Fire Occurrence Reporting System (FORS) Study

Business Needs Analysis

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Prepared for the:

National Fire and Aviation Executive Board

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EXECUTIVE SUMMARY

OVERVIEW

Each federal wildland fire management agency uses unique forms and standards for reporting wildland fires. State fire occurrence data collection systems follow different data reporting requirements that vary from state to state. Although much of the information collected by each entity is similar in nature, data standards, values, definitions, and descriptions for each data element often differ. This has resulted in data inaccuracies and inconsistencies that hamper fire planning, information reporting, and data analysis.

The Fire Occurrence Reporting System (FORS) study was designed to identify business needs for the development of a proposed list of critical and common fire occurrence data elements to be used by the interagency fire community. This study was not intended to identify or recommend technical solutions.

Stakeholders representing specific business areas within the wildland fire community were systematically interviewed to document a set of business needs that fulfill their missions and satisfy upward reporting requirements. The FORS study team created a data element inventory of the legacy fire occurrence reporting systems, identified overlaps and gaps in data coverage within these legacy systems, and proposed a list of normalized data elements that are critical for national interagency fire occurrence reporting.

The FORS study team met with the fire occurrence agency Subject Matter Experts (SMEs) to refine and validate the interview findings, establish a set of conclusions and recommendations, and identify critical and common data elements.

FINDINGS

The FORS study business needs analysis yielded findings in four areas: Data Management, Short- and Long-Term Decision Support, and Reporting. Findings are excerpted below:

1. Accurate data with consistent values, data element definitions, and structures across all agencies is required to report credible information to the public and policymakers and to support credible research and analysis. Surrogate data systems (Sit/ICS-209 and others) are being utilized to gain information about current-year fire status for decision support because official fire occurrence systems are not intended to provide information for real-time decision support. Use of multiple systems leads to discrepancies in data over time
2. Access to fire occurrence information needs to be streamlined to allow users to easily access and retrieve fire occurrence data in a timely manner.
3. Data for every fire on lands served by members of the interagency wildland fire community should be accessible and retrievable using standard and reliable methods.
4. The ability to collect and archive computer files of coordinates and other geospatial data depicting the fire perimeters supports a variety of research, planning, and fuels management needs, improves data validity, and facilitates the ease of retrieval for related data, such as vegetation, roads, etc.
5. Current fire occurrence data is used to support fire resource and severity funding decisions by the Geographic Area Coordination Centers (GACCs) and Multi-Agency Coordination (MAC) Groups.
6. Air quality personnel must identify and communicate public health risks from both planned and unplanned wildland fires.
7. A fire containment date is required to comply with emergency stabilization and rehabilitation policy.
8. Fuels management and prevention planning efforts require current fire information to adjust their plan of work.
9. Analysis of trends in fire occurrence supports planning decisions for fire management.

10. Research, predictive services, and fire planning groups (specifically Fire Planning Analysis (FPA)) need to analyze fire occurrence data to better understand historic fire patterns and effective use of fire resources.
11. There is a need to analyze the relationship between fire management strategy and fire behavior.
12. Fire occurrence data is required to perform wildland fire risk assessment.
13. There is a need to understand the effectiveness of fuels management activities.
14. Fire occurrence and its associated costs are analyzed to support fire management reporting and budgeting.
15. There is a need to provide fire occurrence information for briefings to government officials.
16. There is a need to inform the public of current fire activity.
17. Students, researchers, Congressional staff, and other interested parties request current, post-fire, and historic information and data.
18. Fire occurrence data must be reported to meet established legal and conventional requirements and must be defensible.

CONCLUSIONS

Based on interviews and data analysis, the FORS study concludes that:

1. There is consensus across business areas and among the agency fire occurrence SMEs on the following high-level business rules:
    a. The critical and common data elements are mandatory across all federal agencies, with a subset of data elements for use by the states.
    b. Fire records need to be accurate, complete, and consistent across all fire occurrence reporting systems.
    c. Critical and common data elements need to be accessible and retrievable in a timely manner.
    d. A unique fire identifier is needed so that individual fires can be identified across all agencies.
    e. Fire occurrence reporting data should be entered only once in the identified system of record.
    f. There is a strong need for interagency fire occurrence data stewardship for critical and common data elements.
    g. Geospatial data needs to become a critical and common element as this capability matures within all agencies.
2. There is consensus among agency fire occurrence SMEs on 38 critical and common data elements required for fire occurrence reporting. These data elements are:

Critical and Common Data Elements ** Federal Only*		
Acres burned, final fire size	*Fire perimeter geospatial data file **	*Injuries*
*Acres burned by state/owner **	*Fire report, reported by **	*Other structures lost*
Fatalities	*Fire report, approved/authorized by **	*Other structures threatened*
*Fire cause, specific **	*Fire resource, kind and category **	*Point of origin county*
Fire cause , general	*Fire resource quantity **	*Point of origin datum **
*Fire containment date and time **	*Fire response objectives met **	*Point of origin landowner*
*Fire control date and time **	*Fire type **	*Point of origin latitude*

Critical and Common Data Elements * Federal Only		
Fire discovery date and time	*Fire type, highest complexity type **	*Point of origin longitude*
*Fire escape indicator **	*FireCode **	*Point of origin state*
Fire identifier, unique	*Homes lost*	*Responsible agency unit identifier **
*Fire out date and time **	*Initial response date and time **	*Weather station ID, primary **
*Fire land type **	*Homes threatened*	*WUI indicator **
*Fire name **	*Initial fire strategy **	

3. There are currently gaps, overlaps, and redundancies for the 38 critical and common data elements identified by the FORS study.
4. Consistent interagency data standards are required for at least the critical and common data elements.
5. Fire occurrence data needs to be a complete and consistent record for every fire across agencies and over time.
6. Fire reporting personnel must have the ability to correct invalid data throughout the reporting process.
7. A diverse audience needs easy access to all critical and common fire occurrence data elements.

RECOMMENDATIONS

Based on the findings and conclusions, the FORS study team and agency fire occurrence SMEs developed the following recommendations:

1. Clarify for all users of fire occurrence data that the legacy fire occurrence reporting systems reviewed in this study are not intended to be sources of real-time fire statistics. Further, if there are subsequent phases of the FORS study, establish sideboards for those phases on the real-time collection and dissemination of fire data.
2. Create a short-term business-centric task group to develop standards for the 38 critical and common data elements identified by the FORS study.
3. Create an ongoing interagency stewardship group to oversee shared fire occurrence business.
4. Reinforce that each agency must adhere to existing fire reporting policies and enhance training programs for fire occurrence reporting personnel.
5. Create a task group to develop a unique interagency fire identifier that can link individual fires across relevant systems.
6. Continue to develop geospatial capabilities within all agencies in relation to the collection, archiving, and retrieval of fire occurrence data.
7. Establish a single, immediate point of access to interagency fire occurrence data; perhaps by relying upon Web-based technology.
8. Document that the states' legacy systems use a subset of the 38 critical and common data elements identified in the FORS study. Request the states consider using the unique fire identifier recommended above. Encourage the states to implement additional critical and common data elements as they feel appropriate.
9. Integrate the results of this FORS study into the National Wildland Fire Enterprise Architecture (NWFEA) project. *[Project Manager Note: This recommendation is unsupported in the study - perhaps because no enterprise architecture stakeholders were included in the analysis.]*
10. Determine the need to address unresolved issues identified during the FORS study.

PROJECT EXECUTION

Commonthread Incorporated and the FORS study team followed a structured analytical process, which consisted of project definition, data discovery, analysis, and report development. The FORS study team interviewed stakeholders during group interview sessions or by telephone. In most instances, the interview sessions focused on two or more related business areas. Information from the interviews was captured in meeting notes and on a data needs spreadsheet, which was later incorporated into a database. The database enabled the complex relationships within the data to be easily viewed and reported, which supported the refinement of the findings by the agency fire occurrence SMEs.

FIRE OCCURRENCE REPORTING SYSTEM (FORS) STUDY
BUSINESS NEEDS ANALYSIS

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1. INTRODUCTION

This report presents the findings of the Fire Occurrence Reporting System (FORS) study, which was designed to identify business needs for the development of a proposed list of critical and common fire occurrence data elements to be used by the interagency fire community.

This study was authorized and sponsored by the NFAEB. To complete this analysis, Commonthread worked closely with the FORS study team (see Appendix A), which included representatives from each of the federal wildland fire management agencies and the National Association of State Foresters (NASF).

The purpose of the FORS study was to analyze the business requirements needed to fulfill the specific fire reporting mission of the agencies and the overall wildland fire community, and to satisfy the upward reporting requirements for the federal agencies and the states. The study results emphasize that the wildland fire community must find ways to ensure that fire statistics are reliably consistent between federal agencies and states to meet fire management and planning needs, support historical data requirements, and address questions from stakeholders concerning data accuracy. **This FORS study was not intended to identify or recommend technical solutions.**

To meet the project objectives, Commonthread worked in collaboration with the FORS study team to design and facilitate a structured analytical process, which consisted of project definition, data discovery, analysis, and results elaboration. Through a series of interviews and moderated discussions, Commonthread gathered extensive business requirements data. The FORS study team examined the data to identify a group of general business needs along with critical and common data elements that, if applied consistently across all involved organizations, can support the development of a cohesive and accessible dataset that will meet the minimum needs of fire management. This report is collaborative result of all of the members of the FORS study team.

CHARTER OBJECTIVE AND BUSINESS NEEDS ANALYSIS

The specific project objective was to identify the data elements required for timely and accurate federal and state fire occurrence reporting, and to identify missing or overlapping data elements. The FORS study team worked within the purview of the FORS Study Project Charter, dated August 8, 2006. In accordance with the charter, the project scope consisted of an interagency business analysis of fire occurrence reporting requirements of the federal fire agencies and the states. Data obtained through interviews and discussion was captured in spreadsheets and then incorporated into a database to demonstrate the range of business needs and the relationship to business areas and data elements.

FORS STUDY BACKGROUND

The National Wildfire Coordinating Group (NWCG) initiated a business requirements study in January 2004 to ensure that business and data requirements used by all participating entities had been identified and that existing data systems were evaluated to determine the best course of action toward use of a single fire occurrence reporting system across all agencies. In July 2005, the National Fire and Aviation Executive Board (NFAEB) re-chartered the project to evaluate existing legacy systems and to identify common data elements used within these legacy systems.

The study identified up to 11 data elements common to all systems, and 27 common elements among the federal systems. However, the study surveyed data elements only and did not address fire occurrence business needs. The legacy systems analyzed were:

- Wildland Fire Management Information (WFMI) Fire Occurrence Systems – Bureau of Land Management (BLM), National Park Service (NPS), Bureau of Indian Affairs (BIA)
- Fire Management Information System (FMIS) – Fish and Wildlife Service (FWS)
- Fire Statistics System (FIRESTAT) – U.S. Forest Service (USFS)
- National Fire Incident Reporting System (NFIRS) – Federal Emergency Management Agency/U.S. Fire Administration

- NASF National Fire Reporting System – supported by Texas A&M University

In August 2006, the NFAEB expanded the project scope to perform a full fire occurrence reporting business needs analysis across the interagency wildland fire community.

2. FIRE OCCURRENCE REPORTING: CURRENT SITUATION

Each federal wildland fire management agency uses unique agency-derived forms for reporting wildland fires on their lands. Despite similarities, data standards for the collected data and the definitions and descriptions for each data element often differ. The legacy fire occurrence reporting computer systems and data sets were each created to support their respective agency's unique business needs. This has resulted in errors and discrepancies among fire data compilations and analyses, which has hampered fire management and research efforts across the interagency wildland fire community.

Fire occurrence data from the states is collected in several systems. The NASF National Fire Reporting System, supported by Texas A&M University contains nine data entities that all states have agreed to report annually. Each state maintains their own systems; many of which collect significantly more than these nine data entities. The U.S. Fire Administration National Fire Incident Reporting System (NFIRS) receives data from state wildland fire agencies in addition to fire districts.

Reporting business rules for each agency and state also differ. For example, most agencies and states report fire cause, however, the cause codes are broken down into differing general, specific, or statistical causes. Some agencies require very specific information regarding the cause of a fire, for investigative and/or reimbursement reasons, while other agencies do not report specific causes in the fire occurrence reporting system. These agencies leave the investigative and reimbursable reporting to a different reporting system.

Documentation of a wildland fire begins as soon as the fire is discovered and reported. All fire management programs have an established system for initial wildland fire reporting. The initial reports typically provide some estimate of fire location, size, fuels, and fire behavior, and include a subjective estimate of fire potential. Fire dispatchers use this information to determine initial response. However, this initial report data is often quite subjective and can contain errors of omission, accuracy, and timeliness. Within the first 24 hours following an initial fire report, the reported location of the point of origin may be updated as a result of changes in determination method (lookout using an Osborne Firefinder versus on-the-ground Global Positioning System (GPS) device). Fire size, fuel model, and fire behavior information is also subject to change by the time that initial response forces arrive on scene. Initial response forces might also change the initial information about the fire once they adequately size up the situation. Essentially, initial fire reporting data is very fluid and is subject to change as more accurate information becomes available.

The dispatch offices summarize the initial report information and report daily to an upper-level office (Regional or Geographic Area Coordination Center). Initial report information is compiled for regions and nationally to produce Daily Situation Reports, which are used to summarize the overall wildland fire situation and help determine national, regional, and incident priorities and daily resource needs. As initial report information is updated at the regional level, summaries need to be updated, making it difficult to track actual fire occurrence information in the short term. All initial report information needs to be considered as preliminary estimates.

Fires that become significant (generally 100 acres in timber, 300 acres in grassland/rangeland, or where a Type 1 or a Type 2 Incident Management Team is assigned) are subject to daily reporting via the National Interagency Situation Reporting System (which includes both Situation Reports and the ICS-209 Reports, Sit/ICS-209) which is part of the National Fire and Aviation WEB Application (FAMWEB). The Incident Management Situation Report (IMSR) issued by the National Interagency Coordination Center (NICC) is generated from this information. At this time, the Sit/ICS-209 is the only common reporting form used by federal agencies. It provides a daily snapshot of fire size, fire potential, injuries and/or fatalities, structures threatened and/or destroyed, fire resources assigned, estimated cost, and expected containment date. Differences in interpretation and inconsistent areas of emphasis exist between agencies and reporting units, and these differences affect virtually all areas of fire management and planning.

Information submitted from Sit/ICS-209 reports is also used to help establish incident priorities, and therefore can be used as a communication tool by incident commanders to justify their need to acquire additional resources at times when resource availability is limited. However, the fire costs estimated on ICS-209 forms almost never coincide with actual incurred fire costs, and can only serve as gross estimates for assessing the financial impacts of a fire. Acreages on large fires may fluctuate daily due to changes in fire perimeter mapping, even when fire growth is slow or negligible.

Once the fire is declared out, the official fire occurrence report is initiated. Information contained in official agency fire reporting systems is used to support long-term fire management planning, program evaluation, oversight, and policy analysis. However, since each agency uses its own legacy reporting system, the information generated differs from agency to agency. Even seemingly common data elements are often interpreted differently by the agencies. Agencies also differ in their business rules regarding the timeliness of the final fire report. Because of various factors, final reports may not be completed until the fire season is over or even until the following calendar year. In cases where there are ongoing investigations or financial obligations, fire reports may not be approved until years after the fire is declared out. Therefore, fire occurrence reporting stakeholders often must use information from other surrogate systems and other data sources (e.g., Sit/ICS-209) until the official fire occurrence reports are complete and available.

3. METHODS

The FORS study was designed to identify data requirements across agencies and functional business areas in order to develop a proposed list of critical and common fire occurrence data elements. The FORS study project charter calls for these study deliverables:

- Validated list of fire occurrence reporting stakeholders (see Appendix B).
- Analysis of business requirements to understand the fire occurrence reporting data elements needed by fire occurrence reporting stakeholders to fulfill their specific missions and satisfy upward reporting elements (see Appendixes C and D).
- Updated data element inventory of legacy fire occurrence reporting systems, which includes an overlap analysis and gap analysis of legacy data system data elements and any other data elements identified in this business requirement study to identify redundancies or gaps (see Appendix G).
- Proposed list of normalized data elements deemed critical for national interagency fire occurrence reporting.
- Executive summary, study findings, and recommendations.

To meet these objectives, Commonthread and the FORS study team followed a structured analytical process, which consisted of project definition, data discovery, analysis, and report development.

PROJECT DEFINITION

The NFAEB authorized the FORS study team to interview stakeholders representing business areas that utilize fire occurrence information. NFAEB and the FORS study team developed a list of stakeholders that appropriately represent the full range of business areas within the wildland fire community and representative agency fire occurrence SMEs. Both stakeholders and SMEs were selected by NFAEB for interviews. The Fire Directors notified their respective agency fire occurrence SMEs via e-mail to request that they participate in the study. A spreadsheet was used to track interview scheduling, location, and stakeholder participation.

Upon project initiation, Commonthread developed a project plan to guide the discovery and elaboration phases of the business needs analysis. The project plan was reviewed and accepted at a project team meeting on July 10, 2006.

DATA DISCOVERY

Interview Process

The FORS study team interviewed stakeholders during group interview sessions or by telephone. In most instances, the interview sessions focused on two or more related business areas. These sessions were conducted in Boise, Denver, Missoula, and Washington, DC. A meeting scheduled in Portland was cancelled, and several of the Portland stakeholders were interviewed by telephone. Interviews began on August 8, 2006 and were concluded by November 30, 2006.

From a pool of 113 stakeholders identified, 82 either attended an interview session or were interviewed by telephone. Thirty-one stakeholders were unable to respond to our request for interviews within the time allotted or were excluded by personal request (see Appendix B).

Interview Documentation

Information from the stakeholder interviews was captured both in meeting notes and within a data needs spreadsheet. The meeting notes delineated the business needs identified by the stakeholders, and itemized the specific data now used to meet those needs as well as other information, such as open questions and recommendations. The notes were the basis for the data needs spreadsheet, which documents the

business areas, business needs statements, and data elements that emerged during the interviews, as delineated above. The spreadsheet also includes notes about the uses of the data element and records stakeholder comments. A separate worksheet was developed for each interview session and for the telephone interviews. Other worksheets were created to track data management business needs, which addressed data accuracy and completeness, and the ability to access information in an efficient and timely manner.

Although the spreadsheets effectively supported collection of information, they contained redundancies that hampered efficient data analysis. Consequently, the spreadsheet data was loaded into a database. The database enabled the complex relationships contained within the data to be easily viewed and reported, which supported the refinement of the findings by the agency fire occurrence SMEs.

A comprehensive business needs spreadsheet can be found in Appendix C. Meeting notes are presented in Appendix E.

ANALYSIS

Business Needs Analysis

During the interview process, agency fire occurrence SMEs acknowledged that it is a normal practice for all the federal agencies to collect fire occurrence reporting data after the fire is out and often after the fire season is over. Both fire planning and fire research stakeholders expressed a need to broaden the discussion by including data that is normally collected during incident management. Other business areas also expressed this need. This data includes such information as daily fire resources deployed and daily fire perimeters.

Many of the stakeholders expressed a need for fire information on several timescales, including a near real-time basis. As a way to frame the topic, the FORS study team relied upon the following timelines:

Tier	Business Rule for Time Due	Required Data
One	Within 24 hours of the start of a fire	The Initial Report with FireCode, Fire Name and Location data.
Two	Within 5 – 7 days of the fire being declared “out” or “controlled”	Data elements typically needed for the immediate after action report, including acres burned by agency and by ownership, size class, and cause.
Three	Individual agency standards apply	As determined by each individual legacy fire reporting system.
Four	TBD	The complete cost data, multiple-year statistics, investigation and narrative.

Stakeholders defined specific business need statements that related to fire occurrence data elements. Analysis of these statements resulted in four broad groupings: data management, short-term decision support, long-term decision support, and reporting. Data management statements addressed needs for data accuracy, consistency, and access. These were initially tagged as global business needs and later identified as proposed business rules. The remaining business need statements were analyzed further to identify similarities. This analysis resulted in twelve general business need statements, listed below. A matrix that ties these general business needs to the critical and common data elements is presented in Appendix D.

- Analyze data for fire planning and research.
- Analyze fire costs.
- Assess fire management strategy.
- Determine trends in historic fire effects.
- Determine impact and effect of a fire.

- Determine requirements for prevention efforts, enforcement, and education.
- Determine quantity and quality of emissions.
- Quantify workload.
- Support Burned Area Emergency Rehabilitation (BAER) efforts.
- Respond to information requests and data calls.
- Respond to reporting requirements.
- Support real-time decision-making.

Data Element Analysis

Each legacy data element was compared across all legacy systems to identify similarities. A crosswalk analysis of all the data elements created a legacy system matrix that was captured using a Microsoft Excel spreadsheet. The data elements that emerged from the FORS study were compared to those in the legacy system matrix. This analysis identified data elements that are collected in all legacy systems and data elements that exist in or are missing from one or more of the legacy systems. There were also instances where a data element was identified as a business need but not collected in any legacy fire occurrence system (see Appendix G).

Where possible, data elements descriptions from the legacy system were carried over to the FORS study database. Where multiple descriptions were found, a generalized description was chosen to convey the intent of the data element name. When a data element was not part of any legacy system, stakeholders were asked to supply a description for the new data element name. These descriptions are only in this study to add clarity to the data element names and are not intended to establish specific data element definitions.

Identification of Gaps and Overlaps

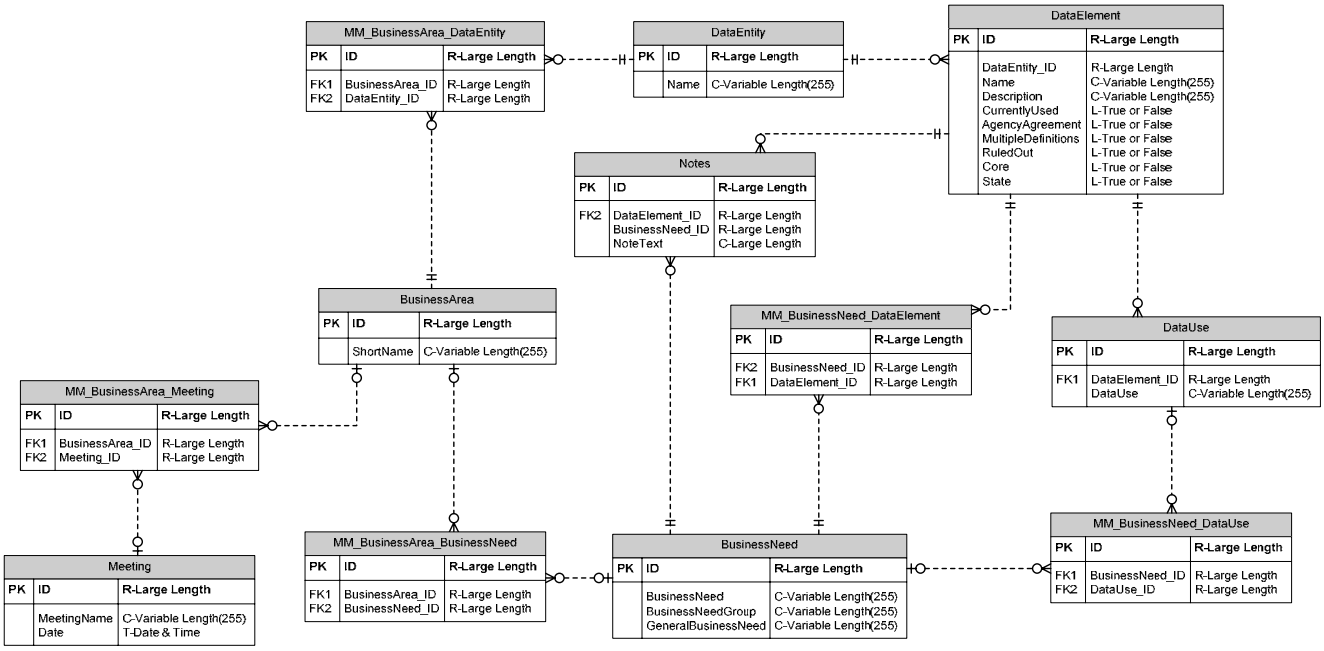
Prior to beginning the business needs analysis, the FORS study team developed a matrix of data elements and definitions belonging to each of the legacy systems (listed in Section 1, Introduction). During interviews, stakeholders were asked to review the matrix to identify elements that are required for their business area and to select their preferred definition. The annotated matrix was collected and the results were tabulated and added to the spreadsheet. No follow-up or validation was conducted. When the interviews were complete, the matrix was modified to identify the data elements collected through the business needs analysis process.

Agency fire occurrence SMEs at the December project milestone meeting were asked if each individual data element should be required, could be omitted, or could be derived from other information. The final spreadsheet, which is included as Appendix G, identifies data elements that are not collected in any of the legacy fire occurrence reporting systems, as well as those that are collected in multiple systems. Some of the identified data elements appear to be collected in only one of the legacy fire occurrence reporting systems, some in several, and some may be in all. Although in many cases the data element labels and general descriptions appear to be the same across multiple systems, this FORS study did not attempt to reconcile the actual business definitions, values, rules, and formats used by each agency.

FORS Study Database Structure

The information collected during the FORS study was analyzed to create a Microsoft Access database structure, shown below. This entity relationship diagram (ERD), is required to understand the relational nature of the data.

FORS Entity Relationships



The database was an essential tool to allow data elements to carry forward from the initial business need statements to the general business need statements that were later presented to the agency fire occurrence SMEs.

VALIDATION

At the project milestone meeting held in Boise on December 13-14, 2006, the FORS study team met with the agency fire occurrence SMEs to review, refine, and validate the findings; draw conclusions; and develop recommendations. These findings, conclusions, and recommendations are presented in later sections of this report. Prior to the meeting, the FORS study team organized the data to streamline analysis during the meeting.

During the review meeting, the group validated the general business needs statements and their relationships to business areas and the critical and common data elements. Adjustments were made where necessary. Through discussion, the group reviewed and revised the business needs pertaining to data management. Data management business needs that applied to all of the business areas were tagged as global business needs and then later identified as proposed high-level business rules. The agency fire occurrence SMEs were asked to identify critical and common data elements and add any missing data elements. Thirty-eight data elements, with a sub-group for the states, were selected as critical or common for recommendation to the Fire Directors. The database was updated to identify these elements.

The group then developed a set of recommendations for the FORS study. These recommendations, which are listed in Section 6, Recommendations, will be presented to the NFAEB. A listing of the 38 critical and common data elements recommended by the FORS study is included in Section 5, Conclusions, of this report.

SPREADSHEET AND DATABASE DEVELOPMENT

The design of the FORS study database was driven by the relationships that were observed during analysis of the business needs of the interview spreadsheets. Several many-to-many relationships were identified and are enumerated on the ERD. This design was used to create the database.

The interview spreadsheet was rearranged into a flat file configuration and imported into the FORS study database. Tables and their relationships were populated through a series of queries. A series of custom forms was developed to use in viewing, editing, and adding data and relationships. The database was updated throughout the project to reflect addition and refinement of data elements and relationships.

4. FINDINGS

The FORS study business needs analysis yielded findings on four major themes:

- Data management.
- Short-term decision support.
- Long-term decision support.
- Reporting.

DATA MANAGEMENT

1. **Accurate data with consistent values, data element definitions, and structures across all agencies is required to report credible information to the public and policymakers and to support credible research and analysis.**

   Information provided in briefings and reports to the public, Congress, other state officials and the media should be reliable and credible. A consistent and complete historic record is required to avoid errors in reporting numbers of fires, fire locations, costs, and other relevant data. Many of the inconsistencies that hinder reliability and credibility are directly correlated to interagency differences in data element definition and interpretation as well as timeliness issues which force the use of surrogate systems (e.g. SIT/ICS-209) to obtain information and data about current year fires. In addition, existing reporting requirements and timeframes are not aggressively enforced. An accurate, timely, and complete historic record is essential to conduct credible analysis. Incomplete data produces misleading results.

2. **Access to fire occurrence information needs to be streamlined to allow users to easily access and retrieve fire occurrence data in a timely manner.**

   When a fire occurs and data is collected that describes date, time, and location of the fire, this real-time data is needed by fire business stakeholders to brief interested entities and to perform decision support analysis. As the data on a fire expands and matures, it is needed by a widening group of stakeholders. Once the historical fire records are complete, they are used to inform stakeholder groups and facilitate fire program planning, cost and resource analysis, and performance measure reporting.

3. **Data for every fire on lands served by members of the interagency wildland fire community should be accessible and retrievable using standard and reliable methods.**

   A consistent method to identify, access, and retrieve data for every fire is required to ensure a complete record of fire occurrence data. This would require that costs for miscellaneous (A, B, C, and D) fires classified by the USFS that are currently tracked collectively be tracked individually. In addition, the ability to uniquely identify individual fires, including fires that become part of a large fire complex, is required to assemble an accurate fire occurrence history for use in analysis and cost modeling (the FireCode system does not meet this need). A complete dataset is required to accurately define density of fire occurrence. The ability to identify a unique fire is especially important in determining the total cost for a fire. Fire costs are often spread across multiple agencies with different fire occurrence databases. Support for long-term decision making has a significant need for an accurate count of fires that occur on the landscape, along with critical data about each fire.

4. **The ability to collect and archive computer files of coordinates and other geospatial data depicting the fire perimeters to support a variety of research, planning, and fuels management needs, improve data validity, and facilitate the ease of retrieval for related data, such as vegetation, roads, etc.**

   When geospatial data is collected for the point of origin for a fire, its accuracy can be easily validated and other relevant data can be derived. Research, fire planning, fuels management, predictive services, and external affairs personnel are interested in polygons that describe the daily perimeter of the fire over the duration of the fire event. This is useful for current reporting of fire occurrence data, as well as the ability to look back over time to determine trends in fire occurrence and to correlate fire perimeter data with commonly available geospatial datasets, such as fuel loading, ownership, and site-related data, such as proximity to population centers. It is acknowledged that the capability to collect accurate and timely GIS data varies across the federal and state agencies. A majority of the larger, more complex fire management programs have a substantial ability to analyze geospatial data.

SHORT-TERM DECISION SUPPORT

5. **Current fire occurrence data is used to support fire resource and severity funding decisions by the Geographic Area Coordination Centers (GACCs) and Multi-Agency Coordination (MAC) Groups.**

   Fire occurrence data is used to support incident management and understand the progression of a fire, as well as to support decision-making for deployment of resources. Predictive services, research, and fire planning provide information to GACC and MAC Group decision-makers concerning fire potential to estimate demand for fire resources and to support severity funding decisions. On large fire events, fire occurrence data is used to run models like FARSITE, FSPro, WFSA, and WFIP. Although this data is usually available for an individual fire, it is far more difficult to gather across fires occurring simultaneously. Specific data requirements that arose during the interviews include daily fire size and an estimate of fire activity, such as the number of hours of active spread in standardized formats.

6. **Air quality personnel must identify and communicate public health risks from both planned and unplanned wildland fires.**

   Air quality personnel use data from current, unplanned fire events to estimate smoke emissions for reporting health threats to the public. The quantity and quality of emissions are estimated using fire modeling applications, such as Blue Sky. Data required for analysis includes ignition date and time, fire latitude and longitude, and actual acres burned by day. The most significant data is the actual area of fire activity and acres burned, so that downwind emissions can be calculated. Weather forecasting information can also influence decisions on whether to proceed with planned fires, such as Wildland Fire Use (WFU) or prescribed fires. During an event, fire behavior analysts predict fire growth over the next 24 hours. Air quality teams use this information to estimate the downwind impact of smoke emissions. Data describing the possible adverse impacts of fire growth may be useful for other decision-makers.

7. **A fire containment date is required to comply with emergency stabilization and rehabilitation policy.**

   The fire containment date must be known to establish the start date for BAER activities, which are governed by legal time constraints. Therefore, accurate containment data is critical to this program.

8. **Fuels management and prevention planning efforts require current fire information to adjust their plan of work.**

   Effective fuels management planning requires knowledge of current and historical fire occurrence in order to plan placement of fuel treatments. The objective is to geospatially locate fuels treatments in order to reduce the risk of catastrophic wildfires and the potential harm to the environment and communities at risk. At the same time, reduction of fuels from a high hazard to a more moderate or low hazard requires knowledge of the potential intensity and severity of current wildland fires on the landscape.

   Fire prevention planning requires knowledge of the location and nature of human-caused fires. In addition, knowledge of specific fire outbreaks (such as Fourth of July, railroad operations, or arson) enables fire managers to pre-position prevention teams to specifically target the increased risk or ignition source.

LONG-TERM DECISION SUPPORT

9. **Analysis of trends in fire occurrence supports planning decisions for fire management.**

   Fuels management, fire planning, and prevention teams analyze historic fire information to define geographic trends. This analysis identifies locations for future prevention, fuels, or wildland fire use activities. Prevention teams analyze fire occurrence data, especially fire cause and location, to plan for fire prevention education. Research, predictive services, and fire planning personnel identify historic trends to validate the outputs from fire planning or predictive models, and also analyze trends in fire costs relative to locations, time of year, and fire size. Research personnel need to report trends in fire occurrence and delineate relationships between fire and vegetation changes over decades. In addition, research teams use fire occurrence data to determine global trends in long-term fire effects, such as carbon balances. Credible trend analysis requires data for every fire that occurs. Grouping of fires may result in incomplete data for trend analysis.

10. **Research, predictive services, and fire planning groups (specifically FPA) need to analyze fire occurrence data to better understand historic fire patterns and effective use of fire resources.**

    Research, predictive services, and fire planning groups require data concerning the quantity and kind of resources deployed on historic fires and the fire conditions that created the demand for these fire resources. Fire resource data is correlated to fire size, fire cause, and fire types. Understanding daily fire size and identifying the day that fire resources were deployed allow fire planners to estimate the effectiveness of different kinds of fire resources under varying conditions and predict resource demands under various scenarios. Fire managers use fire occurrence data to validate fire danger ratings, which are used to set triggers for staffing level (resource readiness) and adjective ratings (public awareness). This data can also be used to validate modeling results. Fire planners must determine the stress on available fire resources on days when a single fire occurs, when a large fire occurs, and when multiple fires occur. This data is partially collected in legacy Final Fire Reports and may also be in ROSS.

11. **There is a need to analyze the relationship between fire management strategy and fire behavior.**

    Research, fire planning, and fuels management groups analyze the relationship between fire management strategy and fire progression, including the trends toward large, intense fires. Fuels managers and fire planners need to know the initial fire strategy for historic fires and any changes in fire strategy over time, as well as whether the initial management strategy was successful in meeting objectives. Fuels management personnel must determine the significance of prescribed fire escapes and the conditions that were present on escaped fires. While currently only one change in fire strategy is recorded, stakeholders requested the ability to record multiple changes in strategy over the duration of the fire. The adoption of the Appropriate Management Response (AMR) policy

will significantly complicate the use of fire occurrence reporting data. Currently researchers can assume that fires are classified as wildfires to be suppressed (Suppression), Wildland Fire Use (WFU), or prescribed fires (Rx). There is a further assumption that all suppression fires are aggressively managed, which might not be true with AMR. To answer questions about the effectiveness of different fire management strategies, we must be able to accurately identify the relationship between management strategy and historic fire behavior. The current simplistic assumptions may no longer be valid.

12. Fire occurrence data is required to perform wildland fire risk assessment.

Risk assessment models and analyses identify the potential for serious fires within a given location and help to prioritize options for mitigation activities. Fire research and predictive services are primarily engaged in risk assessment analysis. Fire occurrence data required for this type of analysis includes the location of fires, their start date and time, the number of hours of active spread of the fire by day, and an estimate of the weather when the fire grew. Air quality, predictive services, and prevention groups use fire hazard risk modeling to support program management and planning. Fuels management groups use fire occurrence as a key measure for risk assessment. The ability to identify individual fires, including fires that become part of large fire complexes, is required to obtain an accurate fire occurrence history for use in analysis and modeling. A complete dataset is required to accurately define density of fire occurrence. As part of risk assessment, fire occurrence data is combined with other data, such as population density to determine the impacts of future WUI expansion.

13. There is a need to understand the effectiveness of fuels management activities.

Fuels management groups must be able to assess the effectiveness of hazardous fuels reduction treatments on the landscape, in specific fuel types and under specific conditions, to appropriately plan fuels treatments. This requires examination of the relationships between historic fire behavior and past hazardous fuels reduction activities.

14. Fire occurrence and the associated costs are analyzed to support fire management reporting and budgeting.

Fire research is required to perform cost analyses, including trend analysis and forecasting. Fire occurrence data is needed to support fire progression models which derive the cost of fire relative to fire characteristics. External affairs and fire planning groups analyze fire costs to develop alternatives in land use planning. Currently, fire research staff use cost models to compute one of the performance measures in the USFS 10-year implementation plan, and this performance measure will probably be part of the new wildland fire decision support system development. Department of Interior research groups are currently developing a similar cost model.

REPORTING

15. There is a need to provide fire occurrence information for briefings to government officials.

External affairs and national fire management staff are required to provide information on current fire activity to brief the President's office, the Congress, the Secretaries of the DOI and USDA, and state governors. These briefings usually report data on the number and size of current fires by state and the number, type, and ownership of fire resources deployed on each fire. Other information is required in extreme wildfire events or when evacuations, injuries, or fatalities occur. These briefings can be requested at any time from the point when the fire is discovered until it is declared out.

16. **There is a need to inform the public of current fire activity.**

    The media and public require immediate and timely information on current fire conditions. Air quality groups are required to inform the public on potential threats to public health caused by smoke emissions from a wildland fire and the potential for smoke from a WFU or prescribed fire. External affairs teams are routinely asked for specific location and fire intensity data for current fire events by geographic location, in addition to other related data. To report the actual level of IA activity in a coordinated and realistic way within a state or region, information on current fires needs to be coordinated across agencies. These teams also report fire occurrence information to educate and promote wildland fire use and prescribed fire management strategies. External coordination teams must report fire growth and fire behavior daily on a static map.

17. **Students, university researchers, Congressional staff, and other interested parties request current, post-fire, and historic information and data.**

    Current, post-fire, and historic fire occurrence data is of interest to various entities outside the fire science community. This data should be readily available and should not require correction of redundant, erroneous, or incomplete data. The External Affairs group suggested that the public have easy access to historic fire information. Current and post-fire information needs to be readily available once a fire event begins and data is collected, so that these information requests can be satisfied in a timely manner.

18. **Fire occurrence data must be reported to meet established legal and conventional requirements and must be defensible.**

    Some agencies require that any human-caused fire be investigated and the investigation case ID be correlated to the initial fire ID assigned. Fire occurrence data is required to support local fire protection planning (CWPP). States and federal agencies are required by the GPRA to report losses on fires and other summary information. Losses include damage to communities and the environment, specifically the numbers of homes and structures lost to wildland fire, and the numbers of injuries and fatalities. Federal agencies also report the number of fires controlled during initial attack. Air quality groups are required by the EPA to prepare annual summaries of smoke impacts on airsheds and to develop annual emissions inventories. Other local and state reporting requirements also apply. Consistency of data collection and enforcement of reporting timelines is required to meet pertinent legal and conventional requirements.

5. CONCLUSIONS

Based on the interview results and the analysis of the fire occurrence reporting systems now in use, the FORS study team has identified the following conclusions:

1. **There is consensus across business areas and among the agency fire occurrence SMEs on the following high-level business rules:**
   - Critical and common data elements are mandatory across all federal agencies, with a subset of these data elements for use by the states.
   - Fire records need to be accurate, complete, and consistent across all fire occurrence reporting systems.
   - Critical and common data elements need to be accessible and retrievable in a timely manner.
   - A unique fire identifier is needed so that individual fires can be identified across all agencies.
   - Fire occurrence reporting data should be entered only once in the identified system of record.
   - There is a strong need for interagency fire occurrence data stewardship for critical and common data elements.
   - Geospatial data needs to become a critical and common element as this capability matures within all agencies.

2. **There is a consensus among agency fire occurrence SMEs on the critical and common data elements required for fire occurrence reporting.**

   Agency fire occurrence SMEs reviewed the findings from the business needs analysis and identified a set of critical and common data elements for the federal agencies, with a subset identified for the states. The following table contains a list of the critical and common data elements identified during the FORS study.

Critical and Common Data Elements

FORS Study Critical And Common Data Element Name	Generalized Description	Federal or Federal and State
Acres burned – final fire size	*The total number of acres burned by the fire.*	*Federal and State*
Acres burned by state/owner	*The final size of the fire in number of acres burned within each state and each owner.*	*Federal*
*Fatalities **	*The total number of fatalities associated with the fire.*	*Federal and State*
Fire cause - specific	*The 30 specific cause codes required for prevention reporting and planning.*	*Federal*
Fire cause - general/description	*The general reason that the fire occurred.*	*Federal and State*
*Fire containment date and time **	*The date and time that a control line (that can reasonably be expected to stop the fire's spread) has been completed around the fire.*	*Federal*
Fire control date and time	*The date and time at which the fire is controlled and not expected to escape, even under the severest weather conditions.*	*Federal*
Fire discovery date and time	*The date and time the fire was discovered or confirmed.*	*Federal and State*

FORS Study Critical And Common Data Element Name	Generalized Description	Federal or Federal and State
Fire escape indicator	*An indicator of whether the fire escaped from either a prescribed or a Wildland Fire Use (WFU) fire.*	*Federal*
Fire identifier - unique	*A unique identifier for each fire, across agencies and time.*	*Federal and State*
Fire initial response date and time	*The date and time of that initial response action was taken on the fire.*	*Federal*
Fire land type	*An area of significant administrative concern, requiring special consideration, or officially designated or legislated (WUI, Wilderness, etc.)*	*Federal*
Fire name	*The specific name assigned to the fire.*	*Federal*
Fire out date and time	*The date and time the fire was designated as out.*	*Federal*
*Fire perimeter geospatial data file **	*The geospatial data file that describes the fire's perimeter.*	*Federal*
Fire report - reported by	*The name of the person accountable for entering the report data into the legacy fire occurrence reporting system.*	*Federal*
Fire report - approved/authorized by	*The name of the person who approved or authorized the fire report.*	*Federal*
Fire resource - kind and category	*Pre-defined look-up table data.*	*Federal*
Fire resource quantity	*The total number of fire resources used on a fire by kind and category.*	*Federal*
*Fire response objectives met **	*A Y/N indicator for whether the management strategy objectives were met on a fire. This includes the initial and subsequent fire management strategies.*	*Federal*
Fire type	*The fire type code and description of the type of incident (wildfire, WFU, Rx Fire).*	*Federal*
*Fire type - highest complexity type **	*The number that corresponds to the highest incident complexity assigned to the fire.*	*Federal*
FireCode	*The unique four character code obtained through the FireCode System and assigned to the fire for cost accounting purposes.*	*Federal*
Homes lost	*The total number of homes burned or destroyed by the fire.*	*Federal and State*
Homes threatened	*The total number of homes threatened by the fire but not involved.*	*Federal and State*
Initial fire strategy	*The fire strategy initially used on a fire, such as WFU or IA.*	*Federal*
Injuries	*The total number of injuries associated with the fire.*	*Federal and State*
*Other structures lost **	*The total number of other structures burned or destroyed by the fire.*	*Federal and State*
*Other structures threatened **	*The total number of other structures threatened by the fire but not involved.*	*Federal and State*
Point of origin county	*The county in which the point of origin for a fire occurred.*	*Federal and State*
Point of origin datum	*Short descriptor of the geographic datum corresponding to the reported location coordinates.*	*Federal*

FORS Study Critical And Common Data Element Name	Generalized Description	Federal or Federal and State
Point of origin land owner	*The landowner at the point of origin.*	*Federal and State*
Point of origin latitude	*The latitude location of the fire's origin point specified in degrees, minutes, and seconds or decimal degrees.*	*Federal and State*
Point of origin longitude	*The longitude location of the fire's origin point specified in degrees, minutes, and seconds or decimal degrees.*	*Federal and State*
Point of origin state	*The state in which a fire occurs.*	*Federal and State*
Responsible agency unit identifier	*The unit identifier for the agency that has legal responsibility to protect the land at the point of origin.*	*Federal*
Weather station ID - primary	*The unique identifier for a particular station where weather measurements are taken.*	*Federal*
WUI indicator	*A flag that indicates if any burned acres were in the Wildland Urban Interface.*	*Federal*

***** Elements identified in gap analysis***

3. There are currently gaps, overlaps, and redundancies for the 38 critical and common data elements identified by the FORS study.

Identification of overlaps and gaps within the 38 critical and common data elements indicates that 7 data elements are not part of the legacy fire occurrence reporting systems, 5 are contained in only one system, and the remaining 26 are contained in more than one system.

The critical and common data elements selected during the business analysis are currently collected by at least one existing fire occurrence reporting system, with the exception of the critical and common data elements designated with asterisks in the table above. Further analysis is needed to more completely identify the data elements covered by individual systems and to resolve differences between these data elements and the elements defined in the FORS study.

4. Consistent interagency data standards are required for at least the critical and common data elements.

Each fire reporting agency has developed its own business rules and protocols for reporting fire information. Although the protocols and business rules are similar in nature, there are no standardized interagency fire occurrence data or methods for data collection. This has resulted in use of different data elements and data standards, and different data element descriptions for seemingly the same data need, interpreted differently by each agency. Interagency data stewardship would foster the coordination that is needed to reconcile differing data standards.

5. Fire occurrence data needs to be a complete and consistent record for every fire across agencies and over time.

Initial reports of a fire include basic location, fuels and fire behavior information. This information is used to determine initial response actions, and should be consistent across agencies to allow a coordinated response. Subsequent reporting is sometimes confined to a ‘need to know’ basis, especially if the initial response team is seeking more resources. Wider distribution of consistent information is needed. To provide complete fire occurrence records, historic fire occurrence data needs to be consistent with and possibly tied to other reporting systems, such as Sit/ICS-209 and NFPORS, when appropriate.

6. **Fire reporting personnel need to have the ability to correct invalid data.**

   Once valid data is identified, fire occurrence data needs to be accessible for revision. The ability to correct fire occurrence data to ensure accuracy and consistency is essential to provide credible fire occurrence information. Because data is collected by multiple agencies, personnel within an agency might not have sufficient access or permissions to correct errors, inconsistencies, and redundancy that they detect. In addition, data entry personnel may not be sufficiently familiar with fire occurrence data or fire management business needs to recognize errors, inconsistencies, and redundancies in fire reports. Interagency data stewardship or internal changes in training and workflow could address these two issues. To ensure quality and accountability, the ability to audit records would be required.

7. **A diverse audience needs easy access to all critical and common fire occurrence data elements.**

   Information requests from stakeholders, media, the general public, and state, local, and national political offices require that information be consistently available and accessible, reasonably accurate, and timely.

6. RECOMMENDATIONS

During the December 13-14, 2006 meeting, the agency fire occurrence SMEs and FORS study team developed the following set of recommendations for presentation to the NFAEB:

1. **Clarify for all users of fire occurrence data that the legacy fire occurrence reporting systems reviewed in this study are not intended to be sources of real-time fire statistics. Further, if there are subsequent phases of the FORS study, establish sideboards for those phases on the real-time collection and dissemination of fire data.**

   There are two distinct aspects to this recommendation. First, clarify for all users of the legacy fire occurrence reporting systems' data that the data was never intended to support real-time fire reporting or decision making. At best, the completed fire reports are typically entered into the fire occurrence reporting systems days or weeks after a fire is declared out.

   Secondly, if there are follow on steps beyond the FORS study, any future efforts would benefit from clarity about the goals as they relate to the fire community's need for information during a fire's event. Although this FORS study accepted and documented the business need for the information, it did not attempt to recommend solutions to the need.

2. **Create a short-term business-centric task group to develop standards for the 38 critical and common data elements identified by the FORS study.**

   a. Data standards to include: definition, format, precision, range of values, validation rules, responsibilities, "mandatory-ness", and timetable.

   b. Submit proposed standards to the wider fire business community and the DAWG for adoption as NWCG data standards and incorporated into the National Wildland Fire Enterprise Architecture.

   c. Recommend that common data standards be implemented and used in all legacy fire occurrence systems as appropriate.

3. **Create an ongoing interagency stewardship group to oversee shared fire occurrence business with the following objectives:**

   a. Coordinate fire occurrence business practices and data standards across agency boundaries.

   b. Resolve future issues as business and technology changes occur.

   c. Develop a capacity to address future needs that will require further consideration of critical and common data requirements, such as the need for Daily Acres Burning for emissions calculation.

   d. To the extent the states are willing to participate, reach out to and coordinate with fire occurrence representatives at the state level.

4. **Reinforce that each agency must adhere to existing fire reporting policies and enhance training programs for fire occurrence reporting personnel.**

   Many stakeholders expressed discontent about the delay in reporting of fire occurrence data into the legacy fire occurrence reporting systems as well as concerns about the completeness and accuracy of the data. Agency fire occurrence SMEs acknowledged wide disparity in the quality and timeliness of the existing data set from one reporting unit to the next. In some cases it may be due to workload priorities in the fire reporting offices and/or confusion with the business rules.

5. **Create a task group to develop a unique interagency fire identifier that can link individual fires across relevant systems.**

   There is not a single method of identifying every individual fire across all federal agency boundaries and over time. There are a variety of identification mechanisms that serve a subset of the broad fire community, but problems develop when different business groups or agencies attempt to link with other fire-related and financial systems, such as the National Interagency Situation Reporting System (Sit/ICS-209), FireCode, ROSS, etc. The task group needs to be sensitive to the states' need to be a participant in this development.

6. **Develop and implement the capability to collect, archive, and retrieve standardized fire perimeter geospatial data files as GIS capability matures within the fire community.**

   Geographic Information Systems (GIS) offer significant opportunities to enhance the timeliness, accuracy, completeness, and usability of fire occurrence data. Individual agencies and business communities are starting to gain from these opportunities; however, there remain many technical and operational hurdles to be overcome before the fire community can fully implement the technology on a national basis.

7. **Develop a proposal to establish a single point of access to interagency fire occurrence data for at least the critical and common elements.**

   Assign a task group to explore a range of options for data retrieval. These could include:

   a. Establish a data warehouse for critical and common data elements.

   b. Foster interagency access to existing systems.

   c. Allow each agency to develop their own methodology to implement the critical and common data requirements using legacy systems while ensuring that each agency has needed access to collected data.

   d. Possible use of web linking technology to give the viewer the impression all of the data is in one place, when in reality it resides in agency-centric systems of record.

8. **Document that the states' legacy systems use a subset of the 38 critical and common data elements identified in the FORS study. Request the states consider using the unique fire identifier recommended above. Encourage the states to implement additional critical and common data elements as they feel appropriate.**

9. **Integrate the results of this study into the Reporting and Fire History Services components of the fire core blueprint effort of the NWFEA project.**

   [Project Manager Note: This recommendation is unsupported in the study - perhaps because no enterprise architecture stakeholders were included.]

10. **Determine the need to address unresolved issues identified during the study.**

    These issues are listed in Section 7, Unresolved Questions.

7. UNRESOLVED QUESTIONS

The following questions emerged during the interview process but were not directly addressed because they were deemed out of the scope of this study:

1. Should there be an effort to reconcile the various data sets (e.g. FireCode, ROSS, NFPORS, Sit/ICS-209, fire occurrence reporting systems, etc.) post-fire to resolve inconsistencies in the data collected? If so, to what extent should it be automated?
2. Where does the existing proposal to “Create an 'end-to-end' fire reporting system..." and its implications for the fire community fit in the wildland fire Enterprise Architecture and the recommendations in this FORS study? See the eGov Disaster Management Task Group Report (2006; page 31, recommendation 6.3).
3. Currently, a GPRA performance measure is applied for the number of acres degraded by fire. However, there is no uniform or reliable method for defining degraded acres; often all burned acres are reported as degraded. Should this practice be reviewed?
4. Does the law enforcement community have a business need for fire occurrence information?
5. What are the interagency business rules for reporting complex fires and constituent fires?
6. When the fire community further incorporates geospatial technology into its information technology environment it will need to be compliant with existing directives, guidelines, and Executive Orders pertaining to the topic (e.g. Executive Order #12906).
7. Other technical issues, such as Daily Acres Burning for emissions calculation, will require future consideration.
8. What relevance does the FORS study have to other fire business groups? Share FORS study findings with other fire business groups and recommend that they review their data standards and they assess their ability to collect and report fire data in a timely manner. Consider coordinating the results with all systems that collect the same or similar information.

8. TERMS AND ACRONYMS

Term	Definition
AMR	Appropriate Management Response
BAER	Burned Area Emergency Rehabilitation
BIA	Department of Interior, Bureau of Indian Affairs
BLM	Department of Interior, Bureau of Land Management
CWPP	Community Wildfire Protection Plans
DAWG	NWCG Data Administration Working Group
ESR	Emergency Stabilization and Rehabilitation
FARSITE	Fire Area Simulator
FEMA	Federal Emergency Management Agency
FMIS	Fire Management Information System
FORS	Fire Occurrence Reporting System
FPA	Fire Program Analysis
FSPro	Fire Spread Probability
FWS	Department of Interior, Fish and Wildlife Service
GACC	Geographic Area Coordination Center
GAO	Government Accountability Office
GIS	Geographic Information System
GPRA	Government Performance and Results Act
GPS	Global Positioning System
IA	Initial Attack
ICS-209	Incident Status Summary
IT	Information Technology
MAC	Multi-Agency Coordination Groups
NASF	National Association of State Foresters
NFAEB	National Fire and Aviation Executive Board
NFIRS	U.S. Fire Administration National Fire Incident Reporting System
NFPORS	National Fire Plan Operations and Reporting System
NPS	Department of Interior, National Park Service
NWCG	National Wildfire Coordinating Group
NWFEA	National Wildland Fire Enterprise Architecture
ROSS	Resource Ordering Status System
SME	Subject Matter Expert
USFS	Department of Agriculture, U.S. Forest Service
WFIP	Wildland Fire Implementation Plan
WFMI	Wildland Fire Management Information System
WFSA	Wildland Fire Situation Analysis
WFU	Wildland Fire Use
WUI	Wildland Urban Interface

9. REFERENCES

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3. National Fire Plan, 2000
4. Coarse Assessment of Federal Wildland Fire Occurrence Data–A report for the National Wildfire Coordinating Group by CEFA, 2002
5. NASF Resolution on National Fire Reporting, 2002
6. Fire Statistics Task Group Final Report, 2003
7. Predictive Services White Paper – Integrated Fire Statistics Data Needs, 2003
8. Reporting Fire Statistics by State, Local, and Tribal Fire Organizations– A White Paper to Focus the Issue for the Short Term, 2003
9. Fire Occurrence Reporting System Charter, 2005
10. Report of the eGov Disaster Management Task Group to the National Fire and Aviation Executive Board, 2006
11. Draft version of USFS Individual Wildland Fire Report, officially adopted for use in FY2007, 2006
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13. NFIRS Version 5.0 Design Documentation Manual, 2006

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Business Needs Analysis
Appendices

Appendix A: FORS Study Team and Agency Fire Occurrence SMEs Spreadsheet
Appendix B: Stakeholders and Interview Tracking Spreadsheet
Appendix C: Business Area to Business Need Spreadsheet
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Appendix E: Stakeholder Meeting Notes - Interview Sessions
Appendix F: Agency SME Meeting Notes
Appendix G: Fire Occurrence Reporting Legacy System Matrix

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Appendix A
FORS Study Team and Agency Fire Occurrence SMEs

FORS Study Team Member	Business Area	Phone	Email
Wallace, Mike - NPS	NFAEB Liaison	208-387-5225	Mike_Wallace@nps.gov
Wordell, Thomas - USFS	Federal Business Lead	208-387-5816	twordell@fs.fed.us
Smith, Keith - NASF	State Business Lead	208-947-3735	Keith_Smith@blm.gov
Schlobohm, Paul - BLM	FENWT Representative	208-387-5196	Paul_Schlobohm@nifc.blm.gov
Potter, David - BIA	FORS Study Project Manager	208-387-5237	David_Potter@nifc.gov
Noneman, John - BLM	Senior IT Project Manager	208-387-5496	John_Noneman@nifc.blm.gov
Vorbeck, Tina - FedSource	Data Technical Specialist	208-387-5395	Tina_Vorbeck@nifc.blm.gov
Tae, Michele - Commonthread Inc	Business Analyst	208-336-9616	michele@cmnthrd.com
Benscoter, Mike - Commonthread Inc	Business Analyst	208-336-9616	
Streetman, Austin - Spatial Dynamics	Data Analyst	208-345-6788	
Myers, Lisa - Spatial Dynamics	Technical Writer	208-345-6788	Lisa@spatialdynamics.com
Cole, Kyme - Commonthread Inc	Technical Writer	208-336-9616	

Agency SME	Business Area	Phone	Email
Brooks, Becky - FWS	Fire Occurrence Business SME	208-387-5345	Becky_Brooks@fws.gov
Larrabee, Steve - BIA	Fire Occurrence Business SME	208-387-5586	Steve_Larrabee@nifc.gov
Miracle, Dale - NPS	Fire Occurrence Business SME	208-387-5212	Dale_Miracle@nps.gov
Pederson, Roshelle - BLM	Fire Occurrence Business SME	208-387-5162	Roshelle_Pederson@nifc.blm.gov
Saleen, Nikki - USFS	Fire Occurrence Business SME	208-947-3777	nsaleen@fs.fed.us
Breedlove, Bill - USFS	Fire Occurrence Business SME	202-205-0996	bbreedlove@fs.fed.us
Wright, Elizabeth - USFS	Fire Occurrence Business SME	619-445-6235	ewright@fs.fed.us

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Appendix B
Stakeholders and Interview Tracking Spreadsheet

Stakeholder	Business Area	Phone	Email	Session Date	Session Location	Interview Status
Achtemeier, Gary - USFS		706-559-4239	gachtemeier@fs.fed.us	By Phone	Phone - GA	Cancel
Bahr, Dick - NPS	Fuels and Fire Use	208-387-5217	Dick_Bahr@nps.gov	23-Aug-06	Boise, ID	Done
Bahro, Bernie - USFS	Research/Fire Behavior/Modeling	916-640-1066	bbahro@fs.fed.us	By Phone	Phone - CA	No Response
Beighley, Mark - OWFC	OWFC Director		Mark_Beighley@ios.doi.gov	17-Oct-06	Washington, DC	Done
Bloms, Rod - FWS	Fire Occurrence Business SME	208-387-5599	Rod_Bloms@ios.doi.gov	15-Aug-06	Boise. ID	Cancel
Boehle, Tina - NPS	External Affairs/Prevention	208-387-5875	Tina_Boehle@nps.gov	15-Aug-06	Boise, ID	Done
Botti, Steve - NPS	Fire Planning and FPA	208-387-5210	Stephen_Botti@nps.gov	8-Aug-06	Boise, ID	Done
Bradshaw , Larry - USFS	FENWT	406-329-4979	lbradshaw@fs.fed.us	26-Sep-06	Missoula, MT	Done
Breedlove, Bill - USFS	Fire Occurrence Business SME	202-205-0996	bbreedlove@fs.fed.us	17-Oct-06	Washington, DC	Done
Brenner, Jim - FL State	State/Field External Coordination	850-488-6111	BrenneJ@doacs.state.fl.us	By Phone	Phone - FL	Done
Brooks, Becky - FWS	Fire Occurrence Business SME	208-387-5345	Becky_Brooks@fws.gov	8-Aug-06	Boise, ID	Done
Brown, Tim - DRI	Research/Fire Behavior/Modeling	775-674-7090	Tbrown@dri.edu	By Phone	Phone - NV	Done
Buescher, Chuck - USFS	State/Field External Coordination	208-634-0391	cbuescher@fs.fed.us	23-Aug-06	Boise, ID	Done
Burnett, Vanessa - DHS	State/Field External Coordination	202-646-4072	vanessa.burnett@dhs.gov	17-Oct-06	Washington, DC	Done
Burril, Les - USFS	Law Enforcement	703-605-4734	lburril01@fs.fed.us	17-Oct-06	Washington, DC	No Follow Up
Calkin, Dave - USFS	Research/Fire Behavior/Modeling	406-542-4151	decalkin@fs.fed.us	26-Sep-06	Missoula, MT	Done
Carlton, Don - Pvt	Fire Planning and FPA	503-887-6536	dcarlton1@aol.com	By Phone	Phone - OR	Done
Carpenter, John - USFS	Law Enforcement	912-267-2607	jcarpenter@fs.fed.us	17-Oct-06	Washington, DC	No Follow Up
Chase, Carolyn - USFS	Mathematician	406-329-4823	cchase@fs.fed.us	26-Sep-06	Missoula, MT	Done
Christensen, Erik - BLM	Fuels and Fire Use	208-387-5165	Erik_Christiansen@nifc.blm.gov	By Phone	Phone - ID	Done
Cook, Wayne - USFS	FENWT	928-443-8071	whcook@fs.fed.us	26-Sep-06	Missoula, MT	No Follow Up
Crabtree, Gladys - NPS	Fire Occurrence IT SME	208-387-5214	Gladys_Crabtree@nps.gov	As Needed	Boise, ID	No Follow Up
Curcio, Gary - NC State	Fuels and Fire Use	252-520-2402	Gary.Curcio@ncmail.net	17-Oct-06	Washington, DC	No Follow Up
Davis, Rose - USFS	External Affairs/Prevention	208-387-5437	rzdavis@fs.fed.us	15-Aug-06	Boise, ID	Done
Delong, Nancy - USFS	Resource Ordering	208-947-3710	ndelong@fs.fed.us	23-Aug-06	Boise, ID	No Follow Up
Douglas, Jim - OWFC	State/Field External Coordination	202-606-3211	Jim_Douglas@ios.doi.gov	17-Oct-06	Washington, DC	Done
Dupuis, Dennis - BIA	Fuels and Fire Use	208-387-5041	Dennis_Dupuis@nifc.gov	23-Aug-06	Boise, ID	Done
Eardley, Randy - BLM	External Affairs/Prevention	208-387-5895	Randy_Eardley@nifc.blm.gov	15-Aug-06	Boise, ID	Done
Ervin, Dan - USFS	Fire Occurrence IT SME	208-867-3320	dervin@fs.fed.us	As Needed	Boise, ID	No Follow Up

Appendix B
Stakeholders and Interview Tracking Spreadsheet

Stakeholder	Business Area	Phone	Email	Session Date	Session Location	Interview Status
Finney, Mark - USFS	Research/Fire Behavior/Modeling	406-329-4832	mfinney@fs.fed.us	By Phone	Phone - MT	Done
Fitch, Mark - USFS	Air Quality and FCAMMS	602-771-2374	mjfitch@fs.fed.us	30-Aug-06	Denver, CO	Done
Fitzsimmons, Allan - OWFC	State/Field External Coordination	202-606-0488	Allan_Fitzsimmons@ios.doi.gov	17-Oct-06	Washington, DC	Done
Furr, Alexandra - US Fire Admin	State/Field External Coordination	301-447-1353	Alexandra.Furr@dhs.gov	By Phone	Phone - DC	Done
Galloway, Don - TX State	State/Field External Coordination	979-458-6507	dgalloway@tfs.tamu.edu	By Phone	Phone - TX	Done
Gebert , Krista - USFS	Research/Fire Behavior/Modeling	406-542-4174	kgebert@fs.fed.us	26-Sep-06	Missoula, MT	Done
Goodman, Susan - BLM	Remote Sensing and GIS	303-236-4242	Susan_Goodman@blm.gov	30-Aug-06	Denver, CO	Done
Goodrick, Scott -	Air Quality and FCAMMS			By Phone	Phone	Done
Haddow, Dennis - FWS	Air Quality and FCAMMS	303-914-3809	Dennis_Haddow@fws.gov	By Phone	Phone - CO	No Response
Hamill, Deb - USFS	NFIRS	801-531-5320	Dhamill@fs.fed.us	By Phone	Phone - UT	Done
Hao, Wei-Min - USFS	Remote Sensing and GIS	406-329-4838	whao@fs.fed.us	26-Sep-06	Missoula, MT	No Follow Up
Hartog, Jeanette - USFS	External Affairs/Prevention	801-625-5245	jhartog@fs.fed.us	15-Aug-06	Boise, ID	Done
Havlina, Doug - BLM	Research/Fire Behavior/Modeling	208-387-5061	Doug_Havlina@nifc.blm.gov	By Phone	Phone - ID	Done
Heyerdahl, Emily - USFS	Research/Fire Behavior/Modeling	406-829-6939	eheyerdahl@fs.fed.us	26-Sep-06	Missoula, MT	Cancel
Hilbruner, Mike - USFS	Research/Fire Behavior/Modeling			By Phone	Phone	Done
Hislop, LeighAnn - BLM	State/Field External Coordination	208-384-3300	Leigh_Ann_Hislop@blm.gov	23-Aug-06	Boise, ID	No Follow Up
Jackson, Bill - R8 Air Quality Coord	Air Quality and FCAMMS	828-257-4815	bjackson02@fs.fed.us	By Phone	Phone - NC	Done
Kelly, Kim - BIA	Remote Sensing and GIS	503-808-2741	Kim_Kelly@or.blm.gov	29-Aug-06	Portland, OR	Done
Kennedy, Joe - NY State	FENWT	518-359-7030	Kennedy@northnet.org	17-Oct-06	Washington, DC	Done
Kishpaugh, Amy - FWS	Budget	208-387-5502	Amy_Kishpaugh@fws.gov	8-Aug-2006	Boise, ID	No Follow Up
Lahm, Pete - USFS	Air Quality and FCAMMS	202-205-1084	plahm@fs.fed.us	17-Oct-06	Washington, DC	Done
Langner, Linda - USFS	Budget	703-605-4886	llangner@fs.fed.us	17-Oct-06	Washington, DC	Cancel
Larrabee, Steve - BIA	Fire Occurrence Business SME	208-387-5586	Steve_Larrabee@nifc.gov	15-Aug-06	Boise. ID	Done
Leenhouts, Bill - FWS	Remote Sensing and GIS	208-387-5584	Bill_Leenhouts@fws.gov	17-Aug-06	Boise, ID	No Follow Up
Leonard, Charlie - USFS	Predictive Services	208-387-5093	cleonard@blm.gov	17-Aug-06	Boise, ID	Done
Lile, Elizabeth - USGS	Remote Sensing and GIS	303-202-4326	ellile@usgs.gov	30-Aug-06	Denver, CO	Done
Liu, Yon -	Air Quality and FCAMMS			By Phone	Phone	Done
Lynch, Mary - NPS	State/Field External Coordination	907-356-5863	Mary_Lynch@ak.blm.gov	By Phone	Phone - AK	Done
Madrid-Hipke, Katy - BLM	Remote Sensing and GIS	208-387-5369	Katy_Madrid-Hipke@blm.gov	17-Aug-06	Boise, ID	Done

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Stakeholder	Business Area	Phone	Email	Session Date	Session Location	Interview Status
Magliano, Karen - CA Air Board	Air Quality and FCAMMS	916-322-7137	kmaglian@arb.ca.gov	By Phone	Phone - CA	Done
Manski, Jonathan - BLM	FireCode Administrator	541-573-4546	Jonathan_Manski@or.blm.gov	By Phone	Phone - OR	Done
Marsha, Terry - BIA	Predictive Services	503-808-2756	Terry_Marsha@or.blm.gov	By Phone	Phone - OR	Done
Maxwell, Charles - FWS	Predictive Services	505-842-3419	Charles_Maxwell@fws.gov	By Phone	Phone - NM	Done
Mazzu, Linda - BLM	Fire Planning and FPA	208-387-5168	Linda_Mazzu@nifc.blm.gov	8-Aug-06	Boise, ID	Done
McCaffrey, Maggie - BLM	External Affairs/Prevention	970-240-5396	Maggie_McCaffrey@blm.gov	30-Aug-06	Denver, CO	Done
McGillivary, Keith - BLM	Fire Occurrence IT SME	208-387-5076	Keith_McGillivary@nifc.blm.gov	As Needed	Boise, ID	No Follow Up
McHugh, Chuck - USFS	Research/Fire Behavior/Modeling	406-829-6953	cmchugh@fs.fed.us	26-Sep-06	Missoula, MT	Done
Menakis, Jim - USFS	USFS Research / IRMWT	406-329-4958	jmenakis@fs.fed.us	26-Sep-06	Missoula, MT	No Follow Up
Miller, Carol - USFS	Research/Fire Behavior/Modeling	406-542-4198	cmiller04@fs.fed.us	26-Sep-06	Missoula, MT	Done
Miracle, Dale - NPS	Fire Occurrence Business SME	208-387-5212	Dale_Miracle@nps.gov	15-Aug-06	Boise. ID	Done
Mitchell, Wayne - CDF	FENWT	707-576-2960	Wayne.Mitchell@fire.ca.gov	By Phone	Phone - CA	Done
Morgan, Penny - U of I	Research/Fire Behavior/Modeling	208-885-7507	Pmorgan@uidaho.edu	By Phone	Phone - ID	Contacted
Nichols, Tom - NPS	Budget	208-387-5216	Tom_Nichols@nps.gov	23-Aug-06	Boise, ID	No Follow Up
Nordgren, Bryce - USFS	Remote Sensing and GIS	For Dr. Hao	bnordgren@fs.fed.us	26-Sep-06	Missoula, MT	Done
Olson, Andrea - FWS	Fire Occurrence IT SME	208-387-5597	Andrea_Olson@fws.gov	As Needed	Boise, ID	No Follow Up
Owens, John - BLM	Fuels and Fire Use	208-387-5186	John_Owens@nifc.blm.gov	23-Aug-06	Boise, ID	Done
Pace, Tom - EPA	Air Quality and FCAMMS	919-541-5634	Pace.Tom@epa.gov	By Phone	Phone - NC	Done
Paintner, Kara - NPS	Air Quality and FCAMMS	970-267-2121	Kara_Paintner@nps.gov	30-Aug-06	Denver, CO	Done
Paris, Sharon - BLM	BAER	208-373-4028	Sharon_Paris@blm.gov	17-Aug-06	Boise, ID	Done
Pederson, Roshelle - BLM	Fire Occurrence Business SME	208-387-5162	Roshelle_Pederson@nifc.blm.gov	15-Aug-06	Boise. ID	Done
Peterson, Janice - USFS	Air Quality and FCAMMS	425-744-3425	jlpeterson@fs.fed.us	29-Aug-06	Portland, OR	Done
Potter, David - BIA	Fire Occurrence IT SME	208-387-5237	David_Potter@nifc.gov	As Needed	Boise, ID	No Follow Up
Probert, Felicia - BLM Law	Law Enforcement	208-387-5131	Felicia_Probert@blm.gov	By Phone	Phone - ID	Contacted
Quayle, Brad - USFS	Remote Sensing and GIS	801-975-3737	bquayle@fs.fed.us	By Phone	Phone - UT	Done
Queen, Lloyd - U of M	Remote Sensing and GIS		lpqueen@ntsg.umt.edu	26-Sep-06	Missoula, MT	Cancel
Randal, Dave - Air Sci	Air Quality and FCAMMS	303-988-2961	Drandall@airsci.com	30-Aug-06	Denver, CO	Done
Roland, John - USFS	Air Quality and FCAMMS	202-205-0533	jroland@fs.fed.us	17-Oct-06	Washington, DC	Cancel
Roose, Howard - BLM	Fire Planning and FPA	208-947-3781	Howard_Roose@nifc.blm.gov	8-Aug-06	Boise, ID	Done

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Stakeholder	Business Area	Phone	Email	Session Date	Session Location	Interview Status
Roy, Deb - USFS	State/Field External Coordination	503-668-1756	diroy@fs.fed.us	By Phone	Phone - OR	No Response
Saleen, Nikki - USFS	Fire Planning and FPA	208-947-3777	nsaleen@fs.fed.us	8-Aug-06	Boise, ID	Done
Sapsis, Dave - CDF	Research/Fire Behavior/Modeling	916-445-5369	Dave.Sapsis@fire.ca.gov	By Phone	Phone - CA	Done
Schlobohm, Paul - BLM	FENWT	208-387-5196	Paul_Schlobohm@nifc.blm.gov	15-Aug-06	Boise, ID	Done
Schwab, Rich - NPS	BAER	208-387-5642	Richard_Schwab@nps.gov	By Phone	Phone - ID	Done
Scott, Jeff - BLM	Budget	208-387-5568	Jeff_Scott@nifc.blm.gov	8-Aug-06	Boise, ID	Done
Segar, John - FWS	Fire Planning and FPA	208-387-5976	John_Segar@fws.com	23-Aug-06	Boise, ID	Done
Sexton, Tim - USFS	Fuels and Fire Use	208-387-5223	timsexton@fs.fed.us	23-Aug-06	Boise, ID	Done
Skeels, Jon - USFS	Resource Ordering	303-236-0630	jskeels@fs.fed.us	30-Aug-06	Denver, CO	Done
Smith, Keith - NASF	Fire Occurrence Business SME	208-947-3735	Keith_Smith@blm.gov	17-Aug-06	Boise. ID	Done
Smith, Brad - TX State	Predictive Services	903-297-4840	Bsmith@tfs.tamu.edu	By Phone	Phone - TX	Done
Sorbel, Brian - NPS	Remote Sensing and GIS	907-644-3413	Brian_Sorbel@nps.gov	By Phone	Phone - AK	Done
Stephen, Doug - NPS	Research/Fire Behavior/Modeling	303-969-2947	Doug_Stephen@nps.gov	By Phone	Phone - CO	Done
Szymoniak, Mary Ann - USFS	IOSWT	208-387-5944	mszymoniak@fs.fed.us	By Phone	Phone - ID	Done
Taber, Mary - BIA	Fuels and Fire Use	208-387-5042	Mary_Taber@nifc.gov	23-Aug-06	Boise, ID	Done
Van Hemelryck, Kim - FWS	Fuels and Fire Use	208-387-5957	Kim_VanHemelryck@fws.gov	By Phone	Phone - ID	No Response
Wamack, Chuck - BLM	Resource Ordering	208-387-5418	Chuck_Wamack@nifc.blm.gov	23-Aug-06	Boise, ID	No Follow Up
Weber, Susan - USFS	Fire Planning and FPA	208-947-3770		8-Aug-06	Boise, ID	Done
Westerling, Anthony - Scripps	Research/Fire Behavior/Modeling	858-822-4057	Leroy@ucsd.edu	By Phone	Phone - CA	Done
Wimmer, Sheldon - BLM	State/Field External Coordination	801-539-4091	Sheldon_Wimmer@ut.blm.gov	By Phone	Phone - UT	Done
Winship, Kathy - FWS	Budget	208-387-5712	Kathy_Winship@fws.gov	8-Aug-06	Boise, ID	Done
Wolf, Jim - ODF	Fire Planning and FPA	541-324-3446	jwolf@odf.state.or.us	29-Aug-06	Portland, OR	Retired
Woolley, Richard - BLM	Predictive Services	775-861-6421	Richard_Woolley@nv.blm.gov	17-Aug-06	Boise, ID	Retired
Wordell, Thomas - USFS	Predictive Services	208-387-5816	twordell@fs.fed.us	17-Aug-06	Boise, ID	Done
Wright, Elizabeth - USFS	Fire Occurrence Business SME	619-445-6235	ewright@fs.fed.us	15-Aug-06	Boise. ID	Done
Ziel, Robert - MI State	Research/Fire Behavior/Modeling	906-249-1497	ZielR@michigan.gov	By Phone	Phone - MI	Done

Appendix C
Business Area to Business Need

Business Area	General Business Need	Business Need Statement	Time
Agency Fire Reporting Data Management	Analyze data for fire planning and research.	Analyze the relationship between fuels treatments and wildland fire activity.	Post-Fire
Agency Fire Reporting Data Management	Analyze data for fire planning and research.	Report the suppression activities for fire planning analysis and modeling.	Historic Fire
Air Quality	Determine impact and effect of a fire.	Report the location of historic fire events on the landscape.	Historic Fire
Air Quality	Determine requirements for prevention education.	Report real-time information for prevention planning and staffing. (Risk Assessment and Fire Hazard Risk).	Current
Air Quality	Determine the quantity and quality of emissions.	Analyze fire occurrence data to estimate the quantity and quality of emissions using fire modeling applications such as Blue Sky.	Current
Air Quality	Determine the quantity and quality of emissions.	Analyze fuel consumption to forecast emissions due to a prescribed fire or WFU fire.	Current
Air Quality	Determine the quantity and quality of emissions.	Determine the type of emissions that may result from prescribed fire.	Current
Air Quality	Determine the quantity and quality of emissions.	Develop an annual emissions inventory.	Post-Fire
Air Quality	Determine the quantity and quality of emissions.	Report the number of acres burning (cumulative/airshed) to determine whether or not more acres can burn (such as in Rx fire). This is a daily need (real-time).	Current
Air Quality	Determine the quantity and quality of emissions.	Report information to compose annual summaries of smoke impacts of airsheds.	Post-Fire
Air Quality	Determine the quantity and quality of emissions.	Report smoke emissions from a fire and/or potential for smoke emissions from a WFU or prescribed fire to the public.	Current
Budget	Analyze fire costs.	Report fire costs across agencies.	Post-Fire
External Affairs	Analyze data for fire planning and research.	Analyze and model fire behavior.	Historic Fire
External Affairs	Analyze data for fire planning and research.	Report fire occurrence to promote wildland fire use and prescribed fire management strategies.	Post-Fire

Appendix C
Business Area to Business Need

Business Area	General Business Need	Business Need Statement	Time
External Affairs	Analyze data for fire planning and research.	Validate fire planning information with different fire causes based on historic occurrence.	Historic Fire
External Affairs	Assess Fire Management Strategy.	Report whether all consultations required by regulation were completed.	Post-Fire
External Affairs	Determine impact and effect of a fire.	Report acreage burned by land ownership across agencies.	Post-Fire
External Affairs	Determine requirements for prevention education.	Report data to develop fire prevention messages and education efforts to respond to geographic trends.	Post-Fire
External Affairs	Respond to information requests and data calls.	Respond to information requests and data calls.	Post-Fire
External Affairs	Support real-time decision-making.	Report fire occurrence information over the duration of a fire event.	Current
External Affairs	Support real-time decision-making.	Report the actual level of IA activity within a state or region to present a more realistic picture to the media and the public.	Current
External Coordination	Analyze data for fire planning and research.	Analyze fire costs to develop alternatives in land use planning.	Historic Fire
External Coordination	Analyze data for fire planning and research.	Report percentage of acres burned at a given severity level.	Post-Fire
External Coordination	Analyze fire costs.	Report fire costs across agencies.	Post-Fire
External Coordination	Assess Fire Management Strategy.	Report fire retardant use on a fire.	Post-Fire
External Coordination	Assess Fire Management Strategy.	Report initial actions and follow-up actions on an incident.	Post-Fire
External Coordination	Determine impact and effect of a fire.	Report acreage burned by land ownership across agencies.	Post-Fire
External Coordination	Determine impact and effect of a fire.	Report all wildland fire on the landscape independent of ownership.	Historic Fire
External Coordination	Support real-time decision-making.	Report fire growth/fire behavior on a static map daily.	Current

Appendix C
Business Area to Business Need

Business Area	General Business Need	Business Need Statement	Time
Fire Planning	Analyze data for fire planning and research.	Analyze fire costs to develop alternatives in land use planning.	Historic Fire
Fire Planning	Analyze data for fire planning and research.	Analyze the relationship between fuels treatments and wildland fire activity.	Post-Fire
Fire Planning	Analyze data for fire planning and research.	Determine probable fire occurrence.	Historic Fire
Fire Planning	Analyze data for fire planning and research.	Report both wildland fire use and "wildfire" for policy analysis.	Historic Fire
Fire Planning	Analyze data for fire planning and research.	Report fire occurrence data to support local fire protection planning (CWPP).	Post-Fire
Fire Planning	Analyze data for fire planning and research.	Report percentage of acres burned at a given severity level.	Post-Fire
Fire Planning	Analyze data for fire planning and research.	Report standardized fire cause data for planning efforts.	Post-Fire
Fire Planning	Analyze data for fire planning and research.	Report the suppression activities for fire planning analysis and modeling.	Historic Fire
Fire Planning	Analyze data for fire planning and research.	Validate fire planning information with different fire causes based on historic occurrence.	Historic Fire
Fire Planning	Analyze data for fire planning and research.	Validate fire planning information with different fire types based on historic occurrence.	Historic Fire
Fire Planning	Analyze fire costs.	Report fire costs across agencies.	Post-Fire
Fire Planning	Assess Fire Management Strategy.	Determine if fire management strategy objectives were met.	Historic Fire
Fire Planning	Assess Fire Management Strategy.	Determine if the initial management strategy was successful: Yes/No.	Current
Fire Planning	Assess Fire Management Strategy.	Report initial actions and follow-up actions on an incident.	Post-Fire
Fire Planning	Determine impact and effect of a fire.	Report acreage burned by land ownership across agencies.	Post-Fire
Fire Planning	Determine impact and effect of a fire.	Report all fires by fire type.	Post-Fire
Fire Planning	Determine impact and effect of a fire.	Report that "there was a fire" for legal purposes.	Current
Fire Planning	Respond to reporting requirements.	Report performance measures.	Post-Fire

Appendix C
Business Area to Business Need

Business Area	General Business Need	Business Need Statement	Time
Fire Planning	Support real-time decision-making.	Analyze fire occurrence (e.g., to identify potential hot spots) to support decision-making at the GACC and MACC level.	Current
Fire Planning	Support real-time decision-making.	Determine fire potential for pre-positioning resources.	Current
Fire Planning	Support real-time decision-making.	Determine the stress on available fire resources on days when a single fire occurs, when a large fire occurs, and when multiple fires occur. Note: This data is collected as part of the Full Fire Report and may also be in ROSS.	Current
Fire Planning	Support real-time decision-making.	Report fire activity to provide "real-time" information to the California Governor's Office.	Current
Fire Planning	Support real-time decision-making.	Report fire activity with fire danger ratings indices to set operational decision points.	Current
Fire Research	Analyze data for fire planning and research.	Analyze the relationship of past fuels treatments to fire behavior.	Historic Fire
Fire Research	Analyze data for fire planning and research.	Analyze the relationship of past fuels treatments to initial attack effectiveness.	Historic Fire
Fire Research	Analyze data for fire planning and research.	Assess risk by identifying patterns such as the growth in large fires over time; especially looking at the geographic areas.	Historic Fire
Fire Research	Analyze data for fire planning and research.	Determine probable fire occurrence.	Historic Fire
Fire Research	Analyze data for fire planning and research.	Report both wildland fire use and "wildfire" for policy analysis.	Historic Fire
Fire Research	Analyze data for fire planning and research.	Report fire occurrence data to support local fire protection planning (CWPP).	Post-Fire
Fire Research	Analyze data for fire planning and research.	Report historic fire occurrence to combine with other data, e.g., population density, fuels, weather, to identify potential ignitions and acres burned; to plan for future expansion of WUI; and to relate to historic norms.	Historic Fire

Appendix C
Business Area to Business Need

Business Area	General Business Need	Business Need Statement	Time
Fire Research	Analyze data for fire planning and research.	Report standardized fire cause data for planning efforts.	Post-Fire
Fire Research	Analyze data for fire planning and research.	Report the number of acres burned that result from a burn-out operation on a large fire.	Post-Fire
Fire Research	Assess Fire Management Strategy.	Analyze the relationship between fire management strategy and the trend toward large fires.	Historic Fire
Fire Research	Assess Fire Management Strategy.	Assess fire management strategy objectives relative to fire progression.	Current
Fire Research	Assess Fire Management Strategy.	Report fire retardant use on a fire.	Post-Fire
Fire Research	Determine trends in historic fire effects.	Determine global trends in long term fire effects, such as carbon balances.	Historic Fire
Fire Research	Determine impact and effect of a fire.	Report all fires by fire type.	Post-Fire
Fire Research	Determine impact and effect of a fire.	Report all wildland fire on the landscape independent of ownership.	Historic Fire
Fire Research	Determine impact and effect of a fire.	Report that "there was a fire" for legal purposes.	Current
Fire Research	Determine trends in historic fire effects.	Report trends in fire occurrence and the relationship to how vegetation changes over decades.	Historic Fire
Fire Research	Quantify workload.	Quantify the workload associated with different fire causes based on historic occurrence.	Historic Fire
Fire Research	Quantify workload.	Quantify the workload associated with different fire types based on historic occurrence.	Historic Fire
Fire Research	Quantify workload.	Quantify workload associated with different fire resources based on historic occurrence.	Historic Fire
Fire Research	Support real-time decision-making.	Analyze data to support decision-making during large fire events, e.g., run models like FSPRO, WFSA, WFIP.	Current
Fire Research	Support real-time decision-making.	Determine fire potential for pre-positioning resources.	Current
Fire Research	Support real-time decision-making.	Report fire activity to provide "real-time" information to the California Governor's Office.	Current

Appendix C
Business Area to Business Need

Business Area	General Business Need	Business Need Statement	Time
Fire Research	Support real-time decision-making.	Report fire growth/fire behavior on a static map daily.	Current
Fire Resource Status	Analyze data for fire planning and research.	Validate fire planning information with different fire causes based on historic occurrence.	Historic Fire
Fire Resource Status	Support real-time decision-making.	Determine the stress on available fire resources on days when a single fire occurs, when a large fire occurs and when multiple fires occur. Note: This data is collected as part of the Full Fire Report and may also be in ROSS.	Current
Fuels Management	Analyze data for fire planning and research.	Analyze historic fire information to define trends that may identify locations for future prevention, fuels, or fire use activities.	Historic Fire
Fuels Management	Analyze data for fire planning and research.	Assess risk to support fuels tech transfer where historic fire is a key measure.	Post-Fire
Fuels Management	Assess Fire Management Strategy.	Report and assess changes in fire management strategy over time.	Post-Fire
Fuels Management	Determine impact and effect of a fire.	Assess Fuels / WFU on a per-fire basis.	Post-Fire
Fuels Management	Determine impact and effect of a fire.	Determine impact and effect of a fire.	Post-Fire
Fuels Management	Determine impact and effect of a fire.	Determine the significance of prescribed fire escapes.	Post-Fire
Fuels Management	Respond to information requests and data calls.	Respond to information requests and data calls.	Post-Fire
GIS and Remote Sensing	Analyze data for fire planning and research.	Analyze spatial data for fire planning.	Post-Fire
GIS and Remote Sensing	Respond to information requests and data calls.	Respond to information requests and data calls.	Post-Fire
National Reporting	Analyze fire costs.	Report historic fire occurrence information to justify fire program budgets.	Historic Fire
National Reporting	Determine impact and effect of a fire.	Report each fire to create a unique fire occurrence record.	Current
National Reporting	Respond to information requests and data calls.	Report fire occurrence information for briefings.	Current

Appendix C
Business Area to Business Need

Business Area	General Business Need	Business Need Statement	Time
National Reporting	Respond to information requests and data calls.	Respond to information requests and data calls.	Post-Fire
Performance Measures	Respond to reporting requirements.	Report performance measures.	Post-Fire
Post-Fire Rehab	Analyze data for fire planning and research.	Analyze the relationship between fuels treatments and wildland fire activity.	Post-Fire
Post-Fire Rehab	Analyze data for fire planning and research.	Report the suppression activities for fire planning analysis and modeling.	Historic Fire
Post-Fire Rehab	Report containment date for BAER.	Report fire containment date to comply with policy for beginning emergency stabilization and rehabilitation activities.	Current
Predictive Services	Analyze data for fire planning and research.	Assess risk to predict overall fire potential for planning, budgeting and staffing.	Historic Fire
Predictive Services	Support real-time decision-making.	Determine the stress on available fire resources on days when a single fire occurs, when a large fire occurs, and when multiple fires occur. Note: This data is collected as part of the Full Fire Report and may also be in ROSS.	Current
Prevention	Analyze data for fire planning and research.	Analyze and model fire behavior.	Historic Fire
Prevention	Analyze data for fire planning and research.	Validate fire planning information with different fire causes based on historic occurrence.	Historic Fire
Prevention	Determine impact and effect of a fire.	Report acreage burned by land ownership across agencies.	Post-Fire
Prevention	Determine requirements for prevention education.	Report real-time information for prevention planning and staffing. (Risk Assessment and Fire Hazard Risk).	Current
Prevention	Respond to information requests and data calls.	Respond to information requests and data calls.	Post-Fire
States (NASF)	Analyze data for fire planning and research.	Analyze fire costs to develop alternatives in land use planning.	Historic Fire
States (NASF)	Analyze data for fire planning and research.	Report percentage of acres burned at a given severity level.	Post-Fire

Appendix C
Business Area to Business Need

Business Area	General Business Need	Business Need Statement	Time
States (NASF)	Analyze fire costs.	Report fire costs across agencies.	Post-Fire
States (NASF)	Assess Fire Management Strategy.	Report fire retardant use on a fire.	Post-Fire
States (NASF)	Assess Fire Management Strategy.	Report initial actions and follow-up actions on an incident.	Post-Fire
States (NASF)	Determine impact and effect of a fire.	Report acreage burned by land ownership across agencies.	Post-Fire
States (NASF)	Determine impact and effect of a fire.	Report all wildland fire on the landscape independent of ownership.	Historic Fire
States (NASF)	Respond to reporting requirements.	Report fire losses for State's annual federal reporting requirements.	Post-Fire
States (NASF)	Support real-time decision-making.	Report fire growth/fire behavior on a static map daily.	Current
Wildland Fire Use	Analyze data for fire planning and research.	Analyze historic fire information to define trends that may identify locations for future prevention, fuels, or fire use activities.	Historic Fire
Wildland Fire Use	Assess Fire Management Strategy.	Report and assess changes in fire management strategy over time.	Post-Fire
Wildland Fire Use	Determine impact and effect of a fire.	Assess Fuels / WFU on a per-fire basis.	Post-Fire
Wildland Fire Use	Determine impact and effect of a fire.	Determine impact and effect of a fire.	Post-Fire
Wildland Fire Use	Determine impact and effect of a fire.	Determine the significance of prescribed fire escapes.	Post-Fire
Wildland Fire Use	Respond to information requests and data calls.	Respond to information requests and data calls.	Post-Fire

Appendix D
Data Element to Business Need

Data Element	General Business Need												Count	Critical	Currently Collected*
	Analyze data for fire planning and research.	Analyze fire costs.	Assess Fire Management Strategy	Determine trends in historic fire effects.	Determine impact and effect of a fire.	Determine requirements for prevention education.	Determine the quantity and quality of emissions	Quantify workload	Respond to information requests and data calls.	Respond to reporting requirements.	Support for BAER efforts	Support real time decision making.			
Acres at Discovery					●								1	N	Y
Acres at Initial Response					●								1	N	Y
Acres Burned - Burn Out	●												1	N	N
Acres Burned by State and Owner	●	●		●	●	●	●	●	●	●	●		10	Y	Y
Acres Protected by Agency					●								1	N	N
Actual Area of Activity							●						1	N	N
Actual Level of IA Activity								●	●			●	3	N	N
Administrative - Approved/Authorized By					●								1	Y	Y
Administrative - Report Entered By					●								1	N	Y
Administrative - Reported By	●									●			2	N	Y
Bug Kill Acres	●												1	N	N
Detection Type					●								1	N	Y
Fatalities			●				●		●	●		●	5	Y	Y
FBPS Fuel Model	●	●	●	●		●	●	●		●		●	9	N	Y
Fire Cause Code - General	●	●	●		●	●	●	●	●	●		●	10	Y	Y
Fire Cause Code - Specific						●		●					2	Y	Y
Fire Cause Code/Desc	●					●		●					3	N	Y
Fire Code	●	●							●	●		●	5	Y	Y
Fire Consultation			●										1	N	Y

*** Currently Collected in at least one legacy Fire Occurrence System**

Appendix D
Data Element to Business Need

Data Element	General Business Need												Count	Critical	Currently Collected*
	Analyze data for fire planning and research.	Analyze fire costs.	Assess Fire Management Strategy	Determine trends in historic fire effects.	Determine impact and effect of a fire.	Determine requirements for prevention education.	Determine the quantity and quality of emissions	Quantify workload	Respond to information requests and data calls.	Respond to reporting requirements.	Support for BAER efforts	Support real time decision making.			
Fire Containment Date/Time	●	●			●		●		●	●	●	●	8	Y	N
Fire Control Date/Time	●	●			●		●		●	●		●	7	Y	Y
Fire Cost - Agency	●	●							●	●		●	5	N	Y
Fire Cost Agency - Date Estimated		●							●	●		●	4	N	N
Fire Cost Agency - Date Final		●							●	●			3	N	Y
Fire Cost Agency - Estimate		●							●	●		●	4	N	Y
Fire Cost Agency - Final	●	●							●	●			4	N	Y
Fire Danger Rating (BI or ERC)	●	●				●						●	4	N	Y
Fire Discovery Date/Time	●	●	●	●	●	●	●	●	●	●		●	11	Y	Y
Fire Identifier - Unique					●								1	Y	Y
Fire Initial Response Date/Time	●	●	●		●			●	●	●			7	Y	Y
Fire Intensity Level	●			●	●		●			●		●	6	N	N
Fire Land Type	●	●	●		●	●			●	●		●	8	Y	Y
Fire Name	●	●			●		●		●	●		●	7	Y	Y
Fire Out Date/Time	●	●		●	●	●	●		●	●			8	Y	Y
Fire Perimeter Shapefile	●			●	●		●		●			●	6	Y	N
Fire Perimeter Shapefile - Burn Severity	●		●	●	●		●				●	●	7	N	N
Fire Perimeter Shapefile - Daily Acres Burned	●		●	●	●		●					●	6	N	N
Fire Reporting Agency	●	●			●		●		●				5	N	Y

*** Currently Collected in at least one legacy Fire Occurrence System**

Appendix D
Data Element to Business Need

Data Element	General Business Need												Count	Critical	Currently Collected*
	Analyze data for fire planning and research.	Analyze fire costs.	Assess Fire Management Strategy	Determine trends in historic fire effects.	Determine impact and effect of a fire.	Determine requirements for prevention education.	Determine the quantity and quality of emissions	Quantify workload	Respond to information requests and data calls.	Respond to reporting requirements.	Support for BAER efforts	Support real time decision making.			
Fire Resource Day	●		●					●		●		●	5	N	Y
Fire Resource Fatality Count	●				●				●	●			4	N	N
Fire Resource Kind, Category	●		●					●		●		●	5	Y	Y
Fire Resource Owner	●		●					●		●		●	5	N	N
Fire Resource Quantity	●		●					●		●		●	5	Y	Y
Fire Resource Severity Request Indicator	●							●					2	N	N
Fire Response Objectives Met			●									●	2	Y	N
Fire Severity Level	●				●		●						3	N	N
Fire Size - Daily	●	●	●		●		●	●	●	●		●	9	N	N
Fire Size - Final Acres Burned				●			●						2	Y	Y
Fire Size - Total Acres Within Perimeter Protected by Agency					●								1	N	Y
Fire Size Class	●	●			●				●	●		●	6	N	Y
Fire Type Change Date/Time			●										1	N	Y
Fire Type Code / Desc	●	●	●	●	●	●	●	●	●	●	●	●	12	Y	Y
Fireline Intensity	●												1	N	N
FRCC - Post Fire	●		●	●	●					●			5	N	Y
FRCC - Pre Fire	●		●	●	●					●			5	N	Y
Fuel Load	●			●	●		●					●	5	N	N

*** Currently Collected in at least one legacy Fire Occurrence System**

Appendix D
Data Element to Business Need

Data Element	General Business Need												Count	Critical	Currently Collected*
	Analyze data for fire planning and research.	Analyze fire costs.	Assess Fire Management Strategy	Determine trends in historic fire effects.	Determine impact and effect of a fire.	Determine requirements for prevention education.	Determine the quantity and quality of emissions	Quantify workload	Respond to information requests and data calls.	Respond to reporting requirements.	Support for BAER efforts	Support real time decision making.			
Fuel Type				●			●						2	N	N
Homes Lost					●				●	●		●	4	Y	Y
Homes Threatened	●		●		●				●	●		●	6	Y	N
IA Control Percent	●	●	●	●		●		●	●	●		●	9	N	Y
Incident Complexity Type	●				●		●						3	N	Y
Initial Fire Response Objective Met			●										1	N	N
Initial Fire Strategy	●		●		●				●	●		●	6	Y	Y
Injuries					●		●			●			3	Y	N
Length of Fire Seasons												●	1	N	N
NFDRS Fuel Model	●			●		●	●						4	N	Y
NFPORS Treatment ID	●									●			2	N	Y
Number of Starts												●	1	N	N
Other Structures Lost					●				●	●		●	4	Y	Y
Other Structures Threatened	●		●		●				●	●		●	6	Y	N
Ownership Within Perimeter	●	●	●		●				●	●		●	7	N	Y
Pile or Broadcast							●						1	N	N
Planned Date of Ignition							●						1	N	N
Planned Number of Acres Burned							●						1	N	N
Point of Origin - County	●						●		●	●			4	Y	Y

*** Currently Collected in at least one legacy Fire Occurrence System**

Appendix D
Data Element to Business Need

Data Element	General Business Need												Count	Critical	Currently Collected*
	Analyze data for fire planning and research.	Analyze fire costs.	Assess Fire Management Strategy	Determine trends in historic fire effects.	Determine impact and effect of a fire.	Determine requirements for prevention education.	Determine the quantity and quality of emissions	Quantify workload	Respond to information requests and data calls.	Respond to reporting requirements.	Support for BAER efforts	Support real time decision making.			
Point of Origin Accuracy	●	●	●	●	●	●	●	●	●	●		●	11	N	N
Point of Origin Aspect	●	●	●				●		●			●	6	N	Y
Point of Origin Data Collection Method	●								●				2	N	N
Point of Origin Datum	●	●	●	●	●	●	●	●	●	●		●	11	Y	Y
Point of Origin Elevation	●	●	●				●		●			●	6	N	Y
Point of Origin Land Owner	●	●	●		●	●			●	●		●	8	N	Y
Point of Origin Latitude	●	●	●	●	●	●	●	●	●	●		●	11	Y	Y
Point of Origin Longitude	●	●	●	●	●	●	●	●	●	●		●	11	Y	Y
Point of Origin Slope	●	●	●				●		●			●	6	N	Y
Point of Origin State	●	●			●				●	●			5	Y	Y
Potential for Loss												●	1	N	N
Protection Type		●											1	N	N
Rate of Spread	●					●						●	3	N	N
Reimbursable Indicator		●											1	N	N
Responsible Agency Unit Identifier	●	●	●		●	●			●				6	Y	Y
Retardant Used Indicator			●										1	N	N
Shift To Fire Strategy	●		●		●				●	●		●	6	N	Y
Spread Direction	●											●	2	N	N
Strategy Escape or Fire Type Change	●		●		●								3	N	Y

*** Currently Collected in at least one legacy Fire Occurrence System**

Appendix D
Data Element to Business Need

Data Element	General Business Need												Count	Critical	Currently Collected*
	Analyze data for fire planning and research.	Analyze fire costs.	Assess Fire Management Strategy	Determine trends in historic fire effects.	Determine impact and effect of a fire.	Determine requirements for prevention education.	Determine the quantity and quality of emissions	Quantify workload	Respond to information requests and data calls.	Respond to reporting requirements.	Support for BAER efforts	Support real time decision making.			
Strategy Shift Reason	●		●		●				●	●		●	6	N	Y
Time Zone					●								1	N	N
Value of Structures Threatened	●	●				●						●	4	N	N
Vegetation Classification Scheme Code	●												1	N	Y
Vegetation Classification Type Identifier	●												1	N	Y
Weather Station ID - Primary	●		●		●		●					●	5	N	Y
Weather Station ID - Secondary	●		●		●		●					●	5	N	N
WUI Indicator	●	●	●		●	●			●	●		●	8	Y	Y

*** Currently Collected in at least one legacy Fire Occurrence System**

Appendix E
Stakeholder Meeting Notes - Interview Sessions

FIRE PLANNING/FPA - Aug 8, 2006

MEETING ATTENDEES:

Stakeholders: Howard Roose, Nikki Saleen, Linda Mazzu, Becky Brooks, Jeff Scott, Sue Weber, Kathy Winship, Steve Botti

FORS Project Team: David Potter, John Noneman, Tom Wordell, Mike Benscoter, Lisa Myers, Michele Tae

AGENDA:

1. Welcome/Introductions
2. Business Needs Discovery
3. Information Discovery
4. Data Element Discovery

MEETING GOAL:

The goal of this meeting was to identify fire occurrence data required to meet the business needs of FPA and fire planners.

IDENTIFIED BUSINESS NEEDS

- What consultations with other parties/agencies (endangered species, other regulatory consultations like historic preservation) are required on a fire?
- We need some linkage to tie fire cost information to financial accounting systems. Reconciliation with financial systems NOTE: USFS A-D fires needs to be recorded individually to meet fire planning needs.
- Need a system for reporting that would report all types and kinds of fire - good and bad.
- FPA data needs should be captured; there should be some kind of geospatial depiction of fires rather than just point of origin. LANDFIRE, and other databases could then provide additional site data.
- Performance data needs to be accumulated to meet GPRA reporting needs.
- Need to link with NFPORS.
- All data needs to be congruent and entered only once. Decisions need to be made about what systems do what and how far they go with a single point of entry for information, end-to-end.

DATA USES

- Acres burned could be used to report and monitor Land Management Plans objectives against actions taken on the ground. This could be annual reporting and may be required to show changes in land conditions relative to land management objectives.
- Determine need for updating an FMP - how have things changed in an FPU?
- Interaction with cooperators - especially in terms of threat fires - and to determine accurate workload and define workload between and among cooperators.
- To report levels of forces needed or used by fire type (like prescribed, WFU, IA, etc.). To validate planning tools developed by FPA against actual forces used.
- Time between reporting and IA determination to determine whether or not another agency is billed.
- Data to determine time-related IA success rate.

- To report cause - fire by general and specific cause.
- Ability to report acreage by ownership - agreements, billings, planning, how costs are split, how handle interagency issues.

INFORMATION NEEDS - DATA ELEMENTS

Business need	Data required to meet
Ability to meet need for FPA fire event scenario	Fuels information at site Desired condition Spatial data - perimeter; Land designations, e.g. WUI Point of origin (location) Fuels and vegetation within perimeter Slope, aspect, elevation Weather, seasonal weather, temp, humidity, wind speed and direction Discovery time Time of initial attack Date and time - discovery, IA, containment and control, fire out Fire Management Strategy and shift of strategy Fire intensity - various ERC/BI/FIL Topography Land ownership Protection responsibility
Ability to report all types of fires	Fire cause - HCI, lightning, etc. AMR - WFU, Confine Control Contain Information on prescribed fire (see Bin Items) Aggressiveness of response - on a sliding scale Strategy applied; intent Data to cross-reference actual deployed fire resources (vs. requested resources) and costs to action/response (more specific than just AMR, etc.) for modeling and to understand historic trends Data about national fire preparedness status at time of fire and what was effect on fire resources received Cost per acre of suppression
Ability to define and report workload	Forces used (kind, category of fire resources - engines and dozers, copters by type) KCT used by each day of the fire. Forces used by fire type (link to fire type and strategy) False alarms and effect on workload/cost (need consistent classification and reporting) Data on ownership of fire resources Data on leadership and overhead Augmentation by out-of-area forces Indicator of severity request as reason that fire resource was available on the fire
Costs	Complete cost of each and every fire (after fire out) - by agency etc. Fire code can be used to pull cost data for each fire (each fire to have an individual code; no grouping) - this needs to be available to the fire planners - this is a measure of efficiency, cost per acre, cost sharing, useful for modeling
Other GPRA information	Damage to communities and environment Number of homes and structures lost to wildland fire; needs shared definition of reportable structure Percentage of bad fires controlled during initial attack
Fuels and vegetation	Fuel model - 40 fuel models with canopy attributes - to calculate probability of fire and potential size under various weather scenarios. This data is available. This is the fuel model within the perimeter of the fire. This info needs to be archived for historical analysis and planning and should remain with the fire record. FRCC (more on this is dependent on FPA determinations) - in terms of planning goals; are goals being met through application of strategies Vegetation type

Business need	Data required to meet
Location	Point of origin and perimeter (perimeter at final fire size) Determination of required level of accuracy Perimeter - after it's out; only for fires of a certain size >10 acres WUI information What's the ownership of lands within the perimeter (GIS data layer) - for cost-sharing; maybe workload within jurisdictions; allocation Land use designation
Landscape data	Elevation, slope, aspect - topography within perimeter - to determine possible rate of spread, access, fire resources
Weather	Season, humidity, fire weather observations - on an hourly basis (may not need if we have point of origin) - to estimate fuel moisture Weather Station data - primary and secondary weather station and its location at time of fire
Timing issues	Dates/times of discovery, IR, control, containment, out, rehab - best possible data. (reminder that this is a legal document - needs to be to the minute for some data)
Strategy	Information on change of fire management strategy - original/new, when change in strategy is implemented. Correlation with fire resources use, etc. Correlation with FMPs. One change allowed, based on current policy.
Protection responsibility	Who has protection responsibility which may differ from owner.
Fire type	Classification of fire WFU, AMR, prescribed fire, false alarms, miscellaneous incidents Used to correlate to workload

IMPORTANT GLOBAL NEEDS/RECOMMENDATIONS

1. There is a global requirement for accuracy, timeliness, and consistency in reporting. Among other basic reasons for this, keep in mind that the fire record is part of the legal record.
2. A single, rolling, 'diary' fire report per incident is required. The agency in charge of protection prepares the report; this avoids duplication, inconsistencies; ensures data integrity. The 209 forms contribute to the inconsistency of data - the information on the 209 is needed, but cannot be relied on to be accurate and consistent over the duration of an event.
3. All affected agencies must have access to the fire reports.
4. Data should be extracted from relevant data sources whenever possible. The data sources must be reliable. This helps to avoid redundancy and reduce data entry requirements.

OBSERVATIONS ON THE MEETING PROCESS

1. A longer meeting duration could be helpful.
2. Consider submitting a listing of the data elements that are currently requested on various entities' forms, analysis could add or eliminate elements.
3. More preliminary work prior to meetings would be helpful; maybe a briefing before the meeting.

BIN ISSUES, POTENTIAL BUSINESS RULES, AND MISCELLANEOUS NOTES

1. Proposed Business rule: The fire occurrence report should cover IA as well as the full extent of fire, the life of the event.
2. Proposed Business rule: The complete record should include accurate spatial data as of the time of the fire.
3. Potential business rule: Only the jurisdictional agency prepares the fire report.
4. What are the data sources for derived data?
5. What about prescribed fire, is it included in fire occurrence data?
6. What is the lifetime of the financial records vs. the fire record lifetime?
7. What should be the link between various reports - 209s, etc.?
8. How will spatial information be addressed and incorporated?

9. Will FRCC changes be reported?
10. Should burn severity mapping be part of the fire occurrence record? How would it relate?
11. Questions to be addressed may include: did the fire response meet the objectives? Did the fire respond to the applied strategy?
12. We need a definition of successful IA that meets everyone's needs.
13. What about information on any fatalities - how to address data history over time; links to safety information systems.
14. GPRA - the fuels group needs to be considered
15. Address resource value - monetary - value change up or down.
16. FPA is using the Federal Register definition of WUI - is this the across-the-board definition to be used?
17. What is the definition of strategy?
18. How are the ranges of response within AMR defined? Should national fire directors be queried for further definition of gradations within AMR?
19. What about all risk; other fire causes?
20. How will false alarms be reported?

EXTERNAL AFFAIRS/PREVENTION and FIRE OCCURRENCE - Aug 15, 2006

MEETING ATTENDEES:

Stakeholders: Jeannette Hartog, Roshelle Pederson, Steve Larrabee, Dale Miracle, Randy Eardley

FORS Project Team: Tom Wordell, David Potter, John Noneman, Paul Schlobohm, Mike Benscoter, Michele Tae

AGENDA:

1. Business Needs
2. Data Elements
3. Fire Report and Related Information
4. Fire Reporting Documentation
5. Suggested Business Rules
6. Bin Items and Open Questions

IDENTIFIED BUSINESS NEEDS:

1. The ability to obtain the statistical cause, location, ownership, and geographic area of historic fires in order to target future prevention efforts and to monitor the effectiveness of those efforts over time.
2. The ability to report quarterly GPRA evaluations.
3. The ability to provide a short-term summary of fire occurrence information for GPRA critical elements and for public relations data calls.
4. The ability to have timely, accurate, and complete reporting fire occurrence data.
   - o Current agency protocols are not being adhered to.
   - o Incentives may be needed to achieve this.
   - o Incomplete, inaccurate, and inconsistent report results from the lack of this.
5. The ability to "roll-up" data across agencies/bureaus for severity prevention teams.
6. The ability to provide consistent data to establish and maintain credibility and confidence with interested parties, e.g., Congress, Government agencies, the media, and the public.
7. The need to reduce questions regarding inaccuracy and inconsistency in data within and between agencies, systems, and timeframes.
8. The ability to provide appropriate access to interested user groups (e.g., scientific community) to support their need for information.
9. The ability to integrate cost data with fire occurrence data, especially cost data fire-by-fire across agencies, to support information requests and data calls.
10. The ability to provide accurate data to reduce need to audit/clean-up data.
11. The ability to identify one system-of-record and owner-of-record for data to ensure data integrity.
12. The ability to identify a logical, unique fire record (one record/fire) to ensure accuracy of data (remove duplicates).
13. The ability to provide accurate data for litigation purposes.

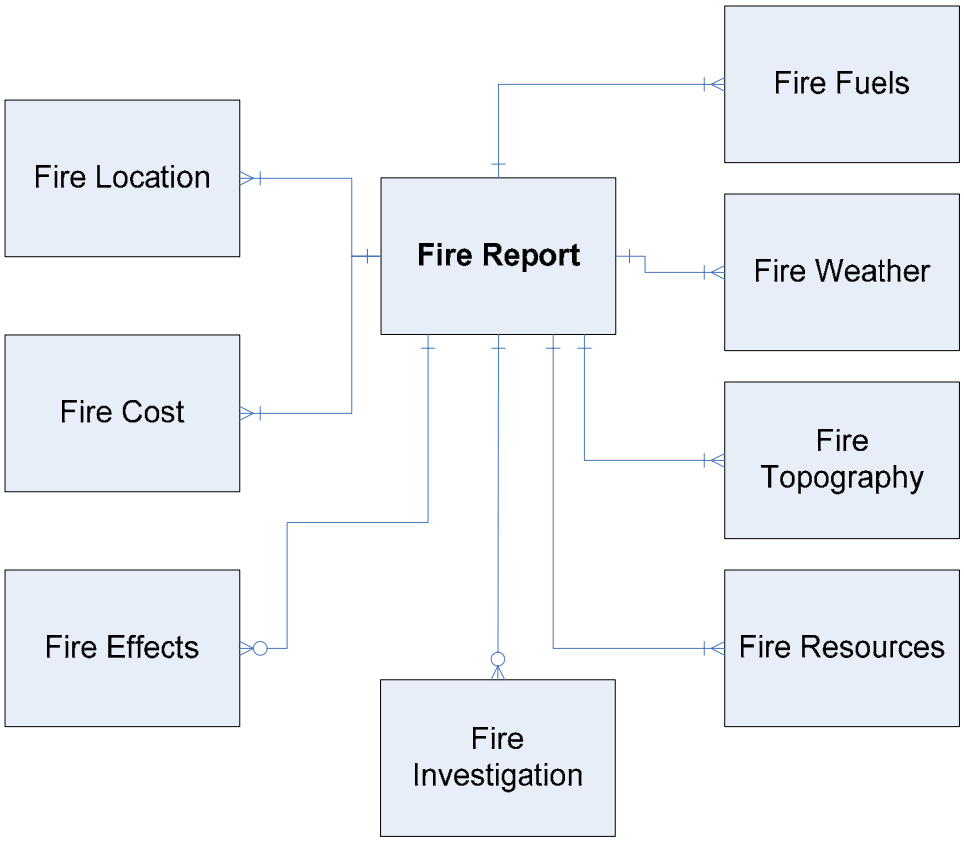
DATA ELEMENTS

The data elements listed below were discussed during this meeting and are specific to this program area only. They do not represent all data elements required for the FORS project.

Data Element	Business Use / Need
Perimeter (spatial)	Knowing the fire perimeter supports access to supporting information.
Point of Origin	Requested in legal actions and may be critical to such actions
Method of collection for Point of Origin	May be useful to understand the accuracy of the data, e.g., visual estimate, GPS unit, etc.
Fire Cause	Need to change the miscellaneous designation to undetermined and add why it is underdetermined with a √ box. This will clarify the fire cause information that is provided.

FIRE INFORMATION DISCUSSION

The following diagram was developed to illustrate the fire report and related groups of information.



Legend:

- A line with a hash mark indicates a required relationship. All information must relate to a fire report.
- A line with a hash mark and crow's foot indicates that there may be multiple occurrences of information relative to a fire report.
- A line with a circle and a crow's foot indicates that the related information exists under defined conditions.

FIRE OCCURRENCE REPORTING

It is helpful to view the fire report as an evolving set of documentation with four distinct tiers:

Tier	Business Rule for Time Due	Required Data
One	Within 24 hours of the start of a fire	The Initial Report with Fire Code, Fire Name and Location data.
Two	Within 5 – 7 days of the fire being declared "out" or "controlled"	The After Action Report with Acres Burned by agency and by ownership, size class, and cause.
Three	TBD = To Be Determined	The full 1202 or 5100-29 required data.
Four	TBD	The complete cost data, multiple-year statistics, investigation and narrative.

SUGGESTED BUSINESS RULES

1. Report each fire individually to compare fires equally across agencies (do not lump A, B, and C fires).
2. The final fire package from the 209 reports should roll over to the fire occurrence reporting data, especially for workload.
3. Agencies should report prescribed fire and wildfire in the same way. At this time, they are split, e.g., BIA, NPS, and FWS.

BIN ITEMS AND OPEN QUESTIONS

1. Too many fires are assigned the statistical cause of "Miscellaneous" on the fire reports.
2. Better training and instructions for completing a fire report are needed.
3. Up to 25% of fires are not represented in the GPRA end-of-fiscal-year reports due to lack of timeliness in completing the fire reports. Consider rule: Require summary data within 7-10 days of discovery.
4. Loss data is sensitive, e.g., BIA resource losses on tribal lands.
5. How are fire costs reported? As a lump sum for the full fire across agencies?
6. What is the process to correct invalid data, including historic data?

GIS/REMOTE SENSING, EXTERNAL AFFAIRS, and PREDICTIVE SERVICES - Aug 17, 2006

MEETING ATTENDEES:

Stakeholders: Sharon Paris, Katy Madrid-Hipke, Charlie Leonard, Paul Schlobohm, Tom Wordell, Keith Smith

Project Team: Michele Tae, David Potter, Mike Benscoter (part-time)

AGENDA:

1. Business Needs
2. Data Elements
3. Suggested Business Rules
4. Bin Items and Open Questions

BUSINESS NEEDS

1. The ability to respond promptly to information requests and data calls from Congress, the States, Government agencies, the media, and the public.
2. The ability to access complete and accurate fire occurrence information in order to be a credible resource for fire occurrence information.
    - Multiple information sources delay response to requests and produce duplicate, inaccurate, and inconsistent data that results in a lack of credibility and additional information requests to answer questions.
3. The ability to have a single point of access to an integrated, interagency data set for current and historic fire occurrence information in order to provide information that is complete, accurate and timely.
4. The ability to query data and display the results graphically and spatially to validate fire occurrence information and to respond to information requests and data calls.
    - *Note*: We need to ensure the ability to query the data spatially, to draw a polygon on a map, and to retrieve fire occurrence data across agencies for the defined area.
5. The ability to use fire perimeter data to perform spatial analysis for fire planning, e.g., to analyze the fire perimeter data in time slices over the duration of a fire, or to assess multiple fire perimeters (current and historic) in an area for current or future events.
    - Establish interagency protocols for perimeter data (e.g. Geospatial Task Group recommendations).
    - Establish and maintain a national repository for fire perimeter data.
6. The ability to produce spatial information that is easy to use and understand to ensure that information provided to requestors meets expectations.
7. The ability to track who accesses fire occurrence information to understand the consumers of this information and to better respond to information requests.
8. The ability to limit access to data elements that may be restricted by law or policy, e.g., the value of resource loss on agency lands.
9. The ability to track and quantify workload (resource utilization) for fires to correlate to the Fire Danger Rating Indices in order to set current decision points. The business question: When will the fire events occur that will require increased staffing? These events are characterized as fire day, large fire day, and multiple fire day and they are defined at the local planning level. This need is addressed by analyzing historic data. However It is also important to understand: What is the stress on available fire resources on days when a single fire occurs, when a large fire occurs, and/or when multiple fires occur.

    Note: Fire danger analysts do not know this, and cannot get it from existing fire occurrence data. A connection to ROSS or the results of item 12 below may be needed.

10. There is a need to correlate current year fire danger indices to current year fire occurrence to understand how well the indices are predicting the workload and thus aid the assessment of the changing demands for fire resources.
11. The ability to identify the containment date and time for a fire in order to establish DOI policy and timelines for Emergency Stabilization and Rehabilitation activities and plans.
12. The ability to correlate workload to resource usage and capability using daily, geospatial information over the duration of the fire in order to develop proactive resource allocation decision support tools for Predictive Services information requests. This requires an integrated, interagency set of fire occurrence data.
13. To meet annual, federal reporting requirements, each state must report the following information for all fires within each fire protection district:
    - Total number of injuries or fatalities (due to wildland fire?)
    - Total number of homes threatened
    - Total number of homes lost
    - Total number of other structures threatened
    - Total number of other structures lost
14. The ability to track historic fire occurrence information when land ownership or administration agency changes to provide complete and accurate information in response to information requests and data calls.

DATA ELEMENTS

The data elements listed below were discussed during this meeting and are specific to this program area only. They do not represent all data elements required for the FORS project.

Data Elements	Business Use / Need
Containment Date and Time	To model suppression activities (e.g., duration initial attack) for fire planning.
Initial Suppression Management Strategy Success	Indicates whether the initial strategy was successful: Yes/No.
Fire Perimeter (Shapefile, collection of lat/longs, or GPS points)	To respond to information requests and data calls; to model suppression activities for fire planning.
NFPORS Treatment IDs related to a fire location	To define the relationship between fuels treatments and wildland fire activity to respond to information requests and for fire planning.
Unique Fire Identifier (Fire Code, Fire Name, Fire Type, Fire Discovery Date and Time, Fire Cause, Fire Point of Origin)	To provide fire occurrence information over the duration of a fire event.

SUGGESTED BUSINESS RULES

1. Minimum fire occurrence report data must be available within 48 hours of the start of a fire, e.g., fire code, fire location, fire discovery date and time, fire cause, fire name.
2. Additional fire occurrence report data must be accessible within days of the start of the fire. How many days?
3. Each fire occurrence report must include the fire code, fire name, fire type, Fire Discovery Date and Time, Fire Cause, Fire Point of Origin, land ownership and reporting agency.
4. A unique fire report is required when an ignition requires a unique response. Note: There are circumstances when the IA response may address multiple ignitions. There are also circumstances where several fires are grouped (complexed) into one large fire; the constituent fires should be tracked with a unique fire identifier.

BIN ITEMS AND OPEN QUESTIONS

1. There is a GPRA performance measure for the number of acres degraded by fire. However, there is no uniform or reliable method for defining degraded acres; often all burned acres are reported as degraded.
2. The record of treatments related to a fire is stored in NFPORS for fuels treatments or the ESR project fire for ESR. The fire occurrence record is therefore incomplete. Is there a need to link this information?
3. In determining whether information is required, should the FORS project consider the statistical relevance of the data?

FUELS/FIRE USE GROUP - Aug 23, 2006

MEETING ATTENDEES:

Stakeholders: Dick Bahr, Tim Sexton, John Segar, Mary Taber, Dennis Dupuis, Chuck Buescher, John Owens

Project Team: Paul Schlobohm, Michele Tae, David Potter, and Mike Benscoter (part-time)

TOPICS DISCUSSED

1. Business Needs
2. Business Data Elements
3. Recommendations
4. Suggested Business Rules
5. Bin Items and Open Questions

BUSINESS NEEDS

The Stakeholders for Fuels and Fire Use defined overarching needs for fire occurrence information. They include:

1. The ability to analyze historic fire information to define trends that may identify locations for future prevention, fuels, or fire use activities.
2. The ability to determine the significance of prescribed fire escapes.
3. The ability to respond to information requests and data calls from local, state and federal government agencies, Congress, and the public.

Many of the business needs defined below identify the data that is required to meet these overarching needs.

1. The ability to determine the impact /effect of a fire, such as burn severity, the beneficial effect of a fire or the degradation to the ecosystem as a result of the fire, damage to property, loss in dollars, and structures saved and lost. Note: FRCC may be useful as a placeholder until we develop a measure.
2. The ability to bring legacy fire occurrence data forward to develop a complete record of historic fire with consistently defined data attributes.
3. The ability to track one fire through time with one identifier, even if the fire type changes, such as a prescribed fire that becomes a wildfire.
4. The ability to respond to information required to evaluate the Fuels and Fire Use programs.
5. The ability to assess suppression effects on fires and the environment.
6. The ability to correlate prescribed fire to wildland fire to identify relationships and to determine the impacts on damage and cost.
7. The ability to report the amount of acres burned by state and other statistics as part of annual reporting requirements.
8. The ability to standardize the definitions of specific and/or general causes for human-caused fires.
9. The ability to have an accurate record of what occurred, such as historical use of fire and fire staffing. Note: There is a need to validate the initial data collected for an unplanned fire. This is easier if geospatial technology is used.

BUSINESS DATA ELEMENTS

The following data elements were specifically discussed:

- Management strategy (such as point protection, confinement, containment).
    - A fire can make use of multiple management strategies.
    - For each management strategy, it may be helpful to know the beginning and end dates.

    - Should the fire management policy change, this data element would also change.
- Fire size over the duration of the fire.
- Final fire perimeter as a shapefile.

RECOMMENDATIONS

1. Link to NFPORS using the treatment ID when appropriate.
2. Link the fire number to the case ID to get investigation data.
3. Broaden the definition of management strategy to address wildfire and wildland fire use, such as Initial response and ranges of suppression activity (AMR).
4. Have a single point of data entry with the ability to identify duplicates. This could begin with a geospatial point of origin.
5. Pull data from existing link systems wherever possible.
6. Create non-redundant systems.

SUGGESTED BUSINESS RULES

1. One fire may be related to multiple fire management strategies over time.
2. Fire Type is defined as prescribed fire, wildfire, and wildland fire use.
3. Spatial data is required for fires with a size greater than a defined threshold.
4. False alarms and natural outs should be reported as fire occurrence.
5. Fires designated as A, B, or C size class should be grouped to reduce data entry requirements.
6. Large fires (D + fires) require that all data be defined, such as costs, etc.
7. Fire effects should be determined when the size is greater than a defined threshold.
8. Data quality requirements must be established and integrated into data collection.
9. Fire occurrence data must serve as a permanent record, including all related data links, to allow complete historical analysis.

BIN ITEMS AND OPEN QUESTIONS

1. What is the role of the Sit 209 data?
2. Is daily fire perimeter data required? What degree of accuracy is required for FORS?
3. There is currently no consistent way to measure loss of structures. Could county tax records be used to define value?
4. How is hazard reduction defined?
5. What is the relationship between fire type and fire management strategy?

FIRE RESOURCES and AIR QUALITY - Aug 30, 2006

MEETING ATTENDEES:

Stakeholders: John Skeels, Dave Randal, Kara Paintner, Maggie McCaffrey, Susan Goodman, Lisa Lile, and Mark Fitch

Project Team: John Noneman, Mike Benscoter, Michele Tae

AGENDA:

1. Business Needs
2. Suggested Business Rules
3. Data Needs

BUSINESS NEEDS

1. The ability to provide accurate unplanned fire occurrence data to respond to information requests. This includes a minimum set of data that is available at the onset of the fire and validated over time. Note: The effort to collect the minimum data set must be reasonable over the duration of a fire. Examples of data needs include:
    - Requests by OMB and Congress on fire program performance and evaluation, fire location and costs, and fire program staffing and funding.
    - Requests by other interested parties, such as local governments, researchers, etc.
2. The ability to use fire occurrence data for analysis and modeling for program planning. Examples include:
    - The ability to retrieve 30 years of data to provide a statistically significant historic fire occurrence data set.
    - The ability to develop fire susceptibility areas by analyzing historic points of origin and performing spatial modeling.
    - The ability to identify areas of potential species invasion, such as cheat grass, using pre- and post-fire occurrence point data.
    - The ability to identify potential treatment locations based on historic conditions and the role of fire.
    - The ability to determine the impact on air quality of emissions from historic fires with correlation to historic ozone levels.
    - The ability to determine the role of fire in air quality and visibility indices.
    - The ability to support the regional air quality emissions inventory required to meet EPA standards. Data required includes fire location, date, and acres burned by day.
    - The ability to determine trends to help plan prevention program activities based on the historic number of human-caused fires, specific human activities that contributed to these fires, and other relevant information, such as the coincidence of hunting season, weather, etc.
    - The ability to perform hazard/ risk modeling for fire mitigation and to support preparedness planning.
    - The ability to identify historic fire resource needs and usage to plan for program funding and staffing.
    - The ability to provide data to modeling applications, such as:
        - Landscape scale modeling – SPATIAL
            - Such as, RMLANDS; SIMMPL.
            - FO data – accurate location (point of origin) and large fire perimeter.
        - Fire shed model

- History range of variability.
- Also used to predict of how treatments play out over time.

3. The ability to use fire occurrence data to support decision-making. Examples include:
   - The ability to support management of the immediate air quality impact from wildfires, wildland fire use, and prescribed fires. This determination requires one year of historic fire occurrence data with fire point of origin and number of acres burned per day for the location of the fire.
   - The ability to validate data that may be used in other systems, such as ROSS.

SUGGESTED BUSINESS RULES

1. There is a need to differentiate between the official record (USFA), the agency record of a fire or a fire (1202; 5100-29), and interagency fire occurrence reporting.
2. There is a need to differentiate between the data required for (real time) mobilization and management for both planned and unplanned fire events, and the data required for reporting, planning, and analysis.
3. The NIFSIP minimum data set includes:
   - Incident #.
   - Unit ID.
   - Date/Time.
   - Location – Lat/Long.
   - Final size.
   - Exposure (threats to structures, etc.).
   - Wildland fire cause.
   - Area type – land, designation, such as WUI.
4. It is better to emphasize building the most usable data set, with a lesser emphasis on meeting all the needs of all end users.
2. Data entry staff needs to be better trained and equipped with a good, easy-to-use system and a simple form to complete. They also need to understand the value of the data and how the data is used.
3. Good data validation is essential. Analysis and modeling tools are only as good as the data that feeds them.
4. Data should be entered once and used many times, which emphasizes the need for accurate data.
5. There could be one system for the minimum data set with links to other systems.
6. Spatial data must be included in system design from the beginning, not as an afterthought.
7. Daily, event-based data is required to understand fire occurrence.
8. Loss of trained staff increases the potential for inaccurate data collection.

DATA NEEDS

1. A complete and accurate record of all fires regardless of size or location.
2. Air quality requires information on fires that grow to 100 acres or more. Note: the Sit 209 is now the primary source for smoke management data, and this data has a high potential for inaccuracies.
3. Critical data for all fires for air quality includes:
   - Date.
   - Location.
   - Fire type.
   - Unit ID.

- Acres/day.
- Fuel loading (can be derived from location).
- Note: For planned events, very accurate data is required to determine acceptable event timing relative to smoke management.

4. For air quality planning, a determination if the fire is natural or human-caused is required.
5. FRCC is also useful for air quality.
6. Final fire perimeter is required to validate and correct the SIT 209 data.
7. A precise daily acreage of a fire is required; at this time acreage is estimated.
8. GIS needs to define all fire acres, including metadata and datum.
9. Accurate fire location and fire size improves fire effects information.

FIRE RESEARCH, FIRE ENVIRONMENT, and FIRE ECONOMICS - Sep 26, 2006

MEETING ATTENDEES:

Stakeholders: Carolyn Chase, Krista Gebert, Carol Miller, Chuck McHugh, Dave Calkin, Larry Bradshaw, Bryce Nordgren

Project Team: Michele Tae, David Potter, Mike Benscoter

AGENDA:

1. Business Needs
2. Data Elements and Uses
3. Bin Items and Open Questions

BUSINESS NEEDS

1. The ability to respond to information requests and data calls from OMB, Congress and government agencies. This includes the development of models to answer questions, e.g. where would fire spread if it were not suppressed?
2. The ability to easily access complete, accurate and timely data for credible reporting, analysis and modeling. For example, Air quality forecasting requires data that is as immediate as possible; fire planning requires credible data for reporting and for input to analysis models. Access to data is now fragmented and could be improved with a single, consistent location for fire occurrence information.
3. The ability to identify individual fires, including fires that become part of a large fire complex, in order to obtain an accurate fire occurrence history for use in analysis and modeling.
    - Used to accurate define density of fire occurrence.
4. The ability to base analysis on complete and accurate data to avoid providing misleading information as support to decision makers.
    - This includes the consistent, accurate input of a unique fire identifier (e.g. Forest Service P-code) for every fire, including (A, B, C) miscellaneous fires and the need to omit duplicates.
    - When data is aggregated, duplicates result in invalid data.
    - The lag in reporting cost information results in incomplete data.
    - As databases and systems change, there is a need to maintain access to all historic data to avoid incomplete data sets.
5. The ability to track fire phenomenology (e.g. fire behavior, environment, etc) and fire management information to enable analysis of relationships between fire management decisions and fire behavior.
    - Used to understand changes in management strategy and phenomenology.
    - Used to identify trends in fire occurrence by management strategy by location.
    - Used to relate fire occurrence to climatology to identify long-term trends.
    - Used to understand incident management and the progression of a fire.
    - Used to analyze where fire would spread if it were not suppressed.
    - Used to support decision making at different management levels, e.g. GACC, etc. and to identify the need to develop new tools.
    - Used to identify efficiencies, such as centralization of tasks and fire resources.
6. The ability to obtain complete and accurate fire occurrence data for relative risk assessment and forecasting, e.g. to support severity funding decisions.
7. The ability to support fire progression models which derive the cost of fire relative to fire characteristics.

8. The ability to access consistent data structure and values over an extended period of time in order to perform trend analysis.

USES FOR FIRE OCCURRENCE DATA

1. To respond to the OMB request to produce a Stratified Cost Index that identifies trends in costs and fire occurrence.
   - To identify trends in cost per acre and cost per fire by size class.
   - To understand the relationship between the total budget, cost per acre and acre targets.
   - To identify deviations and flag for review.
   - Note: Current sample of data is too small.
2. To assess future risk, e.g. to identify and understand the false alarm ratio, that may be seasonal.
3. To understand the relative risk of fire by geographic area.
4. To credibly answer NFAEB / GAO / OMB questions and data calls.
5. To track the WFU decision process and to identify WFU candidates.
6. To identify cost containment decisions.
7. To provide planning and decision-making support.
8. To quantify the number of fires suppressed.
9. To support planning for hazardous fuels treatments by assessing risk by location.
10. To aggregate annual fire occurrence information to support carbon accounting.
11. To ground-truth other data (sources/methods); to validate methods through comparison of model outputs to historic data.
12. To develop performance measures for effectiveness, reporting, monitoring and accountability.
13. To identify the cost of human-caused fires.
14. To reduce reliance on anecdotal information.
15. To aggregate data to identify the percent of fire with high costs per acre.
16. To aggregate data to perform suppression cost forecasting.
17. To justify fire planning decisions.

DATA ELEMENTS

Data Elements	Business Use / Need
Unique identifier	To identify the unique occurrence of a fire.
Cost Code	To identify the code used to track costs for a fire. To enable the development of the Stratified Cost Index.
Point of origin	To identify the location of a fire and to omit duplicates.
Discovery date/time	To identify the temporal dimension of fire occurrence.
Size	To understand the relationship between fire size and other fire occurrence information.
Management Strategy, e.g. Initial Response, WFU, etc.	To understand the relationship between fire management strategies and fire occurrence. One fire may have many fire strategies over time.
Management Strategy Date and Time	To understand the changes if fire management strategy relative to the progression of a fire.
Start date and time (actual and estimated)	To understand the relationship between seasonality and fire occurrence.
Fire Cause (human or natural)	To understand the relationship between fire cause and other fire occurrence information.
Final fire size	To determine the cost per acre and cost per fire by size class.
Fire name	To further identify a fire for data validation.

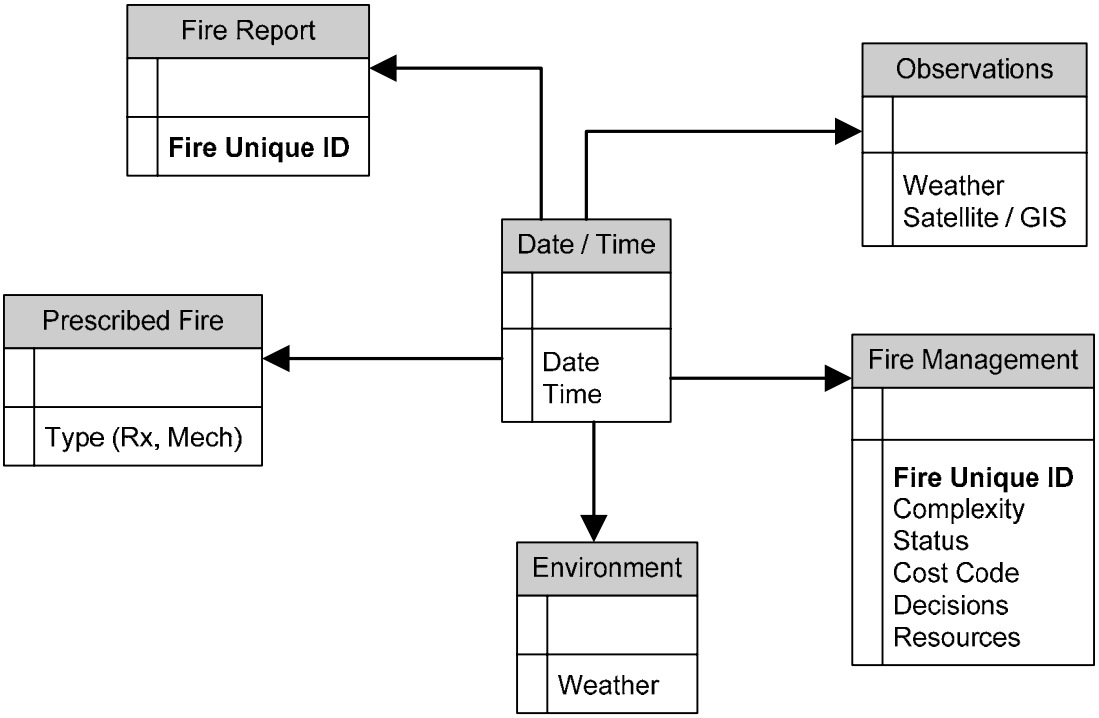
Data Elements	Business Use / Need
Fuel Model	To perform fire behavior modeling. Need NFDRS, FBPS – '40', at ignition and at escape.
Complex / Individual	To define whether is fire is part of a complex or is a complex that includes individual fires.
'Out' date	To understand the progression of a fire over time.
Number of acres burned by jurisdiction/ownership	To respond to reporting requests by different agencies.
Name of person entering and approving data	To enable research of missing or inaccurate data.

OPEN QUESTIONS

1. What are the business needs by law enforcement for fire occurrence information?
2. Standard business rules are required for complex fires and constituent fires?
3. Should prescribed fire be included in fire occurrence data? These fires are needed for air quality but vegetation management uses other data sources.

NOTES

1. There are problems with the data that is currently used to support decisions. Researchers, in many cases, are unable to obtain complete, accurate data. This results in the use of anecdotal data which can produce misleading results.
2. There is currently no reliable way to identify the barriers to WFU as a management strategy. There is no incentive for deviating from a management strategy of No Risk.
3. When OMB or a Department requests information for one agency, it is often the case that the same request is made of all fire management agencies. This becomes difficult due to the inconsistencies in data definition and data collection.
4. A cost / benefit framework is being considered.
5. Where estimated data is entered, the actual data should also be collected.
6. When possible, data should be derived from a single source and not stored redundantly.
7. There is an assumption that planning and analysis for fuels is supported by spatial databases, e.g. vegetation management.
8. Currently the Sit-209 data is routinely used to identify resources used on a fire. The resources are used to assess suppression effectiveness, which must be pieced together from the daily Sit-209 reports.
9. There should be a uniform log of fire information that identifies fire resources and tactics used on the fire, line built, etc. Due to incomplete information, questions cannot be answered, e.g. how much line was built to protect structures, did invasive species result from the use of dozers, etc.
10. A fire summary data set would be useful to provide standard data about fires. A small fire may use only the summary data set. A large fire could have both summary and detail data sets.
11. A data model of fire information is useful to understand relationships.


Fire Report
Fire Unique ID
Observations
Weather
Satellite / GIS
Date / Time
Date
Time
Prescribed Fire
Type (Rx, Mech)
Fire Management
Fire Unique ID
Complexity
Status
Cost Code
Decisions
Resources
Environment
Weather

Appendix F
Agency Fire Occurrence SME Meeting Notes

Agency Fire Occurrence SMEs - December 13 & 14, 2006

MEETING ATTENDEES:

Bill Breedlove, Kevin Conn, Steve Larrabee, Dale Miracle, John Noneman, David Potter, Nikki Saleen, Paul Schlobohm, Keith Smith, Tina Vorbeck, Tom Wordell, Liz Wright.

From Commonthread: Michele Tae, Mike Benscoter, Austin Streetman, Kyme Cole

MEETING OBJECTIVES:

Review, Validate and Develop FORS Project Findings, Conclusions and Recommendations

The following materials were reviewed by the meetings attendees:

- Table of business areas and the related business need statements.
- Table of business need statements related to the summarized (meta) business needs.
- Table of business needs that apply across all business areas and the related global business need statements.
- Matrix of data elements and the summary business needs.

FORS Summary (meta) Business Needs Statements

The following summary business needs statements were reviewed and accepted by the meeting attendees.

- Analyze data for fire planning and research
- Assess Fire Management Strategy
- Determine trends in historic fire effects
- Determine impact and effect of a fire
- Determine the quantity and quality of emissions
- Analyze fire costs
- Quantify workload for fire planning and research
- Support BAER data needs
- Support Prevention analysis
- Respond to information requests and data calls
- Support current fire decision making

FORS Global Business Needs

The following global business needs were agreed upon by the meeting attendees following a discussion of the findings from the interviews.

- Mandatory set of critical and common data across all Federal agencies, with a subset for the States that conform to established, interagency data standards.
- Accurate, complete, consistent fire records.
- Direct and reliable access for data retrieval for at least the critical and common elements.
- Uniquely identify every fire (across all agencies).
- Reduce data entry redundancy.
- Interagency fire occurrence data stewardship for at least the critical and common elements.

Recommendations

At the conclusion of the meeting, the meeting attendees developed the following list of recommendations to be presented to the NFAEB:

- Agencies should enforce their existing fire reporting policies and enhance their training and education for fire occurrence reporting personnel.
- Assign a task group to develop an interagency, unique fire identifier for use in all fire-related systems, such as Sit-209, FireCode, ROSS, etc.
- Assign a task group to develop and maintain data standards (definition, format, precision, mandatory ness, range of values, validation rules, who collects and when) for the critical and common data elements.
    - Recommend that the critical and common data standards be implemented and used in all legacy fire occurrence systems.
    - Recommend the common use of external systems, such as FireCode, SIT-209, ROSS, etc.
- Create an interagency stewardship group to oversee the federal and state fire occurrence business.
- Develop and implement the capability to collect and store standardized fire perimeter shape files.
    - Geospatial data needs to become a critical and common data element as the capability matures within all the agencies.
- Develop a proposal for a single point of access to interagency fire occurrence data for at least the critical and common data elements.
    - Assign a task group to explore a range of options for access and retrieval of critical and common data. Options may include:
        - Data warehouse
        - Interagency access to existing systems
        - Allow each agency to develop their own method of implementation
- Explore the existing the eGov Disaster Management Task Group Report and the "end-to-end" recommendation in section 6.2 (page 35).
- Acknowledge that there are future needs that will require further consideration of critical and common data requirements, such as the need for Daily Acres Burning for emissions calculation.
- Acknowledge the State's subset of the critical and common data elements.
    - Recommend that States use the unique fire identifier recommended above.
    - Encourage States to implement data standards for critical and common data.
- With respect to our global business need for data accuracy, share our findings with other fire business groups.
    - Recommend that other fire business groups review their data standards and report their ability to accommodate the "end to end" requirement for fire occurrence reporting. Consider coordinating the results with all systems that collect the same or similar information.

Critical Data Elements:

Meeting participants identified the following list of critical and common data elements. There is conceptual agreement on these data elements. Significant additional is required to standardize definitions, format, mandatory-ness, etc. This work will validate the degree of commonality across the fire community.

FORS Critical Data Element	Federal / State
Acres Burned by State/ Owner	Federal and State
Admin-Approved/ Authorized by	Federal
Admin-Reported By	Federal
Agency Unit Identifier	Federal
Cause Code / Description	Federal and State
Cause-Specific (30 choices)	Federal

FORS Critical Data Element	Federal / State
Fatalities	Federal and State
FireCode	Federal
Fire Containment Date / Time	Federal
Fire Control Date / Time	Federal
Fire Discovery Date / Time	Federal and State
Fire Identifier - Unique	Federal and State
Fire Initial Response Date / Time	Federal
Fire Name	Federal
Fire Out Date / Time	Federal
Fire Perimeter Shape file	Federal
Fire Resource Kind and Category	Federal
Fire Resource Quantity	Federal
Fire Size Final Acres Burned	Federal
Fire Type Code / Description	Federal
Fire Type - Incident Complexity Type (Highest)	Federal
Homes Lost	Federal and State
Homes Threatened	Federal and State
Injuries	Federal and State
Other Structures Lost	Federal and State
Other Structures Threatened	Federal and State
Point of Origin County	Federal and State
Point of Origin Datum	Federal
Point of Origin Land Owner	Federal
Point of Origin Latitude	Federal and State
Point of Origin Longitude	Federal and State
Point of Origin State	Federal and State
Strategy - Fire Response Objectives Met	Federal
Strategy - Initial Fire Strategy	Federal
Strategy - Escape? (Rx, WFU)	Federal
Weather Station Id- Primary	Federal