Operations and Maintenance Business Plan

February 26, 2008

REVISION HISTORY

Document Version #	Revision Date	Description of Change	Section #/ Paragraph #	Name
2.0	5-17-07	Included comments on 2nd draft review from teams	Throughout	Bastian
2.1	5-22-07	Added revision page, formatted org. chart, and minor edits	Throughout	Oates
2.2	5-23-07	Additions to mission and governance	Sec 2 and 7	Bastian
2.3	5-25-07	Consistency edits, formatting, footnote	Throughout	Oates
2.4	6-7-07	Initial EOC comments	Throughout	Bastian
2.5	6-15-07	Comments, primarily stylistic	Throughout	Goff and Oates
2.5	6-20-07	Updated diagrams, minor text alignment, provisional executive summary	Throughout, Sec 7 and 8	Oates
2.6	6-21-07	EOC & LF team comments	Throughout	Bastian
2.7	7-3-07	NWCG – PMO Review	Throughout	Bastian / Crittenden
2.8	10-31-07	NIFC Scoping meeting, NFAEB, and EOC comments	Throughout	Bastian
2.9	11-28-07	Consistency edits and format	Throughout	Bastian / Crittenden / Jeske
3.0	1-4-08	EOC and Team final review and comments	Throughout	Bastian

CURRANCY OF PLAN

This operations and maintenance Business Plan was written with the best available information at the time. The simple act of putting thoughts to paper will at some time in the future cause the information and materials documented and referenced in this plan (as well as the technical plan) to become outdated, obsolete, or over taken by management events. The program sponsors along with agency and departmental leadership will provide program oversight and direction.

Operations and Maintenance Business Plan

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EXECUTIVE SUMMARY

Introduction

- LANDFIRE (LF) is a multi-agency initiative that applies consistent methodologies to develop comprehensive maps and data that describe vegetation and wildland fire/fuel characteristics across the United States.
- The LF charter directs the development of an "Operations and Maintenance (O&M) Handoff Plan." This business plan, in association with the technical plan, comprises the O&M "Handoff Plan." An O&M program is necessary to maintain LF data timeliness, quality, and distribution services to support department and agency mission needs.
- Updating LF is critical in order to protect the significant investment in the original development of LF and support maturing fire management programs and multifaceted natural resource management programs across the country that use the best available science and technological data to manage resources effectively and efficiently.

Impact on Mission Areas

- An O&M program supports updated LF data that reflects dynamic changes in landscape condition due to natural and human-caused environmental events for management applications in resource and fire activities, such as Fire Program Analysis.
- An O&M program enables quality and timeliness of LF data that supports Strategic Goals and Performance Measures for the 10-Year Comprehensive Strategy Implementation Plan for Wildland Fire Management under the: The National Fire Plan, Healthy Forests Restoration Act, and Initiative.

Operations

- The addition of newly acquired or updated data, data archiving, documentation, technical transfer, user-support, and infrastructure services for distribution of data products.

Maintenance

- The actual updating of the LF data products originally specified in the LF Charter, but are approved by governance and provide for innovations to these products. The maintenance process is provided for since the initial LF mapping under three categories:

  - Refresh (short-term update) vegetation & fire behavior layers due to landscape changes.
  - Biennial (long-term update) will use or be informed by the refresh improvements to update landscape changes to vegetation and fire behavior for the life of the program.
  - Decadal comprehensive remapping ingests biennial updates for applicable data layers.

Improvement

- Includes development approved through a governance process to maximize quality, timeliness, and defensible science that supports LF data products.

Innovation

- Numerous opportunities provide capability to enlarge the original application of LF data assets for applications outside of its original scope through technological advances.

Governance

- Includes oversight, roles and responsibilities, and standard business processes for implementing an O&M program, using processes partitioned between an executive oversight group and Business Lead(s) / Program Manager. This process may change or modify elements prescribed in these plans as agreed upon by this governing body to achieve departmental or agency needs or objectives.

1.0 Introduction

1.1 Description

LANDFIRE (LF), also known as the Landscape Fire and Resource Management Planning Tools Program, is a joint program among the U.S. Forest Service, the U.S. Department of the Interior (DOI) programs, and The Nature Conservancy. LF applies consistent methodologies and processes to develop comprehensive maps and data describing vegetation and wildland fire/fuels characteristics across the United States. LF data products facilitate national, regional, and large landscape-level fire and natural resource planning activities, and reporting of these management activities to provide land and fire managers, planners, scientists, and policy makers with the information they need to make better-informed decisions. Consistent and standardized data products; provide for strategic analysis and planning to support the national prioritization of fire management resources. LF National data assist management in addressing wildland fire threats and managing complex resource issues. These products have provided managers with data to plan and implement in a collaborative, landscape-scale, cross-boundary, interagency approach.

LF data also supports land managers decisions to help identify where fire hazards and fire risks to local communities are located, identify where to rehabilitate fire-dependent landscapes, analyze natural resources and habitats, and enhance management knowledge of fire behavior to improve firefighting safety in programs such as the Fire Program Analysis (FPA) System and Wildland Fire Decision Support System (WFDSS).

Although LF provides significant value for the wildland fire community, it also provides extensive value for other land and natural resource management organizations and/or programs that will benefit and are affected and influenced by landscape vegetation and fire data condition. This additional value includes providing an informational foundation to support applications in land management planning, environmental analyses, biological evaluations, and resource assessments. Scientifically sound geographic information shared among institutions is critical for effective and meaningful decision making.

LF is the first consistent and standardized implementation of methodologies and processes to develop fire and vegetation data products for the United States. This type of integrated geospatial vegetation, fuel, and fire regime database has never existed previously in the public or private sector. There are other groups that have been mapping vegetation (National Land Cover Database – NLCD and Gap Analysis Program – GAP), but these have not modeled at such a complex level or have not completed the entire United States. Data products produced by LF are essential for setting strategic direction, supporting resource and staffing determinations, designing conservation management, and assessing risks to the environment, public and private organizations, and communities.

1.2 Purpose

Background

The purpose of this document is to describe the transition from "LANDFIRE, the Project" to "LANDFIRE, the Program." This business plan provides justification regarding the criticality of update and maintenance of LF data products to support and improve the management and stewardship of America's natural resources, both for public and private lands.

The initial charter for LF specified a set of specific deliverables, including an "Operations and Maintenance Handoff Plan." The steps necessary to develop, implement, and fund an Operations and Maintenance (O&M) program are described in two "Handoff Plans" - O&M Business Case and Technical Plan. These O&M plans were developed and reviewed by the chartered organization of the initial LANDFIRE investment. The implementation of the O&M LANDFIRE program is within the sponsoring agencies' discretion and prerogative related to the placement of the program, how it will be organized and put into service, along with the continued governance, oversight, and management of the program.

Updating LF is critical in order to support maturing fire management programs and complex natural resource programs which use the best available science and technological data to manage resources effectively and efficiently. The central element of managing lands is the geography and spatial relationships of terrain and environmental characteristics across landscapes. LF data products are a database that shares information resources about the natural environment, minimizes data redundancy or the need for individual units to develop their own data, and improves data accuracy from having the geo-spatial data developed for all lands of the United States using consistent methodologies. Now that the initial LF data sets have been developed, management decisions can be supported through geo-spatial analysis. LF allows managers to streamline processes, automate tasks, and save time and money.

Without an O&M program in place, LF is relegated to a static, one-time only, creation of U.S.-wide vegetation and fire data based on the NLCD aggregated satellite imagery with a time stamp of 1999 to 2002. LF is at risk of becoming obsolete in a short period of time as critical data products will become out dated, resulting from numerous environmental dynamics, including continual natural and human-influenced changes in the landscape. The mission-oriented requirement for maintaining updated LF data is highlighted in some of the recent Government Accountability Office (GAO) reports:

- January 2002. Severe Wildland Fires: Leadership and Accountability Needed to Reduce Risks to Communities and Resources, GAO-02-259

- August 2003, Wildland Fire Management: Additional Actions Required to Better Identify and Prioritize Lands Needing Fuels Reduction, GAO-03-805

- September 2003, Geospatial Information: Technologies Hold Promise for Wildland Fire Management, but Challenges Remain, GAO-03-1047

- June 2004, Wildland Fires: Forest Service and BLM Need Better Information and a Systematic Approach for Assessing the Risks of Environmental Effects, GAO-04-705

- January 2005, Wildland Fire Management: Important Progress Has Been Made, but Challenges Remain to Completing a Cohesive Strategy, GAO-05-923T.

- May 2006, Wildland Fire Management: Update on Federal Agency Efforts to Develop a Cohesive Strategy to Address Wildland Fire Threats, GAO-06-671R

- September 2007, Wildland Fire Management: Better Information and a Systematic Process Could Improve Agencies' Approach to Allocating Fuel Reduction Funds and Selecting Projects, GAO-07-1168.

In each report, emphasis is placed on the critical requirement for comprehensive geospatial data products that is developed utilizing consistent methods and processes.

Plan Overview

The program will facilitate the collection, standardization and synthesis of fire and vegetation management data across all ownership units in a collaborative interagency process, at ecologically-relevant scales that capture landscape characteristics, patterns, and processes that are relevant to management factors, such as fire (risk, hazard, and severity) and natural resource (habitat and distribution). The schedule supports the business needs and functions of the land management agencies, other affected agencies, and a vast array of partner organizations (some of these are listed in section 2.4) across the United States. The program is essentially a comprehensive set of carefully integrated O&M activities.

There is a minimum baseline of O&M activities necessary to continue meeting the requirements of wildland fire management programs, as well as other organizations. These activities are partitioned between the more frequent updates included in the biennial mapping effort, and periodic updates of the decadal remap. The biennial update approach focuses on activities that will update vegetation and fire behavior layers. The decadal re-mapping activity includes a comprehensive update of all LF data products, defined through the review and approval of the governance process, which is based on the most current scientific methodologies at the time of the remap. The geospatial data products that will be reviewed include; vegetation, fire behavior, fire effects, vegetation models, and fire regime layers similar to those specified in the original LF charter. The remainder of this document outlines core business elements of an O&M strategy to satisfy the present and anticipated future requirements of management and users. This document outlines the business tasks necessary for

the operations, maintenance, improvement, innovation, and governance of the program. This plan is a companion document to the O&M technical plan and the O&M budget outline. The continued cost-sharing between DOI and U.S. Forest Service fire programs as well as other contributions from land and natural resource management organizations and programs are critical components of this program.

2.0 Impact on Mission Areas

2.1 Mission Support

It is necessary to align investment budget requests from DOI, U.S. Forest Service, state agencies, and private organizations by clearly identifying how programs support priorities at national and regional levels. In particular, this identification describes how the investment relates to strategic plans and supports program activities specifically for DOI and U.S. Forest Service.

LF data products support DOI and U.S. Forest Service fire management program Strategic Goals and Performance Measures which are identified in the 10-Year Comprehensive Strategy Implementation Plan, National Fire Plan, Healthy Forests Initiative and Restoration Act. These plans and initiatives also affect state agencies and private landowners. The program will provide an ongoing capability for LF data and services to support DOI, U.S. Forest Service, and state, municipal, private, and academic customers. Related to the natural resource management programs, these products support the Department's Strategic Plans and further work is being done by the current LF Executive Oversight Committee (EOC) providing communication to and from their agencies as well as other organizations and programs to discuss and implement broader coordination and involvement from these user-groups that will benefit from the updated deliverables produced by the LF program.

One of the principle goals of the program is to provide a common database platform for the natural resource and fire management communities. The design and architecture of LF provides for a strong connection between the natural resource and fire management program areas.   The initial LF charter initiated this blending of fire and natural resource data sets together with the title of the project being; The Landscape Fire and Resource Management Planning Tools Program,

DOI and U.S. Forest Service Missions

Department of the Interior

DOI protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities.

Mission Areas and Outcome Goals Relevant to LANDFIRE

Resource Protection

- Improve the health of watersheds, landscapes, and marine resources that are DOI managed or influenced in a manner consistent with obligations regarding the allocation and use of water

- Sustain biological communities on DOI managed and influenced lands and waters in a manner consistent with obligations regarding the allocation and use of water

- Protect cultural and natural heritage resources

Resource Use

- Manage or influence resource use to enhance public benefit, promote responsible use, and ensure optimal value: energy, minerals, forage, forest products

Serving Communities

- Protect lives, resources and property.

- Advance knowledge through scientific leadership and inform decisions through the applications of science.

Recreation

- Provide for a quality recreation experience, including access and enjoyment of natural and cultural resources on DOI managed and partnered lands and waters.

Forest Service

The mission of the U.S. Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.

Mission Areas and Outcome Goals Relevant to LANDFIRE

Reduce the risk from catastrophic wildland fire

- Restore the health of the Nation's forests and grasslands to increase resilience to the effects of wildland fire.

Reduce the impacts from invasive species

- Restore the health of the Nation's forests and grasslands to be resilient to the effects of invasive insects, pathogens, plants, and pests.

Provide outdoor recreational opportunities

- Provide high-quality outdoor recreational opportunities on forests and grasslands, while sustaining natural resources, to meet the Nation's recreational demands.

Improve watershed condition

- Increase the number of forest and grassland watersheds that are in fully functional hydrologic condition.

2.2 10-Year Implementation Plan: U.S. Forest Service, DOI, Governors, and Partners

In light of the severe wildland fire occurrences in the year 2000 with continued severe seasons, and the creation of the National Fire Plan, both governmental and non-governmental entities (Secretaries of the Departments of Agriculture and the Interior, Governors, counties, and tribes) collaborated in addressing a range of wildland fire management issues through the "Implementation Plan for the 10-Year Strategy."

The implementation plan sets forth desired outcomes and performance measures. LF serves an important role providing geospatial data products to assist and support many of these measures focused on restoring fire-adapted ecosystems and reducing hazardous fuels. This results in reduced risks to landscapes and communities, as well as improving safety, fire prevention, and suppression. In the implementation plan, there are specifically two goals where LF data products are identified for use (Goal 2, and Goal 3—Part A, are detailed below). Geospatial data will help managers in making strategic prioritized recommendations related to hazardous fuels. LF data supports the goals and measures of the 10-Year Strategy and Wildland Fire Leadership Council (WFLC) initiatives. LF data may also inform the determination of when a fuels treatment meets plan objectives. Additional work is needed, but LF data may be able to be used to determine if conditions are improving across ownerships over time.

Goals, Implementation Outcomes, and Performance Measures Relevant to LANDFIRE from the 10-Year Implementation Plan

Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment

Goal 2 - Reduce Hazardous Fuels

- Implementation Outcome

  Hazardous fuels are treated, using appropriate tools, to reduce the risk of wildfire to communities and to the environment.

- Performance Measures

  a) Number and percent of Wildland Urban Interface (WUI) acres treated that are identified in Community Wildfire Protection Plans (CWPPs) or other applicable collaboratively developed plans, and the number and percent of non-WUI acres treated that are identified through collaboration consistent with the implementation plan.

  b) Number of acres treated per million dollars gross investment in wildland urban interface WUI and non-WUI areas.

    c) Percent of collaboratively identified high priority acres treated where fire management objectives are achieved as identified in applicable management plans or strategies.

Goal 3 - Restoration and Post-Fire Recovery of Fire-Adapted Ecosystems

Part A - Restoration of Fire-Adapted Ecosystems

- Implementation Outcome

  Fire-adapted ecosystems are restored and maintained, using appropriate tools, in a manner that will provide sustainable environmental, social, and economic benefits.

- Performance Measures

  a) Number and percent of acres treated, through collaboration consistent with this implementation plan, identified by treatment category (i.e. prescribed fire, mechanical, and wildland fire use).

  b) Percent of the natural ignitions occurring in areas designated for wildland fire use or consistent with wildland fire use strategies that are allowed to burn and the number of acres burned.

  c) Number and percent of acres treated to restore fire-adapted ecosystems which are:

    - Moved toward desired conditions, and
    - Maintained in desired conditions.

2.3 President's Management Agenda

The President's Management Agenda (PMA) is an aggressive strategy for improving management of initiatives across the Federal Government. It focuses on improving key areas of management across the government in budget and performance integration, improved financial management, strategic management of human capital, expanded electronic government, real property asset management, and competitive sourcing. LF best supports the PMA through expanded electronic government.

Expanded Electronic Government

This initiative fosters government operational improvements, including "Share information more quickly and conveniently between the federal and state, local, and tribal governments" and "Automate internal processes to reduce costs internally..." Both of these improvement areas are supported by LF. LF is a component of the Geospatial One-Stop initiative within the geospatial Line of Business (LOB). This LOB provides mapping services and geospatial data across all levels of government. Creation of digital data, including layers of geospatial information, that are critical

inputs to planned government information systems, are envisioned to reduce cost and enhance efficiency and application of geospatial data and services related to managing the nation's forests, shrub, and grasslands and firefighting resources to meet the core missions of the Federal agencies and their State and local partners.

2.4 Impact of Not Implementing the Program

Needed Capability

As was stated in section 1.2 (Purpose); updating LF is critical in order to support a maturing fire management program and complex natural resource programs which use the best available science and technological data to manage resources effectively and efficiently. Major project investments initiated at the DOI and U.S. Forest Service must be justified by specifying in rigorous analytical terms the need for agency action to resolve a shortfall in the agency's ability to: 1) provide the services required by its users and customers, or 2) to explore a technological opportunity for performing agency missions more efficiently and effectively. Key to this justification is identifying the operational or functional capability that is needed to resolve a "capability shortfall," or identifying what can be achieved through a technological opportunity.

A capability shortfall is identified for LF. At present, there is not a defined O&M organization or integrated funding allocation to enable the ongoing provision of LF data and services. LF data needs to reflect the dynamic environment where natural processes such as weather and natural disasters; wildland fire management activities; and, other natural resource management activities (human induced) have altered vegetation and fire characteristics. Primary capabilities required for LF O&M activities (Refresh, Biennial, and Decadal) are as follows:

- Maintaining up-to-date and quality LF data products in an organized timely fashion will require ongoing activities to ensure that vegetation and disturbance dynamics occurring over time are accurately depicted (based on the extent and severity) to ensure that appropriate scale information for national planning purposes in available.

- Maintaining data sets at a minimum 30 meter pixel size supplements local-scale data and provides a "safety net" for agencies that do not have adequate local data.

- Maintain and prepare for enhancement of the set of field data used to create data products. Differences in in-situ programs maintained by agencies (including the issues of protection of data location information … i.e. Forest Inventory Analysis (FIA) and availability of field data with time sensitive deadlines) make assembly of national-consistent data sets difficult.

- User support, along with communications and outreach, is needed to ensure that a feedback loop is in place to provide for customer questions, satisfaction, information, and education.

Support the Management of Changing Landscape Conditions

Climate change is an important issue affecting the fire management organizations, public lands, and communities. The changing nature of the climate and environment affect many of the goals for fire business, restoration and conservation within the natural range of variability, and resource protection. The LF program has the capability to provide data to support management, agency, and policy decisions related to the issue of climate change. It will be difficult to analyze, plan, and prepare for the complex influences of the climate on vegetation without the data products LF is producing as these data products may be used to evaluated areas that have or are becoming more vulnerable to stand replacing fires given changes in the variance of precipitation and temperature. LF the program will enable managers to have the most current and up-to-date information to more efficiently and effectively manage constantly changing conditions.

Criticality

"Criticality" typically refers to systems considered "mission-critical." Systems can represent business processes, technology operations, or strategic information assets. At the DOI and U.S. Forest Service, mission-critical systems typically support one of four cross-cutting LOBs, including 1) wildland fire management, 2) law enforcement, 3) financial management, and 4) recreation. With regard to LF data, mission critical information is provided to the wildland fire management LOB. The critical nature of the LF data in support of LOB objectives is detailed as follows:

Protecting and Maintaining Return on Existing Investment

There will have been a significant investment of time, resources, dollars ($40 million over the life of the development of the LF investment-five years), and other project and program coordination with LF data product dependencies (some of these dependencies are addressed below); thus it is critical to protect this initiative by assuring that the data remains timely and accurate. Not maintaining the timeliness of LF data products and services will result in the reduction in benefit-cost contribution provided from the original LF national data investment. As such, at a minimum, the current projected annual benefit of $18.5 million will be significantly reduced in a short span of time as the data products become outdated. As agencies funding and technical expertise is limited or declining, the need for a national program is imperative to support management's planning and strategic direction. In the long term application of the program, sponsoring agencies will continue to require the consistent approach and timeliness of data products for management applications.

Limited Alternative Sources

LF is the only national vegetation and wildland fire program of its kind, which has comprehensive coverage of all 50 states. Subsequently, the unique nature of this set of data makes it a significant strategic asset. Comparable nation-wide data are not available from an alternative information source.

Program Source Data

LANDFIRE is dependant on many other programs and data. The success of the LF program relies on mission-critical links across program areas. Some of the key programs that provide data components to the LF initiative include:

- The Landsat Program (Landsat Data Continuity Mission - LDCM) provides for the acquisition of imagery of the earth from space resulting in Landsat Thematic Mapper satellite data. This satellite imagery is at a scale appropriate for use in vegetation and wildland fuel mapping. LDCM is proposed as part of the NLIP (National Land Imaging Program) that is recommended by the Presidents Office of Science, Technology, and Policy (OSTP) and supported by NASA, DOI/USGS, USDA, DOD, NGA, DOC, DOE, NOAA, DOS, and DOT. NLIP is being hosted and managed by DOI to meet U.S. civil land imaging needs.

- The National Land Cover Database (NLCD) Program provides 21-classes of land cover classifications applied consistently over the United States. This program is on a general schedule of producing a national map every 10 years. There are proposals to make it a five year rotation program of work.

- The Forest Inventory Analysis Program which provides the Nation's continuous forest census collecting information on status and trends in forest area and location; in the species, size, and health of trees; in total tree growth, mortality, and removals by harvest; in wood production and utilization rates by various products; and in forest land ownership.

Program Deliverables

There are many projects or program areas that depend on data like LF. Given the national scope and extent of the data, these users would not be able to perform their program functions or analyses. If these downstream users are hampered by timeliness and the lack of necessary inputs there will be mission critical gaps in the abilities of the agencies to function effectively and efficiently. The use of the LF program deliverables will vary by project, agency, organization, and user needs. Some of these downstream dependent users within the fire management organization include:

- NIFC (National Interagency Fire Center) The Fire Center (located in Boise, Idaho), is the nation's support center for wildland firefighting. Eight different

agencies and organizations are part of NIFC. Decisions are made using the interagency cooperation concept because NIFC has no single director or manager.

- NIFCG (National Interagency Fuels Coordination Group). This group was established shortly after the National Fire Plan in October of 2001 and its primary purpose is to provide leadership and coordination in uniting the Departments' (Agriculture and Interior) natural resources and fire management programs under a common purpose for reducing risks to communities while improving and maintaining ecosystem health. The primary goal is to provide assistance and guidance in the development and implementation of an effective interagency fuels management program including addressing risks from severe fires in WUI communities and restoring healthy ecological systems in other wildland areas.

- FPA (Fire Program Analysis) is a common interagency process for fire management planning and budgeting to evaluate the effectiveness of alternative fire management strategies through time, to meet land management goals and objectives. FPA will reflect fire objectives and performance measures for the full scope of fire management activities. It is a tool to ensure wildland fire management actions meet performance targets. It will incorporate geospatial data to inform resource allocations and provide for trade-offs between wildland fire program components.

- WFDSS (The Wildland Fire Decision Support System) supports the NWCG Wildland Fire Situation Analysis Task Group (WFSATG). The WFDSS project developed a scaleable decision support tool to support the line officer in making good decisions for all unplanned ignitions that escape initial attack or will be managed as wildland fire use events. The project scope includes re-engineering the existing Wildland Fire Situation Analysis (WFSA) and Wildland Fire Implementation Plan (WFIP) processes and supporting applications.

- FENWT (Fire Environment Working Team). The purpose of this team is to provide interagency oversight, strategic direction and vision relating to measuring and predicting the wildland fire environment. The FENWT was formed in 2004 to establish an integrated programmatic approach to the activities that were formerly the responsibility of multiple groups and teams. FENWT coordinates with other groups that are focused on measuring and predicting the wildland fire environment.

- FUWT (The Fire Use Working Team, formally the Prescribed Fire and Fire Effects Working Team) The mission of this team is to coordinate and advocate the use of wildland fire to achieve land management objectives, promote a greater understanding of the role of wildland fire and its effects, and recommend and maintain a fire use qualification system.

Some of the above identified teams or groups may likely have representation and serve on the Change Management Board (CMB) for the LANDFIRE program (CMB discussed in sections 5 and 7).

Program Coordination

This section describes examples of program coordination that may result in improved use of LF data products. The objective of such program coordination is to improve overall programs and services, and/or to save time and money by more efficiently using existing resources or developing partnerships to leverage key program requirements through inter-governmental and inter-agency programs. Coordination activities could include planning, budgeting, and management practices. This section is not meant to be an exhaustive list or approach to provide for coordination activities or approaches, but rather is an exploration of program coordination and processes that might offer key elements to include or consider such as; facility and data utilization, local data collection platform for enhancement of the dataset, incorporation of legacy data sets, efficient use of operating budgets, improved governmental services and operations that would fit within a program coordination master plan.

One of the principle areas where more program coordination could occur is with the natural resource programs. Within the LANDFIRE design and architecture there is a strong connection with the natural resource management program areas encompassing the "LAND" part of LANDFIRE. The initial charter for LF set the tone for a coordinated and collaborated effort between natural resource and fire programs when it named the project; The Landscape Fire and Resource Management Planning Tools Program,

An example of this is the initial efforts being explored and developed between LANDFIRE and the Gap Analysis Program (GAP) to develop a partnership with some of the common products produced by each program. The purpose of GAP is to provide broad geographic information on the status of ordinary species (those not threatened with extinction or naturally rare) and their habitats. This program maps at a state- and national-level, existing natural vegetation to the level of dominant or co-dominant plant species, predicted distribution of native vertebrate species, and public land ownership and private conservation lands. It also shows the current network of conservation lands, compares the distributions of any native vertebrate species, group of species, or vegetation communities of interest with the network of conservation lands, and provides an objective basis of information for local, state, and national options in managing biological resources. In this example each program (LANDFIRE and GAP) would work together to produce a common data product and then separately develop the value added information users have come to know and have relied on for their management needs.

3.0 Operations

3.1 Overview

"Operations" refer to continued data archiving, documentation, technical transfer, user-support, communications/outreach, and infrastructure services for distribution of LF data products. In particular, operations activities include the archiving of all data products including those developed from the initial production cycle of the LF program inclusive of the LF reference database. More specific details are listed in the technical plan.

3.2 Key Components

Data distribution O&M components and services will support continuous and reliable access to LF data products. Key components include but are not limited to the following as technology improves or governance dictates:

- Addition of newly acquired or updated LF data.
- Provision of comprehensive information security, disaster recovery, business resumption, and business continuity activities.
- Equipment and services to provide continuity of operations for uninterrupted data distribution services and data backup.
- Software and hardware maintenance and replacement.

4.0 Maintenance

4.1 Overview

"Maintenance" refers to the actual updating of the LF data products as specified in the initial LF Charter or as dictated by technological and scientific advances approved through the governance process. LF maintenance activities are designed to update landscape changes that alter vegetation using three approaches outlined below. See the technical work plans for the specific details related to the approaches and products of these maintenance actions.

1. <u>Refresh</u> the vegetation and fire behavior fuel layers that have had a major landscape disturbance (for example, wildland fires, storm damage, insects and disease) between initial 2001 NLCD imagery. Information will be processed as early as 2008 into FY 2009. This is a one time, best effort level of work with the processes evaluated for the biennial update.

2. <u>Biennial updates</u> will build upon and be informed from the improvements developed for the 'refresh.' This comprehensive national approach will be applied on a 2-year update cycle for the life of the program and may be implemented through phases. These 2-year updates will be maintained on the distribution site on either a separate server or as unique layers within the National Map LF data distribution site for input into the decadal remapping

effort. Once the decadal remapping is completed these updates will be removed and replaced by the next generation of biennial updates.

3. <u>Decadal comprehensive remapping</u> will capture gradual, cumulative, and broad-scale changes (for example drought, climate, invasive species, vegetation succession, loss of open space). This process will update applicable data layers from the initial development period of LF or as determined by the governance process. These decadal maps, including the first LANDFIRE iteration, will be maintained and available for user access to evaluate trends and monitor changes overtime.

Processes for producing and maintaining LF data reduce the need for similar efforts being conducted at regional scales along with the potential for duplication of effort, inconsistent methodologies, incompatible adjacent databases, and incomparable results. The LF suite of program data and services provides private and public users with a nationwide set of vegetation, natural resource, fire, and fuels information.

4.2 Key Components

The LF products are principally focused on National- to Regional-scale planning and analysis. A key component of the maintenance and improvement part of LF O&M is to build upon the lessons learned from the initial mapping effort. Information collected as part of the LF After Action Review (AAR) Workshops as well as comments received through the LF helpdesk will be analyzed and evaluated for incorporation during the maintenance updates. The biennial update process provides focused and continuous updates over the course of a 10 year planning horizon. The decadal remapping will provide periodic harmonization bringing all data assets of varying biennial periods of currency to an equivalent update period. In particular, data assets that are not updated through the biennial process will be renewed through the decadal remapping effort with a frequency based on a 10 year cycle as this program of work is dependent on the current 10 year NLCD program.

The following are key tasks in conducting the decadal remapping:

- Acquisition and processing of the national satellite imagery catalog
- Compilation of recently collected field data on a national scope
- Applying contemporary ecological knowledge in map unit refinement
- Remapping existing vegetation, wildland fuel, and approved data under the governance process.

4.3 Technology Transfer

Technology transfer is an additional component of maintenance activities. Under LF O&M, technology transfer consists of supporting the curriculum for training courses. Collectively, the curricula and content of these courses will be adjusted to meet changing user needs and changes in application technology. It is expected that user needs will sharply increase as the utility of LF data products evolves. The goal for the future of LF technology transfer is to transfer this responsibility from the Interagency Fuels Group sponsored National Interagency Fuels Technology Team (NIFTT) to

more established training programs and curricula, for example, the National Advanced Fire and Resource Institute (NAFRI) or through the National Wildfire Coordinating Group (NWCG) curriculum. Technology transfer also provides for user support services and communication and outreach approaches.

5.0 Improvement

"Improvement" refers to developments (technological and scientific advancements) approved through the governance process; that maximize maintenance efficiencies, product quality, timeliness, and ensure that defensible science is brought to bear on data products. Improvements will evaluate recommendations in geography level progress resulting from research and development efforts. Through the governance process, a formal organization will be supported to acquire feedback and recommendations that contribute to managing the performance of the program and improving the quality of future LF products. Improvements will be reviewed by the LF Change Management Board (CMB), Technical Advisory Group (TAG), and an Executive Oversight Governance Group (EOGG) using a change control process. The governance functions of the CMB, TAG, and EOGG are discussed in Section 7.

"Improvement" also provides for how the program investment will reduce costs or improve efficiencies across management disciplines. One key aspect of improvement is the continuation of benefits realized by the program. The original business case for the program is summarized below, and describes the primary return on investment that will be maintained and extended by implementing the program.

- Continued accuracy, consistency, and reliability of data from LF will not only provide the capability to prioritize areas with hazardous buildup of fire fuels, it will also enhance natural resource management and rangeland planning by providing vegetation data at the landscape scale and across jurisdictional boundaries.

- Effective fuels treatment and fuels management will be enhanced with current LF data that reflects recent fires and other disturbances on the landscape.

- Analysis conducted in support of the original LF mission need statement and business case resulted in a tangible benefit estimate of a 1% reduction in the number of natural resource acres burned. The reduction in burned acres is translated to a cost savings estimated to be $18.5 million per year. The highlights of the cost and benefit evaluation are as follows:

  Annual benefits of LF data:
  Acres burned.................. 4,924,488
  % reduction..................... 1.00
  Acres saved.................... 49,244

Structures saved............. 10.91

Annual LF benefits value:
Suppression Costs............ $ 7,603,845
Structures Saved............. $ 1,090,792
Natural Resources Saved. $ 9,848,976
Total.............................. $18,543,613

The program is expected to maintain and improve the existing suite of LF data and services. The suite of LF data products are identified in the technical plan. At a minimum, it is expected that the program will return the same level or will most likely exceed the annual benefits estimated for the initial investment as fires are increasing in size and complexity.

6.0 Innovation

"Innovation" refers to the development of new data products or changing existing products for applications outside of the scope of the LF program and original executive charter.

Numerous innovation opportunities have and will be discovered that enlarge the primary use of LF data assets. Research and development which is supported by programs such as the Joint Fire Science Program (JFSP) fit within this innovation category. A valuable opportunity exists to transform and integrate LF data products and existing or future service investments to benefit overall natural resource management objectives. The expectation is an increase in overall program efficiency and consistency with important implications for long term planning, habitat anaylsis, risk analyses, as well as cost savings. A significant interest has been expressed, and is currently being evaluated, for use of LF data in a wide range of resource condition, assessment, monitoring, and appropriate management response activities. The lack of updated data would significantly limit the innovation capability of LF data for this and other activities.

Innovations outside the scope of the program are anticipated to deliver significant strategic and operational benefits to the Resource Management LOB.

The innovations aspect of the LF program will also consider linkages to new programs which may serve as important roles in updating and maintain the LF products.   A few examples of these linkages include The National Ecological Observatory Network, NASA's climate change program, U.S. Global Earth Observation, and Global Earth Observation System of Systems. LF may contribute to several of these programs through: (1) combating land degradation, (2) understanding environmental factors affecting human health and well-being, (3) loss of life and property, (4) ecological forecasting, and (5) sustaining water resources.

Potential innovational opportunities that may contribute to the program will be considered by the program organization (figure 1). They will be evaluated within this organization considering the scope, schedule, and budget effects of the program of work. Depending on the effect to scope, schedule, and budget; innovations may be addressed in the following manner. Innovations of a low effect may be reviewed by the CMB and approved for inclusion in the program by the program manager and business lead(s), innovations of a moderate effect would possibly be reviewed by the CMB, program manager, business lead(s), with a recommendation from the TAG and approved by the EOGG, and innovations of a high effect would be reviewed by the CMB, program manager, business lead(s), TAG, and EOGG and would be presented to the sponsor for approval.

7.0 Governance

7.1 Introduction

"Governance" refers to oversight, roles and responsibilities, and a standard business process for implementing the elements listed above. The "Governance" process of the LF program may change or modify business or technical elements prescribed in this Business Case or in the Technical Plan as agreed upon by this governing body to achieve departmental or agency needs or objectives. The governance process is partitioned between the EOGG, Business Lead(s) and Program Manager. The CMB and TAG provide fire and natural resource organization and science recommendations respectively. The EOGG is ideally comprised of five members with a possible make-up including two U.S. Forest Service representatives; two DOI representatives; and, one National Association of State Foresters representative (on behalf of states and counties). The TAG is also ideally comprised of 5 members consisting of representation from U.S. Forest Service Fire Science, DOI Science, private organization, and academia. The TAG evaluates, analyzes, and makes recommendations related to the science of LF to the EOGG, Business Lead(s), and Program Manager for approval and implementation of "Improvements and Innovations" depending on the effect of the change. The CMB proposes, receives, evaluates, analyzes, and makes recommendations related to the agency stakeholders of LF to the EOGG, Business Lead(s), and Program Manager for approval and implementation of "Improvements and Innovations" depending on the effect of the change. The organization of the governance process is provided in Figure 1.
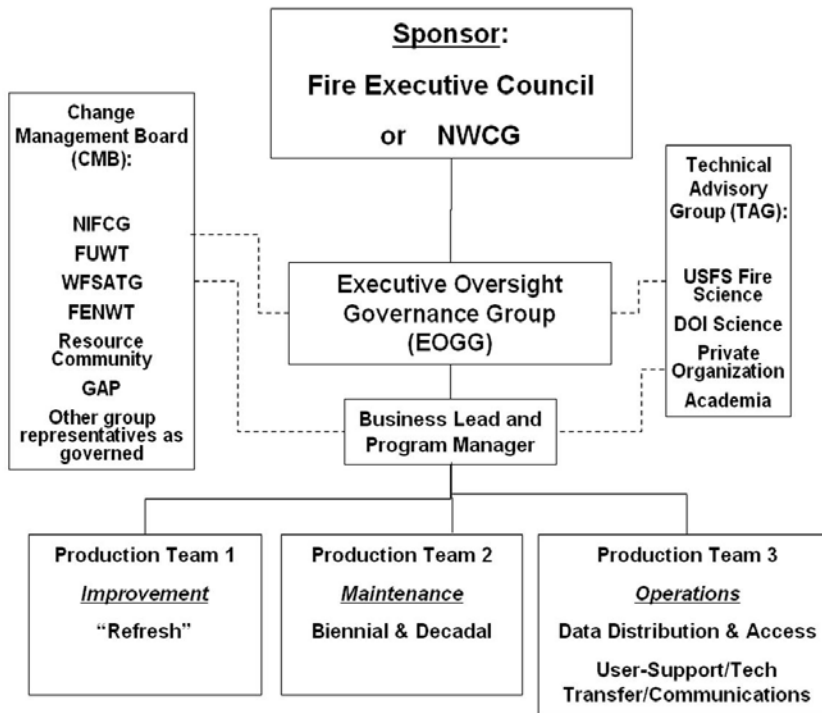
Figure 1. LF Governance Organization

7.2 Roles and Responsibilities

Conceptual roles and responsibilities for the groups comprising the governance organization are as follows:

<u>Executive Oversight Governance Group:</u>

1) Provide strategic direction for the improvement and innovation of the LF program.
2) Organizing interagency funding to implement the program.
3) Support the incorporation of LF products and concepts into agency business practices.
4) Provide a point of coordination and collaboration within and between sponsoring agencies.
5) Make high-level decisions regarding the improvements and innovations of the program.
6) Consider recommendations from the Business Lead(s)/Program Manager, CMB, TAG or other program advisors regarding the overall execution of high-level improvements and innovations.

7) Help leadership make decisions regarding scope, time, quality and cost tradeoffs.

Business Lead(s):

1) Represent the business community (interagency partners) external from the program team.
2) Providing direction to the program manager to ensure that business requirements and stakeholder expectations are met.
3) Establishing, maintaining, and communicating the business case for LF.
4) Developing and implementing the program communications plan.
5) Representing the LF program as spokespersons to stakeholders and various publics.
6) Coordinating among staff units and agencies National and Regional levels.
7) Facilitating and coordinating linkages among related national efforts.
8) Assisting the program manager and EOGG in resolving issues affecting scope, time, quality, and cost.
9) Providing program progress reports and feedback to the business community.

Program Manager:

1) Has direct, day-to-day responsibility for the program.
2) Organizing, leading, and directing the program team.
3) Ensuring that the program elements are completed within scope, meeting quality objectives, on schedule, and within budget.
4) Developing, maintaining, and managing a comprehensive program management plan.
5) Oversee development of project plans and annual work plans.
6) Ensuring completion, delivery, and acceptance of all program deliverables specified in the program charter.
7) Developing and submitting budgets, and tracking program expenditures.
8) Reporting program status according to Departmental, Agency, and sponsoring entity requirements.

Production Team Leads:

1) Provide information to upper management regarding program progress and issues on scope, time, quality and cost on a regular basis.
2) Make technical decisions regarding production and provide recommendations to Program Manager.
3) Provide technical expertise and recommendations documenting possible improvements and innovations of the program and elevate to upper management.
4) Manage production to meet schedule, cost, and quality objectives.

Change Management Board:

1) Provide recommendations and information to project management regarding issues on scope, time, quality and cost on a regular basis.

2) Evaluate user community recommendations regarding products and production and provide recommendations to Program Manager / Business Lead(s).
3) Provide recommendations documenting possible improvements and innovations of the program related to stakeholder needs.
4) Meet regularly to evaluate, consider, and provide recommendations.
5) CMB members may elevate issues individually for consideration to the Program Manager for further evaluation.

Technical Advisory Group:

1) Provide technical information and review with recommendations regarding improvements and innovations of the program to upper program management.

8.0 LANDFIRE O&M Program

In this section a series of process and timeline diagrams are provided to illustrate the operational relationships within the program plan.

The timeline diagram in Figure 2 depicts each of the program aspects as they are implemented over time.
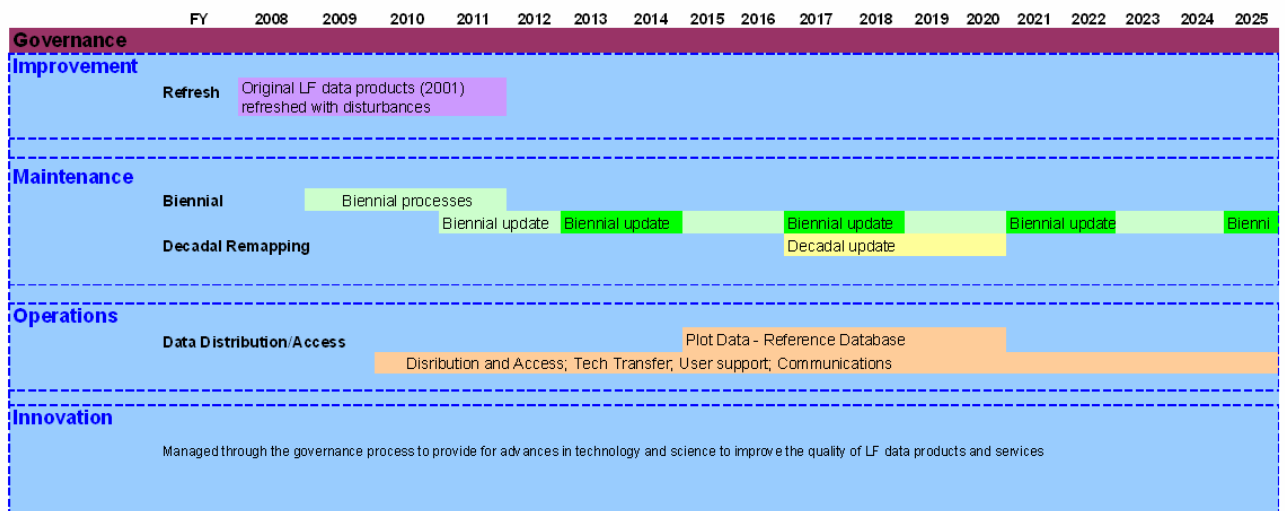
Figure 2. LF O&M Timeline

The swim lane diagram in Figure 3 depicts the transition from the initial LF investment to the integrated components of the program.
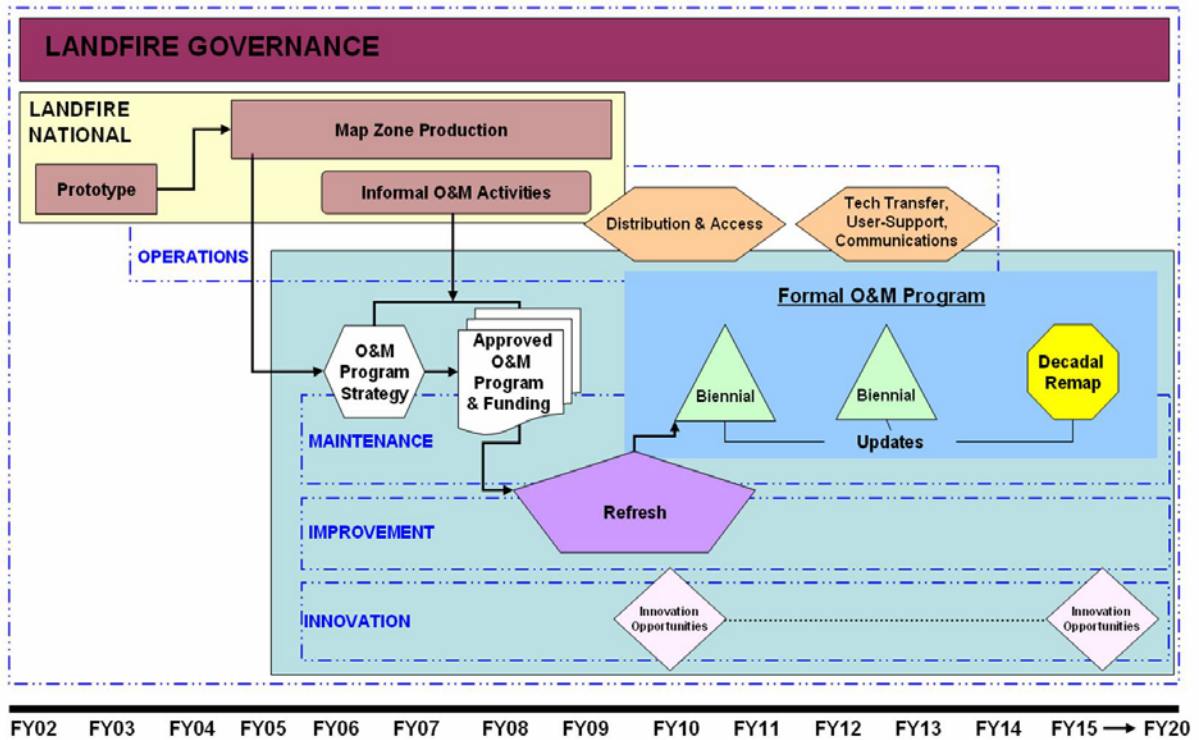

Figure 3. LF O&M Transition and Integration

The cycle diagram in Figure 4 depicts the adaptive management cycle of integrating the operations, maintenance, improvement, and innovation aspects of the program.

LANDFIRE Program Cycle

Improvement
REFRESH
vegetation
& fuel data layer maps
from 2001 to 2008

Governance

Maintenance

Biennial Updates
Landscape Disturbances
National / Regional
Possibly – Local
Multi-agency data

O&M Program
Core Data &
Map Products

Decadal Re-Map
Landscape Changes
National / Regional
Possibly – Local
Multi-agency data

Operations
Data Distribution
- access & archiving
User-support, technical transfer,
Communications, web page,
& outreach
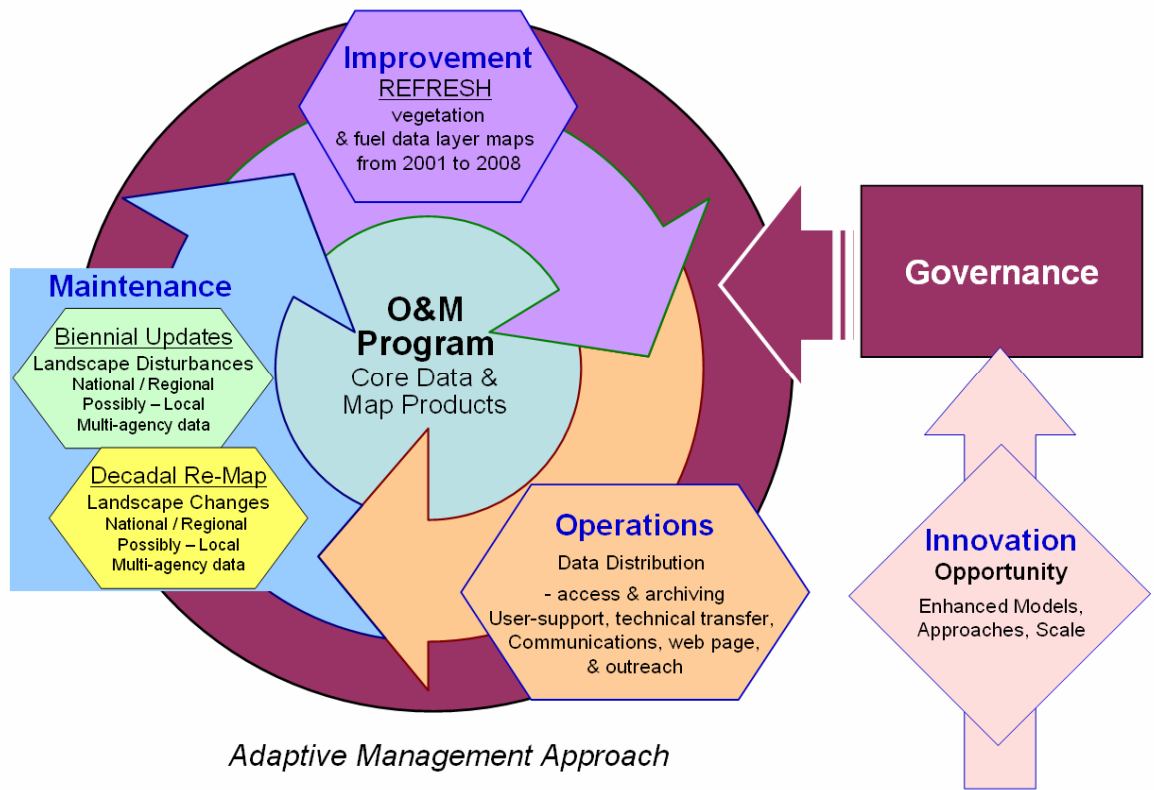
Innovation
Opportunity
Enhanced Models,
Approaches, Scale

Adaptive Management Approach

Figure 4. LF Program Cycle