Legislative Audit Division

State of Montana

Report to the Legislature

December 2004

Performance Audit

Wildland Fire Administration

**Department of Natural Resources and Conservation
Forestry Division**

Fire And Aviation Management Program

This report provides information on DNRC's role in wildland fire suppression. The report focuses on the 2003 fire season and addresses questions posed by the Legislative Audit Committee about fire costs, communication/coordination with federal and local fire protection agencies, and availability of resources. Based on our review we developed conclusions and recommendations in a number of areas including:

▸ The most effective cost containment strategy is preventing fires from getting large. To improve accomplishment of this strategy, initial attack resources must be enhanced.

▸ Fire business practice controls are in place and the majority of these controls were adhered to on 2003 project fires. However, improvements can be made both during and after fires.

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Performance audits conducted by the Legislative Audit Division are designed to assess state government operations. From the audit work, a determination is made as to whether agencies and programs are accomplishing their purposes, and whether they can do so with greater efficiency and economy. The audit work is conducted in accordance with audit standards set forth by the United States Government Accountability Office.

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Performance audits are performed at the request of the Legislative Audit Committee which is a bicameral and bipartisan standing committee of the Montana Legislature. The committee consists of six members of the Senate and six members of the House of Representatives.

Legislative Audit Division

Performance Audit

Wildland Fire Administration

**Department of Natural Resources and Conservation
Forestry Division**

Fire And Aviation Management Program

Members of the audit staff involved in this audit were Lisa Blanford, Steven E. Erb, Joe Murray, and Mike Wingard.

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December 2004

The Legislative Audit Committee
of the Montana State Legislature:

In December 2003, the Legislative Audit Committee approved a performance audit of the state's wildfire preparedness and suppression programs. Wildland fire administration is often done in a multi-jurisdictional environment between state, federal, and local government agencies. The Department of Natural Resources and Conservation (DNRC) is responsible for administering the State of Montana's wildland fire activities.

This report provides information on DNRC's role in wildland fire suppression. The report focuses on the 2003 fire season and addresses questions posed about fire cost, communication/coordination with federal and local fire protection agencies, and availability of resources. The audit found the most effective cost containment strategy is preventing fires from getting large. We also noted fire business controls exist on project fires. While these of controls were generally followed during the 2003 fire season, we noted some improvements could be made to further strengthen the controls.

Our report provides conclusions regarding the department's wildland fire administration process and recommendations to improve DNRC's initial attack capabilities, fire business controls, and aviation resources. We also make a recommendation to the legislature to clarify Montana's wildland fire policy. A response to the audit finding from DNRC officials is contained at the end of the report.

We wish to express our appreciation to the department, officials from federal and local government agencies, and private wildland fire contractors for their cooperation and assistance during the audit

Respectfully submitted,

(Signature on File)

Scott A. Seacat
Legislative Auditor

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Introduction

This performance audit was done at the request of the Legislative Audit Committee. The report provides information on DNRC's role in wildland fire suppression. It addresses questions about fire costs, communication/coordination with federal and local fire protection agencies, and availability of resources for wildland fire preparedness and suppression.

We used the 2003 fire season as the basis for the bulk of examination/analysis of wildland fire administration because of the few significant fires in 2004. Our examination consisted of interviews, policy/procedure reviews, and examination of the documentation associated with a judgmental sample of fires. Additionally, we observed current fire suppression and overall administration efforts of state, county, and federal fire protection agencies by going to three separate fires that occurred during 2004.

Background

While there are different types of fires based on size and complexity, for purposes of understanding the level of administration needed for those fires, there are really only two kinds of fires: initial attack fires and extended attack fires. The distinction between them is the length of time to extinguish. Initial attack fires are typically contained or controlled within 1-2 operational periods, with 24 hours being a typical operational period. Extended attack fires are incidents that could not be contained or controlled by initial attack forces and need more firefighting resources. Extended attack fires can range from two days to several months depending upon location, topography, and forest fuels.

Fire Protection Agencies are Initial Attack-Oriented in Terms of Resources

Montana's fire protection agencies (state, federal, and local) are initial attack-oriented firefighting forces. Their primary objective is to aggressively respond to reports of fire in an attempt to keep the fires as small as possible. To do this, these agencies often rely upon one another to assist/support their initial attack efforts. This reliance and interdependence has been forged through mutual aid and various other types of agreements. The administration of initial attack fires is typically conducted by the fire protection agency responsible for protecting that land. An incident commander working for that entity

is orders the necessary resources and determines how those resources (personnel and equipment) are used to suppress the fire.

If a fire becomes or is designated an extended attack fire, a substantively different administrative approach generally comes into play. Because these fires are already large and/or complex or rapidly getting to that point, the administrative entity or entities protecting the land recognize their initial attack resources are no longer sufficient to fight the fire and even if they were to do so, they would be unavailable to respond to other initial attack fires. As a result, it becomes necessary to bring in what are called, "Incident Management Teams (IMTs)"to manage and ultimately suppress the fires. At present, only one administering entity in Montana (DNRC) has what can be described as its own IMT, the County Assistance Team. However, its role and involvement has been limited to specific types of fires in Eastern Montana.

IMTs are Used to Manage Project Fires

Instead of each agency having its own IMTs, there has been a coalition of agency resources developed. By agreement and necessity, selected local, state, and federal personnel from their respective agencies have been recruited and trained over the years to participate on IMTs. These interagency IMTs are requested to manage extended attack or what are more commonly called, "project fires". Numerous coordination/oversight organizations have been created to regulate firefighting methods and business practices to help standardize training standards, and fire administration differences between the protection agencies. This coalition of resources has not only been necessary to help ensure firefighter and public safety, but to address the growing costs of fighting wildland fires. The National Wildfire Coordinating Group (NWCG) is comprised of federal agency representatives and the Association of State Foresters (of which Montana is a member). The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to solve problems of a substantive nature. The NWCG is the certifying body for wildland fire training courses and is responsible for standardizing fire business practices.

Regional coordinating groups have also been created to more specifically address firefighting in similar geographic areas. The Northern Rockies Coordinating Group (NRCG) provides oversight and recommendations for all interagency wildland fire management activities in the Northern Rockies geographic area. The group itself is composed of federal wildland agencies, DNRC, Montana Disaster and Emergency Services Division, Idaho Department of State Lands, North Dakota Forest Service, Montana Firewarden's Association, Montana Fire Chief's Association, and Montana Sheriff's and Peace Officer's Association. The designated Northern Rockies geographic area is comprised of Montana, North Dakota, northern Idaho, and a small portion of South Dakota and Wyoming. The NRCG provides more specific fire administration guidance through established operational requirements, protocols for mobilization of resources, and specific business practices, such as standardized payment rates for heavy equipment and fire engine rentals. While each of the NRCG partners has some flexibility and outlined differences in their practices with regard to fires within their respective jurisdiction, the NWCG and NRCG guidelines essentially dictate fire management practices for joint jurisdiction project fires in the Northern Rockies geographic area.

General Observation: Wildland fires are expensive and mother nature impacts experience-based management decisions.

Based on our audit work, it is readily apparent combating wildland fires is inherently expensive. Based on data reviewed, we found the 10-year average cost of suppressing fires of 10 acres or less was approximately $4,500 per fire. In comparison, suppression costs for fires of 5,000 acres or larger averaged $2.3 million per fire. Aviation resources, heavy equipment, and crews are required to directly or indirectly attack wildland fires. Equally important factors in costs are topography, weather, and forest fuels. The strategies created and resources deployed are experience-based calls by the administering entities and Incident Management Teams. As with most human decision-making, post-fire reviews show there are instances when different judgments could have been made, established procedures/policies were overlooked, and inefficiencies occurred.

During the last four years, numerous studies have been conducted with regard to wildland fire administration and more specifically of

wildland fire suppression costs. Five common themes are central to these studies:

▸ The most effective cost containment strategy is to prevent fires from escaping initial attack.

▸ There is a critical need to reduce fuel levels in wildland areas so fires are less likely to overwhelm initial attack capabilities.

▸ Movement into the wildland urban interface has increased fire suppression costs.

▸ Nationally, there needs to be greater integration of local firefighting resources in the overall wildland firefighting strategies.

▸ If the climate prognosis is correct, the prevailing climatic conditions (drought) may well exist for the next 20-30 years. The catastrophic fires that have occurred in the past five years provide a sobering insight into what the future may hold.

Montana's 2003 Fire Season Should be Placed in Perspective

The significance of the fire danger and level of suppression activity during a fire season is important to understanding the actions of DNRC and its fire partners. Decision-making, policies and procedures, as well as existing business practices were all impacted and tested by the severity of the 2003 fire season. It is also important to recognize the administration of Montana fires was impacted by fires in other parts of the United States due to the lack of readily available qualified personnel and equipment resources. The following are paraphrased excerpts from an NRCG-commissioned study of fires in the Northern Rockies that offer the reader some perspective regarding the fires of 2003.

▸ Large fires were prevalent in the Northern Rockies. There were substantially more large fires here than any other region of the western United States and they burned more acres than any other area except Southern California.

▸ The Northern Rockies fires were widespread, with several in Idaho, Eastern Montana, and North Dakota. Northwestern Montana had several large fires early in the fire season, threatening towns. Southwestern Montana had large fires threatening subdivisions near Missoula, Florence, Lolo Creek, etc. Central and South Central Montana had at least 10 large fires.

> ‣ Fire Season began early with large fires starting by July 13. On July 25-26, a series of lightning storms produced more than 6000 down strikes in North and Central Idaho and Southwest Montana. This storm ignited dozens of fires, and by the end of July the region had 12 major fires burning. On August 10, 400 new wildfires (nationally) were reported, including two new large fires in the Northern Rockies. Over the next two days, another 671 new fires were reported nationally, adding nine new large fires. By August 15, there were (or had been) 52 project fires in the Northern Rockies.

> ‣ At the peak of fire activity there were 34 Incident Management Teams managing fires in the Northern Rockies and overall, during the 2003 fire season there were 89 IMT assignments.

> ‣ Fire costs for the Northern Rockies likely exceeded $325 million. Information provided from DNRC and the Legislative Fiscal Division indicate state's portion of these costs will exceed $76 million.

Utilizing information from the above noted cost containment report; Montana and therefore DNRC faced a designated fire danger of "very high" to "extreme" for approximately two months of 2003.

Chapter II describes the "players" in wildland fire administration and how the state's wildland fire administration is funded.

Chapter II provides background information regarding organization of the fire protection agencies (federal, state, local) and private sector resources. We also discuss how wildland fire preparedness and suppression is funded and present detailed information on the fire cost factors. Our paraphrased conclusions are:

Conclusions:
‣ *Effective cost containment strategies on large fires should concentrate on the cost factors: equipment, personnel, and aviation.*
‣ *The best-cost containment strategy is to prevent a fire from getting large.*

Fire Administration is Being Improved

We also state in Chapter II, the report various aspects of wildland fire administration could be improved, but the 2003 fire season was unprecedented. The types, locations, and number of fires stressed operational and control systems. Additionally, DNRC, either on its own or through partnership with local and federal fire protection

agencies, has or is actively working to address many of the issues and deficiencies identified from the 2003 fire season.

Chapter III - Initial Attack of Wildland Fires

DNRC has responsibility for protecting over 52 million acres from wildland fire. To perform initial attack duties, DNRC utilizes a combination of federal, state, tribal, contracted, and local fire service organization resources. In this chapter we describe how these varying entities interact, how wildland fires are detected and resources dispatched. The following are paraphrased conclusions about initial attack operations.

Conclusions:

‣ *DNRC has established procedures and provided resources for locating, reporting, and responding to wildland fires.*

‣ *Resources are generally dispatched without delays when fires are located near boundaries between state, local, tribal, and federal protection areas. This results in more aggressive initial attack efforts.*

‣ *State, federal, and local entities coordinate fire suppression activities during initial attack.*

‣ *DNRC is meeting its goal to suppress 95 percent of fires at less than 10 acres and the department should continue its aggressive initial attack policy.*

Helicopters and extra resources acquired during severe fire conditions have enhanced initial attack capabilities

Over the past several years, DNRC's initial attack program has increased its capability with the addition of helicopters. The department deploys helicopters to the Northwestern (Kalispell), Southwestern (Missoula), and Central (Helena) Land Offices for the entire fire season and uses their other three helicopters to supplement those Land Office's needs and respond to fires in the eastern portion of the state as needed.

In addition to expanded aviation resources, DNRC has established a process to enhance initial attack capability and response when fire danger levels meet established criteria. When these fire danger levels are met or exceeded, DNRC fire personnel can formally request additional resources. The requests for these "severity resources" follow an

established approval process and typically consist asking for more aircraft, engines, and additional ground crews that come from the public and private sector. Severity resources are "pre-positioned" in areas with the highest risk for fire ignition and then used if fires start. In the past five years, approximately $8.3 million has been expended on severity resources. We developed a conclusion and recommendations regarding supplemental initial attack resources, they are paraphrased as follows.

Conclusion:

▸ *Helicopters and severity resources supplement DNRC initial attack capabilities, but lead to increased costs. Controls are in place for monitoring utilization of these resources.*

Recommendations to DNRC:

• *Coordinate with the Northern Rockies Coordinating Group to implement a two-tiered rate system for severity resources.*

• *Make completion of the fire program analysis a high priority.*

• *Seek support for additional funding from the legislature for the county cooperative program.*

• *Seek legislation to establish a formal risk financing method for severity funding.*

Chapter III ends with discussion of the National Fire Plan and how federal funds distributed to local communities for fuel reduction programs are administered by DNRC. Presently no state funds are being specifically used to supplement the federal fuels mitigation program and no statewide fuels reduction plans exist. Our paraphrased conclusion is:

Conclusion:

▸ *The state's fuels reduction efforts are not coordinated to ensure those areas with the greatest risk are treated. This is due to lack of statewide information on forest*

*fuels and complete reliance on inconsistent federal
funding streams to address fuels mitigation projects.*

Chapter IV - Wildland Project Fires

In calendar year 2003 over 80 percent of all state fire suppression costs were attributable to 19 fires. Three of the fires (Cooney Ridge, Black Mountain, and Boles Meadow) accounted for 46 percent of the costs. This chapter explains the administrative aspects of suppressing project fires from the time a fire is turned over to an Incident Management Team (IMT) through return of the fire's management to the administrative entity. We also address legislative questions regarding fire suppression costs.

Our primary focus during review of project fires was to examine the types and use of business controls employed by the administering entities and IMTs. Audit testing identified several fire business controls that could be improved. The following are paraphrased conclusions and recommendations on several factors impacting fire costs.

Conclusions:

▸ *Fire business practice controls are in place and the majority of these controls were adhered to during project fires in 2003. However, improvements can be made.*

▸ *DNRC and other agencies involved in dispatch recognize and are addressing problems identified during 2003. While agencies have taken specific steps to improve the dispatch process, improvements are still needed.*

▸ *Mandated limitations on hours and days worked exist for the safety of fire personnel, but contribute to increased fire costs and can create negative, but often-inaccurate public perceptions about personnel work activity.*

▸ *Fires in wildland urban interfaces increase fire suppression costs.*

Recommendations to DNRC:

• *Standardize first and last day of work payments to local fire departments.*

- *Take steps to ensure on-site equipment inspections are performed on project fires.*

- *Change the language in future equipment contracts to reflect damage claim clauses used in national engine and aviation contracts.*

- *Work with federal and other partners to improve and expand Delegation of Authority language to provide more specific direction to Incident Management Teams.*

- *Strengthen the cost share agreement development process by increasing training and support for Line Officers.*

- *Aggressively implement use of Incident Business Advisors on project fires.*

- *Take advantage of opportunities presented during close-out briefings to have more detailed discussion of a fire's administration.*

- *Ensure Line Officers conduct detailed performance appraisals of Incident Management Teams and work with NRCG to incorporate appraisal information into the overall evaluation of the role of IMTs.*

- *Work with the NRCG to establish meaningful performance measures for all personnel assigned to fire incidents, including contracted resources. Also, incorporate requirements for performance appraisals to be conducted by IMTs into each fire's Delegation of Authority.*

Chapter V - Post Fire Activities

Once a fire is over and also after the fire season winds down, there are many post-fire activities that take place related to project fires. They include review of suppression tactics, resource availability analysis, and coordination efforts. Other post-fire activities involve cost recovery efforts, contracting issues, and payment for fire cache items used during fires. The following paraphrases our conclusions and recommendations regarding DNRC post-fire activities.

Conclusion:

▸ *DNRC fire personnel are active participants in the interagency arena and have the opportunity and responsibility to present and protect Montana's interest with regard to wildland fire administration.*

Recommendations to DNRC:

- *Clarify policy outlining conditions on when it will pay for individuals and industry for assisting in suppression efforts on accidentally started fires.*

- *Establish tighter controls over fire cache items by including more specific language in each fire's Delegation of Authority, requiring Line Officers to ensure fire cache controls are being followed, and modifying department policy regarding fire cache losses so it mirrors NRCG policy.*

- *Continue its own efforts as well as work with the NRCG to solicit competitive proposals for wildland firefighting contracts.*

- *Actively examine cost benefits of renting versus purchasing items for wildfire suppression, and along with NRCG, reexamine fire cache contents to determine whether changes are needed.*

- *Immediately begin cross-training other department staff for FEMA cost recovery efforts and review of federal fire bills.*

- *Employ formal retrospective cost studies to examine efficiency and effectiveness of wildland fire suppression efforts and provide results to fire managers.*

- *Strengthen capabilities of Line Officers by providing training and additional resources for large project fires and when requested on other fires.*

- *In cooperation with other fire protection agencies explore options to more consistently involve dispatch in discussing, evaluating, and documenting the role of dispatch in a fire's administration.*

Chapter VI - Aviation Resources

Aviation plays a significant role in both fire suppression and fire costs. Aircraft, whether large air tankers delivering fire retardant or helicopters conducting water drops, are one of the most visible symbols of the wildland firefighting effort. This chapter discusses DNRC's aviation resources and provides recommendations to enhance this resource's safety and effectiveness, especially with regard to initial attack.

Recommendations to DNRC:

- *Request appropriations for sufficient personal services to provide for a continuous helitack capability for each helicopter assigned to land offices during the fire season.*

- *Request sufficient personal services resources to safely and effectively operate all assigned aircraft and more accurately reflect actual pilot operating requirements.*

- *Request sufficient personal services resources to properly staff its aviation maintenance program.*

Chapter VII - Wildland Fire Management

Due to our audit approach several important issues that did not directly relate to those items discussed in the previous chapters, or were too wide-ranging to be included in specific discussions needed to be addressed. These topics are presented in Chapter VII and we provide a variety of conclusions and recommendations to both DNRC and the Legislature.

Conclusions:

▸ *The combined impact of the issues of training equivalencies, availability of training, and the timeframes associated with obtaining some firefighting credentials hampers the full utilization of some local resources.*

▸ *Any strategies to enhance use of local firefighting forces in the suppression of wildland fires must address the conditions and issues impeding local forces from being a fully integrated partner in the wildland firefighting environment.*

Recommendations to DNRC:

- *Establish formal agreements with local fire service organizations to clarify responsibilities and compensation for responding to DNRC fires occurring outside the statutorily designated fire season.*

- *Present to the NRCG and Legislature a proposal for the formation, maintenance, and funding of additional Type 3 Incident Management Teams in Montana.*

Recommendation to the Legislature:

▸ *Authorize a study to develop and update fire-related statutes to address current development and environmental*

conditions and improve wildland fire suppression management and mitigation.

Department Response To The Recommendations:

We provided DNRC with 26 recommendations to improve the administration of the suppression of wildland fires. The department's responses to these recommendations are included in the report appendices. Overall, the department concurred with all the recommendations and provided responses and implementation dates for each recommendation.

Chapter I - Introduction

Background

The Legislative Audit Committee (LAC) received a letter from legislators requesting a performance audit of the state's wildfire preparedness and suppression program on December 17, 2003. (see Appendix D). The LAC approved a performance audit of the Department of Natural Resources and Conservation's (DNRC) wildland fire management practices.

Concurrently, during the fall of 2003 and into 2004 the Legislative Finance Committee and staff from the Legislative Fiscal Division were also studying wildfire suppression issues and the costs associated with the 2003 fire season. The Environmental Quality Council Agency Oversight Subcommittee also heard testimony on wildland fire issues in January of 2004.

Audit Objectives

The following audit objectives were formulated and primarily based on the questions/issues posed to the LAC.

‣ Determine the resources available for initial attack crews and examine the distribution of initial attack crews.

‣ Determine state and federal severity policies and guidelines.

‣ Determine the communication and coordination between federal, state, and local agencies with regard to "protection boundaries", mutual aid, etc.

‣ Determine the process for requesting and prioritizing resource needs for fires.

‣ Determine the cost drivers for fire management and suppression.

‣ Determine what cost controls, such as pre-established rates and contracts, are in place.

‣ Determine the process for, and fairness of, the establishment of the federal/state/local/private share of fire suppression costs.

‣ Determine the state's costs for protecting landowners and compare them against revenues derived from landowner assessments.

‣ Determine if there is a need for an incentive program for landowners to reduce fire risks and what the role of the insurance industry is in this area.

‣ Determine if changes in training are needed in light of the changing emphasis for fighting fires, i.e. increasing density of

wildland/urban interface, expanded demand for resource protection, etc.

▸ Determine if the legislature needs to consider modifying state policy with regard to fire suppression.

▸ Evaluate allegations of fraud or inappropriate or inefficient use of state resources.

Scope and Methodologies

Our primary audit focus was on the previous and current fire seasons (2003 and 2004). With few significant fires in 2004 our observations of fire suppression operations were limited. We used the 2003 fire season as the basis for the bulk of our examination/analysis of wildland fire administration. We supplemented this information with interviews, policy/procedure review, and examination of available documentation.

Further discussion of our audit scope and methodologies is located in Appendix A. Appendix A also includes information on data limitations.

Key Terms and Definitions

The wildland firefighting vocabulary involves several terms and definitions and descriptions of layers of organizational oversight. The following are key terms and definitions used in the report.

• **Area Command** - An organization established to: (1) oversee the management of multiple incidents that are each being handled by an incident management team (IMT) organization; or (2) to oversee the management of a very large incident that had multiple IMT's assigned to it. Area Command has the responsibility to set overall strategy and priorities, allocate critical resources based on priorities, ensure that incidents are properly managed, and that objectives are met and strategies followed.

• **Complex Fire** - Two or more individual incidents located in the same general area which are assigned to a single Incident Commander (IC) or unified command.

• **Contained and Controlled** - These are two separate concepts. "Contained" is defined as a completed fuel break around a fire. "Controlled" is defined as firelines (fuel breaks) that have been strengthened so flare-ups within the perimeter of a fire will not break through the fireline.

- **Extended Attack** – Actions on a wildland fire that has not been contained or controlled by initial attack forces and for which more firefighting resources are arriving, enroute, or being ordered by the initial attack Incident Commander.

- **Incident Command System** - The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure, with responsibility for the management of assigned resources to accomplish stated objectives pertaining to an incident.

- **Incident Commander (IC) and Incident Management Team (IMT)** - The individual responsible for management of all incident operations at the incident site. The IC supervises an Incident Management Team composed of persons with designated fire administration responsibilities. Incident Commanders and IMTs typically change as fire complexity and size changes and/or after a designated period of fire administration (usually 14 days).

- **Initial Attack** - The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire. A fire designated as an initial attack fire is typically contained or controlled within 1-2 operational periods. 24 hours is a typical operational period.

- **National Wildfire Coordinating Group (NWCG)** – A group comprised of representatives of the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service and Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. The NWCG is the certifying body for all training courses in the National Fire Curriculum. The group is also responsible for standardizing fire business practices.

- **Northern Rockies Coordinating Group (NRCG)** - The NRCG provides oversight and recommendations for all interagency wildland fire management activities in the Northern Rockies geographic area. The group is composed of all five federal wildland agencies, DNRC, Montana Disaster and Emergency Services Division, Idaho Department of State Lands, North Dakota Forest Service, Montana Firechiefs Association, Montana Firewarden's Association, and the Montana Sheriff's and Peace Officer Association. The group was established to provide an interagency approach to wildland fire management and all risk support on all land ownerships within the states of

Chapter I - Introduction

Montana, North Dakota, northern Idaho, and a small portion of South Dakota (the Northern Rockies Geographic Area).

- **Preparedness Levels** - Preparedness levels (fire danger levels) are dictated by burning conditions, wildland fire activity, and resource availability. Resource availability is the area of most concern. There are five levels of preparedness with one being the lowest and five being the highest.

- **Pre-suppression** - Encompasses placement of resources and all activities in preparation to detect and suppress wildland fires.

- **Prevention** - Eliminates preventable wildfires with special emphasis on Wildland/Urban Interface areas.

- **Project Fire** - A fire of such size or complexity that a large organization and prolonged activity is required to suppress it.

- **Protecting Agency** - Agency responsible for providing direct wildland fire protection to a given area.

- **Overlapping Protection** - Local fire service organization protection may overlap federal or state protection areas.

- **Suppression** - This includes all activities involved in a wildland fire from detection through mobilization and demobilization of fire resources.

- **Wildland Urban Interface** - The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Report Organization Overview

- Chapter II provides background information on the scope of the 2003 fire season and who the key players in the wildland firefighting effort in Montana. Observations and analysis conducted during this evaluation determined increasing the emphasis on fuels reduction and enhancing initial attack capabilities will have the greatest potential for reducing both the size and the cost of wildland fires.

- Chapter III explains how DNRC conducts initial attack on wildland fires. Recommendations are made concerning how the state could reduce initial attack costs and ensure firefighting resources are allocated properly.

- Chapter IV discusses fires that escape initial attack (project fires). There is a discussion of responsibilities on project fires, how these fires are managed, resources that are available for fighting these fires, and how costs are contained on these fires. Recommendations are made for implementing procedures to reduce project fire costs, ensure the state's guidance on fire

suppression and cost goals are implemented by fire managers, and ensure DNRC fire representatives are better able to support the state's fire objectives.

- Chapter V discusses post-fire activities. Recommendations are made to reduce the state's vulnerability from equipment damage and losses from fire caches, reduce equipment costs through competitive bidding, and for DNRC to embark on an active process of evaluating fires, tactics, and costs.

- Chapter VI describes DNRC's aviation resources, its limitations, and offers recommendations to increase this resource's safety, availability, and effectiveness.

- Chapter VII discusses and makes recommendations regarding the need for a legislative study of fire-related statutes, the need for change to enhance the role of local resources in wildland fire suppression, and the need to establish more Type 3 Incident Management Teams in Montana.

- The appendices of this report provide information on the scope and limitations of this evaluation. There is also a comparison of how other states support and pay for their wildland firefighting efforts. Finally, there is DNRC's response to the recommendations.

Chapter II - Background

Introduction

In this chapter we provide information on Montana's fire history, how fire suppression is financed, wildland fire administration by various entities, national studies and illustrative materials regarding fire risk and fire management. We present a description of the magnitude of the 2003 fire season and its impacts on the existing fire suppression resources in the state.

General Observation Regarding Wildland Fires

Based on interviews, observations, review of national studies, and analysis of fire suppression expenditures, it is readily apparent that combating wildland fires is inherently expensive. Aviation resources, heavy equipment, and crews are required to directly or indirectly attack wildland fires. Additionally, while a fire's suppression is equipment and manpower dependent, ultimately topography, weather, and fuel conditions are as big a factor in fire extinguishment as the efforts employed to fight the fire. The strategies created and the resources deployed to fight a wildland fire are experience-based calls by the administering entities and incident management teams. As with most human decision-making, post-fire reviews show there are instances where different judgments could have been made, established procedures/processes were overlooked, and inefficiencies occurred.

Fuels Reduction and Enhanced Initial Attack are the Primary Ways to Reduce Fire Suppression Costs

Generally, our audit work and analyses indicate to reduce fire suppression costs state, federal, and local governments should make every effort toward preemptive efforts to eliminate or reduce the number of large-scale fires. Specifically, this means increasing the emphasis on fuels reduction and enhancing the initial attack on reported fires to reduce the number that grow to what are commonly called "project" fires.

General Organization of Statewide Fire Management Agencies

The recognized fire protection agencies in Montana are the U.S. Forest Service, Bureau of Land Management (BLM), DNRC, and local fire service organizations (depending on fire location). Other federal agencies including the Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service, and National Park Service also have fire suppression responsibilities and resources. The National Park

Service is typically involved only when a fire is within a national park. The BIA works with various Native American tribes for fires originating on Indian reservations.

Primary Federal Agencies are Forest Service and BLM

Forest Service resources are distributed throughout the national forests via Ranger Districts, with each district having resources (personnel, engines, other equipment) available for suppressing fires starting in their district. Additional resources can be requested at forest and regional levels of the Forest Service, and DNRC and local assistance can also be requested.

The BLM and BIA also have wildfire administration resources for fires located on land under their jurisdiction. Their primary areas of responsibility are east of the Continental Divide. Their resources include personnel, engines, and other equipment, such as aviation resources. While they can request other federal resources to assist them, local fire departments and DNRC are primarily the mutual aid cooperators in Eastern Montana.

Forestry Division's Fire and Aviation Management Program (FAM) Responsibilities are Statewide

DNRC's wildland fire administration is the responsibility of the Forestry Division's Fire and Aviation Management Program (FAM). The program has approximately 83 FTE and hires approximately 48 seasonal FTE. There are eight sub-programs within the program including aviation, fire prevention, fire pre-suppression, fire coordination, county fire management, fire suppression, and equipment development and support which includes the Federal Excess Personal Property Program.

The state is separated into six areas, each with an area land office and each under the jurisdiction of an Area Manager. Each area land office also has a Fire Program Manager who is responsible for all fire-related activities in the area. Area land offices are located in Kalispell, Missoula, Helena, Lewistown, Billings, and Miles City. The majority of FTE are under the control of area land offices.

Local Fire Service Organizations

Local fire service organizations include municipal fire departments, rural fire districts, fire service areas, and rural fire companies. Rural

fire districts provide the bulk of the structural and wildland fire administration resources in the counties. Due to drought and the increasing wildland/urban interface their wildland fire responsibilities have grown. Numerous fire departments (rural and municipal) in Montana supplement their local funding by contracting with state and federal agencies to provide firefighting resources from outside their jurisdiction.

Private Sector Firefighting Resources

Private sector firefighting resources include individuals who have fire engines, skidgines, water tenders, dozers, etc. available to assist on state or federal fires. The amount and type of utilization of this resource depends on the fire season. These resources must have qualified personnel and certified equipment to obtain work on state or federal fires. They are called/assigned through various arrangements around the state, depending upon location.

Wildland Fire Administration by DNRC

One of DNRC's missions is to protect the state's natural resources from wildfire. The department accomplishes its mission of protecting private and public lands through two levels of responsibility: Direct Protection and State/County Cooperation.

Direct Protection

Direct protection is land assigned to a recognized wildland fire protection agency where landowners pay a fee for the fire protection provided. DNRC currently has responsibility for protecting over 5.1 million acres under direct protection. Direct protection responsibilities are provided in two types of areas:

1. Montana Forest Fire Districts
2. Agreement Areas (Commonly referred to as Affidavit Units)

Each type of direct protection is described below.

Forest Fire Districts

A Forest Fire District is an area authorized and established by DNRC under section 76-13-204 MCA, for the protection of classified forestland from fire. All classified forest landowners are assessed an annual fee for wildland fire protection and all forestland is protected by one recognized fire protection agency. Protection within a District is the most intensive form of forest fire protection provided

within the state. District boundaries are established through a majority vote of the landowners. Payment for protection of another agencies land within a district (i.e. federal ownership) is handled on a fire protection offset basis where federal agencies protect approximately equal amounts of state and private land. Fire prevention, detection, and suppression services are provided by the state in all districts. National Forests or portions of National Forests have been formed into protection districts.

Agreement Areas (Affidavit Protection Units)

An Affidavit Unit is an area of forestland receiving fire protection by DNRC as authorized under section 76-13-201(2), MCA. An affidavit is a sworn, notarized statement of the landowner's inability to protect his own land from fire and his willingness to pay for protection. Landowners within these areas may request fire protection by a recognized fire protection agency by signing an agreement to pay a fee. No private lands in these units are protected without a signed affidavit. Unlike a Forest Fire District, not all forestland is protected by one agency. Forest landowners with signed agreements receive the same degree of protection as landowners within a forest fire district. A landowner may also sign an agreement (affidavit) to have non-forest land protected for a fee.

DNRC meets its direct protection responsibilities in three ways:

1. Self Protection – DNRC employs firefighters and buys fire equipment to respond to and suppress wildland fires.

2. Offset Protection – DNRC exchanges areas with equal acreage and suppression costs to other recognized wildland fire protection agencies. This is most commonly done with federal agencies, such as the Forest Service.

3. Contract Protection - This type of protection is provided to State and private owned lands by a recognized fire protection agencies. These fire protection agencies are required to provide protection at the same or higher level as they do on their own lands. Currently, DNRC has 145,817 acres under contract with the Confederated Salish and Kootenai tribe.

State-County Cooperative Protection

Over 45.3 million acres are currently protected through the State-County Cooperative Protection. All state and private land in a county that is not protected by direct protection are protected under

State-County Cooperative Protection. A county provides basic levels of fire protection through a system of volunteers, county personnel, and rural fire districts. A county may receive support from the department in matters of organization, planning, prevention, equipment, training, and fire suppression. All fifty-six counties now participate in this program. Landowners do not pay for this protection.

The following table shows the acreage of land DNRC protects under direct protection, federal offset, and State-County cooperative protection.

Table 1

Land Protected By DNRC (in acres)
Fiscal Year 2003-04

Land Ownership	Direct Protection	Federal Offset	State/County Cooperative (56 Counties)	Total # of Acres
State and Private	3,481,884		45,309,480	48,791,364
Tribal/BIA	4,551	145,817		150,368
Forest Service	950,322	1,454,676		2,404,998
Dept. of Interior*	715,558	105,693		821,251
Total	5,152,315	1,706,186	45,309,480	52,167,981

* Includes Bureau of Land Management, Bureau of Reclamation, and U.S. Fish and Wildlife Service

Source: Compiled by the Legislative Audit Division from DNRC Records.

Funding of Montana Wildland Fire Protection and Suppression Expenditures

There are various sources of funding used to pay for the state's two components of wildland fire administration: wildland fire preparedness and wildland fire suppression. Section 76-13, Part 2, MCA, establishes the responsibility of owners of classified forested land to provide wildland fire protection for their property and establishes the process by which landowners agree to pay for state fire protection. An assessment process currently generates approximately one-third (1/3) of DNRC's appropriated budget for its fire protection program. The assessment amount is statutorily

limited and proceeds are placed in a state special revenue fund. Currently, 57,427 landowners in 33 counties pay a minimum of $30 per ownership for less than 20 acres and an additional $0.19 per acre for ownerships greater than 20 acres. This generates approximately $2.4 million of the $7.4 million annual budget of the Fire and Aviation Management Program. The remainder of the preparedness budget is provided by the state General Fund and some federal funds.

Fire Suppression is Presently Paid for With Supplemental Appropriations

DNRC does not receive a general appropriation for wildland fire suppression costs. Instead, these costs are funded through supplemental appropriations approved during a subsequent legislative session. Historically, DNRC has borrowed funds to pay fire suppression expenses out of its general appropriation and from inter-departmental loans to ensure cash flow between legislative sessions. The State of Montana also gets reimbursed from federal agencies to help cover some of its fire suppression costs.

The following table shows historical information on Fire and Aviation Management Program funding for both fire preparedness and fire suppression over the past ten years.

Table 2

Fire Protection and Suppression Appropriations
Fiscal Years 1995-2004
(in Millions)

Fiscal Year	Preparedness[1]	Suppression[2]
1995	$ 4.76	$ .37
1996	$ 5.15	$ 1.17
1997	$ 5.14	$ 6.23
1998	$ 5.57	$ 1.08
1999	$ 5.75	$ 9.46
2000	$ 6.25	$ 5.15
2001	$ 6.36	$59.06
2002	$ 7.00	$15.92
2003	$ 6.68	$ 3.30
2004	$ 7.36	$76.29

[1] Preparedness funding provided by regular appropriations
[2] Suppression funding provided by supplemental appropriations

Source: Department of Natural Resources and Conservation and Legislative Audit Division.

Placing Montana's 2003 Fire Season in Perspective

The significance of the fire danger and level of activity in 2003 is important to understanding the actions of DNRC and its fire partners (local departments, federal agencies). Decision-making, policies and procedures, as well as existing business control practices were all impacted and tested by the severity of the 2003 fire season.

The following are paraphrased excerpts (chronologically organized) from the NRCG-authorized study, "Cost Containment Report" issued in June 2004.

▸ In 2003, large wildland fires were prevalent in the Northern Rockies area. There were substantially more large fires than other regions of the Western United States and they burned more acres than any other area except Southern California.

▸ The Northern Rockies fires were widespread, with several in North Central Idaho, Eastern Montana and North Dakota. Northwestern Montana had several large fires early in the season, threatening West Glacier and the North Fork of the Flathead. Southwestern Montana had large fires threatening subdivisions near Missoula, Florence, Petty Creek, and Lolo Creek. Central and South Central Montana had at least 10 large fires.

▸ Fire season in the Northern Rockies began early with the Box Canyon and Jim Town fires occurring on July 13th. On July 25th and 26th, a series of lightning storms produced more than 6,000 down strikes in North and Central Idaho and Southwest Montana. This storm ignited dozens of new fires. Initial attack forces were spread thin and while the majority of fires were caught, by the end of July, the Northern Rockies geographic area had 12 major fires burning. On August 10th, 400 new wildfires (nationally) were reported that had started the previous day, including two new large fires in the Northern Rockies. Over the next two days, another 671 new fires occurred (nationally) adding nine new large fires. By August 15th, project fires totaled 52 in the Northern Rockies.

▸ The NRCG implemented the Area Command structure to help manage the increasing number of large fire incidents. At the peak of fire activity there were 34 Incident Management Teams and four Area Command Teams administering fires in the Northern Rockies. Overall, during the 2003 fire season, there were 89 Incident Management Team assignments.

▸ Fire costs for 2003 for the Northern Rockies likely exceeded $325 million.

Chapter II - Background

DNRC resources and capabilities are primarily geared towards initial attack. DNRC officials believe they have the internal resources to appropriately address up to a Preparedness Level (Level) 3. According to the "Cost Containment Report" noted previously, the Northern Rockies geographic area was at Level 3 by July 15th, Level 4 by July 19th, and Level 5 by July 26th. The Level did not return to Level 3 until September 17th. Since Montana makes up the bulk of the Northern Rockies geographic area, these Levels generally portray Montana's fire danger. Using this generalization, Montana and therefore DNRC, faced a Level 4 category of fire danger/activity or higher for approximately two months.

2003 Fires on State-Protected Land

The following charts show historical fire activity for fires greater than 100 acres on state-protected land and a breakout of annual fire costs to provide the reader with additional information about the magnitude of fire activity.

Figure 1

Number of Fires on State-Protected Land Greater than 100 Acres 1998-2003
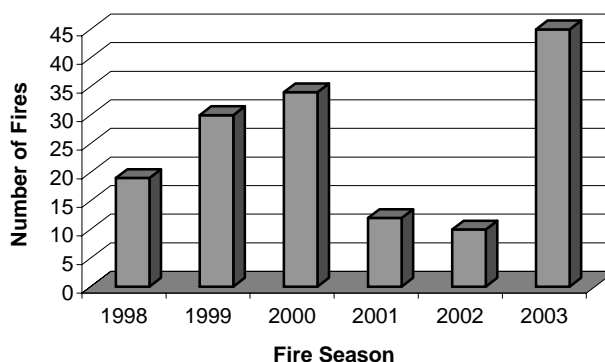
Source: Department of Natural Resources and Conservation Records.

Figure 2

Fire Costs on State Protected Land
1998-2003
(in millions)
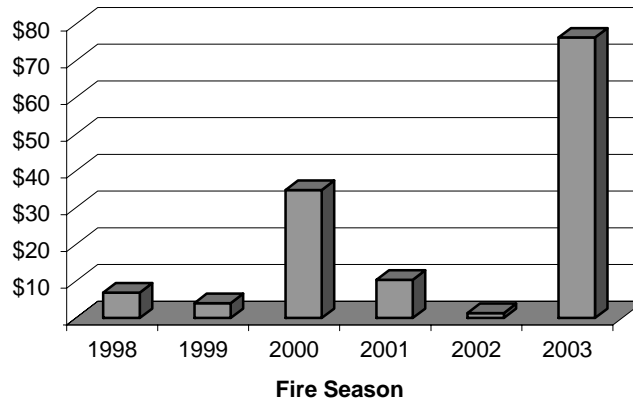
* 2003 data is estimated, all others are actual.

Source: Department of Natural Resources and Conservation.

Fire Cost Factors

The items that generate the costs of fire suppression are basic to the tasks involved in wildfire management. No matter the size of the fire, equipment, personnel, and their support systems account for the major suppression cost categories. Approximately 90 percent of the state's costs for the 2003 fire season were in the following SABHRS categories:

- 42.0% - Heavy Equipment and Equipment manned/fueled
- 23.0% - Fire Suppression Services: Crews and Engines, Aviation
- 9.5% - Emergency Fire Fighters
- 6.0% - DNRC Overtime
- 4.0% - Small and Non-office Equipment
- 3.0% - Food
- 1.5% - DNRC Regular Pay

Estimates on the costs of large federal fires in Montana in 2003 show the same general expense categories.

To get an understanding of 2003 fire season costs we compared the state's costs for fire seasons 2001 and 2002 to 2003. We identified

2003 cost categories that showed both significant dollar and percentage increases over the 2001 and 2002 fire seasons. All of those identified are directly associated with large fires, but are also the cost drivers for any size fire: heavy equipment, suppression services, and aviation. In addition, several other categories showed large percentage increases and relatively higher dollar increases. Non-office equipment, vehicles non-travel (IMT vehicles used at fire), small equipment, system development, minor tools, office supplies, and trailers were among these items. These items are all associated with administration of larger fires.

In fact, over the last ten years 68 percent of the total costs of fires can be attributed to fires of 1000 acres or more. In 2003, DNRC was involved in 682 wildland fires. Nineteen fires (2% of the total number) accounted for 80 percent of the total suppression costs. Just three of the fires (Cooney Ridge Complex, Black Mountain #2, and Boles Meadow) accounted for 46 percent of the costs.

Conclusions:
- ▸ *Effective cost containment strategies on large fires should concentrate on the high cost factors: equipment, personnel and aviation.*

- ▸ *The best cost containment strategy appears to be to prevent a fire from getting large so mobilization of teams, equipment and crews is not needed.*

This conclusion is supported by other studies on fire suppression costs.

National Studies of Fire Suppression Cost Containment and Related Issues

During the course of the last four years, numerous national and regional studies have been conducted with regard to wildland fire administration and more specifically of wildland fire suppression costs. The following lists some of the organizations responsible for the study of wildland fires and includes the title and date of the reports.

- ▸ General Accounting Office (GAO) "Wildland Fire Management," March 2002

▸ National Academy of Public Administration "Containing Wildland Fire Costs: Utilizing Local Firefighting Forces," December 2003

▸ National Academy of Public Administration "Wildfire Suppression: Strategies for Containing Costs," September 2002

▸ National Association of State Foresters "Costs Containment on Large Fires: Efficient Utilization of Wildland Fire Suppression Resources," July 2000

▸ National Association of State Foresters/U.S. Department of Agriculture "Forest Service Action Plan, Large Fire Cost Reduction Action Plan," March 2003

▸ U.S. Department of Agriculture "Policy Implications of Large Fire Management: A Strategic Assessment of Factors Influencing Costs," 2000

▸ Northern Rockies Coordinating Group "Cost Containment Report," June 2004

▸ Wildland Fire Leadership Council "Large Fire Suppression Costs: Strategies for Cost Management," August 2004

▸ National Interagency Complex "Incident Management Organization Study-Findings and Recommendations (Final Draft)," November 2004

There are essentially five common themes central to these studies:

1. The most effective cost containment strategy is to prevent a wildfire from escaping initial attack efforts. If a fire escapes initial attack, costs grow exponentially.

2. There is a critical need to embark on a reduction in fuel levels existing throughout wildland areas. Eliminating the build-up of excess fuels will reduce the incidence of fires able to grow so quickly they overwhelm the capabilities of initial attack resources.

3. Movement into the wildland urban interface has increased fire suppression costs.

4. Nationally, there needs to be a greater reliance and integration of local firefighting resources in the overall wildland firefighting strategies. Costs of firefighting grow significantly when a fire is fought using resources from outside the region, both personnel and equipment. Using local volunteer firefighters could significantly reduce this cost.

5. If the climate prognosis is correct, the prevailing climatic conditions (drought) may well exist for the next 20-30 years.

The catastrophic fires that have occurred in the past five years provide a sobering insight into what the future may hold.

Summary

Throughout the remainder of the report we use the above noted studies and identified cost drivers to support our findings and/or for evaluation criteria. It is clear from our review/analysis of these reports there has been extensive study of fire suppression costs and the causes of those costs. The challenge is incorporating the recommendations of these various studies into Montana's experience.

While the following chapters of this report will provide conclusions and recommendations that various aspects of wildland fire administration could be improved, it is important to understand 2003's fire activity was unprecedented. The types, locations, and number of fires stressed operational and control systems. Additionally, DNRC, either on its own or through partnership with local and federal fire agencies, has or is actively attempting to address many of the issues/deficiencies that "cropped up" from the 2003 fire season in order to be prepared for future seasons.

Chapter III – Initial Attack of Wildland Fires

Introduction

DNRC's major responsibility related to wildland fire protection is initial attack of wildfires on forested and range lands. Initial attack is fire suppression activities taken by resources that are first to respond and arrive at a fire.

This chapter discusses DNRC initial attack operations and resources. It includes information regarding actions taken when a report of a fire is received, and describes coordination between state, federal, and local resources.

DNRC Initial Attack Field Operations

Each DNRC land office has wildland fire suppression responsibilities. However, differences exist in the departments approach in fire suppression depending on whether it has direct protection or state-county cooperative responsibilities.

Unit Offices Administer Initial Attack Activities in Direct Protection

Unit offices within the designated boundaries of the three land offices with direct protection responsibilities conduct various DNRC field activities, including initial attack on wildfires. Most unit offices are responsible for several hundred thousand acres of state, private, and federal land. To accomplish fire protection, area offices in Kalispell, Missoula, and Helena hire seasonal fire crews during the fire season.

To improve initial attack coverage, the Southwestern, Northwestern, and Central Land Offices also locate crews at initial attack stations, which are only staffed and operated during fire season. For example, the Southwestern Land Office has fire crews located at its unit office in Anaconda. However, to provide more efficient coverage in the northern portion of its protection area, the Anaconda unit staffs an initial attack station near Garrison. The following displays DNRC's land offices, unit offices, and initial attack stations.

Figure 3

DNRC Land Offices

Northwestern LO   Central LO   Northeastern   Eastern LO

Southwestern LO

Libby   Olney

Marion ■   ▲ Kalispell

Swan Lake

Plains

Clearwater

Lincoln ■

Missoula ▲   Garrison ■   ▲ Helena

Anaconda

Lewistown ▲

Miles City ▲

Billings ▲

Dillon ●

Lima ■

Southern LO

▲ DNRC Land Offices

■ Initial Attack Stations

● Unit Offices With Initial Attack Responsibilities

State-County Cooperative Protection

DNRC Direct Protection

Source: Compiled by the Legislative Audit Division.

Conclusion: DNRC has the responsibility of protecting over 52 million acres of state, private, and federal lands from wildland fires. Initial attack of wildland fires on these lands relies upon a network of DNRC, federal, and local government agencies.

How are Wildland Fires Detected and Resources Dispatched?

An efficient detection system is an integral part of any fire protection organization. DNRC's fire detection process is composed of two primary elements: lookout towers and aerial detection. Presently,

DNRC has 10 lookouts located around Western Montana and the Forest Service has over 30. Some are manned all summer and others are only manned in times of high fire danger.

The department also has three fixed-wing aircraft located in Helena, Missoula, and Kalispell to spot wildfires from the air. Aerial detection provides several benefits in fire suppression. For example, aircraft allow the department to fly areas immediately after a storm to help detect fires soon after they start. Aircraft also provides coverage of areas that lookouts cannot see or during times when lookouts are not manned. If needed, these aircraft can also be used to help ground crews locate fires in difficult terrain. Other ways DNRC detects wildland fires include reports from the public, reports from federal (such as federal lookouts) and local agencies, and DNRC fire crew patrol activities. Federal aircraft also play an important role in detecting wildfires. For example, the U.S Forest Service will report a fire to DNRC if it finds a state fire while patrolling federal lands. In Eastern Montana, the Bureau of Land Management performs all air patrols and reports fires to the appropriate agency.

Dispatching of Initial Attack Resources

Once wildland fires are detected initial attack resources must be dispatched to the fire's location. Interagency dispatch centers are generally responsible for dispatching federal and DNRC initial attack resources. Interagency dispatch centers are located in Billings, Dillon, Helena, Kalispell, Lewistown, Missoula and Miles City. Audit observations of dispatch center operations noted they have developed formal protocols, called run cards, which outline the type and amount of resources dispatched to fires based on fire conditions. National firefighting standards recommend dispatching the closest available resources to fires, regardless of protection responsibilities, to ensure a timely response. Our observations of dispatch center operations found they are sending the closest available initial attack resources.

Higher fire danger increases the number of initial attack resources sent to fires because of the potential to become project fires. For

example, during times of extreme fire danger protocols usually require at least one ground crew and a helicopter with a water bucket be sent to a fire. This allows the helicopter to immediately begin dropping water until a ground crew arrives. If needed, ground crews may continue to use the helicopter until they have the fire under control or order additional resources through the dispatch center to assist in their firefighting efforts.

Local Entities Receiving Fire Reports Notify Interagency Dispatch Centers

A review of 2003 fire records and interviews with DNRC and local fire officials indicate initial attack activities are coordinated. Other entities receiving reports of wildland fires generally refer the calls to the interagency dispatch center in their area. For example, if a local 911 center receives a report of a wildland fire, they generally notify the interagency dispatch center so the appropriate federal or state agency can be dispatched to the fire. However, if a wildland fire is in an area of overlapping protection with a local fire department, 911 personnel have a responsibility to notify and dispatch the local fire department. Therefore, in areas of overlapping protection or fires close to protection boundaries, audit work found resources from more than one government entity (federal, state, or local) are often dispatched to fires. These additional resources help keep most fires small.

Conclusions:

‣ *DNRC has established procedures and provided resources for locating and reporting wildland fires. These resources include state and federal lookouts, air patrols, and reports from the public.*

‣ *Dispatch centers have developed protocols for sending appropriate amounts, types, and closest initial attack resources (state, federal, local) to fires based on fire conditions.*

‣ *Resources are generally dispatched without delays when fires are located near boundaries between state, local, and federal protection areas.*

Initial Attack Resource Levels

One of the questions addressed in the audit related to the department's success at initial attack and the extent of resources available for these efforts. The following sections provide information on DNRC's success in suppressing fires at the initial attack stage. These sections also discuss the types and levels of department initial attack resources.

DNRC Is Keeping Most Fires Small and This Helps Control Suppression Costs

DNRC's goal is to suppress 95 percent of fires at less than 10 acres through aggressive initial attack. From 1993 to 2003, the department kept 95.6 percent of fires (in direct protection areas) at less than 10 acres. The following table illustrates the reported percentage of fires suppressed at fewer than 10 acres between 1993 through 2003.

Table 3

Fires in DNRC Direct Protection Areas
1993-2003 (Unaudited)
(Excludes false alarms)

CalendarYear	Total # Fires < 10 acres	Total # Fires > 10 acres	Total # Fires	% Fires < 10 Acres
1993	192	1	193	99.5%
1994	669	35	704	95.0%
1995	229	9	238	96.2%
1996	340	22	362	93.9%
1997	189	3	192	98.4%
1998	331	13	344	96.2%
1999	403	20	423	95.3%
2000	436	32	468	93.2%
2001	294	13	307	95.8%
2002	286	10	296	96.6%
2003	477	18	495	96.4%
Total	3846	176	4022	95.6%

Source: Compiled by the Legislative Audit Division from DNRC records.

As the table shows, DNRC's success ranges from 93.2 percent in 2000 to 99.5 percent in 1993. The department was slightly under its 95 percent goal in just two of the last ten years. According to DNRC officials, a number of factors impact the department's ability to meet

its goal. These include fuel and weather conditions, number of fires burning, and initial attack resources available. Multiple fires starting from a single storm significantly impact the department's ability to respond to all fires because initial attack resources get stretched thin. Consequently, some of these may grow into large fires. For example, DNRC's Southwestern Land Office had 100 fires burning during a three day time period (August 8 through August 10, 2003). DNRC crews were able to contain 94 of the fires, but six grew to be large fires.

We analyzed the department's fire suppression costs between 1993 through 2003 for fires less than 10 acres. This work supports the assertion keeping fires small is cost effective. Based on data reviewed, we found the 10-year average cost of suppression for fires less than 10 acres was approximately $4,538 per fire. This compares to average suppression costs of approximately $2.3 million for fires 5,000 acres and larger during the same time period.

> *Conclusion: Keeping fires small is the most effective way to control fire costs. The department is meeting its goal to suppress 95 percent of fires at less than 10 acres. The department should continue its policy of aggressive initial attack and suppressing at least 95 percent of fires at less than 10 acres.*

DNRC Initial Attack Resource Levels

The Kalispell, Missoula, and Helena land offices have direct protection responsibilities for an average of 1.7 million acres each. This acreage is divided into areas of protection among field unit offices. The following table provides information on the amount of initial attack resources available within land offices.

Table 4

DNRC Initial Attack Resource Types and Levels for Direct Protection Areas

Resource Type	*Number Of Resources*		
	Northwestern Land Office (NWLO)	**Southwestern Land Office (SWLO)**	**Central Land Office (CLO)**
Seasonal Firefighters	49	50	21
Type 3 & 5 (500 gallon) Engine	0	7	1
Type 4 (750 gallon) Engine	1	0	0
Type 6 (200 gallon) Engine	19	18	8
Water Tender (1,500 gallon) Engine	3	1	2
Type 2 Helicopter	1	1	1
Helitender	1	1	1
Fixed Wing Airplane	1	1	1

Source: Compiled by the Legislative Audit Division from DNRC data.

DNRC assigns resources by considering the state's protection responsibilities and fire load (fuels, access to land) in each land office. The NWLO and SWLO are similar in geographic size and also have the same number of unit offices responsible for initial attack. These two land offices have similar amounts and types of initial attack resources. The CLO has approximately half the amount of initial attack resources as the other two land offices. Since the CLO has fewer resources, the land office relies on the state-county cooperative protection approach in these areas. The department provides supplemental equipment and crews to several local fire departments to assist with these duties. For example, during fire season the CLO stations a type six engine at the Wolf Creek Volunteer Fire Department.

DNRC Has Improved Initial Attack Capabilities With More Helicopters

Over the past several years DNRC's initial attack program has increased its air support capabilities with addition of helicopters. Helicopters are located in three land offices (NWLO, SWLO, and CLO) and are used for a variety of initial attack duties including water bucket drops and shuttling crews to and from fires. DNRC does not specifically assign helicopters to the three land offices in

Eastern Montana. However, helicopters can be deployed there when needed.

In June 2004, the Governor's office requested the department obtain another helicopter to be used for wildland fire suppression. The department acquired a 1969 Huey helicopter through the Federal Excess Personal Property Program. DNRC expended Federal Job Growth Grant funds and general operating funds to prepare the helicopter for use on wildland fires. Total development costs were $256,000. The helicopter was completed and ready for use in August 2004. The helicopter is located in Helena and not assigned to a department land office. It is considered a statewide resource and can be dispatched to different areas of the state when needed. The Governor's 2007 budget requested funding for another helicopter. Chapter VI discusses helicopter resources in more detail.

Severity Resources Are Used To Supplement Initial Attack

Department officials believe DNRC's current levels of initial attack resources are sufficient for moderate to high levels of fire danger. During very high to extreme fire conditions, department resources are generally not sufficient. Approximately five years ago the department began incorporating other resources to supplement its initial attack capabilities during times of very high to extreme fire danger. Initial attack severity resources come from the private and public sector. Examples of supplemental initial attack resources include aircraft, engines, and additional ground crews.

Severity resources are "pre-positioned" (i.e. put on stand-by and/or used in patrol status) in areas with the highest risk for ignition of wildfire and then used for initial attack when fires start. The department also uses severity resources to supplement its ability to detect fires (i.e. lookouts) and prevent man-caused fires by hiring fire prevention specialists on a temporary basis. Fire prevention specialists are used to educate the public regarding fire danger and fire precautions while in the forest. In the past five years approximately $8.3 million has been spent on severity resources.

According to DNRC officials, the main benefit of severity resources is they give the department flexibility to hire resources when needed and release them when no longer needed. However, DNRC officials acknowledged these resources contribute to higher initial attack costs.

Audit work found the department has a formalized process for determining when severity resources are needed. Formal guidelines have been developed using several national fire standards. This criterion includes fire danger levels, fuel ignition components, expected weather conditions, and potential growth of fires. All requests for severity resources are reviewed and approved by three levels of department management prior to deployment: area fire program managers, the Fire and Aviation Bureau (FAMB) Chief, and the Forestry Division Administrator. The FAMB Chief and area fire program managers monitor fire conditions to ensure severity resources are released when no longer needed.

> *Conclusion: Helicopters and severity resources help supplement DNRC initial attack capabilities but lead to increased costs for initial attack. Controls are in place for reviewing the need, hiring, and releasing of severity resources.*

A Two-Tiered System Could Help Reduce Severity Costs

When an aircraft is placed on severity, the department pays different rates depending on whether or not the aircraft is flying. We noted when other initial attack resources are hired under severity the department pays a single rate regardless of whether the equipment is on stand-by or responding to a fire. All rates are set in the Interagency Incident Business Management Handbook developed by National Wildfire Coordinating Group (NWCG).

According to DNRC officials, the NWCG rates have profit margins built into them to account for "wear and tear" of equipment that occurs on a fire. However, equipment on stand-by does not experience this wear and tear because it is generally placed in one location and not used until it responds to a fire. Therefore, the

department should develop a two-tiered payment system, similar to
aviation resources, that uses a stand-by rate and an operating rate. A
two-tier system would have two benefits. First, it would help the
department reduce the total amount it spends on severity resources.
Secondly, it would ensure higher rates are only paid when equipment
is actually being used. The following table provides possible
scenarios that could be incorporated and how they would reduce
what the state pays for these resources on a daily basis. The
scenarios provided are for commonly used wildland fire equipment.

Table 5

Potential Two-Tiered Equipment Rates for Severity Resources

Type of Equipment	Current Operational Daily Rate	25% of Daily Rate	50% of Daily Rate	75% of Daily Rate
Type 5 Engine w/Crew	$ 1,400	$ 350	$ 700	$ 1,050
T-5 Dozer	$ 1,260	$ 315	$ 630	$ 945
SK-5 Skidgine	$ 2,632	$ 658	$ 1,316	$ 1,974
Lowboy (26-40 Tons)	$ 770	$ 193	$ 385	$ 578

Source: Compiled by the Legislative Audit Division.

As the table shows, there are different possibilities the department
could consider when implementing a two-tiered system. Each could
reduce the department's cost for using severity resources. For
example, in 2003 the department paid $16,380 to place a T-5 dozer
and lowboy on severity (i.e. stand-by) for approximately 8 days but
was not used on a fire. If a 50 percent stand-by rate existed this cost
would have been reduced to $8,190. In total, the department
expended $2.6 million on heavy equipment hired under severity in
2003. A 50 percent standby rate could have potentially saved the
state up to $1.3 million. The department has never pursued
implementing a two-tier system for severity resources. Our
interviews indicated at least some contractors and local fire
departments have expressed a willingness to accept a lower stand-by
rate for equipment placed on severity. However, developing a lower

stand-by rate could potentially reduce availability of contracted severity resources because not all contractors would accept the lower rate. The department would need to coordinate its efforts to establish stand-by severity rates through the NRCG since it provides oversight for all interagency wildland fire management activities, including rates paid to wildland fire contractors.

Recommendation #1
We recommend DNRC coordinate with the Northern Rockies Coordinating Group to implement a two-tiered rate system for severity resources.

Fire Program Analysis Will Evaluate Initial Attack Resource Levels and Distribution

DNRC fire officials indicated the department's initial attack ground forces (engines and seasonal fire crews) have generally remained the same over the last 20 years. The department has informally discussed taking a more aggressive initial attack approach by raising the percentage of fires suppressed at less than 10 acres from 95 percent to 98 percent. However, it is unclear whether the department could accomplish this goal with existing resources since they are only slightly exceeding its current 95 percent goal.

Presently, the department does not know whether its existing initial attack resources are effectively distributed around the state. DNRC recently hired an analyst to examine the department's initial attack resources and their placement. In general, this will be accomplished through analysis of the state's historical fire activity and comparison of this data to how initial attack resources are dispersed around the state. This study is being done in conjunction with federal fire agencies and will also review initial attack resources available at federal and local agencies. The goal of this analysis is to determine whether, and how the department and its partners can get more efficient coverage with the initial attack resources they currently have. Increased efficiencies in location and level of initial attack resources could reduce the department's reliance on hiring severity resources.

Chapter III – Initial Attack of Wildland Fires

> **Recommendation #2**
> **We recommend DNRC make completion of the fire program analysis project a high priority and provide a report to the 2007 Legislature.**

Budget Cuts Are Impacting Portions of the State-County Cooperative Program

According to FAM Bureau officials, department budget cuts made to address actions of the 2002 Special Legislative session, have impacted the department's ability to manage the state-county cooperative program in Western Montana. The department provides 11 counties in the SWLO and NWLO with several wildland fire services, including equipment and training. Department information shows DNRC has experienced a three percent decrease in operating funds and a reduction of 4.15 FTE for the program. According to the department, these reductions will have the following impacts on the 11 western counties participating in the program:

▸ DNRC will no longer continue to place wildland firefighting equipment in these counties. Equipment will only be provided to counties in the CLO, NELO, SLO, and ELO.

▸ The department will no longer coordinate or certify wildland fire training for these counties. Counties will also be required to purchase their own training materials with limited department assistance.

▸ DNRC employees will no longer provide these counties with wildland fire training as part of their job duties and it can only be provided on a volunteer basis.

FAM Bureau officials acknowledge as a consequence, some local government officials are questioning whether an interagency partnership in fire suppression truly exists.

County Initial Attack Equipment is Aging

Budget limitations are also impacting the extent the department can upgrade or replace initial attack vehicles it has provided to counties. Audit work found much of the state-provided equipment used by counties for initial attack of wildland fires is aging. For example, DNRC has loaned counties in the NELO area a total of 86 wildland fire vehicles. Thirty-nine vehicles (45 percent) are between 25-34 years old and twenty-one vehicles (24 percent) are 37 years old.

County fire officials are concerned they will not be able to effectively use these vehicles much longer to initial attack fires. The reasons range from lack of replacement parts to difficulty of repair.

> **Recommendation #3**
> **We recommend DNRC seek support for additional funding from the Legislature for the County-Cooperative portion of the program.**

Financing Severity and Reducing Suppression Cost Risks

For a long period of time, the state of Montana has only used one basic method of funding wildfire suppression costs. It has relied upon supplemental appropriations to pay for wildfires. However, most pre-suppression activity is budgeted. In a sense the state has been self-insuring, but with no real risk model to guide its activity. The state pays "the bill" at the end of the year with General Fund and other "reserves". There is no ongoing program to control costs built into such a model. This funding model is similar to many other states and the federal government. In contrast, the State of Oregon applies a different factor to the model. It insures itself for catastrophic loss of wildfires through Lloyd's of London by paying an annual premium of $3.75 million with a $15 million deductible for $25 million of insurance.

Severity Uses Unbudgeted Funds and Supplemental Appropriations

In the past five years Montana has added another element to its model of funding suppression. Worsening fire conditions (severity) have forced the department to use the supplemental appropriation process to cover the cost of hiring and placing additional resources in areas that are at a higher risk of wildfire. The state uses unbudgeted resources to mitigate the risk of large wildfires and covers the associated expenses through supplemental appropriations. However, the ability of these resources to move quickly to respond to initial fires has helped the state reduce the number of larger fires according to a study completed by the department. By formulating the deployment criteria and utilizing severity resources the department created a risk management element to the present funding model. There is no appropriation or budget for these expenditures. It is a

program established by an executive department without formal budget review and appropriation by the Legislature.

In a sense, the state has been informally moving toward "self-insurance" without the formal process of risk identification and mitigation. However, it should be the goal of self-insurance to use budgeted funds from within an organization to reduce the risk of catastrophic loss, since such a loss in the case of a fire comes from the General Fund. A formal risk model would include identifying the major risks; measuring those risks; and, controlling those risks. It also includes monitoring.

An Alternative Approach Should be Considered to Fund Severity Resources

The objective of formal risk financing is to minimize cost over the long-term. From a financial budgeting point of view, it is easier to work with the costs that do not vary wildly from one year to another. The risk-financing model selected must allow the organization to maintain and develop control over risk exposures. When assuming responsibility for losses it will naturally require the promotion of risk management, better communication, motivation and awareness. The risk financing model selected should enhance the level of these various aspects of the organization thereby aiding in control of costs.

One such model is for the state to fund and budget for a severity program. Over the last five years the state expended approximately $8.3 million just on severity resources. These resources include heavy equipment, engines, and personnel costs. The following chart displays annual expenses.

Table 6

Annual Severity Expenditures

Fiscal Years 2000 through 2004

Location	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
Central LO	$ 484,898	$	$ -	$ 104,485	$ 9,449
Northwestern LO	$ 984,197	$1,091,648	$ -	$2,291,639	$ 30,975
Southwestern LO	$ 651,582	$ 32,280	$ -	$1,388,143	$ 44,740
Eastside (ELO, NELO, SLO)	$ 192,031			$ 447,003	
Minnesota CL215's Aircraft					$514,419
Totals:	**$2,312,708**	**$1,123,928**	**$ 0**	**$4,231,270**	**$599,583**

Source: Compiled by the Legislative Audit Division from SABHRS Information.

Legislative funding of a severity resources program, along with other risk-related activities, would provide a more stable insurance model. The model itself, financed with appropriated funds could be used for three critical areas that impact Montana's overall fire costs. They would be:

‣ Pre-positioning additional resources for initial attack during severe fire danger periods.

‣ Obtaining/upgrading local initial attack resources.

‣ Promoting wildland urban interface fire risk mitigation.

For example, placing a fixed amount each year in a risk management fund could be used at the start of the fiscal year, which corresponds with the start of the fire season, for severity funding. Funds remaining after the fire season could be used to fund other programs of risk management. With a known budget there is more of an incentive to manage funds to best use resources. Such a budget control does not exist under the current supplemental appropriation process.

The funding source for such a program is a legislative decision. Currently, General Fund monies are being used to fund severity so that a much greater amount of General Fund expenditures will not be

needed to suppress large fires. The same option of continuing to use General Fund monies remains, but other options include earmarking some of the state's insurance premium tax, which goes to the General Fund, to the risk management fund. Other states are using additional landowner assessments or timber taxes.

A risk management model, established in statute, would formalize the risk financing method. How much the legislature wants to spend on reducing the risk of wildfire depends on the willingness to accept the risk and expenses associated with large fires.

Recommendation #4
We recommend DNRC seek legislation to establish a formal risk financing method to be used for severity funding, increasing the effectiveness of initial attack, and reducing the risk of wildfires.

Other Funds are Available for Mitigation Efforts

The National Fire Plan is the implementation of federal wildland fire policy and was instituted following the disastrous 2000 wildfire season. The key attributes of the plan are:

‣ The safety of firefighters and the public are paramount.

‣ Emergency stabilization and rehabilitation of severely burned areas is essential to protect lives and properties downstream of burned areas.

‣ Hazardous fuel levels must be reduced in the country's forests and rangelands.

‣ Communities at risk from wildfires need assistance to reduce the threat of fire in the wildland-urban interface.

Since 2002, Montana has received slightly more than $6 million in National Fire Plan funding through the Western States Fire Management and Community Assistance Grants. This funding is provided to reduce the build-up of hazardous fuel levels in the state's forested areas.

DNRC coordinates local government's efforts to acquire federal fuel reduction grants and is the conduit to "pass through" the grants to the local communities. However, the department itself does not specifically fund fuel reduction programs with state funds. Because the state has relied exclusively on grants from the federal government for its fuel reduction programs, it is vulnerable to fluctuations in federal funding. The effort to reduce the fuels build-up is further weakened because DNRC has not identified where the most critical need for fuel reduction work is or how large the problem of hazardous fuel levels is throughout the state's forested areas.

The importance of reducing hazardous fuel levels in the nation's forests has been identified as one of the most critical elements in reducing the number, intensity, and cost of wildland fires in every national study completed in the last five years.

> *Conclusion:* **The state's fuels reduction efforts are not coordinated to ensure those areas with the greatest risk are being treated. This is due to the lack of statewide information on the level of forest fuels and the complete reliance on inconsistent federal funding to reduce forest fuels.**

Chapter IV – Wildland Project Fires

Introduction

In calendar year 2003, over 80 percent of all state fire suppression costs were attributable to just 19 larger (project) fires. Legislators had questions related to the cost of suppressing large wildland fires. The remainder of this chapter provides discussion of the administrative aspects of suppressing project fires and addresses the cost related questions. The last part of the chapter presents conclusions and recommendations relative to the cost of suppressing large wildland fires.

Administering Entities on Project Fires

It is important to note once fire escapes initial attack efforts (whether they are local, state, or federal), initial attack resources are typically pulled off the fire and returned to their initial attack responsibilities. At this time an interagency Incident Command System typically assumes suppression efforts under the direction of an administering entity.

While a fire's origination point helps define who administers or manages a fire and how fire costs are assigned, it is not necessarily a steadfast rule. For example, in the eastern portion of the state, DNRC and the applicable county are often jointly the administering entities, or DNRC and a federal agency, plus the county can be the administering entities. Also, in 2003 DNRC and the Forest Service "traded" administrative responsibilities on fires because of location and resources.

Line Officer

The administering entity designates what is known as a "Line Officer" to be the agency representative for that fire. There may be more than one Line Officer on a fire. The Line Officer directs the overall management activities of the fire. For DNRC, the assigned Line Officers are usually the Area Managers or the Unit Managers, depending on location and circumstances of the fire and fire season. Due to the number of project fires in 2003 and the limited number of Line Officers, it was necessary for DNRC to obtain a Line Officer from another state for at least one fire. For the federal agencies, the designated Line Officer can vary from a Fire Management Officer within BLM to the District Forest Ranger for the Forest Service.

Decisions made by the Line Officer can have a significant impact on fire costs and tactics used in suppressing the fire.

Incident Management Teams

Fires are typically managed via some sort of formal command type structure. State and federal wildland firefighting agencies use the Incident Command System to manage fires. The premise of the Incident Command System is every incident or event has certain primary management functions that must be performed.

The following organizational chart outlines the incident command system and its organizational elements as employed for wildland fire management.

Figure 4

Incident Command System

Source: National Wildfire Coordinating Group.
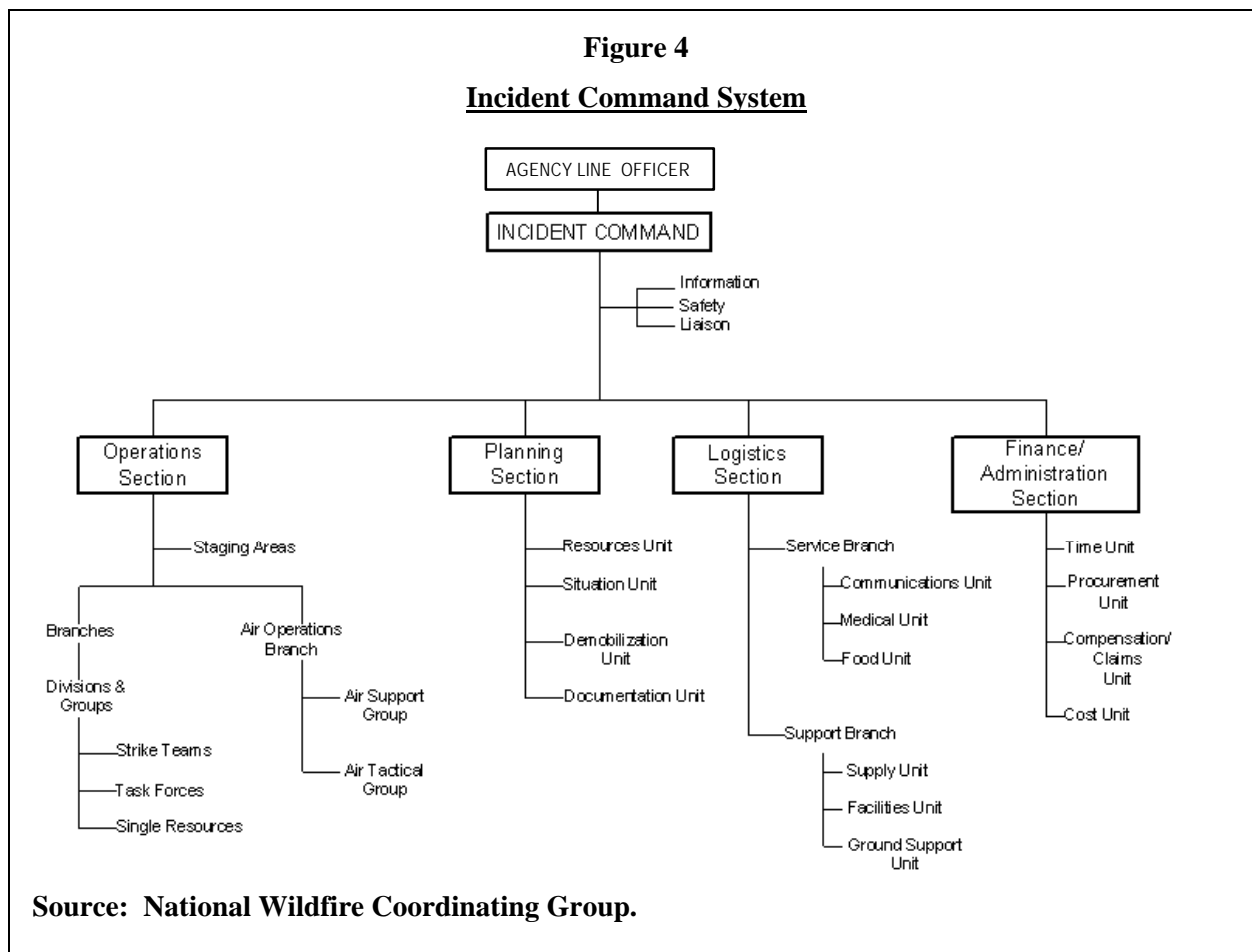
**Types of Incident
Management Teams**

Wildland fires that escape initial attack are managed by Type 1, 2, or 3 Incident Management Teams organized as shown in Figure 4. The type of team and the number of team members required is determined by a fire's complexity. Factors include fire behavior, number of firefighters required, resources threatened (natural resources, structures, etc.), firefighter and public safety, and number of jurisdictions involved. The largest, most complex fires are managed by Type 1 teams. Fires of moderate complexity are managed by Type 2 teams. Large, but less complex fires are managed by Type 3 teams. Several and different types of teams can be employed on a project fire. As a fire grows more complex, its management may transition to a higher level team. Conversely, once suppression objectives have been achieved on a project fire, management may be passed back to a lower-level team. The following table is a comparison chart showing team characteristics.

Table 7

Incident Management Team Comparison

Team Details	Type 1	Type 2	Type 3
Team Composition	Formal	Formal	Formal/as needed
Number of Team Members	27 +/-	21 +/-	3 to 10
Fire Complexity	Most Complex	Moderately Complex	Fires that Escape Initial Attack
Number of Firefighting Personnel on Assignment	500-2,500	100-500	20-100

Source: National Academy of Public Administration.

Team members are typically made up of state, federal, and local government/fire department employees. Recently, teams have been adding retirees from government fire management agencies and other sources to bolster a dwindling source of active government employees. Personnel on Type 1 and Type 2 teams are permanently assigned. In Montana, a Type 3 team, the County Assist Team (CAT), primarily consists of DNRC, local government/fire department personnel, and private sector individuals who have wildland fire experience.

Type 1 and 2 teams typically manage fires in the geographic area where team members are located. Due to the extreme fire season in 2003, it was sometimes necessary to request and use IMTs from outside the geographic region. This generally increased complexity of fire administration and costs on project fires to varying degrees.

> *Conclusion:*   ***During the 2003 fire season it was necessary to request and utilize IMTs from outside the geographic region. This increased the complexity of fire administration and costs associated with project fires to varying degrees.***

Creation of a WFSA

Over the past several years, firefighting strategy tools have been established and employed to help create somewhat standardized strategies for fighting wildland fires. Policy at both the state and federal level now requires the creation of a Wildland Fire Situation Analysis (WFSA) to help administering entity and the Incident Management Team determine firefighting methods. The WFSA document (depending on the fire and its duration) may be modified (potentially daily) to reflect changing circumstances. The following outlines the basic topic areas of a WFSA:

▸ Fire situation (includes topography, land ownership, fire behavior, weather)

▸ Fire objectives

▸ Safety issues

▸ Alternatives for managing the fire

▸ Estimated suppression costs for the alternatives

▸ Resource value losses for alternatives

▸ Safety assessment for alternatives

▸ Decision summary

The use and value of the WFSA is a somewhat controversial issue among Line Officers and Incident Management Teams. Opinions regarding its value and role in fighting a fire vary. This is due in part to revisions to the WFSA document, changes to the process, and the challenges and time commitment associated with completing the document. DNRC and it NRCG partners should continue to refine

the purpose of the WFSA and the level of effort needed for its completion and use.

> *Conclusion:* **The WFSA is designed to help the administering entity and the Incident Management Team determine the overall strategy for fighting project fires. Due to revisions and challenges associated with completing the document's topic areas, it has become an issue that needs to be further addressed by the NRCG partners.**

Delegation of Authority

In addition to the WFSA, the administering entities and Line Officers must begin crafting other documents used for a fire's management. The Delegation of Authority assigns management of the fire to the Incident Commander of the Incident Management Team.

The level of detail in a Delegation of Authority varies depending upon the Line Officers, type and location of the fire, and parties involved. Training documents provided to DNRC Line Officers state "the letters of delegation should be specific enough to ensure the Line Officer gets the desired results, but broad enough to let the Incident Management Team perform their management duties." Our reviews of Delegation of Authority documents indicate significant variability in the detail associated with these documents.

Cost-Share Agreement

As noted previously, fires can have joint jurisdiction. As a result, a signed agreement must be developed to designate what is to be paid for, and by whom. While the agreement is primarily a matter for the administering entities to work out, it is also of importance to the Incident Management Team which is responsible for documenting fire suppression activities. Historically, cost-share agreements were pro-rated based on acreage consumed by fire with each entity paying based on the acres under their jurisdiction. However, due to modification of firefighting strategies, the need for alternative (more expensive) strategies in some environmentally-sensitive areas, and increased attention to overall fire costs, other types of cost-share agreements have been employed.

Chapter IV – Wildland Project Fires

Interviews as well as analysis of cost-share agreements suggest there is some urgency to negotiate at least a working draft of a cost-share agreement in order for the Incident Management Team to set up appropriate cost-accounting procedures. Conversely, due to the large number of variables associated with project fires it is sometimes necessary to delay finalization of the cost-share agreement for several months. Although DNRC has established policy/procedure for review of cost-share agreements prior to their approval, our findings suggest some possible improvements could be made.

Fire Suppression Administrative Activities

The following sections provide information about administrative activities that occur on large fires.

In-Briefing

Upon accepting an assignment, the IMT is directed to a specific mobilization point whereby they typically meet with the Line Officer(s) to receive an in-briefing. At this briefing the team will obtain information/intelligence on initial attack activity, previous IMT activity (if it is a transition team), weather, local government/landowner issues, WFSA details, etc. Upon completion of the in-briefing, the Incident Commander signs the Delegation of Authority and the team leaves for the incident to set up a command post (fire camp) and initiate fire management activities.

Fire Activity/Management Reports

During the course of the IMT's tenure on the fire, there are daily and often twice-daily briefings held by the IMT. Depending upon the fire and other circumstances, the Line Officer(s) are typically present for at least one of the briefings. In addition, the Line Officer and Incident Commander often communicate by radio or telephone during the course of every day of the incident. The amount of time the Line Officer spends at the fire camp or on the firelines varies by individual and is based on the fire, comfort with the IMT, and other factors such as conflicting job priorities.

In addition to daily briefings, the IMT prepares and submits various documents to the Line Officer and other entities to show estimated costs, progress and strategies for managing the fire. The progress

reports and action plans provide critical information to the Line Officer and the entities prioritizing/directing resources to this and other fires.

Getting Resources To A Fire

Fire management is a resource-driven process. From the vehicles used to get personnel to the fire to the replacement of broken tools, someone must organize, order, monitor/control, and return nearly every single resource on a fire. Through historical experience, dispatch and agency personnel have created basic "order" packages that correlate to the type of fire and IMT. However, this is only the starting point when it comes to project fires. Personnel, equipment (all types), and aviation resources, must be ordered by the IMT through the dispatch system.

To quickly respond to the needs of an IMT, supply depots (interagency fire caches) have been set up in various locations within the geographic area, as well as nationally. These fire caches are federally-administered and contain many of the basic supplies needed by the IMTs to manage a fire. The caches can be accessed by any of the recognized interagency parties, including DNRC. Supplies in the caches range from tents to packaged meals to the numerous paper forms required to order more materials and document fire activities. Records are kept of the materials ordered for individual fires and the IMT is responsible for returning all nonconsumable items to the fire cache. Information on consumables and broken/lost cache items is provided to the administering entities and they are billed accordingly. We discuss fire cache issues in the next chapter.

Mobilization of Resources

In almost any fire season, and especially during the 2003 season, there are often competing demands for resources from the IMTs managing project fires. While some cache items may become scarce, a more common need is fire crews, equipment, and aviation resources. The level of competition depends on the number and type of fires. Subsequently, it is necessary to establish priorities for the allocation of fire resources. This responsibility falls to one or more of the various organizations assigned this task. Prioritization and

mobilization of resources generally begins at the zone level (Montana has 5 zones) and ranges up to the national level. Zone mobilization tends to focus on closest available resources at the local level, while national coordinating groups focus on such items as aviation resources.

Resource prioritization and ordering processes are complex due to the multiple organizational entities involved and the contractual arrangements in place to obtain many of the resources. For example, interagency fires that have at least 150 people on them are supposed to use nationally-contracted caterers to supply meals, although there are exceptions. On the other hand, local vendors can in most cases supply porta-potties and washing stations. What and who gets mobilized and when has been complicated by the increasing availability of competing private sector resources at the local, state, and national levels.

Typical Resources Ordered For Fires are Affected by Location and Availability

The type of resources utilized for fires is somewhat affected by the location and type of fire, but can also be dictated by resource availability. On the east side of the state, fire management is heavily dependent on heavy equipment (dozers, graders), engine crews, and in select cases hand crews. Aviation resources can play a large role in eastside fires when/if they are available. Fires on the west side of the state where there are heavily forested areas rely on similar resources, but the emphasis on a particular resource may be different. For example, firelines in Eastern Montana are often created by heavy equipment, whereas in Western Montana lines must often be cut by hand due to topography and/or other factors. Accessibility to the fires is often the primary differentiation between the types and numbers of resources ordered. However, fires with higher priorities may get resources that other fires could use, but which are unavailable due to scarcity. Aviation resources would be an example of a firefighting tool that may not be available for a fire. As a result, alternative resources must be utilized.

IMT/Fireline Personnel Assignment Lengths and Work/Rest Ratios

In order to provide for safe, efficient, and effective support to project fires, policies have been established for work/rest and length of

assignments for the IMT and personnel resources working on firelines. IMT personnel must appropriately manage work and rest periods, assignment duration, and shift length for all personnel. Management of these areas is or can be impacted by other fires as a result of reassignments to or from these fires. IMT personnel must plan for and ensure all personnel are provided a minimum 2:1 work to rest ratio (for every 2 hours of work or travel, provide 1 hour of sleep and/or rest). Work shifts that exceed 16 hours must be justified and there should be mitigation measures employed to reduce fatigue.

Fatigue is also addressed through maximum lengths of assignments. A standard assignment length is 14 days, exclusive of travel to and from a person's home unit. At the end of the 14 days, personnel must (with some exceptions) receive two mandatory days off. Whether personnel are paid for the days off depends upon whether they are federal, state, local, or contract resources. Although an extension of 14 days on an assignment may be allowed, two mandatory days off must be provided prior to the 22nd day of the assignment.

Fire Close-out

Regardless of the number of IMTs working on a fire, at the end of each team's assignment there is a close-out briefing with the Line Officer(s). The briefing purpose is to discuss communication, coordination, and tactics. Additionally, the Line Officer(s) provides the team with a performance appraisal. Based on interviews and reviews of documented close-outs, there is significant variability in the formality and depth of discussion of a fire's management. While this variability can be impacted by the urgency to move the team to another assignment and/or the Line Officer's prior experience with the IMT, we believe greater emphasis needs to be placed on the close-out briefings.

Business Practices of IMTs and Administering Entities

Due to the number and size of project fires in the past decade, the administering entities (state and federal) have implemented a significant number of business controls. These controls help monitor and manage fire costs. Significant controls are:

▸ **Pre-season Inspections**: By policy, there is a pre-season safety and functionality equipment inspection process. Contracts are established for private sector contractors and local fire departments that wish to participate in firefighting efforts. These processes also entail examination of whether personnel have the appropriate qualifications.

▸ **Dispatch System**: The dispatch system for wildland fire calls is directed by protocols, procedures, and required documentation of activities.

▸ **Resource Orders**: As part of the dispatch process, orders for all resources are documented either on paper or through an automated system, sometimes both. This system allows for review of ordered resources, helps monitor resources on a fire, and helps determine proper pay for resources on a fire.

▸ **On-site Inspections**: In addition to the pre-season inspection of heavy equipment and engines, there are established procedures for inspections prior to those resources being placed on a fireline. In addition to pre-fireline inspections, there are also established procedures for post-fire inspections to help insure equipments' "fire worthiness" before being released to another fire and/or to determine if the equipment was damaged in some way that the contractor or operator will be seeking compensation.

▸ **IMT Controls**: Incident Management Team members all have responsibilities for containing costs (formally and informally). Some examples are as follows:

- **Planning Section**: responsible for ordering, monitoring, and demobilizing resources on a fire. All personnel on a fire must first report to the Planning Section's Resource Unit to be "checked in" when they arrive at a fire.

- **Logistics Section**: responsible for providing facilities, services and material in support of the incident. Logistics section staff receives and stores all supplies for the incident and maintains an inventory of items. Items must be checked out of inventory and then returned at the end of the incident.

- **Finance/Administration Section**: responsible for getting personnel and equipment "on the payroll", tracking fire costs, keeping firefighter timesheets, and shift tickets for equipment usage, among a myriad of other duties.

- **Operations Section**: responsible for the on-site management and monitoring of equipment and personnel, including directing the use of resources and signing equipment shift tickets and crew time reports.

▶ **Other Contractors**: As the number of private sector contractors seeking participation in fire activities has increased, so has the level of peer review of these resources during a fire. Additionally, contractor associations are being formed and minimum standards are being proposed by the contractors themselves to monitor and control private sector contractors.

▶ **Line Officer and IBA**: The Line Officer receives written and verbal information from the IMT on firefighting progress, resource utilization, and projected dates for containment and control of a fire. Beginning with the 2003 fire season, some Line Officers employed Incident Business Advisors (IBAs) to assist them in monitoring fire costs and IMT cost containment activities.

▶ **Fire Invoice Package**: As part of the return of delegation of fire management responsibilities to the administering entity (Line Officer), the Finance/Administration Section typically works with agency personnel (DNRC and federal) at the applicable office to finalize a fire's financial and operational documentation into what is called the "fire package". Additionally, Finance section and agency personnel coordinate what expenditures have not yet been authorized for payment and discuss any other pending finance-related issues.

▶ **Review of Invoices**: All fire-related expenditure information is reviewed by the Helena Central Office for final approval and payment authorization.

▶ **Bureau Review of Invoices**: FAMB staff review and evaluate expenditure-related documents to assess DNRC's portion of a fire's costs. This includes review of rates and amounts paid to contractors and local fire departments as well as aviation resource costs assigned to a particular fire.

▶ **Review of Federal Fire Bill**: By agreement, the federal agencies "bill" DNRC for expenditures associated with resources, which are provided by them or under their contracting process. This typically includes aviation, food catering, fire cache supplies, etc. DNRC personnel examine these bills from the BLM and Forest Service for accuracy.

▶ **FEMA Review**: Some fires are eligible for receipt of Federal Emergency Management Administration (FEMA)-Fire Management Assistance (FMA) funds. DNRC expends considerable resources to compile and verify expenditure documentation prior to submitting requests to FEMA.

Conclusions and Recommendations

Chapter IV – Wildland Project Fires

After the 2003 fire season, the legislature had several questions related to cost containment issues on project fires. These questions related to:

▸ Existing cost controls.

▸ The use of pre-established costs or contracts for equipment, services and other resources to control costs.

▸ Impact of the Wildland Urban Interface on suppression costs.

▸ Determining federal, state and local share of costs.

Cost Controls on Project Fires

The National Wildfire Coordinating Group (NWCG) established business practices that agencies are to follow in administering all fire incident business management. These practices are contained in NWCG's Interagency Incident Business Management Handbook. The handbook was developed to assist participating agencies of the NWCG constructively work together by establishing fire business procedures and controls. Each agency is to follow the direction set forth in the handbook in all incident business management functions.

During the audit, we tested adherence to the business practice controls that have been established by the NWCG to ensure they were followed on project fires. We specifically examined business controls that exist over:

• Resource ordering and dispatching.

• Contracting for equipment and services.

• Fire invoicing and payment.

We examined records for seven large-scale fires that occurred in 2003 and one fire during the 2004 fire season. This involved examining the contracting, resource ordering, and payment records for over $5 million dollars of expenses incurred fighting these particular fires. Our control testing was supplemented with observations during fires in 2004 and interviews with various IMT members and DNRC staff. The following table details the results of our tests.

Table 8

Fire Business Controls – Audit Testing Results

	Control In Place	Control Tested	Control Could Be Improved
Pre-Fire Season Controls			
Fee Schedule For All Equipment and Personnel By Geographic Area	✓	✓	
Pre-Established Contracts For Privately Owned and Local Government Equipment and Crews	✓	✓	
Pre-Season Equipment Inspections	✓	✓	
Centralized Resource Availability System	✓	✓	✓[1]
Controls During Fire			
Copy Of Contract In Finance Files	✓	✓	
Resource Order Exists	✓	✓	✓[1]
Daily Crew Time Reports Completed	✓	✓	
Daily Crew Time Reports Reviewed By Government Official	✓	✓	
Daily Equipment Shift Tickets Completed	✓	✓	
Daily Equipment Shift Tickets Reviewed By Government Official	✓	✓	
Invoice Generated	✓	✓	
Rate Paid Matches Contract Rate	✓	✓	✓[2]
Hours and Days Paid Match Daily Time Records	✓	✓	
Invoice Signed By Government Official	✓	✓	
On-Site Equipment Inspection	✓	✓	✓
Damage Claims Supported, Documented and Paid According To Policy	✓	✓	✓
Commissary, Fuel/Oil Charges Accounted For	✓	✓	
Fire Invoice Packets Reviewed By IMT For Completeness and Accuracy	✓	✓	
Daily Cost Reports Generated and Distributed	✓	✓	

Legend and Footnotes:

✓ = Applies

[1] = Related business control

[2] = Correct rates were paid to all contractors except local fire departments.

Source: Compiled by the Legislative Audit Division.

Chapter IV – Wildland Project Fires

> *Conclusion:*   ***Fire business practice controls are in place and the majority of these controls were adhered to during project fires in 2003. However, improvements can be made.***

Areas for Improvement

Audit testing identified five fire business controls that could be improved. The following sections discuss these areas.

Resource Ordering and Dispatching Could Be Improved

A basic component of the control process on major fires is the dispatch network established to obtain and move resources. The system should get the proper resource to the fire when requested. The system should also maintain timely tracking of resources so resources can be made available again as quickly as possible. The resource order, generated at the dispatch center, is the form used by dispatchers, service personnel, and logistics coordinators to document the request, order and release of resources, and track resources on an incident.

From review of resource orders, dispatch records, and other documents on four major state fires during the 2003 fire season, the following items were identified:

▸ Most resources arrived at the fire when requested. There were instances when resources were one to three days late. Most of the lengthier delays occurred on one fire. The resources involved were heavy equipment, engines, water tenders, and aircraft.

▸ There were resources at all incidents that were not initially mobilized by dispatch. Records indicate dispatch was aware of these resources through initial attack information or when called to provide resource order numbers so resources could be paid for. In almost all cases these were resources involved in initial attack or were local area resources.

▸ The release dates documented on the Resource Ordering and Status System (ROSS), when compared to actual release dates, reveal a problem with mobilization and demobilization information. There were ROSS dates that indicated resources were available when they were not; and, resources were not available when they actually were. This was found for all fires reviewed.

‣ In all but some minor cases, the resource ordered was what arrived. There were instances where the resource arrived and was not in compliance with standards. This caused some of the delay noted in the first bulleted item. Fire managers also expressed safety concerns with unqualified personnel and equipment being dispatched, but this was not a common concern.

‣ The dispatch system was greatly influenced by the extreme fire activity in the geographic region. There were cancellations and re-ordering. Resources were moving from incident to incident. Dispatch staffing was a problem on fires. Several staff resources arrived after orders were cancelled and there was some double ordering of staff. Communications between dispatch centers and the incidents was also problematic at times.

‣ In two cases, fires were located in bordering areas that could be served by different dispatch centers, and this occurred. The fire team got the resources needed, but the dispatch centers were not always aware of the others' resource orders.

On these sampled fires, dispatch did not provide much of a cost containment control. Dispatch was focusing entirely on its primary role of getting resources on and off the fire. The fact ROSS demobilization dates were not accurate indicates a problem with providing fire resource managers with current and complete information on available resources. This information is essential in obtaining the closest available qualified resource.

Delays on getting the proper resources to fires can result in expansion in size or hours of fire activity. This can increase costs and safety risk. Not having an up-to-date list of available resources can cause resources to be ordered from further away than necessary and cause delays in mobilization and demobilization. Both of these circumstances come with increased costs, which include travel time and expenses.

2003 Fire Season Strained Dispatch Capabilities

Dispatch managers and our review of dispatch documentation indicated the 2003 fire season involved dispatch activity well beyond most anything the staff had experienced in the past. The amount of fire activity stressed the dispatch system. This was compounded by the fact the ROSS system was "fully" implemented in 2003 and relatively new to dispatch personnel. Some personnel were using

hand-written dispatch records and then entering them into ROSS when time was available. When it was necessary to hire new temporary extended dispatch staff because of the number of fires in 2003, this compounded the training problem.

Steps Being Taken to Improve ROSS

Dispatch and fire and aviation management are aware of the problems associated with the 2003 fire season and the simultaneous implementation of ROSS. Prior to the 2004 fire season numerous steps were taken to address these problems. The ROSS system itself was updated to provide easier navigation, quicker retrieval of resource information, and new search functions. There are still problems that need to be addressed. Additional training of personnel was prioritized. Training exercises included cross-training of personnel from different dispatch centers and mock incidents. Reviews were conducted of dual dispatch centers on fires. Some changes were made for these dispatch centers as to who would be responsible for initial attack dispatch and extended attack dispatch. Additional processing capacity was added to ROSS. Dispatchers' experiences with ROSS in 2004 indicated more positive feedback from the field on its performance.

> *Conclusion:* ***DNRC and other agencies involved in dispatch recognize and are addressing the problems identified during the 2003 fire season. The agencies have taken specific steps to improve the dispatch process. There are still improvements needed.***

Rates Paid to Local Fire Departments

Local fire departments assist state and federal agencies in suppressing project fires. The rates paid to all contractors including local fire departments are contained in NWCG's Interagency Incident Business Management Handbook. Local fire departments working in the Northern Rockies geographic area are paid on a daily rate basis. However, NRCG's supplement to the handbook states local fire departments are to be paid on an hourly rate basis on the first and last day of assignment (not to exceed the daily rate).

As part of our review of fire-related invoices, we reviewed payments to local fire departments to ensure the correct rate was paid on the first and last day of assignment. Audit testing revealed incorrect payments to local departments. Local fire departments were incorrectly paid a daily rate rather than an hourly rate for first and last day on a fire.

DNRC payments to local fire departments are significant. During the 2003 fire season, the department paid local fire departments $913,000 for their work on six large fires. Our review of records showed local fire departments were overpaid for work on at least three fires. Although the overpayments were not significant, this error occurred on all three of the fires we reviewed.

Three factors caused the errors in payments to local fire departments. First, the templates used by DNRC for contracts with local fire departments differ. While some contain special provisions stating local government forces will be paid at the hourly rate as opposed to the daily rate for first and last day of work, other contracts do not include this language. Second, the language pertaining to payment of local fire departments contained in NRCG's supplement to the handbook is unclear regarding when to start paying (actual hours worked as opposed to operational period). Third, not all DNRC staff that review fire invoices prior to payment have a clear and consistent understanding regarding paying local fire departments for first and last day of work.

Recommendation #5

We recommend DNRC standardize first and last day of work payments to local fire departments by:

A. Developing and distributing one contract template.

B. Working with NRCG to clarify language in the NWCG Business Handbook.

C. Providing clear direction to DNRC staff responsible for reviewing payment invoices.

Chapter IV – Wildland Project Fires

**On-Site Equipment
Inspections**

In addition to pre-season inspections, equipment inspections are
conducted on-site at project fires. Completing pre-season
inspections reduces the time needed to conduct on-site inspections
prior to putting equipment on the fire. During the audit, we reviewed
records for a sample of project fires to determine whether on-site
equipment inspections were done. We found these inspections do
not always occur.

DNRC is aware of the problems relative to on-site equipment
inspections. Department staff indicated improving the success of
getting these inspections done during a severe fire season is
problematic for a number of reasons. First and foremost, during
periods of extreme fire conditions and multiple fires, resources
sometimes move on and off fires faster than the administrative
process is set up – so inspectors may not be in place at the fire or else
inspections may be by-passed or skipped. Once a fire becomes a
project fire and an IMT is assigned, IMT members are responsible
for performing equipment inspections, and DNRC is no longer
directly responsible for the function. It can then become an
interagency problem. Finally, the post inspection process can be
problematic due to the rush of getting resources demobilized and
reassigned to the next fire.

These issues aside, there are two primary things that contribute to
problems with equipment inspections on large fires. First,
Delegations of Authority to the IMTs responsible for managing
incidents do not provide any direction or expectation the team will
ensure on-site inspections are conducted and documented. Secondly,
there is sometimes a lack of personnel on IMTs available to perform
inspections of equipment. This is generally because this is a peak
workload period for IMT logistics staff, thus equipment inspections
may not get done due to lack of resources on the team at this point in
time.

On-site equipment inspections are important for safety related
reasons. They are also important for business purposes – primarily

documenting damage claims. To help improve controls over this process, the department can:

▸ Include language in the Delegation of Authority that stipulates Incident Management Teams will ensure on-site inspections of all equipment will be conducted and documented.

▸ Work with NRCG to address the issue of not enough qualified personnel to perform equipment inspections on fires administered by Incident Management Teams.

Recommendation #6

We recommend DNRC take steps to ensure on-site equipment inspections are performed on project fires by:

A. Including language in the Delegation of Authority specifying on-site inspections of equipment will be conducted and documented.

B. Working with NRCG to address the issue of adequate resources to conduct equipment inspections on fires managed by IMTs.

Audit testing also revealed problems with the equipment damage claims process. Without on-site equipment inspections, control of the numbers and amounts of damage claims becomes more difficult and leads to an increase in fire costs.

Equipment Damage Claims

Claims may be filed against the government for property loss, property damage, or personal injury. Damage claim procedures are contained in the Interagency Incident Business Management Handbook. Finance section members of the IMT ensure claims are investigated, provide recommendations for each claim, and ensure all required forms, information, and documentation are obtained. Contracting Officers from the administering entities are responsible for settling all contract claims within their jurisdiction and in conjunction with incident agency policy.

Inconsistent Decisions Are Made Regarding Payment of Damage Claims

As part of our review of fire related invoices, we reviewed records related to property damage claims to ensure claims were documented, supported, processed and paid according to policy.

Testing revealed no concerns with the portion of claims processing for which Incident Management Teams are responsible. However, we did note inconsistencies in settling damage claims – which is the part of the process the administering agency is responsible for, in this case DNRC. We found staff were inconsistent in decisions regarding what damage the state will and will not pay for. For example, contractors were sometimes reimbursed for damage to tires and other times not. Inconsistent decisions on damage to portable water tanks, scratched or dented equipment, broken windshield or door glass, and missing or lost equipment are other examples.

Conflicting Contract Language Causing Payment Inconsistencies

The fact so many different DNRC staff (in 2003) assisted with settling damage claims contributed to differing claims decisions. However, it appears the primary cause of variation in settlement decisions is confusing and conflicting contract language. Contract terms contained in equipment agreements DNRC uses provides the following regarding general damage responsibilities:

‣ Clause 10 states the Government will assume risk for loss, damage, or destruction of equipment rented under the contract except no reimbursement will be made for loss, damage, or destruction due to (a) ordinary wear and tear, (b) contractor negligence that caused or contributed to loss, or (c) damage caused by equipment defects.

‣ Clause 11 states except as provided in clause 10, the Contractor will be responsible for all damages to property that occur as a result of Contractor or Contractor's agents or employee fault or negligence.

In contrast, national contracts for wildland fire engines and aviation resources (national contracts are developed by the National Interagency Fire Center) state the government shall not be liable for any loss, damage or destruction of equipment, except for loss, damage or destruction resulting from the negligent or wrongful act(s) of Government employee(s) while acting within the scope of their employment. Contractors are responsible for making all repairs to equipment furnished under the contract and only reimbursed if the government is grossly negligent. Equipment damage is a known risk of doing business and contractors currently have private insurance to cover damages and repairs.

Damage Claims Are Increasing

According to members of Incident Management Teams and DNRC staff, damage claims for contractor equipment are increasing, both in terms of numbers and dollar amounts. On the Cooney Ridge fire alone, over 80 individual damage claims were filed. Some of the damage claims are significant in terms of dollars – damage to a Heliwell portable tank was estimated at $5,800, damage to tires and hubs on a water tender estimated at over $2,900. Currently, it is not possible to determine total dollars paid in damage claims due to the way data is recorded and tracked.

Revise Contract Language, Improve Policy, and Provide Training

DNRC staff is aware of the issues surrounding settling damage claims and have tried to clarify it through department policy by providing examples of claims usually reimbursed and not usually reimbursed. However, the crux of the problem lies with the contract language. The current contract damage clause needs to be re-written to mirror language contained in national contracts and include a clause the government will not pay for damage unless it is grossly negligent. In addition, contracts could contain language that clearly discloses there is a risk of damaging equipment while being used for wildland fire suppression.

Recommendation #7

We recommend DNRC:

A. **Change the language in future equipment contracts to reflect damage claim clauses used on national engine and aviation contracts.**

B. **Provide all DNRC staff responsible for settling contract damage claims better direction through revised department policy and training.**

Impacts of Fighting Fires in the Wildland Urban Interface on Suppression Costs

Wildland fires that burn near infrastructure, roads and homes make it necessary for fire managers to involve tactics aimed at protecting structures, communities and infrastructure during suppression efforts. Fire documentation maintained by all fire agencies including DNRC does not break out specific costs related to fighting fires in the wildland urban interface. However, national cost containment

studies have conclusively found because of the differing tactics involved in suppressing fires in wildland urban interface, there is an increase in fire costs. Issues related to wildland urban interface are discussed in further detail in Chapter VII.

Conclusion: *Fighting fires in a wildland urban interface increases fire suppression costs.*

Work/Rest Requirements and Assignment Length Limitations Increase Fire Costs

The IMT assigned to a fire is responsible for assuring a safe work environment. To help maintain this environment, limitations on hours and days worked have been placed on all assigned fire personnel. The administration of these limitations is a time-consuming and potentially complicated task, especially during a busy fire season. Balancing the needs of personnel with the limited number of resources available can and does impact how fires are administered and how/when they are demobilized from a fire. As a result, fire costs have increased due to the necessity to rest and/or hold over personnel both directly on the fireline and for those administering the fire. A fire season such as 2003 only compounds the problems and costs associated with work limitations because of limited and widespread resources, as well as the overall competition for those resources.

Another impact of work/rest requirements and assignment length limitations can be an adverse perception by the public about work ethics and amount of work conducted. Whether it is a landowner/homeowner trying to save their property, or a general member of the public who observes/visits a fire camp, it can be difficult to understand/accept the need for hour and day limitations when a wildland fire is burning out of control. For example, public criticism of wildland fire administration on the Missouri River complex was quite vocal because landowners and local fire department personnel who had aggressively been initially attacking the fire for many hours did not understand work/rest requirements. In this case, assigned fire crews left the fire shortly after their arrival (in some cases) because their fire-related work plus travel time to the fire placed them at (or over) work/rest limitation for the day (16

hours). Assignment lengths also can be negatively viewed by those unfamiliar with the limitations. IMT changes, personnel on mandatory rest and relaxation (R&R), and other factors are not necessarily viewed as positive, efficient aspects of wildland fire suppression.

Conclusions:

▸ *Limitations on hours and days worked by fire personnel on an incident exist for the safety of fire personnel.*

▸ *These limitations contribute to increased fire costs and create negative, but often inaccurate, public perceptions about the work activity of personnel on a fire.*

Delegation of Authority Needs More Detail

During the audit, we reviewed Delegation of Authority documents for fires DNRC was involved in during the 2003 and 2004 fire seasons. We found the delegations do not contain much detail, especially specific to cost containment expectations.

Several of the national cost containment studies address the Delegation of Authority and contain specific recommendations related to drafting these documents. One such study, the Large Fire Cost Reduction Action Plan, March 2003, states all agency Line Officers should issue Delegations of Authority that reflect specific cost objectives and cost monitoring procedures. In addition, the U.S. Forest Service fire management policy includes components to incorporate in the Delegation of Authority including cost constraints and suppression guidelines. The example Delegation of Authority letter included in the policy manual contains a section on cost accountability with specific measurable objectives such as:

▸ Emphasize good accountability for supplies ordered from the cache. Keep the incident loss tolerance within 10 percent of all property and supplies provided to the fire.

▸ By 10:00 a.m. each day, provide the Line Officer with a daily fire suppression cost data, by category, for the incident.

▸ An Incident Business Advisor has been assigned to the incident and the Incident Commander is expected to keep this person fully informed of fiscal issues, expenditures, and limitations.

Delegation of Authority Cost Containment Language is Vague

We found delegations tend to provide more specific direction regarding tactical operations – i.e. protect residential structures in the area, rehabilitate firelines near streams. Direction or expectations related to cost containment are usually limited to a phrase such as, "minimize and contain costs" with no specific expectations or direction provided. The lack of clear expectations provides no incentive or direction on containing costs.

Lack of detail in delegation documents occurred for two primary reasons. Historically the guiding principle in drafting delegations was to keep the document broad enough to allow the IMT to be responsive to contingencies that develop during the incident. However, this mindset is changing, due in part to intense scrutiny and numerous wildland fire management recommendations made in recent years. The studies recommend Delegations of Authority include specific cost containment objectives. While DNRC has acknowledged results of the national studies and adopted them by reference, specific change has not been incorporated into the department's fire management policy manual. Consequently, Line Officers have not been provided clear guidance on how specific Delegations of Authority should be related to cost containment.

DNRC Could Include More Cost Containment Objectives in Delegation of Authority

Cost containment related expectations and directions that could be addressed in the Delegation of Authority include:

▸ Establish controls over fire cache to minimize losses.

▸ Work with department staff to identify local contract resources available for use, including local fire department resources.

▸ Use aviation resources in a cost effective manner by actively assessing cost and benefits of air tankers and large helicopter usage.

▸ Demobilize most expensive resources (hand crews, aviation, heavy equipment) as soon as possible.

▸ Ensure pre and post use equipment inspection forms are prepared for all equipment to reduce damage claims.

> **Recommendation #8**
> **We recommend DNRC:**
>
> A. **Work with federal and other partners to improve and expand Delegation of Authority language.**
>
> B. **Include more specific direction in the Fire and Aviation Management 900 Policy Manual on the development of Delegations of Authority.**
>
> C. **Change the Delegation of Authority format to provide more specific guidance on cost containment expectations.**

Emphasize Cost Share Agreement Development Skills

On a large fire, there are typically several government agencies responsible for suppression costs. Cost share agreements document each agency's financial responsibilities for incident costs. Jurisdictional representatives for each agency typically negotiate, develop and sign cost share agreements. For DNRC, initially it is the Line Officer's responsibility to recognize the need for a cost share agreement, initiate the agreement, submit the agreement for review, and sign and finalize the agreement. During the audit, DNRC staff expressed concern regarding the cost share negotiation process. Concerns included:

▸ Inexperienced staff is negotiating (or have negotiated in the past) some cost share agreements. This occurred due to staff turnover and the loss of experienced Line Officers within DNRC.

▸ In a couple of instances, IMT members rather than DNRC staff negotiated initial cost share agreements. This happened during the 2003 fire season when so many fires were burning concurrently that DNRC did not have enough Line Officers to assign.

▸ Some initial cost share agreements were negotiated by Line Officers brought in from out of state to represent DNRC. The magnitude of the 2003 fire season and lack of staff were the cause.

▸ The department may be negotiating too many agreements based solely on acres burned.

▸ FAM Bureau was excluded from cost share negotiations during the 2003 fire season.

Department management is aware of these concerns and took steps to tighten up controls over cost share negotiations. Because cost share agreements define the state's responsibilities for costs, DNRC established review procedures to ensure department management are involved in the process. A department memorandum dated July 27, 2004, outlines the approval process. Once a draft cost share agreement is formulated, it must be routed to Fire and Aviation Management Bureau (FAMB) for review to ensure it is complete, well-structured, and done in such a way as to be compatible with the way the state records expense data on SABHRS, and adheres to the Six-Party Agreement and any appropriate FEMA documentation requirements. It is then forwarded to Forestry Division management for review and approval.

Cost Share Training Needed

DNRC action taken to establish a management review process for cost share agreements is a good control measure. However, the department must still rely on the negotiating skills and recommendations of its Line Officers assigned to the fire. This is a skill that Line Officers have stated needs improvement. Training of Line Officers in the area of cost share negotiation and development is critical. Cost share agreement training provided to Line Officers should include a review and discussion of cost share agreements developed for previous DNRC responsibility fires and include opportunities to develop cost share agreements as part of the coursework.

Line Officer Mentoring

In addition, the department could make better use of mentoring tactics by assigning its more experienced Line Officers to assist less experienced staff. Mentoring could also be accomplished by working with partner agencies (USFS, BLM, NPS) to allow DNRC staff to observe federal agency representatives during cost share negotiations, perhaps in other regions. In addition, the department could supplement Line Officers with a person experienced in cost share negotiation and development on large project fires; especially when there are concurrent multiple fires in an area or zone and DNRC Line Officer availability is stretched thin.

> **Recommendation #9**
>
> **We recommend DNRC strengthen the cost share agreement process by:**
>
> **A. Providing additional training and mentoring opportunities to Line Officers.**
>
> **B. Assigning a specialist to assist Line Officers with cost share negotiations on the more complex project fires.**

Strengthen Incident Business Advisor Role

On large wildland fires, the agency administrator (Line Officer) has the option of requesting an Incident Business Advisor (IBA). An IBA is responsible for monitoring incident costs and advising the Line Officer and IC on methods to reduce costs. Although IBAs report directly to Line Officers, they must work closely with the IMT. An employee of the agency with jurisdiction over the fire usually fills the IBA position. On a large and/or lengthy incident, several IBAs may be assigned. Absent an IBA, there is no single staff function solely responsible for monitoring all business management functions on large fires. No one is available to assist the Line Officer with identifying cost-related issues or to take action to reduce costs.

Most cost containment studies recommend integrating an IBA or financial advisor on project fires. A study done by the National Academy of Public Administration for the U.S. Congress and the Departments of Agriculture and Interior stresses the use of an IBA and states, "Using an IBA on large wildland fires to advise the Line Officer, work with the IMT and advocate cost-saving strategies is a practical avenue for considering opportunities for cost-savings". The cost containment study, Large Fire Cost Reduction Action Plan, March 2003, makes several key points related to the IBA stating agencies should:

▸ Reinforce the need for additional highly skilled IBAs.

> ▸ Reinforce the existing direction to ensure IBAs are assigned to all Type I incidents. Consider assigning an IBA to Type II incidents with high cost potential.

> ▸ Assign additional cost containment support positions when incidents exceed $12 million. The IBA position often becomes overrun in high cost incidents and a single IBA is insufficient. In order to fill this need, it may be necessary to rely on experience of persons retired from the firefighting business.

DNRC has Started Using IBAs, but Their Role is Uncertain

Federal agencies have used IBAs on larger fires for several years. As a result of the 2003 fire season, DNRC recently decided to make use of this function. Beginning with the 2003 fire season, the department identified staff to fill the IBA role. The department also provided a training session for the newly appointed IBAs and included Line Officers in the session to give them an understanding of the IBA function. However, discussions with some of the department's Line Officers and IBAs reveal there is still confusion and uncertainty regarding the role and responsibilities of the IBA. Staff assigned to fill the role of the IBA are not certain what activities they should perform when assigned to a fire. In addition, although there were opportunities during the 2004 fire season when an IBA should have been assigned to a fire, they were not. These were missed training opportunities.

DNRC Can Take Several Steps to Improve IBA Function

Recognizing the need for and benefits of an IBA is a good management decision by DNRC. DNRC needs to take the next step and require IBAs to be assigned and used as part of controlling costs. The two larger 2004 fires cost nearly $490,000 and yet no IBA was assigned. DNRC must develop and strengthen the role of the IBA. In order to do this and emphasize the importance of this position, the department should:

▸ Devote more effort to train IBAs.

▸ Assign IBAs to fires to gain experience.

▸ Explore the feasibility of using federal IBAs to mentor DNRC IBAs.

▸ Ensure Line Officers and IBAs work together closely.

▸ Ensure IBAs on large incidents have the authority to make decisions on fiscal issues.

‣ Ensure the Delegation of Authority addresses the need to integrate the IBA into the operation.

‣ Strive to use IBAs on type 3 or larger fires.

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Recommendation #10

We recommend DNRC:

A. Develop a program to provide effective training and mentoring for department IBAs.

B. Ensure Delegation of Authority contains direction on the use of IBAs.

C. Aggressively implement the use of IBAs on Type 3 or larger fires.

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Make Better Use of Opportunities at Close-out Briefing

Close-out briefings are conducted at the end of the incident and involve IMT command staff and agency representatives. These briefings are meant to be a retrospective review of what happened during the incident and a discussion of ways management of incidents could be improved in the future. A written evaluation of the IMT's performance is also part of close-out briefings.

During the audit, we observed the close-out briefings for two fires that occurred during the 2004 fire season. We also discussed close-out briefings with department staff and IMT representatives and reviewed related documents. While close-out briefings are generally conducted, they tend to be general in nature and not involve much detailed discussion. Due to the vast experience of many of the fire management staff involved in close-out briefings, these meetings could be more beneficial. Things that could be discussed include:

‣ Agency ability to order IMT as either a partial or full team.

‣ Agency administrator performance at the incident and what could be done to better assist the IMT.

‣ Retrospective review of use of aviation resources and cost/benefit.

‣ Review of resources ordered for logistical support.

‣ Discussion of incident cost data generated by Incident Cost Accounting and Reporting System.

> ‣ Level of success in identifying underutilized resources and demobilizing them from incident.

> ‣ Coordination and communication with dispatch and ordering of resources.

Interviews indicated there is sometimes a rush at the end of an incident to get teams released and on to the next fire so the close-out briefing is short-changed. However, there are other opportunities when time constraints are not a factor and close-out briefings could be more detailed in nature. The department should take advantage of the opportunities close-out briefings present.

Recommendation #11
We recommend DNRC take better advantage of opportunities presented during close-out briefings by encouraging a more detailed level of discussion of a fire's administration.

Evaluation of IMTs and Contractors Could Be Improved

During our review of "fire packages" as well as in our interviews, we determined the performance appraisal of the IMT, as well as the fire fighting forces, could be enhanced with increased scrutiny by DNRC and the NRCG.

IMT Appraisals

According to the NRCG, operating plans for IMTs, group performance appraisals should be conducted at the end of their incident assignments by the administering entity line officer. Our review of the appraisal forms show the forms are general in terms of appraising specific operational activities. This is especially true with regard to cost containment. The present IMT appraisal contains only one question with regard to cost management and the form's format only requires a "yes" or "no" answer, with comments being optional. Our review of completed appraisals show there is not much detailed feedback/comments included in many of the performance appraisals. Lastly, interviews and observations suggest performance appraisals appear to be more of a formality than a working document designed to comprehensively evaluate and improve IMT productivity. As an example, interviews with IMT personnel stated unless the completed appraisals are extremely negative, the forms remain in the fire

package and are not distributed to the administering entities or the NRCG for use in overall evaluation of IMTs.

The IMT is responsible for implementation of the administering entities fire management expectations. The delegation of authority, the cost-share agreement and ultimately the performance appraisal are the documents that should define and subsequently measure how well the IMT did their job. While the close-out briefing and post-fire reviews can speak to the generalities of performance, documentation in the form of comprehensive evaluations is the cornerstone of improving that performance. A detailed performance appraisal can provide the IMT, the administering entities, and the NRCG with the formal basis upon which to incorporate changes/improvements when such alterations are deemed necessary. Without detailed expectations and measurement of achievement of those expectations, there is little incentive for IMTs to modify tactics or change existing fire management practices. Additionally, if the administering entities and/or the NRCG neither compiles nor summarizes the appraisals and uses them to determine whether a specific IMT or IMTs in general are operating according to established plans and meeting NRCG objectives, a critical business control is being overlooked. Given the importance of the IMT relative to determining and containing costs on large wildland fires, we believe a more comprehensive performance appraisal of IMTs is warranted and these appraisals should be incorporated into the overall examination of IMTs.

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Recommendation #12
We recommend DNRC:

A. **Ensure Line Officers conduct detailed performance appraisals of IMTs, placing special emphasis on meeting cost containment goals.**

B. **Submit modifications of the existing IMT appraisal form to NRCG to provide more detailed feedback of IMTs.**

C. **Submit copies of IMT appraisals to NRCG and DNRC officials as part of an overall evaluation of the role of IMTs.**

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Chapter IV – Wildland Project Fires

Contracted Resource Appraisals

As part of our review of fire packages, we examined the mandated performance appraisals given to state, federal and contracted fire crews, first-aid personnel, contracted equipment operators, etc. We determined there is no specific control in place to ensure all applicable appraisals are completed. Additionally, we noted very few of the appraisals speak to specific areas of improvement. Rather, they are either general in nature or have only complimentary remarks. We also noted completed appraisal forms appear to remain with the fire package rather than be compiled and analyzed by the administering entities or NRCG.

The NWCG handbook on interagency business incident practices requires job performance requirements be established and provided to personnel when assigned to an incident. The performance elements are to be measurable and relate directly to assigned tasks. Incident supervisors are to evaluate performance throughout the incident and appraisals are to be completed.

While our interviews suggest informal appraisals of resources is likely occurring on an ongoing basis by Area and Unit Fire Program Managers and federal officials, lack of detailed performance appraisals can have two major consequences. First, substandard resources may continue to be utilized on fires and secondly, there is not an established track record to monitor performance. Given DNRC and the NRCG are investigating the feasibility of creating a competitive bid process for many contracted personnel resources on fires, it is essential performance criteria be established and review of performance on each fire be conducted.

Interviews with IMT members indicated some team members are hesitant to formally criticize performance because they believe there are not necessarily detailed criteria to compare performance against, and because of the short-term and often transient nature of personnel assigned to a fire. They admitted it is often easier to release (demobilize) a poor or non-performing resource, such as a fire crew or equipment operator from the incident. By releasing the resource

without a comprehensive performance appraisal they do not have to deal with a confrontation over productivity.

The NRCG tasked its Incident Business Practices Working Team and other working teams to examine the administration of contracted resources. A position paper authored by the teams stated contract language for 2004 Emergency Equipment Rental Agreements should include requirements for completed, detailed performance appraisals and they must be included in the payment package in order for equipment payments to be processed. However, the 2004 Interagency Incident Business Handbook does not include these requirements, and our observations of two 2004 fires indicated IMT personnel did not incorporate the suggested procedures into equipment payment processing.

In order to enhance and verify the positive contributions of assigned fire resources, performance measures should be established and meaningful performance appraisals conducted. Such appraisals will be critical if/when competitive bidding for resources is incorporated into general fire business practices. DNRC can require and incorporate a more consistent and comprehensive performance appraisal process into Delegations of Authority to IMTs and its future incident business practices. However, to be fully effective the NRCG will need to also adopt these measures and utilize the outcomes to refine the overall resource ordering process now under review.

> **Recommendation #13**
>
> **We recommend DNRC work with the NRCG to:**
>
> A. **Establish formal, comprehensive, and meaningful performance measures for all personnel assigned to fire incidents.**
>
> B. **Adopt the recommendations of its Incident Business Practices Working Team regarding performance appraisals for contracted resources.**
>
> C. **Incorporate requirements for performance appraisals to be conducted by IMT personnel of all contracted, as well as state/federal resources into each fire's delegation of authority.**
>
> D. **Compile and analyze the performance appraisal results as part of the personnel resource ordering/selection process.**

Chapter V - Post Fire Activities

Introduction

Once a fire is over and/or the fire season winds down, there are many post fire activities that take place related to project fires. Some post fire activities relate to fire operations such as review of suppression tactics, resource availability, or coordination between various entities responsible for wildland fire suppression. Other post fire activities involve fire business issues such as cost recovery efforts, contracting, or payment for fire cache items used during fires. During the audit, we reviewed the department's involvement in post fire activities. This chapter addresses post fire activities and is organized into the following sections:

▸ Fire Business.

▸ Fire Operations

Post Fire Business Activities

During the audit, we reviewed business related activities that occur during the post fire season. The following lists the areas examined and shows those where there are issues to be resolved. A discussion of each area follows the table.

Table 9

Post Fire Activities - Business

Fire Business	Does It Occur?	Issues To Be Resolved?
DNRC Staff Review Fire Invoices	✓	✓
DNRC Review of Federal Agency Bills	✓	
FEMA Cost Recovery Efforts	✓	
Payment to Individuals for Assisting in Suppression Efforts	✓	✓
Controls Over Fire Cache	✓	✓
Efforts to Solicit Competitive Proposals	✓	✓
Assess Rent Versus Purchase of Property	✓	✓
Cross Train Key Fire Business Staff		✓

Legend:
✓ = Applies

Source: Compiled by the Legislative Audit Division.

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DNRC Review of Fire Invoices

DNRC staff conducts a detailed review of all fire invoices to ensure the bills are valid and adequately supported. The review is performed as invoices first come into the department by staff at unit and area offices. In addition, FAMB and Centralized Services Division (CSD) staff also review IMT-approved invoices and perform further testing and scrutiny of bills. During the recent Financial/Compliance audit (04-17) of the department, audit staff examined the portion of bill review completed by CSD and an issue arose related to the lack of supporting documentation included with invoices sent to CSD for payment. The issue was referred to this performance audit for expanded testing.

During the performance audit, we expanded testing by reviewing invoices and documentation maintained in field offices. We examined over $5 million in fire suppression invoices and related documentation. Our testing found business practice controls are in place - field and FAMB staff review invoices and all invoices had supporting documentation. We found a misunderstanding regarding what supporting documents are to be sent to CSD to support payment of fire related invoices. The department is currently working to resolve this issue and maintain system efficiency by reducing the current duplication of documents for payment purposes while ensuring invoice review controls are maintained.

Review of Federal Fire Bills Helps Reduce State Costs

The federal government bills DNRC for the state's share of costs for resources provided to suppress wildland fires. The primary bill is the Forest Service bill since this agency acts as a clearinghouse for fire suppression costs for most nationally contracted wildfire resources such as air tankers, heavy-duty helicopters, food caterers, fire cache supplies, fire crews, and wildland engines. Rather than submitting bills for each individual fire, the Forest Service rolls up costs for all the season's fires and staff refers to this as "the big bill". DNRC also receives invoices from BLM and the National Park Service, when applicable.

DNRC staff review the bills from each federal agency to determine accuracy and develop the state's portion of the expenses. Once

DNRC receives the bill, staff analyze the expenses and request supporting data to assure charges are the state's responsibility. The state's financial obligations are routinely reduced as a result of the review process and subsequent negotiations. DNRC's review of the 2003 fire season Forest Service bill has already reduced the state's estimated obligations to date by approximately $5 million. The Forest Service bill to Montana remains under review and negotiation.

FEMA Cost Recovery Efforts

The Department of Homeland Security, Federal Emergency Management Agency (FEMA), supports states with grants for fire management costs. The federal cost share for FEMA grants is 75 percent. Most fire suppression costs that occur during the period of declaration are typically eligible. This includes equipment, supplies, personnel, camp support, and aviation resources. During the 2003 fire season, there were 8 FEMA declarations that benefited the state by providing grants. There were no requests for FEMA grants during the 2004 fire season.

DNRC establishes a FEMA Cost Recovery Team (CRT) to identify all costs eligible for reimbursement and submit a grant application requesting federal reimbursement. CRT staff compiles eligible costs, assembles supporting documentation and forms, and completes required project worksheets. To accomplish the amount of work required with FEMA cost recovery, the department hires temporary staff to assist with the effort. The personnel costs involved in this effort are reimbursed at 75 percent as part of grant management. The state has received FEMA grants totaling $ 32.3 million to date for 2003 fire season costs due to the efforts of the department's Cost Recovery Team.

Clarify Policy for Payments to Individuals Assisting With Suppression Efforts

It is commonly thought if someone starts a wildland fire, they are responsible for paying at least some of the fire suppression costs. However, section 50-63-103, MCA, only makes parties who intentionally start a wildfire "liable for any and all damages to another's property and is strictly liable for the cost of suppressing said fire." If someone starts a fire by accident, DNRC officials stated they are expected to help in suppression efforts.

Our review of 2003 fire suppression costs noted two instances where someone accidentally started fires. Both parties assisted in fire suppression efforts, but the department did not handle payments consistently.

It is important to have a clear policy on whether someone will be paid to assist with suppression efforts when they accidentally start a fire. In each instance, department officials said land office management made a judgment call on whether payments should be made. Department policy does not specifically address what it should do in situations like these. DNRC 300 Manual (policy 312.71) allows the department to hire private sector resources and discusses the billing process to be followed when they hire private resources. It does not discuss whether or not payments should be made when industry or individuals accidentally start a fire.

Recommendation #14
We recommend DNRC clarify its policy outlining conditions on when it will and will not pay individuals and industry for assisting in suppression efforts on accidentally-started wildfires.

Strengthen Fire Cache Controls

National and regional fire caches maintain large quantities of supplies used in support of wildland fire fighting. For example, when DNRC experiences project fires, supplies are often ordered through the Forest Service's Northern Rockies Interagency Support Cache located in Missoula. A Bureau of Land Management's (BLM) Fire Cache located in Billings is often used by DNRC to order supplies for project fires in Eastern Montana. In most cases, the Incident Management Teams (IMT) managing fire suppression activities are responsible for ordering the supplies they need. Fire cache supplies fall into one of three categories:

▸ **Consumable Supplies** - These items normally are generally consumed on a fire and not expected to be returned to the issuing cache. Examples of consumable supplies are batteries, plastic canteens, and miscellaneous medical supplies.

▸ **Durable Goods** - These items are considered to have a useful life expectancy greater than one fire and should be returned to the issuing cache within 30 days of the end of a fire. Examples of durable goods include fire hose, hose fittings, hand tools, tents, and fire shirts.

▸ **Accountable Property** - Accountable property has values of at least $200 and includes property items such as chain saws and pumps. These items should also be returned to the issuing cache at the end of a fire.

As part of its process to pay fire suppression costs, the department receives separate billing documents for each fire from the fire cache that provided supplies to a fire. The department pays fire cache costs, including costs for items not returned to the cache. If a bill from a Forest Service cache includes items not returned to the cache, DNRC pays the percentage of fire suppression costs agreed to in the cost share agreement. For example, if the cost share agreement requires the state to pay 95 percent of fire suppression costs, it must also pay 95 percent of the final cache bills. For BLM fire caches, the department negotiates each bill, including costs for items not returned.

Improvements Can Be Made in Fire Cache Contracts

Interagency and department policies require controls exist over fire cache items issued to fires. For example, Northern Rockies Coordinating Group (NRCG) policy requires controls for both issuance and return of accountable and durable property for the duration of a wildfire. DNRC policies indicate fire personnel are expected to account for a "high return percentage" of items to fire caches. Since items can be damaged on fires, NRCG policy provides for a 10 percent loss rate on fires and indicates losses over 10 percent shows a need for increased management control.

Our review of fire cache bills noted improvements are needed for controls over fire cache items on project fires. During the 2003 fire season, the department had to pay $690,604 for durable goods and property not returned to the fire cache. This payment included $479,801 to the Northern Rockies Interagency Support Cache and $210,803 to the Bureau of Land Management fire cache. Several fires during the 2003 fire season met or exceeded the 10 percent loss

tolerance level. To give a perspective of these losses, the following provides different examples of fires that experienced cache losses from the two major fire caches.

Table 10

Examples of 2003 Fires With Fire Cache Losses

Northern Rockies Interagency Support Cache

Fire Name	Dollar Value of Items Not Returned	Approximate Loss Rate
Cooney Ridge	$85,402	10 percent
Crazy Horse	$68,010	15 percent
Lincoln Complex	$13,772	17 percent
Mineral-Primm	$133,166	14 percent
Winslow Creek	$41,915	9 percent

Billings Bureau of Land Management Fire Cache*

Fire Name	Dollar Value of Items Not Returned
Hobble Fire	$126,747
Missouri Breaks	$ 16,526
Swain	$ 38,138

* Bills from BLM do not provide the same level of detail so approximate loss rate cannot be calculated.

Source: Compiled by the Legislative Audit Division From DNRC records.

As the table shows, there can be substantial dollar effects due to lack of controls over fire cache items on fires. The examples include two fires (Cooney Ridge and Winslow Creek) that did not exceed the NRCG's loss tolerance; but show there can still be relatively significant impacts on the cost of fires.

Several Circumstances Result In Items Not Getting Returned

DNRC officials indicated items not getting returned to the issuing fire cache is an on-going problem. Department officials related several scenarios suggesting how/why items do not get returned to the appropriate cache.

▸ Hundreds of public and private crews are working on fires. All are using cache items and are not necessarily returning everything they use to fire officials.

▸ IMTs administering fire suppression activities are not tracking fire cache supplies and equipment ordered. The problem is compounded when multiple teams work fires.

▸ Generally when multiple fires are burning in the same area a "complex" is created. This means fires that were being managed under separate fire names and numbers are all put under a single fire name and number and managed by one IMT. However, this also allows supplies and equipment that were ordered under the other fires to be moved around between multiple fires.

▸ Equipment moved around on fires between fire crews without approval from supervisors.

▸ The nature of the 2003 fire season stretched DNRC and IMT capabilities to control fire cache items because of the numbers of teams, crews, and items involved.

Cache Controls Can Be Improved Through the Delegation of Authority and Better Policy

The Delegation of Authority transfers responsibility for management of fire suppression activities to the IMT. Our review of several delegations of authority for the 2003 fire season noted they did not include expectations for IMTs to ensure controls were in place over fire cache supplies and equipment. The department needs to include specific language in each fire's delegation of authority outlining its expectations for fire cache controls. This should include providing the IMT with guidelines on what it considers an acceptable control system. The department should also require its Line Officers to verify IMTs have implemented fire cache control systems the department wants.

DNRC current policy related to fire cache controls does not foster a strong system for fire cache controls. In fact, DNRC policy provides for acceptable loss tolerance rates for durable goods between 5 percent and 25 percent. This compares to a NRCG loss tolerance rate of 10 percent. While the department does require lower rates for some specific items, several are still higher than the NRCG rate. To help tighten its controls, the department should establish new policy that lowers its acceptable loss tolerance rate to the same levels as NRCG.

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> ### Recommendation #15
> **We recommend DNRC:**
>
> A. **Include more specific language in Delegations of Authority requiring IMTs to establish tighter controls over fire cache items.**
>
> B. **Require DNRC Line Officers to ensure fire cache controls on fires are being followed.**
>
> C. **Modify department policy regarding acceptable fire cache losses so it is more in line with NRCG policy.**

Continue Efforts to Solicit Competitive Proposals

The NWCG standardized procurement of wildland firefighting resources on an interagency basis. The group developed uniform contract language and established payment rates by region. Federal and state agencies abide by the established contract payment rates. Standardization was necessary because most large fires burn on land multiple agencies are responsible for.

Contractor payment rates are established through the Wage Determination Service Contract Act (SCA) that specifies the minimum hourly wage rage (base rate) for occupations. NWCG uses the SCA rates as the basis for setting contract rates for wildland fire resources. The base rate is adjusted upwards to reflect the typical 14-hour per day work period involved in wildfire suppression, fringe benefits for employees, and a 35 percent payroll burden. Rates are established on a daily rate basis. Examples of contract rates paid in the Northern Rockies Region are presented in the following table.

Table 11

Contractor Rates in Northern Rockies Geographic Region
Effective 2003-2004

Equipment	Daily Rate Operated
Wildland Engine, Type III	$1,624
Dozer, Class T 9 (i.e. Caterpiller D7)	$2,100
Skidder, Class S 1	$1,050
Water Tender, Class WT 1	$1,694

Source: Compiled by the Legislative Audit Division from NRCG records.

Contractor Rates are Not Set by Competitive Bid

The rates paid to contractors in the wildland fire fighting business are not established through a competitive bid process. As federal and state agencies grapple with the high costs of wildfire suppression, the current rate setting structure is under review. The Pacific Northwest Region (Oregon and Washington) has pursued a different contractor payment structure based on competitive proposals. Since 1988, the Pacific Northwest Region has awarded contracts based on low, qualified price. According to the available documentation these efforts have led to reduced rates for many equipment types including private wildland engines. The Northern Rockies Region is in the preliminary stages of considering pursuing competitive proposals. The NRCG Business Committee is organizing this effort and met in November 2004 to discuss advantages and disadvantages of competitive proposals. Business Committee members also recently met with members of the Pacific Northwest Region to discuss their contracting system. DNRC staff participate on the NRCG committee and are actively pursuing efforts to solicit competition to pursue the best value and quality.

In addition to DNRC's efforts to solicit competitive proposals via work with the NRCG Business Committee, the department has

pursued competitive proposals for items that do not have a set rate. DNRC staff solicited and awarded competitive proposals for contractors interested in supplying portable toilets and sack lunches beginning with the 2004 fire season. These efforts resulted in cost savings to the state. Last year, the department paid $75 per day/per unit for portable toilets. With competitive proposals, the average daily rate is now $39. During the 2003 fire season, prices for sack lunches varied significantly and were as high as $18. The average price of a sack lunch is now $9. Rates have not yet been established for the 2005 fire season.

Efforts to pursue competitive proposals for the best value make sense from a business perspective and such efforts should continue. However, there are several things that make it challenging to pursue competitive proposals. First, the fact that wildfire contracting is an interagency endeavor means more government agencies must come to a mutual agreement. Second, there is a risk rates could turn out to be higher than current rates. Third, the Pacific Northwest system has a disadvantage since contractors with the lowest costs are ranked highest and offered the most assignments. Under that system, there is little incentive for improvement or to offer the best service. As a result, this region is exploring the benefits of awarding contracts based on best overall cost and capability.

> **Recommendation #16**
> **We recommend DNRC continue efforts to solicit competitive proposals for wildland fire fighting contracts.**

Re-Evaluate Rent Versus Purchase of Fire-Related Items

The NRCG commissioned an interagency fire cost containment review in March 2004. The purpose of the review was to examine a sample of large fires from the 2003 fire season and provide recommendations to NRCG partners on how to contain future fire suppression costs. The contractors interviewed experienced fire managers involved in these fires and analyzed final fire packages to provide direction for cost containment. Montana fires reviewed included Cooney Ridge (DNRC protection), Winslow (DNRC

protection), Cathedral Peak (U.S. Forest Service), and Treasure County Complex (State-County Protection).

The contractors issued several recommendations that relate to the cost of renting versus purchasing items used on wildland fires. All these items are used in administering the fire. The contractor's recommendations include:

▸ Add large tents (Yurts) to the Northern Rockies fire cache.

▸ Review the use of mobile offices and consider staging agency-owned office trailers in strategic locations.

▸ Purchase equipment when leasing is more expensive.

▸ Consider area-wide contracts for rental cars and trucks from rental companies.

▸ Delay vehicle surplus property sales to the fall for serviceable vehicles to be available for the fire season.

Rental Costs Can Exceed Cost to Purchase

Our findings support implementation of these recommendations. During the 2003 fire season, we found examples of items used on a daily rental basis and total rental costs exceeded cost to purchase. The following are examples:

Winslow Fire

▸ 16' x 24' tent rented for 15 days, total cost $2,700

▸ 4 mobile office trailers with generators rented 17 days, total cost $31,780

▸ 3 photocopiers and 1 fax rented 17 days, total cost $11,968

▸ Portable toilet rentals for 30 days, total cost $28,295

Cooney Ridge Fire

▸ Pressure washer rented for 2 days, total cost $1,720

▸ Seven 19' x 35' tents rented for 26 days, total cost $72,491

Inefficient purchasing decisions happen for a number of reasons. Some of the items are not currently maintained in the fire cache system. In other cases, items were no longer available in the fire cache as they were checked out to specific fires during periods of peak fire activity. Sometimes items are rented locally in order to take advantage of quicker availability and easy access, but have the

disadvantage of higher prices. Another contributing factor is not all items have established rates via interagency incident business management practices. Items such as photocopy and fax machines, portable toilets and mobile office rates must be negotiated on an incident-by-incident basis.

Equipping and Maintaining a Fire Camp Can Account for More Than 11 Percent of Total Fire Costs

DNRC is but one party in an interagency arena, so addressing business practices is more complex because of multi-party authority. However, DNRC does have involvement in fire business operations through participation in NRCG. National cost containment studies found assembling a fire camp and providing services to feed, sleep, and supply firefighter needs for large fires accounts for greater than 11 percent of total fire costs. As a result, we believe DNRC should actively pursue the following action items:

‣ Work through NRCG to study and cross-match items purchased and rented locally against current fire cache items to identify high volume items that should be included in the regional fire cache.

‣ Increase availability of state or regional fire cache-owned items (previously rented) that generate costs in excess of their value such as tents, mobile office spaces, computer equipment, power washers, generators, and photocopy and fax machines.

‣ Make more cost effective decisions regarding use of vehicles procured through rental companies by negotiating better rates for daily rate and mileage.

‣ Work with NRCG to establish set rental rates for photocopy machines, faxes, portable toilets, and mobile offices when it is necessary to rent these items.

Recommendation #17

We recommend DNRC:

A. Actively examine cost benefits of renting versus purchasing items for wildfire suppression.

B. Along with NRCG partners, reexamine fire cache contents to determine whether changes should occur as a result of 2003 fire season experiences.

Cross Train Key DNRC Fire Business Staff

Fire business is complex and requires a great deal of knowledge on the part of staff functioning in key finance-related positions. One such key position in DNRC is the staff that organizes, manages, and oversees review of the federal bills (big bill review) and FEMA cost recovery efforts. The federal bills presented to Montana for the 2003 fire season (pre-negotiation) totaled more than $40.2 million. The work of the department's FEMA Cost Recovery Team resulted in approximately $32.3 million in federal grant monies. These are significant review/oversight responsibilities for the department, both in terms of dollars at stake and amount of effort involved.

Currently, one DNRC staff member is responsible for overseeing, managing, and conducting these functions. This staff member is critical to department operations in this area. No other staff members have been fully cross-trained to perform this individual's functions. One or two other staff do have some basic knowledge of responsibilities involved – but nothing comprehensive. The department needs to ensure it cross-trains other staff to be able to cover the duties of this position.

Recommendation #18
We recommend DNRC immediately begin cross-training other staff for FEMA cost recovery efforts and review of federal fire bills.

Post Fire Operations

The following lists the areas we examined during our review of post fire activities. The table presents information on the different subject areas and shows those where there are operational issues to be resolved. A discussion of each of the areas follows the table.

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Table 12

Post Fire Activities - Operations

Fire Operations	Does It Occur?	Issues To Be Resolved?
Retrospective Reviews of Suppression Efforts	✓	
Participate in Fire Coordinating Committees	✓	
Enhance Line Officer Skills	✓	✓
Evaluate Dispatch Efforts on Project Fires		✓

Legend:
✓ = Applies

Source: Compiled by the Legislative Audit Division.

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Retrospective Fire Reviews

In 2004, the Wildland Fire Leadership Council (WFLC) chartered a Strategic Issues Panel on Fire Suppression Costs. A diverse group of senior level managers and administrators from federal, state, and local governments studied the last five years of fire cost reports and analyzed more than 300 past recommendations. The Panel interviewed a wide variety of individuals including researchers, special interest group representatives, fire managers and other government officials to better understand the issues and develop substantive actions.

One of the primary actions was to commit to improving the fire cost data infrastructure as a prerequisite step towards improving accountability and strengthening fire management performance. This action is directly related to our audit objectives. Important questions the group said could be answered with good cost and operational data are similar to concerns expressed by Montana legislators. These questions include:

▸ Do total costs and major cost drivers exist for wildland fire suppression?

▸ Do relative costs of fighting wildfires in wildland urban interface and non-wildland urban interface settings differ?

▸ What is the influence of geographic, managerial, and organizational variables on suppression costs?

▸ Are there relationships between fuels treatment investments and potential changes in subsequent wildland fire suppression costs?

▸ What are the comparisons in expenditures for protecting the values inside agency boundaries versus the values outside?

The national report calls for development of an integrated database for all federal, state, and local agencies. The concept is to use cost information and information on the factors that influence cost (fire physical setting, values-at-risk, managerial actions, etc.) to better understand the factors that result in high costs.

DNRC has Created Over 200 Expenditure Categories to Help Track/Monitor Fire Costs

It appears Montana has a good start in compiling cost data and developing a review structure. In terms of state costs, financial information is available and established business controls are in place. Over 200 expenditure categories are tracked on each fire.

Currently, DNRC has policy in place to allow for fire critiques, essentially a critical review of a fire's administration. While not mandatory and not consistently used, it is a judgment call as to their utilization. DNRC officials indicated they have initiated steps to institute an alternative methodology to fire critiques. The alternative, called an "After Action Review," is used by other fire organizations. It is a facilitated discussion of how fire activities addressed four basic questions:

1. What did we set out to do?

2. What actually happened?

3. Why did it happen?

4. What are we going to do next time?

A timeframe for instituting this alternative fire review process has not been established.

After Action Reviews Would Provide Additional Information Regarding Fire Administration

The available cost information combined with After Action Reviews could provide the state with an opportunity to better understand fire suppression cost containment. The state could use this information

to better identify actual costs and their drivers, and by combining this data set with other sets of data from other critiques and reviews, more fully assess suppression effectiveness or the efficiency with which it manages costs. Overall, an alignment of accounting data with performance, geographic, topographic, demographic, and fuel data will help provide meaningful information for managing and containing future fire costs.

Combining Accounting and Fire Administration Data Would Increase Ability for Cost Containment

To date there have been no formal retrospective cost studies by the department that tie the two data sets together. For example, department and other agency staff agree the presence of structures increases the cost of suppression, but what level of increase is not quantified. Use of aviation resources is another example. National strategic assessment reviews found, "The efficiency and effectiveness of the current level of aviation resources is unclear". Further, "It appears that aviation resources are most effective during initial attack. However, costly aerial resources are often used in extended attack efforts which are likely to be futile due to fire intensity, weather, topography, and lack of ground support". Yet, aviation resources typically comprise upwards of 30 percent of fire suppression costs. The department could review cost and effectiveness of aviation resources under certain fire conditions. There are other examples of changing suppression tactics when fire is in the wildland urban interface. However, the costs of these changes have not been evaluated in terms of how effective the expenditures were.

According to fire managers, the results of such a comparison would be:

▸ Better understanding of fire management costs by multiple stakeholders.

▸ Greater confidence in fire management agencies through more transparent and science-based management judgment.

▸ Identification of opportunities for major cost savings or increases in the effectiveness of expenditures.

▸ More solid basis for comparing losses averted and other benefits of fire suppression and management with the amounts invested and expended.

▸ Better understanding of the tradeoffs between suppression and other investments in fire management, including prevention, fuels management, and initial attack.

Retrospective Cost Studies Could Improve Wildland Fire Suppression Efforts

The department could begin using retrospective cost studies by selecting a sample of fires as a starting point – one or two fires for example. Next, staff needs to determine what cost resource categories to examine for the particular fire and then compare cost data to fire operations decisions to identify effectiveness and efficiency of those decisions. In addition, detailed cost data compiled through this process could be provided to the department's fire managers as another tool to assist managers in assessing tactical decisions. For example, basic data such as cost per load of retardant dropped from an air tanker or total cost per flight hour of a Type I helicopter could be compiled and provided to incident managers making fireline decisions. This type of cost data could also be integrated into the department's fire cost estimating system (MTCARS) for the upcoming fire season.

Recommendation #19
We recommend DNRC employ formal retrospective cost studies in order to examine efficiency and effectiveness of wildland fire suppression efforts and provide results to fire managers.

Participation in Wildland Fire Coordinating Committees

As noted, there are numerous committees that have been created to review the fire administration process. These range from safety to business committees that meet throughout the year to discuss ongoing and potential issues impacting not only DNRC, but the Northern Rockies geographic area. DNRC also has a Fire Advisory Council, made up of the Area Fire Program Managers, FAMB officials, and others. This council meets in the spring and fall to discuss committee-generated issues and how DNRC will proceed with regard to the input obtained.

FAMB as well as Area and Unit Office personnel are also members of various NRCG-related committees that discuss geographic and

national issues ranging from training standards to business issues such as the use of private sector contractors. Additionally, the NRCG Board of Directors meets as a whole, twice a year to address committee issues and plan applicable policy directives. The Forestry Division administrator is also a member of the National Association of State Foresters and this organization also meets on a regular basis to obtain input on wildland fire administration. The FAM Bureau Chief is a member of the Western States Fire Managers, which meets on a regular basis and has monthly conference calls. Seventeen Western States Fire Program Managers are included. There are numerous other association-related and federal committees and organizations that formally or informally conduct fire reviews and provide input/recommendations to the applicable entities during the off seasons.

> *Conclusion:*   ***DNRC fire personnel are active participants in the interagency arena and have the opportunity and responsibility to appropriately present and protect Montana's interests with regard to wildland fire administration.***

Enhance Line Officer Skills

During the audit, we examined the role of Line Officers who are the administering entities representative. The Line Officer(s) direct the overall management activities of the fire. Our discussions and observations revealed the job of DNRC Line Officer is impacted and complicated by a number of issues. First, Line Officers wear "many hats" and have other duties and responsibilities in addition to fire management – timber sales, trust land management, personnel issues, etc. Many of these duties are either delayed or not done at all during times of peak fire activity. Secondly, during the 2003 fire season, two of DNRC's Line Officers with one or more project fires in their area were also newly-promoted area managers with limited fire experience and no Line Officer experience. Thirdly, there were so many fires going on at the same time DNRC did not have enough staff available to fill the position of Line Officer in some circumstances. The department appropriately responded by bringing in Line Officers and Line Officer representatives from other states and hiring a retired DNRC staff as a Line Officer to represent the

state's interests on a fire. Based on interviews, it is clear DNRC and it's Line Officers faced and successfully overcame unprecedented challenges relative to the 2003 fire season. However, based on drought forecasts and past history, we believe DNRC should prepare to increase support to new and existing Line Officers.

Agency Line Officers must view and interpret risk management from a broad perspective including: cost containment, safety issues and fire fighter risk, alternative strategies and tactics, balancing environmental impacts, and community concerns and political pressures. In order for Line Officers to be most effective, they must have experience and knowledge of fire effects, fire management, and fire behavior and/or have ready, full-time access to these resources. They must also have a broader picture perspective in terms of balancing benefits of suppression tactics against costs.

Line Officers Should be Provided with Decision-Making Tools

The National Association of State Foresters recognizes issues related to Line Officer experience and issued a recommendation that agency management provide Line Officers with better decision-making tools and then support and encourage calculated risk-taking as they set suppression objectives. Other wildfire cost containment studies mirror this and stress the importance of training, gaining experience, maintaining responsibility and involvement in the incident, and providing clear direction to IMTs. Some of the specific recommendations include:

‣ Agency management should ensure Line Officers responsible for fire suppression actions are properly trained. Training should include:

   o Line Officers should be required to attend either national or regional training courses in fire management leadership.

   o Methods of cost containment and efficient management of suppression resources.

‣ Assign experienced Line Officers to mentor less experienced Line Officers during an actual incident.

‣ Require the Line Officer to order an Incident Business Advisor to collaborate in providing fiscal review and oversight.

‣ Establish clear, uniform job performance standards for Line Officers and assess and document performance.

▸ When an incident reaches a Type 1 complexity, assign an experienced person to assist the Line Officer.

An IMT's decisions and actions revolve directly around the input and guidance they receive from the Line Officer. If cost containment is to be a key factor in management of the incident, that priority must be clearly and effectively communicated to the IMT by the Line Officer at the outset. The trend towards larger more expensive fires, coupled with the past and upcoming loss (retirements) of some of the department's experienced Line Officers represents a challenge to department management. The department needs to increase its efforts to develop and expand the capabilities of its Line Officers.

Recommendation #20

We recommend DNRC strengthen the capabilities of its Line Officers by:

A. **Sending Line Officers to regional and national training when feasible.**

B. **Encouraging the use of training assignments to gain additional practical experience.**

C. **Requiring the Line Officer to order an IBA on all type 3 or larger fires.**

D. **Assigning an experienced person to assist the Line Officer on Type 1 fires and when requested for other fires.**

Evaluate the Role of Dispatch in Project Fire Incidents

While nearly all dispatch centers in Montana are interagency in nature and the majority of their funding and personnel come from the Forest Service and/or BLM, their impact on fires and therefore their impact on state fire costs are significant. From the initial report of a fire through its extinguishment, "dispatch" and more specifically dispatchers are a key component in the obtainment and allocation of fire resources. This is especially the case in terms of fire costs when incidents move beyond initial attack into project fires.

Based on our audit work, we determined there is minimal involvement by dispatch in overall fire administration beyond basic introductions and directions at the in-briefings of fires to be administered by IMTs. Dispatchers and dispatch centers are not specifically provided updates on fire strategies nor formally incorporated into incident management briefings. This is despite their role in ordering/obtaining the resources needed to extinguish a fire. Additionally, even though there are closeout briefings between the Line Officer(s) and the Incident Management Teams to discuss fire administration, we noted there is inconsistent dispatch presence at these briefings. Finally, while IMTs receive a performance appraisal from the Line Officer, there is presently no formal procedure in place to document/discuss the role of dispatch in a fire's administration.

This limited involvement by dispatch and lack of assessment of their performance comes despite the number of complaints by Incident Management Team personnel and others in 2003 about dispatch and resource ordering procedures currently in place. Increasing the presence of dispatch in strategy decision-making and ultimately the evaluation of the fire's administration would provide both the IMT and dispatch with the opportunity to discuss the challenges associated with a particular fire. In addition, it would provide immediate feedback to dispatch personnel and Line Officer(s) on how a key component of fire administration (resource ordering) is operating and what, if any operational changes could/should be considered at the team or dispatch level.

A recommendation regarding this issue goes beyond the DNRC level because the majority of dispatch centers are primarily operated by federal agencies. There is state involvement, however, since state personnel are often part of the dispatch team. We recognize practical issues may sometimes limit their involvement in individual fire discussions due to continued initial attack responsibilities and potentially other project fires. Despite this and other unforeseen obstacles, it is still important for DNRC (with its fire suppression partners) to explore options of involving dispatch personnel in

formal procedures to document, discuss, and evaluate the role of dispatch in a fire's administration.

> **Recommendation #21**
> **We recommend DNRC, in cooperation with other fire protection agencies, explore options more consistently involve dispatch in discussing, evaluating, and documenting the role of dispatch in a fire's administration.**

Chapter VI - Aviation Resources

Introduction

Aviation plays a significant role in both fire suppression and fire costs. Aircraft, whether large air tankers delivering plumes of fire retardant or helicopters conducting water drops, are one of the most visible symbols of the wildland firefighting effort. When used effectively, aircraft are an essential tool for limiting the growth of a fire and can become a force multiplier when used in conjunction with a ground attack. This chapter discusses the aviation resources owned and used by DNRC in its suppression of wildland fires and their related costs.

Aircraft Sources

There are three sources of aircraft available to the State of Montana for wildland firefighting. DNRC has three fixed wing aircraft and six helicopters for initial attack, air supervision/coordination, and reconnaissance operations. The state has also entered into contracts with other aircraft operators to augment its own aviation assets to meet shortfalls and ensure availability of aircraft during periods of high fire risk. During the 2003 and 2004 fire seasons, the state contracted for this type of exclusive use support with the State of Minnesota. The state also has access to a network of contract aircraft that has been established by the federal government for firefighting operations. This network includes helicopters, large air tankers, and single engine air tankers.

Contract rates for each type of aircraft varies depending on the capability of the aircraft and is broken down into a daily availability rate and a flight hour rate. The daily availability rate is charged to the user whether the aircraft is flown or not. The flight hour rate is added to the daily availability rate to cover the costs of the contractor actually flying the aircraft. Availability rates are set for 14 hours of daily availability. The flight hour rate is paid for those hours the aircraft actually flies.

Aircraft Types, Capabilities, and Uses

There are three primary types of aircraft used in firefighting operations: helicopters, large air tankers, and single engine air tankers (SEATS). Each has its own strengths and weaknesses and fits into its own firefighting niche. Helicopters are generally used for

transporting crews and supplies into areas not accessible by road and for direct attack on a fire using water dropped from buckets deployed beneath the helicopter. Large air tankers are multi-engine fixed wing aircraft generally used to drop fire retardant near the fire to slow a fire's advance. The CL-215 Super Scoopers Montana contracted for from Minnesota are also large air tankers and can drop up to 35,000 gallons of water or foam per hour, depending on the location of the water source. SEATs are fixed wing aircraft able to drop water, foam, or retardant on a fire. The following discusses each type of aircraft in more detail.

Helicopters

Helicopters are designated as either Type I, II, or III, depending on the lift capability of the aircraft. Type I helicopters have the greatest lift capacity, either in terms of passengers that can be transported or gallons of water that can be carried. Type I helicopters also have the highest costs associated with their use on a fire. Helicopters have the advantage of extremely accurate water delivery.

Large Air Tankers

Large air tankers are operated from designated air tanker bases located throughout the Western United States. In Montana, air tanker bases are established at Helena, Missoula, Kalispell, Billings, and West Yellowstone. These aircraft have a capacity of between 2,000 and 3,460 gallons of retardant. During the fire season, the U.S. Forest Service pays the daily availability rate for the large air tankers and the costs of the flight time and retardant are charged to individual fires. Air tanker flight hour costs vary from $2,695 to $4,960. Availability of large air tankers has been significantly reduced following several wing failures in 2003 and the grounding of the national air tanker fleet in May 2004. Since May, a few of these air tankers have been returned to service, but there are significantly fewer available for firefighting operations. Large air tankers have the advantage of speed of their response and being able to drop large amounts of retardant that covers a large area.

Single Engine Air Tankers (SEATs)

SEATs are small single engine fixed wing aircraft that have a capacity of about 800 gallons. Many of these aircraft are converted from agricultural spraying operations. They have generally been

used on range fires although with the grounding of the large air tanker fleet, these aircraft are now being used more in forested areas. There are currently 12 SEAT bases established in Montana. Daily availability rates vary from $1,285 to $1,855 depending on model of aircraft. Flight hour costs vary from $940 to $1,820 per hour. SEATs normally are able to operate closer to the fire than large air tankers and reduce turn around times but are not able to deliver as much retardant in a single drop.

DNRC Capabilities

DNRC currently maintains a fleet of three Cessna C-180 single engine fixed wing aircraft, two Type III helicopters, and four Type II helicopters. During the fire season, the airplanes are used primarily as reconnaissance aircraft and air attack platforms. They are capable of carrying a total of four people. The helicopters are primarily used for initial attack operations. The following summarizes DNRC's aircraft, identifies its cost per hour, and shows the rate it would cost per flight hour if the helicopters were contracted, rather than owned.

Figure 5

DNRC Aircraft Information

AIRCRAFT TYPE	MISSION	PASSENGER CAPACITY*	WATER CAPACITY	COST PER FLIGHT HOUR
C-180 (Fixed Wing)	Reconnaissance Air Attack Platform	4	N/A	$ 95.00
Bell 206BIII (Type III Helo.)	Initial Attack	4	100 Gallons	$ 355.00 *($521 Contract Rate)**
UH-1H (Type II Helo.)	Initial/Extended Attack	8	324 Gallons	$ 875.00 *($2,450 Contract Rate)**

*Capacity includes pilot
**The contract rate is the flight hour rate to contract for an equivalent private helicopter.*

Source: Compiled by the Legislative Audit Division from DNRC records.

During the 2003 fire season, the state augmented its aviation resources with those from the National Guard and the states of Florida and Minnesota. The Montana Army National Guard provided three Type I Blackhawk helicopters for 46 days and flew over 300 hours against fires. During this time, these helicopters dropped nearly 915,000 gallons of water and cost over $765,000. Florida provided a Type II Cobra helicopter for 15 days at a cost of $41,744. This helicopter flew a total of 35.5 hours. Minnesota provided both Super Scooper fixed-wing water bombers and a Type II helicopter. The Super Scoopers were on duty for 45 days and flew 426 hours on 33 different fires. They delivered 814,600 gallons of water onto fires and cost a total of $1,894,506. The Minnesota helicopter flew 10.5 hours over 8 days at a total cost of $57,528. During this time, the Minnesota helicopter dropped 1,350 gallons of water.

Aircraft Deployment

In preparation for a fire season, DNRC deploys one airplane and one Type II helicopter to each land office with direct protection responsibilities (Northwest, Central, and Southwest). The remaining two Bell 206 helicopters remain at DNRC's Helena base and are used to support initial and extended attack activities wherever needed. During the fire season, aircraft maintenance operations remain concentrated at Helena with DNRC sending out its mechanics to the deployed sites as needed. There have not been any decisions made yet where to employ the recently added fourth Huey helicopter, for the 2005 fire season.

To support its flight operations, the DNRC aviation branch has a total of 1.5 FTE for its helicopters, 0.3 FTE for its fixed wing aircraft, 2.0 FTE (plus one contract person) for all aircraft maintenance, and 2.0 FTE for management requirements (who also fly the helicopters).

Issues Limiting the Increased Effectiveness of DNRC Aviation Resources

During 2003, the state's aviation resources provided significant support to suppression operations. DNRC helicopters flew over 780 hours and dropped over 1,000,000 gallons of water in direct support of fire operations. The state's fixed wing aircraft flew 984 hours

conducting reconnaissance and air attack flights. However, there are two issues limiting the increased effectiveness of DNRC's aviation assets. The first is the lack of dedicated helitack crews for use on state helicopters. The second is insufficient personnel to maintain and operate the state's aviation resources.

DNRC Needs to Provide Dedicated Helitack Crews for Aircraft Assigned to Direct Protection

In an initial attack situation, the helicopter has unique capabilities that make it especially valuable. It is able to travel directly to a fire site. Trees or other objects do not obstruct visibility from helicopters. Helicopters are able to rapidly shuttle between existing water sources and the fire and put more water on a fire than capable from a standard initial attack wildland engine. However, the advantages a helicopter creates come at a cost. The helicopter by itself is unable to ensure a fire is completely extinguished without confirmation from forces on the ground and is very costly to operate.

To maximize effectiveness, helicopters should be used in combination with firefighters on the ground. Rather than have to wait until a wildland fire engine can arrive, which can take a considerable amount of time, the helicopter can carry its own ground firefighters and then drop them near the fire. After dropping off the firefighters, the helicopter can begin deploying water from its bucket while firefighters begin to line the fire on the ground. This combination of helicopter and ground firefighters is the basis for helitack operations.

Coordinated Initial Attack Helps Keep Fires Small

Coordinated initial attack is important. Discussions with DNRC fire management personnel have identified numerous instances where wildland fire engines were delayed or prevented from arriving on a fire due to its remoteness or lack of road access. Because of existing fire conditions, lack of access, and recognition of helitack advantages, Land Office's chose to temporarily augment helicopter crews with engine firefighters to assist the helicopter manager in deploying the fire bucket and providing a helitack capability. By the time an engine arrived, helicopter crew members had lined the fire and prevented its escape.

As an example, the Southwest Land Office dispatched its helicopter to a fire near the 2003 Boles Meadow fire. The helicopter was dispatched with three firefighters, taken from a wildland fire engine, in addition to the required helicopter manager. While enroute, the helicopter identified a previously unreported fire. Dispatch reported there were no available initial attack resources to deal with this new fire. The helicopter was able to land near the fire, disembark two firefighters to immediately begin surrounding the fire and then proceeded on to the original fire. Once at the primary fire, the helicopter manager and one additional firefighter conducted initial attack operations in conjunction with the helicopter. Once that fire had been extinguished, the helicopter returned to the unreported fire and was able to assist in lining the secondary fire. By the time dispatch was able to identify and dispatch another initial attack resource, the fire had been lined and contained. The ground engine was then able to take over, and the helicopter and its crew members, returned to a standby status.

We cannot conclude either of these fires would have grown to project size if the helicopter had not had firefighters embarked. What is illustrated is the helicopter's ability to arrive at nearly any fire more rapidly than firefighters traveling via roads. The helicopter also has the ability to rapidly deliver large quantities of water to a fire whereas a wildland fire engine is limited to 300 gallons of water before it has to depart the fire and resupply. With helitack crews working on the ground and the helicopter dropping water from above, a fire in many circumstances can be delayed enough to allow fire vehicles to arrive on scene. If even one project fire can be prevented, the cost savings could easily cover the costs of the helitack resources.

More Resources are Needed to Have Dedicated Helitack Operations

As mentioned, DNRC deploys helicopters to three land offices: Central, Southwest, and Northwest. Of these, only the Central Land Office has dedicated helitack crewmembers. None of the Land Offices has sufficient staffing during fire season to allow for helitack operations seven days a week while also meeting mandatory rest requirements. The Southwest and the Northwest Land Offices have

to pull a crew off a wildland fire engine to be able to conduct helitack operations, thereby leaving a valuable initial attack resource unmanned. From the Land Office's viewpoint, the question becomes which initial attack resource has the greatest value, the engine or the helitack capability of the helicopter? Presently, DNRC is not able to maximize its helicopter resources due to a lack of personnel to support helitack operations.

To conduct helitack operations with a single helicopter, the minimum crew, excluding the pilot, is a helicopter manager and at least two firefighter crew members. This staffing will only allow for helitack capability for six consecutive days due to mandatory rest requirements of one day off in seven. To conduct continuous helitack operations, staffing levels would need to be modified to include one helicopter manager, one assistant manager, and four firefighter crewmembers for each helicopter in the DNRC inventory. If additional helicopters were added to the state's inventory, additional helitack crewmembers would need to be identified to effectively use the aircraft in initial attack. Helicopters being temporarily deployed to an area outside of Helena would then be deployed as a complete module that includes the aircraft, pilot, and helitack crew.

DNRC has Conducted Analysis of Helitack Capabilities and Needs

The Southwest Land Office recently conducted an analysis of existing FTE staffing levels at each of the land offices assigned helicopters to evaluate helitack capabilities. This analysis determined each of the land offices required additional helicopter-related personnel; Central Land Office requires an additional 0.50 FTE, Southwest Land Office requires an additional 1.5 FTE, and Northwest Land Office requires an additional 1.34 FTE. These additional FTE positions would provide continuous helitack capability at each land office for the assigned Huey helicopter without having to pull personnel from engines. During the off-season, the helicopter manager would be responsible for conducting aviation specific training for other fire personnel to increase firefighters' awareness of how to utilize and evaluate air operations at a wildland fire. The following table describes current helitack

FTE assigned to each land office and the FTE needed to meet a 7-day helitack capability during the fire season. DNRC estimates a dedicated helitack capability would increase personal services costs by $81,586 annually.

Table 13

Current and DNRC-Determined Staffing
Needed to Provide a Helitack Capability

Land Office	Position	Current Staffing	Proposed Staffing	Net Change
Central	Helo Manager	1.00	1.00	0
	Asst. Helo Manager	0.25	***0.50***	0.25
	Helo Crewmember	0.25	0.25	0
	Helo Crewmember	0.25	0.25	0
	Helo Crewmember	0.25	0.25	0
	Helo Crewmember	0	***0.25***	0.25
	Fueler	0.25	0.25	0
	Aerial Observer	0.25	0.25	0
	Total FTE	2.50	3.00	0.50
Southwest	**Helo Manager**	0.50	***1.00***	0.50
	Asst. Helo Manager	0.50	0.50	0
	Helo Crewmember	0.25	0.25	0
	Helo Crewmember	0.25	0.25	0
	Fire Fighter I	0	***0.25***	0.25
	Fire Fighter I	0	***0.25***	0.25
	***Fueler ***	0	***0.25***	0.25
	***Aerial Observer ***	0	***0.25***	0.25
	Total FTE	1.50	3.00	1.50
Northwest	**Helo Manager**	0.50	***1.00***	0.50
	Asst Helo Manager	0.33	***0.50***	0.17
	Helo Crewmember	0.33	***0.25***	0
	Helo Crewmember	0	***0.25***	0.25
	Fire Fighter I	0	***0.25***	0.25
	Fire Fighter I	0	***0.25***	0.25
	Fueler	0.25	0.25	0
	Aerial Observer	0.25	0.25	0
	Total FTE	1.66	3.00	1.34
	Total Helitack FTE	5.00	9.00	4.00

*These positions at the Southwest Land Office are currently staffed with contract personnel.

Source: Compiled by the Legislative Audit Division from DNRC records.

> **Recommendation #22**
> **We recommend DNRC request appropriations for sufficient personal services to provide for a continuous helitack capability for each helicopter assigned to land offices during the fire season.**

DNRC Does Not Have Sufficient Pilots or Maintenance Personnel to Support Existing Aviation Resources

The staffing requirements needed to operate DNRC aircraft have not kept pace with the growth in the number of aircraft. DNRC is authorized a total of 3.5 FTE to operate its six helicopters and 0.3 FTE to operate its three fixed wing reconnaissance aircraft. These staffing levels fail to provide adequate pilots to operate all aircraft during the fire season. The inability to operate all aircraft during periods of high fire risk reduces DNRC's initial attack capabilities and the end result could be fires that exceed initial attack. Of even greater concern is, existing staffing levels seriously weaken safety and management oversight capabilities and could result in the loss of an aircraft and crew. The requirement to provide effective oversight of aircraft operations becomes even more critical during a severe fire season and as more aircraft are added to the inventory.

The use of DNRC's fixed wing reconnaissance aircraft is funded at a 0.3 FTE for all three aircraft combined. Given the importance of spotting and accurately locating a fire as early as possible, the reconnaissance aircraft provides a capability of rapidly responding to emerging fire threats, such as the passage of thunderstorms, that does not exist with any other firefighting resource. This capability could have a critical influence on the success of an initial attack. During extreme fire conditions, each of the three fixed wing aircraft fly routes that last from 2 to 2.5 hours. If conditions warrant, the aircraft may be requested to fly the reconnaissance route more than once per day. This situation exceeds the existing FTE appropriations and requires DNRC to expend operations funds for overtime to expand reconnaissance coverage. Current fixed wing pilot funding is $12,237. In order to more accurately reflect the actual operating requirements of the aircraft, DNRC estimates personal services funding would need to be increased by $70,786 per year.

DNRC has authorization for 0.5 FTE pilot positions for each of three helicopters and 2.0 FTE for aviation management and safety oversight. DNRC fills the pilot positions with three full-time positions that extend from March 1 through September 30 each year. DNRC has relied on three additional contract helicopter pilots to provide continuous availability for the three primary helicopters assigned to the direct protection land offices. DNRC has a difficult time finding qualified applicants to fill these short duration positions and meet the experience requirements. During the 2004 season, DNRC received only one application for its advertised helicopter position. In years past, there have also been very few applicants and most have not met the flight experience requirements. Additionally, in order to hire qualified applicants, the Aviation Section has been allowed to use operations funds to hire pilots at the equivalent of 0.66 FTE. The current funding for helicopter pilots is $87,984. In order to operate all helicopters during the fire season, DNRC estimates an additional $144,293 is required for personal services.

DNRC Will Likely Have More Helicopters Than Pilots in the 2005 and Possibly 2006 Fire Seasons

Current world events have had a further drain on DNRC's ability to operate its helicopters. Three of DNRC's helicopter pilots, including the Aviation Section's full-time safety manager, are also in the Montana National Guard and have recently been deployed to the Middle East. These pilots will be lost to DNRC through at least the 2005 fire season, and likely the 2006 fire season as well. This leaves DNRC with only enough pilots to fly three helicopters six days a week. If the aviation branch manager and the aviation safety manager are included in the daily schedule, then DNRC will be able to provide helicopter coverage for three helicopters on a continuous basis. This leaves three helicopters unmanned unless there is a decision by DNRC not to provide continuous, seven day-a-week helicopter coverage.

> **Recommendation #23**
> **We recommend DNRC request sufficient personal services resources to safely and effectively operate all assigned aircraft and more accurately reflect actual pilot operating requirements.**

Aviation Management Oversight Has been Reduced Due to Several Factors

Using aircraft to fight wildfires is an extremely high-risk type of flight operation. Wildland fires can create poor visibility and extreme turbulence. Fires frequently occur in areas with limited maneuverability. Water sources that helicopters rely on for fire bucket operations are frequently surrounded by trees or other obstacles that increase the potential for mishaps. Given the large number of fires that break out within each land office's area of responsibility due to lightning strikes, there is potential for the helicopter being needed numerous times during one operational time period. Even if there are not many fires in a concentrated area, there is the very real possibility fires will occur on a daily basis throughout the helicopter's protection boundaries resulting in the potential for long-term fatigue. Because of the high value of aviation assets and the risks presented by flight operations in a fire situation, there is a greater need to ensure operational and safety procedures are rigorously followed. The only way to ensure procedures are routinely being followed is through an active monitoring of flight operations and pilot flight checks.

As more aircraft, and more pilots are added to DNRC's inventory, the Aviation Section manager must expend more effort on oversight responsibilities. The Aviation Section Supervisor must ensure pilots are complying with organizational standards, and the day-to-day management obligations are being completed. In light of world events, existing pilot staffing levels, and the requirement to ensure helicopters are available, both the Section Supervisor and the safety manager positions are now required on a daily basis to pilot a helicopter. Any need to conduct operational pilot evaluations results in at least one helicopter being unavailable for initial attack operations. Any pilot illness means at least one helicopter is unavailable. In all of these scenarios, the state will be left with at least one helicopter, the resource with the fastest response capability and the greatest impact on an initial attack, unavailable.

Aircraft Maintenance

DNRC does not have sufficient FTE to fully maintain all aircraft. Currently, DNRC is authorized 2.0 FTE plus one contract maintenance personnel to maintain all nine DNRC aircraft. All

maintenance personnel are licensed airframes and powerplant (A&P) mechanics with one also being qualified as an A&P Inspector. This is the same manning level that existed in 1997, when a Federal Aviation Administration review of DNRC's aviation program documented the need for an additional 2.8 FTE to maintain DNRC aircraft. At the time DNRC had eight aircraft.

Since then, DNRC has built one new helicopter and the 2007 biennium budget request includes funding to add one additional Type 2 helicopter, bringing the total to ten aircraft. Following the 1997 recommendation, the Fire and Aviation Management Bureau requested an increase in maintenance staffing. The request for the additional FTE was not approved at the departmental level.

Deployment of resources to locations outside of Helena during the fire season places unique workload requirements on the Aviation Maintenance program. In order to comply with Federal Aviation Administration requirements, certain maintenance activities are required to be signed off by a qualified inspector. These activities include any maintenance associated with safety of aircraft flight or to maintain the airworthiness of the aircraft.

If maintenance is required on the aircraft outside of the Helena area, two mechanics must travel to the aircraft location, including the A&P Inspector. This leaves the Helena location with only one A&P mechanic and no ability to complete maintenance that requires an inspector sign-off. This could result in a loss of aircraft availability. Frequently, due to the type of maintenance that has to occur, all three mechanics travel to the aircraft location. This has resulted in 820 hours of overtime for the two state FTE positions and an additional 410 overtime hours for the contract maintenance provider during calendar year 2004.

The 1997 aviation review identified a critical need for additional maintenance resources that has still not been met. The need to ensure the effectiveness of the aviation maintenance program is imperative to the safety of the state's pilots and helitack crew

members. Failing to adequately staff DNRC's Aviation Maintenance Program could also negatively impact DNRC's ability to operate its aviation resources during critical periods. In order to provide these additional maintenance FTE, DNRC estimates it will need to increase its personal services budget by $161,118 per year.

Recommendation #24
We recommend DNRC request sufficient personal services to properly staff its Aviation Maintenance Program.

Summary

Based on DNRC projections, the combined increase in funding required to fully utilize and maintain its aviation resources to the levels discussed above would be in excess of $457,000 per year. This would be an increase of approximately 6% of the 2004 Fire Protection budget request. As with the provision of budgeted severity funding discussed in Chapter II, the funding source and amount of funding to provide such an increase is a legislative decision. Also, like severity funding and the utilization of such funds, increasing aviation resources is a risk management decision. As noted, the average cost for a fire of 10 acres or less is approximately $4,538, compared to $2.3 million for fires of 5,000 acres or larger.

Chapter VII – Wildland Fire Management

Introduction

The questions we were asked to address in this performance audit were varied in nature; and the subsequent audit objectives focused on a number of different areas. Due to our examination approach (initial attack, project fires, post fire) there are numerous important issues that did not directly relate to those items discussed in the previous chapters, or were too wide-ranging to be included in specific discussions. These topics are presented in this chapter.

Broad Cost Containment Strategies

In Chapter II we concluded effective cost containment strategies on large fires should concentrate on high cost drivers: equipment, personnel and aviation, and the best cost-containment strategy appears to be to prevent the fire from getting large so mobilization and support of equipment and crews is not needed. We further addressed the issue in Chapter III by recommending the Legislature establish a formal risk financing method be used for severity funding, increasing the effectiveness of initial attack, and reducing risk of wildfire

Other national studies have addressed the same issues. These studies identified three key attributes as having a significant influence on both the number of fires occurring throughout the Northwest and the cost of fighting those fires: existing environmental conditions, excessive forest fuels, and impacts of the wildland urban interface.

What do the Studies Suggest to Reduce Fire Costs?

The least expensive fire is the one that never starts. Unfortunately, there is nothing that can be done to completely prevent fires. There are actions that can be undertaken by governments, local communities, and landowners to reduce the impact of fires. Removing excess fuels is a critical activity. Developing and maintaining a robust and aggressive initial attack capability is the best defense to prevent fires from growing out of control. Finally, policies for controlling where structures and infrastructure are located and how they are constructed will reduce the vulnerability of communities and individuals located in the interface.

Eliminating excess fuels in the forests, and the wildland urban interface in particular, is critical to preventing fires from growing to a size where they become unmanageable. However, to be effective, fuels mitigation efforts must be coordinated into all levels of forest management, to include land/resource planning efforts. Landowners in the interface must take an active role in removing fuels on their property and create "defensive space" around structures. Fire managers must consider the value of previously burned land in future fuels mitigation efforts. Forest managers must implement activities that ensure once a fire has burned through an area, hazardous fuel levels are not permitted to return.

Movement into the wildland urban interface is driving up the costs of fighting wildland fires. The costs and difficulties associated with eliminating wildland fires in the interface area could be significantly curtailed if local governments exercised their authority to establish "firewise" building codes and subdivision regulations and required all property owners to establish defensible spaces around all structures.

Do Montana Statutes Reflect the Current Focus on Wildland Fire Management?

Montana statutes are silent on these issues. Statutes do not address any of the key issues identified: existing environmental conditions, excessive fuel, and impacts of the wildland urban interface. Montana statutes also do not directly address the DNRC policy of aggressive initial attack. Those areas that statutes do address have not been substantively updated or revised in over 50 years.

The following lists various fire-related statutes in Montana Code:

- Mutual aid agreements with Rural Fire Districts
- Rural Fire Protection
- Mutual aid agreements with Municipal Fire Departments.
- Intergovernmental cooperation
- State planning and execution
- Investigation of fires
- Protection from fire

- Protection of forest resources

- Provision of fire protection services

- Control of timber slash and debris

- State Forests and Firewardens

- Hunting and fishing prohibited in fire danger areas

These statutes address various aspects of fire management, but provide no guidance for overall wildland fire policy and are scattered throughout the MCAs. DNRC is placed in a position to develop its own general direction and subsequent strategies. For example, implementing an aggressive initial attack philosophy and a severity program that is funded through supplemental appropriations is not specifically addressed in the statutes.

Throughout the course of our audit fieldwork as well as in testimony to various fire-related committees, statements from DNRC officials, local fire department chiefs, and county fire wardens suggest the need for update and revision of the statutes associated with "fire". These groups further suggest some of the statutes no longer reflect reality with regard to fire agencies and fire operations at the local and state level. For example, in section 76-13-102, MCA, the forest fire season is defined as beginning May 1 and ending September 30 of each year. Due to prolonged drought conditions as well as changing demographics relative to public encroachment into wildlands, this definition may no longer be applicable.

Legislative Direction Needed

Given the absence of overall fire management policy, the inapplicability of some statutes to current circumstance, and the general consensus among officials associated with fire administration that statutory revision/update is needed; the legislature needs to establish policy in this area. If necessary, an interim legislative committee could be appointed to study, update, and re-codify the fire-related statutes to address current development and environmental conditions and improve wildland fire suppression management and mitigation.

Chapter VII - Wildland Fire Management

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Recommendation #25

We recommend the Legislature authorize a study to develop and update fire-related statutes to address current development and environmental conditions and improve wildland fire suppression management and mitigation.

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Local Resources Do and Should Play a Critical Role in All Aspects of Wildland Fire Suppression

Local fire resources play an important role in suppression of wildfires in all 56 counties. In most, if not all, the cost containment studies completed in the past five years there has been an overriding theme: enhance/increase initial attack capabilities to reduce the number of project fires. These studies assert the most cost-effective way to increase these capabilities is to increase the role of local firefighting resources. Additionally, several of the studies imply costs could be lower on project fires if more local firefighting resources were used, as opposed to bringing in resources from outside the geographic region. The studies also discuss issues that hinder or prevent local resources from greater participation in wildland fire suppression, primarily related to training.

It is important to note, these reports appear to assume local/volunteer fire departments are fully staffed and have firefighters who are available whenever and for however long they are needed. As a counterbalance to some of these studies, DNRC's 2004 Montana Fire Department Survey identified some limitations to local resources having greater participation in the suppression of wildland fires. The primary limitation identified in the survey is the need to balance personal, employment, and firefighting time demands. Given that 97.8 percent of Montana's fire departments are manned completely by volunteers, or a mixture of volunteers and paid firefighters, this limitation on need to balance time demands is a critical component in the role of local resources in wildland fire suppression.

Another factor affecting Montana is the changing demographics of the state and how this is affecting availability of volunteers and

equipment for local departments. DNRC personnel have seen a gradual decline in the number of members in local departments in many areas around the state, but particularly in sparsely populated rural areas. Concurrently, due to a limited and sometimes shrinking tax base, revenues are not readily available to upgrade/replace fire equipment. However, in Western and Southwestern Montana, a growing population base has allowed the addition of engines and stabilized or even enhanced membership in some departments. The variability in local resources (human and mechanical) is a challenge when attempting to forge a unified, consistent initial attack strategy.

The national studies, the DNRC survey, and our audit work all show local resources have shown the willingness and desire to participate in suppression efforts whether it be initial attack work or extended attack relative to project fires. However, due to ongoing debates regarding applicability of training, availability, and payment, as well as questions about local government resources being in competition with private sector contractors, local force capabilities have not been fully utilized. Additionally, these debates have impacted and subsequently blurred what should be a partnership in wildland firefighting. There are multiple causes for these debates, but essentially they boil down to two primary issues in Montana: training and payment for services.

Training Issues Hamper Utilization Of Local Resources

We noted there are differences between the training standards of local resources and those of DNRC and the federal agencies. DNRC and the federal crews must receive an assortment of wildland fire training that meet national standards. Local resources must meet the standards developed within their own county or jurisdictional area. While DNRC and the NRCG accept local fire department standards of training when these departments respond to an initial attack, this has been an evolutionary process and this acceptance has not fully resolved the debates regarding training standards differences. This is illustrated by the position of DNRC, as a member of the NRCG, requiring local resources wanting to participate in project fire suppression to meet the same training standards as the state and federal agencies, as well as private sector contractors. This is

primarily a matter of safety to assure all firefighters on a project fire have the same qualifications and use consistent practices to be able to assure mutual reliance upon one another.

While many local departments can and do have firefighters who meet the NRCG wildland firefighting standards, there is no universal agreement on the need for all the training. This is especially evident at or above the engine boss level. An engine boss is responsible for a wildland fire engine and a crew of usually 2-3 firefighters. Many local departments have volunteers with large numbers of years of experience, who for varying reasons have not obtained/received the equivalent NRCG certification. So, despite their experience and position within the local fire department, they have been excluded and/or their roles limited relative to participation in project fires.

Resolution of Training Standard Differences Must be Resolved

Training equivalencies is a nationwide debate and DNRC and the NRCG in conjunction with the applicable state and national organizations are working towards a solution. However, it remains an unresolved issue. General availability of training and the types of training available is also a matter of concern to local departments. Matching available training courses with volunteer firefighter schedules has long been an issue. Additionally, the amount and types of easily available training is restricted both by design and resource limitations. Placement in training courses is a nomination-based process that factors in existing qualifications/certifications of the requestor and the perceived needs for these types of qualifications in a given geographic area. Nominations from local departments as well as from DNRC personnel seeking training are routed through an approval process. Due to the time it takes to pre-qualify for some positions, the nomination process, and the limited number of trainers and classes, it can be years before individuals obtain their desired credentials.

> *Conclusion:*   *The combined impact of the issues of training equivalencies, availability of training, and the timeframes associated with obtaining some firefighting credentials hampers the full utilization of some local resources.*

Payment of Local Resources Could Impact Future Use

State law gives fire departments the responsibility for all fires occurring within their fire district, including structure fires and wildland fires. As a result, volunteer fire department protection boundaries often overlap DNRC protection boundaries. This generally occurs in the wildland/urban interface areas. Joint response to reports of wildland fires can and should be viewed as a positive component of fire suppression. However, most DNRC fire resources are only available during the designated statutory fire season of May 1 through September 30. DNRC has minimal resources available for fires outside this designated period due to historical and funding reasons. Extended periods of drought and the effects of an expanding wildland/urban interface have made Montana's fire seasons much longer than the statutorily-defined season.

As a result of fire seasons that can now be year-round, local departments have had to bear the responsibility of fighting wildland fires by themselves for approximately seven months of the year. While local forces have the statutory obligation to fight these fires, some departments have sought compensation for responding to and fighting fires they see as "DNRC" fires. The role of DNRC versus the local departments during what are called the "shoulder" season is an unresolved, and in some areas, a contentious issue. DNRC officials acknowledge they do not have the resources or funding to appropriately respond to fires outside the designated fire season and have unresolved, policy questions about payment of local departments. While DNRC can and has compensated local departments for responding to some DNRC fires, the issues of when this is appropriate and what rates should be paid for these responses remains an area of discussion.

Department policy requires the agency to develop "close cooperation and coordination" with counties in fire suppression activities. In addition, the NRCG local firefighters mobilization guide recommends agreements be in place with local departments to "define protection responsibilities and jurisdictions." Our audit work indicates DNRC and local fire officials agree there should be formal

agreements to address local fire department initial attack efforts. However, there are over 350 local fire departments in Montana. Developing agreements and keeping them updated would be difficult, according to both local fire officials and DNRC personnel. To reduce the necessity to negotiate a large number of agreements, the department is looking into establishing "zone or regional" agreements.

To address whether local departments will receive future compensation for responding to shoulder season fire incidents and what the level of compensation should be, department officials need to establish formal policy. This policy development will likely need to include discussions/negotiations with local departments and/or their representative associations. Additionally, any zone or regional agreements developed should clearly spell out when or if local departments will be paid for shoulder season events and what the compensation levels will be.

Recommendation #26
We recommend DNRC establish formal agreements with local fire service organizations to clarify responsibilities and compensation for responding to DNRC fires occurring outside the statutorily designated fire season.

Use Of Local Resources On Project Fires

In addition to unresolved issues regarding the involvement of local forces in some initial attack circumstances, there is also controversy regarding utilization and payment of local forces for the suppression of project fires. Historically, DNRC has not paid local departments to work on project fires within their own jurisdictions, although there are formal policy exceptions to do so. However, assuming the local departments have met the applicable NRCG qualifications, local personnel and their equipment could work on and be compensated for project fires outside their jurisdictional areas. Some departments actively seek out project fire work to increase/enhance their existing equipment and personnel experience levels. In these circumstances, local departments become contractors and then are in competition

with private sector contractors seeking project fire work. Local departments receive the same compensation rates for personnel and equipment. This does not result in cost containment, but does provide monetary resources to departments to upgrade equipment and facilities.

In addition to the controversies surrounding local government resources using publicly purchased equipment to compete with the private sector, there are also unresolved issues relative to the state's liability. Recently, DNRC was deemed partially liable for damages to a local fire department engine working on an out-of-state fire. Attorneys representing the local fire department's insurance company believe DNRC was partially responsible because the firefighter was viewed as an employee of DNRC due to how the firefighter was hired and the equipment's operating agreement. In response to the potential liability and financial exposure associated with that hiring arrangement, DNRC changed the procedures for hiring local government resources for assignments out of the Northern Rockies geographic area. The change also impacted how they were hired within the region as well. Some local departments viewed this procedural modification as an impediment to their involvement with project fires. This issue has strained the relationship between DNRC and some local departments and has exacerbated other controversies regarding training and initial attack response. DNRC officials have indicated their intent to work with the local departments to address the use of local forces on fires both in and out of their jurisdictions.

> *Conclusion: Any strategies to enhance the use of local firefighting forces in the suppression of wildland fires must address the conditions/issues that are impeding local forces from being a fully integrated partner in the wildland firefighting environment.*

Availability of Incident Management Teams-Now and in the Future

The IMT is the key component in resource utilization decision-making. Although the team typically operates in general parameters set by the administering entity or entities (Line Officer), the IMT

orders the resources, decides how to use the resources, and determines when the resources should be demobilized. Obtaining an IMT familiar with the geographic area, historical fire behavior, availability of resources, and local personnel and politics substantively improves fire administration, and according to fire administration personnel helps control fire costs.

As noted, IMTs typically consist of members who are located relatively close to one another, and they are typically assigned/associated with a particular geographic region. According to a report issued in October 2004, the following shows Incident Management Team availability nationwide and for the Northern Rockies (MT) for 2004.

▸ 17 Interagency Type 1 teams (2 located in Northern Rockies)

▸ 35 Interagency Type 2 teams (6 located in Northern Rockies)

▸ 22 state teams (varying type) (1 designated Type 3 team-Eastern MT only)

▸ 4 Interagency Area Command teams (1 located in Northern Rockies)

Historically, IMT members were recruited and selected from the applicable fire organizations with heavy emphasis from the federal agencies and a lesser percentage from state agencies. However, due to some of the following factors the future of IMTs is in a transitional phase:

▸ Overall personnel reductions in natural resource programs.

▸ Less agency emphasis on creating/maintaining a talent pool of fire personnel resources.

▸ An increasing number of fire and other assignments for IMTs.

▸ Demographic trends such as an aging workforce, two-career families, and changing career interests.

As a result, the number of IMTs has been declining and membership has been changing. For the 2005 fire season the number of IMTs in the Northern Rockies geographic area could be potentially reduced. The significance of the loss of geographic-area teams will be substantive. There are additional expenses associated with bringing

in out-of-area IMTs and, according to state fire personnel, their lack of experience/knowledge with Montana fires and their administration has led to increased fire costs in the past and greater challenges for the administering entities.

Membership of IMTs has been changing due to retirements, team member withdrawals due to conflicting obligations, and the time and training obligations associated with advancement into team positions. As a result, more team positions have had to be filled by others, primarily retirees from fire agencies and some from other sources. When/if positions on Type 1 and 2 teams are filled by retirees or others, the NRCG mandates a trainee from one applicable fire agency also be included on the team. The purpose of the mandate is agency personnel need training and experience and they cannot get this without being on a team. The result is, bigger, more expensive teams and there are still challenges with finding trainees, especially for certain team positions.

Studies Suggest IMT Changes to Address Issues

The most recent study of IMT operations, "Interagency Complex Incident Management Organizational Study," which was still in draft form as of October 18, 2004, proposes numerous changes to IMT operations. The draft study offers nine key implementation recommendations ranging from changing policy to require increased employee participation in support of incident management, to creating a new model for managing complex incidents. One of the more significant recommendations would be the creation of full-time Incident Management Teams to help train other IMTs, provide assistance with fuels management issues, and supplement existing IMT capabilities. One of these full-time IMTs would be located in each of the six existing geographical regions, including the Northern Rockies. Participation on the team by state employees would need to be worked out through agreement. Creation of such a resource along with other recommendations in the study could address many of the identified issues noted in other studies. This study also recommended expansion/enhancement of local firefighting resources through the creation of Type 3 IMTs in order to take advantage of

local ability to effectively supervise initial and extended attack and provide personnel for Type 3 teams.

More Type 3 Teams Needed For In-State Fires

Relative to perceived need, there are only a limited number of actively operating Type 3 teams nationwide. In Montana there is only one and by design it operates exclusively in Eastern Montana. Although there is a multitude of Type 3 and higher qualified agency and local fire department personnel in the state, due to participation in Type 1 or Type 2 teams, their positions within their organizations, or other job duties, another Type 3 team has not yet been made operational.

According to various national studies, there should be an increased emphasis on the creation of Type 3 teams. The reasons include:

‣ Training and ability to rapidly deploy Type 3 teams is essential to the success rate of incident containment or efficient transition to a Type 1 or Type 2 team and in some circumstances from a Type 1 or Type 2 back to a Type 3 team.

‣ Type 3 teams would generally be developed from federal, state, and local governments and would typically be assigned to fires near their locality. As a result, they would be familiar with geography/topography of the area, have a potentially greater understanding of possible fire behavior, and have more of an appreciation/knowledge of local issues and concerns. Consequently, fire administration would be more efficient and likely, less costly.

‣ While training to qualify for a position on a Type 3 team is still relatively extensive, there is a greater pool of potential team members for at least a couple of reasons. First, Type 1 and Type 2 IMT personnel reaching the end of their team assignment may be interested in serving on a Type 3 team that will focus on "local" fires. Second, veteran firefighters who have been interested in fire administration but dissuaded by the training requirements and length of time to qualify for Type 2 or higher assignments could see Type 3 teams as an attainable option to remaining a firefighter.

As stated, numerous studies have recommended creation of more Type 3 IMTs in order to reduce the need to obtain the more expensive Type 1 or 2 teams. However, the challenge of development of Type 3 teams is compounded by the need for

monetary resources. It will be necessary to obtain funding to develop, train, supply, and maintain this level of firefighting capability. Creation of the Eastern Montana Type 3 IMT, known as the County Assistance Team (CAT) has been evolutionary both in its development and relative to the availability of funds to meet its basic operational needs. Emulating its positive characteristics such as teamwork, rapid and effective response, and ability to effectively address local considerations should be encouraged.

However, the challenges will be source funding, basic equipment needs, and the ability to incorporate ongoing training as part of its operations. The CAT and any other Type 3 teams being considered for Montana must obtain the appropriate resources to be the effective firefighting tool envisioned in the national studies. There will be costs associated with team development, but given that one project fire is likely to cost from a minimum of $750,000 to over $20 million, the upfront expenditure of funds for Type 3 teams to prevent one or more very large fires could be cost effective.

Recommendation #27
We recommend DNRC present to the NRCG and Legislature a proposal for the formation, maintenance, and funding of additional Type 3 Incident Management Teams for Montana.

Appendix A

Audit Scope and Methodology

Our primary focus was on the previous and current fire seasons (2003 and 2004). With few significant fires in 2004 our observations of fire suppression operations were limited. We used the 2003 fire season as the basis for the bulk of our examination/analysis of wildland fire administration. We supplemented this information with interviews, policy/procedure review, and examination of available documentation.

Audit work consisted of the following:

▸ Interviews with all parties involved in areas of wildfire suppression.

▸ Observing and documenting the administration of fire suppression activities on fires.

▸ Compiling and analyzing expenditure information regarding fire costs. The primary emphasis of this analysis was identifying cost categories and determining the "cost drivers" for suppressing wildland fires, both on individual fires and for the overall season.

▸ Examining "fire packages" associated with individual fires. The review of this documentation focused on two areas: determining how and what resources were ordered/utilized, and the demobilizing/payment authorization of those resources.

▸ Examining 2003 and/or 2004 fire packages to document the "paper trail" and authorization process for payment of fire costs from the time the resource is ordered through payment.

▸ Examining dispatch-ordered resources based on pre-conditions (pre-ordered resources), resource orders by the fire management team, including contracted equipment and personnel, inspections (pre- and post-fire), payroll-related data, invoices, Emergency Equipment Rental Agreements, de-mobilization schedules and checklists, etc. for individual fires.

▸ Identifying/evaluating the role of state Fire and Aviation personnel and DNRC Centralized Services personnel in the paper trail and authorization process.

▸ Examining cost-share negotiations and agreements for multi-jurisdictional fires, as well as review of post-fire finalization and negotiation of fire costs.

▸ Examining the ordering, utilization, monitoring and payment of aviation resources.

- ▶ Observing the role of dispatch with regard to ordering and monitoring resources.

- ▶ Examining state policies, and procedures in relation to national standards and organizations and other states.

- ▶ Examining initial attack capabilities and responsiveness from the perspective of appropriateness of location and level of those resources by determining what is presently in place relative to historical and current fire activity.

- ▶ Reviewing the utilization of "severity" resources to improve initial attack as well as pre-positioned resources in the event of an extended attack fire.

- ▶ Identifying current funding arrangements and how assessment funds are used to pay for wildland fire suppression.

Scope Limitations

Because of the limited fire activity on state protected land during the 2004 fire season we were unable to fully observe many of the activities and control systems at work. We did observe operations on three major fires. As a result, testing of fire administration and controls systems for the audit was conducted using documentation from the 2003 fire season.

**Follow-Up On Public
Allegations and Concerns**

During the audit we received a number of public comments and allegations concerning activities surrounding the 2003 fire season. These items addressed a number of different areas. We attempted to address each one. The following is a list of those concerns and how they were addressed.

▸ A citizen alleged mismanagement of federal funding for engines dispatched for wildfires in Eastern Montana. Engines were dispatched out of Wyoming for a fire in Ashland, MT instead of from Billings. The caller said this cost the state extra for each truck brought in from out of state. Our follow-up indicated that the dispatch center followed protocol. Personnel at the dispatch center used the ROSS system to identify closest available resource. Their operating plan requires them to check through Montana (Eastern), Wyoming, and the Dakotas, for equipment on the ROSS system. In this case the Wyoming equipment was available and closest as indicated on ROSS. The Billings resources did not show on ROSS. The department and other agencies met to determine if there were resources available in Billings, and why they did not show up on ROSS.

▸ A citizen who observed one of the 2003 suppression efforts expressed several concerns. He stated he was at a fire camp and was amazed at the perceived waste of resources. He stated the fire camps were like small cities. People were milling around and at times no one appeared to be on the fire line. Our follow-up review of fire documentation verifies fire camps were large and contained support services to handle the large number of crews. There was documentation that conditions during the fires caused crews to be pulled off fires and back to camp at times. Safety protocol also calls for only a certain number of hours per crew/person on a fire. We observed three fire camps during the 2004 fire season. The fire camps for two fires in the Eastern part of the state were well organized and meetings and movements were well scheduled. For a federal fire in Western Montana the fire camp was also well organized and meetings were well scheduled. There was no indication of excessive down time.

▸ There were several reports teams were burying equipment rather than turning it in for re-use. All of these came from third-party sources. When we asked for specific locations or for callbacks from the individuals who reported these activities, we received no further information and were unable to follow-up.

▸ There were also questions wondering if fighting fires at night had been done away with as policy. The individuals were concerned crews were missing some of the best times of the day

to fight fires since the humidity is usually higher, it is cooler, and the winds are normally calmer. Our follow-up indicated the policy of fighting fires at night had not been abandoned. It had been scaled back due to safety concerns in the late 1990's and early 2000's. The 2003 fire season had fuel and snag conditions that made fire managers very concerned about night suppression efforts. Decisions not to conduct suppression efforts at night were based on those concerns. Currently fire managers are revisiting policy on night suppression efforts. The revisions will address which activities can be safely conducted at night and aid in fire suppression efforts.

▸ Information was presented to us that seemed to represent an inherent conflict of interest on the part of an owner of equipment who was involved in dispatching equipment. With the dispatch rotation under the control of the contractor, other equipment owners believed they could be easily overlooked in the dispatch process. This process was used in one area during the 2003 fire season, but was changed for the 2004 fire season by returning dispatch rotation responsibility to the dispatch center.

▸ An individual presented information that seemed to indicate someone had altered shift tickets and other documents on a federal fire. Also included was an example of an individual who may have been paid for more days than was necessary on the fire. Since this was a federal fire and not state responsibility, the documentation was shared with the U.S. Forest Service. Forest Service personnel reviewed the documents and other source documents and concluded the information provided to us did in fact contain identification errors. However, the mistakes were made on the part of fire team business personnel. The transposition of numbers and the loss of shift tickets caused the problems. Other original documentation supported the payment of the contractors.

▸ Allegations of conflict of interest and nepotism were made concerning a DNRC employee and a local rural fire department. An internal investigation of the matters indicated the worst fire season on record required and exposed actions that in normal years may not have been implemented. The department concluded, and documentation supports, the policy used for payment for local resources needed to be clarified. There was no impropriety on the part of the DNRC employee. There was, however, a situation that created the appearance of a conflict of interest. The department decided clear guidance is needed to ensure all financial transactions involving fire departments are conducted at "arms-length", and by DNRC staff that are not

filling duel leadership roles. DNRC employees are still encouraged to become involved in their communities and offer their knowledge and skills to local organizations such as volunteer fire departments. There was also a recommendation the Fire and Aviation Management Bureau clearly establish policy on the hiring of local government resources for all assignments. With regards to nepotism charges, there were occasions when the DNRC employee was directly supervising a family member. This was not on a permanent basis. Again, recommendations were made to clarify policy to provide clear guidance to all employees on the hiring and supervising of relatives in the workplace. In all the above cases, the department found no evidence these relationships led to any wrongdoing by the parties involved. However, the perception of conflict of interest was evident in all cases.

Appendix C

Other States' Wildland Firefighting Programs

As part of this evaluation, we contacted six neighboring states to determine who is responsible for their wildland firefighting efforts, how they fund and conduct pre-suppression activities, how they fund and conduct suppression activities, what type of resources the state provides for wildland firefighting, and how expenses are paid for when fire costs exceed anticipated funding requirements. As imagined, there are almost as many different programs as there are states.

The responsibility for fighting wildland fires fell between the local county government and the state, although Colorado specifically identifies the Sheriff as the responsible party. If a fire escaped initial attack, there were varying degrees of assistance that were available to manage the fire. Some states, such as Oregon and Washington, had expended the resources necessary to establish state Incident Management Teams. All states had established programs for funding pre-suppression activities. These were generally a combination of assessments against landowners and appropriations from the state's General Fund. Severity funding was more sporadic with two of the six states not having any authorization for severity funding.

Other States Have Suppression Budgets

All six states had established a budget for suppression of wildland fires in contrast to Montana. Generally, each of these states established an account that was paid into by each of the participating counties or fire districts. Payments into the account were generally based on assessments of landowners or harvested forest products. In the case of Washington, the legislature appropriates suppression funding based on the 10-year average for wildland fires minus the high and low years. In some cases, the assessments were determined by a formula established in state law, in other cases, the assessment was established by a board of landowners or the participating counties themselves. Idaho's suppression funding mechanism is based on withholdings from timber sales.

Once fire costs were generated, the suppression funds were distributed by a governing board or the state forester. In some cases, states had to reach a threshold of fire costs, similar to a co-pay, before the suppression account could be accessed. In Utah, each county was required to establish a budget for suppression based on an average of suppression costs for the previous seven years. Each county or district that was battling a fire was also required to exhaust all mutual aid agreements prior to submitting bills to the suppression account.

In the event the suppression account was unable to meet all firefighting costs, the remaining costs were generally paid for by an appropriation from the state's General Fund. Oregon has established the only commercial wildland firefighting insurance policy in existence with Lloyds of London that includes a $15 million deductible followed by $25 million in coverage. The policy premiums of $3.75 million are paid for out of the state's preparedness funds. Washington was considering establishing a similar insurance policy, but the requirements to be met were considered prohibitive. Alberta, Canada, had an insurance policy for one year but losses were so high for the insurance company the policy has not been renewed. A number of states are re-evaluating the effectiveness of their suppression budgeting following successive years where the budget has been insufficient to meet fire costs.

Resource Levels Vary by State

Each of the states had different beliefs on what resources it should maintain for wildland firefighting. Washington has expended significant resources to develop its own firefighting capability with 10 helicopters, 55 hand crews (of 10 or more people), five Type 2 Incident Management Teams, and a number of mobile kitchens and command posts. Utah generally had the fewest state resources with the state providing only a few Type 6 wildland engines. Utah relies extensively on county resources to provide the necessary equipment to fight wildland fires. Only Washington had its own aviation assets, other than Oregon's two fixed wing spotter aircraft. All other states relied on exclusive-use and call-when-needed contract aircraft. The following table describe other states' wildland fire programs and shows Montana for comparison purposes.

Appendix D

Legislative Audit Committee
Montana State Legislature
Room 160, State Capitol
PO Box 201705
Helena, MT 59620-1705
(406) 444-3122

HOUSE MEMBERS
Representative Jeff Pattison, Chair
Representative Dee Brown
Representative Tim Callahan
Representative Hal Jacobson
Representative John Musgrove
Representative Rick Ripley

SENATE MEMBERS
Senator Jim Elliott, Vice Chair
Senator John Cobb
Senator Mike Cooney
Senator John Esp
Senator Dan Harrington
Senator Corey Stapleton

December 17, 2003

Senator John Cobb
Senate District 25
P.O. Box 388
Augusta MT 59410

Senator Jim Elliott
Senate District 36
100 Trout Creek Road
Trout Creek MT 59874

Representative Hal Jacobson
House District 54
4813 US Highway 12 W
Helena MT 59601

Representative Jeff Pattison
House District 95
HCR 71   Box 2176
Glasgow MT 59320

Members of the Legislative Audit Committee:

In light of ongoing interest and concern with the costs of fighting Montana's wildfires we are requesting a performance audit of the state's wildfire preparedness and suppression program. We would intend that the audit would provide the Legislature with valuable information on the policies, practices and costs of fighting wildfires. The Legislature could then use this information to effectively budget and craft policy to provide direction and resources to those agencies responsible for fighting wildfires. The goal would be safe, effective and efficient wildfire fighting.

The performance audit could address a number of interrelated topics. For example:

► What are the cost drivers for fire management and suppression?
► What is the process for determining/prioritizing resource needs for fires?
► Are sufficient resources available for initial attack crews?" If not, what is preventing them from getting the resources they need?
► Are initial attack crews properly disbursed?
► Does a policy of focusing on "structural protection" lead to larger fires and, in turn, higher suppression costs? If this is going to be the policy for future fire suppression, what can the state expect in terms of future costs?
► Are there areas of coordination between federal, state, and local agencies that create inefficiencies and add costs in suppression efforts?   When fires are close to "protection boundaries" does this lead to confusion or disagreements over which agency should respond to fires?
► How much revenue does the state currently collect specifically for wildfire suppression?   Do the revenue sources correspond with the parties being protected?
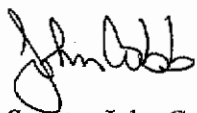
▶ Does the state's cost for protecting private landowners match revenues derived? Is there a need for an incentive program for landowners to reduce fire? What is the role of the insurance industry in this area?

▶ Does the state have pre-established costs or contracts for equipment, services, and other resources to help control costs? What cost control procedures are in place?

▶ How much input do local and State of Montana officials have in determining fire suppression efforts/cost vs. federal officials?

▶ How is the federal/state/local/private share of costs determined? Does it have an impact on decision-making for resources and timing? Is it a fair and consistent process?

▶ Are protection boundaries and related training still effective in light of changing emphasis for fighting fires, i.e. structural, urban interface, resource protection?

▶ What are the possibilities for resource sharing with surrounding states while at the same time maintaining the highest possible levels of safety and quick response?

▶ Does the legislature need to establish basic policy for fire suppression?

In a related area, the activities of non-state parties can also affect state resources. There are a number of perceived inefficiencies and inconsistencies in the fire fighting policies and strategies of federal agencies; for example, letting a fire burn itself out rather than immediately extinguishing it, thereby incurring more personnel costs, and paying contractors to stand by in case of need. To what extent do these policies incur waste in federal fire fighting efforts and what share of this putative waste would the State of Montana pay for?

An objective look at these topics would be a valuable resource for the 2005 Legislative Session. Using the outcome of the audit in coordination with the work of the Finance Committee would give the Montana Legislature and the citizens of Montana a good first step in attacking this ongoing concern. We would hope that the Audit Committee would see fit to prioritize a performance audit.
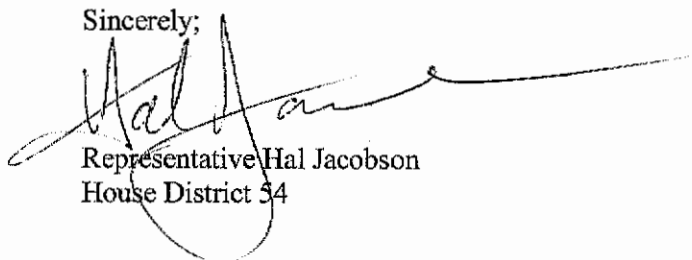
Thank you.

Sincerely;
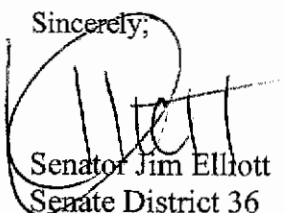
Senator John Cobb
Senate District 25

Sincerely;

Representative Hal Jacobson
House District 54
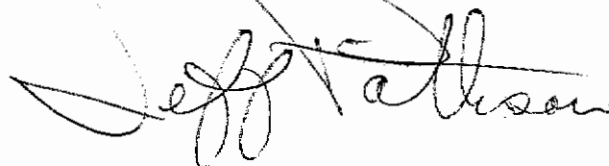
Sincerely;

Senator Jim Elliott
Senate District 36

Sincerely;

Representative Jeff Pattison
House District 95

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JUDY MARTZ
GOVERNOR

═══ STATE OF MONTANA ═══

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7 December 2004

Jim Pellegrini
Deputy Legislative Auditor
Legislative Audit Division
Room 160, State Capitol
PO Box 201705
Helena, MT 59620-1705

Dear Mr. Pellegrini:

Attached you will please find responses by the Montana Department of Natural
Resources and Conservation to the recommendations made within the final Performance
Audit report on DNRC Wildland Fire Administration. I appreciate the efforts of you and
your staff, and look forward to further discussions and consideration of these issues
before the Legislative Audit Committee on December 22, 2004.

Sincerely,

Arthur R. "Bud" Clinch
Director
Montana Department of Natural Resources and Conservation

C: Ann Bauchman
    Ted Mead

Chapter II – Background

Chapter III – Initial Attack of Wildland Fires

Chapter III – Initial Attack of Wildland Fires (Continued)

Recommendation #1
We recommend DNRC coordinate with the Northern Rockies Coordinating Group to implement a two-tiered rate system for severity resources.

Response: We concur with the need to work on an interagency basis towards potentially reducing costs of severity expenses. The interagency fire business committee is undertaking this as part of a larger strategic change to fire business practices. In addition to a two-tiered rate system, the intention is to also develop a bid process for these types of contracts. There is some concern that we are returning to a method that we previously had determined was complex and difficult to administer. We do anticipate additional administration workload with this change.

Implementation Date: May 2006   p. 29

Recommendation #2
We recommend the DNRC make completion of the Fire Program Analysis (FPA) project a high priority and provide a report to the 2007 Legislature.

Response: We concur that this program analysis project is critical and have recently hired one position to lead the effort over the next two years. This need was identified in the recent Fire Program Strategic Plan and our goal is to have an analysis completed in time to include any Legislative proposal in the Governor's OBPP for the 2007 legislature. This will likely require a redirection of existing FTE.

Implementation Date: January 2007   p. 30

Recommendation #3
We recommend the DNRC seek support for additional funding from the Legislature for the County Coop portion of the program.

Response: We concur with the need to better fund the County Coop portion of the DNRC Fire Program. Currently the Counties provide fire protection for 45 million acres in Montana. Recent budget cuts, combined with aging equipment have diminished the effectiveness of this program and strained local relationships as the DNRC decreased services. Suppression capability is decreased when training is limited and equipment is stretched beyond a reasonable life expectancy. Additional investment in this program will provide significant real benefits to Montana taxpayers by increasing firefighter safety and reducing fire suppression costs in the future. Any proposal would need concurrence by the Governors OBPP.

Implementation Date: January 2007   p.31

Recommendation #4
We recommend DNRC seek legislation to establish a formal risk financing method to be used for severity funding, increasing the effectiveness of initial attack, and reducing the risk of wildfires.

Response: We agree with the need to formalize the financing of the severity portion of the program, however, we are uncertain as to how this would be structured to be consistent with other department appropriations. We do feel that the utilization of additional resources as part of our preparedness effort has proven to be an effective cost containment strategy and look forward to continued use of this procedure when needed. We welcome the opportunity to work with the support of the legislature and concurrence of the Governor's OBPP to make any changes deemed necessary.

Implementation Date: January 2007   p. 34

Chapter IV – Wildland Project Fires

Chapter IV – Wildland Project Fires (Continued)

Recommendation #5
We recommend the DNRC standardize first and last day of work payments to local fire departments by:
A.   Developing and distributing one contract template.
B.   Working with NRCG to clarify language in the NWCG Business Handbook.
C.   Providing clear direction to DNRC staff responsible for reviewing payment invoices.

Response:

    A. We agree that one contract template for equipment use agreements will provide better consistency in this process.
    B. We agree to work to clarify the language within the Fire Business Management Handbook and work within NRCG annually to update this book.
    C. We also agree with the need to provide clear direction to all DNRC staff involved with reviewing any payment invoices. This will include both field based staff as well as personnel within the Centralized Services Division in Helena.

Implementation Date: May 2005   p. 53

Recommendation #6

We recommend the department take steps to ensure on-site equipment inspections are performed on project fires by:

A.   Including language in the Delegation of Authority specifying on-site inspections of equipment will be conducted and documented.

B.   Working with NRCG to address the issue of adequate resources to conduct equipment inspections on fires managed by IMTs.

Response:

A. We agree with the need to clearly state the agency expectations regarding equipment inspections within the Delegation of Authority. This will be added to our policy guidance on Delegation of Authority, and included in annual training sessions.

B. We agree with the recommendation of working within NRCG to better provide adequate resources to conduct these inspections. However equipment inspectors are only one position area within the Incident Management Team (IMT) operations where severe shortages affect the ability to provide expected oversight. As addressed later in the Audit Report, IMT maintenance is an important issue unto itself. We are currently working with the NRCG partners to maintain the existing level of IMTs .

Implementation Date: May 2005   p. 55

Recommendation #7

We recommend DNRC:

A.   Change the language in future equipment contracts to reflect damage claim clauses used on national engine and aviation contracts.

B.   Provide all DNRC staff responsible for settling contract damage claims direction through revised department policy and training.

Response:

A. We concur with the recommendation to improve the damage claim processes. The changes recommended to the contract language will likely be incorporated within the overall business practice changes previously described, and are planned to be in place for the 2006 fire season. We do anticipate an increase cost for these contracts as more liability for damages is moved to the contractors.

Implementation Date: May 2006

B. We have revised department policy with regards to claim processing, and are planning additional training for DNRC staff in Spring 2005. We anticipate establishing a lead employee at each Land Office to focus this process and provide better consistency across the Department.

Implementation Date: May 2005   p. 57

Chapter IV – Wildland Project Fires (Continued)

Recommendation #8

We recommend DNRC:

A.   Work with federal and other partners to improve and expand Delegation of Authority language.

B.   Include more specific direction in the Fire and Aviation Management 900 Policy Manual on the development of Delegations of Authority.

C.   Change the Delegation of Authority format to provide more specific guidance on cost containment expectations.

Response: We agree with the need to improve the Delegation of Authority process. This will include more specific language addressing cost containment expectations, use of Incident Business Advisors, and IMT documentation and reporting requirements. We will provide more specific policy direction within our Fire Program manuals to direct these changes. This policy change will incorporate changes to the Delegation of Authority format to assure specific direction related to cost containment actions.

Implementation Date: May 2005   p. 61

Recommendation #9

We recommend the department strengthen the cost share agreement process by:

A.   Providing additional training and mentoring opportunities to Line Officers.

B.   Assigning a specialist to assist Line Officers with cost share negotiations on the more complex project fires.

Response: We concur with the recommendation and will include cost share training in the Spring 2005 training sessions. We will also take advantage of all opportunities to have inexperienced line officers work under the guidance of more experienced personnel whenever possible. We will assign an IBA to assist Line Officers during cost share negotiations.

Implementation Date: May 2005 and ongoing   p. 63

Recommendation #10

We recommend the department:

A.   Develop a program to provide effective training and mentoring for department IBAs.

B.   Ensure Delegation of Authority contains direction on the use of IBAs.

C.   Aggressively implement the use of IBAs on Type 3 or larger fires.

Response: We concur with the need to develop and utilize the Incident Business Advisor position for any Type 3 or larger fires. Towards that end, we will provide effective IBA training in spring of 2005, and use all the opportunities to mentor newer IBAs that the 2005 and future fire seasons provide. As stated above, we also intend to improve the Delegation of Authority format and related policy guidance to include direction regarding the use of IBAs.

Implementation Date: May 2005   p. 65

Recommendation #11

We recommend the department take better advantage of opportunities presented during close out briefings by encouraging a more detailed-level of discussion.

Response: We concur with the need to better utilize the close out briefing to provide us with improved information regarding such items as resource costs and utilization, IMT performance, agency line officer performance, dispatch communications, and cost containment measures used. Towards that end, we will include work within NRCG to inform the IMTs within the Northern Rockies of this increased expectation, as well as including this in our Spring 2005 Line Officer training.

Implementation Date: May 2005   p. 66

Recommendation #12

We recommend the department:
- A.   Ensure line officers conduct detailed performance appraisals of IMTs, placing special emphasis on meeting cost containment goals.
- B.   Submit modifications of the existing IMT appraisal form to NRCG to provide more detailed feedback of IMTs.
- C.   Submit copies of IMT appraisals to NRCG and DNRC officials as part of an overall evaluation of the role of IMTs.

Response: We concur with the need to improve the use of performance appraisals of IMTs. In addition to specifically evaluating cost containment objectives, we will propose to NRCG a revised format that will compel line officers to provide a more complete evaluation of IMT performance. Currently copies of the IMT appraisals are submitted to NRCG as well as the responsible agencies' line officers.

Implementation Date: May 2005   p. 67

Recommendation #13

We recommend DNRC work with the NRCG to:
- A.   Establish formal, comprehensive, and meaningful performance measures for all personnel assigned to fire incidents.
- B.   Adopt the recommendations of its NRCG Business Management Committee regarding performance appraisals for contracted resources.
- C.   Incorporate requirements for performance appraisals to be conducted by IMT personnel of all contracted, as well as state/federal resources into each fire's delegation of authority.
- D.   Compile and analyze the performance appraisal results as part of the personnel resource ordering/selection process.

Response: We concur with the needs to provide meaningful performance measures for personnel and will work within NRCG to improve the existing process. We are currently working within the NRCG Incident Business Practices Working Team to develop a system for all contracted resources which will become a critical portion of the competitive bid process. The current plan includes a compilation of performance records for all resources to be included as part of the bid awarding process. This complete proposal is planned to be implemented by fire season 2006, yet the performance evaluation portion is intended to be in place for the 2005 fire season. Inclusion of a specific performance evaluation objective into the delegation of authority will be included in the DNRC Line Officer training session.

Implementation Date: May 2005   p. 70

Recommendation #14
We recommend DNRC clarify its policy outlining conditions on when it will and will not pay individuals and industry for assisting in suppression efforts on accidentally started wildfires.

Response: We feel that adequate policy exists to direct DNRC staff to provide investigation on any person caused fire, and then using that investigation report to pursue reimbursement for all costs. However, to ensure better compliance with these policies, we will emphasize training at the Line Officer level.

Implementation Date: May 2005   p. 74

Recommendation #15
A. Include more specific language in each fire's Delegation of Authority requiring IMTs to establish tighter controls over fire cache items.
B. Require DNRC line officers to ensure fire cache controls on fires are being followed.
C. Modify department policy regarding acceptable fire cache losses so it is more in line with NRCG policy.
Response: We concur with the need to improve the direction given to IMTs regarding fire cache supplies control. This will include better Delegation of Authority language, as well as a clear review and acceptance by the line officer at the IMT close out. DNRC policy will be changed to align with the NRCG Cache guidelines. Additionally, we intend to assign a liaison to work directly with the Northern Rockies Cache to address DNRC issues.

Implementation Date: May 2005   p. 78

Recommendation #16
We recommend DNRC continue efforts to solicit competitive proposals for wildland fire fighting contracts.

Response: We agree with the need to solicit competitive bids, and are moving towards that goal. We currently have some contracts awarded for specific items (ice, porta-potties, lunches, etc.) for DNRC use. We are also working within the NRCG Fire Business Management Committee to move more types of resources (engines, water tenders, etc.) to a competitive bid process.

Implementation Date: May 2006   p. 80

Recommendation #17

We recommend DNRC:

A.   Actively examine cost benefits of renting versus purchasing items for wildfire suppression.

B.   Along with NRCG partners, reexamine fire cache contents to determine whether changes should occur as a result of 2003 fire season experiences.

Response:

A. We concur with the recommendation of reviewing all portions of the business of fire supply, including examining the cost benefits of purchasing some items rather than renting them. Purchases of a capital nature (trucks, large office equipment, etc.) would require changes in state purchasing guidelines. Also, when evaluating the cost of purchasing items, the long term maintenance and storage is a cost that must be included in the analysis.

B. Annually we review the cache contents and their suitability for current operations. We agree with the recommendation to review this again given the experiences of the 2003 season. Adjustments have been made in cache items since the 2003 fire season.

Implementation Date: May 2005 and ongoing.   p. 82

Recommendation #18

We recommend DNRC immediately begin cross-training other staff for FEMA cost recovery efforts and review of federal fire bills.

Response: We concur with the recommendation to increase staff ability to work in the FEMA cost recovery and federal fire billing areas. We have begun this additional training for the federal bills of 2004 and hope to have several more employees involved during the 2005 fire season.

Implementation Date: Ongoing   p. 83

Recommendation #19

We recommend DNRC employ formal retrospective cost studies in order to examine efficiency and effectiveness of wildland fire suppression efforts and provide results to fire managers.

Response: We concur with the recommendation to employ a method to review fire costs after the fire season. We currently ask that an "After Action Review" be conducted on fires where needed, as determined by the line officer. Specific inclusion of a cost analysis as part of these reviews will be added to the policy by fire season 2005. Additionally, the Fire Program Analysis process will provide a larger picture view of the efficiency of the current resource and staffing levels and their locations based on the DNRC fire protection responsibilities.

Implementation Date: May 2005 and ongoing   p. 87

Recommendation #20
We recommend the department strengthen the capabilities of its line officers by:
A.   Sending line officers to regional and national training when feasible.
B.   Encouraging the use of training assignments to gain additional practical experience.
C.   Requiring the line officer to order an IBA on all type 3 or larger fires.
D.   Assigning an experienced person to assist the line officer on Type I fires and when requested for other fires.
Response:

A. We agree with the need to strengthen our line officers' capabilities related to management and administration of the fire program. We have a workshop for line officers planned for Spring 2005 to cover the items recommended in this report. We've found national and even regional courses to be marginally effective in providing the skills and abilities needed by our line officers.
B. We will continue to encourage the use of all training opportunities for our line officers, realizing that other program responsibilities often preclude their participation.
C. While we see the value of using an IBA on type 1 and type 2 fires, we feel the line officer should have the flexibility to determine when they are needed on type 3 incidents.
D. We agree with the benefit of assigning experienced people to assist line officers on Type I, and even Type II fires. Currently our policy states that we expect one line officer representative to be assigned for a Type 2 fire and two for a Type 1 fire. Again, given the current level of staffing, and the recent challenging fire seasons, we will likely continue to be hard pressed at times to meet this goal. Options we have used, and will continue to rely on to meet this need, include hiring of retirees and/or other states' line officers. We hope to provide a better field guide by fire season 2006 to enable line officers and DNRC managers to anticipate and plan for these types of needs.

Implementation Date: May 2005 and ongoing   p. 90

Recommendation #21
We recommend DNRC, in cooperation with other fire protection agencies, explore options to more consistently involve dispatch in discussing, evaluating, and documenting the role of dispatch in a fire's administration.

Response: We concur with the recommendation to better include the dispatch portion of the organizations in review, evaluation, and changes of their role in fire administration. Currently it is our expectation that dispatch be involved in all IMT in briefings, close out meetings, and any "After Action Reviews' conducted by DNRC. This issue will be reinforced at the Line Officer training session.

Implementation Date: May 2005   p. 92

Recommendation #22

We recommend DNRC request appropriations for sufficient personal services to provide for a continuous helitack capability for each helicopter assigned to land offices during the fire season.

Response: DNRC concurs with the increased effectiveness that additional helitack crews would afford the agency during future wildfire seasons. Legislative requests to develop two additional helitack crews would follow recommendation of the pending fire program analysis, and be contingent upon concurrence by Governor's Office of Budget and Program Planning.

Implementation Date: January 2007   p. 101

Recommendation #23

We recommend DNRC request sufficient personal services resources to safely and effectively operate all assigned aircraft and more accurately reflect actual pilot operating requirements.

Response: DNRC concurs with this recommendation, and have included a request for 0.35 FTE and associated personal services funding as a part of the 2005 executive budget proposal. Additional legislative requests would follow identification of need either through pending fire program analysis or FAA review of the aviation program, and be contingent upon concurrence by Governor's Office of Budget and Program Planning.

Implementation Date: January 2005   p. 102

Recommendation #24

We recommend DNRC request sufficient personal services to properly staff its aviation maintenance program.

Response: We concur with this recommendation, and have requested an additional 1.00 FTE and related personal services and operating funding as a part of the executive budget for the 2005 legislative session. This proposal would fund one additional mechanic for the DNRC aviation maintenance program. Additional legislative requests would follow identification of need either through pending fire program analysis or FAA review of the aviation maintenance program, and be contingent upon concurrence by Governor's Office of Budget and Program Planning.

Implementation Date: January 2005

p. 105

Recommendation #25
We recommend the Legislature authorize a study to develop and update fire-related statutes to address current development and environmental conditions and improve wildland fire suppression management and mitigation.

Response: We concur with this recommendation; DNRC legal staff has done preliminary research into affected statutes and potential clarifications to improve wildland fire roles and responsibilities in Montana. DNRC agrees that such an effort would require legislative direction to be successful, and would be willing to chair or help staff a committee formed to develop legislative revisions to existing fire wildfire statutes.

Implementation Date: January 2007   p. 110

Chapter VII – Wildland Fire Management Issues (Continued)

Recommendation #26
We recommend DNRC establish formal agreements with local fire service organizations to clarify responsibilities and compensation for responding to DNRC fires occurring outside the statutorily designated fire season.

Response: We concur with the recommendation, though emphasize this applies primarily to DNRC direct protection areas in the Northwest, Southwest, and Central Land Offices. DNRC initiated discussions with rural fire departments (RFDs) in early 2004 to revise existing operating plans and reach agreement on appropriate protocols for wildland fire response, and payment of resources outside the core wildfire season. Agreement has been reached with some RFDs, while other negotiations have been delayed by disagreement over dispatch protocols and reimbursement rates. DNRC intends to continue negotiations with RFDs to execute such agreements as soon as possible, but RFDs are under no obligation to finalize such agreements and further delays could occur.

Implementation Date: June 2005 and ongoing   p. 114

Recommendation #27
We recommend DNRC present to the NRCG and Legislature a proposal for the formation, maintenance, and funding of additional Type 3 Incident Management Teams for Montana.

Response: We concur with the need for additional Type 3 Incident Management Teams to be Formed and managed by NRCG. DNRC and its partners in NRCG have concerns over the existing ability of wildland fire agencies to adequately staff the six Type 2 and two Type 1 IMTs in the Northern Rockies. Creation and management of additional Type 3 teams will need to occur with additional staff funded by each respective agency, or come at the expense of decommissioning existing Type 2 IMTs. We anticipate the NRCG to identify the number and location of Type 3 IMTs needed in the state, and this would be incorporated into any DNRC legislative proposal submitted to the Governor's OBPP that may arise out of that study.

Implementation Date: January 2007 and ongoing   P. 119