WISCONSIN DIVISION OF FORESTRY
WILDLAND FIRE MANAGEMENT PROGRAM ASSESSMENT
MARCH, 2010

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Foreword

The Fire Program Assessment that is a comprehensive review of a key program in the Division of Forestry's overall strategy to protect and sustainably manage forests in Wisconsin. Amid much change since the program was last evaluated in the early 90's, the effort acknowledges shifts -- social, economic and ecological -- in values related to Wisconsin's forests and the people whose lives and property we are tasked with protecting. The forests themselves are changing, and both partner and technological capabilities are growing, compelling us to take a fresh look at the program.

The group that was brought together to manage the assessment operated on an aggressive timeline, considering all the assessment was asked to accomplish. Their work began last summer with extensive efforts to gather input from all those with an interest in the fire program, including numerous external partners and cooperators. Many chose to share their perspectives, and that input was crucial to developing informed, pertinent conclusions.

The Forestry Leadership Team established a Fire Program Assessment Team consisting of 12 people. The Work Groups that assisted with specific aspects of the effort involved several dozen more staff. Although those were the only staff with direct responsibilities for the assessment, many others made contributions to the effort. Many staff took the time and made the effort to provide their thoughts to the team through the various surveys and cafes used during the process.

I want to thank all those who participated in the assessment. I'm particularly appreciative of the Fire Program Assessment Team for their investment of significant time and energy over the last nine months. The push to complete this work before Spring fire season has been realized due to their determined efforts.

The recommendations here will be reviewed and discussed by the Forestry Leadership Team. This work will feed into the upcoming forestry program alignment effort that will be initiated in the next few months. That effort will help the Division align our human and fiscal resources to maximize our ability to protect and sustainably manage Wisconsin's forests well into the future.

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Acknowledgements

A well crafted charge from Division Leadership provided a sound basis for the establishment of an effective assessment team, and set the stage for a focused and thorough review.

Appreciation needs to be extended throughout the Division of Forestry (DOF). Beyond the Fire Program Assessment Team (FPAT), there were also forty+ additional folks that did the hard discipline-specific labor required of the Work Groups (WG). That output was needed on a very short time schedule and the extra effort put in by the members of those groups on short notice was crucial to the development of a quality assessment.

Even more broadly, most in the Division did respond, in some way, to the needs created by the assessment. Some contributed information or background specifically requested by the Assessment team or one (or more) of the Work Groups. But almost everyone responded to at least one of the surveys or cafés that were conducted through the summer and fall, and contributed critical input as to program effectiveness, and the things that work on the ground. Those contributions provided the broad background that contributed to a comprehensive review of the fire program.

Additionally, almost everyone felt the effects of the "partial absences" of those directly involved in the study, whose time was diverted to the demands of the assessment. Work load shifted, and those that were not directly involved picked up the pieces and made sure that the essential work and services of the Division were completed.

Thanks to all who made extra efforts to assure that the Wisconsin Division of Forestry continues to provide the best service possible to the people of the state of Wisconsin.

Much appreciation is also due to Wisconsin's counties for their willingness to share a wealth of information about their property valuation and improvement information, which made the improvements perspective of the risk assessment possible.

SUMMARY

In summer of 2009, a team was assembled to assess the Wildland Fire Management Program, an effort to be completed by March of 2010. Employing eight different subject oriented Work Groups, the team conducted a series of information gathering efforts in late summer to gain insight input from throughout the Division of Forestry and from key partners.

As a result of the assessment team's work, a number of changes in the approach to the fire program were identified. While there are many priority recommendations identified at the beginning of Chapter 2, these items provide a big-picture overview of key program impacts proposed here.

- Fire program activity levels should be established based on Fire Landscapes (FL). The 16 landscapes identified are based on physical characteristics on the ground and property-based characteristics associated with development.

- 76 tractor plows are recommended to be based in the field, with one cache unit based in Tomahawk. Currently, there are 76 units assigned to the field, and four cache units, 3 of which are assigned to the field. Additionally, 2 heavy dozers and 4 low ground (marsh) units should be assigned to the field.

- A specific full time equivalent (FTE) position should be assigned to each tractor plow, heavy dozer and low ground unit to assure their availability. Presently, some units are staffed by backup operators or partners to be identified at the time of need. Using this approach provides the depth presently being met by backup operators.

- 53 Type 6 engines and 60 Type 8 engines are recommended for assignment to the field, each with a specifically identified individual associated with it. The Type 6s should be staffed by initial attack rangers linked to a fire response unit. 29 specifically identified staff should be assigned to the Type 8 engines, including 22 team leaders, and 3 Bureau of Forest Protection staff. The remaining 31 Type 8s would be linked to staff yet to be identified.

- Four cooperative area rangers, using Type 8 engines, are proposes to be assigned responsibilities in parts of the present cooperative area. These should be positions focusing on various activities in the cooperative area, but available to help with fire needs in landscapes where the Division has initial attack responsibility.

- A specific field based FTE workload associated with Wildland Urban Interface (WUI) needs was identified for the four highest risk landscapes. Two landscapes involve a full FTE of work and two involve .5 FTE of work. The staff assigned to accomplish this should have no less than 50% of their position involved with WUI work.

- Some fire landscapes not presently in organized protection areas were identified as having wildland fire risk as high or higher than some areas for which we presently have initial attack protection responsibilities. In those areas, the Division would support efforts to bring about legislative change to adjust boundaries between Department of Natural Resources (DNR) organized protection and cooperative areas, if requested by local government.

- Funding needs to be provided for key program areas now largely dependent on diminishing federal grant funding. Specifically identified was fire prevention and WUI related activities.

- There are some areas where there should be exploration of opportunities to share responsibility with external partners to a greater extent than is currently the case. For example, fire departments may provide help with prevention efforts and Home Ignition Zone (HIZ) assessments.

- It is recommended that a number of key program areas, identified at the end of Chapter 2, be examined further in the near future. Those areas could not be properly studied with in the time frame allowed for this assessment.

Another peripheral product of the study is the establishment of a group that will develop a mechanism to look comprehensively at workload across the Wildland Fire Management Program. The product of this group's effort will identify total workload throughout the fire program across the landscapes. When the same process has taken place for other forestry disciplines, it will facilitate assembling staffing recommendations, by location and landscape, to meet the overall workload.

CHAPTER 1

Introduction and Background

The mission of the Division of Forestry is to work in partnership to protect and sustainably manage Wisconsin's forest ecosystems to supply a wide range of ecological, economic, and social benefits for present and future generations.

Within the 2009-11 biennium, the Forest Leadership Team (FLT) will be examining how Division resources are aligned with mission, niche and workload throughout the entire division. This is due to a number of factors.

- The work the Division needs to do to meet objectives has changed and will continue to do so.
- The extent and composition of the forest is changing, as is the location of human dwellings and their value in relation to our forests.
- There have been changes in how Wisconsin's forests contribute to economic, ecological, and social values.
- Opportunities and customer expectations resulting from advances in technology continue to evolve.
- A large number of vacancies will soon occur, many due to retirement, which will provide opportunities to shift positions while minimally impacting remaining staff.
- The capabilities of natural resource external partners are changing.
- Many partnerships have been, and continue to be, significantly enhanced.
- There is increasing public and legislative scrutiny of the work the Division does.

As a result, the Division will need to be able to demonstrate the make-up and importance of their work, why Division resources are best suited to accomplish that work, and ensure that they are accomplishing that work as efficiently and effectively as possible.

The Wildland Fire Management Program is an integral part of accomplishing the Division of Forestry's mission. It plays a key role in the sustainable management of forest resources, through early detection and rapid initial attack to limit the damage caused by wildfire, as well as preventing such damage, and performs a vital service to protect public health and safety.

Other aspects of the Division's forestry programs have been assessed in recent years, and have relatively current information on the pertinence and efficacy of their programs. The Fire Program, which involves more than a quarter of the Division's forestry budget, has not been reviewed since the early 90's. Many changes have taken place since then and the activities the Division needs to undertake to meet the mission of the Wildland Fire Management Program need to be addressed in response to those changes.

The Fire Program Assessment was undertaken to take a broad overview of the Fire Program in light of changes that have taken place in the fire landscape over the past twenty years. Those changes have been multifaceted, involving both natural changes in cover types, and changes wrought by human behavior, the most significant related to building and home development activities in previously unimproved and wild lands. These changes have significant implications on the response capability needed to meet the statutory charge to the Division. Further, the current economic environment has created new pressures on the prioritization and distribution of resources within the spectrum of forestry activities. As such, it is

essential to reassess the efficacy of the resources deployed for the purpose of managing the threat from wildland fire in Wisconsin.

Purpose and Objectives

The purpose of this effort is to determine how to allocate the Wildland Fire Programs limited resources to best meet the mission of protecting life, property and natural resources from wildfire throughout Wisconsin. The main objectives were to -

1. Provide for the health and safety of our employees and general public by keeping this as the top priority in all assessment considerations.

2. Describe public and forest protection needs/risks in Wisconsin.

3. Explain how public and forest protection needs can best be met if program funding were to

    a. remain the same,

    b. increase 10% and 20%,

    c. decrease 10% and 20%,

    considering the Department's role, role of partners, and various resource allocations.

4. Evaluate ways to increase efficiencies and effectiveness in the fire program, including utilization of new technology, use of resources (staffing standards), infrastructure and appropriate fire suppression equipment mix.

5. Identify any changes needed to current statutes, policies, agreements, and operational procedures.

6. Complete a Fire Program Assessment, providing a final report by March 7, 2010.

A number of items were specifically identified as not needing to be addressed by this assessment, because of very recent studies or reviews. Included in this group -

- Protective status
- Quals/ National Wildfire Coordinating Group (NWCG) requirements
- Out of state fire assistance
- Training needs
- Physical fitness requirements
- Work/rest guidelines
- Law Enforcement

Organization

The contents of this report are organized to familiarize the reader with the process that took place in the development of the recommendations. Provided in Chapter 1 is background information about what led to the decision to conduct the assessment. The purpose of the assessment and the objectives it is designed to meet are laid out. The approach to the assessment and the mechanisms employed to gain information and look at components of the program are discussed, as well as the methodology used to analyze and process that information and arrive at conclusions.

Chapter 2 presents conclusions that have relevance across the state. Recommendations may be here because they involve activities that occur across much or all of the state (e. g., burning permit issuance). Others relate to policy or process that is not specifically associated with a particular location (e. g., statutory changes).

Chapter 3 addresses the allocation of specific resources to specific landscapes throughout the state. The proposed distribution of the resources that comprise the core of fire program related expenditures, our on-the-ground suppression equipment and the people that staff it, are identified here. Other staffing needs are addressed here, as are the extent and nature of programmatic commitment to specific program areas (e. g., school programs).

Chapter 4 addresses what changes would be proposed in the Fire Program if budgetary funding were either to be increased or decreased. If additional funding becomes available, what new initiatives or additions to our current program would most significantly enhance the capacity for the Wildland Fire Program to accomplish its mission? Correspondingly, if we had to cut components of the recommended program based on current allocations, which of those would least impair our capability to meet program objectives?

Lastly, the appendices provide some information guides that will be helpful to the reader going through the report. Also included here are links to the reports generated by the Work Groups. These reports further illuminate the thought processes that went into the recommendations at a level impossible to incorporate into the body of this report.

Methodology

One of the challenges at the outset was how to effectively approach such a large task as "assessing the Fire Program", and doing so in such a short period of time. To be successful and reasonably well received, it was imperative that a great deal of information and thinking had to be gathered from the far flung and disparate ends of the state. Conditions, circumstances and situations vary greatly across the state. Still, it was essential to identify ways to function that allow for maximum geographic versatility. To do that, we needed to understand and have input from throughout the state.

So as mentioned before, the approach settled on was to begin with two distinct decisions. First, we identified a series of opportunities and mechanisms to provide the opportunity for all forestry staff to provide their input into the process. Critical partners also had the opportunity to provide input. There were, among the mechanisms to gain input -

- Web based survey for all forestry staff, as well as some external partners
- Café-style discussion at Ranger Recert
- Meetings by Dispatch Group with Forestry Technicians and Dispatchers
- Café-style discussion at Forestry Operations Team (FOT), Forestry Leadership Team (FLT), and Team Leader meetings
- Fire Department Advisory Council discussions
- Fire Department survey
- Discussions with internal partners
- Requests for info from partner federal agencies in Wisconsin
- Discussion with fire program partners from other states.
- Fire prevention and wildland-urban interface (WUI) survey
- Numerous other less formal discussions

The second initial decision was to distribute the workload associated with the nuts and bolts of the reviewing and looking into specific aspects of the fire program to Work Groups. Each group was comprised of 6-8 personnel, including representative field staff and appropriate staff specialists, plus a representative from FPAT, to act as liaison between the Work Group and FPAT. Those Work Groups reviewed the input from the survey/café processes and looked at the needs associated with their part of the program. Once complete, they each developed a report which included recommendations for the most effective allocation of resources in their program area. They were asked to make specific recommendations for a climate of increased funding or decreased funding. In some, but not all cases, they provided costs associated with their recommendations.

Unique among the work groups was the Stratification Work Group. They looked at how to approach the differentiation of wildland fire risk levels, on the ground, across the state. It was determined that the product of the Stratification Work Group needed to be accomplished to facilitate the work of the other Work Groups. Therefore, the Stratification Work Group was given a short deadline to complete their work at the outset of the effort. In September, 2009, they provided their results. Fire landscapes were identified as the mechanism to assess differing needs across the state.

Once that basis for work was completed, the remaining Work Groups proceeded with their efforts, assessing their subject area in terms of the various needs of the landscapes. They completed their initial efforts and provided the first version of there reports and recommendations in December, 2009.

FPAT reviewed the Work Group reports and, where necessary, requested clarifications. They also distinguished recommendations between statewide ones and those associated with specific landscapes.

Equipment and personnel allocations were decided on, as were other position related decisions. Statewide recommendations were reviewed and approved, set aside, or identified for further exploration in the near future, but after the assessment. Those approved were moved into the "package" of current funding level allocations.

The level of investment in the fire program was determined, separating out those costs that are fire program specific from those that are integrated, such as supervision. An operating number of $12 million was identified as the current level of investment to be used for this assessment.

As FPAT considered the recommendations from the various Work Groups, and built the package to fulfill a current funding allocation, items were costed out. The overall collection of recommendations was discussed and adjusted to fall into the $12 million level that comprises the current allocation.

SUPPRESSION RESOURCE AND PERSONNEL FORMULA

One aspect of the process, though somewhat complex, is of sufficient importance to merit some separate discussion.

One of the first biggest challenges of FPAT, after receiving recommendations from the Work Groups, was to reconcile equipment and personnel recommendations related to fire suppression staffing. The Suppression Work Group made recommendations on equipment placement and the Command & Control Work Group made recommendations on personnel location, and the two recommendations didn't correlate. As equipment and the personnel needed to staff it must fit together, discussion ensued to identify specific allocations that would reconcile the two sets of recommendations. To understand how this reconciliation was done, it is important to discuss the methodology the Work Groups used to make their recommendations.

At the outset, working together, the Suppression and Command & Control Work Groups developed a formula to allocate heavy units. The formula, though complicated, was based on the fire risk in a given landscape, and a flame length coefficient based on the predominant fuels in the landscape. Using the size of a landscape and the risk associated with that landscape, a raw number of tractor plows needed to protect each landscape was identified. This included at least one tractor plow in each landscape. At that point, both Work Groups, working independently of each other, applied a judgment factor to reallocate some of the tractor plows (and technicians) from lower risk landscapes to higher risk landscapes. Additionally, the Suppression Work Group added in the remaining tractor plows currently in the field but which were not included in the total identified by the formula. It was the difference in allocation from Suppression Work Group, expressed as tractor plows, and the Command & Control Work Group, expressed as forestry techs, that had to be worked through and reconciled by FPAT.

It is important to understand that there were differences in approach between the two Work Groups that accounted for the variations in their recommendations. For example, the Suppression Work Group allocated units in landscapes, regardless of whether or not there currently are facilities in those landscapes to house the equipment. The Command and Control Work Group did not allocate to landscapes without facilities, but provided for that protection by accounting for units in adjacent landscapes to meet those needs. For example, in column C of the chart below, Suppression Work Group shows 20 units in FL 4 and 3 units in FL 11. In column D, Command and Control shows no units in FL 11, but shows 23 units in FL, 3 more than Suppression Work Group. In essence, they agree on the equipment needed to address the needs of the two landscapes, but accounted for it differently.

The following table indicates, sequentially, the various manifestations of allocation through the process.

Table 1A: Tractor Plow/Forest Technician Allocation Evolution

A.	B.	C.	D.	E.
Fire Landscape	**Original Formula = Tractor Plows and Forestry Technicians**	**Original Formula + Extra Units + Professional Judgment = Tractor Plows (Suppression WG)**	**Original Formula + Professional Judgment = Forest Technicians (Command and Control WG)**	**Final FPAT Recommendations**
1	1	0	0	0
2	3	0	0	0
3	4	4	3	3
4	14	20	23	23
5	1	1	1	1
6	2	2	2	2
7	7	8	7	7
8	11	13	10	10
9	7	7	7	7
10	2	0	0	2
11	3	3	0	0
12	1	0	0	0
13	2	4	3	3
14	2	1	2	2
15	11	14	14	14
16	2	2	2	2
LeMay	0	0	0	1
TOTAL	**73**	**79**	**74**	**77**

Aside from the tractor plows, it was decided that all heavy equipment, including low ground units and heavy dozers, needed to have an FTE position identified with them, to assure the capacity to staff them. So once those equipment needs were identified, positions followed, though they were not necessarily identified as having to be technicians.

Additional distinctions between these two Work Groups occurred in the area of Type 6 engines and Type 8 engines, on the part of Suppression, and rangers and other staff, on the part of Command and Control. Generally, the idea was to allocate Type 6s based on the allocation of tractor plows, using the historical standard of 1:2 (FL 4, 7, 15) or 1:1 (all others), depending on the area.

Ultimately, FPAT based the allocation of these units (and personnel) on the ratio-based formula, with some very limited alterations. The Type 8 allocation was based on a 1:1 ratio with Type 6s, to allow for the capacity to release initial attack Type 6 engines from lesser fire situations. Additional Type 8s were allocated for bureau rangers (3) and coop fire positions (4). For the field Type 8s, the personnel to staff them was not specifically identified, though team leaders would have Type 8s. The ranks of foresters would seem a logical source to staff many of the others, though those decisions are left to the implementation process.

FEDERAL LAND IN WISCONSIN

In determining how to assess the needs of federal land in Wisconsin, and how to factor in the availability of suppression resources federal agencies used, a consistent approach had to be identified. In the end, it was decided that any acreage for which a federal agency had suppression responsibility and resources (e. g., Chequamegon Nicolet National Forest (CNNF), Necedah Refuge) would not be considered, nor would that equipment figure into suppression staffing. On federal lands where the Division does have suppression responsibility, such as on certain BIA lands, those acres were included.

Regarding the Imbalance Agreement with the Forest Service on the CNNF, the acres involved were not factored in, as the exchange of protection areas is a virtual wash, acreage-wise. FPAT did not assess needs to smaller geographical areas than the fire landscape level, so the implication of the Imbalance Agreement on specific FRUs was not considered.

FIRE RESPONSE UNIT CONSIDERATIONS

FPAT did not look beyond the fire landscape. As such, any fire response unit (FRU) specific adjustments resulting from this assessment will be addressed during the implementation phase. One of the topics recommended for future discussion relates to softening or eliminating FRU boundaries.

Fire Landscapes

One of the most significant products generated by the Wildland Fire Program Assessment occurred near the beginning of the effort. Early on, the Stratification Work Group determined that the most effective way to identify and express the concept of fire suppression risk in Wisconsin was through the identification of distinct fire landscapes (see Figure A).

The process used to identify the 16 fire landscapes developed for the study is discussed in great detail in the Stratification Work Group's final report, which is linked in the appendix. Still, the concept is of such fundamental importance to the way the assessment was conducted that it merits brief discussion here.

Broadly, the team tried to assess some of the factors considered in the previous fire study from the early 1990s, to try to identify what had changed since then which would impact fire risk. They assessed a wide variety of data sources across a spectrum of features associated with the land. Many were rejected, because the data was older, the information was not available statewide, or because of some other complicating factor associated with the data. One of the factors rejected for distinguishing fire landscapes was historical fire occurrence, because data related to it is not available statewide. Later in the process, fire occurrence was considered, albeit on a different level for different purposes.

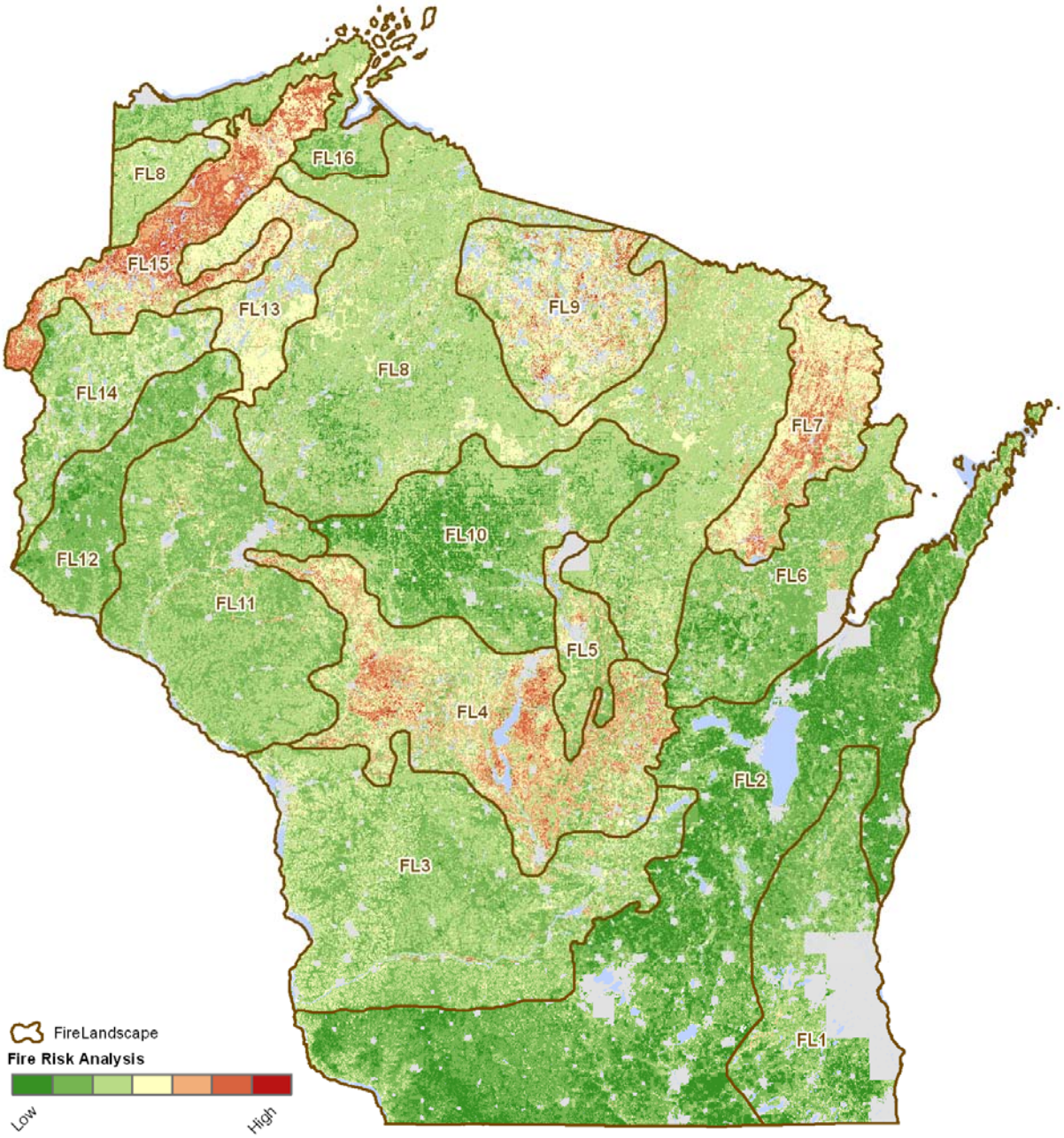
In the end, the Stratification WG wove together databases associated with five features to generate the fire landscape map for the state. Those features were -

- Vegetation
- Ecological Subsections
- Soils
- Land Parcel Improvement
- Forest Patch Size

Some of the landscapes are geographically large, and many are rather small. But their correlation with a sense of what fire managers and foresters see as reasonable distinctive divisions across the state is encouraging.

In and of itself, the fire landscape concept will not adjust the existing administrative boundaries. But it provides essential insight into the fire risk exposure from place to place on the ground. As some of the subject areas recommended for further review are assessed, and staffing recommendations are implemented as personnel changes occur, the variations associated with differences in landscapes will become more significant.

Figure A:
Fire Risk Analysis by WI Fire Landscape



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WI Department of Natural Resources
Division of Forestry
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CHAPTER 2

Statewide Recommendations

This chapter contains a variety of recommendation-oriented information, and its organization needs to be briefly addressed. Initially, there are some general observations that provide some context for understanding the process that led FPAT to these recommendations.

Following that are the recommendations themselves –

- Suppression Equipment
- Work Group Recommendations
  - Priority Recommendations
  - Other Important Recommendations
- Recommendations for Future Considerations

Understanding this will help with processing the information which follows

General Observations

Before addressing recommendations that impact across the state, it is important to mention some essential concepts that did not entail recommendations in and of themselves, but are underlying concepts or principles that guided the appraisal of the suggestions from the various Work Groups.

Of primary importance is the acknowledgement and endorsement of the idea that the Wildland Fire Management Program is dependent on ground based resources, early detection, and aggressive initial attack. This principle may be gleaned from the various recommendations, but it is such an essential guiding philosophy that it needs to be stated outright.

Also acknowledged is the issue of funding for support and operational expenses associated with staffing and equipment use. This support has deteriorated over the years as expenses have risen, forcing managers to make difficult and potentially counterproductive decisions about equipment use. Actual historical expense levels were used to cost equipment use, which will partly address the recent funding shortfall, and restoration of full cost support was high on the list of priorities, should funding increase. This need was not addressed exhaustively here, because it also applies to non-fire disciplines. But once the workload analysis process is complete, and FLT settles on staffing levels, support for personnel and equipment operating costs is essential, for both fire and forestry based programs.

As a result of the identification of value of using fire landscapes to identify need, previous terms used to identify and distinguish protection areas are largely obsolete. Intensive/extensive, levels of protection (LOP), and pine/hardwood references have very limited value. Intensive and extensive areas are referenced in statute and administrative code related to burning permit requirements, but have little relevance beyond that.

Pervasive in many of the needs and proposed applications is the need for sufficient information technology support. While there are some specific references, the need for web-based applications and databases, as well as information dissemination, has become the norm. It is essential that the Division be able to

support those efforts, as they improve efficiency, reduce cost of operations, and provide for better data to drive future management decisions.

Lastly, as the Fire Program grows leaner and more efficient, there is a growing need for staff to be increasingly flexible in what they do and the places across the state where they may be called to do it, as conditions change through a fire season. As such, there was a clear recognition of the underlying need for consistency of approach and application throughout the assessment. In some cases, it is expressed specifically, but in others it may be less apparent. But it is essential for staff to be familiar with organization and protocol wherever they may be asked to go across the state, and consistency of application is crucial for that to occur.

Recommendations

SUPPRESSION EQUIPMENT

Among the first of the broad recommendations to which FPAT directed its attention was the allocation of fire suppression resources across the state. The following table indicates optimal allocation with current resources across the state, by landscape, as identified by FPAT. These recommendations are also included in the landscape-by-landscape proposals in chapter 3.

Table 2A: FPAT Resource Allocation

Fire Landscape	Heavy Units	Type 6 Engines	Type 8 Engines	Low Ground Units	Comments
1	0	0	0		
2	0	0	2		2 Coop rangers w/8s
3	3	4	5	1	1 Coop ranger w/8
4	23	12	12	1	
5	1	1	1		
6	2	2	2		
7	7	4	4		
8	10	10	10		
9	7	6	6	1	
10	2	2	2		
11	0	0	1		1 coop ranger w/8
12	0	0	0		
13	3	2	2		
14	2	1	1		
15	14	7	7	1	
16	2	2	2		
LeMay, Bureau	1	0	3		Bureau rangers w/8s
TOTAL	**77**	**53**	**60**	**4**	

Further recommended is that for each piece of equipment, a specific position be identified with that equipment. That will more likely assure that when the need arises for the equipment, there will be an individual available, and familiar with the equipment, to provide for its safe operation and statewide mobilization. While the positions linked to specific equipment will be substantially similar to how it is done now (e. g., techs with heavy units), the approach to link a specific position with each of the 194 pieces of equipment shown will likely result in some different positions having dedicated fire responsibilities.

WORK GROUP RECOMMENDATIONS

After those broad observations, following is a listing of various recommendations with statewide implications approved by the Fire Program Assessment Team. The first group of recommendations listed is those which FPAT considered high priority. Each recommendation is listed, followed by a notation in parenthesis, which indicates the source of the recommendation.

CC – Command and Control Work Group
Comm/Disp – Communications and Dispatch Work Group
Det – Detection Work Group
E&E – Efficiency and Effectiveness Work Group
Fac – Facilities Work Group
WUI/Prev – WUI and Prevention Work Group
Supp – Suppression Work Group
FPAT – FPAT as a team

Following each priority recommendation is a sentence or two, *in italics,* regarding the thinking behind the priority nature of the recommendation.

Following that list is a long series of recommendations approved by FPAT which, though important, do not rise to the same priority as those listed in the first group. Notation is the same, but there is not an explanation following these. In some cases, the reason for the recommendation is apparent, but in any case, their background can be referenced in the Work Group report from which they originate.

It should be noted that other Work Group recommendations were not supported for implementation if they were out of the scope of the assessment, were local decisions or programmatic in nature, needed more consideration, or were not appropriate for the fire program at this time. All recommendations from Work Groups can be found in their reports, linked in the Appendix.

PRIORITY RECOMMENDATIONS

Command and Control Recommendations:

- **Adopt the fire landscape concept as the basis for stratification. (CC)**
  The fire landscape better correlates wildland fire related risk than any other assessment system discussed.
- **Adopt the Canadian Forest Fire Danger Rating System (CFFDRS) as the basis to determine fire staffing and preparedness levels in Wisconsin. (CC)**
  CFFDRS better identifies anticipated fire behaviour at higher fire danger levels, especially in more volatile fuels types.
- **Invest the time necessary to complete development of the staffing guide. (CC)**
  A more comprehensive and consistent approach to staffing, taking into consideration fire risk, will lead to better allocation of resources.
- **Adopt a statewide preparedness level concept as a means to assist in determining both daily fire staffing needs and statewide preparedness levels. (CC)**
  As greater geographic agility is required for a leaner staffing arrangement, a statewide staffing approach is more appropriate for preparedness.
- **Establish one "Type 3" incident management team (IMT) core short team (10-15 members) per area in organized protection for rapid response. Maintain a minimum of four regional expanded teams (10-15 additional members). (CC)**

This approach balances the need for a shorter team locally, while still providing for an expanded team for larger incidents in a region.

- **Expand organized protection in FL 14, 11, 3 if local political entities request it and it makes sense when all factors are considered. (CC)**

  Some areas of high fire risk were indentified in current coop areas. More robust involvement in the fire program there by our Wildland Fire Management Program would be appropriate, if local political bodies concur.

Communications & Dispatch Recommendations:

- **Allow Dispatch Centers to occasionally cover radio communications in another DG during periods of low or moderate fire potential and no detection. (Comm/Disp)**

  With our increased communications capacity resulting from technological advances, this arrangement will result in greater flexibility for dispatchers, allowing them to address other priority work.

- **Radio communication equipment should be on a planned replacement schedule as follows: (Comm/Disp)**
  - **Base Stations – 15 years**
  - **Dispatch Consoles – 12 years**
  - **Mobile Radios – 10 years**
  - **Portable Radios – 7 years**

  It is essential to keep our communications equipment current and operational. A systematic approach is the best way to assure that.

Detection Recommendations:

- **Fire Towers: Beginning in 2010, Staff 68 DNR-owned fire towers and 1 United States Forest Service (USFS) (Perkinstown) fire tower. (See Detection Work Group Report Appendix A, Map 3 for map of staffed and unstaffed towers.) (Det)**

  The established staffing plan for towers is appropriate and should be maintained.

- **Aerial Fire Detection: Utilize aerial resources for fire detection, but generally limit it's use to times when either: 1) fire towers are not staffed or do not exist, or; 2) burning conditions are very high or extreme, or; 3) special weather situations, such as following lightning storms, or; 4) to aid in pinpointing the location of smokes that have been difficult to locate otherwise. (Det)**

  The use of aerial fire detection resources is both essential and expensive, and must be used judiciously to maximize its contribution to the Wildland Fire Program.

Efficiency & Effectiveness Recommendations:

- **Co-op and Suppression Specialists to solicit input from Area Fire Staff and develop draft guidance for Bureau approval on fire department response, staffing, billing and co-op activity guidelines. (E&E)**

  These efforts would lead to a consistent and predetermined plan related to wildland fire response coordination with fire departments. That plan would be put into effect through a new Memorandum of Understanding to be executed with all cooperating fire departments.

- **Develop voluntary best management practices (BMPs) to reduce fire risk. (E&E)**
  - The BMPs could be developed by an ad hoc group consisting of members from the Fire Management, Prevention and Silviculture Specialist Teams or other experts.
  - Incorporate recommendations and BMPs into MFL template and transfer plans, as well as non-tax law stewardship plans. Once BMPs are developed they could be incorporated into the revised MFL template that will need to be further refined for use with WisFIRS.
  - Implement BMPs on state, county and tax law lands as soon as possible after development. This may require additional training of staff and consultants that work on those properties.

Identifying sound practices that will mitigate risk and which can be shared with all stakeholders will provide broad awareness and relief to fire risk.

Facilities Recommendations:

- **Utilize DNR Construction Representatives to conduct energy audits for facilities to find areas that can be improved to reduce utility costs. (Fac)**
  This is an easy and systematic way to reduce cost, saving resources for higher priority needs.
- **Create a standard template for layout and construction of ranger stations and warm storage buildings utilizing the most energy efficient construction materials and design to help counter balance maintenance and operational costs of ranger stations and warm storage buildings. (Fac)**
  Needs are consistent, within a narrow range, for all fire program facilities, and establishing a standard design will reduce cost and time associated with developing a new facility.

WUI/Prevention Recommendations:

- **Provide base funding for prevention program. (WUI/Prev)**
  Much of the funding for the prevention program comes from shrinking federal grant dollars. Base funding will provide a more sound foundation for the program, so as to better plan and anticipate meeting program prevention needs.
- **Three FTE's worth of time should be devoted to WUI specialist duties: 1 FTE in FL 4, 1 FTE in FL 15, .5 FTE in FL 7, and .5 FTE in FL 9 with no less than 50% WUI-related duties assigned to any one position. (WUI/Prev)**
  WUI related needs and the risk associated with WUI is growing and needs to be addressed in organized and consistent fashion. Having personnel in the highest risk landscapes with a significant focus on this need will enhance the effectiveness of our programs response.
- **Suspend all residential burning when fire danger reaches very high or extreme. Continue to utilize and suspend burning via WIS-BURN hotline & website during Very High & Extreme fire danger days as well as seek authority to suspend burning on Air Quality Advisory Days when burning permits are required. (WUI/Prev)**
  A consistent approach to burning based on fire danger levels and air quality concerns will better address wildland fire risk at the times it most urgently needs to be addressed.
- **Provide base funding for WUI related activities, specifically education/outreach, fuels reduction, and planning. (WUI/Prev)**
  Almost all the funding for WUI mitigation activities comes from shrinking federal grant dollars. Base funding will provide a more sound platform for the program, so as to better plan and anticipate meeting mitigation needs.
- **Switch to an ALIS-based burning permit system, phasing out the emergency fire warden (EFW) program as permit writers. (WUI/Prev)** (Note that there will be a $3 charge to the public for using ALIS. There would also be a free on-line option for the public. Switching to ALIS will pay for the call in number as well as result in some surplus for the prevention program.)
  The ALIS system is an established one, which citizens already use for various permit and license-related needs.

Suppression Recommendations:

- **The current allocation model for placement of equipment should be revised and based on fire landscape considerations as opposed to historical "pine" vs. "hardwood" or "levels of protection." Resources should be allocated throughout the state based on the fire landscape concept, utilizing a combination of a mathematical formula and professional fire manager judgment. (Supp)**
  The fire landscape model is the recommended approach to characterize wildland fire risk and is discussed more extensively in the Methodology section of the report.

- **Adopt Suppression Work Group change of investment recommendation #1 which calls for three statewide mobile hand tool/personal protective equipment (PPE) caches to be located in central, northeast, and northwest Wisconsin plus one in LeMay. Maintain normal operating station inventory and area pump caches. (FPAT/Supp)** Savings is $131,000 or $13,000 amortized annually over 10 years. FPAT chose a change of investment recommendation in the Suppression Work Group report rather than what the Work Group actually recommended to FPAT.

  With the increase in the numbers of trained and equipped firefighters, consolidation of existing tool caches is appropriate and results in a significant savings.

General Recommendations from Fire Program Assessment Team:

- **Adopt the Measures of Success document to provide direction to the fire program and work planning. (FPAT)**

  The Measures of Success document provides an excellent framework for assessing the efficacy of the fire program in the future.
- **Assign an Ad Hoc group to identify Fire Program work tasks, the time required to ordinarily complete the task and then determine the quantity of each task within each of the 16 fire landscapes. (FPAT)**

  This effort is essential to effectively evaluate workload in the Fire Program. A team has been identified and plans to have their work completed by the end of summer.
- **Key statutory changes to consider: (FPAT)**
  - Continue to support passage of Statute 287.81(4). (E&E)
  - Under 26.97(1), include citation authority to credentialed Forester Rangers for burning illegal materials under Wis. Stats. 287.81(4). However, Forester Rangers would not be the primary enforcement authority for Statute 287 but would have incidental authority when responding to fires as part of their normal duties. (WUI/Prev)
  - Create stronger enforcement protocol for debris burning. (WUI/Prev)
  - Update the definition of "forest fire" in Chapter 26 to include "wildfire." (WUI/Prev)
  - Create a fire prevention surcharge for burning violations. (WUI/Prev)
  - Eliminate distinction between intensive and extensive areas. Refer instead to areas of organized protection. (FPAT)
  - Investigate concept of asking courts to assess suppression cost surcharge to citations in lieu of billing. (FPAT)

  A variety of changes in statute are desirable to better correlate with proposed changes in the fire program.
- **Address critical information technology (IT) needs within fire program during the Division of Forestry's alignment process. (FPAT)**
  - Develop, maintain, and update (periodic and/or as needed) a web-based statewide situation report. (E&E)
  - Create an integrated web-based accomplishment reporting system that will automatically populate data from other reports and systems. (Fire Report data will automatically input to Fire Accomplishment Report, etc.). System should be usable by all managers for creation of custom reports. (E&E)
  - Create a web-based statewide fire information site similar to the National Interagency Fire Center (NIFC) Situation Report. The creation of a statewide fire information site could keep local units informed of events, conditions, and issues on a statewide basis. The site should be updated on a periodic and/or as needed basis. Friday updates heading into the weekend would be desirable during fire season. (E&E)
  - Include the burning permit issuance option of getting your own permit on-line. (WUI/Prev)

- Currently, the phone portion of WIS-BURN is a separate entity from the web portion; therefore, web-base the phone and web for seamless and consistent changing of daily fire restriction information. (WUI/Prev)
- In fire report system, create sub-categories for structures to be able to better identify WUI issues. Add the day's Fire Danger Adjective in order to be able to look at patterns at different adjective levels. (WUI/Prev)
- Fire Reports: Consider additions to fire report data collection and fields. Collecting information about the estimated value of structures and resources saved could be used in future analysis to determine the cost effectiveness of tower and aerial detection. (Det)

Increasingly, web-based applications will play a central role in the fire program, as they do throughout forestry. It is essential to be positioned to be able to respond to such IT needs.

OTHER IMPORTANT RECOMMENDATIONS

Command and Control Recommendations:

- Invest the time necessary to develop the infrastructure that supports the Canadian Forest Fire Danger Rating System (CFFDRS) / National Fire Danger Rating System (NFDRS) platform for field implementation by the 2011 spring fire season. (CC)
- Continue to support and utilize the NFDRS platform for decision making & analysis. (CC)
- Maintain DNR's wildland fire expertise. (CC)
- Maintain shared (DNR and volunteer fire department) initial fire attack responsibilities. (CC)
- Maintain continued use of tractor-plows as the primary wildland fire suppression tool. (CC)
- Maintain wildland fire training for Wisconsin fire departments. (CC)
- Investigate the use of the National Fire Report System (NFRS) to report wildland fires occurring in the Co-Op Fire Protection Areas. (CC)
- Explore with cooperating federal agencies ways to support each other's wildland fire programs. (CC)
- Maintain a fully funded Forest Fire Protection Grant program for Wisconsin FD's. (CC)
- Maintain the present Madison Command Center; update equipment and technology as future advances occur. (CC)
- Staff the Command Center on an 'as needed' basis with existing Central Office Forestry staff similar to what is presently occurring. (CC)
- Update the Forestry Operations Handbook; Chapters 50-20, 50-21 and 50-30. (CC)
- Consolidate Chapter 5120-20 of the Fire Management Handbook and Chapter 50-30 of the Forestry Operations Handbook. (CC)
- Support sharing and pre-positioning of resources across respective fire boundaries (Fire Response Units, Areas, and Regions). (CC)
- Continue to utilize the Regional Forestry Leader to be Regional Fire Coordinator and the main point of contact for the Central Office and Command Center (when activated). (CC)
- Continue to support the concept of "closest resource" for strong and efficient wildfire initial attack. (CC)
- Continue the sharing of daily operations plans between fire managers. (CC)
- Maintain the capability to establish an operational command structure within two hours of dispatch. (CC)
- Charge the Fire Working Group with identifying Core and Expanded Incident Management Team (IMT) membership. Core team membership needs to be adequate as not to fall behind the power curve on an incident. (CC)
- Continue to be opportunistic in utilizing partners as IMT members. (CC)
- Explore the concept of a 24-7 regional forestry duty officer. (CC) FPAT feels that it would be beneficial to work on the concept of a department regional duty officer to provide support to

volunteer fire departments doing initial attack. It would be beneficial during times when there is no fire staffing (off duty or not spring fire season) as well as for coop areas needing help with suppression or investigation.

Communications & Dispatch Recommendations:

- Migrating DNR forestry frequencies to narrowband operations after the spring 2011 fire season. This will be at the same time Mutual Aid frequencies are recommended to be narrowbanded thus encouraging our partners to change concurrently. This will minimize future communications difficulties. (Comm/Disp)
- Appoint one person in each dispatch group (DG) to routinely check in with Counties and local Fire/EMS to query any upcoming changes in communications. (Comm/Disp)
- Appoint a lead person in each DG to facilitate communications planning with all county(s) and local levels of public safety. This relates to Homeland Security initiatives to have written communications plans in place. Without coordination, plans may be established without DNR inclusion. (Comm/Disp)
- An FTE with a percentage (<20%) of dispatch duties written into their position description to serve as the support / back-up dispatcher in all Dispatcher Centers. (Comm/Disp)
- The Department should continue to look for efficiencies without compromising operational needs with other agencies as program and communication technology continues to evolve. (Comm/Disp)
- Pursue Office of Justice Assistance funding for Dispatch Center connection to the State radio over IP network. (Comm/Disp) This is mandatory.
- Continue to assist State Patrol Bureau of Communications Radio Technicians with routine maintenance tasks on an as-needed basis. (Comm/Disp)
- Assign responsibility to continue to investigate equipping Ranger Type 6 engines with laptops, GPS and GIS technology to the appropriate committee. (Comm/Disp)
- Develop a policy on the use of cell phones on the fireline. (Comm/Disp)
- As mobile radios are replaced in the field, the old radios should be targeted to update the mobile radios in the Area IMT trailers. (Comm/Disp)
- Area Forestry Leaders should continue to evaluate the needs of incident command post (ICP) sites as well as the infrastructure (radio masts, antennas telephone lines) of these sites in their area and implement improvements or additions as needed. (Comm/Disp)
- Continue to investigate opportunities to utilize other electronic communication technologies that will enhance communication capabilities for IMT operations. (Comm/Disp)
- The Division should move forward to secure a Telecommunications Service Priority agreement with each telephone company that provides service in a DNR protected area. This issue is all-risk in scope and perhaps should be procured in cooperation with Wisconsin Emergency Management as an all-risk blanket agreement for all state emergency service agencies. (Comm/Disp)
- Define a policy or standard operating procedure (SOP) that core IMT section leaders dedicate their agency cell phone to that section of the IMT for the duration of the incident. (Comm/Disp)
- All areas should test their ICP's to make sure they have adequate cell signals in each of their ICPs. If they don't, they should purchase an In-Building Wireless Cellular Amplifier for their Area IMT trailer if local funding allows. (Comm/Disp)
- Investigate agreements with cellular carriers to provide cellular on wheels support for voice and data which may include Cellular on Wheels (COW)/Cellular on Light Truck (COLT) service as part of the next state cell phone contract. (Comm/Disp)
- Further study the idea of outfitting one used Toughbook per DG with an air-card and purchasing a system entry port to allow secure access to the dispatching system for all hazards incident management. Costs would be ongoing air-card costs. (Comm/Disp)
- Invest time in determining the most efficient and effective Dispatch Center structure. (FPAT)
- Develop standard Dispatch Center blueprint. The blueprint should be followed for new construction. Existing Dispatch Centers should consider the blueprint to be the recommended

configuration and should implement recommendations as local budgets allow. The concepts listed here should be considered in coming up with a blueprint. (FPAT)

- Dispatch Center office size should be a minimum of 300 square feet and more square in shape. (Comm/Disp)
- Each Dispatch Center should be connected to a backup generator that is capable of starting automatically and transferring the power source from building power to generator power. (Comm/Disp)
- Each Dispatch Center should be equipped with four network connection points. (Comm/Disp)
- Each Dispatch Center should be equipped with a non-networked printer. (Comm/Disp)
- Wireless headsets should be provided with each radio console that can be used for the radio console that can be used for both radio and telephone. (Comm/Disp)
- DNR Dispatch Centers should have the ability to turn on and off the state MARC 1 repeaters from their radio consoles. (Comm/Disp)
- DNR Dispatch Centers should have the ability to communicate over the point to point radio channel. (Comm/Disp)
- Each Dispatch Center should have a minimum of two telephone lines and the availability to access additional phone lines in the building if needed. (Comm/Disp)
- Each Dispatch Center should allow for 2 primary work stations and 2 secondary work stations. (Comm/Disp)
- Each Dispatch Center should be set up on their own HVAC (heating, ventilation and air conditioning) zone. (Comm/Disp)
- Each Dispatch Center should be equipped with two networked computers with identical software, dual monitors and external hard drive. (Comm/Disp)
- Each Dispatch Center should have two identical touch screen radio consoles. (Comm/Disp)

Detection Recommendations:

- New Fire Tower Technology: Explore the possible use (lease) of new fire tower plotting technology. This technology may allow the current fire tower density to be reduced and improve the accuracy of single shot fire tower sightings. Rough estimated cost is $2400 per season for a typical Dispatch Group. (See Detection WG Report appendix C.) (Det)
- Time Reporting: Require pilots and/or dispatchers to separate aerial detection cost/time from aerial suppression cost/time. This will aid future efforts to more accurately determine the costs of aerial detection versus aerial suppression. (Det)

Efficiency & Effectiveness Recommendations:

- Define and clarify command structures of respective organizations and protocols for cooperation and partnership. (E&E)
- Identify and establish opportunities for participating in each other's IMT training and mobilizations. (E&E)
- Develop guidelines and procedures for cooperation on each other's fires, including participation in debriefings. (E&E)
- Identify joint training opportunities to enhance cooperation and effectiveness on large incidents. (E&E)
- Department will continue to maintain open communication with federal agency personnel during incidents to facilitate the ordering and movement of resources. (E&E)
- Rangers and/or Team Leaders and/or Area Leaders to meet with Emergency Management organizations to clarify respective roles, explore areas of cooperation and develop (or clarify) procedures for responding to incidents. (E&E)
- Bureau to develop and sponsor training for Regional Leaders, Area Leaders and Dispatchers to address and practice joint functions as incidents increase in complexity. (E&E)

- Rangers to recruit local governments to assist in public education on fire and emergency response issues. (E&E)
- Continue to foster relationship with other Department programs to ensure that resources are utilized more effectively on fires. (E&E)
- Investigate and implement appropriate standardized GPS equipment as budgetary constraints allow. Based on a cost/benefit relationship, navigation systems should be a priority. Continue to reassess GPS technology on a periodic basis and update as needed. (E&E)
- Allow rangers the option of laptops as their issued computers. Consider issuing the laptop as a standard ranger computer as technology develops and/or if GPS tracking is utilized in the future. (E&E)
- Continue to develop cooperative relationships with local fire departments that include sharing of resources such as thermal imaging cameras on an as needed basis. As budgetary circumstances dictate, and if unit prices continue to decrease, consider the limited purchase of thermal imaging units. (E&E)
- Review and update the Individual Forest Fire Report Handbook. This would allow the handbook to be more aligned with the newer electronic report. Specific items of interest included consideration of a further breakdown of structures and adding an unknown category to the fire cause information chapter. (E&E)
- In addition, develop connectivity between various fire handbooks, manual codes, policies, procedures, etc., so only one master reference is needed to address all aspects of the fire program. (E&E)
- Bureau of Protection will identify opportunities to detail our reporting requirements and further explain the need and use of the data collected. (E&E)
- Better communicate Bureau Fire staff itineraries through the Dispatch group during fire season. (E&E)
- Utilize newer technologies such as Live Meeting to share information more broadly and quickly across Teams, Areas, Regions and statewide. (E&E)
- Work with Conservation Wardens to identify individuals who continue to burn illegal materials, as they might be using areas that would be considered illegal dump sites. (E&E)
- Work to phase out the use of burn barrels in protection areas and encourage non-protected areas to do the same. Continue to promote where these household items should be recycled or disposed of. (E&E)

Facilities Recommendations:

- Continue construction of warm storage buildings & replacing cold storage buildings. All buildings should be built with 14-foot high and 12-foot wide overhead doors. (Fac)
- Maintain the use of the current weather stations in combination with other weather stations at airports, etc. (Fac)
- When a fire tower is dismantled, structural integrity tests should be conducted to help establish usable life expectancy of these structures. This testing should then be used to establish a replacement schedule for fire towers. (Fac)
- Maintain current single engine air tanker (SEAT) bases as is, activating them as needed based on SEAT contracts implemented. (Fac)
- Keep the pilot offices co-located at the hangers. (Fac)
- Review ranger station, warm storage and airplane hanger lease requirements as they come due to verify if they are still pertinent and cost effective to the Division of Forestry needs. (Fac)
- When a new ranger station is built, vacate the old building to reduce the fiscal impact of utilities. Other divisions may still utilize the building as long as they take over the costs. (Fac)
- Utilize the most cost effective method when comparing contracting facility maintenance versus utilizing Forestry employees to complete the work. (Fac)

- ❖ As ranger stations come up for replacement, look into the feasibility of combining ranger stations with other ranger stations or other functions as appropriate. (Fac)
- ❖ Consider construction design of warm storage buildings to allow for winterizing during non-fire periods. (Fac)
- ❖ Postpone replacement of ranger stations until alignment process has taken place. (FPAT)
- ❖ Develop criteria to give guidance as to when fire towers should be dismantled or sold. (FPAT)

WUI/Prevention Recommendations:

- ❖ Include the burning permit issuance option of getting your own permit on-line. (WUI/Prev)
- ❖ Maintain handbook currency. (WUI/Prev)
- ❖ Maintain and develop key partnerships and assure that messages shared are consistent. (WUI/Prev)
- ❖ Make efforts to better inform and interrelate with the field the objectives and specifics of the WUI program. (WUI/Prev)
- ❖ Develop communication tools for the Prevention and WUI programs. (WUI/Prev)
- ❖ Develop deliberate mechanisms to obtain feedback from the field as to the efficacy of the WUI program and ways to improve it. (WUI/Prev)
- ❖ Develop specific practices to better incorporate local input into WUI solutions. (WUI/Prev)
- ❖ More fully utilize the flexibility of the phone system (e.g. expand burning opportunities when the fire danger is lower). (WUI/Prev)
- ❖ Keep promotional material giveaways unique to appropriate fire management and fire prevention events and programs. (WUI/Prev)
- ❖ Smokey school program visits should be limited to grades K-3. (WUI/Prev)
- ❖ Create a "Smokey's Helper Vest" generic uniform and Smokey Guideline booklet so that teachers and other credible organizations (i.e. Boy Scout groups) can do programs without the presence of DNR. (WUI/Prev)
- ❖ Prioritize local events based on appropriateness, target & size of audience, & distance from stations. (WUI/Prev)
- ❖ Fire danger signs should be utilized, maintained & kept accurate, especially in spring. (WUI/Prev)
- ❖ Use businesses/partners to change fire danger rating signs to reduce mileage/time by DNR forestry field staff to change fire danger rating signs (based on 20% of signs administered by partners). (WUI/Prev)
- ❖ Support the effort of utilizing Department of Transportation (DOT) electronic signs during emergency forest fire regulations. (WUI/Prev)
- ❖ Adjective levels need to correlate with appropriate burning permit issuance; based on predicted indices, residential burning will not be allowed (burning permits suspended) when an adjective level is on Extreme or Very High. (WUI/Prev)
- ❖ Move towards higher quality aluminum signs. High traffic areas, and move away from lower traffic areas and poster boards. (WUI/Prev)
- ❖ Encourage seasonal residents to take refuse home instead of burning it before they leave: develop seasonal campaign. (WUI/Prev)
- ❖ Field staff should work more closely with Air & Waste to promote the DNR Model Burning Ordinance in appropriate communities and identify alternatives to burning in outreach material. (WUI/Prev)
- ❖ Create a downloadable "fact sheet" of year to date totals, restrictions, and fire danger statewide; sort of a "daily ops plan" for the media. (WUI/Prev)
- ❖ Consider utilizing unstaffed static displays when possible, using local staff to maintain the supply of publications accompanying the displays (based on a 10% reduction in events). (WUI/Prev)
- ❖ Lend displays to partnering organizations (based on a 10% reduction in events). (WUI/Prev)
- ❖ Continue informing partners through newsletters. (WUI/Prev)

- Newspaper ads and inserts should be first supported in Fire Landscapes 4, 7, 9, and 15 (priority) and in FL 3, 5, 6, 8, 10, 13 and 14 (secondary) as appropriate with elevated fire danger and creating awareness of fire occurrence and anniversaries of historic project fires. (WUI/Prev)
- Statewide PSA purchases should be coordinated by the Central Office. The timing of the purchases should be during the spring and/or in times of traditional high fire danger. (WUI/Prev)
- Forestry staff should develop strong relationships with local media outlets to encourage playing PSA's during non-traditional spikes in fire occurrence. (WUI/Prev)
- Continue to print forest fire publications, permits, laws, & debris burning brochures; hand out with all permits issued. (WUI/Prev)
- Utilize the Fire Danger Adjective Level magnets for all forestry vehicles and partners (i.e. fire departments), especially during times of high fire danger. (WUI/Prev)
- Pre-position fire equipment in high visible locations (e.g. gas stations, grocery stores, etc.) on Very High/Extreme days. (WUI/Prev)
- While working with media outlets, it is recommended to encourage fire danger updates in weather portions of television, radio, & newspapers. (WUI/Prev)
- Consider focusing media efforts on state borders (Minnesota, Illinois, & Michigan) utilizing the partnerships of Great Lakes Forest Fire Compact. (WUI/Prev)
- Media training for field fire staff on media relations is strongly encouraged. (WUI/Prev)
- Fire personnel should wear nomex uniform, especially in the spring whenever possible. (WUI/Prev)
- Based on the proposed statewide distribution of supplies and labor, it is recommended that the Fire Prevention Specialist Team develop a detailed "Prevention Plan" for each Fire Landscape. The plan would consist of fire occurrence information, target audiences, key messages, special considerations and specific hazard mitigation and fire prevention methods specific to each landscape. (WUI/Prev)
- National Fire Plan - Hazard Mitigation funding will be prioritized for projects in Fire Landscapes 4, 15, 9, and 7. The second tier of priority funding goes to projects in Fire Landscapes 3, 8, 14, 11, 16, 5, 13, and 6. Projects in Fire Landscapes 2, 10, 12, and are of a lower priority. (WUI/Prev)
- Engage in a partnership to educate power line companies to identify hazard trees and to recognize the most dangerous wildland fire fuels. (WUI/Prev)
- Target power line fuels reduction efforts around Firewise Communities and communities with a CWPP where power line fire starts are known to be a problem. (WUI/Prev)
- Clean up of storm damage, using Hazard Mitigation funds, should be prioritized for public lands and communities at risk. Individual private landowners should seek storm damage mitigation funds through Wisconsin Forest Landowner Grant Program. (WUI/Prev)
- The creation of brush collection sites should be supported in high/very high risk communities, especially when the project is identified in a CWPP. (WUI/Prev)
- The creation and maintenance of fuel breaks should be supported in Fire Landscapes 4, 15, 9, and 7, particularly when the breaks are listed as a mitigation strategy in a CWPP. (WUI/Prev)
- Support the use of prescribed burning for fuels reduction as a primary objective in FL 4, 15, 9, and 7, particularly when prescribed burns are listed as a mitigation strategy in a CWPP. (WUI/Prev)
- Support prescribed burning for habitat improvement in fire-dependent communities, but not necessarily with Hazard Mitigation funds. (WUI/Prev)
- Assist private property owners with fuels reduction activities through the Firewise Communities USA program and the Hazard Mitigation program. (WUI/Prev)
- The number one priority partnership in the WUI program is between WUI specialists and local DNR staff, particularly forester-rangers, forestry technicians, team leaders, and area forestry leaders. (WUI/Prev)
- Promote Community Wildfire Protection Plans in area of high crown fire risk, primarily in Fire Landscapes 4, 15, 9, and 7. (WUI/Prev)

- ❖ Promote Firewise Communities in communities at risk, particularly in Fire Landscapes 4, 15, 9, and 7. (WUI/Prev)
- ❖ Prioritize structure zone map book creation in Fire Landscapes 4, 15, 9, and 7. Mapping of high hazard areas in Fire Landscapes 3, 8, 14, 11, 16, 5, 13, and 6 are a second tier of priority. (WUI/Prev)
- ❖ Partner with local fire departments to assist in school programs. (WUI/Prev)
- ❖ School fire prevention programs in grades K-3 shall be conducted in FL 4, 5, 7, 9, 15 once every three years by DNR forestry field staff. (WUI/Prev)
- ❖ School fire prevention programs in grades K-3 should be conducted in FL 3, 6, 8, 10, 11, 13, 14, 16 once every three years by DNR forestry field staff. (WUI/Prev)
- ❖ School fire prevention programs in grades 4-12 should be conducted when special opportunities exist in FL 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, and 16 by DNR forestry field staff. (WUI/Prev)
- ❖ School fire prevention programs conducted by DNR forestry field staff in K-12 are not recommended in FL 1, 2, 12. (WUI/Prev)
- ❖ Support staff attendance at events in landscapes FL 1, 2, 12 when event has a large attendance and is appropriate for a fire prevention message. (WUI/Prev)
- ❖ Continue to support mechanical Smokey at Smokey's Schoolhouse w/in State Fair. (WUI/Prev)
- ❖ Identify and promote more low-cost means for debris or garbage disposal within local communities. (WUI/Prev)
- ❖ Support fire danger adjective level information currently in the "cooperative" area; secure staff time and dedication to support this effort for fire danger information on a statewide basis. (WUI/Prev)
- ❖ Support roadside brushing in FL 4, 15, 9, and 7, particularly when the project is listed as a mitigation strategy in a community wildfire protection plan (CWPP). (WUI/Prev)
- ❖ Develop guidelines and support initiatives of Best Management Practices to reduce fire risk. Create an Ad-Hoc team with a variety of field representation and agency partners to create the guidelines and outline implementation. (WUI/Prev)
- ❖ Encourage zoning regarding fire-resistant vegetation, access/egress, signage, water supplies, debris removal, building materials, defensible space, and maintenance in new developments in communities at risk. (WUI/Prev)
- ❖ Conduct Home Ignition Zone Assessments in Fire Landscapes 4, 15, 9, and 7, using DNR field staff, WUI specialists, and/or local fire departments as part of targeted projects as described on page 37 of the WUI/Prevention Work Group report. (WUI/Prev)
- ❖ Explore the concept of Fire Prevention Team assignments. Similar to suppression resources, Fire Prevention Team Members could be mobilized from lower risk areas of the state to the area of need. Teams would run from 1-2 weeks, depending on the need and funding source. Labor hours for local resources will come out of a local budget and must be supported by the area forestry leader. Supplemental funding for the Teams could come from federal Hazard Mitigation Grants. (WUI/Prev)

<u>Suppression Recommendations</u>:

- ❖ The Division of Forestry should continue to be primarily a "ground based" suppression organization utilizing tractor/plows and engines, in conjunction with air attack for intelligence and safety. (Supp)
- ❖ Fire Cache and Equipment standards, once approved, must be documented in handbooks for effective program implementation. (Supp)
- ❖ Cache inventories should be recorded in Fire Action Plans using a standard template to allow for consistent reporting and more effective utilization. (Supp)
- ❖ All heavy units should be configured with a type 4 engine pulling a tilt-bed trailer that carries a tractor/plow. This will maintain maximum statewide mobility and ensure that all units are initial

attack capable. In addition, all type 4 engines should be built primarily for wildland fire suppression including all-wheel drive. (Supp)

- Aerial suppression resources should be utilized to supplement ground suppression resources for initial attack in the five highest risk landscapes (FL 4, 7, 9, 13 and 15), and for project fire support statewide. (Supp)
- Maintain access to either CL 215 or CL 415 suppression aircraft through interagency agreements with our Great Lakes Forest Fire Compact (GLFFC) partners on an "as-needed" basis for project fires. Large air tankers should be ordered as a pair when the need arises. (Supp)
- Within Fire Landscapes 1, 2, 10, 12, local fire departments with appropriate wildland fire training should be able to routinely suppress wildland fires with only occasional/minimal DNR suppression resource assistance. (Supp)
- Within Fire Landscapes 3, 5, 6, 8, 11, 14, & 16 it is important to have a strong DNR and fire department partnership. Fire departments should be utilized to provide initial attack services in concert with DNR suppression resources. (Supp)
- Within Fire Landscapes 4, 7, 9, 13 and 15, DNR must respond as initial attack and be supported by fire departments. Fire departments should provide an important role in both initial attack and in structural protection within these high risk fire landscapes. (Supp)
- Continue to develop and foster relations with local hand-crews/squads where available. Utilize these crews on a more routine basis for prescribed fires, station stand-by assignments, and on smaller fires to promote more interest and experience, and to foster greater cooperation. (Supp)
- Each Fire Response Unit should identify one or two primary private equipment contractors or local units of government having heavy equipment and work more closely with them, rather than identifying every contractor that has a piece of equipment)
- Continue to develop and foster working relationships with federal partners having suppression resources within Wisconsin. Look for opportunities to expand the availability of these resources to supplement our needs but do not include these resources as part of our initial attack allocation model. (Supp)
- A main focus of the LeMay Center should be to continue to investigate, conduct research, and develop new technologies and equipment. (Supp)
- Dedicate a type 4 engine and tilt-bed trailer to each piece of low ground equipment. (Supp)
- Dedicated DNR air attack aircraft should be available to all fire landscapes that are staffed by DNR fire control resources. Fire landscapes 3, 4, 8, and 15 should have more dedicated air attack aircraft than others based on size of the landscape and associated risk. A total of 13 such aircraft is recommended. (Supp)
- Establish a heavy air tanker base (CL 215/415) at Eau Claire to preposition two heavy air tankers when conditions warrant. (Supp)
- Recognize the periodic need for, and develop procedures to utilize Great Lakes Forest Fire Compact crews, contract crews, and/or national hand crews on an as needed basis for project fire support or for extended mop-up situations. (Supp)
- Research the idea of incorporating Argo and/or Polaris utility terrain vehicle (UTV) type units into our suppression effort. Recommend using 6 wheel + units that are more safe, stable and versatile than conventional ATVs currently used by many fire departments and other DNR staff. (Supp)

RECOMMENDATIONS FOR FUTURE CONSIDERATION

In the course of discussion, various topics arose that FPAT thought merited further investigation. However, the tight time constraints under which this effort took place prevented FPAT from conducting those investigations. But enough of them were considered sufficiently important to be recommended for consideration at some point in the near future. Whether those efforts are conducted by FOT, FLT, a

Specialist Team or an ad hoc group, they need to be discussed and considered, as they have potentially important implications in the future.

- Investigate the concept of asking courts to assess a suppression cost surcharge to citations.
- Consider benefits of eliminating fire response units all together or making fire response unit boundaries significantly “softer”.
- Explore ways to address work-rest issues and simultaneously provide depth of staffing in the program across all boundaries.
- Explore the idea of maintaining 1-2 Type 2 all-risk incident management teams.
- Develop methodology and criteria for how to combine and locate facilities.
- Assess location related ties for personnel. Is it time to move past the idea that a person is tied to a location? For example, after “fire season”, should a person be able to move to where the forestry work is at rather than have to report to a specific station?
- Further explore the idea of hiring forestry technicians in the fire program in classes, with a mentoring program, so that they will be able to complete the full spectrum of expected job duties similar to the forester/ranger class.
- Evaluate the LeMay Center for enhancing communications and efficiencies.

CHAPTER 3

Allocation of Resources by Fire Landscape

This chapter addresses the characteristics and recommendations that are distinctly identified based on characteristics of the 16 fire landscapes in Wisconsin. Before a landscape-by-landscape listing of those recommendations, there is a chart showing the allocation of our most frequently used suppression equipment, by landscape. Following that is a chart showing characteristics of the landscapes and the values used to identify the fire risk in each landscape. Also included is a large map showing the landscapes.

EQUIPMENT ALLOCATION

The following table shows the recommended distribution of Heavy units, Type 6 engines, Type 8 engines and low ground units, by landscape.

Table 3A: FPAT Resource Allocation

Fire Landscape	Heavy Units	Type 6 Engines	Type 8 Engines	Low Ground Units
1	0	0	0	0
2	0	0	2	0
3	3	4	5	1
4	23	12	12	1
5	1	1	1	0
6	2	2	2	0
7	7	4	4	0
8	10	10	10	0
9	7	6	6	1
10	2	2	2	0
11	0	0	1	0
12	0	0	0	0
13	3	2	2	0
14	2	1	1	0
15	14	7	7	1
16	2	2	2	0
Bureau	1	0	3	0
TOTAL	**77**	**53**	**60**	**4**

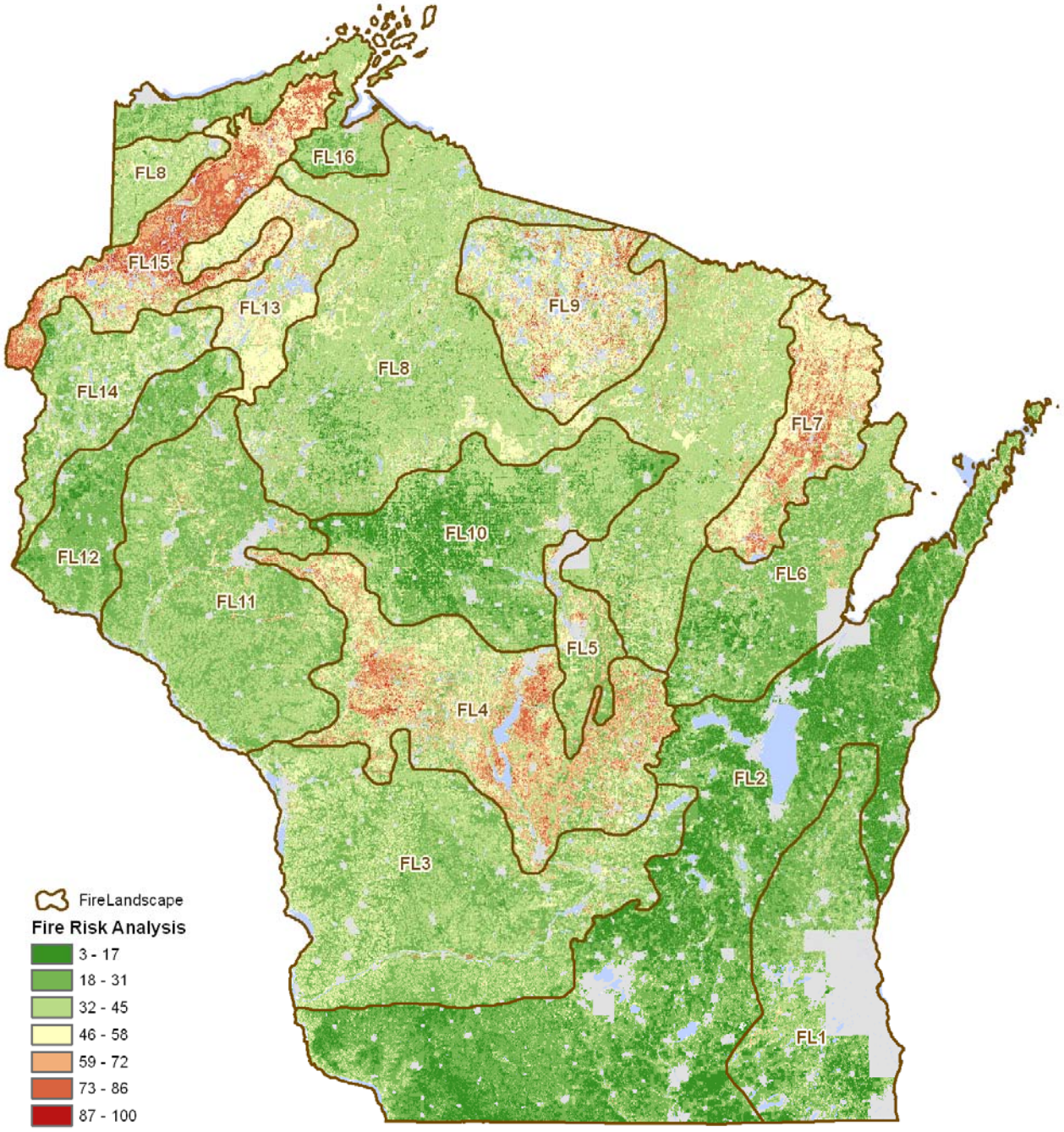
The next two pages include 1) a table showing the ranking of the various risk characteristics used to assess and prioritize each of the landscapes in the state, and 2) a map (Figure B) showing the landscape boundaries and the pixel arrangement throughout the state, with shading indicating the overall risk. Note that the values in the chart show the average throughout the landscape.

Table 3B: Fire Landscape Rankings by Input Values

Fire Landscape	Acreage	Area (square miles)	Total Ranking (Avg Value of Pixels)	Ecological Subsections Ranking	Soils Ranking	Soil Input Ranking (Wt. Soils and Ecological Subsections)	Vegetation Ranking	Fuels Ranking (Weighted Soils and Vegetation)	Patch Size Ranking	Improvements Ranking
FL15	**1301162**	**2033.07**	**59.99**	**1**	**1**	**1**	**1**	**1**	**3**	**13**
FL7	**1035749**	**1618.36**	**52.20**	**2**	**3**	**2**	**2**	**2**	**5**	**11**
FL4	**2789397**	**4358.43**	**48.43**	**3**	**4**	**3**	**3**	**3**	**8**	**7**
FL9	**1496600**	**2338.44**	**45.61**	**5**	**2**	**5**	**6**	**4**	**6**	**8**
FL13	**900897**	**1407.65**	**43.84**	**6**	**9**	**7**	**5**	**6**	**1**	**12**
FL5	**467685**	**730.76**	**39.09**	**4**	**5**	**4**	**10**	**5**	**13**	**5**
FL8	**6497446**	**10152.26**	**38.61**	**11**	**10**	**10**	**7**	**7**	**4**	**16**
FL14	**1011692**	**1580.77**	**35.54**	**9**	**8**	**9**	**9**	**9**	**7**	**3**
FL16	**811233**	**1267.55**	**34.62**	**16**	**16**	**16**	**4**	**11**	**2**	**15**
FL3	**3750241**	**5859.75**	**34.06**	**7**	**11**	**8**	**8**	**8**	**9**	**10**
FL11	**2741768**	**4284.01**	**32.33**	**8**	**6**	**6**	**11**	**10**	**11**	**14**
FL6	**1614647**	**2522.89**	**29.96**	**13**	**7**	**12**	**12**	**12**	**12**	**2**
FL10	**2099686**	**3280.76**	**28.57**	**12**	**12**	**13**	**13**	**14**	**10**	**9**
FL12	**1006238**	**1572.25**	**28.02**	**10**	**13**	**11**	**14**	**13**	**14**	**6**
FL1	**2071530**	**3236.77**	**26.96**	**15**	**14**	**14**	**15**	**15**	**15**	**1**
FL2	**6294084**	**9834.51**	**22.86**	**14**	**15**	**15**	**16**	**16**	**16**	**4**

Chart is arranged in order from highest to lowest Total Ranking.
Total Ranking is the mean value of pixels throughout the landscape.
Soil Input Ranking is the combination of weighted Ecological Subsection and Soil values.
Fuels Ranking is the combination of the weighted Soil and Vegetation values.
Numerical rank values in all cases are from highest to lowest and do not indicate relative risk between landscapes.
The Fire Landscapes were numbered from the southeast to the northwest of the state.

Figure B:
Fire Risk Analysis by WI Fire Landscape



The Department has made reasonable efforts to provide accurate information, but cannot exclude the possibility of errors or omissions in sources or of changes in actual conditions. The Department makes no warranties of any kind, either express or implied. Changes may be periodically made to the information herein – contact the originator of the data with any questions regarding appropriate use.

WI Department of Natural Resources
Division of Forestry
12/03/09 CRK

LANDSCAPE-BY-LANDSCAPE CHARACTERISTICS AND DESCRIPTIONS

Following are recommendations for resources and program activities specific to each of the sixteen fire landscapes identified by the Stratification Work Group and used as the basis for the assessment.

A page is allotted to each landscape and includes -

- A small map indicating the location of the landscape in the state.
- The name attributed to the landscape.
- A brief description of some of the fire related characteristics and fire potential of the landscape.
- A listing of the resources and program activity recommended for the landscape, including
  - Initial attack suppression equipment and staff
    - Heavy units, including Type 4 engines, tractor plows and Forestry Technicians
    - Low ground units, including transport units and operators
    - Heavy dozers, including transport units and operators
    - Type 6 engines and Forester Rangers
    - Type 8 engines and operators
  - Suppression air resources
  - Coop Rangers (whom will have Type 8 engines)
  - Specifically identified suppression relationships with adjacent FLs
  - Aerial detection resources
  - Staffed fire towers
  - Structural zone mapping priority
  - WUI staff commitment (to be applied at no less than 50% time per to an employee)
  - Hazard mitigation commitment
  - School fire prevention programs
  - Media related prevention
  - Cooperative Areas in this landscape to be supported for addition into organized protection (Yes-if requested, No, or N/A)

FL # 1: "Southeastern Wisconsin"

Description: FL1 contains a high amount of urbanization and agriculture, and is climatically affected by Lake Michigan, resulting in above average precipitation. Though fire occurrence data is incomplete because this area is in the cooperative protection area, wildland fires will most likely remain under 500 acres.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	0
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	0
Type 8 engines:	0

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Aerial Detection Resources: No

Staffed Fire Towers: 0

Structural Zone Mapping: As needed, by local government

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: Very limited

School Fire Prevention Programs: Recommended, by local partners

Media Related Prevention: Will benefit from statewide prevention messages

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: No

FL # 2: "Southern and East Central Ag and Hardwoods"

Description: FL2 has extremely fragmented forestland, with much upland and lowland grass types. There are topographic issues, especially in the southwest area. Fire occurrence data is incomplete because most of this area is in the cooperative protection area, but wildland fires will generally be less than 500 acres. There is significant structural load in this landscape.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	0
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	0
Type 8 engines:	2

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 2

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Aerial Detection Resources: No

Staffed Fire Towers: 0

Structural Zone Mapping: As needed, by local government

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: Very limited

School Fire Prevention Programs: Recommended, by local partners

Media Related Prevention: Will benefit from statewide prevention messages

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: No

FL # 3: "Southwest Wisconsin"

Description: FL3 contains steep terrain, which influences fire behavior and suppression activities. While there are some areas of sandy soils in the northeast and along the Wisconsin River, the area contains a significant component of grassy fuels. Parts of the landscape are in the cooperative protection area, with limited fire data. But fires rarely exceed 500 acres here, and then, generally, only in grasslands.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	3
Low Ground Units, including transport units:	1
Heavy dozers, including transport units:	0
Type 6 engines:	4
Type 8 engines:	5

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 1

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Aerial Detection Resources: Yes

Staffed Fire Towers: Dodgeville has no towers

Structural Zone Mapping: Secondary priority, limited to high hazard areas

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: FL3 is a secondary mitigation area; only limited, specific situations will be considered for mitigation efforts.

School Fire Prevention Programs: May be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based messages, as appropriate, with elevated fire danger.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: Yes, if requested

FL # 4: "Central Wisconsin Sands"

Description: FL4 contains extensive areas of jack and red pine, with dry, sandy and organic soils. There are extensive wildland -urban interface areas. There is a great history of and potential for a 10,000 acre project class fire, and there have been four fires greater than 2500 acres since 1975. This landscape has a higher structural load than any of the other pine dominated landscapes.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	23
Low Ground Units, including transport units:	1
Heavy dozers, including transport units:	1
Type 6 engines:	12
Type 8 engines:	12

Suppression Air Resources: Justified

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: Some heavy units housed in this landscape are to provide protection for FL11.

Aerial Detection Resources: Yes

Staffed Fire Towers: 16

Structural Zone Mapping: Priority objective

WUI Staff Commitment (to be applied at no less than 50% time per employee): 1.0 FTE

Hazard Mitigation Commitment: FL4 is a primary mitigation area; CWPPs, Firewise and other mitigation efforts will be supported.

School Fire Prevention Programs: Must be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based, targeted messages, regardless of weather conditions, to address local circumstances and situations.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: N/A

FL # 5: "Central Wisconsin River Sands and Ag"

Description: FL5 features organic soils and marshes, with scattered pine fuels along the Wisconsin River. There are significant improvements, especially in the Stevens Point and Mosinee/Wausau areas. There is the potential for fires larger than 500 acres, with significantly larger fires possible in marsh areas. Peating is a concern here.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	1
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	1
Type 8 engines:	1

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Aerial Detection Resources: Yes

Staffed Fire Towers: 2

Structural Zone Mapping: Secondary priority, limited to high hazard areas

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: FL5 is a secondary mitigation area; only limited, specific situations will be considered for mitigation efforts.

School Fire Prevention Programs: Must be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based messages, as appropriate, with elevated fire danger.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: N/A

FL # 6: "Northern Lake Michigan Coast and Lowland"

Description: In an area with weather impacted by Lake Michigan, the high number of improved parcels is a concern. Parts of the landscape are in the cooperative protection area, with limited fire data. But fires rarely exceed 500 acres here.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	2
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	2
Type 8 engines:	2

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Aerial Detection Resources: Yes

Staffed Fire Towers: 0

Structural Zone Mapping: Secondary priority, limited to high hazard areas

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: FL6 is a secondary mitigation area; only limited, specific situations will be considered for mitigation efforts.

School Fire Prevention Programs: May be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based messages, as appropriate, with elevated fire danger.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: No

FL # 7: "Northeast Sands"

Description: FL7 has large areas of excessively drained sands, and significant areas of pine cover type. Coupled with below average precipitation, this landscape has the potential for fires in excess of 1000 acres. These may be made more complex by numerous areas of structural development.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	7
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	4
Type 8 engines:	4

Suppression Air Resources: Justified

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Aerial Detection Resources: Yes

Staffed Fire Towers: 6

Structural Zone Mapping: Priority objective

WUI Staff Commitment (to be applied at no less than 50% time per employee): .5 FTE

Hazard Mitigation Commitment: FL7 is a primary mitigation area; CWPPs, Firewise and other mitigation efforts will be supported.

School Fire Prevention Programs: Must be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based, targeted messages, regardless of weather conditions, to address local circumstances and situations.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: N/A

FL #8: "Northern Forest"

Description: FL8 contains large, contiguous forested blocks with low road density, numerous wetlands and drainages, and organic soils. It also features occasional topography or rock outcrops. While the low road density results in the potential for fires in excess of 500 acres, such fires have been very rare.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	10
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	10
Type 8 engines:	10

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: Some heavy units housed in this landscape are to provide protection for FL10.

Aerial Detection Resources: Yes

Staffed Fire Towers: 13, plus Perkinstown (USFS owned)

Structural Zone Mapping: Secondary priority, limited to high hazard areas

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: FL8 is a secondary mitigation area; only limited, specific situations will be considered for mitigation efforts.

School Fire Prevention Programs: May be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based messages, as appropriate, with elevated fire danger.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: No

FL # 9: "Northern Highlands"

Description: FL9 contains large areas of outwash sands and gravels, and a high concentration of improvements surrounding the numerous lakes. While there are large areas of pine cover type, much of this is older, larger pine. The landscape has the potential for a fire in excess of 500 acre, and they have occurred in the distant past, though the last 35 years have not seen such a fire.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	7
Low Ground Units, including transport units:	1
Heavy dozers, including transport units:	0
Type 6 engines:	6
Type 8 engines:	6

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Staffed Fire Towers: 8

Aerial Detection Resources: Yes

Structural Zone Mapping: Priority objective

WUI Staff Commitment (to be applied at no less than 50% time per employee): .5 FTE

Hazard Mitigation Commitment: FL9 is a primary mitigation area; CWPPs, Firewise and other mitigation efforts will be supported.

School Fire Prevention Programs: Must be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based, targeted messages, regardless of weather conditions, to address local circumstances and situations.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: N/A

FL # 10: "Central Ag and Hardwoods"

Description: FL10 is a landscape of significant topographic features. Forested land here is highly fragmented amidst much agricultural land. Though fire occurrence data is incomplete because much of this area is in the cooperative protection area, wildland fires will most likely remain under 500 acres.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	2
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	2
Type 8 engines:	2

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: Some heavy units housed in FL8 are to provide protection for this landscape.

Aerial Detection Resources: Partial

Staffed Fire Towers: 2

Structural Zone Mapping: As needed, by local government

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: FL10 is a secondary mitigation area; only limited, specific situations will be considered for mitigation efforts.

School Fire Prevention Programs: May be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based messages, as appropriate, with elevated fire danger.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: No

FL # 11: "West Central Wisconsin"

Description: FL11 contains areas of steep terrain and bluffs, and sandy soils. Generally, wildland fires would be expected to remain under 500 acres. However, fire occurrence data is incomplete because the majority of this area is in the cooperative protection area.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	0
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	0
Type 8 engines:	1

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 1

Specifically Identified Suppression Relationships with Adjacent Landscapes: Some heavy units housed in FL4 are to provide protection for this landscape.

Aerial Detection Resources: No

Staffed Fire Towers: 1

Structural Zone Mapping: Secondary priority, limited to high hazard areas

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: Very limited

School Fire Prevention Programs: May be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide prevention messages

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: Yes, if requested

FL # 12: "Western Prairie"

Description: FL12 features areas of open grass and marsh, with some steeper topography near the Mississippi River. This landscape has limited potential for a fire exceeding 500 acres. Historical fire data is not complete for this area, as nearly all of it is in cooperative protection.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	0
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	0
Type 8 engines:	0

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Aerial Detection Resources: No

Staffed Fire Towers: 0

Structural Zone Mapping: As needed, by local government

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: Very limited

School Fire Prevention Programs: Recommended, by local partners

Media Related Prevention: Will benefit from statewide prevention messages

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: No

FL # 13: "The Northern Moraines"

Description: FL13 has rolling topography and large blocks with limited, poor quality roads. It also contains areas of dense improvements and sandy soils around scattered lakes. Though not frequent, the potential for a fire in excess of 5000 acres exists here.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	3
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	2
Type 8 engines:	2

Suppression Air Resources: Justified

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: Some heavy units housed in FL15 are to provide protection for this landscape.

Aerial Detection Resources: Yes

Staffed Fire Towers: 3

Structural Zone Mapping: Secondary priority, limited to high hazard areas

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: FL13 is a secondary mitigation area; only limited, specific situations will be considered for mitigation efforts.

School Fire Prevention Programs: May be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based messages, as appropriate, with elevated fire danger.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: N/A

FL # 14: "St. Croix Moraines"

Description: FL 14 contains fairly high improvement density around many of the lakes and the area near the Twin Cities. There are also areas of marshlands and other grass fuels, and some pockets of sand and conifers. While this landscape does not have a high potential of a fire exceeding 500 acres, the structural loading would add to the complexity. Fire data is not complete for this area as some of it is in cooperative protection.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	2
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	1
Type 8 engines:	1

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: None

Aerial Detection Resources: Yes

Staffed Fire Towers: 2

Structural Zone Mapping: Secondary priority, limited to high hazard areas

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: FL14 is a secondary mitigation area; only limited, specific situations will be considered for mitigation efforts.

School Fire Prevention Programs: May be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based messages, as appropriate, with elevated fire danger.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: Yes, if requested

FL # 15: "Northwest Sands"

Description: FL15 features low nutrient, excessively dry outwash sand deposits, and large blocks of continuous fuel, most of which is conifer. There are also many areas of high density improvements, especially around the numerous lakes. There is a history of 10,000+ acre project class fires, and the potential exists for them to occur again. The combination of continuous pine cover type, sandy soils, and areas of structural loading make this a very challenging fire landscape.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	14
Low Ground Units, including transport units:	1
Heavy dozers, including transport units:	1
Type 6 engines:	7
Type 8 engines:	7

Suppression Air Resources: Justified

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: Some heavy units housed in this landscape are to provide protection for FL13. The low ground unit is also to provide support o FL16. The low ground unit is also to provide protection for FL16.

Aerial Detection Resources: Yes

Staffed Fire Towers: 13

Structural Zone Mapping: Priority objective

WUI Staff Commitment (to be applied at no less than 50% time per employee): 1.0 FTE

Hazard Mitigation Commitment: FL15 is a primary mitigation area; CWPPs, Firewise and other mitigation efforts will be supported.

School Fire Prevention Programs: Must be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based, targeted messages, regardless of weather conditions, to address local circumstances and situations.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: N/A

FL # 16: "Superior/Ashland Clay"

Description: FL16 is dominated by heavy, clay soils, and is significantly influenced by Lake Superior. There are large blocks of wetlands and other grasses, and limited roads can make access difficult. There is the potential for a 500 acre fire, though it would be mostly fueled by light flashy fuels.

Initial Attack Suppression Equipment (including staff)

Heavy units, including Type 4 engines, tractor plows:	2
Low Ground Units, including transport units:	0
Heavy dozers, including transport units:	0
Type 6 engines:	2
Type 8 engines:	2

Suppression Air Resources: No

Coop Rangers (whom will have Type 8 engines): 0

Specifically Identified Suppression Relationships with Adjacent Landscapes: The low ground unit housed in FL15 is also to provide support for this landscape.

Aerial Detection Resources: Yes

Staffed Fire Towers: 2

Structural Zone Mapping: Secondary priority, limited to high hazard areas

WUI Staff Commitment (to be applied at no less than 50% time per employee): None

Hazard Mitigation Commitment: FL16 is a secondary mitigation area; only limited, specific situations will be considered for mitigation efforts.

School Fire Prevention Programs: May be conducted in K-3 every 3 years

Media Related Prevention: Will benefit from statewide messages, with additional locally based messages, as appropriate, with elevated fire danger.

Cooperative Areas in This Landscape to Be Supported For Addition into Organized Protection: N/A

CHAPTER 4

Investment Allocation

To illustrate the progression in developing the investment recommendations in this chapter, it is helpful to begin with how assets are presently invested. That information is broken down by equipment, personnel and program areas in Table 4A. As the components of the proposed investment at the current budget level were assembled, costs were similarly assembled, and are indicated in Table 4B.

The charge to recommend changes based on increases and decreases in investment in the forestry program was a challenging one, from a number of perspectives. Looking at alternatives in the light of potential funding increases was very encouraging. Identifying program enhancements that would provide even more effective protection than presently provided was a positive effort. Alternatively, assessing changes associated with potential funding cuts was challenging. The program cuts identified will result in a significant deterioration of the quality and effectiveness of our present program.

Initially, the cost of specific items had to be identified, to determine how changes in their level impacted overall investment. For example, what would increasing the fleet of heavy units cost? First, the cost of the various components of the unit (Type 6 engine, tractor plow, trailer) had to be identified. As capital items, those costs were then spread out over the useful life of each of the components of the unit (each of which have different lengths). Then, annual operating costs (mileage costs, etc.) had to be determined. Then, with the policy of linking a position to each piece of equipment, the cost of supporting an appropriate portion (in this case, 50%) of an appropriate position (in this case, a forestry technician) had to be calculated. All those components were then brought together to generate a single number associated with a change in such a piece of equipment.

Similar numbers were calculated for numerous program components. In some cases, the cost to support a program component was based on historical numbers. For example, the cost to "fully" support the Forest Fire Protection grant program for fire departments was based on historical grant application levels, regardless of the extent to which we were able to fund them in the past.

Increase and decrease recommendations were largely taken from the various Work Group reports. There were others, particularly program items supported through the Bureau that are not well known in the field (e. g., weather station maintenance), identified in the course of discussion.

Once that list was developed and costed, discussion identified some broad priorities from which to determine the 10% and 20% requirements. Four specific lists of changes were developed that totaled the various needs; 10% increase, 20% increase, 10% decrease, 20% decrease. Those lists were then prioritized, so particular items could be added or subtracted in order, as the situation may determine. That information is in Table 4C (10% increase), Table 4D (20% increase), Table 4E (10% decrease), and Table 4F (20% decrease). In some cases, similar items appear in both

levels of increase or decrease, but at different dollar amounts, as the determination was to change funding to one extent at the 10% level, and to a greater extent at the 20% level. For example, with 10% additional funding, the number of low ground units was recommended to increase from 4 to 5, while with a 20% increase, it was to increase from 4 to 6.

Table 4A: Current Investment

AVERAGE LTE and SUPPLY EXPENDITURES FY'05 to FY'09		
STATE FUNDS	**LTE Salary**	**Supplies**
Radio Pool Cost	$33	$300,000
Single Engine Air Tanker (SEAT)	$16,092	$200,000
Aerial Detection	$19,745	$134,617
Tower Detection	$132,681	$15,000
Coop Fire	$17,457	$21,587
Wildland Urban Interface	$81,480	$0
Suppression	$126,258	$308,298
Rep Payroll	$0	$10,933
Presuppression	$104,071	$356,103
Prevention	$5,697	$75,369
Administer Forest Protection Law	$11,817	$15,266
Forest Fire Protection Grant Program (FFP)	$0	$171,200
Fire Department Payments	$0	$110,392
Dispatching	$2,040	$33
Heavy Equipment Fund	$3,380	$1,250,000
Federal Excess Property Program	$0	$5,000
Great Lakes Forest Fire Compact	$287	$19,691
Operation of Facilities	$15,142	$543,203
Maintenance of Pool	$483	$108,519
Training	$26,118	$167,326
Assistance to Rural Fire Department	$326	$10,400
Uniform Fire Weather & Fire Report	$4,625	$30,758
Technology Exchange & Transfer	$4	$4,325
Information Management	$344	$751
Non-Reportable Fires	$12,094	$28,399
Firefighter Safety	$3,062	$43,557
Incident Command System Implementation	$4,000	$3,762
Specialist Teams	$124	$13,856
Railroad Fire Inspector	$7,117	$774
Administer Federal Grant Program	$0	$3,153
Prescribed Fire	$5,727	$17,785
TOTAL	**$600,205**	**$3,970,054**

Table 4A: Current Investment (continued)

FEDERAL GRANT FUNDS	LTE Salary	Supplies
Hazard Mitigation Projects	$0	$478,507
Prevention	$0	$100,000
Out-of-State Assignments	$41,475	$95,310
Ready Reserve	$1,669	$36,998
FFP Grant - Federal Funds	$0	$370,800
	$43,144	**$1,081,616**

REVENUE NEUTRAL ACCOUNT	LTE Salary	Supplies
Tomahawk Warehouse – Extensive	$1,359	$279,864
Tomahawk Warehouse – Intensive	$2,479	$541,024
	$3,838	**$820,889**

	STATEWIDE FTE PD BASED SALARY AND FRINGE				
CLASSIFICATION	PD %	# Personnel	Total PD Time	Salary and Fringe	Total Salary and Fringe
Foresters	7.84	83	651	$76,648	$498,764
Forester Rangers	50.63	57	2886	$76,648	$2,211,992
Forestry Technicians, Initial Attack	51.07	79	4035	$59,595	$2,404,378
Forestry Technicians, Mechanics	53.22	9	479	$59,595	$285,448
Auto Mechanic Master	91.67	3	275	$56,640	$155,766
Forestry Technicians, Backup	12.50	2	25	$59,595	$14,899
Ranger Operations	12.00	1	12	$54,020	$6,482
Dispatchers	95.00	9	855	$59,595	$509,537
Forester Advanced	95.00	2	190	$88,679	$168,490
Natural Resource Staff Specialist	75.00	4	300	$88,284	$264,852
Aircraft Pilots	21.00	10	210	$71,692	$150,553
Forestry Technicians, Mechanics	96.67	9	870	$59,595	$518,494
Computer Aided Drafting and Design Specialist (CADD)	90.00	1	90	$61,993	$55,794
Natural Resource Policy Coordinator	25.00	1	25	$82,507	$20,627
Invasive Control Specialist	50.00	1	50	$42,525	$21,263
Total		271	10952		$7,287,339

Total Current Investment	
Total FTE Salary And Fringe	$7,287,339
Total LTE Salary And Fringe	$768,644
Total Supplies And Services	$3,970,054
Total Fire Program Current Funding	**$12,026,037**

Table 4B: Proposed Investment

STATE FUNDS	LTE Salary	Supplies
Radio Pool Cost	$0	$300,000
Single Engine Air Tanker (SEAT)	$16,100	$200,000
Aerial Detection	$19,800	$134,600
Tower Detection	$132,700	$15,000
Coop Fire	$0	$50,000
Wildland Urban Interface	$0	$275,000
Suppression	$115,000	$300,000
Rep Payroll	$0	$10,900
Presuppression	$90,000	$300,000
Prevention	$0	$150,400
Administer Forest Protection Law	$8,000	$15,300
Forest Fire Protection Grant Program (FFP)	$0	$171,200
Fire Department Payments	$0	$110,000
Dispatching	$1,000	$0
Heavy Equipment Fund	$3,400	$1,125,000
Federal Excess Property Program	$0	$5,000
Great Lakes Forest Fire Compact	$300	$19,700
Operation of Facilities	$15,000	$493,000
Maintenance of Pool	$500	$100,000
Training	$20,000	$167,300
Assistance to Rural Fire Department	$300	$10,400
Uniform Fire Weather & Fire Report	$0	$30,800
Technology Exchange & Transfer	$0	$4,300
Information Management	$300	$800
Non-Reportable Fires	$10,000	$28,400
Firefighter Safety	$3,100	$43,600
Incident Command System Implementation	$2,000	$3,800
Specialist Teams	$100	$13,900
Railroad Fire Inspector	$7,100	$800
Administer Federal Grant Program	$0	$3,200
Prescribed Fire	$5,700	$16,000
TOTAL	**$450,400**	**$4,098,400**

Table 4B: Proposed Investment (continued)

FEDERAL GRANT FUNDS	LTE Salary	Supplies
Hazard Mitigation Projects		$478,507
Prevention		$100,000
Out-of-State Assignments	$41,475	$95,310
Ready Reserve	$1,669	$36,998
FFP Grant - Fed Funds		$370,800
	$43,144	**$1,081,616**

REVENUE NEUTRAL ACCOUNT	LTE Salary	Supplies
Tomahawk Warehouse – Extensive	1400	$279,864
Tomahawk Warehouse – Intensive	2500	$541,024
	$3,900	**$820,889**

	STATEWIDE FTE PD BASED SALARY AND FRINGE				
CLASSIFICATION	PD %	# Personnel	Total PD Time	Salary and Fringe	Total Salary and Fringe
Foresters	9.89	90	8.9	$76,648	$682,167
Forester Rangers	51.64	61	31.5	$76,648	$2,414,412
Forestry Technicians, Initial Attack	48.39	87	42.1	$59,595	$2,508,950
Forestry Technicians, Mechanics	40	3	1.2	$59,595	$71,514
Forestry Technicians, Advanced	20	1	0.2	$59,595	$11,919
Auto Mechanic Master	70	3	2.1	$56,640	$118,944
Dispatchers	95	9	8.55	$59,595	$509,537
Natural Resource Staff Specialist	75	4	3	$88,284	$264,852
Forester Advanced	95	2	1.9	$88,679	$168,490
Aircraft Pilots	21	10	2.1	$71,692	$150,553
Forestry Technicians, Mechanics	73.5	10	7.35	$59,595	$438,023
Computer Aided Drafting and Design Specialist (CADD)	90	1	0.9	$61,993	$55,794
Natural Resource Policy Coordinator	25	1	0.25	$82,507	$20,627
Invasive Control Specialist	50	1	0.5	$42,525	$21,263
Total		283	110.55		$7,437,044
				Overtime Reduction	$54,300
Total					$7,382,744

Total Proposed Investment	
Total FTE Salary And Fringe	**$7,382,744**
Total LTE Salary And Fringe	**$578,097**
Total Supplies And Services	**$4,098,400**
Total Fire Program Proposed Funding	**$12,059,241**

Table 4C: Ranked Actions for Changes in Investment
10% Increase in Investment

Action to take (in priority order)	LTE	S Line	FTE	Dollar Amount	Rank
Increase operational costs for fleet mileage and fire related facilities		300,000		300,000	1
Fund operations for Aeronautics Section	10,000	25,000		35,000	2
Fund operations for 4 mechanic shops		37,500		37,500	3
Detection/air attack program increase - rate increases		149,400		149,400	4
Fund weather station maintenance		60,000		60,000	5
Increase funding for LTE firefighters from $300,000 to $400,000	100,000			100,000	6
Fund class type training regime for class of forestry technicians (similar to new foresters)		145,000		145,000	7
Fund metallurgical testing of fire towers		10,000		10,000	8
Increase Type 6 engines, with corresponding staff, from 53 to 56		30,300	117,000	147,000	8
Increase wages for tower staff	28,000			28,000	10
Increase low ground unit, with corresponding staff, from 4 to **5**		12,000	12,000	24,000	11
Fund incident management team and mock fire training		61,500		61,500	12
Increase funding for heavy equipment account by $76,600		76,600		76,600	13
Fund 3 Toughbook computers for trial in Type 6 engines		6,000		6,000	14
Partially fund a Regional Duty Officer			20,000	20,000	15
Total				**$1,200,000**	

The investment increases included here would assure funding for essential wildland fire program needs, increase readiness for wildland fire and other incidents, and increase wildland fire suppression fire resources.

Table 4D: Ranked Actions for Changes in Investment
<u>20% Increase</u> in Investment

Action to take (in priority order)	LTE	S Line	FTE	Dollar Amount	Rank
Increase operational costs for fleet mileage		300,000		300,000	1
Fund weather station maintenance		60,000		60,000	2
Increase operational costs for fire facilities		317,200		317,200	2
Detection/air attack program increase – rate increases		149,400		149,400	4
Fund class type training regime for class of forestry technicians (similar to new foresters)		145,000		145,000	5
Increase funding for LTE firefighters from $300,000 to $400,000	100,000			100,000	6
Fund operations for 4 mechanic shops		37,500		37,500	7
Increase Type 6 engines, with corresponding staff, from 53 to 56		30,300	117,000	147,000	8
Fund operations for Aeronautics Section	20,000	51,000		71,000	9
Fund metallurgical testing of fire towers		10,000		10,000	10
Increase wages for tower staff	28,000			28,000	11
Fund incident management team and mock fire training		61,500		61,500	12
Fund increase in air detection in areas with no fire towers		34,000		34,000	13
Increase funding to SEAT program to $320,000	10,000	94,000		104,000	14
Restore 3 heavy units, with corresponding staff, from 77 to 80		73,500	91,500	165,000	15
Reinstate field prevention allotment at $25,000		25,000		25,000	16
Increase funding for heavy equipment account		250,000		250,000	17
Increase funding of FFP Program to $253,900		88,900		88,900	18
Fund 3 Toughbook computers for trial in Type 6 engines		6,000		6,000	19
Increase low ground unit, with corresponding staff, from 4 to **<u>6</u>**		24,000	24,000	48,000	20
Increase structure zone map funds to $60,000		30,000		30,000	20
Partially fund a Regional Duty Officer			20,000	20,000	22
Construct and/or replace 1 new fire tower/year		150,000		150,000	22
Provide prevention resources to fire departments		20,000		20,000	24
Increase staffed fire towers from 69 to 79	17,500			17,500	25
Have LeMay develop a prototype Tomahawk develop one Utility Terrain Vehicle (UTV)		15,000		15,000	26
Total				**$2,400,000**	

The increases proposed here would further enhance all the benefits identified at the 10% level. In addition, these increases would enhance support of key partners, improve prevention efforts, and provide better support for structural protection efforts associated with wildland fires in the highest risk fire landscapes in the state.

Table 4E: Ranked Actions for Changes in Investment
10% Decrease in Investment

Action to take (in priority order)	LTE	S Line	FTE	Dollar Amount	Rank
Improve energy efficiency at facilities to save $54,300/year		54,300		54,300	1
Reduce WUI Baseline funding from $275,000 to $250,000				25,000	2
Eliminate EFW Program		68,600	149,000	217,600	3
Eliminate free on-line burning permits; charge **$3** through ALIS to generate an income of $91,000/year		91,000		91,000	4
Eliminate aerial/tower staffing on moderate days		22,000		22,000	4
Reduce in-state overtime by 10%		50,000		50,000	6
Reduce Coop Rangers from 5 (including Bureau position) to 4		8,700	39,000	47,700	7
Eliminate SEAT Program	16,000	200,000		216,000	8
Reduce IMTs from 9 to 4 expanded teams			100,000	100,000	9
Eliminate LTE back up dispatchers	57,300			57,300	10
Reduced Dispatch Centers from 9 to 8		60,000	60,000	120,000	11
Reduce by 2 ranger stations		10,000	10,000	20,000	12
Eliminate 6 week LTE riders	185,000			185,000	13
Total				**$1,205,900**	

These changes are not recommended, but the least detrimental to the wildland fire program should such cuts become absolutely essential. The reductions envisioned here reduce wildland fire suppression resources, reduce preparedness for wildland fire and other incidents, increase detection time, and reduce the flexibility to fully utilize our wildland fire suppression equipment.

Table 4F: Ranked Actions for Changes in Investment
20% Decrease in Investment

Action to take (in priority order)	LTE	S Line	FTE	Dollar Amount	Rank
Improve energy efficiency at facilities to save $54,300/year		54,300		54,300	1
Eliminate EFW Program		68,600	149,000	217,600	2
Eliminate aerial/tower staffing on moderate days		22,000		22,000	3
Reduce in-state overtime by 10%		50,000		50,000	4
Reduce Coop Rangers from 5 (including Bureau position) to 4		8,700	39,000	47,700	5
Eliminate SEAT Program	16,000	200,000		216,000	6
Reduce WUI Baseline to $175,000		100,000		100,000	7
Reduce from 4 WUI FTE (including Bureau position) to 3			76,000	76,000	8
Reduce IMTs from 9 to 4 expanded teams			100,000	100,000	9
Eliminate free on-line burning permits; charge **$5** through ALIS to generate an income of $227,000/year		227,000		227,000	10
Eliminate use of heavy dozers (2)		34,000	24,000	58,000	11
Eliminate 6 week LTE riders	185,000			185,000	12
Reduce Prevention Baseline to $70,000		30,000		30,000	13
Eliminate LTE back up dispatchers	57,300			57,300	14
Reduce FD payments for IA to $35,000		75,000		75,000	15
Reduce by 4 ranger stations		20,000	20,000	40,000	16
Reduce Dispatch Centers from 9 to 5		240,000	180,000	420,000	17
Convert 20 FTEs staffing heavy units to nine month seasonal fire positions			426,000	426,000	18
Total				**$2,401,900**	

Again, these changes are not recommended, but the least detrimental to the wildland fire program should such cuts become absolutely essential. In addition to the impact of the reductions at the 10% level, these additional cuts would further reduce wildland fire suppression resources, and further reduce the flexibility to fully utilize our wildland fire suppression equipment. Wildland fire response time would be increased. Additionally, the reductions would have a negative impact on our ability to prevent fires, would decrease support for our most important external partner group, fire departments, and would reduce our ability to minimize damage from wildland fires in our highest risk fire landscapes. Additionally, they would increase stress and workload on dispatchers, and reduce the attractiveness of many of our forestry technician jobs, by converting them to seasonal positions.

Appendix A: Commonly Used Acronyms and Their Meanings

ALIS – Automated License Issuance System
BMP – Best Management Practice; a guide to address a particular issue in the overall interest of forest management.
CFFDRS - Canadian Forest Fire Danger Rating System; a system, developed in Canada, of identifying wildland fire risk and behavior based on weather data.
COLT/COW – Cellular on Light Truck/Cellular on Wheels
CWPP – Community Wildfire Protection Plan; a comprehensive plan to address issues impacting the wildfire susceptibility of a community
DG – Dispatch Group; a group of FRUs managed by a single Area Forestry Leader who work with a single dispatch office.
DNR – Wisconsin Department of Natural Resources
DOF – Wisconsin Division of Forestry
DOT – Department of Transportation
EFW – Emergency Fire Warden; individual citizens in organized protection historically responsible for issuing burning permits.
FEPP – Federal Excess Property Program; federal program designed to make available excess used federal property to public agencies for emergency services.
FFP – Forest Fire Protection Grant; a grant program that assists fire departments in preparedness for wildland fires.
FL – Fire Landscape; a geographic area with generally similar wildland fire characteristics.
FLT – Forestry Leadership Team
FOT – Forestry Operations Team
FPAT – Fire Program Assessment Team; the team that conducted this study and developed this report.
FR - Forestry
FRU – Fire Response Unit; an administrative area responsible for local implementation of the fire management program. Comprised of a ranger station (sometimes shared with another FRU) and varying staff and equipment resources.
FTE – Full Time Equivalent; an employee hired to a position of indefinite term.
GIS – Geographic Information System; integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.
GLFFC – Great Lake Forest Fire Compact; a group of states and provinces that work together to address common wildland fire program needs. Includes Michigan, Wisconsin, Minnesota, Ontario and Manitoba.
GPS – Global Positioning System; a U.S. space-based global navigation satellite system that provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth which has an unobstructed view of four or more GPS satellites.
HIZ – Home Ignition Zone; the area around a house or other structure where ignition factors are most important in the ability to protect that structure from a wildland fire.
IA – Initial Attack; the first efforts to quickly extinguish a wildland fire. When unsuccessful, it leads to extended attack, involving more resources and an enhanced level of organization.
ICP – Incident Command Post; a facility that serves as the base for field management of an incident.

ICS – Incident Command System; the system used to build, organize and manage resources on an incident, including a wildland fire. This system is used for incident management throughout Wisconsin.

IMT – Incident Management Team; the team assembled and developed to manage an incident using ICS.

LOP - Levels of Protection

LTE – Limited Term Employee; an employee hired to a position involving limited hours and duration.

MFL – Managed Forest Law

NFDRS – National Fire Danger Rating System; a system, developed in the United States, of identifying wildland fire risk and behavior based on weather data.

NFRS – National Fire Report System

NIFC - National Interagency Fire Center; a central base for managing wildland fire management coordination throughout the country.

NWCG – National Wildfire Coordinating Group; an organization comprised of representatives of various agencies in the wildland fire arena, which establishes guidelines and standards for wildland fire fighting.

PPE – Personal Protective Equipment; fire related equipment designed to protect the firefighter.

PSA – Public Service Announcement

RAWS – Remote Access Weather Station; the weather stations used to gather weather data for identifying and quantifying fire danger in Wisconsin.

SEAT – Single Engine Air Tanker; an aircraft whose function is to fire retardant, gels or foam on a wildland fire. In Wisconsin, their principle function is for initial attack.

SOP – Standard Operating Procedure; A set of instructions covering those features of operations which lend themselves to a definite or standardized procedure without loss of effectiveness. The procedure is applicable unless ordered otherwise.

USFS – United States Forest Service

UTV – Utility Terrain Vehicle; an off road utility vehicle with applications for wildland fire fighting in more remote areas.

VFD – Volunteer Fire Department

WEM – Wisconsin Emergency Government; the branch of Wisconsin state government with overall responsibility for emergency management.

WFLGP – Wisconsin Forest Landowner Grant Program; a division sponsored grant program to provide landowners with cost support to accomplish essential forest management practices.

WG – Work Group; the groups that assessed various wildland fire program components for this study.

WUI – Wildland-Urban Interface; that part of the landscape where wild forest and other lands become developed with homes and other improvements. It results in a potentially dangerous and high risk wildland fire environment, especially in the absence of mitigation practices.

Appendix B: Glossary

Cooperative area – Area in the state where debris burning is administered by local government and no organized DNR suppression forces are maintained.

Extensive area – Area in the state where debris burning is regulated by the DNR and burning permits are needed whenever the ground is not snow covered from January 1 through May 31 and other times when the department so orders. DNR provides organized protection forces for forest fire suppression.

Fire Characteristics Charts - (Andrews and Rothermel, 1982), A logarithmic scale depicting the relationship between fire intensity and rate of Spread

Fire preparedness levels - A statewide indicator of fire readiness. Preparedness levels are a longer-term planning and resource management tool to adequately insure implementation of fire management strategies across the entire state. Preparedness levels are dictated by fuel conditions, fire activity, weather and resource availability. There are 5 preparedness levels.

Fire risk – is described by a numerical value per pixel ($56m^2$) based on five elements, vegetation, soil, improvements (proxy for structures), forest patch size, and ecological subsection, with differing weighting per element based on fire management concerns.

Flame length coefficient – A numeric representation of fire behavior within a landscape based on LANDFIRE fuel modeling, fire weather conditions and the fire characteristics chart to determine equipment appropriateness in a fire landscape.

Heavy dozer – Is a large tracked vehicle with a metal blade in the front to move dirt and other material. It should have a minimum horsepower rating of 100 ie Caterpillar D5 & John Deere 650.

Intensive area – Area in the state where debris burning is regulated by the DNR and burning permits are needed whenever the ground is not snow covered throughout the year. DNR provides organized protection forces for forest fire suppression.

Low Ground Unit - A unit which the basic purpose is to operate in marshes & swamps (soft ground). Typically they have a blade, wide track system and a built in tank and pump system.

Minimum threshold capacity - The least amount of equipment that may be assigned in a fire landscape, based on the risk and area of the fire landscape. Any increase in area or risk in the fire landscape will exceed the equipments ability to provide for effective fire protection.

One hour fuel – Fuels consisting of dead herbaceous plants and roundwood less than about one-fourth inch (6.4 mm) in diameter. Also included is the uppermost layer of needles or leaves on the forest floor. One hour refers to the amount of time it takes these fuels to adjust their fuel moisture level a prescribed amount toward equilibrium with the surrounding air.

One hundred-hour fuel – Dead fuels consisting of roundwood in the size range of 1 to 3 inches (2.5 to 7.6 cm) in diameter and very roughly the layer of litter extending from approximately three-fourths of an inch (1.9 cm) to 4 inches (10 cm) below the surface. These fuels, because of their size, take one hundred hours to make the adjustment referenced in one hour fuels.

One thousand hour fuel - Dead fuels consisting of roundwood 3-8 inches in diameter and the layer of the forest floor more than about 4 inches below the surface. These fuels, because of their size, take one thousand hours to make the adjustment referenced in one hour fuels.

Ten hour fuel - Dead fuels consisting of roundwood 1/4 to l-inch (0.6 to 2.5 cm) in diameter and, very roughly, the layer of litter extending from immediately below the surface to 3/4 inch (1.9 cm) below the surface. These fuels, because of their size, take ten hours to make the adjustment referenced in one hour fuels.

Tractor plow - Dozer with a plow in the back for constructing fireline by exposing mineral soil.

Type 6 engine – A 4x4 pick up type vehicle with a water tank capacity of 150 – 400 gallons, pumping flow rate of 30 gallons per minute and 200 feet of 1 inch and 1 ½ inch hose.

Type 8 engine – A 4x4 pick up type vehicle with a water tank capacity of 100 – 180 gallons, pumping flow rate of 20 gallons per minute and 100 feet of 1 inch hose.

Appendix C: Links to Various Related Reports

Command & Control Work Group Report
Communications & Dispatch Work Group Report
Detection Work Group Report
Efficiencies and Effectiveness Work Group Report
Facilities & Infrastructure Report
Prevention/Wildland-Urban Interface Work Group Report
Stratification Work Group Report
Suppression Work Group Report

Measures of Success