community</li> <li>• Evaluate new research products in terms of their accuracy, usefulness in context, and packaging for supportability.</li> </ul>	<ul style="list-style-type: none"> <li>• Fully integrated research product made available to field</li> <li>• Fully integrated research management in Wildland Fire</li> <li>• Agreed-to research programs are funded with commitment to deliverables, and measured according to accepted standards</li> <li>• Fully matured technology transfer process</li> </ul>

<b>Product and Service Maturity Matrix</b>		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Shared External Services</b>	<ul style="list-style-type: none"> <li>Contract mechanisms, procedures, and terms vary from agency to agency, often for the same piece of equipment from the same contractor.</li> <li>Hiring procedures are completely different from agency to agency. These differences generate confusion, and make hiring for inter-agency functions (such as the NIC or Dispatch) more complex and expensive.</li> <li>Payments; allocations; other business practices done differently.</li> <li>Different agency interpretations of regulations (e.g., Federal acquisition, OSHA, CPIC).</li> <li>Duplication of services and efforts — basic research could use more duplication, but applied research should be standardized. A unified approach is plausible -- the use of ICS provides unified actions over a variety of situations.</li> <li>Lack of overall coordination of products, projects, and services.</li> <li>Current state is more closely controlled outcomes rather than a true service relationship.</li> </ul>	<ul style="list-style-type: none"> <li>Define areas where contracting should be common across the Fire area, and generate contract instruments that will address cost effectiveness and business requirements.</li> <li>Explore simplified, central, non-denominational clearinghouse for contracts and payments with common funds, along with other types of model. Fuels IDIQ can serve as the model.</li> <li>Educate those external to the Fire community of the necessity for standardization within the Fire community.</li> </ul>	<ul style="list-style-type: none"> <li>Expand areas of common contracts and refine the contract instruments.</li> <li>Expand and refine contract and payment clearinghouse.</li> <li>Decision-making group for external services should have no collateral responsibilities and should represent a cross-section of the skill sets needed.</li> </ul>	<ul style="list-style-type: none"> <li>Uniform centralized, standardized contracts and contract administration.</li> <li>Uniform centralized and coordinated payment processes.</li> <li>Single interpretation of rules (OSHA, driving equipment, ...)</li> <li>Measure contracts in terms of results rather than prescriptive outcomes</li> <li>SLAs become a standard business practice for documenting relationships between agencies.</li> </ul>

<b>Product and Service Maturity Matrix</b>		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Technology</b>	<ul style="list-style-type: none"> <li>The inventory of wildland fire applications has been documented at a high-level, but a formal program to manage applications from an enterprise perspective is still at a conceptual stage.</li> <li>Little coordination between agencies' IT organizations to look for redundant IT systems</li> <li>Stovepipe agency IT decisions; no process for validation with fire leadership on priorities</li> <li>Many issues related to IT policy that impact field personnel's ability to perform their jobs</li> <li>Multiple radio make/models cause problems in the emergency response environment</li> <li>Frequency management issues cause problems for fire incident managers</li> <li>GIS technology is not being efficiently applied in wildland fire IT systems</li> <li>Multiple agency IT infrastructures make it difficult to operate in an interagency environment at incidents and at interagency offices and centers</li> </ul>	<ul style="list-style-type: none"> <li>Develop interagency wildland fire IT investment and portfolio management process</li> <li>Create interagency CIO council that addresses field IT issues</li> <li>Create issue escalation process and structure for raising IT issues to the CIO council</li> <li>Create a team to address radio issues</li> <li>Develop proactive collaboration to identify and mitigate security that acknowledge Agency differences, but still enable inter-agency sharing appropriate for the Fire community</li> <li>Develop proactive collaboration to identify and mitigate IT policies that acknowledge Agency differences, but still enable inter-agency sharing appropriate for the Fire community</li> <li>Develop a GIS Strategy for ensuring that GIS technology is effectively applied across wildland fire applications</li> <li>Map the various agency IT infrastructures and develop a strategy for resolving differences.</li> </ul>	<ul style="list-style-type: none"> <li>Implement wildland fire IT investment and portfolio management process</li> <li>Begin routing IT issues to CIO council for resolution</li> <li>Create proactive process that involves fire contacts in the IT policy development process to alleviate conflicts in the interagency fire community</li> <li>Maintain ongoing collaboration and coordination on security issues.</li> <li>Maintain ongoing collaboration and coordination on IT policy issues.</li> <li>Integrate the application of GIS principles and standards into all IT system development efforts</li> <li>Work with agency IT organizations to obtain buy-in for a single wildland fire IT infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>All wildland fire IT investments are managed in an interagency portfolio</li> <li>Wildland Fire and CIO Council are effectively dealing with IT issues</li> <li>Wildland Fire has successfully implemented or received exemption for agency IT policies</li> <li>GIS technology is applied effectively and appropriately across wildland fire applications</li> <li>Wildland Fire is effectively operating as a "virtual single agency" in the interagency environment</li> </ul>
<b>Public Outreach</b>	<ul style="list-style-type: none"> <li>Education about fire's role in ecosystems</li> <li>Public Affairs messages about fire prevention</li> <li>Incident-related information</li> <li>Mitigation of the effects of fire on values at risk</li> <li>Response capability</li> <li>Inconsistent policies and terminologies across units</li> <li>Inconsistent and not always realistic public expectations of Fire Program</li> </ul>	<ul style="list-style-type: none"> <li>Common interpretation of policy</li> <li>Common and consistent terminology (particularly for lay audiences)</li> <li>Develop information and tools to enable transfer of outreach responsibilities and set expectations</li> <li>Develop content for joint programs between Fire and local governmental entities</li> </ul>	<ul style="list-style-type: none"> <li>Publish standardized interpretation of policy and consistent terminology</li> <li>Provide information and tools to enable transfer of responsibilities and set expectations</li> <li>Establishing joint programs for Fire and local governmental entities</li> </ul>	<ul style="list-style-type: none"> <li>Public understanding of the Fire Program with realistic expectations of what it provides</li> <li>A greater share of responsibility for explaining fire management taken on by local community services</li> <li>Established joint programs between Fire and local government entities for providing information.</li> </ul>

<b>Product and Service Maturity Matrix</b>		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Response</b>	<ul style="list-style-type: none"> <li>Any fire has one objective.</li> <li>Primary responsibility is fire; often called in as incident response teams for non-fire incidents.</li> <li>Response capability precludes use of resources for other fire management activities (such as prescribed fire)</li> <li>Multiple expectations of what Fire will perform in all-hazard responses (fishing expeditions)</li> <li>Cost of suppression is perceived to be too high</li> <li>Performance measures are not adequate to address effectiveness of response</li> <li>There is a shortage of qualified personnel to serve in certain ICS positions</li> </ul>	<ul style="list-style-type: none"> <li>Work with FEMA and other parts of DHS to determine types and severity of emergency response that Fire will get involved in.</li> <li>Develop and define consistent approach to AMR across agencies</li> <li>Expectations of those requesting help from Fire make use of kinds of expertise Fire can provide (move towards service catalog) -- no universal catalog of standards and qualifications</li> <li>Common vocabulary and meaning of incident response terms</li> <li>Continue investigating and implementing more cost-effective responses</li> <li>Develop better performance measures of response</li> <li>Analyze training processes to improve efficiencies in delivering training coursework and materials</li> <li>Analyze the qualifications process to improve efficiencies in providing skilled personnel to the workforce</li> </ul>	<ul style="list-style-type: none"> <li>Start looking at individual pieces of fire for their own AMR, rather than considering the fire as a single AMR; AMR must contain cost as well as environment as a factor</li> <li>Mission should be defined to be more closely aligned to actual day-to-day operational work, and appropriate training put in place.</li> <li>Implement consistent approach to AMR across agencies</li> <li>Contribute to universal catalog of standards and qualifications across emergency service agencies</li> <li>Implement improved performance measures</li> <li>Implement changes to qualifications and training processes</li> </ul>	<ul style="list-style-type: none"> <li>AMR implemented consistently and across the board.</li> <li>Responses are as cost-effective as it is possible to make them</li> <li>Adequate availability of resources for wildland fire, and all-hazard</li> <li>Land and resource management plans enable AMR</li> <li>Service catalog of incident responses tied to preparedness conditions with common vocabulary and reference.</li> <li>All emergency service agencies under single universal catalog of qualifications</li> <li>Expanded IQCS incorporates non-incident related skill sets (prescribed fire, monitoring, hazmat)</li> <li>Performance measures address response issues in ways that promote improved performance</li> <li>Training and qualifications processes provide the fastest possible methods to deliver qualified personnel</li> </ul>
<b>Post Wildfire Recovery</b>	<ul style="list-style-type: none"> <li>Assess burned area damages and develop emergency plans to stabilize and prevent further degradation to the post wildfire environment</li> <li>Develop non-emergency plans to repair and restore damaged lands and facilities to approved management plan standards.</li> <li>Implement approved emergency and non-emergency post wildfire recovery plans with available funding.</li> <li>Monitor and evaluate the effectiveness of treatments.</li> <li>Establish and/or revise policies and standards based on monitoring data and research studies.</li> </ul>	<ul style="list-style-type: none"> <li>Redefine closure of wildfire emergency to include implementation of all effective emergency stabilization treatments.</li> <li>Develop performance measures of the environmental- and cost-effectiveness of common emergency stabilization treatment at reducing risks to human safety.</li> </ul>	<ul style="list-style-type: none"> <li>Create an inter-agency mechanism for archiving and retrieving post wildfire recovery information, including sections addressing planning, budgeting, implementation, monitoring, and maintenance.</li> <li>Create a generally accepted and accurate cost risk analysis.</li> </ul>	<ul style="list-style-type: none"> <li>Emergency stabilization fully integrated into wildland fire management planning and operations.</li> <li>Non-emergency burned area rehabilitation and restoration fully integrated into land management planning and operations.</li> <li>Post-wildfire recovery decisions made on the basis of accurate cost risk analysis.</li> <li>Post wildfire recovery decisions made routinely following an adaptive management approach.</li> </ul>

<b>Product and Service Maturity Matrix</b>		Target for Near-Term (1-2 Years Out)	Target for Mid-Term (2-3 Years Out)	Target for Long-Term (4-6 Years Out)
Capability Area	Level 0 (current state)	Level 1	Level 2	Level 3
<b>Smoke Management</b>	<ul style="list-style-type: none"> <li>• Currently a subset of vegetation management -- pre-fire vegetation management techniques are set up in part to manage smoke</li> <li>• Smoke from fire activities is a critical, yet externally-imposed, public health issue.</li> <li>• Smoke suppression conflicts with mandates to put more fires on the ground</li> <li>• Acceptable level of emissions from all fire events</li> </ul>	<ul style="list-style-type: none"> <li>• Commensurate with policy changes in AMR, Smoke Management will need to become integral part of the AMR implementation.</li> <li>• Need to be at the table with the EPA as they write the rules and standards, and with the States as they begin development of the implementation plans</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to explore and refine emission reduction techniques</li> <li>• Continued discussions with the environmental regulatory agencies -- louder voice at the table.</li> </ul>	<ul style="list-style-type: none"> <li>• Smoke management to fit into both air quality objectives and vegetation objectives</li> </ul>
<b>Vegetation Management</b>	<ul style="list-style-type: none"> <li>• Difficulty in achieving good mix of work -- current philosophy is to think of it in terms of acres treated, but not all acres are equal</li> <li>• Resources for Vegetation Management are not always available owing to their need for response activities.</li> <li>• Perceived barrier to full compliance with NEPA, Clean Air Act, Endangered Species Act and other legislation -- only go so far in implementation, avoid doing complex projects to avoid doing environmental assessments</li> <li>• Budget allocations are focused more on reactive rather than proactive vegetation management.</li> </ul>	<ul style="list-style-type: none"> <li>• Adequate resource pool built up</li> <li>• Improve inter-relationship with other disciplines</li> <li>• Develop education leading to increased proficiency for Vegetation Management to be fully compliant with NEPA, Clean Air Act, Endangered Species Act and other legislation, not just Land and Resource Management Plans.</li> <li>• Develop a strategy to make the allocation of funds used for vegetation management more flexible.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased willingness to take on complex Vegetation Management projects that need environmental assessments to comply with NEPA, etc.</li> <li>• Revise Vegetation Management policies and guidelines to support proactive activities.</li> </ul>	<ul style="list-style-type: none"> <li>• All vegetation managed according to collaborative plans that meet regulatory constraints.</li> <li>• Adequate availability of resources for wildland fire</li> <li>• Widely shared vision of how the ecosystem should be, based in part on history.</li> <li>• Environmental laws seen a part of normal business of Vegetation Management, and taken into full consideration</li> <li>• Measure of success in terms other than acres — shared criteria of success based on reduced risk.</li> <li>• Treating more areas -- effects of naturally occurring fires should have less impact. Fire plays a role in ways similar to pre-settlement conditions.</li> <li>• Vegetation can be managed by a variety of techniques other than fire -- add those results into measures.</li> </ul>

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## ACRONYMS

ABS	Aviation Business System	AWSR	Annual Wildfire Summary Report
AD	Administratively Determined	BAER	Burned Area Emergency Rehabilitation
AFFS	Automated Flight Following System	BIA	Bureau of Indian Affairs
AIIC-FWD	Alaska Interagency Coordination Center Fire Weather Database	BLM	Bureau of Land Management
ALMS	Automated Lightning Management System	BPR	Business Process Re-engineering
ALTURASCAD	California Computer Aided Dispatch System	CAD	Computer-aided Dispatch
AMD	Aviation Management Directorate	CAN	Computer-Aided Navigation
AMIS	Aviation Management Information System	CBT	Core Blueprint Team (NWFEA Project)
AMR	Appropriate Management Response	CFES2	California Economics Simulator
APROP	USDA Property Management System	CHEETAH	Computerized Harmonic Evaluation of Episodes & Tools for
ARS	Aviation Resource System		Assessment and Help
AS/PMB	Assistant Secretary-Policy, Management, and Budget	CHS	Comprehensive Health Services
ASCADS	Automated Sorting Conversion and Distribution System	CIO	Chief Information Officer
AWIPS	Advanced Weather Information Processing System	COR	Contracting Officer Representative
		COTR	Contracting Officer Technical Representative

CPIC	Capital Planning and Investment Control	FARSITE	Fire Area Simulator
CTSP	Computer Technical Specialist	FCAMMS	Fire Consortia for the Advanced Modeling of Meteorology and Smoke
CTSPTG	Computer Technical Specialist Task Group	FCCS	Fuel Characteristics Classification System
CWPP	Community Wildfire Protection Plan	FDW	FAMWEB Data Warehouse
DAPS	DCS Automated Processing System	FEAT	Fire Effects Assessment Tool
DAWG	Data Administration Working Group	FEC	Fire Executive Council
DHS	U.S. Department of Homeland Security	FEIS	Fire Effects Information System
DMS	Dispatch Messaging System	FEMA	Federal Emergency Management Agency
DoD	Department of Defense	FEPMIS	Federal Excess Property Management Information System
DOI	U.S. Department of the Interior	FFE-FVS	Fire and Fuels Extension to Forest Vegetation Simulator
DU	Dispatch Utilities	FFI	FEAT/FIREMON Integration
E2E	End to End	FFIS	Federal Foundation Finance System
EA	Enterprise Architecture	FFP	Fire Family Plus
EATIS	Equipment and Training Inventory System	FHX2	Fire History Software
EPA	Environmental Protection Agency	FIMT	Fire Incident Mapping Tool
FACTS	Forest Service Activity Tracking System	FIREMON	Fire Effects Monitoring & Inventory System
FAM	Fire and Aviation Management	FIREPRO	Fire Program Budget Analysis System
FAMWEB	Fire and Aviation Management Fire Applications		
FARS	Federal Aviation Resource System		

FIRES	Fire Integrated Recruitment Employment Systems	HP	Hewlett Packard
FireStat	Fire Statistics System	HPSD-12	Homeland Security Presidential Mandate 12
FLAMMAP	Fire Behavior Mapping and Analysis	HR	Human Resource
FMIS	Fire Management Information System	HRM	Human Resource Management
FMIT	Fire Incident Mapping Tool	HSIN	Homeland Security Information Network
FOFEM	First Order Fire Effects Model	IAMS	Initial Attack Management System
FORS	Fire Occurrence Reporting System	IAT	Interagency Aviation Training System
FPA	Fire Program Analysis System	IBA	Incident Based Automation
FPA2	Fire Program Analysis System - Phase 2	IBS	Incident Business Suite
FRAMES	Fire Research and Management Exchange System	IC	Incident Commander
FS	Forest Service	ICBS	Interagency Cache Business System
FSPro	Fire Spread Probability	ICBS-R	Interagency Cache Business System Re-Engineering Project
FWS	U.S. Fish & Wildlife Service	ICS	Incident Command System
GACC	Geographic Area Coordination Center	IDIQ	Indefinite Delivery Indefinite Quantity
GAO	Government Accountability Office	IIAA	Interagency Initial Attack Assessment
GAO	U.S. Government Accountability Office	IMAP	Internet Message Access Protocol
GeoMAC	Fire Internet Map Server	IMT	Incident Management Team
GIS	Geographic Information System	INCINET	Interagency Incident Administrative Support System
GTSC	Geometronics Technology Service Center		

InciWeb	Incident Information System	NFAEB	National Fire and Aviation Executive Board
IQCS	Incident Qualifications and Certification System	NFES	National Fire and Equipment System
IQS	Incident Qualification System	NFIRS	National Fire Incident Reporting System
IRB	Investment Review Board	NFPORS	National Fire Plan Operations and Reporting System
IRM	Information Resource Management	NIAC	National Interagency Aviation Council
IRMWT	Information Resource Management Working Team	NIC	National Interagency Coordination
IT	Information Technology	NICC	National Interagency Coordination Center
ITC	Intertribal Timber Council	NIFC	National Interagency Fire Center
JFSP	Joint Fire Science Program	NIFFT	National Interagency Fuels Technology Team Tools
KCFast	Kansas City Fire Access Software	NMAC	National Multi-Agency Coordination Group
LANDSUM	Landscape Simulation Model	NPS	National Park Service
MA	Managed Assets	NWCG	National Wildfire Coordinating Group
MAGIS	Multi-Resource Analysis and Geographic Information	NWFEA	National Wildland Fire Enterprise Architecture
MBT	Methodology for Business Transformation	NWFEA SG	National Wildland Fire Enterprise Architecture Steering Group
MODIS	MODIS Active Fire Maps	NWS	National Weather Service
NASF	National Association of State Foresters	OIS	Organization Information System
NBAER	National Burned Area Emergency Rehabilitation	IIAA	Interagency Initial Attack Assessment
NEPA	National Environmental Policy Act	OLMS	Operational Loads Management System

OMB	Office of Management and Budget	SDLC	System Development Life Cycle
OSHA	Occupational Safety and Health Administration	SHIPS	Safety & Health Integrated Personnel System
OWFC	Office of Wildland Fire Coordination	SIMPPLLE	Simulating Processes & Patterns at Landscape Scale
PART	Program Assessment Rating Tool	SIT/209	National Interagency Situation Report
PC	Personal Computer	SLA	Service Level Agreement
PCHA	Personal Computer Historical Analysis	SME	Subject Matter Expert
PFIRS	Prescribed Fire Reporting System	SMIS	Safety Management Information System
PMO	Program Management Office	SOA	Service Oriented Architecture
POP	Post Office Protocol	SWOT	Strengths, Weaknesses, Opportunities, Threats
PRM	Performance Reference Model	SWRA	Southern Wildfire Risk Assessment
RAMS	Risk Assessment and Mitigation Strategies	TCP/IP	Transmission Control Protocol/Internet Protocol
RAWS	Remote Automated Weather Station	TSARS3	Tiered Smoke Air Resource System
ROMAN	Real-time Observation Monitor and Analysis Network	USDA	United States Department of Agriculture
ROSS	Resource Ordering and Status System	USFA	U.S. Fire Administration
SAFECOM	Aviation Safety Communiqué Database	USGS	U.S. Geologic Survey
SAM	Sensitive Area Model	UTF	Unable to Fill
SASEM	Simple Approach Smoke Estimation Model	VCIS	Ventilation Climate Information System
SCG	System Coordination Group	VDDT	Vegetation Dynamics Development Tool

VSA	Virtual Single Agency	WFMI	Wildland Fire Management Information Weather
WF	Wildland Fire	WFSA	Wildland Fire Situation Analysis
WFAS	Wildland Fire Assessment System	WildCAD	Wildland Computer-Aided Dispatch
WFDDS	Wildland Fire Decision Support System	WIMS	Weather Information Management System
WFLC	Wildland Fire Leadership Council	WINCAN	Windows Computer Aided Navigation
WFMI	Wildland Fire Management Information Fire Reporting	WUI	Wildland Urban Interface
WFMI	Wildland Fire Management Information Unit Identifier System		



## OVERSIZE DIAGRAMS

Figure 23 - Fire Plan Implementation Strategy 2006

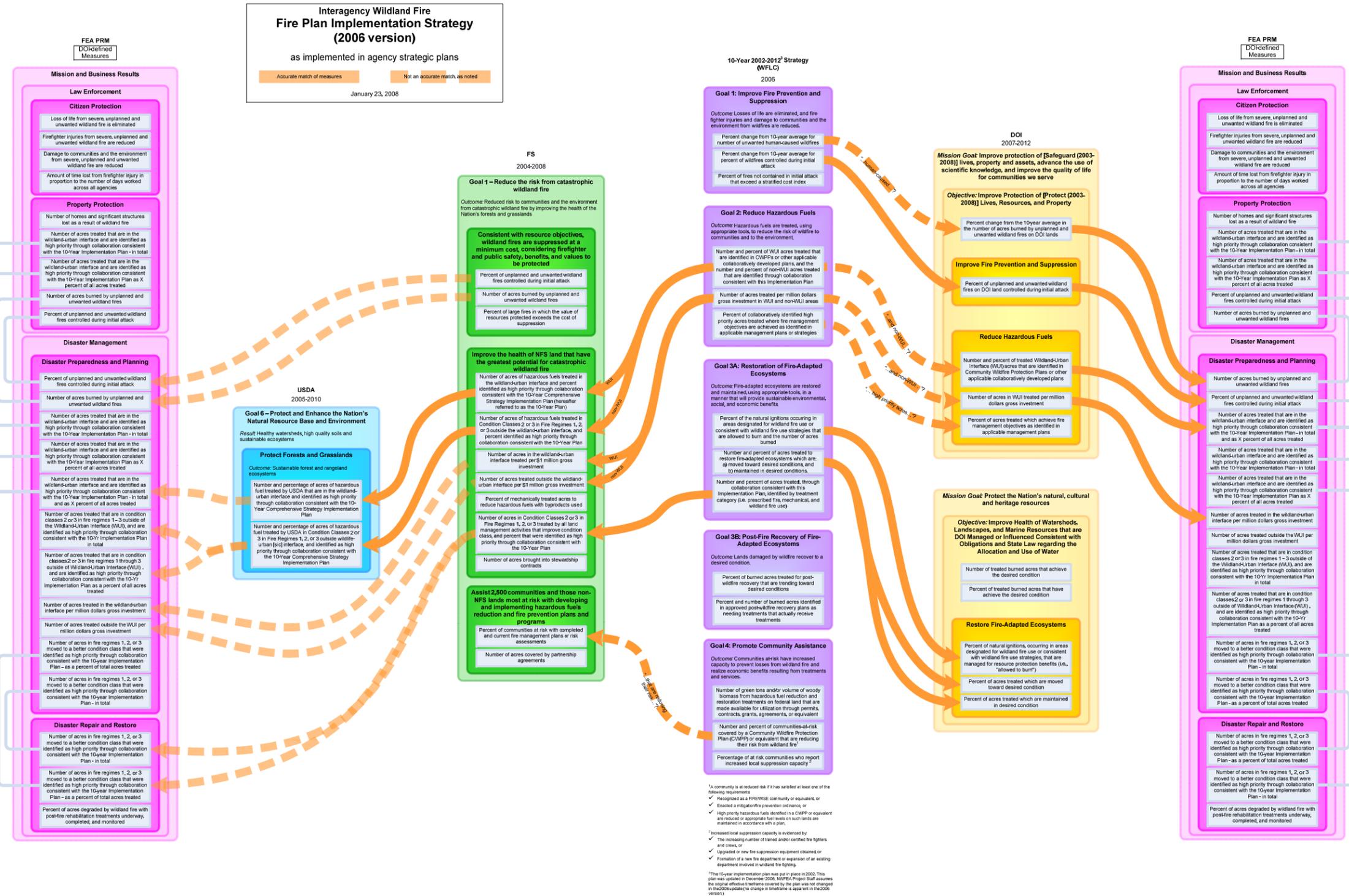




Figure 24: Wildland Fire Systems to Host Mapping

# Wildland Fire Systems "AS-IS Host Site Mapping"

August 23, 2007



