LAND BETWEEN THE LAKES NATIONAL RECREATION AREA

FIRE MANAGEMENT PLAN





Prepared by:	Is] Chad Ingle	2-28-2013
	Chad Ingle, Forestry Technician	Date
Reviewed by:		3-1-2013
	Wm. Patrick Fowler, ES Dept. Mgr	Date
Approved by:	s Brian Beisel	3-1-2013
	Brian Beisel, Acting Area Supervisor	Date

ABSTRACT

Interagency Federal fire policy requires that every area with burnable vegetation must have a Fire Management Plan (FMP). This FMP provides information concerning the fire process for the Land Between The Lakes (LBL) National Recreation Area and compiles guidance from existing sources such as but not limited to, LBL's Land and Resource Management Plan (LRMP), national policy, and national and regional directives.

Firefighter and public safety are the first consideration and are always the priority during every response to any incident. Protecting the welfare of any natural, cultural and other values will also aid management in the determined response to a wildfire.

The following chapters discuss broad forest and specific Fire Management Unit (FMU) characteristics and guidance.

- **Chapter 1** introduces the area covered by the FMP, includes a map of LBL, addresses the agencies involved, and states why the forest is developing the FMP.
- **Chapter 2** establishes the link between higher-level planning documents, legislation, and policies and the actions described in FMP.
- **Chapter 3** articulates specific goals, objectives, standards, guidelines, and/or desired future condition(s), as established in the forest's LMP, which apply to all the forest's FMUs and those that are unique to the forest's individual FMUs.

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Chapter 1. **INTRODUCTION**

Land Between The Lakes (LBL) National Recreation Area developed this FMP as a decision support tool to help fire personnel and decision makers determine the management response to an unplanned ignition. FMPs do not make decisions. Instead, they provide information, organized by FMUs, which provides a finer scale summarization of information than is possible at the forest level. These descriptions bring specific detail about the identifiable areas on the ground. FMPs are not static documents. They will evolve and be revised as conditions change on the ground and as modifications are made to the unit's LRMP.

The purpose of this plan is to identify and integrate objectives that direct national fire policy and the desired conditions at LBL. This FMP formally documents the fire management program for the LRMP for LBL. It provides specific details of the fire program that most efficiently meets fire management direction for the planning period, including organization, facilities, equipment, activities, timing, locations, and related costs. It also provides guidance concerning the appropriate use of suppression strategies. The FMP does not document fire management decisions; rather it provides the operational direction to implement the goals and objectives in the LRMP.



Chapter 2. Policy, Land Management Planning, and Partnerships

The Land Between The Lakes LRMP, which was developed through both an internal and a public involvement process in December 2004, forms the basis for this FMP.

This FMP is a detailed program of action to carry out fire management policies; it will help achieve resource management objectives as defined in LBL's LRMP.

This plan meets National Environmental Policy Act (NEPA) requirements and other State and Federal regulatory requirements by implementing fire management direction outlined in the December 2004, LRMP and analyzed in the Final Environmental Impact Statement for the Revised Land and Resource Plan (FEIS), December 2004.

Federal Wildland Fire Policy-Guiding Principles and Policy Statements:

The following guiding principles and policy statements are excerpted from the Review and Update of the 1995 Federal Wildland Fire Management Policy (January 2001). These remain the foundational principles for Federal Wildland Fire Management Policy.

Guiding Principles

- 1. Firefighter and public safety are the first priority in every fire management activity.
- 2. The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process. Federal agency land and resource management plans set the objectives for the use and desired future condition of the various public lands.
- **3.** Fire Management Plans, programs, and activities support land and resource management plans and their implementation.
- **4. Sound risk management is a foundation for all fire management activities**. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.
- 5. Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives. Federal agency administrators are adjusting and reorganizing programs to reduce costs and increase efficiencies. As part of this process, investments in fire management activities must be evaluated against other agency programs in order to effectively accomplish the overall mission, set short and long-term priorities and clarify management accountability.
- 6. Fire Management Plans and activities are based upon the best available science. Knowledge and experience are developed among all wildland fire management agencies. An active fire research program combined with interagency collaboration provides the means to make these tools available to all fire managers.

- 7. Fire Management Plans and activities incorporate public health and environmental quality considerations.
- 8. Federal, State, tribal, local, interagency, and international coordination and cooperation are essential. Increasing costs and smaller work forces require that public agencies pool their human resources to successfully deal with the ever-lasting and more complex fire management tasks. Full collaboration among federal agencies and between the federal agencies, international, state, tribal and local governments, and private entities will results in a mobile fire management work force that will be available for the full range of public needs.
- **9.** Standardization of policies and procedures among federal agencies is an ongoing objective. Consistency of plans and operations provides the fundamental platform upon which federal agencies can cooperate, integrate fire activities across agency boundaries and provide leadership for cooperation with state, tribal and local fire management organizations.

Guidance for Implementation of Federal Wildland Fire Management Policy (February 2009- Table 1 on p.10):

Federal Wildland Fire Management Policy

1. Safety

Firefighter and public safety is the first priority. All Fire Management Plans and activities must reflect this commitment.

2. Fire Management and Ecosystem Sustainability

The full range of fire management activities will be used to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social components.

3. Response to Wildland Fire

Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fires is based on ecological, social, and legal consequences of the fire. The circumstances, under which a wildland fire occurs, and its likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate response to the fire.

4. Use of Wildland Fire

Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role. Use of fire will be based on LRMP and associated Fire Management Plans and will follow specific prescriptions contained in operational plans.

5. Rehabilitation and Restoration

Rehabilitation and restoration efforts will be undertaken to protect and sustain ecosystems, public health, and safety, and to help communities protect infrastructure

6. Protection Priorities

The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be based on the values to be protected,

human health and safety, and the costs of protection. Once people have been committed to an incident, these human resources become the highest value to be protected.

7. Wildland Urban Interface

The operational roles of federal agencies as partners in the wildland urban interface are wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, state, or local governments. Federal agencies may assist with exterior structural protection activities under formal Fire Protection Agreements that specify the mutual responsibilities of the partners, including funding. (Some federal agencies have full structural protection authority for their facilities on lands they administer, and may enter into formal agreements to assist state and local governments with full structural protection.)

8. Planning

Every area with burnable vegetation must have an approved Fire Management Plan. Fire Management Plans are strategic plans that define a program to manage wildland fires based on the area's approved land management plan. Fire Management Plans must provide for firefighter and public safety; include fire management strategies, tactics, and alternatives; address values to be protected and public health issues; and be consistent with resource management objective, activities of the area, and environmental laws and regulations.

9. Science

Fire Management Plans and programs will be based on a foundation of sound science. Research will support ongoing efforts to increase our scientific knowledge of biological, physical, and sociological factors. Information needed to support fire management will be developed through an integrated interagency fire science program. Scientific results must be made available to managers in a timely manner and must be used in the development of land management plans, Fire Management Plans, and implementation plans.

10. Preparedness

Agencies will ensure their capability to provide safe, cost-effective fire management programs in support of land and resource management plans through appropriate planning, staffing, training, equipment, and management oversight.

11. Suppression

Wildland fires are suppressed at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives.

12. Prevention

Agencies will work together and with their partners and other affected groups and individuals to prevent unauthorized ignition of wildfires.

13. Standardization

Agencies will use compatible planning processes, funding mechanisms, training and qualification requirements, operational procedures, value-to-be-protected methodologies, and public education programs for all fire management activities.

14. Interagency Cooperation and Coordination

Fire management planning, preparedness, prevention, suppression, fire use, restoration and rehabilitation, monitoring, research, and education will be conducted on an interagency basis with the involvement of cooperators and partners.

15. Communication and Education

Agencies will enhance knowledge and understanding of wildland fire management policies and practices through internal and external communication and education programs. These programs will be continuously improved through the timely and effective exchange of information among all affected agencies and organizations.

16. Agency Administrators and Employee Roles

Agency administrators will ensure that their employees are trained, certified, and made available to participate in the wildland fire program locally, regionally, and nationally as situations demand. Employees with operational, administrative, or other skills will support the wildland fire program as necessary. Agency administrators are responsible and will be held accountable for making employees available.

17. Evaluation

Agencies will develop and implement a systematic method of evaluation to determine effectiveness of projects through implementation of the 2001 Federal Fire Policy. The evaluation will assure accountability, facilitate resolution of areas of conflict, and identify resource shortages and agency priorities.

2.1. National and Regional Fire Management Policy

Forest Service policy and direction that are relevant to this plan include:

- National Fire Plan
- Forest Service Manual 5100
- Forest Service Handbook 5109
- Guidance for Implementation of Federal Wildland Fire Management Policy. (February 13, 2009)
- Wildland and Prescribed Fire Management Policy, Implementation Procedures and Reference Guide, August 1998
- Forest Service Manual (FSM) 5100
- Forest Service Handbook (FSH) 5109
- A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment -10- Year Comprehensive Strategy Implementation Plan (May 2002)
- FRCC Guidebooks or Regional Direction
- Interagency Standards for Fire and Fire Aviation Operations 2012
- Healthy Forest Restoration Act
- Healthy Forest Initiative

Federal Wildland Fire Management Policy (1995/2001)

"Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of fire. The circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected dictate the appropriate management response."

Guidance for Implementation of Federal Wildland Fire Management Policy (February 2009)

"Wildland fire"- is a general term describing any non-structure fire that occurs in the wildland. Wildland fires are categorized into two distinct types:

- a. Wildfires Unplanned ignitions or prescribed fires that are declared wildfires
- b. Prescribed Fires Planned ignitions."

The Guidance further states that,

"A wildland fire may be concurrently managed for one or more objectives and objectives can change as the fire spreads across the landscape. Objectives are affected by changes in fuels, weather, topography; varying social understanding and tolerance; and involvement of other governmental jurisdictions having different missions and objectives" and that "Management response to a wildfire on Federal land is based on objectives established in the applicable Land/ Resource Plan ... Initial action on human-caused wildfire will be to suppress the fire at the lowest cost with the fewest negative consequences with respect to firefighter and public safety."

2.2. Land Between The Lakes Land and Resource Management Plan

Land Between The Lakes National Recreation Area Forest Land and Resource Management Plan and Record of Decision (December 2004.)

- Final Environmental Impact Statement for the Land and Resource Management Plan, Land Between the Lakes National Recreation Area, December 2004
- Land Between The Lakes, 2001 NFMAS Analysis
- FWS 2009-B-0084 Biological Opinion
- Heritage Programmatic Agreement and Implementation Plan (Draft)

2.3. Partnership

The general strategy on LBL will be to field an educated response on all fires with safety for firefighting personnel and public safety as the highest priorities. LBL has a good working relationship with the following local resources:

In Kentucky:

- Kentucky Division of Forestry
- Grand Lakes VFD in Lyon County
- Kuttawa VFD in Lyon County
- East Golden Pond VFD in Trigg County
- Lyon County EMS and EOC
- Livingston County EMS
- Trigg County EMS and EOC
- News Channel 6 in Paducah, KY
- National Weather Service
- Kentucky State Historic Preservation Officer

In Tennessee:

- Tennessee Division of Forestry
- Stewart County Volunteer Fire Service
- Stewart County EMS and EOC
- Tennessee State Historic Preservation Officer

Chapter 3. FIRE MANAGEMENT UNIT DESCRIPTIONS

The primary purpose of developing Fire Management Units (FMUs) in fire management planning is to assist in organizing information in complex landscapes. FMUs divide the landscape into smaller geographic areas, describe site-specific safety considerations and to frame associated planning guidance based on physical, biological, social characteristics.

The following information, including the summaries of fuel conditions, weather, burning patterns and other conditions in specific FMUs that help determine the management response to an unplanned ignition and provides a quick reference to the strategic goals in the forest's LRMP.

3.1. Fire Management Considerations Applicable to All Forest Fire Management Units

Wildland fires can occur year-round at LBL but typically, the majority occurs during the spring and fall seasons. The general strategy will be to field an informed response on all fires with safety for fire-fighting personnel and public safety as the highest priorities. A wildland fire can be concurrently managed for one or more objectives and the objectives can change as fire moves across the landscape. Typically, barriers such as roads and streams are used as control lines whenever possible.

Standards are plan decisions that establish requirements and limitations for land uses and management actions needed for the achievement of desired conditions and objectives. All of these standards follow the management principles detailed in the selected "alternative Y" for the LRMP or are legally required for the resource management of the LBL by other criteria listed in this part

- 1. Within the area, 25 feet either side of an ephemeral stream, management activities will maintain the ability of the area to filter sediment from upslope disturbances, provide sediment control within the area, and maintain channel stability downstream. New projects within areas adjacent to ephemeral streams will be designed and mitigated for soil types and classified as hydric, highly erodible, or occurring on slopes greater than 30 percent. (LBL LRMP pg 75)
- 2. Disturbed soil must be stabilized promptly by mulching, geo-textiles, vegetation, or other approved means. (LBL LRMP pg 75)
- 3. All areas requiring re-vegetation for erosion control will be treated within three months following the close out of the ground disturbing activity. The areas will be considered successfully treated when 85 percent or greater vegetation cover is established within two years of the initial treatment. (LBL LRMP pg 76)
- 4. Limit the sum of severely burned and detrimentally compacted, puddled, and displaced land as defined in the Region 8 Soil and Water Conservation Practices (SWCP) to no more than 15 percent of any project or unit area. (LBL LRMP pg 76)
- Soil disturbing activities (excluding roads, trails, and restoration areas) will not take place on water-saturated soils. Standing water and puddling are evidence of a saturated condition. When soil moisture conditions make the soil prone to compaction, soil-disturbing activities will not take place. (LBL LRMP pg 76)
- 6. Water control structures necessary for the control of surface water movement on prescribed fire lines will be installed during fire line construction. (LBL LRMP pg 76)
- 7. Permanent fire lines will have water control structures maintained. Temporary fire lines will be rehabilitated as soon as practicable after any fire. (LBL LRMP pg 76)
- 8. Existing barriers (e.g. streams, lakes, wetlands, roads, and trails) are used whenever possible to reduce the need for fire line construction and to minimize resource impacts. Fire line construction within riparian corridors must be designed in coordination with a resource advisor. (LBL LRMP pg 76)

- 9. Intentional establishment of non-native, invasive plant species, as defined by the Regional Forester's invasive species list, is prohibited. (LBL LRMP pg 76)
- 10. Areas are not burned under prescription for at least 30 days after herbicide treatment. (LBL LRMP pg 76)
- 11. Forest management treatments, within Core Area Prescriptions, will be limited to the minimum necessary level for maintenance and restoration of native ecological communities and/or to provide visitor safety. Treatments may be considered to control or prevent insect infestation and disease, and invasive, non-native plant species. (LBL LRMP pg 79)
- 12. Slash burns are to be prescribed so they do not consume all litter and duff and do not alter structure and color of mineral soil on more than 20 percent of the burn area. (LBL LRMP pg 79)
- 13. When necessary to include deciduous forest communities on mesic and alluvial site types within burning blocks, allow low intensity fires such as backing fires. Direct firing will not be done unless needed to secure control lines and to encourage ecological restoration of native communities such as canebrakes. (LBL LRMP pg 79)
- 14. The removal of embedded, large woody debris (pieces greater than four feet long and four inches in diameter) from stream channels is not allowed unless it poses a risk to public or employee safety or damage to infrastructure. The need for removal is determined on a case-by-case basis. (LBL LRMP pg 79)
- 15. The maximum size of an opening created by forest management treatments is 40 acres. These acreage limits do not apply to areas treated as a result of catastrophic conditions such as wildland fire, insect outbreak, or severe storms. Areas managed as open lands or non-forested areas (e.g. right-of-way and grassy openings) are not subject to this standard and are not included in the calculations of opening size, even within or adjacent to created openings. (LBL LRMP pg 79)
- 16. Vegetation management activities may be conducted within 200 feet of a trail only as a means of enhancing the trail use experience or mitigating damage caused by insects, disease, or natural disaster. Where trails cross through, or are adjacent to fields and wildlife openings, open lands management may be conducted adjacent to the trail. (LBL LRMP pg 80)
- 17. Rare communities are to be protected from detrimental effects associated with management activities and recreational use. Site-specific analysis of proposed management actions and proposed uses identifies any protective or active management practices to enhance the rare community. (LBL LRMP pg 80)
- 18. Mesic coves and dry-mesic transition sites that contain clumps of mature American beech larger than one acre will be protected from detrimental effects caused by management activities. Management activities occur within these sites only where maintenance or enhancement of composition or structure is expected. Areas are surveyed for beech communities prior to initiating projects that may adversely affect them. (LBL LRMP pg 80)
- 19. Protection zones, as specified in the current guidelines for bald eagle habitat management from the US Fish and Wildlife Service, will be delineated and maintained around all bald eagle nest and communal roost sites, unless exempted or modified by the US Fish and Wildlife Service. (LBL LRMP pg 81)
- 20. A Scenic Integrity Objective (SIO) of Moderate or higher will be applied to new projects within Visual Quality Zones (defined below). Existing conditions will be managed as closely as feasible to the assigned SIOs. (LBL LRMP pg 81)
- 21. Along maintenance level 3, 4 and 5 roads, Visual Quality Zones (VQZ's) will be a minimum of 100 feet from road shoulders. (LBL LRMP pg 82)
- 22. VQZs will be a minimum of 100 feet from trails, the LBL shoreline, and around facilities. (LBL LRMP pg 82)

23. A long-term SIO of Moderate will be applied to those areas of LBL that lie outside of the Visual Quality Zones. Document overall wildland fire management program guidance and characteristics common to all FMUs. (LBL LRMP pg 82)

Established requirements set forth in the 2009 Biological Opinion, FWS 2009-B-0084 include:

- No more than 27,000 acres of prescribed burning and/or utilizing a wildfire is allowed within two miles of the cave entrance if winds are expected to transport smoke over the cave entrance.
- Tobaccoport Cave is a smoke sensitive target. No prescribed burning or utilizing a wildfire is allowed within two miles of the cave entrance if winds are expected to transport smoke over the cave entrance.
- No more than 5,000 acres of prescribed burning or utilizing a wildfire is allowed within five miles of the cave entrance between September 16th and November 15th annually (see map on next page).



3.1.1. Land Between The Lakes National Recreation Area Land and Resource Management Plan Guidance

The wise use of fire is needed to maintain and restore many forested communities across the NRA. Without fire, many communities could decline dramatically in future years and shift towards shade-tolerant and fire-intolerant species.

In the past, the significance of the important role fire played in the forest was not realized and fire management policy was suppression oriented. Our forests and numerous wildlife species are dependent on fire for reproduction and the open, grassy habitats that fire creates. Fire-dependent species are slowly disappearing from LBL and the region. The LRMP increases the use of prescribed and wildland fire to restore these important forest communities.

Part 2 of the LRMP contains the overall strategy that will be applied to achieve the Vision of LBL. The Strategy of the LRMP supports both the Forest Service National Strategies and the mission as stated in the Protection Act.

Primary Strategies:

- Ensure that Wildland Fire Response, Fire Management Plans, Prescribed Fire Burn Plans, and related activities reflect firefighter and public safety as the first priority. (LBL LRMP pg 62)
- Reduce hazardous fuels accumulations and manage for a healthy, predominantly oakhickory forest with respect to both species composition and forest canopy structure, and associated wildlife species. Reintroduce fire to improve fire regime and condition class in targeted landscapes. (LBL LRMP pg 62)
- Enhance knowledge and understanding of wildland fire management policies and practices through internal and external communication and education programs. These programs will be modified through timely and effective exchange of information, and will be designed to increase public awareness of the fundamental role of fire in oak-hickory ecosystems. (LBL LRMP pg 62)
- Suppress fires at minimum cost (consistent with resource management objectives), considering firefighter and public safety, benefits, and values to be protected by using the full range of appropriate management responses. (LBL LRMP pg 62)
- Apply the full range of fire/fuels management activities to achieve ecosystem sustainability, including its interrelated ecological, economic, and social components, with the premise that fire is both an essential ecological process and a tool for accomplishing resource management objectives. (LBL LRMP pg 62)
- Use wildland fire, when practical, to protect, maintain, and enhance natural and cultural resources and, as nearly as possible, be allowed to function in its natural ecological role. Use of wildland fire will be based on approved Fire Management Plans and will follow specific prescriptions contained in operational plans. (LBL LRMP pg 62)

These strategies contribute to accomplishing regional and national strategic plans such as the 10-Year Comprehensive Strategy, National Fire Plan, Cohesive Strategy, and Forest Service Strategic Plan, as well as wildland fire policy. Fire program goals reflect Federal fire policy, the core principles and goals of the Comprehensive Strategy, and Cohesive Strategy and provide programmatic guidance for fire management activities.

3.1.2. Physical Characteristics that Apply to All Fire Management Units

Fire Season Determination

The fire season on LBL is divided into two main seasons. The fall fire season begins in mid October as the forest begins to enter dormancy for the year. As the leaves fall and prior to any significant rain or snow event that compact fuels, there is a substantial fuel bed depth of light fuels available for consumption. Winter rains in late November and December begin to wet fuels and with cooler temperatures and higher humidity levels, the fire season ends until spring. As spring begins to arrive in mid to late February frontal passages occur more often. These fronts do not necessarily bring much moisture and any moisture early in the spring is quickly used by trees beginning to leaf out for the year. 100% green-up usually occurs by early May, which provides not only high heat sink, but also shade and higher humidity levels which slow rates of spread and lowers ignition probabilities.

Fuel conditions in the FMU likely to influence fire behavior

The dominant fuel type on LBL is hardwood leaf litter (FBPS-FM8/9). Although some locally heavy loadings of 10, 100, and 1000+ hour fuels occur in areas of wind throw and higher oak mortality. One-hour fuels (leaf litter) are sometimes wind-blown from narrow ridges and accumulate in draws and drains. This can have dramatic effect on fire activity. Chestnut oak stands typically exhibit an open understory structure, which allows for higher effective wind speeds, which serve to accelerate rates of spread and increase the difficulty to control fire. Fires in this forest type often resist any form of direct and parallel control.

- Some areas are dominated by native tall-grass (FBPS-FM3) this is an explosive fuel type that is heavily influenced by wind and humidity. Extreme fire behavior is common in this fuel type.
- LBL was hit by an unprecedented Ice Storm in January of 2009. The Northern portion of LBL, (approximately 100,000 acres) has un-natural fuel build-up through the forest and debris piles remain along many roadsides. This fuel load will dictate wildfire management options for many years into the future.

Fire regime Alteration

FRCC fieldwork and monitoring was completed in the summer of 2006. LBL as a whole is classed as Fire Regime 1 Condition Class 3 with a small percentage being in either Condition Class 2 or 1. Areas in Condition Class 2 and 1 are hardwood drainage areas and dry ridges.

Control problems and dominant topographic features

Terrain is highly dissected. In general, low rising but steep ridge systems dominate the landscape. This topographic roughness is most prevalent in a zone south of Sugar Bay lake Access, east of the Trace and extends to the LBL's southern boundary at Hwy. 79. This zone has a high density of chestnut oak. However, LBL has a high road density and is surrounded by water on three sides.

Other elements of the fire environment affecting management

Improvements, recreation areas, and other infrastructure occur across lbl creating a wildland urban interface concern. During the early and late portions of the fire season, visitor use is extremely high.

• A high density of cemeteries and other cultural resources are present on LBL. Because of this (and due to visual quality concerns), mechanized fire control tactics should be considered only as a last resort. Preservation of cultural resources is one of the primary concerns on LBL.

3.2. Fire Management Considerations for Specific Fire Management Units

- LBL recognizes four Fire Management Units. These areas will dictate the type of response and outlay the strategy/tactics when a wildfire occurs in and around these units.
 - Developed Recreation/Facility Sites FMU
 - Core Area FMU
 - General Forest Area FMU
 - Stewart County Tennessee WUI FMU

3.2.1. FMU Snapshots

• See maps on pages 19-23 of the specific Fire Management units











3.2.2. FMU Guidance

Developed Recreation/Facility Sites FMU

- **Description:** This FMU is designed to recognize the increased hazard of concentrated human populations and their investments in Developed Recreation, Environmental Education, and Administration facilities (facilities). During some portions of the fire season, there is a significant increase in LBL facility visitation. This FMU is a high priority protection area. Public and firefighter safety and protection of private assets (privately owned resources such as recreational vehicles and campers), and public resources (infrastructure) is a critical concern in this FMU.
- Size: These individual areas range in size from 1 acre to 600 acres.
- **State/County Jurisdictions:** Tennessee, Stewart County; Kentucky, Trigg and Lyon Counties.
- Elevation Range: 330 to 650 feet Above Sea Level (ASL)
- **Fuels:** Predominantly hardwood/pine litter (FM-8 / 9), however other fuels including mown/maintained areas, construction materials and hazardous materials are present.
- **Topography:** Gently rolling to steep, highly dissected hills
- Strategic and Measurable Management objectives specific to the FMU
 - Control 95% or higher of all wildland fires during initial attack within the first operational period. Aggressive use of all available resources is approved (including bulldozers) to achieve a response that quickly controls and extinguishes all ignitions that will impact the facility.
 - Design and implement prescribed fire and non-fire applications according to the management plan for each facility (or reference the Facility Master Plan) to improve scenery, improve forest health, and to reduce the risk of fire spread to or from the facility.
- Management Constraints or Criteria Affecting Operational Implementation
 - Incident Commanders may adopt a less aggressive response if seasonality and visitation warrant, or if protection of facility/facility resources can be accomplished with less aggressive response.
 - Ensure that potential facility evacuation is considered as part of the initial attack plan.
 - Ensure that facility and vicinity traffic control is considered as part of the initial attack plan.
 - Ensure there are no unacceptable impacts to cultural resources or threatened and endangered (T&E) species because of aggressive initial attack.
 - Ensure socio-political and economic impacts are considered, including unacceptable smoke impacts to facilities and off-site areas.

Core Area FMU

- **Description:** This FMU is designed to recognize areas that serve as controls in comparative management and, in most cases have little to no management disturbance. Core Areas provide remote, semi-primitive recreational opportunities that have minimal impacts to ecological systems.
- **Size:** All blocks of core = approximately 41,800 acres

- **State/County Jurisdictions:** Kentucky, Lyon and Trigg Counties; Tennessee, Stewart County
- Elevation Range: 330 to 650 feet ASL
- **Fuels:** Predominantly hardwood/pine litter (FM-8 / 9)
- **Topography:** Gently rolling to steep, highly dissected hills
- Strategic and Measurable Management objectives specific to the FMU
 - Control strategies within Core Area prescriptions will be limited to the minimum necessary level to contain wildfires.
 - Incident Commanders should work in coordination with the Heritage Program Manager and the Area Supervisor to set management objectives.
- Management Constraints or Criteria Affecting Operational Implementation
 - Incident Commanders should adopt a less aggressive response and choose MIST tactics without compromising public and firefighter safety.
 - Ensure that vicinity traffic control is considered as part of the initial attack plan.
 - Ensure there are no unacceptable impacts to cultural resources or T&E species because of the chosen response.
 - Ensure socio-political and economic impacts are considered, including unacceptable smoke impacts to off-site areas.

General Forest FMU

- **Description:** This FMU is designed to recognize the role of fire in shaping and maintaining Western Highland Rim and Southern Interior Low Plateau ecosystems. Additionally, fire management in this FMU will recognize the detrimental environmental impacts of excessive mechanized fire suppression and subsequent impacts to dispersed reaction.
 - During some portions of the fire season there is a significant increase in LBL's dispersed visitation (spring turkey hunting season and fall deer archery hunting season). Public and firefighter safety and protection of seasonally present private assets (privately owned resources such as recreational vehicles campers, and tent-camps), is a critical concern in this FMU.
 - Some areas in this FMU, primarily open chestnut oak stands, have exhibited often-extreme fire behavior, which is highly resistant to direct and parallel attack.
- Size: Approximately 120,000 acres
- State / County Jurisdictions: Tennessee, Stewart County: Kentucky, Trigg and Lyon Counties.
- **Fuels:** Predominantly hardwood/pine litter (FM-8 / 9), however other fuels including mown/maintained areas, croplands, and tall-grass (FM-3).
- Topography: Gently rolling to step, highly dissected hills.
- Strategic and Measurable Management Objectives Specific to the FMU
 - Select and implement an appropriate strategy within the first operational period. Confinement within existing barriers to fire spread is the preferred strategy in this FMU.

- Design and implement prescribed fire and non-fire applications according to project specific planning documents, consistent with the LRMP. Oak-Grassland, Nature Watch, and the Devils Backbone Core Area are priority treatment areas.
- All prescribed fire and non-fire applications are designed to improve FRCC, consistent with the LRMP.
- Management Constraints or Criteria Affecting Operational Implementation
 - Incident Commanders may adopt a more aggressive management response if seasonality and visitation warrant, or if fire spread and/or smoke threatens to cause unacceptable impacts to facilities or other special uses (such as special events, gatherings, and holiday weekends).
 - Ensure cultural resources and T&E species values are considered as part of the management strategy (protection of eagle nest sites and cemeteries during confinement strategy for example).
 - Ensure socio-political and economic impacts are considered, including unacceptable smoke impacts to on-site and off-site areas.

Stewart County Tennessee WUI FMU

- **Description:** This FMU is designed to recognize the increased hazard of concentrated human populations and their investments along LBL's forest boundary. This FMU is a high priority protection area. Public and firefighter safety and protection of private assets and public resources (infrastructure) is a critical concern in this FMU.
- **Size:** Approximately 10,000 acres
- State/County Jurisdictions: Tennessee, Stewart County
- Elevation Range: 330 to 650 feet ASL
- **Fuels:** Predominantly hardwood/pine litter (FM-8 / 9)
- **Topography:** Gently rolling to steep, highly dissected hills
- Strategic and Measurable Management objectives specific to the FMU
 - Control 95% or higher of all wildland fires during initial attack within the first operational period. Aggressive use of all available resources is approved (including bulldozers) to achieve a response that quickly controls and extinguishes all ignitions, even in Core Areas, that may affect private lands.
 - Incident Commanders should work in coordination with FS Law Enforcement and responding outside resources such as: Tennessee Division of Forestry and Stewart County Volunteer Fire Service.
- Management Constraints or Criteria Affecting Operational Implementation
 - Incident Commanders may adopt a less aggressive response if seasonality and fire behavior warrant, or if protection of residential property may be accomplished with a less aggressive response.
 - Ensure that potential residential evacuation is considered as part of the initial attack plan and coordinate with Stewart County officials.
 - Ensure that vicinity traffic control is considered as part of the initial attack plan.
 - Ensure there are no unacceptable impacts to cultural resources or T&E species because of aggressive initial attack.
 - Ensure socio-political and economic impacts are considered, including unacceptable smoke impacts to off-site areas.

3.2.3. FMU Characteristics (For All FMU's)

3.2.3.1. Safety

- There is a high potential for unknowing visitors to be in the area. Ensure public notification and evacuation of these visitors from the wildfire boundaries.
- Numerous recreation special use permits occur on LBL. Participants may need to be notified/evacuated during a wildfire.
- Access/Egress-numerous dead end two-track roads with loose gravel, blind corners and some that become impassible with wet-weather conditions.
- Numerous old home-sites occur on the NRA. Hazards include; wells, fences, possible haz-mat, and others.
- Lakeshores provide steep drops and possible haz-mat due to rising and lowering of the lakes.
- Numerous back-country camping areas are present and should be evacuated during beginning stages of a wildfire.
- Potential need for traffic control on all incidents due to high visitation on LBL.
- Possible evacuation of public from facilities and in WUI areas. Coordinate with FS LE&I and outside law enforcement.
- Rattlesnakes, bees, wasps, hornets, ticks.
- Numerous hunting seasons occur in the fall and spring seasons.
- Aviation Hazards
 - Power-lines
 - Communication Sites
 - Numerous military (Fort Campbell) aircraft
- Numerous snags and storm-damaged areas occur throughout the NRA.
- High volume of traffic on highway 68/80

3.2.3.2. Physical

• Local Description:

- The LBL is bounded by water on three sides; Kentucky Lake to the west, Lake Barkley to the east and a connector canal to the north. Hwy 79 in Tennessee makes up the majority of the south boundary except along the WUI areas. The nearest communities include Aurora, Canton, and Grand Rivers in Kentucky and Dover in Tennessee.

• Detailed Southern Boundary Description:

- LBL's boundary begins at Kentucky Lake and follows Hwy 79 east. LBL's boundary heads north approximately 1 mile west of Old Hwy 76 road. This road will connect to Hidden Valley road which dead ends at the boundary. LBL's boundary runs northeast from this location and crosses Boyd road and then the Trace. The boundary continues in a northeasterly direction until it reaches Happy Hollow and Cow Creek roads. LBL's boundary continues east until it reaches Lake Barkley. Hidden Valley, Boyd, Happy Hollow and Cow Creek roads all include WUI areas of concern.
- There is a small piece of FS property that is on the south side of Highway 79 in Stewart County, TN. (See map in Ch. 3.2)

• Topography

- Terrain on LBL is highly dissected. In general, low rising but steep ridge systems dominate the landscape. This topographic roughness is most prevalent in a zone south of Sugar Bay Lake Access, east of the Trace and extends to LBL's southern boundary at Hwy. 79. This zone has a high density of chestnut oak
- Elevation - 330
 - 330 to 650 feet ASL
- Soils
 - Generally, most soils in LBL are derived from limestone, gravelly coastal plain residuum, or from combinations with Pleistocene loess. Many of the soils derived from underlying parent material are typically low in nutrients. Based on the dissected nature of the topography, erosion over a long period had a major impact on the processes of soil formation on the ridge tops and upland slopes. The most common upland soils are of six types: Baxter, Bodine, Brandon, Hammack, Lax, and Saffell. In LBL, soils are so closely interspersed that they are most often mapped as soil complexes or combinations.
 - Soil productivity is a primary concern. Conditions that can influence soil productivity include soil type, aspect, erosion potential, nutrient composition, and past land use. Severe wildland forest fires and other natural and anthropogenic activities can reduce soil productivity.
- Air Quality
 - Class I Airsheds
 - None
 - Residential Areas and Communities
 - Aurora, KY
 - Fairdealing, KY
 - Draffenville, KY
 - Grand Rivers, KY
 - Eddyville, KY
 - Kuttawa, KY
 - Confederate, KY
 - Rockcastle, KY
 - Blue Spring, KY
 - Canton, KY
 - Cadiz, KY
 - Bumpus Mills, TN
 - Dover, TN
 - Transportation Corridors on LBL
 - Highway 453- (Trace) on LBL
 - Highway 68/80- on LBL
 - Highway 79-Southern Boundary of LBL
 - Interstate 24-To the North and the East of LBL

3.2.3.3. Biological

Vegetation

 Vegetation on LBL is predominately-dry upland oak-hickory forest that gives way to mesophytic and riparian stands in the lower elevations. The forest contains multiple stands of planted loblolly pine and some native short leaf pine mostly in the southern portion of NRA. The NRA also contains patches of tall grass covered openlands and agricultural fields.

• Agricultural Fields/Row Crops

- Special use permittees and farmers shall be contacted immediately to protect lives, crops, buildings, equipment, anhydrous tanks, crops, etc.
- Contact Openlands Coordinator; Elizabeth Raikes at 270-924-2062 to inform these permit holders.

• Timber Management Areas

- Consider timber harvest areas that are both planned and ongoing. Contact Timber Shop; Dennis Wilson at 270-924-2070.
- Wildlife Habitats: Not likely to adversely affect populations.
- **Research Areas:** Protect research equipment, (cameras, mobile weather stations), typically in the Oak-Grassland Areas and on the north end of LBL.
- Sensitive Species: Not likely to cause a trend towards federal listing.
- Flowering Plants: Not likely to cause a trend towards federal listing.
- **Birds:** Not likely to negatively impact populations.
- Mammals: Not likely to negatively affect populations.
- **Fish:** Prevent siltation in lakes and streams.
- **Invertebrates:** Not likely to adversely affect populations.
- Amphibians: Not likely to adversely affect populations.
- Threatened/endangered Species:
 - See FWS 2009-B-0084 Biological Opinion.
 - Tobaccoport Cave is a smoke sensitive target for T&E bats.
 - Protect Pisgah and Mammoth Furnace Price's Potato Bean sites from fire.
 - For more information on wildlife, T&E Species or other related topics above, Contact the Wildlife Shop- Steve Bloemer at 270-924-2069 or Elizabeth Raikes at 270-924-2062.

3.2.3.4. Resources

• Cultural:

Cultural resource sensitivity for LBL is moderate to high. There are numerous sites and cemeteries throughout LBL. Contact the Heritage Program Manager via dispatch during the wildfire size-up to determine if there are any cemeteries and/or wooden structures in the immediate area. Reference the Heritage Programmatic Agreement for further details.

- Protect known sites/cemeteries having provided for firefighter/public safety first.
- If safe, utilize Resource Advisor ahead of any dozer-lines.

- Ensure Resource Advisor walks all created dozer-lines before rehabilitation of dozer-lines.
- Ensure the Heritage Program Manager gets a record of the final wildfire report/shapefile
- Contact Heritage Program Manager- Jamie Bennett at 270-994-2975

• Recreation:

- Extensive recreation occurs on the NRA
- Dispersed and Developed camping
- Picnicking
- Geo-caching
- OHV use in Turkey Bay
- Equestrian use
- Hiking/Biking Trails
- Numerous Boat Launches
- Scenic Driving
- Wildlife viewing
- Hunting
 - o Quota
 - o Non-Quota
 - Contact: Steve Bloemer at 270-924-2069

• Indentified Infrastructure:

- North Welcome
- Three Fire Towers
- Murray State University Acid Rain Monitoring Compound
- Twin Lakes Campground
- Demumbers Bay Campground
- Smith Bay Campground
- Taylor Bay Campground
- Sugar Bay Campground
- Golden Pond Rifle Range
- Devil's Elbow Fishing Access and Boat Ramp
- Redd Hollow Campground
- Neville Bay Campground
- Hillman Ferry Campground
- Moss Creek Day Use Area
- Gatlin Point Campground
- Energy Dam Fishing Access and Boat Ramp
- Pisgah Point Campground
- Craven's Bay Campground
- Woodlands Nature Station-other Nature Watch Buildings
- Energy Lake Campground

- Birmingham Ferry Campground
- Fenton Campground
- Elk and Bison Prairie
- Visitor Center
- Admin Building
- LBLA and Maintenance complex
- Turkey Bay OHV
- Wrangler's Campground
- Colson Hollow Group Camp
- The Homeplace
- South Bison Range
- Brandon Spring Group Campground
- South Welcome
- Boswell Landing
- Piney Campground
- Intern Village
- Trace Picnic Stops-Star Camp, Jenny Ridge, Colson Overlook and Cedar Pond
- Farmers' equipment storage-Turkey Creek and near Maintenance Area
- Communication Sites
 - WKMS Tower
 - Kentucky Highway Dept Tower and Building
 - American Tower (Private)
 - Golden Pond Tower
 - TVA Model Tower
- Pipelines and Power-line corridors
 - Transcanada-natural gas pipe-line- Ph# 731-571-5303
 - TVA-Power-lines-Ph# 270-887-8455
 - Pennyrile Power-lines-Ph# 270-522-6678
 - Cumberland Electric-Ph# 931-645-3476
 - TVA Substation-Ph# 270-887-8455
 - AT&T Fiber-optic line-Ph# 800-752-6007

3.2.4. FMU Fire Enviroment

This FMU as a whole is classed as Fire Regime 1 Condition Class 3 with a small percentage being in either Condition Class 2 or 1. Areas in Condition Class 2 and 1 are cove hardwood drainage areas and dry ridges.

3.2.4.1. Fire Behavior

LBL's fire behavior ranges from the most benign to the most extreme. Frontal passage is the primary factor influencing extreme fire behavior. During these frontal passages, high winds and low relative humidity typically produce flame lengths from 4 to 10 feet, especially along lakeshores and in chestnut oak forest types. These fronts also contribute ignition sources in the form of "sleeper" lightning strikes that smolder for as long as three days before igniting a surface fire. Drought also plays a role in fire behavior primarily by increasing residence time, difficulty to contain, and spotting distance. A Keetch-Byram Drought Index measurement of 600 or higher is considered hazardous.

• Fuel Conditions in the FMU likely to influence fire behavior:

-Due to the ice storm that hit the FMU in January of 2009, the Kentucky portion of the FMU will experience extreme fire behavior, especially during periods of drought and low 1,000 hr fuels moistures. These higher fuel loadings begin at the Tennessee/Kentucky state line and conditions worsen as you go north to the canal. Some areas of the FMU are dominated by native tall-grass (FBPS-FM2 and FM3). This is an explosive fuel type that is heavily influenced by wind and humidity. Extreme fire behavior can be expected in this fuel type.

• Potential Control Problems:

-Moderate to heavy fuel loadings in many of the forested areas
-Debris piles along narrow roads through the Kentucky portion of the FMU.
-Lake effect winds
-ERC above 30
-BI above 38
-Old home sites and cemeteries are numerous throughout the FMU
-WUI areas on the south end of the FMU
-Numerous facilities on the FMU
-Intense recreation on the FMU
-Chestnut oak is a "watch-out" species on the unit. Usually occurs on dry ridge tops.

3.2.4.2. Weather

• Weather patterns influencing fire behavior and historical weather analysis:

Weather on the NRA can vary dramatically from year to year but the dominant weather pattern that influences the fire danger and fire behavior on the NRA is frontal passage. Prior to and during a frontal passage high winds and low humidity levels greatly influence rates of spread, spotting problems and ignition. At times dry fronts (or fronts which produce little precipitation) cause abundant dry lightning strikes. -The climate is warm during spring, summer and fall seasons with average temperatures in the 70's and very cold during winter months when temperatures tend to be in the 30's.

-The warmest month of the year is July with an average maximum temperature of 90 degrees Fahrenheit, while the coldest month of the year is January with an average minimum temperature of 25 degrees Fahrenheit.

-Temperature variations between night and day tend to be moderate during summer with a difference that can reach 22 degrees Fahrenheit, and moderate during winter with an average difference of 20 degrees Fahrenheit.

-The annual average precipitation is 51.70 Inches. Rainfall in is evenly distributed throughout the year. The wettest month of the year is December with an average rainfall of 5.13 Inches.

-Highest ERC's are usually seen in May (average 29 to 40) and November (average 41 to 48).

-During periods of drought, the FMO will work with state and county officials in issuing restrictions of campfires to fire rings inside developed campgrounds or complete burn bans, throughout the NRA.

• Fire Season Determination:

LBL's fire season runs generally from October 15 through May 1. There is a typical lull in activity through the months of December and January, but fires are still possible. LBL has also experienced fires outside this typical season; however, these events are usually dependent upon drought conditions and climate change.