

Management Efficiency Assessment on  
Aviation Activities  
in the  
USDA Forest Service



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July 24, 2008**

The Department of the Interior (DOI) has reviewed this assessment and concurs with the findings and recommendations.

**This report was originally  
developed in 2007  
and will be  
updated by the implementation team.**

# USDA Forest Service

## Aviation Activities Management Efficiency Assessment

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## Executive Summary

This Management Efficiency Assessment provides an overview of Forest Service aviation activities and identifies where there are opportunities to implement program improvements and reduce operating costs. The review provides recommendations for follow-on actions and studies to increase program efficiency and effectiveness.

Execution of the assessment is complicated by the fact that the Fire Aviation Management function is not a single, monolithic entity. The assessment team identified six Business Areas within aviation, each of which required separate analyses.

The Forest Service Aviation Activities Management Efficiency Assessment is divided into six sub-reviews based upon the six key distinct Business Areas identified: Aerial Delivery of Firefighters and Support, Aerial Detection and Command and Control, Aerial Fire Suppression – Airtanker and Large Helicopter, Aerial Resource Support (Natural Resources and Fuel Management Missions), Aviation Contract Management and Quality Assurance, and Aviation Program Management. The Business Areas were aligned into complete business units for analysis. The assessment uses 2005 cost data in the various Business Areas.

The mission of the Forest Service is to:

*Sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.*

The Forest Service mission includes four major segments: National Forest and Grasslands, Forest and Rangeland Research, State and Private Forestry, and Wildland Fire Management. Wildland Fire Management provides for the protection of life, property, and natural resources on National Forest Service (NFS) lands and the estimated 20 million acres of adjacent State and private lands<sup>1</sup>.

The primary mission of Forest Service Aviation is to support wildland fire management and the ground firefighter through a variety of means including safe delivery of smokejumpers, rappellers, air attack, aerial delivery of fire retardant and water, firefighter and cargo transport, surveillance, aerial reconnaissance, and fire intelligence gathering. Aviation activities also support Forest Service natural resource programs and interagency partners. High costs associated with fire and aviation activities led the Forest Service to select these activities for efficiency assessment. The assessment recognizes that a large portion of the overall Fire and Aviation Management wildland fire suppression budget is centered on aviation costs with the majority of these costs going to contract aviation resources.

This review focuses on the Forest Service's ability to bring a multitude of aircraft together, both contract and in-house, from throughout the country, to work in harmony on any wildland fire incident and function with interoperability of equipment and operating practices. The review team was challenged with defining an aviation program that fulfills the Forest Service mission, reflects budget realities, delivers an efficient and safe aviation operation, takes advantage of multiple studies completed previously, removes existing barriers identified in

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<sup>1</sup> Forest Service Performance and Accountability Report – Fiscal Year 2004 dated April 2005.

previous studies, is acceptable to interagency partners, reflects the tension between trade-offs necessary for any additional equipment/investments, and minimizes new investments where savings cannot be demonstrated.

Many facets of the Business Areas were identified, analyzed, and evaluated. This final report reflects only those recommendations that are supported and proven by an objective analytical process.

The review was influenced by a number of factors that helped guide the analysis and recommendations, including severity of fire seasons; funds availability and the impact of transferring funds from other programs; availability and capability of aircraft to support the mission; personnel availability; and safety.

The assessment identified numerous assumptions for the Business Areas collectively and individually which became part of the foundation for the recommendations. Assumptions included the following: each region varies in vegetation fuels, geographic, climate and fire potential conditions; aviation resources will continue to be used in wildland fire suppression; to maintain interoperability across Regions, standardization of aviation personnel, equipment and operating procedures would be necessary to meet requirements; and aviation technology is dynamic and continually evolving.

Constraints were identified to ensure that recommendations would be executable. Following are some of the key constraints identified: wildland fire requires an immediate and appropriate response and may include a containment objective within the first burning period after detection; the use of fire suppression assets requires coordinating priorities with interagency partners; additional funding needs are often met by transferring funds from other Forest Service programs; aged aircraft retirements have decreased the size of the government-owned (working capital fund or WCF) and contracted fleet; there is an increasing requirement for the Forest Service aviation program to respond to “all hazard” incidents in support of other agencies (FEMA, etc.).

The Business Areas that were identified cover direct support to firefighters including rapid delivery of helitack crews and smokejumpers for initial and extended attack on wildfire incidents. An integral part of the incident command structure is provided by the aviation activities command and control of aerial resources along with aerial detection and communications. Aerial fire suppression provides large volume delivery of approved fire retardants or suppressants on wildland fires using airtankers and large helicopters. Throughout the year, aviation activities support the overall Forest Service mission.

Aviation support depends predominantly on contract aviation services. This requires a significant effort to administer, and to monitor and direct the most effective use of resources. The Contract Management and Quality Assurance Business Areas are critical to ensure that the aircraft used are safe and capable of providing necessary support. Quality assurance includes both contract and government operations ensuring performance quality and standardization.

Aviation Program Management provides management at all levels through close interagency coordination to obtain and maintain an effective aviation capability to complement ground firefighter capabilities. National, Regional, and Administrative Unit levels actively coordinate and work in conjunction with other federal, tribal, state, and local government agencies and private entities.



Through review of previous studies, interviews, subject matter experts, and analysis of operations and aviation activity cost, this assessment found that there are areas for improvement. However, these findings require additional studies and evaluation, to include updating the eight-year old Aerial Delivered Firefighters (ADFF) Study based upon new information and available resources.

## **General Description of Forest Service Aviation Activities**

The primary mission of Forest Service Aviation is to support wildland fire management and the ground firefighter through a variety of means including safe delivery of smokejumpers and rappellers, air attack, aerial delivery of fire retardant and water, firefighter and cargo transport, surveillance, aerial reconnaissance, and fire intelligence gathering. Aviation activities also support Forest Service natural resource programs and interagency partners.

Fire Management accounts for 75 to 80 percent of agency flight hours. The yearly fluctuations in flight hours result from variations in fire season suppression activities.

Fire suppression and protection responsibilities for natural resources are generally assigned to a lead local, state, federal or tribal agency; however, wildland fires often cross agency boundaries. As a result, wildland fire response is conducted in an interagency and cooperator environment. This assessment takes into consideration potential impacts to stakeholders that may result from implementation of findings and recommendations.

Aviation activities support a wide variety of agency missions, including fire suppression, fire prevention, research study, forest rehabilitation, law enforcement support, aerial photography, infrared detection, and personnel transport. Aerial delivered firefighters (smokejumpers and helitack crews) provide a pool of experienced fire professionals to ensure integrity and continuity of wildland firefighting capability and provide technical expertise to fire and resource managers at all levels of the Forest Service.

The Forest Service owned and operated 26 aircraft (See Appendix G –Aircraft) in 2005. In FY 2005, an additional thirteen aircraft were leased for Forest Service pilot operation and approximately 643 aircraft were contracted, including both airplanes and helicopters (See Appendix H – Forest Service Contracts). These numbers were reported by the regions in the original data call for this review.

Owned and leased aircraft are crewed by Forest Service government employee pilots and manager/pilots. Approved contractors with oversight by Forest Service maintenance and avionics specialists/inspectors maintain these aircraft to Federal Aviation Administration (FAA) standards. Additional cooperating aviation support is provided by other federal or state firefighting organizations when wildland fire incidents are located in areas of mutual interest and concern. Military assets may be employed during the most severe wildland fire situations when no additional commercial resources are reasonably available.

The Forest Service aviation program provides aviation services that support agency managers in accomplishing their land management goals. The Forest Service uses approximately 700 contracted and owned aircraft each year. This number varies from year to year based on the amount of fire activity.

An average of 80,000 flight hours are flown annually. The average Forest Service accident rate is 6.3 accidents per 100,000 hours flown. This is 23 percent below the FFA statistical General Aviation (GA) average accident rate of 8.2 per 100,000 hours flown. The lower Forest Service accident rate is achieved under challenging weather, terrain, and flight profile conditions.

The majority of aircraft services needed to support Forest Service programs are provided through contract and rental agreements with commercial aviation operators. The majority of contracts are complete with aircraft, crews, and maintenance support. Contracts may be "exclusive use" or "call-when-needed" (CWN) and vary in length from 30 days to a year. Rental agreements are simplified CWN contracts. Large transport aircraft are contracted from air carriers or occasionally provided by military services under Memorandums of Agreement (MOA). Approved aircraft operated by cooperating agencies are also used.

The extensive number of contracts and individual contractors located throughout the country require a large number of personnel to administer the contracts and perform quality assurance. Contract Management and Quality Assurance are discussed in Business Area E – Aviation Contract Management and Quality Assurance.

Forest Service exclusive use and CWN contract specifications for aerial firefighting assets used in fire suppression are similar to the specifications for Department of the Interior-Aviation Management Directorate (DOI-AMD) and some state contracts. Through this interagency coordination, aircraft contracted and approved by AMD may be ordered and used interchangeably with Forest Service contracted aircraft. Both agencies agree that complete standardization of contract specifications is desirable.

Cooperator aircraft are owned, leased or contracted and operated by other federal, state, and local government agencies or tribal governments. Some of these aircraft have been obtained through the Federal Excess Property Program (FEPP) and are utilized by states and local government entities for emergency incident operations including wildland fire suppression. The Forest Service utilizes these aviation platforms in a variety of configurations under the auspices of cooperative agreements, interagency operating plans, and Memorandums of Understanding (MOU).

Aviation assets are controlled and managed at all levels as National Shared Resources (NSR), Regional, or local resources based upon the needs and criticality of the incident.

# Aviation Management Efficiency Assessment

## Summary of Recommendations

The assessment team did not identify recommendations by priority.

### Business Area and Description of Recommendation

#### **Business Area A – Aerial Delivery of Firefighters and Support**

##### ***Short-Term Recommendations***

Consolidate helicopter rappel training to one location in each Region in order to promote standardization and efficiency.

Update the Aerial Delivery of Firefighters Study (ADFF) to evaluate and recommend the best mix of helicopter delivered versus airplane delivered firefighters. The study should include an analysis of the optimal locations for staging aircraft and crews based upon improved helicopter capabilities.

Develop a strategic plan for a phased replacement of the smokejumper aircraft in accordance with the Exhibit 300 process. Recommend that the Forest Service replace the current fleet with pressurized aircraft that have increased smokejumper and cargo capacity along with greater range capability.

##### ***Long-Term Recommendations***

Develop a strategic plan to determine the best acquisition method for helitack aircraft in accordance with the Exhibit 300 process.

#### **Business Area B – Aerial Detection and Command and Control**

##### ***Short-Term Recommendations***

Explore WCF for the various funding mechanisms to assist with the acquisition of replacement command and control aircraft.

Explore Agency-owned, lease-to-own, and contract options from the OMB Exhibit -300 business case study/analysis for aviation assets with the various funding mechanisms and authorization to assist with the replacement of leadplane/ASM aircraft.

Evaluate the potential of contracting for multiple ATGS platforms utilizing a single national contract similar to the national helicopter contracts. These platforms would consist of an aircraft and pilot. The Agency will provide the ATGS.

Validate the efficacy of the IR Program with the primary customers, including Incident Management Teams, Line Officers, and Natural Resource Specialists. Also evaluate the adequacy of the technology being used to assist decision makers.

Evaluate Firewatch program expansion for other Agency programs, such as law enforcement. Consider sharing Firewatch resources among Regions and the interagency community for large fire support and other Agency natural resource missions.

Qualify Firewatch pilots at ATP level in order to be able to fulfill the ASM missions.

##### ***Long-Term Recommendations***

Recommend the development of long-term funding and implementation strategy for aviation training and ASM development. Consider changing the existing Forest Service approach to initial ground training for leadplane pilots and geographic area training of ATGS candidates. An example could be a National Aerial Supervision Academy, that includes all command and control aviation resource training. This would consolidate leadplane pilot training and ATGS training into an interagency aerial supervision academy, and could include command and control resources, interagency flight training, S-378, professional flight simulator training and Crew Resource Management.

## Business Area and Description of Recommendation

### Business Area C – Aerial Fire Suppression – Airtanker and Large Helicopter

#### *Short-Term Recommendations*

Develop a value analysis for use by each airtanker base to determine the best method of contracting for retardant, i.e. either full service or bulk. This analysis should also take into consideration the most effective and cost efficient type of retardant to be used at each base (i.e. powder, liquid).

Provide funding allocation within constrained preparedness and suppression budgets for dedicated helicopter managers for the 16 exclusive use Helitankers and Type I bucketed helicopters to maximize the efficiency of large helicopter usage. Forest Service management should be assigned to them on a 7-day basis when the helicopters are activated.

Explore alternative preparedness cost sharing strategies for the annual costs associated with aviation resources (airtankers and MAFFS).

If cost sharing alternatives are not available for the MAFFS program, evaluate alternative resources available for delivery of fire suppressants and retardants.

Utilize the Exhibit 300 study process to determine the appropriate number and mix of large airtankers and helitankers for long-term Agency use. This process is currently being used to determine the number of airtankers.

Until the Exhibit 300 is completed, maintain the large airtanker fleet at the current number of 19 and continue with the ongoing effort to refurbish three government-owned P3s.

Based on the Wildland Fire Management Aerial Application Study, evaluate the recommendation to consolidate airtanker bases from 38 down to 23. Eleven bases should be converted to reload bases and four bases closed.

### Business Area D – Aerial Resource Support (Natural Resources and Fuel Management Missions)

#### *Long-Term Recommendations*

Recommend that research be completed on the feasibility of utilizing Unmanned Aerial Vehicles (UAVs) for data collection.

### Business Area E – Aviation Contract Management and Quality Assurance

#### *Short-Term Recommendations*

Increase Aviation Contract Management and Quality Assurance oversight.

Increase the contract length for select aircraft contracts.

Optimize the mix of Exclusive Use and CWN Contracts to minimize total costs (preparedness and suppression combined).

Maintain a minimum core cadre of 59 agency personnel (24.06 FTE) for quality assurance of pilots and aircraft contracts that should be organized to work under the guidance of their respective national program standardization officer.

#### *Long-Term Recommendations*

Aviation contracts should be reviewed in greater detail for conformance with the new performance-based contract criteria and to improve the balance between Government and contractor risk. This has the potential of reduced contract costs.

## Business Area and Description of Recommendation

### Business Area F – Aviation Program Management

#### *Short-Term Recommendations*

Continue to participate in the ongoing effort to develop interagency strategy and align operational policies.

Utilize National Shared Resources more efficiently by establishing two specific resource coordinator roles (helicopter and fixed-wing) to work with the National Interagency Coordination Center during fire season.

The Forest Service should continue moving toward standardized and Indefinite Delivery Indefinite Quantity (IDIQ) contracts.

The Forest Service should increase the use of End Product contracts for greater cost containment and to shift agency liability to contracted work. The emphasis should support continuation of Forest Service End Product contracts where appropriate.

Further explore the possibility of centralizing aviation management certain Regional aviation management roles into geographic hubs. National aviation management staff will be responsible for overall program management.

#### *Long-Term Recommendations*

Establish Unit Aviation Officers (UAO) as collateral duty positions in each Research Station to provide supervision and oversight.

### General Recommendations – Comments

#### *Short-Term Recommendations*

Utilize the Exhibit 300 process to evaluate the cost effectiveness of owning versus leasing aircraft to be used in support of Agency missions as identified throughout the Business Areas.

Conduct a program review of the Helicopter Inspector Pilot, rotor pilots and supporting platforms.

Review National Type II Helicopter Program.

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## 1. Purpose of the Assessment

The purpose of this assessment is to identify those areas within the Forest Service Aviation and Related Activities that can be improved through efficiencies in personnel staffing, organization, communications, technology application, and procedures.

The assessment was conducted by a Forest Service team supported by the consulting firm of Management Analysis, Inc. using the data call and interview information.

<b>Steering Committee Members</b>	
Lead	Hank Kashdan – Deputy Chief, Business Operations
Member	Jacqueline Myers – Associate Deputy Chief, Business Operations
Member	Tom Harbour – Director Fire & Aviation Management (F&AM)
Member	Denny Truesdale – Assistant to the Deputy Chief, State & Private Forestry (S&PF)
<b>Oversight Committee Members</b>	
Lead - SPPA/MAS	Betsy Walatka – Strategic Planning and Performance Accountability/Management Analysis Studies Staff - WO
Lead – F&AM	Robert Kuhn – F&AM Management Studies Lead - WO
<b>Management Efficiency Assessment Team</b>	
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Member	Sandra LaFarr – Regional Aviation Officer – R9
Member	John Liston – Regional Aviation Officer – R10
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Arthur L. Smith	President, Management Analysis, Inc
Raymond F. Powell	Sr. Management Analyst, Management Analysis, Inc.
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## 2. Master Efficiency Assessment

The review team divided the assessment into sub-studies based upon the six distinct Business Areas, henceforth identified as such, to ease display and analysis of key work items within aviation program. The review recognizes that a large portion of the overall Fire and Aviation Management budget is centered on aviation resources, a significant cost factor in wildland fire suppression. A high percentage of this funding is expended on contracted aviation resources. In 2005, of the \$178 million spent on aircraft costs \$170 million (96 percent) was paid to contractors.

This review provides an overview of Forest Service aviation activities identifies where there are issues common to all Business Areas and provides combined recommendations for improvement. Any issues existing within the current organization have also been identified.

The six individual Business Areas are evaluated in greater detail for each respective area in the subsequent paragraphs starting with Business Area A – Aerial Delivery of Firefighters and Support.

### 2.1. Business Needs Assessment and Justification

#### 2.1.1. Forest Service Strategic Goals and Objectives

The complete Forest Service Strategic Plan for Fiscal Years 2007 through 2012 (National Strategic Plan or NSP) is available at <http://www.fs.fed.us/publications/strategic/fs-sp-fy07-12.pdf>. The Forest Service goals as stated in the plan are:

- Restore, Sustain, and Enhance the Nation's Forests and Grasslands
- Provide and Sustain Benefits to the American People
- Conserve Open Space
- Sustain and Enhance Outdoor Recreation Opportunities
- Maintain Basic Management Capabilities of the Forest Service
- Engage Urban America With Forest Service Programs
- Provide Science-Based Applications and Tools for Sustainable Natural Resources Management

Forest Service aviation activities contribute to accomplishment of the above goals as a major element of initial attack suppression success. The Forest Service has established an internal performance measure in order to meet the Forest Service Goals and Objectives.

“Consistent with resource objectives, wildland fires are suppressed at a minimum cost, considering firefighter and public safety, benefits, and values to be protected.”

“Performance Measure - Percent of unplanned and unwanted wildland fires controlled during initial attack.”

*“FY 2002 Baseline: 98 percent”*

*“FY 2008 Target: 99 percent”*



## 2.2. Aviation Activities Business Areas

Six basic business areas were identified within the scope of the Forest Service mission and related aviation activities. Each of these areas has a distinct mission and direct product to support the agency firefighting mission and natural resource programs. The Business Areas are as follows:

- **Aerial Delivery of Firefighters** - Provides various methods to rapidly transport qualified firefighters to an emerging fire in order to attack and contain the spread. Methods include the use of helitack and smokejumper resources for initial attack in an effort to fully control fires within the first burning period, which is generally defined as 10am to sundown, and to perform extended attack on wildland fires.
- **Aerial Detection and Command and Control** – Provides the various methods for command and control of wildland fires by combining detection technology, fire/forest/aviation/geographic knowledge, and communications. These methods are used to detect and combat wildland fires through Aerial Supervision Modules (ASM), Air Tactical Group Supervisors (ATGS), leadplanes, and infrared technology.
- **Aerial Fire Suppression – Airtanker and Large Helicopter** – Provides direct support to ground firefighters through the aerial delivery of approved fire retardants or suppressants on wildland fires by airtankers and large helicopters.
- **Aerial Resource Support (Natural Resources and Fuel Management Missions)** – Provides support to the overall Forest Service mission to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. This includes missions to support recreation, timber resources, vegetation management, watershed condition, research, and reduction of invasive species.
- **Aviation Contract Management and Quality Assurance** – Provides for the control and monitoring of all contract aviation services including contract performance, safety and interagency standardization of aircraft, pilots, and maintenance.
- **Aviation Program Management** – Provides National, Regional, and local management that develops and maintains effective aviation resources and capabilities to support ground firefighters and natural resource programs. These management levels establish policy standards, provide oversight and determine priorities for acquisition, allocation, and prioritization of aviation resources. Management responsibilities require close interagency coordination.

## 2.3. Justification

Aviation activities are necessary to attaining Forest Service goals because of the nature of wildland fire with its associated geographic location, fuel conditions, and climatic conditions. Another consideration is the necessity for rapid containment and preventing the spread of fire to minimize the loss of life and property.

## 2.4. Assumptions and Constraints

There are three key external factors challenging Forest Service Aviation's ability to achieve the desired outcomes in the Executive Priorities and National Strategic Plan long-term goals. These factors directly impact Forest Service aviation activities' ability to support wildland firefighting.<sup>2</sup> These factors are:

- Continuing region-wide drought in the Western United States and continuing local weather patterns leading to stressed forest vegetation, increased insect and disease activity, and a pattern of catastrophic wildland fires.
- Continuing serious threat of catastrophic wildfires, especially near communities with a buildup of hazardous fuels in the wildland-urban interface (WUI).

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<sup>2</sup> Forest Service Performance and Accountability Report – Fiscal Year 2004

- Continuing transfers of funds appropriated for other purposes to the wildland fire suppression account to pay for suppression costs. Numerous activities and projects designed to acquire and manage forest and grasslands, conduct research, or to help state or private landowners manage their lands are disrupted or completely forgone because of these transfers.

#### **2.4.1. General Assumptions**

The following assumptions are general and applicable for all of the listed Business Areas. This includes all types of airplanes and helicopters that are commercially available and appropriate for the region used. Additional assumptions are identified within each of the Business Areas, where appropriate.

#### **2.4.2. Forest Service Specific Assumptions**

- Standardized aviation personnel, equipment and operating procedures across Regions are necessary to meet the various interagency requirements and agreements as well as to maintain interoperability across regions.
- Aviation resources will be pre-positioned geographically to respond to areas with predicted high fire risk.
- The potential for agency downsizing and pending retirement of many Forest Service employees will influence the ability of the firefighting workforce to perform a key role in future aviation program delivery during peak fire periods as an additional and collateral duty.
- Technology in aviation, fire detection, communication and fire suppression is dynamic and continually evolving. This growth and constant improvement is expected to continue, providing operational efficiencies, safety, and benefits with real-time data.
- Aviation resources will be used in wildland fire suppression. These resources are costly and have inherent risks.
- New security requirements conforming to the Department of Homeland Security mandates are required for pilots, facilities and aircraft.

#### **2.4.3. Natural Resources and Climatic Assumptions**

- Each Forest Service Region varies in vegetation fuels, geographic, climatic, and fire potential conditions.
- Fire occurrences vary from year to year across Regions. There has been an increased upward trend in the last ten years. This upward trend is expected to continue.
- The biomass build up within forest ecosystems has increased availability of vegetation/fuels with fire potential.
- Acres of hazardous fuels treated both by mechanical methods and prescribed fire, have increased for the agency over the last several years. Support from aviation resources is necessary and will continue for prescribed fire treatments.

#### **2.4.4. Public and Political Assumptions**

- The public expects protection from wildland fire and smoke with minimal resource loss and environmental impact.
- Expect greater demands for aviation support of wildland firefighting due to the increase in wildland urban interface (WUI) protection and development in remote areas.
- The Forest Service will have formal Federal Emergency Management Agency (FEMA) tasking for operational support during declared national emergencies. This normally places increased demands on aviation resources.
- The states will seek aerial delivered suppression activities, training, and aviation inspection services from the Forest Service related to their forests and wildlands, many of which are in proximity or adjacent to the National Forests/Grasslands.
- Budgets are expected to remain constrained at current levels. Fire suppression costs have continued to escalate as fuels conditions and habitation patterns shift. Large fire suppression costs have received much attention from OMB, Congress and the agency. Cost containment continues to be a key factor in incident management.

#### **2.4.5. General Constraints**

The following general constraints are applicable for all areas of Forest Service aviation activities. Some of these constraints are addressed further within the individual Business Areas where appropriate.

- Wildland fire requires an immediate and appropriate response. Often, suppression of wildfire may include a containment objective within the first burning period after detection. Line Officers are responsible for considering the full range of appropriate management responses (AMR) and the necessary resources to implement the selected strategy to manage a wildland fire incident.
- Retirements of aged aircraft (Baron, PB4Ys, C-130A, DC4, 6 &7), has decreased the size of the government-owned (WCF) and contracted fleet. Decommissioning 19 agency-owned Barons in 2004 contributed significantly to this decrease.
- Through retirements and other personnel reductions, the Forest Service is losing aviation expertise needed to accomplish and manage firefighting operations.
- The hazardous environment of both aviation and firefighting poses a risk that challenges the prevention of incidents, accidents, and loss of life. Flying is performed in mountainous terrain and at low level altitudes with limited visibility from smoke. This area needs continual oversight and program management emphasis.
- There is an increasing and continuing requirement for Forest Service aviation to respond to “all hazard” incidents in support of other agencies (FEMA, etc.) that, at times can limit the capability to respond to fire missions and be costly to the Forest Service. These costs are often not reimbursed and must be absorbed by the Forest Service agency budget.
- Currently the Forest Service is a signatory to the DOI exemption to the Department of Transportation (DOT) requirements for the aviation transport of hazardous materials i.e., saw gas, fireline explosives, propane, plastic spheres with incendiaries. Current pilot contractors for the Forest Service are also granted this exemption.
- Each pilot has the requirement to maintain normal airspace control, communications, and cloud and visual obstruction clearance while performing a fire mission and communicating with ground personnel.
- There are significant interagency coordination/interfaces between the Forest Service, DOI agencies, and states that are performed at the National, Regional and Administrative Unit levels.
- The use of fire suppression assets requires coordinating priorities with interagency partners.

- Regulations and agency policy set duty limitations on personnel used to fight fires. This can have an impact on the number of firefighters and aviation personnel available during peak fire periods.
- During periods of extended fire activity, additional funding becomes available after budgeted funds are expended. This additional funding is acquired by transferring funds from other Forest Service programs and by special emergency appropriations passed by Congress.
- Public Law –106-181 requires the USFS to retain operational control of all aircraft performing Agency missions.

#### **2.4.6. Stakeholders**

Decisions resulting from this assessment may impact Forest Service employees, other agencies, government entities, and the general public. Forest Service programs are influenced by joint agreements with stakeholders. Fires do not conform to geographical, political, or ownership boundaries. Therefore, it is essential that all agencies with firefighting capabilities work together.

Fire incidents are controlled by the responsible agencies on the ground and through coordination and direction from the National Interagency Fire Center in Boise, Idaho. Actions or decisions made by the Forest Service Fire and Aviation Management organization have the potential to impact stakeholders. These stakeholders include:

##### **2.4.6.1. US Department of the Interior (DOI)**

This entity has major wildfire suppression responsibilities similar to the Forest Service. Each DOI organization is a major stakeholder in the use of aviation resources for firefighting and they work in concert with the Forest Service on wildland fire control. Aviation Management Directorate (AMD) is the key staff element of DOI and works with the Forest Service on wildland fire control. DOI organizations are:

- ◇ Bureau of Land Management
- ◇ US Fish and Wildlife Service
- ◇ Bureau of Indian Affairs
- ◇ National Park Service

##### **2.4.6.2. Cooperative States**

In the mutual interest of wildland fire control, these states work with various stakeholders within their states and interact regionally and nationally with their interagency partners. They use many of the same contracted aviation assets and contractors that are used by the Forest Service. State organizations include:

- ◇ Local Fire Chiefs, Supervisors, Managers
- ◇ National Guard
- ◇ Committees – Northeastern Area State Aviation, Southern Group of State Foresters, Aviation Committee, and Western Area State Aviation Committee (all fifty states)
- ◇ Western Governors Association
- ◇ National Association of State Foresters

##### **2.4.7. Stakeholders Sharing Responsibilities and Assets**

- International – Canada, Mexico, Australia, and New Zealand
- Fire Compacts (shared resources)
- Fire Mutual Aid Agreements between the Forest Service and other wildland firefighting organizations

#### **2.4.8. Other Stakeholders Indirectly Impacted by the Decisions and Future of the Forest Service's Aviation Activities**

- Local Governments
- Tribal Governments
- Fish and Game commissions
- Aviation Industry including contractors
- Timber protection associations (private partners)

#### **2.4.9. Other Federal Agency Stakeholders with the Forest Service in Aviation Activities**

- Department of Defense (DoD – Aircraft support, MAFFS (airtankers), active uniformed military services, National Guard and Reserve components)
- Federal Aviation Administration
- Department of Homeland Security
- Federal Emergency Management Agency
- Transportation Security Agency

#### **2.4.10. Educational, Research, and Organization Activities Stakeholders**

- Academia (Fire management instruction and special related degree programs)
- United States Agency for International Development (USAID)
- Forest Service Research Stations
- National Fire Protection Association (NFPA)

#### **2.4.11. General Public**

The general public is a major stakeholder with the Forest Service. They utilize forests and grasslands for recreation and are property owners adjacent to or surrounded by National Forests/Grasslands.

#### **2.4.12. Protection Offset Agreements**

There are numerous protection exchanges and contracts in all regions.

#### **2.4.13. Reimbursement from Customers**

The aviation services provided by the Forest Service to some customers are reimbursable and negotiated under various agreements. The primary customers providing reimbursement are DOI, DoD, states, tribal governments, and research and academia.

##### **2.4.13.1. Reimbursement to Others from Fire and Aviation Management**

The Forest Service reimburses international cooperators, states, military, and other agencies for aviation services provided. The Air Force is a major provider of additional fire suppression resources on a reimbursable basis.

#### **2.4.14. Training and Expertise to Others**

The Forest Service provides training to other agencies, states, local fire departments, and foreign countries through national and regional training programs. Training is provided for smokejumpers, helitack crews, rappel crews, pilots, and aircraft support personnel.

## 2.5. “As-Is” Assessment

The “As-Is” assessment summarizes all of the Business Areas within the scope of Forest Service aviation activities and describes the current operations. Aviation activities within the Forest Service are currently spread throughout the Regions with policy and oversight performed at the National level.

### 2.5.1. Organizational Structure

The Forest Service organization is composed of a National Office, nine Regions, and one Area as displayed in Appendix D - Forest Service Regions. Six of the Regions are located in the Western United States where the majority of lands under National Forest/Grassland management are located. A depiction of the overall organization with the aviation activities is shown at Appendix E - Organization Descriptions. Forest Service Regions do not coincide with the regional and state alignment of DOI Bureaus.

#### 2.5.1.1. National

Personnel located in the Washington, DC headquarters office (WO) and in Boise, ID by detached WO employees perform national policy development and oversight of aviation activities. Personnel in the WO provide policy and response to senior Forest Service leadership on aviation issues while the Boise personnel provide operational leadership and guidance on aviation activities including interagency coordination.

- **The Assistant Director, Aviation** is responsible to the Director of Fire and Aviation Management for national aviation program administration. Some of the responsibilities for leadership and management of the Forest Service aviation program may be delegated to the National Aviation Operations Officer for Operations (NAOO-O) and the National Aviation Operations Officer for Airworthiness and Logistics (NAOO-A&L). This includes coordination of aviation activities and aviation security policies and procedures with other staffs, agencies, and groups.
- **The National Aviation Operations Officer for Operations** is responsible to the Assistant Director, Aviation for the management and supervision of the aviation operations staff at the National Interagency Fire Center (NIFC). The NAOO-O has the responsibility to:
  - Ensure national program leadership, coordination, oversight, technical expertise and support for national aviation operations.
  - Assist the Regions with technical support, coordination, and oversight to ensure standardization within aviation training and operational requirements.
  - Provide leadership and coordinate interagency cooperation to ensure compatible and standardized aviation operations.
- **National Aviation Operations Officer for Airworthiness and Logistics** is responsible to the Assistant Director, Aviation for the management and supervision of airworthiness and logistics and is located at the National Interagency Fire Center (NIFC). The NAOO-A&L has the responsibility to:
  - Ensure national program leadership, coordination, oversight, technical expertise, and support for the national aviation airworthiness and logistics programs and directly supervise the Aviation Technical Specialist located at NIFC.
  - Assist the Regions with technical support, coordination, and oversight to ensure standardization within the national aircraft fleet requirements.
  - Provide leadership and coordinate interagency cooperation to ensure compatible and standardized aviation airworthiness and logistics.

### 2.5.1.2. Regional

Each of the Regional or Area aviation activities operates under the line authorities and budgets within that region, reporting to the Regional Forester or Station Director. Each Region or Area is required by Forest Service Manual (FSM) 5700 to have a Regional or Area Aviation Officer responsible for planning, organizing, and directing all aviation activities within that unit. They provide the administrative staff control and aviation management and services to the subordinate units within the region or area. The responsibilities include:

- Ensuring that Regional/Area/Station and Forest/Grassland aviation or related plans are supplemented and updated annually to ensure compliance with the current directives, FSM 5700 and the National Aviation Management Plan.
- Reviewing and approving Aviation Project Plans and Unit Aviation Plans, including cost comparisons and Job Hazard Analysis'.
- Ensuring compliance with aviation management and safety policies and procedures.
- Conducting safety evaluations of aviation operations.
- Coordinating with the Regional Aviation Safety Manager on aviation safety and accident prevention programs.
- Maintaining coordination with Administrative Unit Aviation Officers on aviation matters.
- Assisting with National aviation program efforts.

### 2.5.2. Lines of Communication and Authorities

**Administrative Activities During Non-fire Periods** - During non-fire periods Regional aviation personnel report to Fire and Aviation Management at the Regional level with technical and policy support from the National Fire and Aviation Management. See also Appendix E - Organization Descriptions.

**Fire Incident Communications** - When a fire incident occurs, the local incident commander takes command of the incident including the aviation assets assigned to the incident. See also, Appendix E-5 – Incident Command and Communication Organization – During a Fire.

### 2.5.3. Policy

The Aviation Program Management Business Area is responsible for the development and administration of Forest Service policy contained in FSM 5700 – Aviation Management as described in Paragraph 8.2 and Paragraph 8.9.

### 2.5.4. Personnel Staffing

A summary of Forest Service personnel involved with aviation activities by Region is displayed in the table on the following page. A further breakdown is included at Appendix F - Government Personnel Summary by Region.

- **Government Personnel – Permanent** - Positions for which there is work required all year are full-time. Employees are available for assignments that may require them to work beyond the normally scheduled hours and beyond regularly scheduled workdays. Permanent personnel at the field level of the smokejumper, helitack, and suppression areas are those that manage and maintain the various bases, facilities, and equipment during the year. A work year is normally 262 days but this review uses the OPM standard of 1776 productive hours for all analyses.

- **Government Personnel – Permanent Seasonal** - Permanent Seasonal employees are continually on the Forest Service roles, maintain career status, and receive regular benefits. These employees are employed to work the minimum number of pay periods specified for their positions but may be extended to assist with Forest Service natural resource missions. This accounts for a large number of employees during the fire season both as firefighters and as support personnel to the firefighting mission. This group includes a majority of the smokejumper and helitack firefighters that have completed the extensive training and must receive refresher training each year.
- **Government Personnel –Temporary** - A temporary employee works between 16 and 40 hours each week on a prearranged schedule but does not have career status. Temporary employee appointments do not exceed one year. These employees are hired during each fire season to meet the fire mission needs.
- **Government Personnel – Permanent (only part-time aviation activities)** - There are a large number of full-time employees with the Forest Service who have assigned positions for the majority of the year but also perform duties within the scope of this assessment during fire season. Many of these personnel devote a small amount of their total time to aviation activities but are an integral part of the mission fulfillment.

An initial data call identified 3,557 positions that performed activities within the scope of this assessment. This total included 2,394 permanent or temporary personnel and 1,163 designated Militia personnel. The Militia is a large number of Forest Service personnel who have multiple responsibilities and are trained and available to respond to wildland fires. They are available for both firefighting and support anywhere in the National Forests/Grasslands and maintain their qualifications when required. The review team evaluated the responses and determined that 512 of the permanent and temporary positions should be reclassified to Militia because of the small percentage of time devoted to aviation activities and position titles not relevant to aviation. Militia positions are outside the scope of this assessment but their workload devoted to aviation activities is included.

The following table reflects the revised total number (1,882) of non-militia personnel within this Management Efficiency Assessment and their breakdown by appointment type and location. The number of FTEs is fewer than the number of positions because many personnel perform other duties in addition to aviation activities, and others (Seasonal and Temporary) only work a part of the year. For example, contracting personnel may only devote 5 to 20 percent of their time towards work contained in this review and Smokejumper personnel only work during the fire seasons. Additional information is available in Appendix F - Government Personnel Summary by Region.

Region	Permanent and Permanent Seasonal			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	257	156.7	19	116	43.2	16
R-2	24	20.6	7	0	0.0	0
R-3	54	46.7	17	72	22.2	12
R-4	275	185.6	20	123	49.0	21
R-5	350	280.3	35	0	0.0	0
R-6	300	165.7	20	167	54.1	15
R-8	47	31.0	14	10	3.5	1
R-9	31	28.5	14	13	5.8	4
R-10	28	24.7	6	0	0.0	0
WOE	4	4.0	1	0	0.0	0
WOW	11	11.0	1	0	0.0	0
<b>TOTAL</b>	<b>1381</b>	<b>954.8</b>	<b>154</b>	<b>501</b>	<b>177.7</b>	<b>69</b>

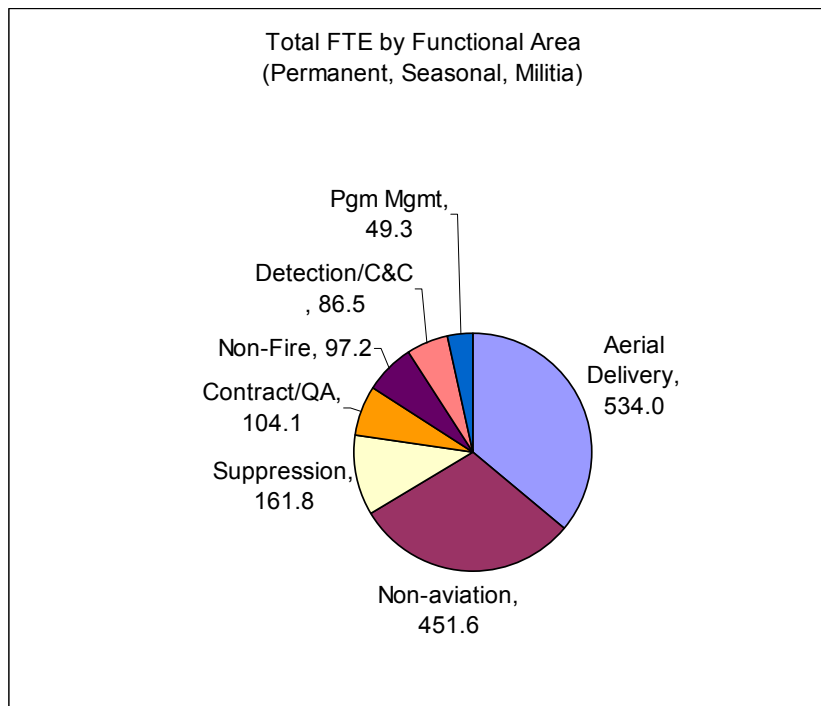
*\* Non-aviation percentage represents collateral duties assigned to personnel in addition to their aviation function.*



The Management Efficiency Assessment reviewed the duties and responsibilities of 1,882 total non-militia positions. The 1,381 permanent positions are spread out among 154 locations within the Forest Service. The 501 temporary personnel are spread out among 69 locations. A large number of these positions have duties in more than one aviation business area. The number of positions and full-time equivalents for each of the business areas is identified in the respective area so the numbers are not additive.

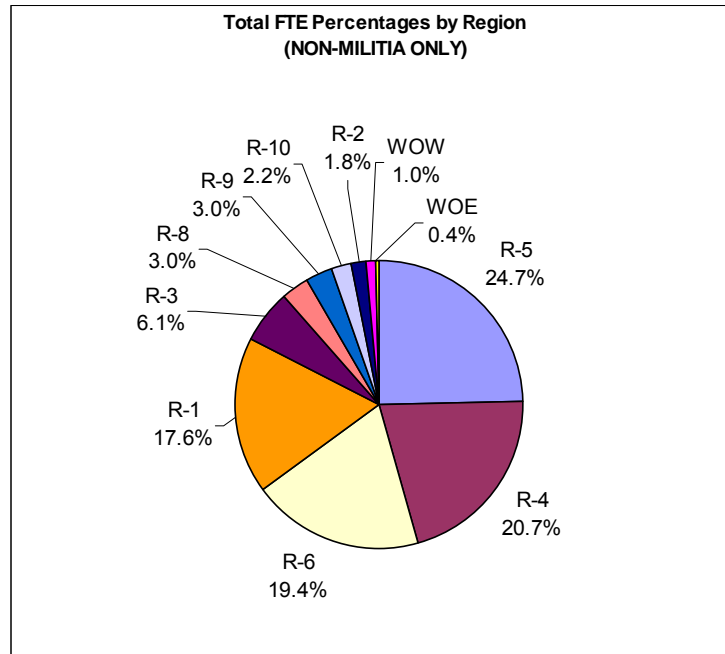
The 1,882 non-militia positions equate to 1,133 FTE. The regions allocated a percentage of time for each of the positions to the various business areas, based upon work performed by the position. For seasonal full-time positions, the percentages were applied to the fractional FTE that the seasonal employee works. For example, an individual's time may be divided 60 percent to aerial suppression, 30 percent to contract quality assurance, and 10 percent to program management. Only the helitack and smokejumper firefighters are devoted exclusively to their Business Area, the largest in this assessment. Since many individuals assigned to aviation related duties also have non-aviation duties, their non-aviation time is outside the scope of this assessment. A summation of the FTEs by the six functional areas and the amount of non-aviation FTEs is displayed in the following chart.

**Total FTE by Functional Area – (Permanent, Seasonal, Militia)**



The following Chart displays the percentage of Full Time Equivalent non-militia personnel within the scope of this assessment by unit, including both permanent and temporary personnel.

**Total FTE Percentage by FS Unit – Non-Militia Only**



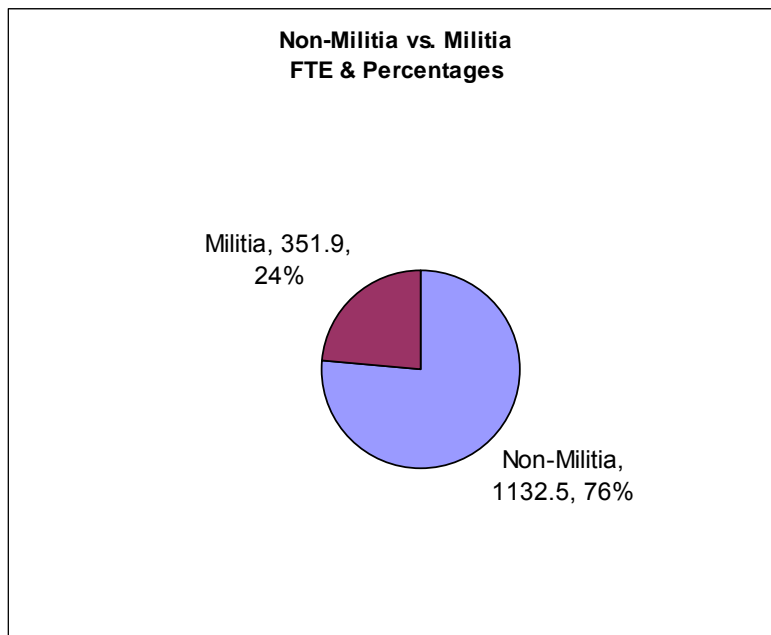
Militia personnel were identified through the course of the review. This amounted to the initial 1,163 Militia identified by the Regions and the 512 personnel reclassified by the review team. As a general business rule, the data from the Regions was evaluated and if the position contained 50 percent or greater work in non-aviation activities, they were considered Militia. Militia personnel may be permanent or temporary employees. If the primary position responsibility was aviation with major responsibilities outside of aviation, the position was considered part of the assessment.

An example of a permanent Militia is a Wildlife Biologist with 20 percent of their time devoted to three of the aviation Business Areas and 80 percent to non-aviation Forest Service duties. Other permanent Militia includes Aviation Dispatcher, Purchasing Agent, and Helicopter Managers.

An example of temporary Militia is an Air Tactical Group Supervisor (ATGS) assigned for 50 days with 15 percent of their time devoted to the Command and Control Business Area and 85 percent devoted to non-aviation Forest Service duties. Others include helicopter crewmembers, Airtanker Base Managers, and Fixed Wing Parking Tenders. The following table reflects the total FTE of Militia personnel that are participating in Aviation Activities.

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	494	27.25	15	13	0.91	7
R-2	107	10.05	1	107	9.10	1
R-3	209	19.25	12	37	7.90	12
R-4	31	21.50	5	18	6.68	4
R-5	5	5.00	3	78	38.15	10
R-6	65	39.62	13	27	4.45	5
R-8	336	52.05	13	6	0.96	3
R-9	79	76.62	11	61	31.52	5
R-10	2	0.90	2	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>1328</b>	<b>252.2</b>	<b>75</b>	<b>347</b>	<b>99.7</b>	<b>47</b>

The following chart reflects the percentage of Militia versus Non-Militia personnel performing aviation activities:



Contractor personnel are not considered in the staffing and are only accounted for in contract costs.

### 2.5.5. Certification Requirements

All pilots, whether government or contractor, must have the necessary Federal Aviation Administration pilot certifications for the category of aircraft that they are flying. Besides FAA certification, pilots are approved by the Forest Service for the flight missions they are performing. Smokejumpers, helitack crewmembers, and select other positions require respective qualifications for their positions to ensure performance capability and safety.

Contractor pilots are assigned by their respective company to fly the aircraft that are contracted by the Forest Service. The only exception is where contractor pilots operate the government-owned Firewatch Cobra helicopters in Region 5.

Government pilots perform duties in all of the Business Areas. This can include flying, inspection and approval of contract aircraft and personnel, training, and administrative duties. Pilots are assigned flight duties based upon workload requirements and their mission qualifications. The majority of these pilot positions are full-time employees. Additional specific information relative to pilots is contained in Appendix R – Pilot Positions. The 88 pilot positions identified in the Agency organizational chart span the Business Areas as shown in the table below. The “Number” column indicates how many of these 88 positions perform a portion of their duties in the specific business areas.

Business Area	All Pilots	
	Number	FTE
Aerial Delivery of Fire Fighters	53	15.50
Aerial Fire Detection and Command and Control	58	19.18
Aerial Fire Suppression	39*	10.78
Aviation Support to Non-fire Natural Resources & Fuel Management	67	10.14
Aviation Contract Management and Quality Assurance	75	14.45
Aviation Program Management	54	9.225
Non-aviation related Forestry duties	40	3.325
TOTAL FTE		82.60

\*This figure represents pilot duties other than flying in support of this Business Area.

## **2.5.6. Capital Resources – Government Owned Equipment and Facilities**

### **2.5.6.1. Aircraft**

The Forest Service owns 26 aircraft through the Working Capital Fund (WCF). See Appendix G –Aircraft for the aircraft summary. All Forest Service owned aircraft are maintained in accordance with applicable FAR 39, 43, and 91 or equivalent standard approved by the National Aviation Operations Officer for Airworthiness and Logistics (see FSH 5709.16.41.1).

### **2.5.6.2. Facilities**

The Forest Service maintains fixed bases for smokejumpers, helitack crew operation, and airtanker support, plus additional satellite facilities closer to the areas of operation during fire periods. These facilities are identified in Appendix I through K. Other aviation activities may operate out of transient facilities within each of the forest/grassland areas that they support.

### **2.5.6.3. Firefighting Support Equipment**

The Forest Service maintains a significant amount of equipment in support of aviation activities. This includes individual firefighting equipment for smokejumpers and helitack crews, storage, pumping and mixing equipment for airtanker bases, support vehicles, and the large MAFFS tank systems used on the Air Force C-130 aircraft.

## **2.5.7. Communications**

In accordance with the Incident Command System requirements, all personnel and aircraft must have communication capability when operating on a Forest Service or interagency incident. Aircraft communication capabilities are specified in each contract for aviation services.

## **2.5.8. Interaction with the National Interagency Fire Coordination Center**

National fire suppression resources are identified in FSM 5134.2 and the National Interagency Mobilization Guide. They include airtankers, MAFFS, ASM/leadplanes and pilots, smokejumpers, smokejumper aircraft and pilots, Type I and II helicopters other than regional initial attack resources, infrared aircraft and pilots, and large contract transport aircraft. All fire aviation activities not specified as national resources are the responsibility of the Regions to contract, approve, and manage as required by their individual fire management programs and needs. These needs are determined primarily through an interagency fire planning process known as Fire Program Analysis (FPA).

## **2.5.9. Current Contracts**

Approximately 96 percent of Forest Service aviation resources are contract aviation support. In 2005 there were contracts for aviation support valued at \$170.4 million. A summary of Forest Service contracts by Region is included at Appendix H – Forest Service Contracts.

### 2.5.9.1. Aircraft Contract Summary

Aircraft are contracted at the National, Regional, and Administrative Unit levels and include pilots, support personnel, and aircraft maintenance. A breakdown of contracts by Region is included at Appendix H-1 – Aircraft Contracts by Region.

Contracts for aircraft are used as described in each of the Business Areas. Contract administration and quality assurance of these contracts is described in Paragraph 7.1. Pilots and aircraft are evaluated annually for qualifications and airworthiness by specific Agency-qualified pilot and maintenance inspectors. Aircraft under contract are ordered through dispatchers and COTRs as required for a specific mission or fire incident. Performance of contract aircraft and pilots is evaluated by designated personnel in the field or on-site at a fire incident.

The following is a summary of the aircraft contracts:

Contract Level	Number of Vendors	Number of Aircraft	Cost (Million \$)
National	55	77	\$97,726,154
Regional	69	111	\$8,732,401
Administrative Unit	217	455	\$63,964,795
<b>TOTAL</b>	<b>342</b>	<b>643</b>	<b>\$170,423,350</b>

### 2.5.10. Other Contracts

The Forest Service contracts for facilities and facility maintenance services to support aviation activities. The data displayed below does not include those facilities used by aviation activities where the facility is shared with other elements of the Forest Service and the cost is covered in a separate cost pool.

Facility Type	Ownership	Number of Contracts	Contract Cost
Aircraft facilities	Forest Service Owned	12	\$182,982
Aviation Administrative Facilities	Forest Service Owned	24	\$573,599
Aircraft facilities	Rental or Lease	16	\$88,118
Aviation Administrative Facilities		19	\$283,091
Equipment (includes MAFFs)	Forest Service Owned	5	\$416,342

## 2.6. Impacts to Stakeholders

Any change to a particular Forest Service function from the “as-is” condition to a new organizational structure or methodology may have an impact to stakeholder operations. Recommendations from this review may generate efficiencies or improvements to the current operation. This assumes the same level of performance and quality as currently present will continue in a contracted function or a modified Forest Service function. However, any recommendation that potentially impacts one or more stakeholders should be further reviewed for potential mitigation prior to implementation.

## **2.7. “As-Is” Issues**

The following issues were identified either in this or previous studies of Forest Service aviation activities. These issues, which support the need for the recommendations and the topics discussed in each of the “Conceptual To-Be Assessments”, are further discussed in their respective Business Areas.

### **2.7.1. Funding**

- Fire and aviation costs must compete with other Forest Service programs for appropriated budget dollars.
- The Forest Service Strategic Plan for Fiscal Years 2004-08 calls for an increase in the initial attack success rate from 98 to 99 percent. This may require increased assets and efficiencies to meet the more demanding performance measure.

### **2.7.2. Aircraft**

- Aircraft for suppression requirements have not been specifically designed and built to support the specific needs. As a result, most aircraft are older and modified for the mission.
- Airworthiness compliance for aging aircraft will reduce aircraft availability because of a diminishing supply of repair parts and components.
- The Forest Service contracts for all helicopter resources with the exception of two Agency-owned Firewatch Cobras. The high cost of contract helicopter use indicates potential savings could be achieved by having a mix of government-owned and contracted Type II helicopters.
- Firewatch helicopters that are currently configured for ASM are not utilized as such because the pilots are currently not qualified in the ATP mission.

### **2.7.3. Personnel**

- During periods of high fire activity there has been limited availability of helicopter managers, especially when contracting for additional CWN aircraft.
- There is currently a shortage of ATGS qualified personnel because of retirements and minimal trainee development resulting in a shortage of ASM modules. ATGS has been identified in the Incident Qualification System as a shortage category position.
- Fixed wing pilot functions other than quality assurance were determined to be commercial. No market test has been performed to determine whether in-house or contracted pilots are more effective. Currently, the Forest Service uses both in-house and contracted pilots to perform these services.

### **2.7.4. Previous Studies**

The Aerial Delivery of Firefighters study (ADFF) completed in 1999 is deficient in the area of helicopter use, supporting bases, and new strategies. Available new technologies and performance capabilities warrant an update to support future decisions and funding allocations.

### **2.7.5. Training and Bases**

- The training of rappellers is not consistent throughout the Regions and is conducted in small groups at multiple locations. This is not an efficient or cost effective use of helicopters for this training.
- There are smokejumper and helitack bases that could be consolidated if higher performance aircraft were available for firefighter delivery. Airtanker bases, located to serve older, slower aircraft, could also be consolidated.
- ATGS personnel receive nonstandard training that varies among Regions.

### **2.7.6. Contracting**

- CWN contracts cost the government more than Exclusive Use contracts because there is no guaranteed use period for the contractors. The mix of the two must be managed efficiently because of the very high cost.
- Increased standardization and consistent interpretation of contract specifications language is important for contractors and other personnel operating across multiple Regions.

## **2.8. Conceptual “To-Be” Assessment**

The following paragraphs are excerpts from each of the Business Areas highlighting the variety of issues explored for recommendations during the review. The complete conceptual “To-Be” is located within each of the Business Areas.

### **2.8.1. Organization**

#### **2.8.1.1. Aerial Delivery of Firefighters**

Current smokejumper bases are dictated by current aircraft capability. Improved aircraft performance would allow for base consolidation which would produce operational efficiencies and greater flexibility for inter-regional operations. Improved training and standardization of helitack and rappel crews would provide efficiencies and greater interoperability among crews supporting different Regions.

#### **2.8.1.2. Aerial Fire Detection and Command and Control**

- National management of the ATGS/ASM program will promote more efficient mobilization of tactical aircraft and aerial supervision command and control resources.
- The Forest Service may benefit from exploring the use of emerging technologies, such as the C4ISR concept to improve coordination of operations for fire use. This may also aid line officers in accomplishing the appropriate management response.

#### **2.8.1.3. Aerial Fire Suppression (Airtanker and Large Helicopter)**

- The Wildland Fire Management Aerial Application Study recommended that airtanker bases be consolidated from 38 to 23. The WFMAA Study would result in the conversion of some bases to reload bases.
- The most cost effective method for contracting retardant is not currently being analyzed for each Forest Service airtanker base, to include personnel and material.
- Assigning dedicated Forest Service management to large helicopters used for suppression may maximize effectiveness and cost efficiency.



#### **2.8.1.4. Aerial Resource Support (Natural Resources and Fuel Management)**

- This area encompasses all special-use and administrative flights performed primarily with resources not engaged in wildland firefighting. These missions are critical to the accomplishment of natural resource management objectives on federal, state, and private lands.
- The establishment of Unit Aviation Officers as a collateral duty at Research Station Headquarters may provide technical assistance to manage the safety and security of aviation resources used in research programs.
- Sharing resources may allow state and federal employees on the same aircraft to incorporate data across agency boundaries.

#### **2.8.1.5. Aviation Contract Management and Quality Assurance**

- Quality assurance entails the inspection and operational oversight of contract aircraft and pilots to ensure they meet Agency requirements for safety and performance. All contracted aircraft will continue to be inspected for airworthiness and pilots checked for mission qualification.
- Many positions perform quality assurance as a minor part of their work responsibilities. To ensure standardization of pilots and maintenance personnel performing inspections, duties could be consolidated into fewer positions with greater quality assurance specialization.
- A significant number of personnel will perform the management and quality assurance of contracts (aircraft and other services) as an additional duty.

#### **2.8.1.6. Aviation Program Management**

- Aviation management was reviewed at all levels and greater standardization within core functions is proposed to improve quality, communication, and interoperability.
- Centralization of various management functions is proposed for improved standardization, balancing of resources, and greater capability in the regions utilizing pooled resources.

#### **2.8.1.7. Pilots**

The assessment documented that 88 pilots are within the scope of this review with most performing duties in multiple business areas. When working in multiple areas, pilots are utilized year-round. Seventy-five pilots devote a portion of their time to quality assurance. Consolidating quality assurance duties did not reduce the total number of pilots but the number of pilots performing quality assurance duties decreased from 75 to 41. This change may improve the effectiveness of the quality assurance pilots.

#### **2.8.1.8. Equipment**

Aerial Delivery of Firefighters Aircraft for the delivery of smokejumpers should be upgraded for efficiencies, improved performance, and ability to consolidate bases for total savings.

#### **2.8.1.9. Aerial Fire Detection and Command and Control**

- Utilize modern technology such as infrared and Firewatch to assist decision makers.
- Improved aircraft for the leadplane ASM role may result in improved performance, faster response to incidents, and the ability to relocate rapidly between regions.

#### **2.8.1.10. Aerial Fire Suppression (Airtanker and Large Helicopter)**

- Aerial delivery of retardants and suppressants utilizing large airtankers and helicopters will continue to be effective for wildland firefighting using. Refurbishment of three government-owned P3s may increase airtanker fleet capabilities.
- The Forest Service may benefit from validating the cost efficiency and effectiveness of military aircraft used for fire suppression, such as the MAFFS program.

#### **2.8.1.11. Aerial Resource Support (Natural Resources and Fuel Management)**

- A wide variety of aviation support will continue to be required for natural resource support in remote areas. This includes seeding, fertilizing, and pesticide/herbicide spraying to promote forest health.
- The new technology of Unmanned Aerial Vehicles (UAVs) is adaptable to the Forest Service mission of natural resource and fuels management surveillance.

#### **2.8.1.12. Aviation Contract Management and Quality Assurance – No Recommendations**

#### **2.8.1.13. Aviation Program Management – No Recommendations**

### **2.8.2. Communications**

#### **2.8.2.1. Implementation of Human Aiding Technology**

- Human aiding technology, including the Command Control Communication Computer/Intelligence Surveillance Reconnaissance concept (C4 ISR), may provide accurate and up-to-date information to firefighters, Incident Management Teams, and Geographic Multi-Agency Coordination Groups (MAC). The use of data links with real time intelligence may improve strategic and tactical planning for deployed crews.
- Human aiding technology may be implemented for resource orders, maps, radio frequencies, weather forecasting, Temporary Flight Restrictions, etc., for real time up link to and from aircraft. This would increase aviation efficiency. New technologies should be routinely evaluated to enhance aircraft efficiency.
- Satellite communication is available for command and control aircraft that may improve operations in the fire incident area, minimizing communication blackouts in remote and steep terrain areas.

#### **2.8.2.2. Implementation of the Automated Flight Following (AFF) System**

- The Automated Flight Following (AFF) system allows for aircraft tracking. Full national implementation of this system may lead to improved aircraft location information and flight tracking, and may result in utilization efficiencies and increased safety margins for crews.
- Automated Flight Following (AFF) technology currently being implemented provides operational efficiencies. AFF has been implemented in some Forest Service contracts and is recommended for future exclusive use aircraft. This would be applicable to all missions and not just non-fire missions.

### **2.8.3. Increased National Aviation Program Management**

Increased National oversight and management of aviation resources requires more integrated communication with Regional level program managers and an active role in the coordination of national aviation resources by all managers. Efficiencies available include:

#### **2.8.4. Acquisition of Improved Aircraft**

- Acquisition of improved aircraft could lead to consolidating smokejumper bases that may produce annual savings.
- Faster and newer aircraft equates to the need for fewer aircraft, reduced maintenance costs, improved availability rate, and potentially reduced accident rate.
- Newer aircraft operate more efficiently due to improved technology resulting in reduced operating costs and decreased use of fossil fuels.

#### **2.8.5. Real Time Information Gathering**

- Real time information will aid decision makers, allowing quicker response to a fire incident and potentially enabling faster containment and reduced cost.
- Real time information allows for more efficient and accurate exchange of data, information, and intelligence.
- Future integration of UAVs for fire detection, intelligence, and real time information could result in reduced risk and costs.

#### **2.8.6. Re-designations of Bases**

Efficiencies may be achieved by re-designating some large airtanker bases.

#### **2.8.7. Consolidation of Training**

- Consolidate helicopter rappel training to one location in each Region in order to promote standardization and efficiency.
- Standardized ASM training will reduce training costs.

#### **2.8.8. Improving the Mix of Aircraft and Type Contract**

- A reduction in Type I helicopter cost will be achieved by using exclusive use versus CWN contracts.
- The improved mix of aircraft types will create a more effective and efficient initial attack response to fires.
- The implementation of dedicated helicopter managers will reduce costs of Type I helicopters by closely monitoring the flight hours and availability of the contract helicopters. This would ensure payment is not made for periods of non-availability.
- The Chief's Blue Ribbon Panel Report recommends that purpose built airtankers be developed to provide several efficiencies including reduced maintenance costs, increased availability, longer service life span, and potentially safer aircraft.

#### **2.8.9. Aviation Contract Management and Quality Assurance**

Quality of contractor operations, government interests, government policy, and core training and qualification standards will be ensured through the retention of a core cadre of Forest Service quality assurance inspectors.

### **2.8.10. Increased National Program Management**

- A more active role by national program managers, in coordinating and allocating national shared resources, will achieve more efficient utilization resulting in cost savings.
- A more centralized management structure will improve coordination, scheduling, and operational assignment efficiency.
- Continue to engage in the development of a long-term interagency aviation strategy that will capitalize on acquisition, allocation and utilization efficiencies that can be applied across federal, state and local partners.
- Establish a standard core Regional aviation management structure that will consolidate all program management within the Regions to improve national coordination of aviation resources and response to national program direction.
- Efficiencies will be gained by having Forest Service quality assurance inspectors under the guidance and supervision of national program managers with standardized programs. The standard inspections, when applied in a consistent method nationwide, will produce a greater level of quality performance and add to the safety of aviation activities, therefore protecting life and property in field operations. Pooling of inspectors will allow more efficient field inspections and workload sharing.

### **2.9. Future Customers or Stakeholders**

The number of customers and/or stakeholders is expected to expand as private landowners, state governments, and other federal agencies, and conservation organizations, along with the general public become more active in forest health issues.

### **2.10. Future of the National Interagency Fire Center**

Improved communication assets utilizing the C4ISR concept would allow greater data exchange with the National Interagency Coordination Center (NICC) for improved decision making and asset prioritization.

### **2.11. Wildland/Urban Interface (WUI) Expansion**

Although private lands are not the responsibility of the Forest Service, there will be continued pressure to contain fires moving in the direction of private lands. Increased biomass buildup adjacent to communities at risk presents current and future challenges. With the increase in WUI, increased use of aviation assets will be required to assist in containment of fire incidents.

### **2.12. Civil Rights Impact Assessment**

A Civil Rights Impact Assessment (CRIA) is required to identify and categorize the civil rights impacts of implementing any realignment initiative that will potentially affect employees. A CRIA for Forest Service employees will be developed if the Fire Executive Council recommends changes to staffing as a result of follow on studies.

## 2.13. Systems

### 2.13.1. Financial Management

The Forest Service manages financial matters using a variety of systems that are important to the successful execution of the aviation activities. Systems are included below:

- PROP (Personal Property Management Information System)
- WCF (Working Capital Fund Accounting Database)
- PCMS (Purchase Card Management System)
- IAS (Integrated Acquisition System)
- EaTIS (Equipment and Training Inventory System)
- ROSS (Resource Order and Status System)
- NFC Inquiry System (National Finance Center)
- FFIS (Foundational Financial Information System)
- FS Travel (travel voucher creation and submission system)
- FedTraveler (web-based travel reservation system)
- Paycheck

### 2.13.2. Aviation Reporting

- All aircraft use is reported for financial management on Forest Service Form 6500-122 "Daily Flight Use Report." Contract aircraft availability, flight and other payment items; or WCF flight, FOR and other rates are entered and accumulated on these forms. This is the basis for payments to vendors and money transfers from Forest Service user accounts to the WCF.
- All aircraft hours flown and associated costs (including facilities), and aircraft use by certain categories of passengers must be summarized and reported. Reporting requirements and instructions are found in FSM 5700.
- Information reported on FS Forms 6500-122, is accumulated in an ADP system called Aviation Management Information System (AMIS). Reports from the AMIS database can generate useful management information. These summaries are of critical interest to aviation managers for determining historical costs and use trends. AMIS data from Fiscal Year 1993 to the most current reports submitted is available from the National Information Technology Center in Kansas City, at <http://famweb.usda.gov>.
- Office of Management and Budget Circular A-126 requires federal agencies to report aircraft use by certain categories of passengers, notably Senior Government officials and non-government employees, to GSA. Justifications for flights involving these classes of passengers must be included in the reports; Federal Property Management Regulation 101-37 provides further direction.
- Federal Aviation Interactive Reporting System (FAIRS) is the General Services Administration (GSA) database that collects all federal aircraft use and inventory through a web based application. AMIS data is used to fulfill this reporting requirement. Reporting is required on a quarterly basis. Aircraft inventory changes are reported through the Washington Office.
- Regional and Washington Office WCF managers produce periodic Working Capital Fund summary reports of aircraft costs and earnings. Aviation managers use these to track costs and trends, plan aircraft use, and develop new FOR and flight rates and other purposes.
- Aviation Mishap and Hazard Reports are submitted on an Internet database reporting system (SafeCom) that covers aviation related accidents, incidents, and hazards is in place and is covered in the Aviation Safety section of this plan.

## **2.14. Additional Systems Utilized within Forest Service Aviation Activities**

- IWEB (a web-enabled suite of applications for various business areas)
- AgLearn (a web-based training system)
- IBM Network (electronic records)
- FS Lotus Notes (agency email system)
- CAHIS (Computer Aided Hazard Identification System)

## **2.15. Recommendations**

Each of the Business Areas was analyzed and recommendations developed based upon the issues identified and cost analysis within the Business Area. Several recommendations were identified in the course of the review that crossed Business Areas and are only identified in this section. The following is a consolidation of all the recommendations. Additional information is available in the respective Business Area.

### **2.15.1. Short-term Recommendations & Efficiencies**

Utilize the Exhibit 300 process to evaluate the cost effectiveness of owning versus leasing aircraft to be used in support of Agency missions as identified throughout the Business Areas.

#### **2.15.1.1. Aerial Delivery of Firefighters**

- Update the Aerial Delivery of Firefighters Study (ADFF) to evaluate and recommend the best mix of helicopter delivered versus airplane delivered firefighters. The study should include an analysis of the optimal locations for staging aircraft and crews based upon improved helicopter capabilities.
- Consolidate helicopter rappel training to one location in each Region in order to promote standardization and efficiency.

#### **2.15.1.2. Aerial Detection and Command and Control**

- See also the Business Area recommendations.
- Explore WCF for the various funding mechanisms to assist with the acquisition of replacement command and control aircraft.
- Explore Agency-owned, lease-to-own, and contract options from the OMB Exhibit -300 business case study/analysis for aviation assets with the various funding mechanisms and authorization to assist with the replacement of leadplane/ASM aircraft.
- Evaluate the potential of contracting for multiple ATGS platforms utilizing a single national contract similar to the national helicopter contracts. These platforms would consist of an aircraft and pilot. The Agency will provide the ATGS.
- Validate the efficacy of the IR Program with the primary customers, including Incident Management Teams, Line Officers, and Natural Resource Specialists. Also evaluate the adequacy of the technology being used to assist decision makers.
- Evaluate Firewatch program expansion for other Agency programs, such as law enforcement. Consider sharing Firewatch resources among Regions and the interagency community for large fire support and other Agency natural resource missions.
- Qualify Firewatch pilots at ATP level in order to be able to fulfill the ASM missions.

### **2.15.1.3. Aerial Fire Suppression – Airtanker and Helitanker**

- See also the Business Area recommendations.
- Develop a value analysis for use by each airtanker base to determine the best method of contracting for retardant, i.e. either full service or bulk. This analysis should also take into consideration the most effective and cost efficient type of retardant to be used at each base (i.e. powder, liquid).
- Provide funding allocation within constrained preparedness and suppression budgets for dedicated helicopter managers for the 16 exclusive use helitanker and Type I bucketed helicopters to maximize the efficiency of large helicopter usage. Forest Service management should be assigned to them on a 7-day basis when the helicopters are activated.
- Explore alternative preparedness cost sharing strategies for the annual costs associated with aviation resources (airtankers and MAFFS).
- If cost sharing alternatives are not available for the MAFFS program, evaluate alternative resources available for delivery of fire suppressants and retardants.
- Utilize the Exhibit 300 study process to determine the appropriate number and mix of large airtankers and helitankers for long-term Agency use. This process is currently being used to determine the number of airtankers.
- Until the Exhibit 300 is completed, maintain the large airtanker fleet at the current number of 19 and continue with the ongoing effort to refurbish three government-owned P3s.
- Based on the Wildland Fire Management Aerial Application Study, evaluate the recommendation to consolidate airtanker bases from 38 down to 23. Eleven bases should be converted to reload bases and four bases closed.

### **2.15.1.4. Aerial Resource Support (Natural Resources and Fuel Management)**

- See also the Business Area recommendations at Paragraph 6.26.1.
- The Forest Service should continue moving toward standardized and Indefinite Delivery Indefinite Quantity (IDIQ) contracts.
- The Forest Service should increase the use of End Product contracts for greater cost containment and to shift agency liability to contracted work. The emphasis should support continuation of Forest Service End Product contracts where appropriate.
- Establish Unit Aviation Officers (UAO) as collateral duty positions in each Research Station to provide supervision and oversight regarding the aviation resources and operations of aircraft use within research projects.
- Increase Aviation Contract Management and Quality Assurance oversight.
- Increase the contract length for select aircraft contracts.
- Optimize the mix of Exclusive Use and CWN Contracts to minimize total costs (preparedness and suppression combined).
- Maintain a minimum core cadre of 59 agency personnel (24.06 FTE) for quality assurance of pilots and aircraft contracts that should be organized to work under the guidance of their respective national program standardization officer.

#### **2.15.1.5. Aviation Program Management**

- Continue to participate in the ongoing effort to develop interagency strategy and align operational policies.
- Utilize National Shared Resources more efficiently by establishing two specific resource coordinator roles (helicopter and fixed-wing) to work with the National Interagency Coordination Center during fire season.
- Create a more centralized management structure through realignment of supervisory functions and program administration to improve coordination, scheduling, and operational efficiency.

#### **2.15.2. Long-term Recommendations**

The following recommendations would require not only further analysis but redirected or additional appropriated resources.

##### **2.15.2.1. Aerial Delivery of Firefighters**

- Develop a strategic plan for a phased replacement of the smokejumper aircraft in accordance with the Exhibit 300 process. Recommend that the Forest Service replace the current fleet with pressurized aircraft that have increased smokejumper and cargo capacity along with greater range capability.
- Develop a strategic plan to determine the best acquisition method for helitack aircraft in accordance with the Exhibit 300 process.

##### **2.15.2.2. Aerial Detection and Command and Control**

- See also the Business Area recommendations.
- Recommend the development of long-term funding and implementation strategy for aviation training and ASM development. Consider changing the existing Forest Service approach to initial ground training for leadplane pilots and geographic area training of ATGS candidates. An example could be a National Aerial Supervision Academy, that includes all command and control aviation resource training. This would consolidate leadplane pilot training and ATGS training into an interagency aerial supervision academy, and could include command and control resources, interagency flight training, S-378, professional flight simulator training and Crew Resource Management.

##### **2.15.2.3. Aerial Fire Suppression – Airtanker and Helitanker**

No recommendations.

##### **2.15.2.4. Aerial Resource Support (Natural Resources and Fuel Management)**

Recommend that research be completed on the feasibility of utilizing Unmanned Aerial Vehicles (UAVs) for data collection.

##### **2.15.2.5. Aviation Contract Management and Quality Assurance**

Aviation contracts should be reviewed in greater detail for conformance with the new performance-based contract criteria and to improve the balance between Government and contractor risk. This has the potential of reduced contract costs.

##### **2.15.2.6. Aviation Program Management**

In the longer term further explore the possibility of centralizing aviation management certain Regional aviation management roles into geographic hubs. National aviation management staff will be responsible for overall program management.



### **2.15.3. General Recommendations**

The Following recommendations are general in nature and cross each of the Business Areas.

Conduct a program review of the Helicopter Inspector Pilot rotor pilots and supporting platforms.

#### **2.15.3.1. Aerial Delivery of Firefighters**

Helitack Crew and Smokejumper activities were excluded as future assessments will address those activities.

#### **2.15.3.2. Aerial Detection and Command and Control**

See also the Business Area recommendations.

### **3. Business Area A – Aerial Delivery of Firefighters and Support**

#### **3.1. Business Needs Assessment**

##### **Forest Service Goals**

This Business Area supports the Forest Service Strategic Goals identified in Paragraph 2.1.1. Specifically, Aerial Delivery of Firefighters (ADFF) and Support expeditiously delivers smokejumpers and helitack crews to perform initial and extended attack to contain forest/wildland fires, thereby reducing the risk from catastrophic wildland fire.

#### **3.2. Business Area Mission Fulfillment**

This business area includes the personnel who provide initial attack to wildland fires through firefighters aerially delivered to the fire. This area provides qualified smokejumpers and helitack firefighters along with the necessary direct support (aircraft, equipment, facilities and contracts) to those personnel to contain a fire and prevent the fire spread. This includes the time spent in preparation for a fire, actual firefighting, recovery from the fire, care of equipment, training associated with the firefighting and methods of deployment. It also includes all smokejumper and helitack crew personnel, pilots and crewmembers for aircraft (fixed wing and helicopter) used in deploying and supporting firefighters with aviation resources. Helicopters and paracargo drops may also be used to support ground firefighters with the supply of materials and equipment in remote areas or in emergency conditions. This Business Area includes Type II and Type III helicopters using water buckets for suppression in direct support of helitack crews following the delivery of the crews. Individuals directly associated with and supervising the smokejumper and helitack mission are also included as are Government personnel managing, maintaining, and operating the smokejumper and helitack bases, storage facilities, and associated firefighting equipment.

In order to perform the firefighting mission with the Aerial Delivery of Firefighters, the primary firefighters, both smokejumpers and helitack crews, are transported to the scene of a fire by aircraft. Smokejumpers are transported via airplanes either Government owned (WCF) or by contract aircraft, from which they parachute out into an area within the immediate proximity of the fire. Helitack crews are transported by contract helicopters that either land in the closest open clearing or rappel from the helicopter close to the fire area.

The Forest Service has seven smokejumper bases from which they operate plus an additional five satellite bases operated on an as needed basis that are closer to areas of high fire probability. Permanent bases have combinations of: barracks, ready rooms, offices, warehouse space for equipment storage, specialized sewing and manufacturing rooms, parachute drying/repair and packing/rigging facilities. Each Forest Service Region hosting smokejumpers has one base designated for recurrent and new smokejumper training. Specialized permanent jump towers and practice/ simulation units are located at each of these facilities. Satellite jump bases are located at airports suitable for the assigned aircraft but have few facilities. Hanger and ramp space are often rented on a short term basis from the local fixed base operator (FBO). Helitack crews operate from Forest Service helitack bases where they train, prepare for fire missions and maintain all of their equipment. Besides the base facilities, and their assigned contract helicopters, there is a significant amount of ground support equipment including vehicles and communication equipment. Since most wildland fire activities are conducted in an interagency environment, it is not unusual for other federal, state and local jurisdictions to be jointly involved in aviation operations. The DOI also has smokejumper and helitack bases and satellites from which DOI firefighting personnel operate. The Forest Service will base its personnel at these locations during severe fire situations. Due to different parachute canopies (round / square) utilized by the DOI/BLM and the USFS, the facilities needed to inspect, dry, and repack Forest Service parachutes are not available at DOI/BLM locations. The Forest Service compensates by bringing extra parachute assemblies. DOI/BLM jumpers also operate out of Forest Service locations and it is common practice to utilize the aircraft assigned to that particular jump base.

Parachute systems used on an aircraft may be different and “mixed loads” are considered standard operating procedure.

International agreements with Canadian Provinces provide for the utilization of smokejumpers, helitack crews and rappel crews across boundaries.

### **3.3. Justification for Business Area**

- The Forest Service need for aerial delivered firefighters exists because of inaccessibility and remoteness of many wildland fire locations. The nature of fire, geographic location, fuels conditions, and climatic conditions dictate that a rapid response is necessary to prevent the spread of fire to minimize loss of life and property and large fire suppression operations costs. Rapid response may minimize the size/growth of the fire, which also minimizes extended exposure of firefighters to the high risks to wildland firefighters and increases cost effectiveness.
- Smokejumpers can be deployed rapidly to inaccessible areas over long distances by means of fixed-wing aircraft. Fixed-wing aircraft have greater range and payload than helicopters and provide for delivery of a larger firefighting force during multiple ignition scenarios.
- The Helitack/Rappel Program provides the ability to insert firefighters in close proximity to a fire using small landing zones or rappel into small areas from the helicopter hovering over the trees.
- Following a helitack insertion, helicopters can be used for other purposes on the fire incident area, e.g. resupply, bucket drop, medical evacuation, or extraction of personnel, reconnaissance, aerial ignition, and command and control functions such as air attack.

### **3.4. Assumptions and Constraints**

The following assumptions and constraints are an expansion to those stated in Paragraph 2.3.

#### **3.4.1. Assumptions**

- Wildland fires are ultimately contained and controlled by ground firefighters. Aerial delivery either by helicopter or by parachute is a method of placing firefighters on the incident and is critical to overall success of initial attack operations.
- Over the last decade the Forest Service has closed hundreds of miles of roads increasing the reliance on aerial delivered firefighters for initial attack of wildfires.
- Experience and previous studies have shown that aviation resources enhance and complement the ability of ground forces to contain a fire and prevent or reduce its spread. This combination increases the production capability of the assigned resources or allows them to operate safer and more efficiently.
- The nature of a fire, geographic location, time of year, fuels conditions, and climatic conditions dictate that a variety of initial attack resources are available for the appropriate response for initial attack. Quick initial attack and containment of new fires minimizes extended exposure of firefighters to the high risks of wildland firefighting.
- Aerial resources will provide for the rapid relocation of ground personnel to support high priority incidents and when necessary, the safe evacuation of personnel due to a medical emergency or withdrawal.

### **3.4.2. Constraints**

- Smokejumpers require a drop zone of sufficient space to provide safe landing with parachute delivery. Weather and environmental conditions dictate when smokejumpers are deployed.
- Smokejumpers are deployed in groups of two to four requiring separation between each group. This requires the aircraft to circle several times to put the smokejumpers onto the correct landing site. It generally takes longer to deploy smokejumpers than helitack/rappellers once either asset is over the deployment site.
- Aircraft are constrained by the distance they can travel (refueling) and flight crew are constrained by the number of hours that they can be utilized (policy requirements). Aircraft may also need to return to a base to pick up additional smokejumpers.
- Extraction of smokejumpers and rappellers following fire containment has to be performed by either land vehicle or helicopter.
- The Forest Service has reciprocal agreements with Canada to assist one another with Smokejumpers and Rappel Crews on wildland fires within border proximity and as needed for other support. Border Agreements are also in place for helitack and other firefighting personnel to cross borders using ground transportation.

### **3.5. Current “As-Is” Assessment**

#### **3.5.1. Basic Facts of Aerial Delivery of Firefighters and Support**

Aerial Delivered Firefighter operations revolve around the following basic concepts of their operation:

- The Aerial Delivered Firefighter program provides the combination of speed, range, and capability to rapidly deliver wildland firefighting resources and logistical support throughout the Forest Service Regions across the nation. Firefighters can be deployed by parachute, helicopter landing in small clearings or rappel insertions based upon local conditions.
- Aerial Delivered Firefighters maintain the skills and capacity to address fire response needs from small wildland fire incidents to full fire suppression activities. The program yields capacity to provide initial attack resources, appropriate management organizations for emerging incidents (ICS positions), plus deliver the optimum crew size based upon the fire control requirements. Use of optimum crew size and rapid transportation capability, is critical for suppression success during fire episodes which results in earlier containment and fewer escapes.
- Aerial Delivered Firefighters provide a workforce capability to support the full range of fire and fuels management (covered elsewhere) needs as well as a broad range of resource management support. These include but are not limited to: all hazard emergency management, prescribed fire implementation, mechanical fuels reduction, fuels treatment planning and design, cartographic and computer data support, dispatch coordination center support, training instruction and coordination, equipment research and design, technology transfer, certified tree climbers, sawyers, and general labor to support a variety of resource management work.

### 3.5.2. Smokejumper Strengths

- Smokejumpers can be deployed to incidents in groups of two or more personnel and have the capability to operate independently once on the ground to fight a fire. When deployed, they are self contained and require minimal additional logistical support for the first 48 hours. They can be re-supplied by airdrop of cargo when required.
- Smokejumpers can be deployed rapidly to inaccessible areas over long distances using the smokejumper aircraft. Fixed wing aircraft have greater range and payload than helicopters.
- Larger airplanes provide for delivery of a larger firefighting force and accompanying equipment and allow for the support of multiple fires.

### 3.5.3. Helitack/Rappel Strengths

- Once on site, the helicopters can be used for other purposes, e.g. resupply, bucket water drop, medical evacuation, or extraction of endangered personnel, reconnaissance, aerial ignition, and command and control functions such as air attack.
- Firefighters can be inserted in close proximity to a fire using small landing zones or inserted by the helicopter hovering over the trees and allowing the firefighter to rappel into a small area.
- Helitack crews have the capability to operate independently once on the ground. They can be organized in squads of two or up to a large crew size depending on fire complexity.
- With larger capacity helicopters, multiple fires or perimeter locations can be supported with helitack crews.

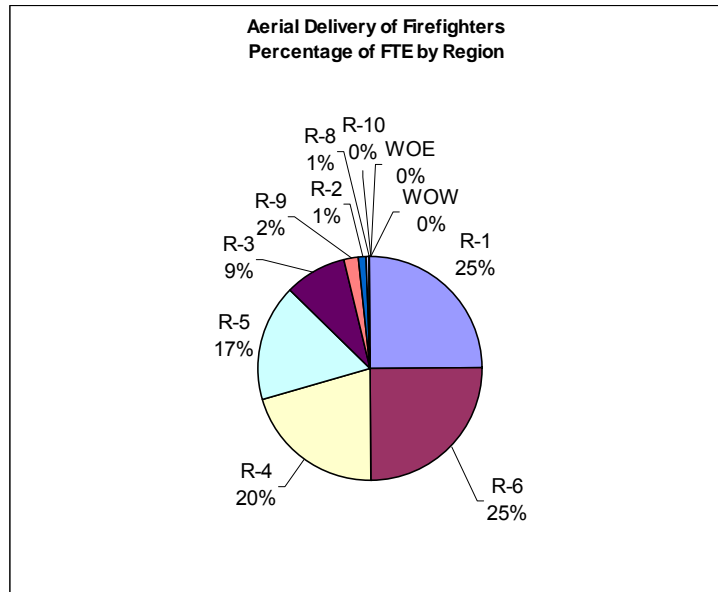
### 3.6. Personnel

A summary of aerial delivery of firefighters personnel, including Smokejumpers, Helitack/Rappel crews, Pilots, Base Managers, support personnel, and respective supervisory personnel, is included at Appendix F - Government Personnel Summary by Region.

- Eight of the 12 smokejumper airplanes are crewed by Forest Service pilots and with the remainder crewed by contractor pilots. All helitack/rappel helicopters are crewed by contractor pilots.
- Total personnel within the ADFP business area are shown in the following table. This business area includes smokejumpers and helitack personnel who are predominantly seasonal employees. The 1,100 permanent, non-Militia personnel represent 384.45 FTE. Because of the seasonality and dispersion of work during the fire seasons, the work performed requires a larger number of positions.
- To account for the severity of the fire seasons, an additional 2,557 qualified temporary personnel and Militia personnel perform the actual firefighting or provide direct support to the aerially delivered firefighters. The number of locations shown display the wide geographic distribution of personnel at all levels of the Forest Service.

	Permanent			Temporary			Total Positions
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations	
<b>Non-Militia</b>	1100	384.45	19	458	127.60	64	1,558
<b>Militia</b>	435	11.55	42	264	10.39	24	699
<b>TOTAL</b>	1535	396	61	722	137.99	88	2,257

The FTE distribution FTE by region is displayed in the following pie chart. As shown, 87 percent of the aerial delivered firefighters are concentrated in four of the nine Regions (1, 4, 5, and 6).



The data call included all personnel associated with aviation. Position descriptions among regions vary, complicating the task of drawing region-to-region comparisons.

Samples of smokejumper associated positions include: Forestry Technician, Supervisory; Smokejumper Pilot; Pilot Smokejumper; Smokejumper Base Manager; Smokejumper; Program Manager; Smokejumper Training Manager; Smokejumper – Forestry Lead Technician plus others.

Samples of helitack associated positions include: Helicopter Crew Lead; Helitack Crew; Aviation Dispatcher; Helicopter Crew – Senior; Helicopter Senior Firefighter; Helicopter Supervisory Pilot; Helitack Lead; and Rappel Base Manager plus others.

### 3.6.1. Pilots

Government pilots who work within this business area are primarily flying WCF smokejumper airplanes but also perform flying duties in most of the other Business Areas. Helicopter pilots are currently all contractor provided.

The Forest Service has 88 pilot positions. Fifty three positions work in this business area, equating to 15.5 FTE. The following table displays the share of pilot duties within this Business Area as reported by the regions.

Business Area	Original all Pilots	
	Number	FTE
Aerial Delivery	53	15.5
TOTAL Positions	88	82.60

### 3.6.2. Personnel Analysis

While most of the personnel are spending the majority of their time within this business area, many of those performing functions in this business area are also performing work in other business areas and on activities outside the scope of this review. These individuals are spread out between the Regional Offices and other administrative units. The 202 personnel that work in this business area 100 percent of their time equate to 115.53 FTE.

Percentage of Effort for Aerial Delivery of FF	Count of Personnel	Number of FTE
100% ADF	202	115.53
Total ADF 50 < 100%	439	207.82
Total ADF 20 < 50%	207	42.59
Total ADF 0 < 20%	253	18.50
Total	1101	384.44

### 3.7. Contracts

A summary of the Forest Service contracts by Region is included at Appendix H – Forest Service Contracts. The contracts specific to this Business Area include helicopters with pilots, aircraft maintenance, hanger and other aircraft leases, smokejumper aircraft and facilities.

#### 3.7.1. Specific Tasks Requirements

##### 3.7.1.1. Smokejumper/Paracargo

The Forest Service Smokejumper program is a National Shared Resource (NSR), with ready movement between bases, Forest Service regions, and interagency geographic areas. Smokejumpers are pre-positioned based upon the predicted fire occurrence in any of the Regions. The strength of the smokejumper program is the greater range of airplanes and greater payloads than helicopters.

Smokejumpers are stationed at various bases and transported in government owned and contracted airplanes. There is close coordination with the BLM smokejumper program. The Interagency Smokejumper Operations Guide (ISMOG) and the Interagency Smokejumper Pilots Operations Guide (ISPOG) provide guidance and direction for smokejumper operations.

Firefighting tools, food and water are dropped by parachute to the firefighters, after they land near the fire, making them self-sufficient for the first 48 hours.

The smokejumper program includes a core cadre of permanent full-time smokejumpers that provide program continuity, recruiting, selecting, and training of new smokejumpers, equipment refurbishment, and base management throughout the year. The remainder of the smokejumpers consists of seasonal full-time and part-time employees who are qualified for the missions. The highest demand for smokejumper activity is from June through October.

The Smokejumper Aircraft Screening and Evaluation Board (SASEB) is a group composed of Forest Service, and BLM aviation managers, smokejumper managers, smokejumper pilots and Department of Interior Aviation Management Directorate (AMD) aviation managers. They are charged with screening and evaluating proposals from sponsoring units for evaluation and approval of new aircraft models for smokejumper/paracargo use. In addition, SASEB, in conjunction with Missoula Technology and Development Center (MTDC) also evaluates and approves all aircraft accessories associated with smokejumper operations. The MTDC recommends candidate aircraft meeting SASEB aircraft performance criteria to the NIAC for flight evaluation and development of necessary aircraft accessories.

### **3.7.1.2. Helitack and Rappel Firefighters**

Helitack and rappel positions are established based upon the predicted needs of each Region. They are mobile and can be deployed as necessary to other Regions. The strength of the helitack and rappel program is the multiple use nature of the helicopter platform and the corresponding precision placement of firefighters. National oversight and technical support ensures standardization and interoperability between Regions. The majority of helitack and rappel helicopters are considered Regional resources. However, there are 7 NSR Type II helicopters. The WO provides funding for Regional staffing (rappel/helitack) of these NSR helicopters.

A typical crew is comprised of 10 to 20 rappel firefighters or 8 to 10 crewmembers for helitack. Helitack and rappel crews can be deployed as multiple firefighting units based on incident requirements. The helitack/rappel program includes a core cadre of permanent full-time personnel that provide program continuity, recruiting, selecting, and training of new helitack/rappellers, equipment refurbishment, and base management throughout the year. Helitack/Rappellers are in demand primarily from June through October. Helitack/Rappel personnel are stationed at various bases using exclusive-use contract helicopters for initial attack. The helitack helicopters are also equipped for dropping water or chemicals with water buckets or fixed tanks. Support helitack modules use helicopters under Call-When-Needed (CWN) contracts, which are mobilized during periods of heavy fire activity, or to accomplish project work (see Paragraph 6.) when exclusive-use contract helicopters are not available. The Interagency Helicopter Operations Guide (IHOG) is a guide for all helicopter activity in the Forest Service.

Some helitack programs have supplemented their aerial delivery capabilities by utilizing helicopter rappelling and cargo let-down functions. Currently, approximately 55 percent of the contracted Exclusive Use aircraft and associated crews have rappel capability. Inaccessible terrain, heavy fuels, timber, steep topography and vast amount of roadless areas are some of the justifications for having a rappel program. Rappellers can be deployed from 250 feet or less above the ground. This form of aerial delivery reduces initial attack response time. The Interagency Helicopter Rappel Guide is the policy document that governs all agency rappel activities.

### **3.7.1.3. Pilots for Aerial Delivered Firefighter Aircraft**

The National Fixed Wing Standardization Pilot is responsible for development and implementation of training procedures and requirements for smokejumper pilots. Smokejumper pilots must be proficient in para-drop techniques and procedures, low level para-cargo delivery, flight in mountainous terrain, and close crew coordination. Helicopters by nature are multiple use platforms and their pilots must be trained for multiple uses within the scope of Forest Service needs. In addition to delivering firefighters, the helitack pilots must be proficient in water/retardant application, cargo delivery, personnel transport, reconnaissance, medevac, aerial observation, and follow-up personnel and equipment retrieval. In addition, for non-fire activities discussed in Paragraph 6, aerial ignition, mapping, and general operation are required. Helicopter crew personnel ensure that operations are carried out in a safe and effective manner in all types of terrain and mission profiles.

### **3.7.1.4. Smokejumper Bases**

Smokejumpers are operating from seven fixed bases with individual base staffing varying from 20 to approximately 80 smokejumpers. Smokejumper bases are located in McCall and Grangeville, Idaho; Redding, California; West Yellowstone and Missoula, Montana; Winthrop, Washington; and Redmond, Oregon. A seasonal (May-July) sub-base is operated in Silver City, New Mexico and is staffed by jumpers from all Forest Service fixed bases. There are also two permanent Bureau of Land Management smokejumper bases that can be utilized by Forest Service smokejumpers - one in Boise, Idaho and the other in Fairbanks, Alaska. However, BLM works primarily from satellite facilities that do not have the loft facilities necessary for hanging and packing Forest Service parachutes. Forest Service satellite bases are located at Miles City, Montana; Salmon, Idaho; Ogden, Utah; La Grande, Oregon; plus San Bernardino, Fresno, and Columbia, California.



Forest Service bases have combinations of: basic barracks and administrative facilities for the smokejumpers plus loft and packing, storage, and training facilities. Parachute maintenance and repair is performed at each base. Large aircraft parking areas and taxiways to the main airport runway are required for the fixed wing aircraft assigned to each base.

#### **3.7.1.5. Helitack Bases**

Helitack crews operate from fixed bases and satellites located in the various administrative units. These bases include a variety of support facilities such as barracks, operations, and warehouse facilities. Each base requires one or more permanent helicopter parking pads with adequate space/clearance for landing and takeoff.

### **3.7.2. Equipment**

#### **3.7.2.1. Smokejumper Aircraft**

All four Regions hosting Smokejumpers also administer owned aircraft and flight crews. Three Regions also contract for additional Smokejumper aircraft. The Washington Office provides oversight for standardization and operational policy.

Aircraft for smokejumper delivery consist of eight Forest Service owned and operated and four full-service seasonal contract airplanes. The mix of the fleet consists of five different types of aircraft which complement each other in performance and load carrying characteristics. The current mix of aircraft has proven adequate and efficient. Each base has varying requirements for lift capacity, speed and take-off and landing requirements.

Several of the Forest Service aircraft (DC-3TPs and C-23A Sherpas) are approaching the operational service life limitations. Availability of critical replacement parts and factory support is declining.

The current Smokejumper fleet of aircraft meets the majority of organizational needs. However, aging aircraft issues and expanding roles of smokejumpers dictate the need to continue looking for suitable replacement platforms that may be capable of greater lift capacity and speeds to deliver large numbers of firefighters with rapid deployment. Some potential additions to the fleet have been identified, but to date, adequate funding does not exist to upgrade.

#### **3.7.2.2. Contract Helicopters**

**Regional Type I, Type II, and Type III Helicopters** - Regions contract for suitable helicopters for use by helitack crews. The majority of the crews are rappel qualified using Type II or III helicopters. Helicopters for rappel crews meet national standards for pilot and aircraft. All helitack helicopters and pilots are equipped for longline and bucket external load work. These helicopters are also used extensively for aerial ignition work. Most Regions also have a large number of additional Type III helicopters under CWN contract to supplement the Exclusive Use contract during periods of high fire use.

**National Type I and Type II Helicopters** - The National Aviation Staff in Boise is directly responsible for coordinating the acquisition of Type I and Type II contract helicopters. Inspection and approval of pilots and aircraft is delegated to regional pilot and aircraft inspectors.

### **3.7.2.3. Support Equipment**

- Equipment requirements include agency approved aircraft and equipment appropriate for the mission.
- Specialized equipment required by smokejumpers includes the jump suits and helmets, parachutes, harnesses, gear bags, and necessary firefighting equipment.
- Specialized rappel equipment requirements for personnel include rappel harness, rappel rope, descent device, plus necessary firefighting equipment.
- Helitack requirements include helitack support and fuel trucks, cargo nets, tools, cables, and flight helmets.

### **3.7.3. Maintenance of Aircraft**

- All contract helicopter and smokejumper aircraft include maintenance provided by the vendor.
- Forest Service owned smokejumper aircraft are maintained by a combination of Forest Service employees and contracted maintenance. Personnel currently performing the maintenance on WCF aircraft are the same personnel whose primary responsibility is to perform quality assurance on contracted aircraft throughout the Regions.
- The contracted maintenance for WCF aircraft are call-when-needed contracts for repair problems that cannot be corrected by the Government aircraft maintenance personnel. Government personnel are primarily performing inspections and minor repairs. All Sherpa smokejumper aircraft are maintained by contract except for minor maintenance.

### **3.7.4. Training**

- There are specific entry level experience and physical fitness requirements that an individual must meet before becoming a trainee/rookie smokejumper. These requirements are contained in the Interagency Smokejumper Operations Guide (ISOG).
- Helitack crews operate in any fire condition and with varying crew size based upon the respective fire complexity. In addition to wildland firefighting training, there are specialized training requirements for helicopter operations and safety. These requirements are contained in the IHOG.
- Rappel program operations require additional training, equipment, and experience to perform in a safe and efficient manner. Training requirements for helicopter rappellers are contained in the IHRG.

### **3.7.5. Multiple Use of Personnel and Equipment**

Both helitack and smokejumper personnel tours of duty are routinely extended to work before and after the core fire season to perform natural resource projects for the various administrative units. The funding for these additional periods is other than Fire and Aviation funds, so the workload and costs for this work are outside the scope of this assessment.

### **3.8. Impacts to Stakeholders**

Recommendations from this assessment may generate efficiency-related changes or other improvements to the current operation. These recommendations may have an impact to stakeholders. Performance levels and program quality will not decline as a result of these changes.

### **3.9. “As-Is” Issues**

#### **3.9.1. Budget**

The Smokejumper Program is a National Shared Resource with funds allocated to the Regions that host those resources. The number of smokejumper positions will vary from year to year due to budget fluctuations and the direction from the line authority for any given base.

#### **3.9.2. Training and Bases**

- In some Regions, rappel training is conducted at multiple locations at various times, leading to differing interpretations of operational procedures, qualification standards, and training protocols.
- Currently there are 95 helitack bases some with overlapping response areas where more than one helicopter is pre-planned for initial attack. There are at least as many additional satellite bases located at various administrative sites and work centers through out the Forest Service system. There may be opportunities for base consolidations that become apparent when the ADFP study is updated. A listing of helitack basis is included at Appendix I - Helitack Bases and Satellites.

#### **3.9.3. Personnel**

- There are variations in organizational structures within the smokejumper units and variations in Position Descriptions for identical job functions.
- The ADFP study indicated that regions are operating below an efficient level for the lift capability of the current smokejumper aircraft. The number of smokejumpers could be increased if additional budget resources become available without increasing the number of aircraft or facilities.
- There are 310 smokejumpers in the Forest Service system (184 FTE). These positions include management overhead, divided among the seven bases with individual base staffing varying from 20 to approximately 80 Smokejumpers.

#### **3.9.4. Equipment**

- The current mix of WCF and contracted smokejumper aircraft meets the current organizational. However, the WCF aircraft will have to be replaced in the future due to aging and airworthiness issues. The Forest Service is currently unable to replace the aging aircraft in the WCF program due to funding issues and unavailability of project funds.
- All helicopters and pilots for the aerial delivery of helitack firefighters have historically been contracted. Since contract helicopters are very expensive, this may not be the most cost effective method for the Forest Service.
- Opportunities exist to organize and coordinate helicopter resources in a manner that leads to more sharing and consistent staffing. Assessing the need for helicopters on a national scale may lead to minimizing needed infrastructure that may reduce cost.
- The 1999 ADFP Study has provided guidance for implementing actions over the last several years. However, the study does not reflect current operating strategies and advances in equipment and technology. For both smokejumper and helitack/rappel programs, the ADFP study needs to be updated and validated.

### 3.10. Assessment

#### 3.10.1. “As-Is” Components to be Retained in the “To-Be”

- The assessment for this Business Area is to leave the numbers of smokejumpers, aircraft and smokejumper bases as currently operating. *The Aerial Delivery of Fire Fighters (ADFF) Study* completed in October, 1999 and the *Aerial Delivery of Fire Fighter Management Option Team Recommendations Final Report* dated September 2000 made recommendations to consolidate bases and use the savings to increase smokejumper numbers. Smokejumpers are currently a National Shared Resources managed at the Regional level and should remain as such. The program management of National Type II helicopters and Regional Standard Category Type II and III helicopter numbers, helitack crews and bases should remain unchanged.
- For both smokejumper and helitack/rappel programs, the ADFF study needs to be updated and validated.

#### 3.10.2. Facilities and Bases

Current smokejumper bases are dictated by current aircraft capability. Improved aircraft performance would allow for base consolidation which would produce operational efficiencies and greater flexibility for inter-regional operations. Improved training and standardization of helitack and rappel crews would provide efficiencies and greater interoperability among crews supporting different Regions. Any facility changes would be contingent on first acquiring the increased passenger capacity of large aircraft as identified above.

For example, the following changes may be possible based upon the acquisition of improved aircraft.

- Reconfiguration the following three smokejumper bases to satellite operations that can be used during periods of critical fire danger or for sustained lightning type fire activity.
  - North Cascade
  - Grangeville
  - West Yellowstone
- Designate additional locations for satellite smokejumper bases in addition to those bases already used for these types of smokejumper operations.
- Define cost savings for smokejumper base realignment and consider appropriate investments in high priority needs to support fire suppression program.
- The following four smokejumper bases would remain as the primary operating facilities:
  - Redding
  - Redmond
  - McCall
  - Missoula
- Facility realignment and changes would result in cost savings in facilities and facility support personnel. However, a portion of the savings would be required to offset the cost of aircraft with improved performance (capacity, range, and speed).
- With the base consolidations the ADFF resources could be more flexible and strategically repositioned before fire events; regional and national level coordination.

### **3.10.3. Communications**

- Human aiding technology, including the C4 ISR concept may provide accurate and up-to-date information to firefighters, Incident Management Teams, and Geographic Multi-Agency Coordination Groups (MAC). The use of data links with real time intelligence may improve strategic and tactical planning for deployed crews.
- New satellite communications for smokejumpers and helitack will improve capabilities to contact deployed crews in remote mountainous terrain.
- The Automated Flight Following (AFF) system allows for the tracking of aircraft. Full national implementation of this system may lead to improved aircraft location information and flight tracking, and may result in utilization efficiencies and increased safety margins for crews.

### **3.11. Efficiencies Available**

Acquisition of improved aircraft could lead to realignment of smokejumper bases that may produce annual savings. However, some bases are multifunctional supporting fire and dispatch operations, command and control aircraft, airtankers, and helicopter operations, and would not be available for consideration.

### **3.12. Future Customers or Stakeholders**

Current and future growth indicates greater expansion in WUI. State and Federal land management agencies, local government entities, insurance companies, and private property owners all have great interest in Forest Service wildland fire protection organizational changes.

### **3.13. Wildland/Urban Interface (WUI) Expansion**

Improvement in speed and response of firefighter delivery for initial attack to contain wildland fires will improve protection of private landowners adjacent to National Forests/Grasslands. The delivery of aerial firefighters expedites initial and extended attack and provides rapid reinforcement of WUI fires.

### **3.14. Performance Analysis**

- The Business Area of Aerial Delivery of Firefighters and Support does not have any performance gaps between the as-is and the conceptual future organization and none will result from implementation of the recommendations. The work requirements, standards of operation, and ultimate performance would not be reduced from the present conditions.
- The recommendations within this Business Area are predominantly to update the Aerial Delivery of Firefighters Study for improved delivery of firefighters using an improved mix and newer modern aircraft could lead to improved efficiencies and cost savings. There would be no change in operation from the present until the effectiveness of change was validated.

### 3.15. Recommendation – Consolidate Rappel Training

Consolidation of rappel training would not result in any performance gaps. It would improve standardization and reduce total training costs and effective use of aircraft utilized for the training.

#### 3.15.1. Historical Costs

##### 3.15.1.1. Personnel

Personnel costs for this Business Area were developed based upon data regarding the personnel working in this Business Area. Costs are calculated for a typical five-year period for a cost comparison. For this assessment, the earliest base-year starts on October 1, 2008 and the base year annual cost is included in this review. Base Year Annual Personnel Cost: \$46,309,04.

##### 3.15.1.2. Equipment

Equipment costs for this Business Area are based upon the data analysis, as divided between the various Business Areas.

- Eight WCF smokejumper aircraft costs: \$1.3 million.
- Four contracted smokejumper aircraft (Dornier-228, Twin Otter, DC3-T, and Casa 212) costs: \$1.9 million.
- Total contract aircraft costs for the Business Area including helitack and other associated aircraft:

Level	Number Contracts	Number Aircraft	Cost
Administrative Unit	106	115	\$18,640,545
Regional	53	73	\$4,824,069
National	32	32	\$5,093,755
Total	191	220	\$28,558,369

##### 3.15.1.3. Contracts

The total contract aircraft costs for this Business Area are shown in paragraph 3.15.1.2.

#### 3.15.2. Cost Estimate Analysis

Anticipated recommendations were evaluated based upon the historic costs. The analysis for each of the recommendations contains the estimated cost, the benefits, and estimated savings.

### **3.16. Recommendation – Update ADFP Study**

Update the ADFP Study to evaluate and recommend the best mix of helicopter delivered and airplane delivered firefighters. Newer modern aircraft capabilities allow more efficient crew delivery. Larger faster pressurized smokejumper aircraft could improve delivery efficiencies. Helicopter models in use today have greater performance capability to operate at higher density altitudes that is necessary for firefighting in many of the mountainous forested areas. The study should include an analysis of the optimal locations for staging aircraft and crews based upon improved helicopter capability. Region 6 has made accomplishments in reorganizing the helicopter, helitack, and rappel crews and has demonstrated potential in other areas for efficiencies. Similarly, support facilities for smokejumpers and helitack crews should be reviewed in light of new aircraft technologies.

#### **3.16.1. Cost Estimate**

The estimated cost, resources needed, and the time-frame to complete the updated ADFP study include:

- Budget: \$220,000
- Number of specialists and study team members: four agency specialists and one consultant contractor;
- Timeframe: 180 days.

#### **3.16.2. Benefits Estimate**

Updated, accurate and comprehensive cost of the Aerial Delivered Firefighter Programs (Smokejumpers and Helitack). The study would be used to determine the ideal mix of aircraft and bases, efficiencies to be derived and the best value economies for informed decision making.

#### **3.16.3. Savings Analysis**

- Potential savings assume that smokejumper aircraft are modernized with increased capacity and performance as identified in an updated ADFP study. The following are examples of base reconfigurations that could be implemented to produce potentially substantial savings.
- Some smokejumper bases could be converted to satellite operations for use during periods of critical fire danger or for sustained lightning type fire activity.
- The reduction of the smokejumper bases through consolidation could result in a savings in personnel, facilities, and overhead.

### **3.17. Recommendation – Consolidate helicopter rappel training to one location in each Region in order to promote standardization and efficiency.**

#### **3.17.1. Cost Estimate**

Two different approaches to rappel training are included for comparative purposes:

Region 4 has 22 helicopters, of which 17 are rappel configured.

- Of the 17 total helicopters, five are Type II and the daily cost is roughly \$4000 and the flight rate \$1600 per flight hour.
- The remaining Type III's run about \$1800 daily and \$750 per flight hour.
- Each operates from a base as established on the various administrative units. Crew sizes, experienced versus rookie rappellers, and the helicopter make/model/ size vary.
- A generic crew has a GS-9 foreman, a GS-8 assistant, two GS-6/7 lead crew, two GS-5/6 senior firefighters, and two GS-4 crewmembers.

- In 2006, 176 people went through 5 days (40 hours) of recurrency, spotter and rookie training at six different locations.
  - All 17 helicopters participated with instructors from the GS-9 and 8 leadership positions.
  - The GS-6 and 7's were trainee instructors.
  - Each helicopter flew approximately 4 flight hours of training time.
- Eleven of the helicopters also flew an average of 3 hours transit time to the training location (5 Type II helicopters and 1 Type III helicopter were already stationed at the training location). Therefore, the total flight time for the Type II helicopters was approximately 32 hours for the week, while the total flight time for the Type III helicopter was approximately 69 hours for the week.
- Figure each instructor and trainee at 40 hours regular time and 24 hours of overtime. Travel to and from the site was by US Government vehicle or in the helicopter and everyone camped at the training location for an average cost of \$300 per person for the training week.
- Training requirements vary by individual with different numbers of tower and live rappels for each person. In addition, spotters are recertified and/or trained as part of the weeklong exercise.

**Summary costs for Region 4 training are provided in the table below.**

Total Flight Time	Type II	32 hours
	Type III	69 hours
Total Flight Cost	Type II	\$102,950
	Type III	\$52,800
Total Other Training Costs		\$52,800
<b>Total Training Cost</b>		<b>\$155,750</b>

For contrast, Region 6 uses one central facility and in 2006 trained 102 people using four Type II helicopters and one high performance Type III helicopter.

- Each helicopter flew at least five or six training hours (35-40 hours total with a cost of \$50,000) plus transit time.
- Daily and flight rates are similar to Region Four.
- The total cost of the training was \$125,000 for all flight hours, personnel overtime, travel and per diem. The home unit covered base eight (40 hours) salary.
- Crew sizes and grades are comparable. The average rookie class varies year to year from 30 to 50.
- A first time rookie requires both extensive rappel tower time and a minimum of eight live rappels with each cycle taking one tenth of a flight hour for each individual rappel.
- Returnees require less tower time and three live rappels.
- Spotter training and certification are conducted at the same time.
- The trainer to trainee ratio is one to four.
- When asked if there had been cost savings by centralizing, the answer was not much if not slightly more cost but the benefit was standardization, reduced exposure and cross training between makes and models.



- During the regular fire season, Region Six reinforces (boosts) helitack/rappellers among their six bases. That type of action is greatly facilitated by this joint training effort.
- In 2006 the National Office awarded the region for “Excellence in Firefighter Preparedness, Training and Safety” in recognition of their helicopter rappel training program.
- Summary costs for Region 6 training are provided in the table below.

Total Flight Time	Type II	25 hours
	Type III	13 hours
Total Flight Cost	Type II	\$10,000
	Type III	\$40,000
Total Other Training Costs		\$75,000
<b>Total Training Cost</b>		<b>\$125,000</b>

- Cost of the travel/per diem to training location should be offset by the gains in efficiency and reduction in the number of training facilities and instructors.

### 3.17.2. Benefits Estimate

- Standardization has potential to result in higher quality training.
- Standardization of personnel could lead to increased personnel effectiveness and greater flexibility.
- Improved efficiency for the conduct of training is anticipated.
- Facilities already exist to handle an additional training workload.

### 3.17.3. Savings Analysis

- Consolidation will result in fewer instructors and the ability to train more people at one session.
- Consolidated training facilities will also lead to a reduction in overhead/management costs.
- Cost pool savings based on facility reduction
- Consolidated training will provide more efficient use of training aircraft and fewer total helicopter hours and resulting hourly cost. The example above showed that Region 4 utilized 17 helicopters for over 100 total hours, while Region 6 utilized 5 helicopters for a total of 38 hours.
- The example above also showed that the total cost of training is reduced through consolidation. The total Region 4 costs of training, including flight hours and trainee expenses, was approximately \$155,750. By comparison, the total cost of training in Region 6 was \$125,000, a difference of \$30,750.
- Further savings may be obtained by consolidating training between two or more adjacent Regions.

### **3.18. Recommendation – Phased Replacement of Smokejumper Aircraft**

Develop a strategic plan for a phased replacement of the smokejumper aircraft in accordance with the Exhibit 300 process. Examine the benefits and savings that might accrue if the Forest Service replaced the current fleet with pressurized aircraft that have increased smokejumper and cargo capacity along with greater range capability. A further review under Exhibit 300 should be pursued for recommended replacement aircraft.

#### **3.18.1. Cost Estimate**

- There are currently eight WCF smokejumper aircraft costing \$1,292,895. In addition, the Forest Service contracts four smokejumper aircraft costing \$1,902,926.
- The additional cost to the Forest Service to conduct an Exhibit 300 study on the smokejumper aircraft is expected to be minimal.

#### **3.18.2. Benefits Estimate**

Phased replacement could result in aircraft with greater range; newer aircraft; larger smokejumper and cargo capacity; reduced maintenance costs (more reliable); fewer bases and fewer personnel.

#### **3.18.3. Savings Analysis**

- Examples of potential savings were identified in the various aircraft contracts that are currently used by the Forest Service in smokejumper operations. A Comparison of the annual costs for De Havilland Twin Otters shows a savings of \$412 per flight hour using WCF rather than contract aircraft:
  - In FY 2006 the contracted Twin Otter at Grangeville, Idaho cost is \$2832 per day for 115 days for an availability total of \$325,680. The flight rate is \$737 per hour.
  - Region 4 operates two Forest Service owned Twin Otters located at McCall, Idaho. The annual Working Capital Fund (WCF) charge for one aircraft for 12 months is \$146,000 which includes pilot salary & program management (based on hours flown), pilot training, maintenance and hanger costs. To that figure add \$42,000 for depreciation and a \$26,000 replacement cost for a total annual cost of \$214,000. The flight rate on the FS aircraft is \$325 hour.
- A similar comparison can be made between the DC-3T that Region 1 operates out of Missoula, Montana and a contracted DC3-T that Region 5 operated out of Redding, California in FY2005 (the last year of a 3-year contract).
  - The Forest Service owned aircraft (WCF) annual cost was \$209,592 plus a flight rate of \$1,075 per hour.
  - The 93-day contract in Redding was \$5823 per day for a total availability cost of \$541,539 plus a flight rate of \$843 per hour.
- In both cases cited above, the cost of an agency owned aircraft is for a full year and the WCF aircraft are available to the Forest Service 12 months a year rather than the short terms of the contracted aircraft.

### **3.19. Recommendation – Develop Strategic Plan for Acquisition of Helitack Aircraft**

Develop a strategic plan to determine the best acquisition method for helitack aircraft in accordance with the Exhibit 300 process.

#### **3.19.1. Cost**

The Forest Service contracted for approximately 138 Type II and Type II helicopters in 2005. The total cost of these contracts was \$126,016,827. The Forest Service does not own Type II or Type III helicopters. See Appendix H-1 – Aircraft Contracts by Region.

#### **3.19.2. Benefit**

- Exhibit 300 study has the potential to identify fewer helitack aircraft that are more reliable with reduced maintenance costs; fewer bases, and fewer management/oversight personnel.
- A mix of standard category Type I, II, and III helicopters may be obtained to improve delivery methods and provide improved support to wildland firefighting.

#### **3.19.3. Savings**

As described in Paragraph 3.18.3, there are potential cost savings by having Forest Service owned aircraft in some areas versus the more expensive contracted aircraft.

#### **Rationale**

- Firefighting is the primary mission and should be the focus and the delivery method of the firefighter, whether by parachute, helicopter, or engine is the means of transportation support.
- The Helitack Crew and Smokejumper functions are more closely related in skills, training, and work performed to the Hotshot and other firefighting functions that will be included in the Firefighting Management Efficiency Assessment.
- Costs, Savings, and Benefits will be deferred until the firefighter study.

### **3.20. Recommendation – Review National Type II Helicopter Program**

Recommend that the National Type II helicopters program be reviewed. The seven aircraft services contracts currently procured nationally cost the Forest Service \$5,626,529 for 974 days availability. The high cost of contract helicopter use indicates potential savings could be achieved through other staffing, ownership or operational options.

### **3.21. Civil Rights Impact Assessment**

A Civil Rights Impact Assessment (CRIA) is required to identify and categorize the civil rights impacts of implementing any realignment initiative that will potentially affect employees. A CRIA for Forest Service employees will be developed if the Fire Executive Council recommends changes to staffing during their follow on studies.

## **3.22. Summary of Recommendations**

### **3.22.1. Short-term Recommendations & Efficiencies**

- Update the Aerial Delivery of Firefighters Study to evaluate and recommend the best mix of helicopter delivered versus airplane delivered firefighters. Newer modern aircraft capabilities allow more efficient crew delivery. Larger faster pressurized smokejumper aircraft could improve delivery efficiencies. Helicopter models in use today have greater performance capability to operate at higher density altitudes that is necessary for firefighting in many of the mountainous forested areas. The study should include an analysis of the optimal locations for staging aircraft and crews based upon improved helicopter capabilities. Region 6 has made accomplishments in reorganizing the helicopter, helitack and rappel crews and has demonstrated potential in other areas for efficiencies. Similarly, support facilities for smokejumpers and helitack crews should be reviewed in light of new aircraft technologies.
- Consolidate helicopter rappel training to one location in each Region in order to promote standardization and efficiency.

### **3.22.2. Long-term Recommendations**

- Develop a strategic plan for a phased replacement of the smokejumper aircraft in accordance with the Exhibit 300 process. Recommend that the Forest Service replace the current fleet with pressurized aircraft that have increased smokejumper and cargo capacity along with greater range capability. A further review under Exhibit 300 should be pursued for recommended replacement aircraft.
- Develop a strategic plan to determine the best acquisition method for helitack aircraft in accordance with the Exhibit 300 process.
- Recommend that the National Type II helicopters program be reviewed. The high cost of contract helicopter use indicates potential savings could be achieved through other staffing, ownership or operational options.

## **4. Business Area B – Aerial Detection and Command and Control**

### **4.1. Business Needs Assessment**

#### **Forest Service Goals**

This Business Area supports the Forest Service Strategic Goals by reducing the risk from catastrophic wildland fire by detecting fires in their early stages and commanding the initial and extended attack to contain forest/wildland fires and prevent spread using technology for detection and aerial command and control over a fire incident.

#### **4.1.1. Business Area Mission Fulfillment**

- This business area combines resources involved with combining detection technology with personnel experienced in fire and aviation, geographic knowledge, and communications to identify and control fires. This includes existing leadplanes, Air Tactical Supervision Module (ASM), Air Tactical Group Supervisor (ATGS), and Infrared technology. Depending upon the availability, either helicopters or airplanes are used. Personnel included are pilots and ATGSs that control wildland fires from the air, and support personnel, including dispatchers, that are in direct communication with the ATGS, leadplanes and aerial detection observers. Associated mission preparatory time and qualification training is also included.
- Command and control supervision provides Appropriate Management Response (AMR) for the safe, operationally effective, and cost efficient application of firefighting resources (aerial and ground) and airspace management. The current aerial firefighting organizational structure, personnel, and platforms have evolved over time to support ground firefighting (leadplane pilot/ASM and ATGS). Command and control personnel provide direct feedback to ground forces regarding situational fire conditions for personnel safety.
- Aerial command and control enables a rapid response to the fire activity for ordering ground and aerial assets, reducing the potential for fire spread, thereby minimizing large fire suppression operations and costs. The safety of personnel and property is enhanced by the decision of aerial command and control personnel observing fire behavior, terrain, and potential fire and weather conditions.
- Command and control provides the early detection and response of suppression resources to minimize fires that have the potential to escape initial attack. Aerial detection provides for large area coverage in short time periods, especially in remote and inaccessible areas. Infrared technology with remote sensing capability provides necessary intelligence to incident management teams and managers including specific location of new and spot fires, fire intensity and perimeter location.
- The aerial observer/detection mission is generally the responsibility of individual Administrative Units. Aircraft are procured under local contracts or agreements. Aerial detection personnel may occasionally utilize command and control aircraft. Aerial detection/observers must be firefighter qualified, but do not meet the criteria for command and control mission and aerial supervision.

#### **4.1.2. Justification for Business Area**

Aerial command and control and early detection meet the mandate by conducting identification of wildland fire for an earlier response by ground or aerial suppression forces. With the high cost of firefighting and aviation suppression, actual observation of incident(s) can maximize the economies of resources. This is accomplished through an early and cost efficient determination of when to deploy, how much, and which suppression assets, to include utilization of interagency assets.

## **4.2. Assumptions and Constraints**

The following assumptions and constraints are an expansion to those stated in Paragraph 2.3.

### **4.2.1. Assumptions**

- Standardized personnel qualifications, equipment and operating procedures for command and control, along with the aircraft platform requirements across Regions, will be necessary to meet the various interagency requirements and agreements. It is also important to maintain the ability to operate across Regions and agencies.
- Standardization of communication capability and avionics is especially important for interoperability not only with ground resources but for national interagency operations and communications.
- Each region varies in geographic, climatic, and fire potential conditions requiring specialized knowledge and skills for aerial command and control personnel so they are able to support multiple regions across the country.
- The increased Wildland Urban Interface (WUI), changes in land use trends, and demographics often require increased aerial resources in close proximity to populated urban interface areas. This increased air traffic can reduce operating efficiency and pose additional safety hazards requiring aerial command and control.
- The public expectation to protect lands and private property is expected to continue. This puts increased pressure on aerial command and control resources to obtain and provide timely information, during multiple incidents, for decision makers regarding which areas to protect and prioritization of resources for appropriate suppression response.
- The command and control function plays a role in the prevention of accidents/incidents/loss of life. This expectation will continue to be emphasized.

### **4.2.2. Constraints**

- Aerial tactics and suppression activities are very time sensitive during emerging fire incidents. Due to changing fire response needs and geographic preparedness levels, the local availability of aircraft may be limited or exhausted requiring on-site command and control decisions.
- Authorization to deviate from Federal Aviation Regulations requires the FAA Grant of Exemption No. 392 for authorization for flights under 500 feet and in congested areas. The requirement of the Leadplane to guide airtankers at low altitudes places greater responsibility on the Leadplane pilot to safely guide the large airtanker in these flight profiles.
- Interagency and international incidents increase coordination workload for the command and control function due to policy differences. Command and control aircraft operating along the border are required to operate in accordance with the various Border Agreements during international firefighting operations.
- Large fires create increased aerial activity. This congested airspace requires increased centralized airspace control.

### **4.3. Current Assessment**

#### **4.3.1. Basic Facts of Command and Control**

Aerial Detection and Command and Control operations revolve around the following basic facts:

- The Aerial detection of fires, over a large area, minimizes the time delay of communication with fire suppression assets. Deployment of aviation command and control assets provides the best available combination of speed, range, and capability to provide oversight to firefighting resources through out the Forest Service regions. Coordination of multiple resources provides for a more effective and efficient method to safely control fires.
- Command and control personnel must have the training and prior experience in the application of aerial and ground firefighting tactics (Per FSM 5109.17, Interagency Aerial Supervision Guide, and Interagency ATGS Guide).
- Use of human aiding technology in avionics is now available for improved real-time intelligence to assist with detection and operational planning.
- Appropriate aircraft selection is possible for initial attack or large fire support when trained command and control personnel are assessing the fire from an aerial platform.
- Trained and qualified personnel provide the ability to rapidly transition from detection to the command and control function directing firefighters to multiple fire locations and updating resources on changing fire conditions.
- Aerial platforms are available within an incident for multiple missions including reconnaissance, operations, and logistical support to firefighters
- Fire incident command and control utilize risk management in the process to weigh each particular situation against the commitment to preserve human life, while protecting property and natural resources.
- Aerial command and control provides situational awareness for all ground resources as to fire status and predicted fire spread. They can make an early determination of threats to private personnel and property and initiate mitigation actions.
- Airspace management over the fire incident is necessary for control of multiple airborne assets to include non-Forest Service aerial assets and civilian aircraft. The aerial command and control can request temporary flight restrictions over the incident through the FAA. In addition, command and control personnel work through appropriate channels to coordinate airspace deconfliction with military flight training routes.
- Leadplanes are an important element of the command and control to accurately guide the large airtankers to release retardants and suppressants at the proper location on an incident allowing for safety of aerial and ground personnel.

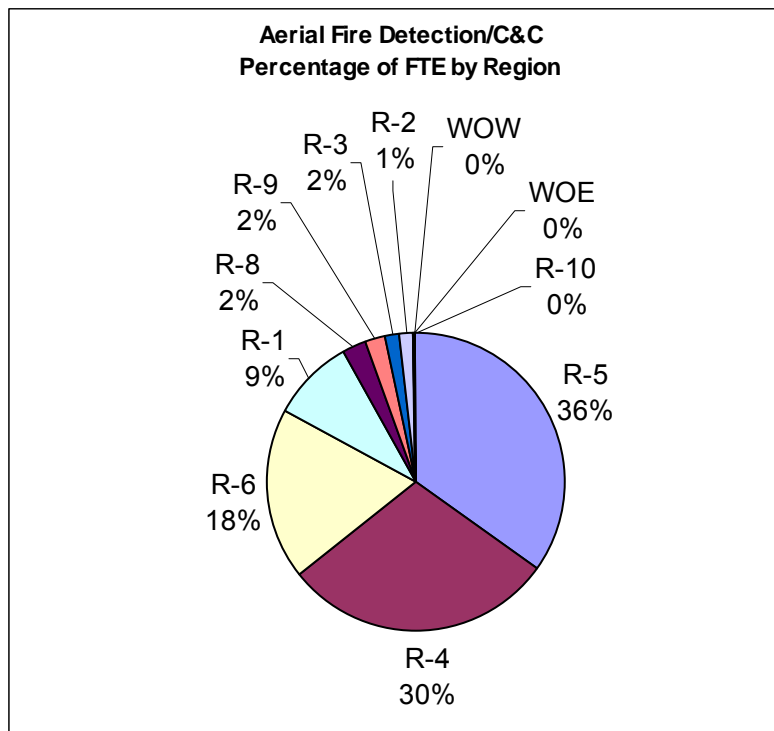
**4.3.2. Personnel**

A summary of those personnel involved with the Forest Service Aerial Detection and Command and Control including Pilots, Air Attack Group Supervisors, and associated dispatch and other support personnel by Region, is included at Appendix F - Government Personnel Summary by Region.

- Personnel within the Aerial Detection and Command and Control Business Area are shown in the following table. This Business Area includes many personnel who perform other duties within the Forest Service and perform command and control mission work primarily on fire incidents. The total of 691 permanent non-Militia personnel represents only 72.03 FTE. Because of the seasonality and dispersion of the work during the fire seasons, the work requires a large number of positions relative to the calculated FTE.
- To account for the severity of the fire seasons additional qualified temporary personnel are used along with Militia personnel who are qualified for the work required within this Business Area. As a result, a total of 1,009 individuals are used to perform the actual work in this Business Area or provide direct support to it. The number of locations shown indicates the wide distribution of personnel among the many areas within the Regions at all levels of the Forest Service.

	Permanent			Temporary			Total Positions
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations	
<b>Non-Militia</b>	691	72.03	98	39	4.81	15	<b>730</b>
<b>Militia</b>	170	5.00	34	109	4.69	20	<b>279</b>
<b>TOTAL</b>	<b>861</b>	<b>77.03</b>	<b>132</b>	<b>148</b>	<b>9.5</b>	<b>35</b>	<b>1009</b>

- The distribution of the FTEs is displayed in the following pie chart that shows the percentage of total personnel FTE by Forest Service Region. As shown, 84 percent of the personnel are concentrated in three of the nine Regions (4, 5, and 6).





- The ATGS and Leadplane Pilot positions and aircraft are currently staffed at the Regional and Administrative Unit levels within the Forest Service.
- Other personnel supporting command and control include dispatchers that are in direct communication with the ATGS, leadplane and aerial observers. These personnel identify the resources available to support the ATGS's command and control request. Based upon the availability, they may order additional resource, in conjunction with other managers, who have ordering authority for contract resources. These personnel are generally conducting dispatch of other firefighting resources and support assets deployed for the incident. These are generally located at the Administrative Unit level and Geographic Area level.
- Many of the personnel performing ATGS duties are assigned other non-fire duties within and are considered Militia. They are trained and fire qualified as ATGS and have extensive knowledge about the specific forests and terrain where assigned, and understand firefighting. These personnel then perform the ATGS duties as necessary for the specific fire. Many are full-time personnel but only a portion of their time is devoted to aviation activities. Others are seasonal or temporary personnel who may be retired from the Forest Service with extensive knowledge but brought in for specific fire missions. The following table displays the number of ATGS personnel.

<b>ATGS Personnel</b>	<b>Number</b>	<b>FTE</b>
Permanent	27	7.91
Militia – Permanent	40	0.71
Militia – Temporary	28	0.45
AD – Temporary	2	0.46
<b>TOTAL</b>	<b>97</b>	<b>9.53</b>

- The Data call encompassed all personnel associated with aviation. Position descriptions among Regions vary. This complicates the task of drawing region-to-region comparisons. A sample of the positions reporting time in this business area is displayed below.
- Those reporting over 20 percent of their time within this Business Area include: Leadplane Pilot, ATGS – Air Tactical Group Supervisor, Helicopter Crew Lead, Center Dispatch Manager, Assistant Foreman, Infrared Pilot, Airplane Pilot, Aerial Observer, and Helicopter Manager.
- Those personnel reporting between 10 and 20 percent of their time within this Business Area include: Aviation Officer (all levels), Supervisory Forestry Technician, Aviation Dispatcher, Helicopter Crewmember, Senior Firefighter, and Smokejumper Squad Leader.

#### **4.3.2.1. Personnel Analysis**

The following analysis of Aerial Fire Detection/C&C is based on the data call. While most personnel are spending the majority of their time within this Business Area, some are also performing work in other business areas and on non-aviation activities outside the scope of this review. These individuals are spread out between the Regional Offices and other Administrative Units. The nine personnel that spend 100 percent of their time in this Business Area equate to 1.79 FTE because they are primarily full-time seasonal personnel. Based upon the analysis contained in the table below, 75 percent of the positions expended less than 20 percent of their time performing command and control work.

<b>Percentage of Effort for Aerial Detection/C&amp;C</b>	<b>Count of Personnel</b>	<b>Number of FTE</b>
100% C&C	9	1.79
Total C&C 50 < 100%	35	17.76
Total C&C 20 < 50%	128	22.16
Total C&C 0 < 20%	520	30.33
<b>Total</b>	<b>692</b>	<b>72.04</b>

### 4.3.3. Contracts

- Contracts for this area are primarily for the aircraft used as leadplanes and for those supporting the ATGS and others in the command and control mission. The leadplane contract is a national contract with performance requirements for the aircraft and required avionics including radios, collision avoidance systems and AFF. The ATGS and detection platforms/aircraft are contracted at the Administrative Unit and Regional levels. There are some aircraft on exclusive use contracts that meet specific requirements for the Administrative Unit and Region needs. The majority of ATGS and detection aircraft/platforms are CWN contracts. The only standard criterion in Exclusive Use or CWN is the national standard for the tactical radio system/package. This results in situations where standard criterion aircraft capability cannot perform across regions.
- A summary of the Forest Service contracts by Region is included at Appendix H – Forest Service Contracts.
- In 2002, the 19 WCF leadplanes (Beach Barons) were removed from service because of airworthiness concerns. This void has been filled with ten leased leadplanes and two WCF, resulting in the current capacity to lead airtankers in fire suppression.

#### 4.3.3.1. Specific Tasks Requirements

##### Leadplane

- Leadplanes, with highly trained pilots, effectively guide the large airtankers above the fire area where the suppressant or retardant is to be dropped. The delivery drops are made at low altitudes (under 500 feet) and in varying terrain. These parameters require pilot reconnaissance prior to the actual mission or drop. The leadplane provides reconnaissance by pilots experienced in the terrain and conditions to identify the precise location needed for the retardant, flight approaches and safe departure routes. The leadplane meets the airtanker and leads them throughout the path to effectively release and drop the load and minimize the on-site time of the airtanker to minimize expensive airtanker costs and allow a faster return.
- Forest Service employee pilots currently fly a combination of Forest Service owned and leased Beechcraft King Air B90, E90 and 200 series aircraft to assist contract pilots flying large multi-engine airtankers in applying fire retardant and suppressants. In the absence of an Air Tactical Group Supervisor, the leadplane pilot establishes air separation for other aviation resources on the incident, provides a “size-up” of the fire to establish tactics, and establishes communications with ground personnel. With agency leadplane pilots and aircraft being shared nationally, the leadplane aircraft and equipment are moving toward a single type aircraft with a standard equipment configuration.
- The Washington Office Boise Aviation Unit is responsible for developing and implementing formal initial and recurrent training for leadplane pilots, designating regional leadplane check airmen, developing standards for leadplane pilot approval and developing operating procedures. Coordination and standardization may be on an interagency basis.

##### Aerial Supervision Module

An Aerial Supervision Module (ASM) is a combination of a lead plane with the addition of air tactical supervision capabilities. It includes an approved lead plane platform, an ASM qualified leadplane pilot and an Air Tactical Supervisor (ATS) who train and work together as a team. The ASM can perform the dual role of a leadplane and provide aerial supervision over a wildland fire incident.

## **Aerial Attack Supervision**

- Fire suppression efforts involving a number of aircraft in one area require the presence of an Air Tactical Group Supervisor (ATGS) or an Aerial Supervision Module (ASM). This allows the ATGS or ASM to coordinate aircraft operations and provide an interface between ground firefighters and aircraft crews. The policy documents that govern this activity are FSM 5700 and the Interagency Air Tactical Group Supervisor Guide (IATGS).
- The ATGS must be knowledgeable in the integration of ground fire suppression tactics with aerial delivered fire suppressants. All Forest Service ATGS's must have a minimum qualification of Division Group Supervisor (DIVS) and meet requirements in FSM 5109.17. Experience and knowledge in many firefighting positions of fire suppression is necessary for an individual to effectively coordinate aerial firefighting resources to support the tactics of ground firefighters.
- The ATGS is responsible for the safety, coordination, ordering, direction and release of aviation assets over an incident. The ATGS is directly responsible for supervision of aircraft on the scene, whether Contract, Cooperator, Military or Forest Service owned aircraft. Responsibilities include the control of all aerial activity over an incident. The complexity of the incident may require that the ATGS administer a Temporary Flight Restriction (TFR) through the Federal Aviation Administration (FAA). Once a TFR is established, airspace management performed by the ATGS may include the media, law enforcement and medical helicopters in addition to incident aircraft. Throughout the duration of the incident the ATGS is in direct communication with the Incident Commander providing recommendations and receiving directions.
- An Aerial Supervision Module is staffed by both an Air Tactical Pilot (ATP) and an Air Tactical Supervisor (ATS). In addition to the ATGS duties, The ATS employs cockpit crew coordination techniques to perform safely in the low-level flight environment. The ATS works closely with the ATP to determine aircraft type for particular tasks based on aircraft performance and capabilities, coordinates fixed wing and rotor wing aircraft operations over an incident, and recommends adjustment of aerial resources as necessary. The ATS must also work closely with the Air Tactical Pilot (ATP) to determine low level Airtanker targets, drop routes and exit paths. The ATGS program is the foundation for the development of Air Tactical Supervisors. The requirement to become a trainee ATS is to have successfully performed as a qualified ATGS for a minimum of 2 years.

## **Aerial Detection and Technology Application of Infrared Sensory and Mapping**

- Over the last 30 years fire detection from fixed lookout stations has been substantially phased out in favor of aircraft patrols. The aerial observer/detection mission is the responsibility of individual Administrative Units. Aircraft are procured under a local contract or agreement. Single engine high-wing airplanes are usually favored because of the increased ground observation capabilities.
- Region 4 maintains the National Shared Resources/ Forest Service owned aircraft that are utilized for the primary mission of infrared detection and mapping of fires and other thermal imagery needs. Infrared (IR) detection and mapping services are also obtained from commercial and/or military sources to supplement in-house capability during severe fire situations. Portable forward looking infrared (FLIR) units are available for temporary mounting in owned, contracted or rental agreement aircraft for fire monitoring and mapping.
- Region 4 is operationally responsible for providing this service with agency pilots, aircraft and support. Infrared operator crewmembers and infrared maintenance support are provided by the IR group hosted in Region 4. Allocation and dispatching of IR aircraft is controlled by the National Interagency Coordination Center. Infrared Pilots may be supplemented by other Regional pilots, along with Emergency Administratively Determined (AD) hired pilots and copilots on detail from other Forest Service and BLM units.

- There are two WCF ATGS platforms (Cobra Firewatch) developed in demilitarized and refurbished Cobra helicopters in Region 5 that are equipped with integrated, sophisticated camera/infrared and mapping sensor packages. The role of these aircraft is to provide a platform for research and development of equipment to assist firefighters. Each of these aircraft is capable of delivering video and audio data via microwave downlink. The systems in each aircraft are capable of geo-referencing ground locations remotely. Information can be recorded on DVD or transmitted via microwave signal. Region 5 performance feedback on this platform has been positive.

### **Pilots**

- Landplane pilots require the additional expertise, beyond that of a point-to-point pilot, in order to assess terrain and climatic conditions close to the ground surface generated by the fire. This knowledge, combined with the detailed knowledge of the capabilities of the airtanker, allow them to effectively guide the airtanker safely into and out of the drop area. This ensures higher accuracy of the suppressant drop in support of the ground firefighters, fire containment, or protection of private property.
- The current program consists of a mix of WCF and contracted aircraft, pilots, and maintenance. The only active Forest Service helicopters are the two Firewatch cobras used in this Business Area that are piloted by contract helicopter pilots and maintained by contract.

## **4.4. Operations Base**

Command and control aircraft and pilots operate out of their Regional bases and move between Regions during the fire season.

### **4.4.1. Logistical Support**

Both Forest Service and commercial procured facilities support this Business Area.

## **4.5. Maintenance**

Aircraft used in this Business Area are WCF that are maintained by contract or contract aircraft that are maintained within the contract specifications.

## **4.6. Impacts to Stakeholders**

- Recommendations from this review may generate efficiencies or improvements to the current operation.
- The most significant anticipated impact is that future the aerial detection and command and control standards and agreements are consistent with current standards and interoperability within the Agency, DOI, and other federal and state agencies. The ICS system that is followed is interagency.

## **4.7. “As-Is” Issues**

- Approximately 72 percent of ATGS duties are currently performed by the militia, Administratively Determined (AD), and cooperators. Recent retirement of ATGS qualified Forest Service employees has created a shortage of qualified personnel within the Forest Service. There are approximately 68 Militia positions performing these duties on fire assignments.
- There is currently a shortage of ATGS qualified personnel because of retirements and minimal trainee development resulting in a shortage of ASM modules. ATGS has been identified in the Incident Qualification System as a shortage category position.
- More timely decisions, effective communications and technical analysis of fire situations are necessary to effectively use expensive airtankers to meet agency response in initial and extended attack.

- The current method of transferring data to the ground firefighters and Incident Commander with line scanner IR equipment requires low-level night flight. The printed maps and IR photos are ground delivered by low level dropping to incident personnel. New technology is available and could be used to improve the delivery via real-time electronic data downlink. IR strategic program management is under the Fire and Aviation National Operations Assistant Director in Boise. Aviation operational support is provided by Region 4 that includes two WCF aircraft on 7-day coverage with pilots and relief crew available to the Regions, as needed. Any potential expansion of the existing IR should be based upon a review by the Incident Management Teams and fire managers as to the effectiveness of the IR technology to support of the Forest Service Goals.
- Firewatch helicopters that are currently configured for ASM are not utilized as such because the pilots are currently not qualified in the ATP mission.
- Current Regional and Administrative Unit CWN contracts do not meet requirements to adequately perform the ATGS mission on a national level (multiple regions). The current typing of ATGS aircraft criterion in Exclusive Use or CWN contracts is the national standard for the tactical radio system/package. This results in a situations where low performance, single engine platforms with slip-in radio packages are filling resource orders with acceptable radio systems but are unable to perform in the fire and flight conditions. Utilizing contracts such as the leadplane contracts, with standardized performance for platform and avionics requirements, are desirable.
- Agency aircraft used in the Command and Control Business Area (over the past 30 years) are fully amortized with an Increased Replacement Cost (IRC) in the Working Capital Fund (WCF) program. Funds have not been retained or collected in the WCF accounts for the replacement aircraft. Identify possibility and process of obtaining replacement platforms in the WCF program.
- Training for ATGS candidates is currently independent and provided regionally and by other cooperators. This duplication of efforts leads to non-standardization and less trainee development. The training quality can also vary among regions and cooperators.

## **4.8. Conceptual “To-Be” Assessment**

### **4.8.1. Maintain Status Quo**

Aerial supervisory command and control resources will be responsible for directing safe, efficient and effective use of aerial resources during wildland fire incidents. Wildland fire conditions are becoming increasingly complex. The increased use of technology, with the incorporation of infrared equipped aerial platforms, will ensure future coordination of aerial resource support over interagency operations. The Missoula and San Dimas Technology Development Centers provide needed support and research development to the aviation and aerial suppression programs.

### **4.8.2. Organization**

- The Forest Service will realign the skills for duties and requirements of the WO ASM/ATGS Program Manager to improve the development of the full ASM configuration. This position will provide a primary contact for Regions to the nationally chartered Interagency Aerial Supervision Steering committee. This will combine National leadplane program and Regional ATGS programs to develop a National ASM program. A National program will address interagency issues, policy and develop methods and procedures for operation guides. The implementation of a national program will promote total mobilization of tactical aircraft and aerial supervision command and control resources to improve program efficiency.

- Establishment of ASM teams to staff agency aircraft. Aerial Supervision Modules combine the traditional leadplane and air attack missions into a single complementary system for greater utility and mission effectiveness. These ASM teams would be nationally controlled and managed at NICC, in direct coordination with regionally managed and controlled ATGS programs. ASM/ATGS program would continue to strengthen emphasis on initial attack with tactical aviation resources, in lieu of committing these resources to large-scale wildland fire incidents to meet public/management expectations.
- National management with Regional support would develop and maintain technical expertise and provide program management and oversight at the National Interagency Fire Center.
- National management of the ATGS/ASM program, with regionally supported ATGS programs, would change from the traditional Administrative Unit, with ATGS collateral duty positions, militia, and reliance on cooperators and ADs to fill resource orders. Input from Regional programs would determine the optimum number of ATGS positions at various levels to meet existing and future program workload. This will require combining units and/or program responsibilities based on program complexity and workload.
- Currently, some full-time ATGS positions are being filled at the GACC and Regional levels based on historical fire season needs. However, not all regions have filled their ATGS positions and future consideration is required for these regions. Future positions should provide additional ATGS staffing for Incident Management Teams and National ASM, as well as create a career ladder for mid-level aviation managers.
- Regions should evaluate the potential of future contracts for a complete ATGS platform, consisting of aerial platform, pilot, and ATGS meeting NWCG 310-1 qualifications and currency requirements.
- The Forest Service may benefit from exploring the use of emerging technologies, such as the C4ISR concept to improve coordination of operations for fire use. This may also aid line officers in accomplishing the appropriate management response. Initiate the emerging C4ISR concept for Forest Service fire operations. For additional information and a diagram of the potential for the C4ISR see also Appendix E-5 – Incident Command and Communication Organization – During a Fire.
- The C4ISR concept is that intelligence is necessary to the coordination of resources along with command and control. Surveillance and Reconnaissance are methods of obtaining this intelligence. As such, the Forest Service could benefit from developing an “Onboard Mission Control” concept as the airborne intelligence for Incident Command. Command and control refers to the ability to direct the ground firefighting forces. Adding computers to the grouping (Command, Control, Communication) reflects the fact that computers are required to enable this coordination. Computers, new satellite technology, and Automated Flight Following (AFF) system are also key components for accurate, real time data and intelligence. The existing Firewatch platform is currently proving the potential of this advanced concept.
- This concept is compatible with existing large fire support and initial attack, fire use monitoring, aerial resource command and control ASM/ATGS/leadplane. However, it enhances the total incident coordination at the operational level for all hazard incidents. Forest Service implementation will improve communications and will interface systems and procedures in place, or being implemented throughout the nation, for emergency preparedness. This further allows coordinated response to national emergencies by all Federal, State, and local agencies.
- The C4ISR concept will require training of existing personnel (aviation and non-aviation), on a National level, incorporating simulations to ensure that they are operating in a standard manner across Regions, to improve communication and understanding for more effective firefighting.

- Desired implementation of the concept is an aerial platform with standardized equipment consoles for communication and intelligence gathering. The console could then be inserted into a standard aircraft that is configured for equipment hookup and flown over the incidents or multiple fire situations with aviation personnel. The console would allow the direct communication of personnel such as incident operations, ground, ATGS air, and intelligence operating from the platform to make better and more efficient real-time decisions for control of incidents.

#### **4.8.3. Equipment**

- The Forest Service owns aircraft for specialized remote-sensing platforms. Aircraft platforms for these systems must be substantially modified to accommodate the detectors and associated equipment. Potential contractors that provide platform aircraft and crews to carry Forest Service IR systems would have to include modification (and de-modification) costs to their bid prices. The Forest Service would have to pay these modification costs each time a contract was issued to a new contractor. Over the long-term, it may be more cost effective to use Forest Service owned and operated airplanes.
- In the past, the number of lead planes/ASM required has been driven by the size and composition of airtanker fleet and fire season progression and intensity. Implementation of the number of ASMs from TARMS/TMOT and USDA Forest Service Aviation Strategic Plan 2003-2008 has been realigned with the NTSB recommendations for airworthiness and operational service life requirements for aircraft. The original strategic plan recommended 30 ASMs based on 44 large airtankers. Based upon the current (2006) availability of 19 airtankers, 12 ASMs are recommended to meet requirements. See also Appendix G-3 – NTSB Recommendation Extract.
- The Forest Service will utilize the Exhibit 300 process for evaluating aircraft and the cost effectiveness of owning versus leasing aircraft for the leadplane ASM role. These aircraft would function in the role of leadplane, air tactical platform and/or aerial supervision module. Aircraft should be 'purpose built' to function in the wildland fire environment. Staffing should be commensurate with the level identified as amended to staff the aircraft 7 days per week.
- Faster and newer aircraft equates to the need for fewer aircraft and reduced maintenance costs. Improved aircraft for the leadplane ASM role may result in improved performance, faster response to incidents, and the ability to relocate rapidly between Regions.
- National contract standards should be utilized for performance requirements for ATGS platforms. Continue Regional and Administrative Unit implementation for detection and utilization at the area and local levels.
- The Forest Service should conduct research in the integration of future technology and equipment would include the utilization of Unmanned Aerial Vehicles (UAV) incorporated with the development of C4ISR capabilities.

#### **4.8.4. Communications**

- Satellite communications for command and control aircraft
- Data link real time fire intelligence
- C4ISR Platform (Command Control Communication Computer/Intelligence Surveillance Reconnaissance)
- Full national implementation Automated Flight Following implement
- Dispatch enhancements for resource orders, maps, frequencies, weather forecasting, etc., for real time up link to and from aircraft

#### **4.8.5. Efficiencies Available**

- Faster and newer aircraft equates to the need for fewer aircraft and reduced maintenance costs
- Newer aircraft and engines are more fuel efficient with the newer technologies
- Real time information aids decision makers
- More efficient and accurate exchange of data, information, and intelligence
- Less training costs in standardized ASM
- Potentially improved accident rate (reduced)
- Future integration of UAV' for fire detection, intelligence, and real time information

#### **4.8.6. Future Customers or Stakeholders**

- Private landowners
- State and Federal land management agencies
- Industry land management companies
- Other all hazard response agencies
- General Public

#### **4.8.7. Future of Interagency Fire Center**

Improved communication assets with the C4ISR would allow greater data exchange with the NICC for improved decision making and asset prioritization.

#### **4.8.8. Wildland/Urban Interface Expansion**

- The need for command and control aircraft is greatly increased by WUI
- Improved Accuracy
- Improved Safety

#### **4.8.9. Performance Analysis**

- Aerial Detection and Command and Control does not have any performance gaps between the present and conceptual future assessment and none will result from the recommendations provided by this review. The work requirements, standards of operation, and ultimate performance would not be reduced from the present conditions.
- The recommendations within this Business Area are predominantly for evaluations to improve methods of funding aircraft, methods of contracting for ATGS platforms, efficacy of the IR Program and expansion of the Firewatch program. There would be no change in operation from the present until the effectiveness of any change was validated.
- Qualifying of Firewatch pilots at the ATP level would increase their capability for ASM mission performance. These are currently contract personnel backed up by qualified government helicopter pilots.
- Long-term expansion of the command and control aviation resource training will provide greater standardization and potentially improved performance during a fire incident.



## 4.9. Cost/Benefit Analysis

### 4.9.1. Historical Costs

#### 4.9.1.1. Personnel

Personnel costs for this Business Area were developed based upon the data call information from each of the Forest Service Regions regarding the amount of personnel working in this Business Area. Developed costs are calculated for a typical five-year period. For this assessment, the earliest base-year starts on October 1, 2008 and the base year annual cost is included in this review. Base Year Annual Personnel Cost: \$9,120,715.

#### 4.9.1.2. Equipment

Level	Number Contracts	Number Aircraft	Cost
Administrative Unit	191	242	\$10,404,417
Regional	55	65	\$1,325,645
National	0	0	\$0
<b>Total</b>	<b>246</b>	<b>307</b>	<b>\$11,730,062.00</b>

### 4.9.2. Cost Estimate Analysis

- Anticipated recommendations were evaluated based upon the historic costs. The analysis for each of the recommendations contains the estimated cost, the benefits, and estimated savings.
- Explore WCF for the various funding mechanisms to assist with the acquisition of replacement command and control aircraft.

### 4.9.3. Cost Estimate

The initial cost of this recommendation is the cost associated with researching the various funding mechanisms to determine the available methods of acquiring aircraft and the authority of the Forest Service to acquire aircraft through certain methods. It is assumed that the added cost to the Forest Service to perform this research would be minimal.

The table below illustrates the purchase price for fully equipped aircraft that could serve command and control functions.

Manufacturer/Model	Equipped Purchase Price (2006)
Beechcraft King Air B200	\$5,088,610
Beechcraft King Air C90GT	\$2,750,000
Pilatus	\$3,350,000

The 2003 Exhibit 300 conducted on the leadplanes showed that the expenses associated with acquiring 20 Government owned leadplanes are approximately \$86,907,157 over a 10 year period (\$4,345,358 per aircraft). These expenses include both fixed and variable expenses. By comparison, the total expenses associated with leasing 20 leadplanes are approximately \$164,426,177 over a 10 year period (\$8,221,309 per aircraft). These expenses include fixed and variable, insurance, and lease costs.

#### **4.9.4. Benefits Estimate**

The Forest Service currently leases aircraft for leadplane/ASM missions. In the past, the Forest Service has owned a fleet of aircraft to accomplish these missions. There is potential for significant long-term cost reduction.

#### **4.9.5. Savings Analysis**

- Research of the currently available funding mechanisms, in addition to current aircraft requirements, will determine if there are realizable savings resulting from utilizing one mechanism versus another.
- The 2003 Exhibit 300 on the leadplanes showed potential cost savings through utilizing government owned leadplanes instead of leased leadplanes.

#### **4.10. Recommendation – Aviation Assets**

Explore Agency-owned, lease-to-own, and contract options from the OMB Exhibit 300 business case study/analysis for aviation assets with the various funding mechanisms and authorization to assist with the replacement of leadplane/ASM aircraft.

##### **4.10.1. Cost Estimate**

- Data collected from the Regions shows that the average annual cost of leased leadplanes was approximately \$313,200 in 2005. By comparison, the average cost of contracted leadplanes was approximately \$436,358.
- The 2003 Exhibit 300 conducted on the leadplanes showed that the expenses associated with acquiring 20 Government owned leadplanes are approximately \$86,907,157 over a 10 year period (\$4,345,358 per aircraft). These expenses include both fixed and variable expenses. By comparison, the total expenses associated with procuring 20 leadplanes using long-term leases are approximately \$164,426,177 over a 10 year period (\$8,221,309 per aircraft). These expenses include fixed and variable, insurance, and lease costs.

##### **4.10.2. Benefits Estimate**

- Currently leasing and contracting for aircraft may be more expensive than Agency owned
- As demonstrated by the above analysis, there is potential for significant long-term cost reduction through greater utilization of agency owned versus leased aircraft.
- Ensures long-term availability, no longer reliant on market.
- Standardization for agency for aircraft performance, maintenance, pilots and training.

##### **4.10.3. Savings Analysis**

- Dollars per year for contracted & Agency owned; use 20 yr life cycle; Potential to re-invest savings into new aircraft.
- The 2003 Exhibit 300 showed potential cost savings through utilizing government owned leadplanes instead of leased leadplanes.

#### **4.11. Recommendation – ATGS Platforms**

Evaluate the potential of contracting for multiple ATGS platforms utilizing a single national contract similar to the national helicopter contracts. These ATGS aircraft platforms would consist of an aerial platform and pilot. The Agency will provide the ATGS.

##### **4.11.1. Cost Estimate**

114 Administrative Unit and 9 Regional level ATGS aircraft were contracted during FY 2005 at a cost of \$6,171,536. These aircraft were contracted using 85 individual contracts.

The TARMS Management Options Team Final Report, dated January 2000, estimated that the purchase costs of ATGS aircraft platforms are \$2.7 million for new aircraft, \$1.2 million for used platforms, and \$352,000 per year for leased aircraft. Operation and maintenance costs were projected to be \$182,000 per year, per aircraft for government owned aircraft; and \$102,000 per year, per aircraft for leased platforms. The report also estimated that the cost of one ATGS, working for six months, is approximately \$30,000 per year plus \$10,000 in training and development costs for a new ATGS.

##### **4.11.2. Benefits Estimate**

- This would allow interoperability between the various Regions with the capability to operate in varying climatic and altitude conditions and meet requirements in the ICS during interagency operations.
- This would increase standardization and quality assurance through national direction and more efficient inspections. The TARMS Management Options Team Final Report states that standardization among aerial supervision roles has the potential to facilitate aerial supervision and safety.
- This would provide consistency and ease of contract administration.
- The standardized contract would be more efficient at all levels from contract issuance to operations resulting in better utilization of limited ASM/ATGS resources.

##### **4.11.3. Savings Analysis**

- Single contracts are generally less expensive than the sum of multiple contracts; longer contract periods lead to savings.
- National contracts may have longer contract periods leading to potential savings in availability and flight time costs. See Paragraph 7.8.2.2.3 for an example of the effects that longer contract lengths have on daily availability rates.

#### **4.12. Recommendation – Validate IR Program**

Validate the efficacy of the IR Program with the primary customers, including Incident Management Teams, Line Officers, and Natural Resource Specialists. Also evaluate the adequacy of the technology being used to assist decision makers. Note: This program was previously studied in FY 2005; however, peer review of this study indicated that costing document for this study may require revalidation.

##### **4.12.1. Cost Estimate**

Cost of reviewing the current IR Program; minimal cost to the Agency. Survey managers at national meetings and workshops. Review of program funding and expenses.

**4.12.2. Benefits Estimate**

- The program could potentially be realigned with IR real time technology similar to the Firewatch program. Real time information assists with appropriate management response necessary to protect resources, enhanced firefighter safety.
- Reviewing of program ensures other forest service programs are aware of capabilities and direction for use of future technology and capabilities.
- New flight technology may enhance efficiency and reduce cost and risk of aviation missions.

**4.12.3. Savings Analysis**

Savings would be determined by the study. The IR Program cost is currently approximately \$2.1 million plus flight costs annually. These costs based on IR and aircraft age issues and fuel cost are expected to increase.

**4.13. Recommendation – Evaluate Firewatch Program Expansion**

Evaluate Firewatch program expansion for other Agency programs, such as law enforcement. Consider sharing Firewatch resources among Regions and the interagency community for large fire support and other Agency natural resource missions.

**4.13.1. Cost Estimate**

Two aircraft were developed using Congressional Special Project funds and administered in the WCF Aircraft Program for approximately \$2.8 million. On average, the hourly flight rate for these two aircraft is approximately \$1,354/hour and the average Fixed Ownership Rate (FOR) is approximately \$271/day. In 2006, the helicopters flew a total of 821 hours with an average contract length of 125 days. Other operation costs associated with the Firewatch program are illustrated in the table below.

Maintenance & Fuel Support (122 days + 90 days heavy winter maintenance)	\$361,485
Contracted Pilots (90 days per aircraft)	\$303,042
Contract Data Van Operators	\$87,043
Maintenance Vehicle & Fuel Support	\$6.90 /mile

**4.13.2. Benefits Estimate**

- Added-value to the Agency and effectiveness as a multi-platform aircraft for intelligence and command and control (ASM).
- Agency/unit programs become aware of technology and in house capabilities.
- Availability nationally for fire seasons in other geographic areas. Interoperability for non-fire season and agency missions.
- Greater utilization of the Firewatch resources and technology. One example in this area is the recent request from Agency law enforcement to utilize the aircraft and IR technology in border patrol mission and other law enforcement duties.

#### **4.13.3. Savings Analysis**

- Potential savings in future capabilities and technology improvements.
- Real time data and download capabilities for decision makers.
- Reduced cost by spreading fixed costs over longer time periods and sharing costs with other programs. For instance, the operating costs shown in the table above could be spread out among multiple programs, preventing one program from absorbing the entire cost.

#### **4.14. Recommendation - Qualify Firewatch pilots at ATP level in order to be able to fulfill the ASM missions.**

##### **4.14.1. Cost Estimate**

Training costs for agency pilots would include travel and flight time for formal training including crew resource management. The TARMS Management Options Team Final Report, dated January 2000, estimated that the initial training and development cost for one new Air Tactical Pilot (ATP) is approximately \$25,000. Additionally, the report estimated that the total annual cost of a GS-12 ATP is approximately \$70,000. However, since the Agency will be qualifying employees already experienced as Firewatch pilots, the additional cost to the Forest Service will not be the total training and personnel cost. It is estimated that the total additional cost to qualify Firewatch pilots at the ATP level would be approximately 1/3 of the cost of new ATPs. This equates to approximately \$31,667 per ATP ( $1/3 \times \$95,000$ ).

Additional Flight time and experience would be on actual fire missions as trainees.

##### **4.14.2. Benefits Estimate**

- Added-value to the Agency and effectiveness as a multi-platform aircraft for intelligence and command and control (ASM).
- Additional ASM's available for fire support.
- Dual role capability can reduce flight time and number of aircraft over incidents.
- Potentially lower suppression costs and natural resources damage.
- Enhanced aviation and ground safety.

##### **4.14.3. Savings Analysis**

- Overall cost savings in flight time and number of aircraft required on incidents. The ASM could perform multiple functions from one platform. This would allow interoperability between the various Regions with the capability to operate in varying climatic and altitude conditions and meet requirements in the ICS during interagency operations.
- These missions include ATGS, leadplane, IR, video, and mapping.
- As stated in the TARMS Management Options Team Final Report, the utilization of ASMs may result in a reduction in suppression costs and natural resources damage and enhanced aviation ground safety.

#### **4.15. Long-term Recommendations**

Recommend the development of long-term funding and implementation strategy for aviation training and ASM development. One possible modification could be a change to the existing Forest Service approach to initial ground training for leadplane pilots and geographic area training of ATGS candidates. An example could be a National Aerial Supervision Academy, that includes all command and control aviation resource training. This would consolidate leadplane pilot training and ATGS training into an interagency aerial supervision academy, and could include command and control resources, interagency flight training, S-378, professional flight simulator training and Crew Resource Management.

##### **4.15.1. Cost Estimate**

- Cost of travel/per diem to training location should be offset by the gains in efficiency and reductions in the number of training sessions currently being conducted.
- The TARMS Management Options Team Final Report estimated that ASM training costs are \$15,000 per module. This cost includes both simulator and resource management costs.
- Region 1 estimated that annual training costs including course materials, simulator time, travel, instructors, and course coordination is \$10,500. Region 5 estimated that a two week ATGS training course costed approximately \$25,000. However, the costs for these two regions do not include the additional flight time that is an essential part of the ATGS training.
- Region 3 estimated that the cost of “refresher” training courses range from approximately \$3,000 to \$5,000, including materials, travel, and course instructors. Again, this training cost does not include additional training flight time that is required.

##### **4.15.2. Benefits Estimate**

- Standardized training would contribute to lowering training costs. This would include ASM training for all candidates with simulator based equipment, such as that developed at McClellan, Sacramento (R-5). Use of the R-5 simulator would incorporate ATGS/ASM annual flight exercises for refresher training.
- The combined training would improve quality of training for ATGS and pilots to perform and train in the ASM Team configuration.
- Improved efficiency and quality of instruction and training devices. Current regional training approach.
- Interagency academy and facilities already exist for both classroom and airport facilities. These facilities have the capability of handling future numbers of trainees. Therefore, the additional facility costs resulting from this recommendation are expected to be minimal.

##### **4.15.3. Savings Analysis**

- Consolidation will result in fewer instructors, with capabilities to train more people at one time.
- Coordinated flights and use of simulators and scheduling will reduce overall flights and fewer aircraft and hourly flight costs.
- Reduction of overhead and management costs in scheduling and administration time.

#### **4.16. Civil Rights Impact Assessment**

A Civil Rights Impact Assessment (CRIA) is required to identify and categorize the civil rights impacts of implementing any realignment initiative that will potentially affect employees. A CRIA for Forest Service employees will be developed if the Fire Executive Council recommends changes to staffing during their follow on studies.

#### **4.17. Systems**

An overview of the systems used by this Business Area to complete the tasks and activities under review is as follows:

- FAIRS (Federal Aviation Interactive Reporting System)
- AMIS (Aviation Management Information System)
- AFF (Automated Flight Following)
- PROP (Personal Property Management Information System)
- WCF (Working Capital Fund Accounting Database)
- PCMS (Purchase Card Management System)
- IAS (Integrated Acquisition System)
- EaTIS (Equipment and Training Inventory System)
- ROSS (Resource Order and Status System)
- NFC Inquiry System (National Finance Center)
- FFIS (Foundational Financial Information System)
- IWEB (a web-enabled suite of applications for various business areas)
- AgLearn (a web-based training system)
- IBM Network (electronic records)
- FS Lotus Notes (agency email system)
- FS Travel (travel voucher creation and submission system)
- FedTraveler (web-based travel reservation system)
- Paycheck

These systems will not be affected by the recommendations within this Business Area.

#### **4.18. Acquisition Strategy**

Acquisition strategy is not applicable for this Business Area Project Lifecycle Schedule.

Project lifecycle schedule is not applicable for this Business Area.

##### **4.18.1. Requirements**

The standards and performance measures for requirements are not applicable for this Business Area.

## **4.19. Summary of Recommendations**

### **4.19.1. Short-term Recommendations & Efficiencies**

- Explore WCF for the various funding mechanisms to assist with the acquisition of replacement command and control aircraft.
- Explore Agency-owned, lease-to-own, and contract options from the OMB Exhibit 300 business case study/analysis for aviation assets with the various funding mechanisms and authorization to assist with the acquisition of replacement command and control aircraft.
- Evaluate the potential of contracting for multiple ATGS platforms utilizing a single national contract similar to the national helicopter contracts. These platforms would consist of an aircraft and pilot. The Agency will provide the ATGS.
- Validate the efficacy of the IR Program with the primary customers, including Incident Management Teams, Line Officers, and Natural Resource Specialists. Also evaluate the adequacy of the technology being used to assist decision makers.
- Evaluate Firewatch program expansion for other Agency programs, such as law enforcement. Consider sharing Firewatch resources among Regions and the interagency community for large fire support and other Agency natural resource missions.
- Qualify Firewatch pilots at ATP level in order to be able to fulfill the ASM missions.

### **4.19.2. Long-term Recommendations**

Recommend the development of long-term funding and implementation strategy for aviation training and ASM development. One possible modification could be a change to the existing Forest Service approach to initial ground training for leadplane pilots and the geographic area training of ATGS candidates. An example could be a National Aerial Supervision Academy that includes all command and control aviation resource training. This would consolidate leadplane pilot training and ATGS training into an interagency aerial supervision academy and could include command and control aviation resources, interagency flight training, S-378, professional flight simulator training and Crew Resource Management.



## 5. Business Area C – Aerial Fire Suppression – Airtanker and Large Helicopter

### 5.1. Business Needs Assessment

#### Forest Service Goals

This Business Area supports the Forest Service Strategic Goals by reducing the risk from catastrophic wildland fire by providing suppressants and retardants for initial and extended attack to contain forest/wildland fires, to prevent catastrophic spread by aerial suppression using airtankers and helitankers, dropping suppressants on or adjacent to wildland fires.

### 5.2. Business Area Mission Fulfillment

- This business area includes the personnel and resources involved necessary to support the large volume aerial delivery of approved fire retardants or suppressants, on wildland fires, through the use of contract airtankers and helitankers, to include Type I helicopter buckets, in direct support of ground firefighters. This area may include bucket water delivery using Type II helicopters when on a direct mission not connected with helitack or smokejumper missions. The area includes government personnel managing, maintaining, and operating the tanker bases, storage facilities, mixing and pumping equipment, and MAFFS equipment.
- Contracted large helicopters, including helitankers, are used to support initial attack, extended attack, and large fire suppression operations on an interagency basis. Large helicopters directly support and/or work for ground firefighters, incident commanders, air tactical group supervisors, helicopter coordinators, aerial supervision modules and Incident Management Teams. Type I helicopters primarily drop water or retardant. They also are available and do perform other logistical missions. Throughout this document any reference to Type I helitankers includes other large bucketed helicopters whether Type I or Type II helicopters that are capable of dropping large volumes of retardants or suppressants.
- Airtankers/helitankers provide large volume, aerial delivery of approved fire retardants or suppressants on forest and range fires during initial and extended attack periods. Initial attack requires rapid deployment of mobile resources, propositioned by predictive services, for maximum efficiency. Extended attack capability is increased by multiple resource deployment, to nearby support bases, for improved turn-around time thereby increasing the total delivery per aircraft hour. The aerial delivery of suppressants reduces the risk to personnel and property when ground tactics cannot safely be utilized or is used to retard the spread of fire until ground forces can arrive.
- The *NATS I and II - National Airtanker Studies*, and the *Wildland Fire Management Aerial Application Study*, *National Airtanker Study*, *TARMS – Tactical Aerial Resource Management Study* and *TMOT – TARMS Management Options Team* identified the need for aerial delivered suppressants and retardants:
  1. Support initial attack to maintain 98 percent success rate and 2008 Forest Service performance objective of 99 percent. See Paragraph 2.1.1.
  2. Prevent spread (minimize large fire suppression operations and costs)
  3. Consider adverse terrain, weather, and fuel conditions when applying retardant
  4. Provide at risk structure protection
  5. Act as a force multiplier for ground firefighting forces

- The application of fire suppressants has the potential of being detrimental to sensitive ecological areas both in the drop zone (on fire) and in the areas around the tanker bases. Analysis is continuing to determine appropriate application of various fire retardants, water enhancers, fire suppressants and water in the ongoing fire suppression action. Expertise is necessary for the application and the appropriate placement of the fire chemical with various options for the various delivery systems. As such, the aerial command and control structure has a major role in determining the specifics for the individual delivery.

### **5.3. Justification for Business Area**

- Aerial delivery of retardants or suppressants on initial attack is critical to provide time for ground firefighters to arrive on the incident and contain the fire. Following initial attack the use of aerial delivered retardant or suppressant provides the ground firefighter support in controlling fire lines and protecting property as a force multiplier of the ground firefighter.
- Large fixed wing airtankers and Single Engine Airtankers (SEATs) are used primarily for initial attack because of their ability to access emerging fires rapidly, and retard or suppress the spread of the fire until ground forces can arrive and contain the fire. Fixed-wing aircraft have the advantage of greater range, based on a faster cruise speed than helicopters. Large fixed wing airtankers and SEATs can be used to support large fires if tactics are justified.
- Helicopters are used to drop retardant or suppressant in support of ground forces and have either fixed tanks or buckets. Large helicopters can be used for either initial attack or large fire support, and historically have been used for large fire support. In recent years, large helicopters have successfully moved into the initial attack role. Helicopters have the advantage of being able to land in and work out of remote areas in close proximity to fires, and if suppressants or retardants are in close proximity to a fire, can deliver liquids to fires at a much cheaper rate per gallon. Tanked helicopters are well suited to work in the Wildland Urban Interface environment, since they do not have an external load (bucket) that could be inadvertently jettisoned.

### **5.4. Assumptions and Constraints**

The following assumptions and constraints are an expansion to those stated in Paragraph 2.3.

#### **5.4.1. Assumptions**

- The helicopter industry will remain adequate to provide needed helicopters with the capability for heavy lift buckets and fixed tanks. However, there may be shortages as described in Paragraph □.
- Strategic bases will be required for airtankers to provide the storage, mixing, and loading of chemical retardants and suppressants.
- A more modern aircraft is needed to replace the current airtanker fleet. Aircraft must now meet the recently established Forest Service approval process for continuing airworthiness and structural integrity in the fire environment.

#### **5.4.2. Constraints**

- Airtanker bases are required for preparing (mixing) retardants and suppressants at an airfield sufficient to support the respective airtanker (runway length and load capacity).
- Airtanker bases must be secured against potential terrorist activity.
- Currently, liabilities of the aircraft operation are assumed by the Government per Public Aircraft, Public Law –106-181. See *also* Appendix N – Public Aircraft, P.L. 106-181.
- Authorization to deviate from Federal Aviation Regulations requires the FAA Grant of Exemption No. 392 for authorization for flights under 500 feet and in congested areas. The requirement of the leadplane and pilot to guide airtankers at low altitudes places greater responsibility on the leadplane pilot to safely guide the large airtanker in these flight profiles.
- There are periods when there are shortages of Type I helicopters as a result of competing industry requirements i.e., energy exploration and overseas firefighting operations.

##### **5.4.2.1. International Resource Agreements**

Airtankers and helitankers operating along international borders are required to operate in accordance with the various Border Agreements during firefighting missions.

#### **5.5. Current “As-Is” Assessment**

##### **5.5.1. Basic Facts of Aerial Fire Suppression**

Aerial Fire Suppression operations revolve around the following basic facts:

- The use of aerial delivered suppressants or retardants can reduce the fire intensity and rate of spread to a more manageable level for ground firefighter tactics
- Airtankers and helitankers are usually modifications of military or commercially available aircraft to disperse suppressants or retardants. A wide variety of aircraft types can be dispatched based upon the specific fire conditions, behavior, location, and support requirements. Select aircraft can be used for multiple capabilities with minor conversions for other missions of personnel or cargo transport.
- The range and speed of airtankers allow them to be rapidly deployed to any area in the United States and deliver a large volume of suppressant.
- Helitankers and bucketed large helicopters can operate out of any location close to the incident, with the advantage of multiple water drops in a short time period. Helitankers may be located in close proximity to high fire potential areas to minimize turn-around flight time.
- Helicopters have the ability to operate anywhere that has a suitable landing area, but still require some infrastructure and management personnel.
- Helitankers can deliver large quantities of suppressants and retardants to a specific area for maximum effectiveness to achieve tactical objectives. Helitankers are capable of performing specific and accurate distribution of suppressants and retardants in the amount applicable for the given fire.

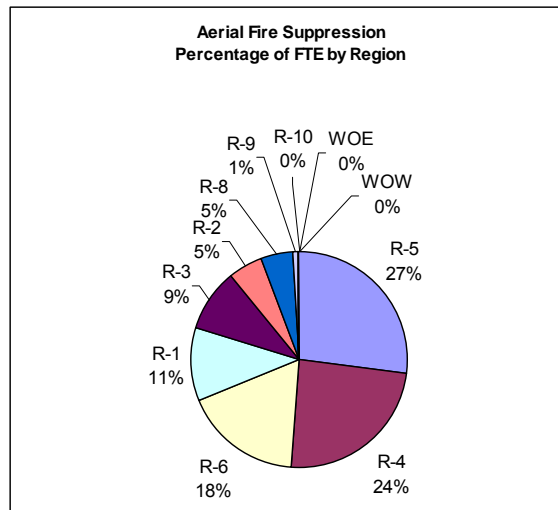
**5.5.2. Personnel**

A summary of those personnel involved with Aerial Fire Suppression including airtanker base managers and operational personnel responsible for preparing the retardant chemicals and loading the tankers plus other associated support personnel, by Region, is included at Appendix F - Government Personnel Summary by Region.

- Since all of the airtankers and helitankers are provided by contract that includes associated pilots and crewmembers, there are no Government pilots flying suppression missions. The only pilots performing work associated with this Business Area are those performing quality assurance, training, and administrative duties.
- Total personnel within the Aerial Fire Suppression Business Area are shown in the following table. The total of 736 permanent, non-Militia personnel represents 117.06 FTE. Because of the seasonality and dispersion of the work during the fire seasons, the work performed requires a larger number of positions rather than just the calculated FTE.
- This Business Area includes Militia personnel who perform other duties within the Forest Service and perform mission work primarily during fire incidents or preparing for the incidents. Many of the personnel only work a small portion of the year. However, during peak fire seasons, the full number of individuals involved may be working simultaneously.
- To account for the severity of the fire seasons, additional qualified temporary personnel and Militia personnel are used, who are qualified for the work required within this Business Area. As a result, 2,278 individuals are used to perform the actual work in this Business Area or provide direct support to it. The number of locations shown display the wide distribution of personnel among the many areas within the Regions at all levels of the Forest Service.

	Permanent			Temporary			Total Positions
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations	
<b>Non-Militia</b>	736	117.06	108	135	23.04	25	871
<b>Militia</b>	1257	15.02	60	150	6.65	32	1407
<b>TOTAL</b>	1993	132.08	168	285	29.69	57	2278

The distribution of the FTE is displayed in the following pie chart that shows the percentage of total FTE by Forest Service Region. As shown, 89 percent of the personnel are concentrated in five of the nine Regions (1, 3, 4, 5, and 6).



The Data call received from the Regions listed all personnel associated with aviation. However, position descriptions among Regions vary. This complicates the task of drawing Region-to-region comparisons. A sample of the positions includes: Airbase Manager, Ramp Manager, Airbase Technician, Helicopter Manager, Forest Aviation Officer, Helicopter Crewmember, Aviation Dispatcher, Senior Firefighter, Aviation Officer (all levels), etc.

**5.5.2.1. Personnel Analysis**

- The following analysis was performed based upon the data received from the Regions regarding the Business Area of Aerial Fire Suppression. While most of the personnel are spending the majority of their time within this Business Area, many of those performing functions in this business area are also performing work in other business areas and in non-aviation activities work for the Forest Service that is outside the scope of this review. These individuals are spread out between the Regional Offices and other Administrative Units within the Forest Service across the country. The 35 personnel that are performing 100 percent of their time in this Business Area equate to 15.96 FTE because these personnel are primarily full-time seasonal personnel. The data presented shows that a large percentage of the personnel (55 percent) performed less than 20 percent of their time devoted to Aerial Fire Suppression support work.

<b>Percentage of Effort for Aerial Fire Suppression</b>	<b>Count of Personnel</b>	<b>Number of FTE</b>
100% Suppression	35	15.96
Total Suppression 50 < 100%	77	31.53
Total Suppression 20 < 50%	217	40.73
Total Suppression 0 < 20%	408	28.83
<b>Total</b>	<b>737</b>	<b>117.05</b>

**5.5.3. Contracts and Specifications**

- The Washington Office West aviation unit and contracting group are responsible for developing, soliciting, and awarding the Forest Service airtanker contract and the subsequent inspection and approval of large airtankers and pilots. They are also involved in the overall coordination of the technical aspects of the airtanker program, including liaison with Interagency Airtanker Board (IAB) and the Department of Interior, Aviation Management Directorate (AMD), formerly the Office of Aircraft Services (OAS).
- The IAB is a group composed of representatives of agencies using fixed-wing airtankers and helitankers. The Board develops and recommends tank and gating system design criteria to the National Interagency Aviation Council (NIAC), manages the process of approving candidate airtankers proposed by operators, maintains records of the airtanker approval process, and grants interim and final approval of specific airtankers. Such approval is required prior to award of airtanker and helitanker contracts.
- Contracts for this area are primarily for aircraft used as airtankers, and helitankers, support base maintenance, and equipment maintenance for those supporting fire suppression missions. Contracts include associated pilots, maintenance support, and some associated equipment.
- A summary of the Forest Service contracts by Region is included at Appendix H – Forest Service Contracts.

#### **5.5.3.1. Specific Task Requirements**

The Forest Service provides management and administration of the exclusive use and CWN programs and direct management of the aircraft.

#### **5.5.4. Equipment**

##### **5.5.4.1. Airtanker**

- Contractor owned and operated large multi-engine airtankers operate from Forest Service airtanker bases. All of the Federal large airtanker contracts are administrated through the Forest Service National Contracting Office. Their primary intent is for initial attack. There is also significant use of airtankers for large fire support to reduce the spreading of the fire.
- The airtanker bases contain the chemical storage and mixing facilities plus the equipment for pumping the mixed chemical into the aircraft. The bases from which contractor aircraft operate are located within the close proximity of National Forest/Grasslands. This ensures the flight time between drops is reduced. Bases must consider security and environmental issues because of the storage and spill potential of the fire suppression and retardant chemicals.

##### **5.5.4.2. Modular Airborne Firefighting Systems (MAFFS)**

- This is a supplemental resource utilized when all contract airtankers are committed to fires and additional assistance is needed. C-130H model military cargo airplanes operated by the Air National Guard and Air Force Reserve units provide this service using the modular retardant delivery systems housed at these units.
- The eight Forest Service owned MAFFS units are pre-staged, with two units at each of three National Guard and one Air Force Reserve locations to be inserted into C-130 aircraft. The units are maintained by Forest Service contracts and overseen by Forest Service personnel.
- The Washington Office West aviation unit is directly responsible for the MAFFS program. This role includes overseeing maintenance of the units and associated equipment; developing and procuring modifications of the equipment; and developing and implementing training for military pilots and loadmasters. This unit annually publishes the MAFFS operating plan and coordinates all other operational matters with the military units. They also provide annual training to Forest Service and interagency personnel who support the MAFFS mission including liaison officers, leadplane pilots, and base managers.
- The use of MAFFS requires a reimbursable payment to the National Guard or Air Force Reserve for the aircraft services, logistical support, and personnel costs.
- Extensive ground support is required when using the MAFFS. The Air Force requires a large number of support personnel for MAFFS activation and the cost is billed to the Forest Service. The maintenance of the MAFFS units (not aircraft) is performed by Forest Service contract personnel, located at each of the Air Force bases where the equipment is stored.

##### **5.5.4.3. Type I Helicopter**

- There are no agency-owned aircraft or agency pilots operating Type I helicopters. The current program consists of contracted aircraft, pilots, and maintenance. Management and administration of the exclusive use and CWN programs and direct management of the aircraft are provided by the Forest Service. Exclusive use Type I helicopters are hosted by Regions and strategically positioned on individual forests/grasslands that provide helicopter management and designated bases.

- Type I CWN helicopter use is a direct product of each fire season's severity. When the supply of exclusive use helicopters is exhausted, individual incidents may order CWN aircraft and helicopter management through the dispatch system. Regions may also order CWN helicopters and management to provide additional firefighting capability. The Type I exclusive use program was initiated to provide quicker initial response and to counter the high costs of CWN Type I helicopters. The National exclusive use program was expanded from 4 to 16 helicopters after the loss of large fixed-wing airtankers due to airworthiness issues. It is expected the exclusive use Type I program will be expanded to 20 helicopters in the future.
- Sixteen exclusive use Type I helicopters are positioned/deployed throughout the nation on various National Forest/Grasslands. Call-when-needed (CWN) Type I helicopters are ordered on an as needed basis and procured using best value practices. CWN Type I helicopters are most often used for large fire support.
- The Agency capability in 2005 consisted of the 16 National Exclusive use Type I Helicopters supplemented by two additional helitankers added for the 2005 season. In total these helicopters worked 1448 contract days and 110 CWN Type I Helicopters worked 660 days. Government personnel provided management and contract administration for these aircraft.
- The agency is currently providing 7-day management for 16 exclusive-use Type I helicopters by a variety of means. In many cases, the majority of funding for these positions is borne by suppression funds (charged to fire codes).
- Employees used to manage these assets are from existing initial attack helicopter crews, which in essence depletes initial attack crews of needed personnel and does not provide the continuity of oversight. Qualified militia are also potential candidates for helicopter management, but Type I helicopters are never at a "home" base, and locating a militia employee available to accept a summer-long assignment is very rare.
- Type I helicopters are always at a premium, and by design they are continually reassigned to areas of high need. This equates to a very challenging management environment, in which continuity of oversight becomes extremely important. Type I helicopters have approximately 8 vendor personnel attached to them including pilots, mechanics, and fuel truck drivers, and the coordination required to successfully oversee this program is substantial.
- Helicopter managers are Contracting Officer Representatives and enforce contractual standards including all maintenance standards, prepare payments documents daily, help geographical area coordination centers make decisions on efficient aircraft use, and ensure that vendors are following the direction of the employing agency. Helicopter managers are the primary Quality Assurance representatives for the agency.
- One example of a quality assurance function provided by Type I Helicopter Managers is with maintenance issues. Type I helicopters require a great deal of maintenance on a daily basis, necessitating vendors to have access to mechanics 24 hours a day. At times, vendors are unable to keep up with required maintenance; however, this information may not get transferred to agency managers. Helicopter managers ensure that vendor helicopters are available for flight during the mandatory available period, or are not paid for the availability period. As an example, during the fire season of 2006, the Helicopter Manager that managed the Heavy Lift Skycrane was able to document 145 hours of unavailability (10 days total), which equated to \$75,000. Without real-time, daily oversight, much of that unavailability may not have been captured.

#### 5.5.4.4. Aircraft Capacity and Types

##### Fixed Wing – (Single to Multi-Engine)

Type	Capacity
Type I	3,000+ gallons (future possible super tanker with 10,000 to 20,000 gal per delivery)
Type II	1,800 – 2,999
Type III	600 – 799 gal
Type IV	100 – 599 gal SEAT Single Engine Airtanker

##### Rotary Wing/Helicopter Tankers

Type	Capacity
Type I – Large	600 – 3,000 capacity with installed tanks or buckets
Type II – Medium	250 -599 gallon cap
Type III – Small	up to 249 gallon

#### 5.5.5. Pilots

The current program consists of contracted aircraft, pilots, and maintenance. There are no agency-owned aircraft or agency pilots operating Type I helicopters for this Business Area.

#### 5.5.6. Operations Bases

- Fixed-wing airtankers and helitankers are different in both operational characteristics and support requirements.
- Fixed-wing airtankers operate from fixed-operating bases located at airports, and have facilities capable of pumping retardant into airtankers. These fixed bases are staffed with permanent employees, and depending on the base, either use militia employees for mixing retardant, or have full-service retardant contracts.
- Helitanker bases (Helibase) can be hosted at a variety of different locations and are generally collocated with existing helicopter initial attack crews. They do not need runways; however, they still need appropriate approach and departure clearance areas and defined landing and parking areas.

A list of bases is included at Appendix J - Smokejumper Bases and Satellites.

#### 5.5.7. Logistical Support

The only logistical support is to provide the bases and associated equipment plus the chemical retardants.

#### 5.5.8. Aircraft Maintenance

All maintenance is performed by contracted aircraft vendors.



## **5.6. Impacts to Stakeholders**

- Recommendations from this review may generate efficiencies or improvements to the current. Recommendations may result in an impact to stakeholders. This is assumed that the same level of performance and quality are present with a contracted function.
- The most significant anticipated impact is that future Aerial Fire Suppression – Airtanker and Helitanker – standards and agreements are consistent with current standards and interoperability within the Agency, DOI, and other federal and state agencies. The existing contracts for airtankers and helitankers follow interagency standards.

## **5.7. Issues**

- Airtanker Base closures identified in previous studies (NATS I, II and others) have not been executed. This results in funding of bases where the need is no longer justified. Some bases are jointly managed by federal and state entities.
- The availability of CWN helicopters is a direct function of competing demands for commercial use of the helicopters such as oil exploration. The 2006 fire season capability was impacted by the unexpected shortage of CWN helicopter availability. Increased exclusive use helicopter contracts would have improved aircraft availability during the peak season.
- The airtanker industry has difficulty meeting modern fleet requirements. Airtankers are also required to have an operational service life as recommended by the National Transportation Safety Board's recommendation A-0429. There are currently no purpose built aircraft that are compatible with the current Forest Service airtanker base infrastructure and that are certificated by the FAA for use in the United States.
- During periods of high fire activity the fleet of commercially available airtankers is periodically insufficient to meet the retardant delivery needs of the wildland firefighting community. To mitigate this shortage, the national Multi-Agency Coordinating Group located at NIFC activates certain aviation military units, known as Modular Airborne Firefighting System (MAFFS) units. The MAFFS units serve the entire interagency wildland fire community, but the considerable expense is funded solely by the Forest Service.
- Some airtanker bases are only used during fire season but must be maintained year round.

## **5.8. Conceptual “To-Be” Assessment**

### **5.8.1. Maintain Status Quo**

- The current airtanker and helitanker programs as described continue as a viable complement to the overall Forest Service firefighting mission. This supports initial attack goals and large fire support and should be continued.
- The control and coordination of the airtankers and helitankers as national assets should remain at NIFC to ensure these expensive assets are deployed to the highest priority incidents.
- Both large airtankers and aerial fire suppression helicopters (helitankers and Type I bucket carrying helicopters) should continue to be National Shared Resources (NSR), and as such be directed by the national coordinating system.
- When MAFFS are activated, the cost to the agency is substantial. The military requires 50-60 personnel for every two airplanes deployed, and several Agency personnel must be assigned to the MAFFS units to liaison and provide logistical support. Currently, the Forest Service is the sole funding provider for all MAFFS activations. The Forest Service should either employ a cost sharing strategy with other user agencies and states, or eliminate the MAFFS program.

- In cost per flight hour, a typical MAFFS mission is more than twice as the cost of a commercial airtanker.

#### 5.8.1.1. Organization

The *Wildland Fire Management Aerial Application Study*, dated October 17, 2005, recommends consolidating large airtanker bases from 38 to 23; 11 of these are a reduction and four are already closed. Full-time staffing at these bases would no longer be needed. The remaining bases would be capable of supporting the current airtankers to include location distribution to accommodate fire support. The 11 bases listed below could be converted to reload bases or potentially transferred to cooperators who are already heavily using the respective facilities (any change would require significant coordination):

- Grangeville (convert to SEAT base)
- Kalispell
- Pueblo
- Rapid City
- Fort Huachuca
- Bishop
- Santa Barbara
- Stockton
- Medford
- Troutdale (reload base)
- Lake City

The four bases listed below have no future aviation-related requirements and have been closed for aviation purposes. If they the agency no longer needs them for other purposes, the bases may be permanently closed or transferred to avoid any recurring maintenance costs.

- Fort Smith/Fayetteville (closed)
- Knoxville (closed)
- London (closed)
- Wyers Cave (closed)
- The Forest Service is not currently analyzing the most cost effective method for contracting retardant for each Forest Service airtanker base, to include personnel and material. Retardant can be contracted using a full service contract, meaning that the vendor provides all personnel required to mix retardant and load aircraft; or by a bulk retardant contract, meaning the vendor supplies retardant and no additional personnel. Historically, the factor that determines which contracting method to use is based on what type of retardant is used at a base, i.e. powdered or liquid concentrate. Liquid concentrate is much less labor intensive, therefore using militia employees is a fairly good option. Powdered retardant must be mixed and therefore requires more people.
- Retardant type differs by airtanker base because vendors bid to provide retardant, and based on base location, shipping costs, available storage, etc., the cheapest type of retardant will differ by base.
- An airtanker base “Best Value” analysis method should be developed and instituted to determine which retardant contracts are more or less cost-effective for the agency.

- The Forest Service has instituted contracts for 16 exclusive use helicopters, but has not allocated money for dedicated management of these helicopters. Large helicopters used for aerial fire suppression will be hosted at existing aviation facilities where possible, but pre-positioned to areas of predicted fire activity as conditions warrant. Assigning dedicated Forest Service management to large helicopters used for suppression may maximize effectiveness and cost efficiency. The extensive cost of the aerial fire suppression resources, whether they are flying or on standby, require dedicated management and effective deployment in support of the fire containment effort and to obtain maximum efficient use for the cost incurred. Current helitanker availability cost per day is from \$8,750 to \$16,744 for exclusive use and from \$19,040 to \$32,760 for Call-When-Needed contracts. Additional costs are incurred for each hour of flight time expended for the helicopter for both types of contracts.

#### **5.8.1.2. Equipment**

- As outlined in the “Wildland Fire Management Aerial Application Study,” the future fleet of aircraft used for aerial fire suppression should be a mix of airplanes and helicopters. It is recommended that the large airtanker fleet be maintained at the current (2006) level of 19, comprised of P3 (9) and P2V (10) aircraft. Currently all P2V and P3 airtankers are contractor-owned, -maintained, and -operated. The current 2006 level is an increase from the 11 airtankers that were originally available for contract in 2005. During 2005 additional aircraft were brought into service on the National contracts. The contract was for 16 airtankers with additional 3 obtained under the additional equipment clause of the contract.
- Refurbishment of three government-owned P3s may increase airtanker fleet capabilities. Based upon further analysis, including the currently commissioned Exhibit 300 the fleet may be expanded in the future.
- An Exhibit 300 analysis should be completed to determine what the most cost effective acquisition method is for all resources used for aerial fire suppression.
- The need exists for an airtanker to be developed for the purpose of aerial delivery of retardants and suppressants. An industry/government joint venture should be considered to energize industry development. As other modernized aircraft are developed and become available, they should also be evaluated for effectiveness.

#### **5.9. Communications**

Implement human-aiding technology for resource orders, maps, radio frequencies, and weather forecasting, Temporary Flight Restrictions etc., for real time up link to and from aircraft. This would increase aviation efficiency. New technologies should be routinely evaluated to enhance aircraft efficiency.

#### **5.10. Efficiencies Available**

- Efficiencies achieved by re-designating some large airtanker bases as recommended will allow redirection of personnel for better uses.
- The improved mix of aircraft types will create a more effective and efficient response to initial attack on fires.
- The implementation of dedicated helicopter managers will reduce costs of Type I helicopters by closely monitoring the flight hours and availability of the contract helicopters. This would ensure payment is not made for periods of non-availability.
- The Chief’s Blue Ribbon Panel Report recommends that purpose built airtankers be developed to provide several efficiencies including reduced maintenance costs, increased availability, longer service life span, and potentially safer aircraft

### 5.11. Performance Analysis

- The Business Area of Aerial Fire Suppression does not have any performance gaps between the present and the future conditions, and none will result from the recommendations provided by this review. The work requirements, standards of operation, and ultimate performance would not be reduced from the present conditions.
- The recommendations within this Business Area identify specific areas that could use additional review leading to improved efficiencies and cost savings. There would be no change in those until the effectiveness was validated. Studies consist of: analyzing the method of contracting for retardant; cost sharing strategies for airtankers; cost effectiveness of MAFFS; and determining the long-term mix of large airtankers and helitankers.
- Conversion of eleven airtanker bases to reload bases and re-designation of four bases from their current recommendation has the potential to reduce funding with no impact on the final delivery of retardant to the fire incident.
- The recommendation of dedicated helicopter managers is primarily for cost avoidance, but could improve the helitanker delivery effectiveness by more intensive management of the high cost aircraft.

### 5.12. Cost/Benefit Analysis

#### 5.12.1. Historical Costs

##### 5.12.1.1. Personnel

Personnel costs for this Business Area are based upon the data call information from each of the Forest Service Regions regarding the amount of personnel working in this Business Area.

- Base Year Annual Personnel Cost:\$14,529,005

##### 5.12.1.2. Equipment

#### Contracts - 2005

Level	Number Contracts	Number Aircraft	Cost
Administrative Unit	125	128	\$22,875,269
Regional	31	36	\$621,115
National	77	77	\$92,632,400
<b>Total</b>	<b>233</b>	<b>241</b>	<b>\$116,128,784.00</b>

##### 5.12.2. Cost Estimate Analysis

Anticipated recommendations were evaluated based upon the historic costs. The analysis for each of the recommendations contains the estimated cost, the benefits, and estimated savings.

### 5.13. Recommendation - Develop a value analysis to assess most effective and cost efficient type of retardant.

#### 5.13.1. Cost Estimate

The initial cost of implementing this recommendation is the associated cost of assigning a team to determine the best method of contracting for retardant at each Forest Service airtanker base. It is assumed that this analysis could be performed in-house during periods of low fire activity. It is estimated that a team of 5 Forest Service personnel (two Airtanker Base Managers, two Airtanker Base Assistants, and one Regional Aviation Officer) could complete the study in a 4 month timeframe at a cost of approximately \$43,000. In addition to the assumptions stated below, supporting calculations for this cost are shown at Appendix S-4 – Cost of Aerial Fire Suppression Recommendations.

- It is assumed that each position will spend approximately 10 hours per week on the study. This equates to approximately 0.09 FTE per position ([10 hrs/week x 16 weeks]/1776 productive hrs/year).
- Some travel may be required in conducting this study. A factor of 10% has been applied to the total personnel cost to account for any associated travel.
- The 2005 operating cost for -Forest Service airtanker bases that have full-service retardant contracts versus those that have bulk retardant contracts are shown in the table below for personnel, contract administration, facilities, and retardant:

	Bulk	Full Service Government Furnished	Full Service Vendor Furnished
TOTAL	\$295,400	\$455,300	\$435,300

- See also the breakdown of these costs in Appendix S-5 – Airtanker Base Cost Calculations.
- The cost of converting airtanker bases to full-service retardant contracts may be higher up-front retardant contract costs, based on the additional required contractor personnel and related contractor furnished equipment.
- During a below average fire season, the cost of the additional contractor personnel will be incurred during the entire contract period, with no opportunity to save base personnel costs even though the fire season is below average.
- Over time, it is possible agency retardant bases will be able to excess vehicles and equipment routinely provided by contractors.

#### 5.13.2. Benefits Estimate

The potential benefits of full-service contracts come in the form of less agency personnel (militia) needed during the fire season to help mix and load retardant aircraft. These employees, many of whom have multiple fire qualifications, will have the opportunity to take other fire assignments, sometimes in shortage areas.

#### 5.13.3. Savings Analysis

The recommended analysis will determine the most cost efficient method of contracting for retardant and will identify any areas where savings are possible. The savings analysis will be completed by determining how much more the agency is charged for a full service contract, compared against how many average employee workdays are available for other duties during an average fire season. In addition, any projected savings in excess equipment or vehicles will be determined in the analysis.

#### **5.14. Recommendation - Dedicated Helicopter Managers for Exclusive Use Helitankers and Type I Bucketed Helicopters**

Provide funding allocation within constrained preparedness and suppression budgets for dedicated helicopter managers for the 16 exclusive use helitanker and Type I bucketed helicopters to maximize the efficiency of large helicopter usage. Forest Service management should be assigned to them on a 7-day basis when the helicopters are activated.

Current helitanker availability cost per day is from \$8,750 to \$16,744 for exclusive use and from to \$19,040 to \$32,760 for Call-When-Needed contracts. Additional costs are incurred for each hour of flight time expended for the helicopter for both types of contracts.

##### **5.14.1. Cost Estimate**

Costs associated with this recommendation will be for employees, qualified to agency standards, for the length of the mandatory availability period.

- It is assumed that the dedicated monitoring staff will consist of two personnel per aircraft for a time period of 75 days at a minimum. Assuming 16 aircraft, 32 monitoring staff will be required. Assuming that each position is detailed for 8 hours per day for 75 days (600 hours), a total of 10.81 FTE are required (32 positions x 600 hrs/year / 1,776 productive hrs/year). As shown in Appendix S-4 – Cost of Aerial Fire Suppression Recommendations, the cost of these 10.81 FTE at the GS-9 level is approximately \$883,167.
- Additional costs will be for the required proficiency training and necessary vehicles and equipment. . A factor of 10% has been added to the total personnel cost of this recommendation to account for training and vehicle acquisition. Therefore, the total cost of training and vehicle acquisition is approximately \$88,317

The total cost of implementing this recommendation is estimated at approximately \$971,484.

##### **5.14.2. Benefits Estimate**

The benefits of adequate management of these helicopters come in the form of fiscal efficiency. With the exception of “supertankers”, these assets are the single most expensive aviation resource used for fire suppression. Management deficiencies can be wasteful for the Agency, so close oversight is warranted. These assets are in very short supply, and having an Agency employee dedicated to their efficient use is a prudent agency decision.

##### **5.14.3. Savings Analysis**

- The Forest Service currently dedicates Helicopter Managers for four of the Type I helicopters (4.0 FTE).
- Militia personnel and AD employees trained as Helicopter Managers manage the other 12 helicopters. It is estimated that a total of 1,008 hours per year are required per position for these duties. This equates to 0.568 FTE per position, totaling 6.816 FTE. Therefore, there are currently a total of 10.816 FTE managing the Type I helicopters. The estimated cost of these personnel is \$898,077. Therefore, with the current cost of \$898,077 and the estimated implementation cost of \$971,484, the Forest Service will not see direct savings in personnel costs. However, it is assumed that savings will be realized in the form of better management of the helicopters. Supporting documentation of personnel costs is shown at Appendix S-4 – Cost of Aerial Fire Suppression Recommendations.
- Savings resulting from the close supervision of Type I helicopters can be demonstrated by displaying actual examples (fiscal costs) of past management deficiencies.

- For example, Type I helicopters require a great deal of maintenance on a daily basis, necessitating vendors to have access to mechanics 24 hours a day. At times, vendors are unable to keep up with required maintenance; however, this information may not get transferred to Agency managers. Helicopter managers ensure that vendor helicopters are available for flight during the mandatory available period. If they are not available for flight, the helicopter manager ensures that the vendors are not paid for this period of unavailability. During the fire season of 2006, the Helicopter Manager that managed the Heavy Lift Skycrane was able to document 145 hours of unavailability (10 days total). Through real-time, daily oversight, this Helicopter Manager was able to capture this unavailability and save the Forest Service \$75,000
- Dedicated managers would also help save money by ensuring that aircraft are used efficiently and that fewer crew changes are required.

### **5.15. Recommendation – Explore Alternative Preparedness Cost Sharing Strategies – Airtankers and MAFFS**

Explore alternative preparedness cost sharing strategies for the annual costs associated with aviation resources (airtankers and MAFFS).

#### **5.15.1. Cost Estimate**

Currently the Forest Service pays for all activation costs associated with MAFFS, and a disproportionate amount of flight time based on use records. In 2006 these costs were approximately \$8,870,452. While the Forest Service is the largest single user of the MAFFS, other Federal Agencies (DOI, DOE) and States also use the MAFFS. Forty-eight percent of MAFFS flight hours are utilized by the Forest Service, while 52 percent of flight hours are utilized by the DOI, DOE, and States combined.

The cost to develop a cost sharing strategy would be minimal, and would be based upon historical MAFFS usage by organization.

#### **5.15.2. Benefits Estimate**

This recommendation would lead to more equitable distribution of MAFFS activation costs between Federal and non-Federal users. The Forest Service is currently absorbing state and local costs when it is not necessarily a requirement to do so.

#### **5.15.3. Savings Analysis**

MAFFS activation costs can be apportioned based upon the historical use of each organization. Using the usage percentages shown in Appendix S-6 – MAFFS Activation Cost (2005 & 2006), it is assumed that 52 percent of the MAFFS activation costs could be apportioned to other users. This equates to an annual savings of approximately \$4,612,635.

### **5.16. Recommendation – Potential Alternatives to MAFFS Program**

If it is determined that cost sharing alternatives are not available for the MAFFS program, the program should be discontinued, and alternative resources should be used when needed, i.e. large helicopters and commercial airtankers.

### **5.16.1. Cost Estimate**

The total costs paid by the Forest Service for the MAFFS program in 2006 were approximately \$9,115,091. This includes both activation and training costs. When this cost is divided by the 600 flight hours flown, it equates to approximately \$15,192 per flight hour. By contrast, for 2006, commercial airtankers cost the Forest Service approximately \$7,109 per flight hour. For calculations see Appendix S-6 – MAFFS Activation Cost (2005 & 2006).

The Forest Service pays for the entire training session for the MAFFS units. This training costs the Forest Service approximately \$245,000 in 2006. Commercial vendors are required to train their own employees. For calculations see Appendix S-6 – MAFFS Activation Cost (2005 & 2006).

### **5.16.2. Benefits Estimate**

The benefits of eliminating the MAFFS program would be the direct cost savings of MAFFS activation and training.

### **5.16.3. Savings Analysis**

With the elimination of the MAFFS program, the Forest Service would no longer pay for MAFFS activation and training costs (\$9,115,091 for 600 hours of flight time in 2006). However, the Forest Service would assume the cost of operating airtankers to replace the MAFFS. Assuming that these airtankers would also operate for 600 flight hours, the total cost to the Forest Service would be \$4,265,400 (at \$7,109/flight hour). This results in an annual savings of over \$5.1 million. While the number of MAFFS activations varies with each fire season, the 2006 data can be used to represent a “severe fire season”.

In some instances, MAFFS are activated but are not actually used to drop retardant. However, the Forest Service still assumes the associated activation costs. During one of the four MAFFS activations in 2006 in Albuquerque, New Mexico, two of the activated airplanes were not used to drop retardant. However, the Forest Service still paid \$733,684 in activation costs. The elimination of the MAFFS program would prevent the Forest Service from absorbing activation costs for MAFFS that are not actually utilized.

## **5.17. Recommendation – Appropriate Mix of Large Airtankers and Helitankers**

Utilize the Exhibit 300 study process to determine the appropriate number and mix of large airtankers and helitankers for long-term agency use. This process is currently being used to determine the number of airtankers. However, there is no Exhibit 300 study in progress for the helitankers.

### **5.17.1. Cost Estimate**

There is no additional cost associated with the Exhibit 300 study for the airtankers, as it is currently being implemented.

It is estimated that the cost of conducting an Exhibit 300 study for the helitankers would be less than \$20,000.

### **5.17.2. Benefits Estimate**

The benefits are in terms of long-term staffing and planning efforts, as well as increased firefighting capability.

### **5.17.3. Savings Analysis**

The savings will be exhibited in the Exhibit 300 process.



## **5.18. Recommendation – Maintain Large Airtanker Fleet and Continue Refurbishment**

Until the Exhibit 300 is completed, maintain the large airtanker fleet at the current number of 19 (P3 and P2V) and continue with the ongoing effort to refurbish 3 P3s for replacement of aging contractor-owned P2Vs. Currently, all large fixed wing airtankers are commercially owned and operated.

The three airtankers recently acquired by the agency will be initially owned and refurbished by the Forest Service. The refurbishment process is expected to take two-three years, and during that period of time the agency will analyze which method of activation will be used to press them into service, i.e. Government Owned/Government Operated, Government Owned/Contractor Operated, Contractor Owned/Government Operated, or Contractor Owned/Contractor Operated.

### **5.18.1. Cost Estimate**

Interim cost to refurbish three existing aircraft in the FS inventory and purchase and convert three new aircraft.

A March 2006 draft report on stabilizing the airtanker fleet estimated that the cost of refurbishing Lockheed Martin P-3 Orion airtankers is approximately \$7,127,000 per aircraft. This cost includes regeneration (\$361,000); depot level maintenance, paint and overhauls (\$4,140,000); special structural inspection (\$1,000,000); and tank conversion and additional accessories (\$1,626,000).

### **5.18.2. Benefits Estimate**

Expanding the airtanker fleet capabilities with the larger aircraft to provide more initial attack and large firefighting capability, and a measured expansion in this direction supports the tentative Exhibit 300 recommendations.

### **5.18.3. Savings Analysis**

- The P-3 Orion study estimated that the seasonal cost for a commercially contracted P-3A airtanker is \$2.3 million and the industry average for P-3C fixed costs is approximately \$1.4 million (both estimates are based on 200 hours of flight time). Therefore, the resultant annual savings is \$900,000. The study estimated a 101% return on investment in eight years.
- Savings would also be realized through the elimination of the current contract costs for the P2Vs.
- Additional savings will be in the form of greater fireline building capability, and potentially fewer escaped wildfires.

## **5.19. Recommendation - Consolidate or Re-Designate Airtanker Bases**

- Based on the Wildland Fire Management Aerial Application Study, consolidate or re-designate the airtanker bases from the current 38 down to potentially 23. Eleven bases should be converted to reload bases and four (previously) bases closed.
- The bases recommended for conversion to reload include: Grangeville (convert to SEAT base), Kalispell, Pueblo, Rapid City, Fort Huachuca, Bishop, Santa Barbara, Stockton, Medford, Troutdale (reload base), and Lake City.
- The following four bases should or already are closed: Fort Smith/Fayetteville, Knoxville, London, and Wyers Cave.

### **5.19.1. Cost**

Costs may include displacing personnel, termination of leases, etc.

### **5.19.2. Benefit**

Benefits may include reduces staffing, reduced facilities, etc.

### **5.19.3. Savings**

Savings from the closure of four bases. Some limited savings from re-designation of bases to reload.

## **5.20. Civil Rights Impact Assessment**

A Civil Rights Impact Assessment (CRIA) is required to identify and categorize the civil rights impacts of implementing any realignment initiative that will potentially affect employees. A CRIA for Forest Service employees will be developed if the Fire Executive Council recommends changes to staffing during their follow on studies.

## **5.21. Systems**

The following list is an overview of the information systems used in this Business Area. No systems will be affected by adopting any of the recommendations in this Business Area.

- FAIRS (Federal Aviation INTERACTIVE Reporting System)
- AMIS (Aviation Management Information System)
- PROP (Personal Property Management Information System)
- PCMS (Purchase Card Management System)
- IAS (Integrated Acquisition System)
- EaTIS (Equipment and Training Inventory System)
- ROSS (Resource Order and Status System)
- NFC Inquiry System (National Finance Center)
- FFIS (Foundational Financial Information System)
- IWEB (a web-enabled suite of applications for various business areas)
- AgLearn (a web-based training system)
- IBM Network (electronic records system)
- FS Lotus Notes
- FedTraveler (web-based travel reservation system)
- CAHIS (Computer Aided Hazard Identification System)

## **5.22. Summary of Recommendations**

### **5.22.1. Short-term Recommendations & Efficiencies**

- Develop a value analysis for use by each airtanker base to determine the best method of contracting for retardant.
- Provide funding allocation within constrained preparedness and suppression budgets for dedicated helicopter managers for the 16 exclusive use helitanker and Type I bucketed helicopters to maximize the efficiency of large helicopter usage. Forest Service management should be assigned to them on a 7-day basis when the helicopters are activated.

- Explore alternative preparedness cost sharing strategies for the annual costs associated with aviation resources (airtankers and MAFFS).
- If it is determined that cost sharing alternatives are not available for the MAFFS program, evaluate alternative resources available for delivery of fire suppressants and retardants.
- Utilize the Exhibit 300 study process to determine the appropriate number and mix of large airtankers and helitankers for long-term Agency use. This process is currently being used to determine the number of airtankers. However, there is no Exhibit 300 study in progress for the helitankers.
- Until the Exhibit 300 is completed, maintain the large airtanker fleet the current number of 19 and continue with the ongoing effort to refurbish 3 government-owned P3s.
- Based on the Wildland Fire Management Aerial Application Study, consolidate or re-designate airtanker bases from the current 38 down to 23. Eleven bases should be converted to reload bases and four bases closed.

#### **5.22.2. Long-term Recommendations**

None recommended.

## **6. Business Area D – Aerial Resource Support (Natural Resources and Fuel Management Missions)**

### **6.1. Business Needs Assessment**

#### **Forest Service Goals**

This Business Area supports the overall Forest Service Strategic Goals identified in Paragraph 2.1.1 by providing aviation support in managing federal, state, and local public and private lands. Components of this Business Area, supporting the Agency goals, include forest health, recreation areas, timber resources, riparian waterways and watershed condition, research, reduction of invasive species, and other disciplines within forest and grasslands management. Government personnel (aviation managers, pilots, staff and crews), perform these missions using WCF or leased aircraft in addition to commercially contracted aircraft with associated pilots. This area also includes all point to point flights for the conduct of mission-related work in addition to that which supports the Agency goals.

### **6.2. Business Area Mission Fulfillment**

- This business area includes the personnel and associated resources (facilities, aircraft, contracts, etc.) involved in providing aviation services and aviation activities assets to the overall Forest Service mission to maintain the forest health, nation's water supply, recreation areas, timber resources, Forest Service research, etc. This includes the management of the aviation special use missions that include government personnel, WCF and contracted aircraft. This area includes all point-to-point flights for administrative transportation purposes when determined to be cost effective in accordance with OMB Circular A-126. The administration of contract aircraft support and quality assurance is included in section 7 Business Area E – Aviation Contract Management and Quality Assurance.
- Significant natural resource and fuels management Special-Use aviation missions are performed with light aircraft flying over extensive areas in support of the Forest Service Natural Resource programs. The Special-Use missions include support to forest health management that include the nation's timber, recreation, land management, invasive species, and watershed management in the following areas: aerial sketch mapping, law enforcement and investigation support, photography, remote sensing, insect and disease surveys, medevac, search and rescue, wildlife surveys, waterfowl surveys, fish stocking, aerial seeding, aerial fertilization, radio telemetry, remote data collection, personnel and cargo transport, natural disaster relief, forest damage assessments, and other support missions. In support of fuels management, aerial ignition is performed for prescribed burning. Aerial applications of herbicides are used for invasive species and noxious weed reduction and pesticides to suppress or eradicate forest pests.
- Aviation transportation provides accessibility to remote areas. These missions require transportation flights to backcountry airstrips, unimproved remote landing sites, water landings within the National Forest/Grasslands, and others as needed to support the mission and cooperators. Emergency support of search and rescue is not a Forest Service mission. However, aviation has provided a proven capability for rapid response to large coverage areas in a short period of time.
- Aviation support to Forest Service Research is necessary for scientists of the various disciplines within the Forest Service to conduct case studies and research.

### **6.3. Justification for Business Area**

- Aviation support to the natural resources mission is critical in the management of public lands and all natural resources identified within this Business Area.
- Forest Service aviation operates in conjunction with partners and cooperators to manage forested lands, grasslands, and multi-purpose public lands and natural resources within the scope of those areas identified by Congress. Aviation assets provide the Forest Service with the transportation method to access remote or distant areas not readily accessible by other means.

### **6.4. Assumptions and Constraints**

The following assumptions and constraints are an expansion to those stated in Paragraph 2.3.

#### **6.4.1. Assumptions**

The need for management of the National Forests/Grasslands is growing as demands increase for recreation, quality water, wildlife and fish habitat, and other ecosystem services important to the economy, health and vitality of the nation. As the need grows for management of the National Forests, the need for aviation support will increase.

#### **6.4.2. Constraints**

- The periodic transfer of funds to cover fire suppression expenses impacts the capacity to accomplish aviation support for natural resource and fuel management programs.
- During fire season, aircraft are less available for natural resource and fuels management missions.

### **6.5. Current Assessment**

#### **6.5.1. Basic Facts of Natural Resources and Fuel Management**

Aerial Support to Natural Resources and Fuel Management operations revolve around the following basic facts.

- The aerial transport of personnel and equipment is provided in areas where roads are not available or would require excessive time by ground travel. The aviation assets provide the best available combination of speed, range, and capability necessary for oversight of Natural Resource programs throughout the Forest Service Regions.
- Aviation is the most efficient method to cover large areas of Natural Resource surveys and provides for the timely receipt of survey and photo information for Natural Resource decisions. Newer technological survey methods deployed by aviation are providing more accurate and complete information for decision makers. With the variety of aircraft available to the Forest Service, large or small area coverage can be provided with the appropriate aircraft selection.
- Aviation provides a cost efficient method for rapidly transporting employees to remote areas along with transporting camp supplies, equipment, and materials to support backcountry projects and maintenance. Inspection and maintenance of remote area recreational facilities (buildings, airstrips, and campsites) can be performed in an efficient manner and allow multiple inspections in the same day for better site management. Remote communication sites and lookouts are supplied and maintained by aerial methods and allow placement of communication equipment in previously non-accessible areas where the transmission is optimal.
- Aerial ignition, provided by aircraft, for prescribed burning is a safe, accurate, and cost effective method for fuel management that can be accomplished in remote areas and monitored for effectiveness.

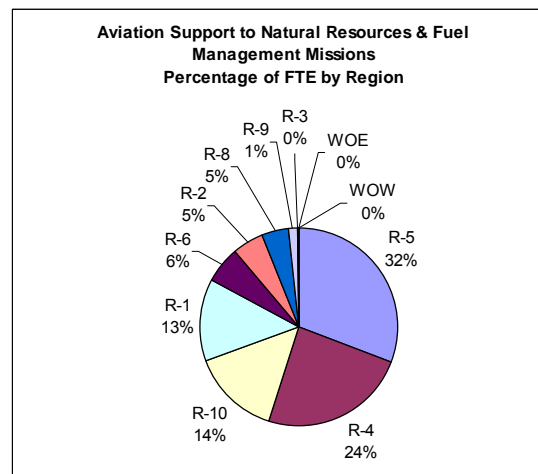
- Some remote Forest Service sites are only accessible by aircraft whether on floats, skis, or wheels. Helicopters can land in relatively small confines without prepared landing facilities or provide cargo drop by external sling. Aviation transportation can take advantage of the small time periods available due to weather or reduced work seasons to complete remote projects.
- Aerial transportation provides one of the safest methods of personnel delivery to remote areas and minimizes exposure to hazardous areas. It also provides the safest method to evacuate personnel from remote areas when necessary for medical or other emergencies.

## 6.6. Personnel

- A summary of those personnel involved with Aerial Resource Support for non-fire natural resource missions, including managers, pilots and other associated support personnel performing missions, by Region, is included at Appendix F-4 – Aviation Support to Natural Resources & Fuel Mgt. (non-Militia) – All Positions.
- Total personnel within the Aerial Resource Support Business Area personnel are shown in the following table. The total of 836 permanent non-Militia personnel represents 81.8 FTE .Because of the seasonality and dispersion of the work during specific seasons, the work performed requires a larger number of positions rather than just the calculated FTE.
- Militia personnel who perform other duties within the Forest Service and perform seasonal natural resource work.
- During peak seasons, the full number of individuals involved may be working simultaneously.
- To account for periods of higher levels of activity, additional qualified temporary and Militia personnel are used, who are qualified for the work required within this Business Area. As a result a total of 1,382 individuals are used to perform the actual work in this Business Area or provide direct support to it. The number of locations shown display the wide distribution of personnel among the many areas within the Regions at all levels of the Forest Service.

	Permanent			Temporary			Total Positions
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations	
Non-Militia	836	81.80	106	218	7.73	36	1054
Militia	246	3.66	27	82	4.03	12	328
TOTAL	1082	85.46	133	300	11.76	48	1382

The distribution of the FTE is displayed in the following pie chart shows the percentage of total FTE's by Forest Service Region. As shown, 83 percent of the personnel are concentrated in four of the nine Regions (1, 4, 5, and 10).



The Data call received from the Regions listed all personnel associated with aviation. However, position descriptions among Regions vary. This complicates the task of drawing Region-to-region comparisons. A sample of the positions includes: Forestry Technician Supervisory, Forestry Lead Technician (smokejumper), Squad Leader, Aviation Dispatcher, Helicopter Operations Specialist, Helicopter Manager, Senior Firefighter, Helitack Foreman, Pilot Infrared, Pilot Supervisory, Aviation Officer (all levels), Airplane Pilot, etc.

**6.6.1. Personnel Analysis**

The following analysis was performed based upon the data received from the Regions regarding the Business Area of Aviation Support to Natural Resources. While most of the personnel are spending the majority of their time in this Business Area, some are also working in other business areas within and/or outside the scope of this assessment. These individuals are spread out between the Regional Offices and other Administrative Units. It is shown that the majority of the personnel (83 percent) spent less than 20 percent of their efforts devoted to natural resource aviation support work.

Percentage of Effort for Natural Resource Support	Count of Personnel	Number of FTE
100% NR	2	2.00
Total NR 50 < 100%	30	13.49
Total NR 20 < 50%	108	18.42
Total NR 0 < 20%	697	49.74
<b>Total</b>	<b>837</b>	<b>83.65</b>

**6.7. Contracts**

Contracts for this area are primarily for aircraft used throughout the year to support the natural resource missions.

Within the Aerial Resource Business Area there is extensive use of contracts that are a combination of Flight Services Contracts and End Product Contracts that are used in conducting aerial application projects. Examples include Gypsy Moth aerial pesticide application, other pesticide programs, aerial fertilization, and invasive species control.

A summary of the Forest Service contracts by Region is included at Appendix H – Forest Service Contracts.

**6.7.1. Specific Task Requirements**

- Observation/Reconnaissance - Forest Service managers and aerial observers use numerous light aircraft and helicopters under contract or rental agreement (and several Forest Service owned and operated aircraft) for forest pest surveys, animal tracking/remote sensing, resource surveys, and other projects requiring aerial observation. Two Forest Service (WCF) aircraft are equipped with modifications for aerial photography for natural resource management and mapping.
- Aerial Application - National Forest/Grasslands, state cooperators and federal partners, use contract aircraft for pest suppression and eradication projects involving aerial application of various materials used in promoting forest health. Many of these projects are extensive and complex and may require coordination for more than one contract. Such projects include pesticide, seeding, and fertilizer application. There may be a multitude of contracts awarded to accomplish various aerial application projects during the same timeframe, which requires extensive oversight on the part of officials from local, state, and federal governments.

- Aerial Ignition - Helicopters are used to drop ignition devices from on-board dispensers and externally slung drip torches to ignite prescribed fires. They are used for projects involving aerial ignition of ground fuels for fuel reduction, vegetative type manipulation, and/or invasive species control. The policy document that governs this activity is the Interagency Aerial Ignition Guide (IAIG).
- Aerial Cargo Delivery - Contract or Forest Service aircraft are used to deliver supplies and construction materials for Forest Service projects in areas that are inaccessible to vehicles or would take an excessive amount of travel time. Projects may relate to the general Forest Service mission or improvement of forest health and fuel management by reducing fire potential.
- Personnel Transportation - Most aircraft used for missions are also available for transportation of personnel when priorities permit. In addition, one large transport aircraft is contracted exclusively for moving firefighters during fire season. A large number of additional aircraft are available under contracts or rental agreements at many locations. Executive travel is managed and reported in accordance with General Accountability Office guidelines.
- Cargo Transportation - All fixed-wing aircraft are available for cargo transport as appropriate. Most of the Type I helicopters and some of the Type II are limited to cargo or to external loads only because of configuration or restricted category type certificate.

The Natural Resource community needs to be familiar with Forest Service aviation policies, handbooks, guides, and procedures. For example, personnel may contract for aircraft and aviation support that does not meet Forest Service standards and may place personnel at risk.

#### **6.8. Airplane and Helicopter Aircraft**

WCF aircraft and contract aircraft are used for administrative transportation of personnel and cargo and special use projects when not committed during the fire season.

#### **6.9. Pilots**

Government employee pilots are utilized outside the fire season for special use missions and administrative transportation of personnel and cargo. This use also allows pilots to maintain flight proficiency and currency without the expenditure of training funds. Contract pilots perform missions when either exclusive use or call-when-needed aircraft are requested for a particular non-fire mission.

#### **6.10. Operations Base**

Generally the aircraft, contracts, and personnel are based in and controlled by Administrative Units to fulfill their individual missions.

#### **6.11. Logistical Support**

Minor maintenance of WCF aircraft is provided by qualified airworthiness inspectors and all other is provided by contract. Contract aircraft are logistically supported by the contractor within the contract specifications.

#### **6.12. Maintenance**

Aircraft used in this Business Area are WCF that are maintained by contract or contract aircraft that are maintained within the contract specifications.

#### **6.13. Impacts to Stakeholders**

The Aerial Resource Support Business Area requires significant coordination and cooperation with State and Local governmental agencies and private/commercial organizations with primarily special use missions and spraying that is adjacent to other lands.



## **6.14. Issues**

- Emerging technologies in use of aviation should be incorporated to gain efficiencies and cost savings. For example, the use of unmanned aerial vehicles (UAV).
- The increase of commercial international commerce and global transportation that results in a greater potential for the introduction and establishment of invasive species is requiring increased aviation reconnaissance and/or various forms of aerial applications.
- The risk of utilizing aviation resources in research studies is often underestimated and there is little oversight regarding the aviation resources and operation of these aircraft.

## **6.15. Conceptual “To-Be” Assessment**

### **6.15.1. Maintain Status Quo**

Aerial resource support in natural resource and fuels management programs encompasses all special-use flights and administrative flights and should be maintained. Many of the aerial resources for missions are accomplished with the personnel and resources contained within this review, providing effective resource use when not being used to fight wildland fires. These missions are critical to the success and accomplishment of managing natural resources on federal, state, and private lands. Such missions include the aerial application of agricultural materials such as pesticides, herbicides, and fertilizers. Other important special-use missions provide support to recreation management, cabin restoration and trail building, reforestation through aerial seeding; wildlife and waterfowl surveys, forest damage assessments and sketch mapping missions; and responding to national disaster assessment needs, both within the agency internally and fulfilling external requests outside the agency.

It is also important that the existing briefing and carding process for fixed-wing, special use mission pilots be continued in the “To Be” organization for the continued safety in the various missions such as mountain flying, aerial sketch mapping surveys, and other special use missions. A recent analysis conducted on aircraft accidents covering a 5-year period revealed that the Forest Service special use aircraft accident rate was less than those of general aviation (6.3 accidents per 100,000 flying hrs for Forest Service versus 8.2 for general aviation).

### **6.15.2. Organization**

The structure of organization should include the establishment of Unit Aviation Officers (UAO) as a collateral duty in each Research Station Headquarters to provide technical assistance and manage the safe and secure operation of aviation resources.

### **6.15.3. Equipment**

- To meet special use mission needs, the contracted and agency owned aircraft should remain varied to accomplish the mission requirements. Trends indicate that the need for aviation support will either remain consistent or slightly increased.
- In aerial photography the issue with contracting jobs has been the inability of contractors to deliver the product on time because of scheduling priorities, weather and sun angle limitations. Once modified with camera hatches, Forest Service owned and operated airplanes have been able to meet many aerial photo needs in a timely way.

#### **6.15.4. Emerging Technologies**

Emerging technologies may provide alternatives to the organization's current practices.

- As new flight technology becomes available it may enhance efficiency and reduce cost and risk of completing natural resource and fuels management aviation missions. An example of this is the use of Unmanned Aerial Vehicles (UAV's) for technical data collection. These are currently being used in other agencies with ongoing tests for improved technologies.
- Automated Flight Following (AFF) technology currently being implemented provides operational efficiencies. AFF has been implemented in some Forest Service contracts and is recommended for future exclusive use aircraft. This would be applicable to all missions and not just non-fire missions.

#### **6.15.5. Efficiencies Available**

- Maximizing the use of End Product contracts increases efficiency by lessening the need for operational control thus decreasing agency liability.
- Utilize state and federal employees on the same aircraft to incorporate data across agency boundaries.

#### **6.15.6. Future Customers or Stakeholders**

- Customers and/or stakeholders are expected to expand in the future as private land owners, state governments and other federal agencies, the public and conservation organizations are all becoming more active in forest health and natural resource management.
- An increase in international commerce and transportation may establish invasive species requiring an increased need for aviation reconnaissance and/or various forms of aerial applications.

#### **6.15.7. Future of Interagency Fire Center - N/A**

#### **6.15.8. Wildland/urban Interface Expansion**

WUI expansion will require increased coordination and monitoring prior to and during the aerial application of pesticides and herbicides.

#### **6.15.9. Performance Analysis**

Aerial Resource Support (Natural Resources and Fuel Management Missions) does not have any performance gaps between the present to the future conditions and none will result from recommendations provided by this review. The work requirements, standards of operation, and ultimate performance would not be reduced from the present conditions.

Primary recommendations within this Business Area are continuing or expanding the contracting operations to the areas of standardized contracts, Indefinite Delivery/Indefinite Quantity contracts, and End Product contracts that could all lead to improved efficiencies and contracting cost savings.

The establishment of Unit Aviation Officers as collateral duty positions in each Research Station would result in improved contract performance with no adverse impact on the final delivery of aviation support to Forest Service research program.

## 6.16. Cost/Benefit Analysis

### 6.16.1. Historical Costs

#### 6.16.2. Personnel

Personnel costs for this Business Area were based upon the data call information from each of the Forest Service Regions regarding the amount of personnel working in this Business Area. Costs are calculated for a typical five-year period for a cost comparison. For this assessment, the earliest base-year starts on October 1, 2008 and the base year annual cost is included. Base Year Annual Personnel Cost: \$9,403,405

### 6.16.3. Equipment

### 6.16.4. Aircraft Contracts

Level	Number Contracts	Number Aircraft	Cost
Administrative Unit	189	285	\$11,723,698
Regional	45	59	\$1,961,572
National	0	0	\$0
<b>Total</b>	<b>234</b>	<b>344</b>	<b>\$13,685,270.00</b>

#### 6.16.5. Cost Estimate Analysis

Anticipated recommendations were evaluated based upon the historic costs. The analysis for each of the recommendations contains the estimated cost, the benefits, and estimated savings.

## 6.17. Recommendation – Further Implementation IDIQ Contracts

The Forest Service is currently moving toward the process of standardized contracts and using Indefinite Delivery Indefinite Quantity (IDIQ) contracts and should be further implemented.

### 6.17.1. Cost Estimate

- Determining cost estimates in this Business Unit is difficult since in many cases the appropriate contract tool is currently being used. The estimated cost to achieve the project goals and objectives are determined prior to writing a contract, therefore, the foundation is already established as to such criteria as cost estimate, benefits estimate, and savings analysis.
- BPA contracts are used for contract calls that are less than \$2,500, such as a flight duty day to accomplish a mission. The BPA is an annual tool that the total cost is not to exceed \$25,000 within a fiscal year.
- IDIQ contracts are being marketed greater to accommodate more than a year and up to five years. The IDIQ provides competition for best price quotes and can be extended after the first year for four consecutive years thereafter resulting in less contract administration and writing time is incurred.

### **6.17.2. Benefits Estimate**

- The IDIQ system requires competition between vendors that generally leads to lower negotiated cost to the government.
- Using the appropriate contract tools complies with the Paper Reduction Act that streamlines the contracting procedures resulting in greater cost-effective contract practice.
- Less contract administration, less contract writing, and more flexibility using the IDIQ.

### **6.17.3. Savings Analysis**

Expanding the Indefinite Delivery Indefinite Quantity (IDIQ) contracting process for project work in natural resource support has the potential to provide increased competition, lower negotiated costs, less administrative overhead, and longer term contracts

## **6.18. Recommendation – Continue and Increase use of End Product Contracts**

The Forest Service should continue and increase the use of End Product contracts for greater cost containment and shifting current agency liability to contracted work. The emphasis should support continuation of Forest Service End Product contracts where appropriate.

### **6.18.1. Cost Estimate**

The cost of implementing this recommendation is associated with the cost of personnel required to produce and manage these contracts and the cost of the contracts themselves. While these costs are not currently available, it is anticipated that the additional cost to the Forest Service as a result of implementing this recommendation will be minimal.

Projects proposed under the administration of End Product contracts require less agency requirements (i.e.: radios, supervision, landing fees, airport agreements).

### **6.18.2. Benefits Estimate**

End Product contracts provide the Forest Service with a contracting tool that requires less administration.

Performance based End Product contracts require contractors to apply their own pro-activity, background, responsibility, and management skills with acceptance of greater liability in accomplishing the requirements of the contract.

### **6.18.3. Savings Analysis**

End Product contracts yield a potential for greater cost-savings through generally less operational oversight, and reduced Government liability. Additionally, projects proposed under the administration of End Product contracts require less agency requirements (i.e.: radios, supervision, landing fees, airport agreements), allowing contractors to lower the rates they charge the Forest Service for use of their services.

## **6.19. Recommendation – Establish Unit Aviation Officers (UA) at Research Stations**

Establish Unit Aviation Officers (UAO) as collateral duty positions in each Research Station to provide supervision and oversight regarding the aviation resources and operations of aircraft use within research projects. Calculations are shown at Appendix S-9 – Cost of Pilots NOT Performing Quality Assurance.

### **6.19.1. Cost Estimate**

- The initial cost of implementing this recommendation is the cost of establishing the UAO as a collateral duty to current positions at each Research Station and any necessary training. It is estimated that the total cost of these UAO positions is approximately \$217,016 (Personnel Costs: \$143,786, Training and Travel Costs: \$73,230). The following assumptions were made when developing costs for this recommendation:
  - There are six Research Stations with 133 Work Units within the Forest Service. It is assumed that each Station will have one UAO.
  - The positions will be graded at the GS-09 level.
  - The positions will each require an average of 12 hours/week for UAO related duties (576 hours/year based on 48 work weeks/year). This equates to approximately 0.324 FTE per position, totaling 1.944 FTE for six UAO positions. At the GS-09 level, annual personnel costs equate to approximately \$143,786 for these positions. Note that costs were developed using FY 2006 pay rates, and will be inflated depending on the year in which the positions are actually established.
  - Travel will be required for approximately three months of the year (assume 20 workdays/month). It is assumed that travel costs for these positions will include per diem and mileage (no airfare). Maximum Per Diem is estimated at \$139/day for each position (average of FY 2006 per diem rates), totaling approximately \$50,040 per year (\$8,340 per position). Annual mileage cost is estimated at \$16,020 (\$2,670 per position). Mileage cost was estimated assuming 30 trips per position at 200 miles roundtrip using the mileage rate of \$0.445/mile. The total travel and mileage cost is estimated at approximately \$66,060.
  - UAO training will consist of a one week Aviation Conference and Education (ACE) Seminar in addition to approximately 20 hours per year of online Interagency Aviation Training.
    - It is assumed that costs of the ACE Seminar will consist of seminar registration costs, travel, and per diem for each trainee. Estimated registration costs are approximately \$100 per position and estimated travel costs are \$400 per position. Per Diem is estimated at \$139/day for each position, totaling \$695 per position for a five week course. Therefore, the total cost of the ACE seminar for six UAO positions is approximately \$7,170 (\$1,195 per position).
    - It is assumed that there will be no additional cost to the Forest Service for online training.

### **6.19.2. Benefits Estimate**

This provides specialized and technical oversight for aviation activities such that it ensures cost efficient use of aviation assets.

### **6.19.3. Savings Analysis**

Designating Unit Aviation Officers for Research Stations will provide greater contractor oversight, operational control, and cost containment

## **6.20. Recommendation – Research Feasibility of Utilizing Unmanned Aviation Vehicles for Data Collection.**

Recommend that research be completed on the feasibility of utilizing Unmanned Aviation Vehicles (UAVs) for data collection.

### **6.20.1. Cost Estimate**

The initial cost implementing this recommendation is the cost of a team assigned to conduct research on the feasibility of utilizing UAVs. It is estimated that this research could be completed by either Forest Service or non-Forest Service personnel for under \$10,000.

The team assigned to conduct the research would determine the additional cost of UAVs and equipment. Historically, as technology advances the cost of equipment that serves a particular function reduces in time.

### **6.20.2. Benefits Estimate**

Implementing new flight technology as it becomes available will enhance efficiency and reduce cost and risk associated with completing natural resources and fuels management aviation missions.

### **6.20.3. Savings Analysis**

The findings will identify savings associated with implementing alternatives.

## **6.21. Civil Rights Impact Assessment**

A Civil Rights Impact Assessment (CRIA) is required to identify and categorize the civil rights impacts of implementing any realignment initiative that will potentially affect employees. A CRIA for Forest Service employees will be developed if the Fire Executive Council recommends changes to staffing during their follow on studies.

## **6.22. Systems**

Systems utilized in natural resource aviation management include Automated Flight Following System (AFFS), Traffic Alert and Collision Avoidance System (TCAS), Global Positioning System (GPS), Remote Sensing System (RS), Forward Looking Infra Red System (FLIR) thermography, Photography and Videography Cameras.

- AFFS is a system that reduces the requirement to ‘check in’ via radio every 15 minutes and provides the dispatcher with a wide range of information on the flight, airspace, and other data that may be pertinent to the flight. This reduces pilot workload, clears overloaded radio frequencies, and provides the dispatcher with much greater detail and accuracy on aircraft location and flight history.
- TCAS is a radar-based airborne collision avoidance system operating independently of ground-based equipment. TCAS-I generates traffic advisories only, TCAS II provides advisories and collision avoidance instructions in the vertical axis plane.
- GPS is a system of satellites, computers, and receivers that is able to determine the latitude and longitude of a receiver on Earth by calculating the time difference for signals from different satellites to reach the receiver.
- RS is used for measuring and mapping applications. Remote sensing makes it possible for earth scientists to collect data from places they could not possibly go. In addition, it allows for data collection in places where a human being would be unable to navigate such as in areas where high winds, tornados, and hurricanes have twisted and destroyed the forest vegetation and timber.

- FLIR is the term for a camera that takes pictures using the infrared portion of the electromagnetic spectrum. These are also called Thermal imagers. Often these contain sub-systems known as Thermal imaging common modules or TICM. FLIRs are often described as "infrared cameras". Since FLIRs use detection of thermal energy to create the "picture" assembled for the video output, they can be used to help pilots maneuver their vehicles at night, and in fog, or detect warm objects against a cold background when it is completely dark (such as a cloudy, moonless night).
- Cameras Systems include airborne high and low altitude photographic systems for filming still photos and/or videography of the forested leaf-on and leaf-off seasonal canopy and topographic features depicting various vegetation types and features of the earth's surface.

These systems would not be impacted by any recommendations contained in this review.

### **6.23. Acquisition Strategy**

Acquisition strategy is not applicable for this Business Area.

### **6.24. Project Lifecycle Schedule**

Project lifecycle schedule is not applicable for this Business Area.

### **6.25. Requirements**

The standards and performance measures for requirements are not applicable for this Business Area.

### **6.26. Summary of Recommendations**

#### **6.26.1. Short-term Recommendations and Efficiencies**

- The Forest Service is currently moving toward the process of standardized contracts and Indefinite Delivery Indefinite Quantity (IDIQ) contracts and should continue in this direction.
- The Forest Service should continue and increase the use of End Product contracts for greater cost containment and shifting current agency liability to contracted work. The emphasis should support continuation of Forest Service End Product contracts where appropriate.
- Establish Unit Aviation Officers (UAO) as collateral duty positions in each Research Station to provide supervision and oversight regarding the aviation resources and operations of aircraft use within research projects.

#### **6.26.2. Long-term Recommendations**

The feasibility of utilizing Unmanned Aerial Vehicles (UAVs) for data collection should be explored.

## **7. Business Area E – Aviation Contract Management and Quality Assurance**

### **7.1. Business Needs Assessment**

#### **Forest Service Goals**

This Business Area supports the Forest Service Strategic Goals identified in Paragraph 2.1.1 through contract management and quality assurance of the numerous contracts supporting Business Areas included in this review. This business area supports the goals of reducing the risk from catastrophic wildland fire, impact from invasive species, and other mission-related work that supports the Agency goals.

### **7.2. Business Area Mission Fulfillment**

This business area includes all personnel providing the contract administration and the control and monitoring of all contract services. This includes the development of contracts, contract administration, ordering, and monitoring for quality for both fire related and natural resource related missions described above. Contract mission performance monitoring includes the safety and interagency standardization of aircraft, pilots, and maintenance as specified in the various contracts. This Business Area supports the other Aviation Activities Business Areas.

### **7.3. Justification for Business Area**

- The specialized mission of the Forest Service, importance of accurate flight performance, associated flying hazards, and importance of total contract compliance requires well developed contracts and significant contract oversight.
- Contract management and quality assurance are essential for the effective use of aviation resources. In 2005, 95 percent of the number of Forest Service aircraft was contracted and 96 percent of the dollars expended for aircraft were for contracted aviation services.
- The oversight, proficiency checks, and certification of contract pilots and aircraft are a direct quality assurance responsibility necessary to ensure that the specification and terms of the contracts are met and safety of flight operations is not compromised.

### **7.4. Assumptions and Constraints**

The following assumptions and constraints are an expansion to those stated in Paragraph 2.3.

#### **7.4.1. Assumptions**

- All contract administration will be performed in accordance with the Federal Acquisition Regulations (FAR).
- Quality assurance for aviation operations will require pilot and aircraft certification of approximately 800 contracted pilots and 600 contracted aircraft. The physical workload of inspecting, approving, and overseeing these aircraft and pilots requires ongoing quality assurance evaluators throughout the Forest Service.
- Oversight of contractors is a core commercial responsibility and requires year-round participation by the government.
- Standardization of Forest Service QA personnel qualifications requires annual individual qualification, certification, and Contracting Officer appointment.
- Cooperative agreements with interagency partners require continuous coordination and standardization of aviation contract specifications.



#### **7.4.2. Constraints**

No business area-specific constraints.

### **7.5. Current Assessment**

#### **7.5.1. Facts of Contract Management and Quality Assurance**

Contract management and quality assurance revolves around the following basic facts:

- The expertise for combining aviation, firefighting, and natural resource program work requires highly skilled and comprehensively trained individuals with specialized technical knowledge to ensure a minimum capability is maintained.
- The current contract and quality assurance system within the Forest Service has been developed over the past 40 years, is successful, is understood and expected by the contractors, and is proven safe.

#### **7.5.2. Personnel**

Forest Service personnel that execute and manage aviation contracts and accomplish quality assurance include:

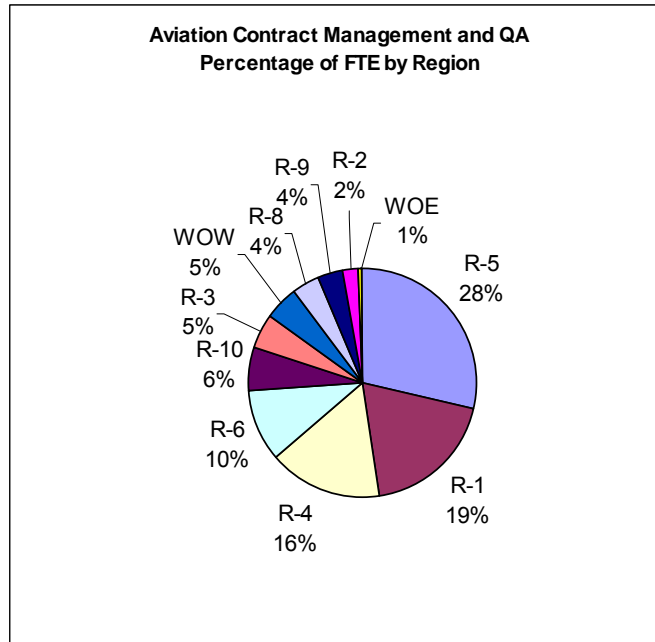
- Contracting Officers (CO) administer a variety of contracts including aviation. The aviation activity within their contracting authority dictates the amount of workload devoted to this business unit. The business of contract quality assurance is generally delegated to others with the responsibility remaining with the CO.
- Contracting Officer's Representatives (COR) manage contractor activities, administer the contracts under the Contracting Officer, and provide oversight to Project Inspectors. Unit Aviation Officers perform this function which accounts for an average of 14 percent of their workload activity. This average is supported by data that was collected by the regions.
- Project Inspectors (PI) provide direct contractor oversight and technical direction on the job within the scope of the contract. These individuals perform the duties of quality assurance and the function of quality assurance evaluators. Helicopter Managers, Resource Managers, and designated Fixed Wing Flight Managers often fulfill this role. These personnel are primarily employed in forest resource programs and devote less than 10 percent of their workload toward the aviation Project Inspector role.
- Contracting Officer's Technical Representatives (COTR) provide certification of contractor aircraft and personnel to meet and maintain contract specifications. Agency aircraft pilots, mechanics, and avionics technicians provide the technical expertise to accomplish these certifications. In addition to quality assurance tasks, these personnel provide technical expertise to field units and management personnel. They provide technical training to field units, pilot and maintain aircraft, and accomplish interagency coordination of operational and standardization issues.

A summary of those personnel involved with the Forest Service contracts, by Region, is included at

- A summary of the Forest Service contracts, by Region, reflecting contract administration and quality assurance workload is included at Appendix H – Forest Service Contracts.
- Total personnel within the Contract Management and Quality Assurance Business Area are shown in the following table. The total of 823 permanent non-Militia personnel represents 99.36 FTE. Because of the seasonality and dispersion of work during specific seasons, the work performed requires larger number of positions rather than just the calculated FTE.
- To account for periods of higher levels of activity, additional qualified temporary and Militia personnel are used, who are qualified for the work required within this Business Area. As a result, a total of 952 individuals are used to perform the actual work in this Business Area or provide direct support to it. The number of locations shown display the wide distribution of personnel, among the many areas, within the Regions, at all levels of the Forest Service.

	Permanent			Temporary			Total Positions
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations	
Non-Militia	823	99.36	127	26	1.69	11	849
Militia	102	2.99	24	1	0.04	1	103
TOTAL	925	102.35	151	27	1.73	12	952

The distribution of the FTE is displayed in the following pie chart that shows the percentage of total personnel FTE by Forest Service Region. As shown, 79 percent of the personnel are concentrated in five of the nine Regions (1, 4, 5, 6, and 10).



Most of the Contracting Officers are administering a variety of contracts other than aviation. Many of the Contracting Officer's Technical Representatives (COTR) is primarily managers or personnel with other responsibilities within the Regions and Administrative Units that are assigned to positions not related to aviation. This Business Area includes aviation maintenance personnel who have the responsibility to inspect aircraft for airworthiness, both contract and WCF. Pilots that perform contract and government pilot qualification check rides and certification checks are considered quality assurance and included in this Business Area. These personnel are identified at Appendix F - Government Personnel Summary by Region.

- The Data call received from the Regions listed all personnel associated with aviation. However, position descriptions among Regions vary; a sample of the positions is displayed below. This complicates the task of drawing Region-to-region comparisons.
- Personnel that perform contract administration positions greater than 20 percent include the following: Contracting Officer, Purchasing Agent, Procurement Technician, and Dispatchers.
- Personnel that perform quality assurance greater than 20 percent of their time include the following plus others: Maintenance Inspector, Helicopter Manager, Helicopter Inspector Pilot, Deputy Fire Staff, Airtanker Base Manager, Assistant Dispatch Center Manager, Airbase Manager, Aviation Inspector, etc.

### **7.5.3. Supporting Contracts**

There are no contracts used to support this specific Business Area. Aircraft used throughout the year to support the pilot check ride requirements are the same aircraft contracted for mission work.

#### **7.5.3.1. Specific Task Requirements**

The following variety of contracts are administered and executed throughout the Forest Service.

- Aviation contract specifications are administered in compliance with interagency agreements for standardization.
- WCF aircraft are maintained through the Aircraft Maintenance Services Contracts that provide inspection, maintenance, alterations, major avionics, storage, and other aircraft maintenance services. In addition, the contracts provide for inventory tracking and reporting, preservation, and management of Government furnished property consisting of MAFFS and C-23A Sherpa aircraft parts and accessories.
- Airtanker Contracts provide the Government with large fixed-wing airtanker services to include the dropping of approved fire suppressant or retardant material on wildland fires over all types of terrain, throughout the United States, including Alaska.
- Long-term Fire Retardant Contracts provide for the normal supply requirement of fire retardant to the U.S Department of Agriculture and the U.S. Department of Interior and may be used by other agencies with formal agreements with the above Departments.
- Smokejumper Aircraft Contracts obtain the services of aircraft fully operated by qualified personnel and equipped to meet specifications for use by the USDA Forest Service and its cooperators. Aircraft use includes, but is not limited to, transportation of personnel, equipment, and supplies for fire initial and extended attack. Additional Forest Service flights include administration activities, transporting and dropping smokejumpers, transporting and dropping paracargo, reconnaissance, testing of parachutes and other aerial equipment.
- A majority of aviation contracts for airplanes and helicopters are administered through Exclusive Use and Call-When-Needed contracts. These contracts are used in all of the Regions and nationally for specific services to support the Forest Service missions and goals identified in Paragraph 2.1.1. A summary of these contracts are included at Appendix H – Forest Service Contracts.

#### **7.5.3.2. Interagency Contract Coordination**

Forest Service contract specifications for all aircraft used in fire suppression are developed on an interagency basis. Such aircraft contracted, inspected and approved by the DOI Aviation Management Directorate (AMD) may be ordered and used inter-changeably with Forest Service-contracted aircraft and vice versa. It is agreed by both agencies that complete standardization of contract specifications is desirable.

**7.5.3.3. Contracts Administered**

- Contracts that are administered and managed by this Business Area are for the support of all the other Business Areas within this review.
- The Forest Service at the National Interagency Fire Center administers contracts for airtankers and a number of Type I / II helicopters. All other aviation contracts are administered at the respective Region or Administrative Unit levels. The number of contracts and aircraft contracted both Exclusive Use (EU) and Call When Needed (CWN) is quite extensive. As such, there is a large contracting and quality assurance workload as displayed by the number of vendors and aircraft in the following tables. There are also many instances where there are multiple contracts for individual vendors thereby increasing the total number of contracts and contracting workload:

**National Level Contracts for Aircraft**

Region	# of Vendors	# of Aircraft	Total Contract Cost
WOW	55	77	\$97,726,154
<b>TOTAL</b>	<b>55</b>	<b>77</b>	<b>\$97,726,154</b>

**Regional Level Contracts for Aircraft**

Region	# of Vendors	# of Aircraft	Total Contract Cost
R-1	3	3	\$1,016,850
R-2	0	0	\$0
R-3	5	10	\$329,127
R-4	13	34	\$482,789
R-5	18	25	\$3,475,772
R-6	20	24	\$2,979,011
R-8	0	0	\$0
R-9	10	15	\$448,852
R-10	0	0	\$0
WOE	0	0	\$0
WOW	0	0	\$0
<b>TOTAL</b>	<b>69</b>	<b>111</b>	<b>\$8,732,401</b>

### Administrative Unit Level Contracts for Aircraft

Region	# of Vendors	# of Aircraft	Total Contract Cost
R-1	36	121	\$ 8,112,369
R-2	16	18	\$ 1,857,917
R-3	23	44	\$ 10,576,100
R-4	45	71	\$ 10,837,304
R-5	13	24	\$ 15,698,294
R-6	24	33	\$ 4,903,985
R-8	28	49	\$ 7,923,761
R-9	7	8	\$ 1,271,339
R-10	25	87	\$ 2,783,725
WOE	0	0	\$0
WOW	0	0	\$0
<b>TOTAL</b>	<b>217</b>	<b>455</b>	<b>\$63,964,795</b>

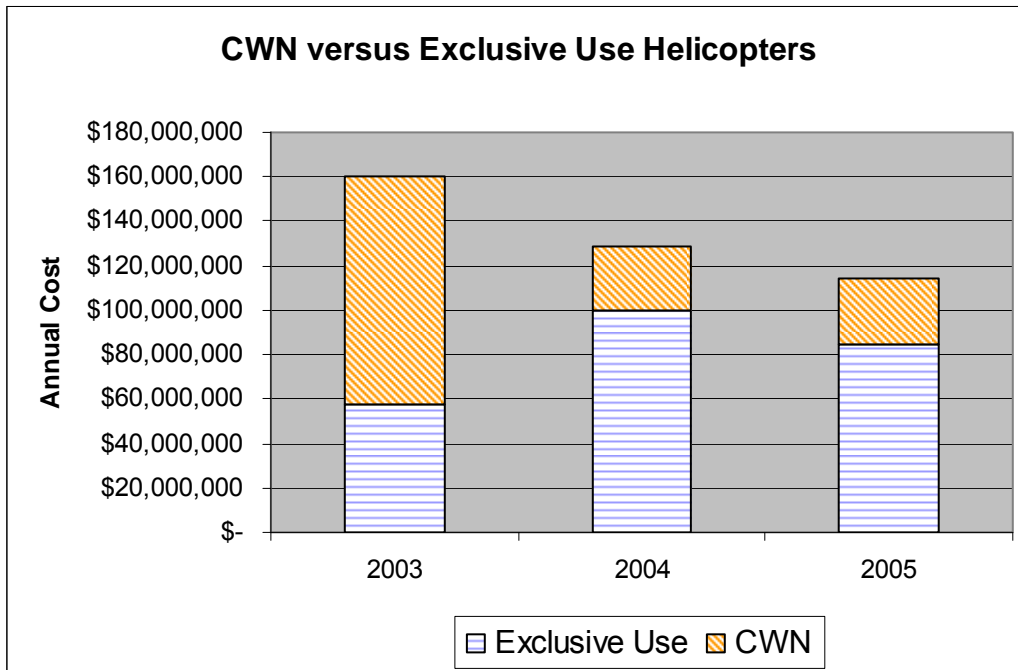
Note: For purposes of this table, the Administrative Unit Level Contracts are aggregated to the listed Regions.

### Summary of Contracts for Aircraft

Contract Level	# of Vendors *	# of Aircraft	Total Contract Cost
National	55	77	\$97,726,154
Regional	69	111	\$8,732,401
Administrative Unit	217	455	\$63,964,796
<b>TOTAL</b>	<b>341</b>	<b>643</b>	<b>\$170,423,351.00</b>

\* Vendors may be repetitive between levels.

Contracts for helicopters are a mix of Exclusive Use and CWN. In recent years there has been a shift to more Exclusive Use contracts as shown in the following chart:



A summary of the Forest Service contracts by Region is included at Appendix H – Forest Service Contracts.

#### **7.5.3.4. Types of Contracts**

Ninety-six percent of the aircraft used to support Forest Service programs are provided through contracts and rental agreements with commercial aviation operators. Contracts may be either "exclusive use" or "call-when-needed". Occasionally, large transport aircraft are chartered from air carriers, or provided by military services under memorandum of agreement. Some use is also made of aircraft operated by cooperating agencies. Almost all Forest Service use of commercially owned aircraft involves procurement of vendor crewed and maintained aircraft for the Forest Service to use for fire and resource management work. However, the one significant exception is the "end product" contract that may involve fixed-wing aircraft, helicopters, or both, for delivery of a specific performance-based service. See Appendix L - Types of Contracts for a description of the types of contracts.

#### **7.5.3.5. Aircraft Contract Preparation**

Contracts are prepared and advertised by Contracting Officers with assistance and consultation from aviation technical specialists. Proposals and bids are evaluated by COs and aviation technical specialists and contracts are awarded. Successful bidders awarded a contract must have their pilots and aircraft inspected by agency pilots and maintenance inspectors to ensure compliance with contract specifications and federal aviation regulations.

#### **7.5.3.6. Aircraft Ordering**

All aircraft services are ordered by the dispatchers at the various levels of the Forest Service under the contractual authority of the Contracting Officer and CORs, based upon requirements and funding available.

#### **7.5.3.7. Administration, Contractor Oversight and Acquisition Management**

The Forest Service Contracting Officer retains all authority for contract actions following award of aircraft contracts; however, they may assign certain administrative and oversight functions to local unit CORs. CORs often further assign many of these duties to Project Inspectors (PIs) that include ATGSs, Helicopter Managers, and Fixed Wing Flight Managers. The aircraft manager has authority to direct operations to maintain a safe, effective, and efficient flight operation no matter the mission. CORs normally approve payments, initiate contract modifications, Stop Work Orders, Notices of Non-Compliance and draft contract modifications for Contracting Officer's approval and execution. COTRs resolve technical and personnel performance issues before and during the term of the contract and within the scope of the contract.

#### **7.5.3.8. Pilot Evaluation**

Evaluation of Contract Pilots - Once the vendor for a contract has been identified, the appropriate Agency representative coordinates a time for pilot flight evaluations. The flight evaluation consists of a check flight and verification of all certifications and experience submitted by the pilot. The representative must have technical knowledge of aircraft capabilities, characteristics, and operating limitations and Forest Service policy/procedures. A special use mission flight evaluation is conducted to ensure that the pilot understands the operational aspects of natural resource flying. The flight evaluation ensures that the pilot flies in a safe and competent manner.

Pilot Inspectors, who are government employees, are required to maintain USDA Forest Service flight proficiency minimums. This includes 100 hours of flight time annually and a Certificated Flight Instructor (CFI) certificate which must be renewed biennially with the FAA. An annual flight physical is required to meet FAA requirements. All pilot inspectors must maintain proficiency in the special use mission areas that are required of the vendor such as smokejumper/paracargo drops, long line/vertical reference, mountainous terrain flying, external loads/aerial ignition devices, and floatplane operations. Performance based evaluation clinics for Inspector Pilots are held annually and attendance is mandatory.

### 7.5.3.9. Personnel Analysis

The following data analysis was performed based upon the data received from the Regions regarding the on the Business Area of Aviation Contract Management and Quality Assurance. The majority of the aviation program personnel with contract management and quality assurance duties are also performing other duties within and/or outside the scope of this review. Contracting Officers normally handle many other non-aviation related contracts, but focus on the aviation and other fire related contracts during fire seasons. These individuals are assigned to the National, Regional, and Administrative Unit Offices. The following table shows number of personnel and representative FTE that are involved with contract administration and quality assurance.

Percentage of Effort for Contract Administration & Quality Assurance	Count of Personnel	Number of FTE
100% Contract Mgt/QA	19	19
Total Contract Mgt/QA 50%<100%	28	15.3
Total Contract Mgt/QA 20%<50%	169	36.7
0 < 20% Contract Mgt/QA	607	39.85
Total	823	99.4

As shown in the table above, 19 individuals were identified as spending 100 percent of their time toward contract management and quality assurance. These personnel are in four of the Regions and consist primarily of Contracting Officers – Aviation; Purchasing Agents, Procurement Technician, and Maintenance Inspectors. Of those spending 50 percent or greater but less than 100 percent, most were aircraft managers and inspectors with only one contracting officer. The vast majority (608) of the personnel performed contract management and quality assurance for less than 20 percent of their time with the average amount of time spent 7 percent. These personnel are disbursed throughout the Regions at all levels of the Forest Service organization.

### 7.5.3.10. Current Contract Quality Assurance

Historically, aviation quality assurance has been accomplished by members of the Forest Service trained to perform and oversee the specialized missions which encompass natural resource flying. Approximately, 94 Forest Service personnel have been designated as “quality assurance” inspectors. These inspectors have been assigned this quality assurance function as additional duties within their Regional organization (maintenance, pilot, avionics, etc). However, based upon the analysis above, only 47 individuals have greater than 50 percent of their duties related to quality assurance or contract management.

### 7.5.3.11. Aviation Contract Management and Quality Assurance Workload

This Business Area has the responsibility for not only management and quality assurance of the contract aircraft and pilot certifications, but also the quality assurance of the WCF aircraft and government pilot certifications.

The following 2005 data submitted from the Regions demonstrates the mix of Government and contract workload that is managed and for which quality assurance is performed. The contract totals include the 13 leased aircraft. This data is representative of the Business Areas.

	Government	Contract	% Contract
Dollars spent on Aviation Activities	\$3,520,294	\$170,423,350	98%
Available aircraft	26	643	96%

## 7.6. Impacts to Stakeholders

Aviation contracts comply with standards adopted by the Forest Service and Cooperating Agency management personnel. All interagency stakeholders employ quality assurance personnel when they provide contracted aviation resources that are available for use by any stakeholder as needed. Changes to Forest Service contract management and quality assurance procedures will potentially affect workload and operating procedures of all stakeholders.

## 7.7. Issues

- CWN contracts cost the government more than Exclusive Use contracts because there is no guaranteed use period for the contractors. Therefore, the contractor's incentive to commit aviation resources is decreased. By example, the vendors of Sikorsky S-64 helicopter charged an average of \$31,500 per day of availability on CWN contracts versus \$14,000 per day of availability on Exclusive Use contracts with guaranteed use periods of ninety days. In this example, the government gets more than twice the value for exclusive use aircraft services contracts.
- Exclusive Use contracts are awarded for terms of a few weeks to several months. Generally, the longer the contract terms the lower the price to the government because the contractor is guaranteed a greater amount of fixed income for long-term commitments. Again, this can be problematic for the Forest Service because of the same funding issues identified in the preceding paragraph.
- All contract and quality assurance standards require commitment from, and agreement with our, interagency cooperators. Changes to current procedures and practices will affect workload and operating procedures of these partners.
- The expertise for combining aviation, firefighting, and natural resource program work requires highly skilled and comprehensively trained individuals with specialized technical knowledge to ensure a minimum capability is maintained. As such, a "core commercial" group of employees should be maintained within the agency.
- The current contract and quality assurance system within the Forest Service has been developed over the past 40 years, works well, is understood and expected by the contractors, and is proven safe. The current methods have buy-in with our interagency cooperators and any changes would require commitment from these partners.
- Increased standardization and consistent interpretation of contract specifications language is important for contractors and other personnel operating across multiple Regions.
- Exclusive Use contracts are funded from allocated "Pre-suppression Funds". Conversely, CWN contracts are initiated and funded after the need for services is identified from "Suppression Funds" that can only be spent while fires are occurring.
- The Forest Service needs to determine the appropriate mix of Exclusive Use versus CWN contracts.



## 7.8. Conceptual “To-Be” Assessment

### 7.8.1. Maintain Status Quo

The Contract Management and Quality Assurance programs, as described above, contribute to attainment of agency goals by providing contract support and should be continued.

### 7.8.2. Organization

- The “quality assurance” responsibility of contractor and agency operations should remain a Forest Service function to ensure not only long-term continuity but mission focus to supporting the respective Administrative Units. The expertise of combining aviation, firefighting, and natural resources is required for the type of contracts as written and is spread out over a large number of locations. As such, a large number of personnel are required for a short period of time for each evaluation at each location. The Forest Service type flying operations, pilot experience and skills are more complex than that of normal FAA commercial operations and do not relate to the FAA model. To maintain or improve the Forest Service level of safety, a high degree of standardization and oversight is required.
- To ensure standardization and quality assurance of the hundreds of commercial operators employed annually by Forest Service, a minimum core cadre of 59 agency personnel (24.06 FTE) should be organized for quality assurance. These personnel would perform under the guidance of their respective national program standardization officer along with their other assigned duties within their respective job descriptions. The personnel identified below do not all perform full-time quality assurance. The 59 personnel will be performing other work responsibilities amounting to 19.34 FTE. These personnel perform quality assurance from 20 to 60 percent of their time during a year. The positions to be maintained are as follows:
  - Airplane quality assurance inspectors (32 agency employees) working under guidance of the National Office Standardization Officers
    - Twelve QA individuals for airtanker/ASM (including light airplane QA)
    - Six QA individuals for smokejumper (including light airplane QA)
    - Six QA individuals for light airplane QA
    - Eight QA individuals for program managers (including light airplane or helicopter QA)
  - Helicopter quality assurance inspectors (agency employees)
    - Nine QA individuals for regional Helicopter Inspector Pilots (HIP)
    - Maintenance quality assurance inspectors (agency employees)
    - Fifteen QA individuals for quality assurance inspectors working for the NAOO Airworthiness
  - Avionics quality assurance inspectors (agency employees)
    - Three QA individuals for quality assurance inspectors working for the NAOO Airworthiness
    - All positions maintain quality assurance, training, and standardization tasks for agency and contractor personnel and/or equipment
- A listing of the Pilots included above that perform quality assurance duties are displayed in Appendix R-1 - Pilots with Quality Assurance Responsibilities (41 Positions).
- Quality assurance positions will be responsible to maintain standardization, quality assurance, and training of more than 800 pilots and 600 aircraft from throughout the U.S. that are contracted or available to be contracted.

- Unit Aviation Officers (UAO) are essential to coordinate between local units and contractors and serve as Contracting Officer's Representatives and will function in the same manner in the future.
- Contracting Officers, CORs and PIs are an essential component of contract administration, oversight, and quality assurance and should continue to function as they currently are.
- A significant number of personnel will perform management and quality assurance of contracts (aircraft and other services) as an additional duty. In addition to those identified above, there remain a significant number of personnel who perform quality assurance duties reporting to CORs and PIs regarding the performance of not only aircraft contracts, but other aviation support contracts. These personnel will continue to have a small percentage of their time devoted to quality assurance. A list of these positions is included in Appendix R-2 - Aircraft Maintenance Quality Assurance Personnel (18 Positions) and Appendix R-3 – Pilots with NO Quality Assurance Responsibilities (47 Positions) includes those with no quality assurance responsibilities.

### **7.8.3. Equipment**

There are no additional equipment requirements beyond those identified in the assessment.

### **7.8.4. Communications**

Reductions in the number of fixed-wing pilots performing quality assurance checks of aircraft and pilots will standardize more of the communications not only within the government contracting and national standardization program managers but with the contracting personnel.

### **7.8.5. Efficiencies Available**

- Efficiencies will be gained by having Forest Service quality assurance inspectors under the guidance and supervision of national program managers with standardized programs. The standard inspections, when applied in a consistent method nationwide, will produce a greater level of quality performance and add to the safety of aviation activities, therefore protecting of life and property in field operations. Pooling of inspectors will allow more efficient field inspections and workload sharing.
- Quality of contractor operations, government interests, government policy, and core training and qualification standards will be ensured through the retention of a core cadre of Forest Service quality assurance inspectors.

### **7.9. Future Customers or Stakeholders**

Future customers and stakeholders are composed of agency employees, interagency partners, international partners, the general public, and contractors.

### **7.10. Future of Interagency Fire Center**

This business area has no affect on future NIFC operations.

### **7.11. Performance Analysis**

- This business area has no performance gaps between the present and the conceptual future assessment and none will result from the recommendations provided herein. The work requirements, standards of operation, and ultimate performance would not be reduced from the present conditions.
- The recommendations within this business area predominantly refine the contracting process by optimizing the mix of type contracts, increased performance based, and increasing the contract lengths for cost avoidance and reduced contract costs.

- The assessment showed that most of the fixed-wing pilots performed quality assurance duties a very small percentage of their time. The reduction of 35 quality assurance positions from the current organization is line pilot personnel who perform QA functions as additional duties. Positions beyond the recommended 59 Quality Assurance personnel for pilot and aircraft certifications are excess to this business area's needs. The consolidation of the 14.5 FTE of quality assurance responsibilities into a fewer number of positions (41 from 75) does not produce any direct savings or performance changes but it reduces the number of pilots that must be trained to perform the quality assurance responsibilities and provides for greater standardization across the aviation contracts. The total amount of work effort is not reduced but is redistributed for efficiency considerations.

## **7.12. Cost/Benefit Analysis**

### **7.12.1. Historical Costs**

#### **7.12.1.1. Personnel**

Personnel costs for this Business Area were developed using the data call information from each of the Forest Service Regions regarding the amount of personnel working in this Business Area. Costs are calculated for a typical five-year period for a cost comparison. For this review, the earliest base-year starts on October 1, 2008 and the base year annual cost is included.

- Base Year Annual Personnel Cost:\$ 11,795,592

#### **7.12.2. Cost Estimate Analysis**

Anticipated recommendations were evaluated based upon the historic costs. The analysis for each of the recommendations contains the estimated cost, the benefits, and estimated savings.

## **7.13. Recommendation – Increase Contract Length for Select Aircraft Contracts**

Increase the contract length for select aircraft contracts. This recommendation is supported by vendor general comments.

### **7.13.1. Cost Estimate**

It is anticipated that costs associated with implementing this recommendation would be minimal. One example of an associated cost for this recommendation is the cost of analyzing current contracts to determine if modifications need to be made to change the contract length.

### **7.13.2. Benefits Estimate**

Longer contract lengths reduce the risk to contractors by increasing stability. This provides an incentive for contractors to decrease their daily availability rates, which reduces the cost to the Forest Service.

### 7.13.3. Savings Analysis

The following table shows the effect that longer contract lengths have on the daily availability rates of vendors that provide Type II helicopters. This data was provided by the Forest Service contracting office and was pulled from records of national contracts on file.

Contract Length	Daily Availability Rates for One Type II Helicopter		
	60 Days	90 Days	>90 days
Vendor 1	\$3,752	\$3,526	\$3,290
Vendor 2	\$3,976	\$3,808	\$3,285
Vendor 3	\$3,640	\$3,220	\$3,000
Vendor 4	\$3,752	\$3,520	\$2,825
Average Daily Rate	<b>\$3,780</b>	<b>\$3,518</b>	<b>\$3,100</b>

This analysis of four vendors shows that, on average, contracts with lengths of 90 days or greater can potentially save the Forest Service an average of 7 to 18 percent. Longer terms within a year equate to potentially increased discounts for this type of helicopter.

There is no current quantitative data to support a decrease in costs for longer terms of five-year versus three-year contracts. However, in the next contract solicitation cycle, the Forest Service national contracting office intends to move to five-year offers following contractor feedback supporting lower rates for longer terms.

### 7.14. Recommendation – Optimize the mix of Exclusive Use and CWN Contracts to Minimize Total Costs

Optimize the mix of Exclusive Use and CWN Contracts to minimize total costs (preparedness and suppression combined). It is critical to analyze the appropriate mix in order to optimize cost containment opportunities.

#### 7.14.1. Cost Estimate

Increased pre-suppression costs with correspondingly greater decreased suppression costs. It is critical to analyze the appropriate mix in order to optimize cost containment opportunities.

#### 7.14.2. Benefits Estimate

Reduced total Agency costs, increased efficiencies of operation, and reduced contract administration workload. An operational benefit includes using the most cost efficient aircraft contract method at any given time over a fire, regardless of use in an initial or extended attack mode.

#### 7.14.3. Savings Analysis

- The increase in preparedness costs to implement this recommendation would be less than the suppression costs that are avoided.
- The 2004, 2005, and 2006 NMAC Efficiency Helicopter Coordinator Savings reports show approximately \$5.9 million in savings through the use of helicopter coordinators to properly manage the utilization of exclusive use versus CWN helicopters. A copy of the Coordinator Log for each study is included at Appendix Q – Helicopter Coordinator Log of NMAC Efficiencies.

- These savings are the result of using pre-suppression funded Exclusive Use aircraft versus suppression funded CWN aircraft.

### **7.15. Recommendation- Maintain a Core Cadre of Agency Personnel for Quality Assurance**

Maintain a minimum core cadre of 59 agency personnel (24.06 FTE) for quality assurance of pilots and aircraft contracts working under the guidance of their respective national program standardization officers. The personnel will also be performing work other than quality assurance amounting to 19.34 FTE. If this recommendation is accepted, implementation should include a study to determine the most effective way for the cadre to operate.

#### **7.15.1. Cost Estimate**

- Initial costs for implementing this recommendation would be personnel and study costs. Study cost is estimated at less than \$20,000.
- Personnel costs for the 59 recommended quality assurance positions total approximately \$3.8 million. Further cost detail is shown at Appendix S-11 – Cost of Quality Assurance Pilot Personnel. The approximate annual costs by position category are broken down as follows:
  - 32 fixed wing inspector pilots (10.96 FTE): \$1.7 million
  - 9 helicopter inspector pilots (3.55 FTE): \$560,000
  - 18 non-pilot QA personnel (9.55 FTE) : \$1.5 million
- Travel costs may be incurred if this recommendation is implemented but should not appreciably change since the workload is not expected to change. Travel data is currently not available to quantify this assumption.

#### **7.15.2. Benefits Estimate**

This would increase standardization and quality assurance of the hundreds of commercial contract operators employed by Forest Service throughout all of the Regions. The core cadre will provide continuity to interagency agreements, standardization, and operating procedures. More efficient inspection schedules will be executed through national direction of multi-Region inspection teams.

#### **7.15.3. Savings Analysis**

- Potential savings resulting from this recommendation will include better coordinated inspection schedules and potentially decreased travel costs. However, currently available travel data is not available to support this assumption.
- While there are expected to be minimal savings in direct personnel costs, the follow-on study would identify further operational savings and efficiencies.

### **7.16. Recommendation - Aviation Contract Review**

Aviation contracts should be reviewed in greater detail for conformance with the new performance-based contract criteria and improve the balance between Government and contractor risk. This has the potential of reduced contract costs.

#### **7.16.1. Cost Estimate**

The cost of implementing this recommendation is expected to be less than \$10,000. This cost is associated with the time spent reviewing current contracts for adherence to specific criteria.

### **7.16.2. Benefits Estimate**

- Performance-based contracts have the potential to require less quality assurance than the current contracts since the contractor is held more to the performance specified within the contract. As a result, quality assurance can be accomplished by sampling rather than detailed 100% inspection.
- A performance-based contract would specify the mission requirements with any parameters and the contractor would have to provide aircraft to capability to meet those requirements. Examples would be: lift capability at a specified density altitude; response time to a fire incident from time of call; and accuracy of mission delivery (firefighter delivery location or retardant release). Failure to meet the requirements could result in default and inability to have future contracts. This then provides an incentive for a contractor to perform within the specifications of the contract.

### **7.16.3. Savings Analysis**

- There are no examples of cost comparisons for changing to performance based contracts with the current Forest Service contracts.
- Total savings are in general a result of the contractor's ability to be innovative in their approach to completing the performance. This is based upon profit margin, incentives, and balancing work with other clients.
- The Forest Service retains liability for the operation of aircraft (per Public Aircraft Law PL 106.181). This liability is extreme in terms of dollars. This function is considered "core commercial" as it is too closely related to the Agency's central mission areas to be considered to be contracted. This is consistent with the Forest Service FAIR Act inventory that treats this function as reason code CA. See also Appendix N – Public Aircraft, P.L. 106-181.
- Over about three years prior to the 1974 national helicopter operations study the Forest Service had 104 helicopter accidents injuring 47 and killing 19 people. The recommendations that were implemented as a result of the study included several components of quality assurance such as inspectors and maintenance personnel. The accident rate decreased dramatically after implementation of study concepts (6.3 accidents/100,000 flight hours).

### **7.17. Civil Rights Impact Assessment**

A Civil Rights Impact Assessment (CRIA) is required to identify and categorize the civil rights impacts of implementing any realignment initiative that will potentially affect employees. A CRIA for Forest Service employees will be developed if the Fire Executive Council recommends changes to staffing during their follow on studies.

### **7.18. Systems**

- Historically, quality assurance has been compromised due to inadequate information sharing between inspectors, Regions, and Agencies. Recently available products such as EaTIS (Equipment and Training Inventory System) are becoming integrated within aviation administration procedures. Following successful Beta testing EaTIS should be instituted to ensure compatible database functions and electronic tracking to improve future quality assurance.
- Systems managing aviation contracts, operations, and administration within this Business Unit includes: the Aviation Management Information Systems (AMIS), Federal Aviation Interactive Reporting System (FAIRS), and the Resource Order and Status System (ROSS).

- AMIS is an ORACLE relational database management system that handles aircraft-use information for both contract and Forest Service owned aircraft. The information is summarized and reported to USDA and GSA on a regular basis. The system is designed to allow units to share data and reports between units. It is an internal agency web-based database that includes various reporting formats to accommodate a specific data or information call.
- FAIRS is a highly secure, web-based aviation management information system that GSA uses to collect and analyze the costs and usage (in hours) of the aircraft that the federal agencies own or hire (i.e., rent, charter, lease, full-service and other contracts). Annually, GSA submits a report from FAIRS to the Office of Management and Budget (OMB). The WOE inputs data into FAIRS based upon AMIS information.
- ROSS is a system that provides automated support to interagency and agency dispatch and coordination offices within the wildland fire organization, which is currently being implemented across the Forest Service. The system will: 1) provide current status of resources available to support all-risk activities such as wildfire and flood; 2) enable dispatch offices to exchange and track resource order information electronically; and 3) enable dispatch offices too rapidly and reliably exchange mission-critical emergency electronic messages.
- None of the recommendations within this Business Area will affect these Systems.

### **7.19. Acquisition Strategy**

Acquisition strategy is not applicable for this Business Area.

### **7.20. Project Lifecycle Schedule**

Project lifecycle schedule is not applicable for this Business Area.

### **7.21. Requirements**

The standards and performance measures for requirements are not applicable for this Business Area.

## **7.22. Summary of Recommendations**

### **7.22.1. Short-term Recommendations**

- Increase the contract length for select aircraft contracts. This recommendation is also supported by one of the vendor general comments
- Optimize the mix of Exclusive Use and CWN Contracts to minimize total costs (preparedness and suppression combined). It is critical to analyze the appropriate mix in order to optimize cost containment opportunities
- Maintain a minimum core cadre of 59 agency personnel (24.06 FTE) for quality assurance of pilots and aircraft contracts working under the guidance of their respective national program standardization officers. If this recommendation is accepted, implementation should include a study to determine the most effective way for the cadre to operate.

### **7.22.2. Long-term Recommendations**

Aviation contracts should be reviewed in greater detail for conformance with the new performance-based contract criteria and to improve the balance between Government and contractor risk. This has the potential to reduce contract costs.

## **8. Business Area F – Aviation Program Management**

### **8.1. Business Needs Assessment**

#### **Forest Service Goals**

This Business Area supports the Forest Service Strategic Goals identified in Paragraph 2.1.1 by providing aviation policy, program management, and oversight of Forest Service aviation programs at all levels.

### **8.2. Business Area Mission Fulfillment**

- The Aviation Program Management Business Area within the Forest Service provides support to fire and natural resource and administrative areas. The work and related authorities and responsibilities are identified in laws, Executive Orders, regulations and agency policy. By law, the authorities and responsibilities lie with the Chief of the Forest Service and are delegated by the Chief in accordance with Forest Service Manual 1200 - Organization. Line officers within the Forest Service have the authority and responsibility to provide and maintain the personnel and skills necessary to meet aviation management objectives.
- The business area of Aviation Program Management is responsible for the development and administration of USDA Forest Service policy as contained in Forest Service Manual 5700 – Aviation Management, and in the handbooks and guides referenced therein.
- This business area includes personnel and resources necessary to administer a safe and effective aviation program at all levels of the agency – National, Regional, Station, Area, IITF, and Forest/Grassland. For position descriptions in this Business Area see Paragraph 8.6. The primary mission of the aviation activities program is to support wildland firefighting operations. Forest Service aviation management also provides support to natural resource and administrative activities. These missions are accomplished in conjunction with other federal and state agencies through close interagency coordination in policy development, strategic planning and operational execution. Overall aviation program management includes personnel at the National and Regional levels that are not involved with the daily execution of aviation operations. These management levels establish policy standards, provide oversight and determine priorities for acquisition, allocation, and prioritization of aviation resources. Additional aviation program management is necessary at the geographic area level and for specific operational areas such as helicopter operations, airtanker operations, etc. Unit aviation officers fill the requirement for aviation management expertise at the geographic area level. Program management for specific operational areas is accomplished at both the Regional and National levels.
- This business area also includes the personnel and associated resources that provide dispatcher support to aviation program management. This is accomplished primarily through Geographic Area Coordination Centers (GACC) managers and dispatchers. This is accomplished primarily through the cost effective allocation and prioritization of scarce resources to meet fire needs and all other risks. This function provides upward reporting to support program management.



### **8.3. Justification for Business Area**

- An aviation management structure is necessary because of the resource values, high cost, and increased risks involved in aerial firefighting operations.
- The Agency assumes liability for all aviation activities under its operational control per Public Law 103.411 as amended in Public Law 106.181 and Advisory Circular AC No: 00-1.1; therefore, the need for highly specialized aviation program management is essential.
- A strong aviation management organization is also necessary for cost containment and efficient use of expensive and limited resources. This includes ensuring proper acquisition, allocation, prioritization, and safe operation of resources.
- This management function is responsible for interaction with all branches of state and federal government regarding strategic planning and integration of aviation policy. Program management personnel develop and interpret agency policy in support of the Department of Agriculture. They also develop and administer the agency budget for aviation activities. National program management is responsible for national scale coordination with other federal agencies and response to requests from the administration and Congress.

### **8.4. Assumptions and Constraints**

The following assumptions and constraints are an expansion to those stated in Paragraph 2.3.

#### **8.4.1. Assumptions**

- Fire and Aviation Management will maintain some level of aviation expertise at the Forest Service headquarters in Washington, DC for interaction with all agency programs at the senior management level.
- An aviation management structure supporting the development and application of an aviation program is necessary to ensure efficient and cost effective use of aviation resources and provide necessary risk management principles and oversight.
- The Forest Service utilizes a multi-tier, decentralized organization model. The aviation program serves all levels of this organization and requires a comprehensive aviation management structure.
- Aviation is a resource utilized by natural resource managers to accomplish land management objectives. An aviation program management structure is essential to ensure the availability, viability, and safe application of this resource.

#### **8.4.2. Constraints**

The Forest Service will use a decentralized organizational structure.

Aviation policies and organizational procedures differ across the spectrum of federal and state organizations creating the need for high level communications and interagency coordination at all levels.

## 8.5. Current Assessment

### 8.5.1. Basic Facts of Aviation Program Management

Aviation Program Management for the Forest Service revolves around the following basic facts:

- National management of the Forest Service aviation program falls under the direction of the Director, Fire and Aviation Management located in Washington, DC. Program management is accomplished by a split office located in Washington, DC and at the National Interagency Fire Center in Boise, ID.
- Regional aviation management is the responsibility of a Regional Aviation Officer and staff of operational program managers and falls under the direction of the Regional Director of Fire and Aviation.
- Administrative Unit level aviation management needs are met by a variety of models tailored to specific aviation management requirements and is normally served by a forest or unit aviation officer.
- The Forest Service has one of the largest aviation programs within the Federal Government, flying approximately 800 aircraft and approximately 80,000 hours per year based on a 10 year average.
- Currently, contract aviation services account for approximately 98 percent of total aviation program costs as reported in the Aviation Management Information System (AMIS) database. FY05 data reflects a total aviation program cost of \$167.1M of which \$164M is contract costs and \$3.1M is Working Capital Fund (WCF) costs. WCF includes agency owned aircraft and associated use costs, some support and facility costs and a portion of employee pilot cost. Contract costs are exclusively for aircraft use and pilot services.
- The total personnel cost of the Aviation Program Management business area is \$6,774,104. This is 1.0 percent of the previous and future total WFPR budgets (FY'05 - \$676,470,000; FY'06 - \$676,014,000; FY'07 - \$676,000,000)

## 8.6. Personnel

A brief descriptive summary of program management personnel with their responsibilities at the National, Regional, and Administrative Unit levels is described below.

### 8.6.1. National Aviation Program Management Personnel

An organizational structure model is displayed at Appendix E-1 – Administrative Organization of Fire and Aviation Management.

Expanded duty descriptions per policy manual direction can be found in Appendix E-2 – Position Descriptions and Responsibilities of National Staff.

- The **Assistant Director, Aviation** position is located within the Fire and Aviation Management staff in Washington, DC and is responsible to the Director of Fire and Aviation Management for overall national aviation program administration. This individual may delegate some of the responsibilities of leadership and management of the Forest Service aviation program to the National Aviation Operations Officer for Operations (NAOO-O) and the National Aviation Operations Officer for Airworthiness and Logistics (NAOO-A&L). This delegation includes coordination of aviation activities, policies and procedures with other staffs, agencies and groups. The Assistant Director has a staff of two Aviation Management Specialists and one developmental Aviation Management Specialist.

- **National Aviation Operations Officer for Operations** is responsible to the Assistant Director, Aviation for the management and supervision of the detached aviation management unit of the Forest Service National Headquarters Office located at NIFC. The NAOO-O has the responsibility to provide national leadership, coordination, technical expertise and support for national aviation programs. This position is also responsible for assisting the Regions with technical support, coordination and oversight and for providing leadership and coordination within the interagency arena to ensure compatible and standardized aviation operations. The NAOO-O supervises the National Aviation Operations staff located at NIFC.
- **National Aviation Operations Staff – Washington Office West (WOW)** is responsible for providing technical expertise and oversight for all components of the Forest Service aviation program. They participate in the development and negotiation of national aircraft contracts, coordinate and participate in the inspection and approval of national contract aircraft and pilots, provide quality assurance oversight and coordinate the technical aspects of the interagency aviation program with other federal and state agencies.
- Listing of National Aviation Operations Staff positions:
  - National Helicopter Program Manager
  - National Helicopter Operations Specialist
  - National Helicopter Standardization Pilot
  - National Fixed Wing Standardization Pilot
  - National Airtanker Program Manager
  - National Airtanker Modernization Program Manager
  - National Smokejumper and ASM Program Manager
  - National Aviation Technology Specialist (detached)
  - National Aviation Program Assistant
- **National Aviation Operations Officer for Airworthiness and Logistics** is responsible to the Assistant Director, Aviation and provides leadership, oversight, technical expertise and coordination for aviation airworthiness and logistics. This position also assists the Regions with maintenance and airworthiness issues and ensures national standards are implemented at the Regional level. This position supervises the National Aviation Maintenance Specialist

### **8.6.2. Regional Level Aviation Program Management Personnel**

Each of the Regional and Area aviation programs operate under the line authorities and budgets within that Region or Area reporting to the Regional Forester or Area Director. The FSM 5700 manual requires that a Regional or Area Aviation Officer position provide administrative staff control and coordination of aviation activities within that geographic area. Regional/Area Aviation Officers are responsible for planning, organizing and directing regional/area aviation activities. They ensure Unit Aviation Plans are supplemented and updated annually to ensure compliance with the National Aviation Plan. They are principal advisors on all aviation matters to the Regional Forester or Area Director, the Regional Fire Director, Deputy and subordinate staff and maintain coordination with Forest/Unit Aviation Officers for local aviation matters. The Regional Aviation Officers advise and assist the national aviation staff in the development of policy and program goals and ensure national program direction is implemented at the Regional and Administrative Unit level.

- The Regional/Area Aviation Officer may supervise all or some of the following staff positions (It should be noted that not all Regions are staffed the same):
  - Helicopter Operations Specialist
  - Helicopter Inspector Pilot
  - Helicopter Program Manager
  - Fixed Wing Operations Specialist
  - Deputy Regional Aviation Officer
  - Aviation Maintenance Inspector
  - Supervisory Pilot
  - Avionics Inspector
  - Aviation Management Specialist
  - Line Pilots with collateral program management responsibilities

### **8.6.3. Administrative Unit Level Aviation Program Management Personnel**

Administrative Units may have an Aviation Officer either as a stand alone position or a collateral duty to perform aviation coordination within the Administrative Unit staff.

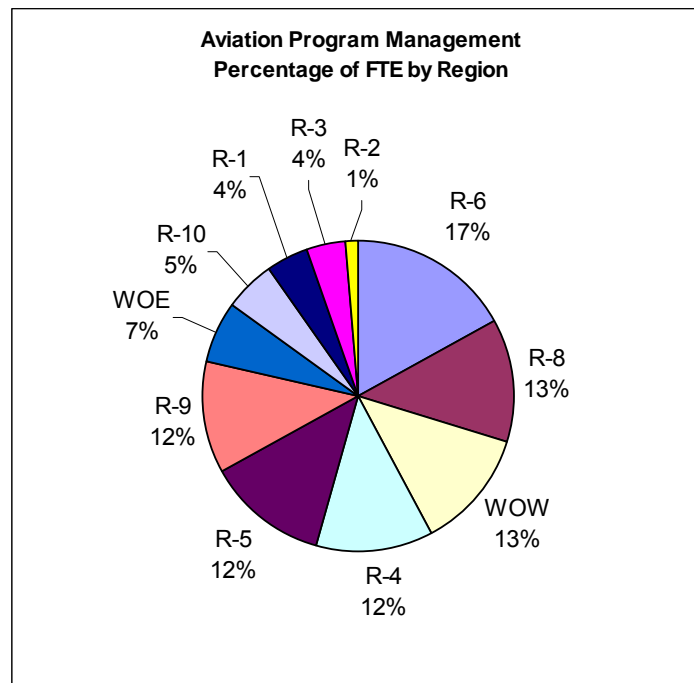
Responsibilities of the Administrative Unit Aviation Officer include: program management of all aviation activities on the Administrative Unit; management of Administrative Unit WCF and/or contract aircraft; development of Administrative Unit aviation plans in alignment with national aviation policy; ensure compliance with Regional and National aviation policy; aviation project oversight for planning, operations and risk assessment; coordinate with Regional Aviation Management as necessary.

### 8.7. Personnel Summary

Total personnel within the Aviation Program Management Business Area are shown in the following table. This Business Area does not have militia personnel. The total of 268 permanent non-militia personnel, represent 48.89 FTE. Program Management is required on a year round basis; however, some of these management requirements are concentrated during the peak fire season. Because of the seasonality and dispersion of the work during specific seasons, the work performed requires a larger number of positions rather than just the calculated FTE. The number of locations shown display the wide distribution of personnel within the Regions at all levels of the Forest Service.

	Permanent		
	Number of Positions	Number of FTE	Number of Locations
Non-Militia	268	48.89	78
Militia *	1	0.10	1
<b>TOTAL</b>	<b>269</b>	<b>48.99</b>	<b>79</b>
* The militia identified in the data call appears to be an anomaly and is negligible in the cost evaluation.			

The distribution of the FTE is displayed in the following pie chart that shows the percentage of total personnel FTE by Forest Service Region. Detailed numbers of Program Management personnel are displayed in Appendix F-6 – FS Aviation Program Management (non-Militia) – All Positions. As shown, 80 percent of the personnel are concentrated in the Regions throughout the Forest Service with 20 percent of Program Management in the WOW and WOE.



The Data call received from the Regions listed all personnel associated with aviation. However, position descriptions among Regions vary; a sample of the positions is displayed below. This complicates the task of drawing Region-to-region comparisons. Personnel that perform Program Management responsibilities greater than 20 percent include the following: Aviation Officer/Assistant at all levels, Aircraft Maintenance Inspector, Aviation Management Specialist, Aviation Safety/Pilot Inspector, etc.

### 8.7.1. Personnel Analysis

The majority of the personnel with program management responsibilities are also performing contract management and quality assurance. These individuals are assigned at the National, Regional, and Administrative Units. Unit level aviation program management is normally performed as a collateral duty to primary position responsibilities that may be outside the scope of this review. The data shows that 72 percent of the positions expended less than 25 percent of their time in this business area.

Percentage of Effort for Program Management	Count of Personnel	Number of FTE	Average Percent of Individual Effort
100% PM	7	7	100%
Total PM 50 < 100%	29	15.74	54%
Total PM 25 < 50%	39	10.77	28%
Total PM 0 < 25%	193	15.38	8%
<b>Total</b>	<b>268</b>	<b>48.89</b>	<b>18%</b>

### 8.8. Interagency Aviation Program Management

Many efficiencies and cost effective utilization of aviation resources can be realized by cooperative efforts among federal, state and local entities with wildland firefighting responsibilities. Current efforts include joint contract specifications, standardized training and qualification criteria, and interagency mission operations guides. Interagency aviation program management activities are conducted primarily at the national level. Implementation of interagency policy and agreements is executed and has oversight at the regional level.

### 8.9. Aviation Management Policy

USDA Forest Service Aviation policy is developed through the following process:

Aviation issues may be brought forward from all levels of the agency and cooperators. The primary technical resources to evaluate issues are the Regional Aviation Officer Council (RAOC) and the National Aviation Safety Council (NASC), which includes the Regional Aviation Safety Managers (RASMs). Issues will initially be presented to these groups to discuss, validate the need for action and to identify options which are responsive to the issues. These two groups work independently on operational and safety issues as appropriate, and meet as a joint aviation council to resolve common issues.

Most issues are technical in nature and will be resolved by these groups. Recommendations will be made at this level and elevated to the Washington Office (WO) for approval and policy issuance. Issues which need to be elevated to the Regional Fire Directors will be forwarded by the NAOO-O and NASTM to the National Director for Fire and Aviation Management through the Assistant Director for Aviation. Prior to elevating issues to the WO, the NAOO-O and NASTM will consult with any agency cooperators who have an interest in the issue. The NAOO-O and NASTM will send a briefing packet to the WO describing the issue(s), options for addressing the issue(s), and when appropriate, cooperators positions/concerns. The Assistant Director for Aviation is responsible for determining what issue(s) will be elevated.

### 8.10. Contracts

There are no aircraft contracts used to support this specific Business Area. Aircraft used throughout the year to support this Business Area are the same WCF or contracted aircraft that are for mission work. Various contracts are issued to assist in specific program management work (i.e. consultant support). The number of studies and support requirements varies from year to year depending on agency priorities, but is typically less than \$250,000 per year.

A summary of the Forest Service contracts by Region is included at Appendix H – Forest Service Contracts.

### 8.11. Forest Service Aviation Program Management Work Matrix

Forest Service aviation program management consists of a variety of sub-functions performed at the representative levels within the organization that encompass the topics displayed in the table below. Each of these sub-functions may require daily or periodic actions consisting of research, interpretation, decisions, communicating, and monitoring. Those actions that are accomplished at each of the levels generally compliment each other rather than being duplicative and are tailored to the specific organizational level, individual Region/area and individual Administrative Unit.

Primary Function	National	Regional/Area	Administrative Unit
Acquisition	X	X	
Aviation Operations Plans	X	X	X
Aviation Safety Oversight	X	X	X
Aviation Security	X	X	X
Aviation Technical Expertise & advice	X	X	X
Budget Management	X	X	X
Contract development & administration	X	X	X
Coordinating & Enhancing partnerships	X	X	X
External Relations	X	X	X
FEPP – Federal Excess Property Program (Avn)	X	X	
General Program Mgt	X	X	X
Internal Relations	X	X	X
Leadership	X	X	X
Managing FS or leased facilities		X	X
Managing Grants & Agreements	X	X	
Policy development & Interpretation	X	X	
Project Aviation Safety Plan		X	X
Staff Supervision	X	X	X
Strategic Planning	X		
Upward Reporting	X	X	X
Working Capital Fund Management	X	X	X
Security Program Management	X	X	X

## **8.12. Impacts to Stakeholders**

Changes in Aviation Program Management would have minimal impact on stakeholders.

## **8.13. Issues**

The current organization structure does not support the most efficient management of national aviation resources. Fire operations leadership determines what aviation resources are needed, contracting acquires these resources, and aviation manages them at multiple levels. There has been a gradual move toward centralized management and utilization of aviation resources, however there is still potential opportunities for improved efficiencies and response.

- Aviation is a fundamental component of wildland firefighting but is a finite resource with large associated costs. As the intensity and duration of fire seasons continue to escalate, a commensurate increase in aviation use is occurring. The changing dynamics of wildland fire, the emergence of mega fires, point protection and wildland fire use together with the limited number of available aviation resources requires a national approach to the management of these resources.
- Declining aviation resources and current cost containment direction has necessitated a move toward national management and prioritization of aviation assets. The efficient and cost effective utilization of aviation resources is imperative but a variety of policy differences across federal, state, and local aviation programs hinders this goal.
- With current cost containment direction efficient and cost effective management of aviation resources is imperative.
- A variety of policy differences exist across the spectrum of federal, state and local aviation programs.
- Currently, fire operations leadership determines what aviation resources are needed, contracting acquires these resources, and aviation manages them. Acquisition and management executed at multiple levels utilizing a variety of models is not optimal in that these models are not equally efficient.

## **8.14. Conceptual “To-Be” Assessment**

### **8.14.1. Maintain Status Quo**

Aviation Program Management as described above is a viable and necessary component of the overall Forest Service mission supports agency goals and should be continued.

### **8.14.2. Organization**

The intent of this particular assessment is to analyze streamlining certain components of the aviation program under centralized management while retaining efficient and effective decentralized execution at the Regional and Unit levels. More active national oversight of aviation resources is recommended to improve quality control, standardization, consistency in operational doctrine, and allocation of resources.

Core functions necessary to perform program management and oversight at the Regional level are crucial to the success of a Regional aviation program. Some Regions may require additional functions to meet specific needs.

- Regional Aviation Officer (RAO)
- Fixed Wing Operations Specialist
- Helicopter Inspector Pilot (HIP)
- Helicopter Operations Specialist (HOS)



- Maintenance/Avionics Inspector
- Quality Assurance Inspector Pilots (Reference Business Area E)

Positions necessary to perform program management and oversight at the National Office will consist of:

- Assistant Director – Aviation
  - National Aviation Security Program Manager
  - Aviation Management Specialist
  - Aviation Management Specialist
  - Developmental Aviation Management Specialist
- National Aviation Operations Officer Operations
  - Airtanker Program Manager
  - Aerial Supervision Program Manager
  - Smokejumper Program Manager
  - National Fixed Wing Standardization Officer (Pilot Inspector)
  - National Rotor Wing Standardization Officer (Pilot Inspector)
  - National Helicopter Program Manager
  - National Helicopter Operations Specialist (HOS)
  - MTDC Aviation Research and Development Specialist
  - Program Assistant
- National Aviation Maintenance and Airworthiness Officer
  - Aviation Maintenance Specialist
  - Aeronautical Engineer

### **8.15. Recommendation – Centralization of Aviation Management**

Centralizing aviation management using the above listed positions may improve the management and utilization of limited aviation resources and utilize employees more efficiently, resulting in potential FTE reductions.

#### **8.15.1. Short-term Centralization**

Under this organization structure, no new positions would be added and no positions would transfer to new locations. The core regional aviation management group would remain intact; however the quality assurance inspector pilots would be supervised by a standardization pilot who in turn would be supervised by the National Aviation Operations staff. This would allow for prioritization and assignment of duties on a national scale. Potential pilot FTE reduction of 25 percent is projected due to management efficiencies. Additionally, overall program management duties for each aviation business line would be assumed by National aviation staff positions already in place. Current sub-regional program management functions being performed in varying degrees at the regional level would no longer be necessary resulting in potential reclassification of GS-13 positions to GS-12. The conceptual organization is displayed at Appendix E-3 – Centralized Program Management.

### **8.15.2. Long-term Centralization**

Potential additional efficiencies could be achieved by consolidating aviation management into four geographic hubs. Each region would retain a core aviation management structure but inspector pilots, maintenance inspectors and avionics inspectors would relocate to a hub, continuing to report to the National office. This would result in further FTE reductions by requiring four standardization pilots rather than one in each Region. The relocation of aircraft assets would also reduce the number hangars and maintenance facilities currently being leased and reduce the number of support contracts. However, consideration must be given to costs that would be incurred by early termination of hangar, maintenance and office facility leases currently in place in each region if not selected as a hub location. For example, Regions 1, 4 and 6 have the largest facility requirements and all have recently entered into long-term leases for new or upgraded facilities financed by airport, city or county governments. Region 1 pays \$200,000 per year on a 20 year lease and early termination cost would be \$4.5 million. Region 4 pays \$390,000 per year on a 5 year lease and early termination cost would be \$1.7 million. Region 6 pays \$278,000 per year on a 15 year lease and early termination cost would be \$4.5 million. An efficient reorganization plan based on regional workload and fire season timeframes is as follows and displayed in Appendix E-4 – Proposed Aviation Program Management Hubs:

- Northeastern Area, Region 9, Region 2
- Region 8, Region 3
- Region 5, Region 4
- Region 6, Region 1, Region 10

Each of these hubs has existing Forest Service facilities capable of supporting this reorganization model.

### **8.16. Equipment**

The equipment utilized is defined in Business Area A, B, and C.

### **8.17. Communications**

Increased National oversight and management of resources requires more integrated communication with Regional level program managers and an active role in the coordination of national resources by all managers.

### **8.18. Efficiencies available**

- A more active role by national program managers, in coordinating and allocating national shared resources, will achieve more efficient utilization resulting in cost savings.
- A more centralized management structure will improve coordination, scheduling, and operational assignment efficiency.
- Continue to engage in the development of a long-term interagency aviation strategy that will capitalize on acquisition, allocation and utilization efficiencies that can be applied across federal, state and local partners.
- Establish a standard core Regional aviation management structure that will consolidate all program management within the Regions to improve national coordination of aviation resources and response to national program direction.

### **8.19. Future Customers or Stakeholders – N/A**

### **8.20. Future of Interagency Fire Center – N/A**

## 8.21. Wildland/urban Interface Expansion – N/A

### 8.22. Performance Analysis

Aviation Program Management does not have any performance gaps between present and conceptual future conditions resulting from the recommendations of this review. The work requirements, standards of operation, and ultimate performance would not change from the present conditions.

The recommendation of establishing resource coordinators during the fire season to work with the NICC improves the coordination and efficiencies of the expensive national shared resources and provides better utilization and cost avoidance of the high cost aircraft.

The short- and long-term recommendations for Program Management centralization would not result in any degradation in performance, but would result in more standardization between units and improved balancing of resources to where the greatest need is present. However it would reduce control at the Regional level with the underutilized resources applied to the areas of greater need especially during the fire seasons.

### 8.23. Cost/Benefit Analysis

#### 8.23.1. Historical Costs

##### 8.23.1.1. Personnel

Personnel costs for this Business Area were developed based upon the data call information from each of the Forest Service Regions regarding the amount of personnel working in this Business Area. Costs are calculated for a typical five-year period for a cost comparison. The earliest base-year starts on October 1, 2008 and the base year annual cost is included. Base Year Annual Personnel Cost: \$6,774,104.

##### 8.23.1.2. Equipment

The only equipment required is standard office equipment (e.g. office telephones, copiers, computers)

##### 8.23.1.3. Contracts

There are no contracts for the specific use of aircraft to support this Business Area. Aircraft may be used for point to point travel when appropriate in accordance with OMB Circular A-126. Costs were identified at \$320,000 during FY 05.

Level	Number Contracts	Number Aircraft	Cost
Administrative Unit	11	11	\$320,865
Regional	0	0	\$0
National	0	0	\$0
<b>Total</b>	<b>11</b>	<b>11</b>	<b>\$320,865.00</b>

#### 8.23.2. Cost Estimate Analysis

Anticipated recommendations were evaluated based upon the “As-Is” Issues and the historic costs. The analysis for each of the recommendations contains the estimated cost, the benefits, and estimated savings.

## **8.24. Recommendation - Continue to Participate in the On-Going Effort to Develop Interagency Strategy and Align Operational Policies**

### **8.24.1. Cost**

The additional cost to the Forest Service to implement this recommendation would be minimal.

### **8.24.2. Benefit**

- More efficient operations at all levels of the organization resulting in better utilization of limited resources.
- Consolidation of contracts and the sharing of resources between agencies. It will help to align contract specifications and streamline the contracting process by utilizing single contracts across multiple agencies.
  - For example, the Forest Service utilized two SEATS in Region 6 in 2005 that were included on a BLM contract. While the BLM produced and managed the SEAT contract, it was much more efficient and cost effective for the Forest Service to utilize the BLM contract rather than develop one of their own. The Forest Service spent approximately \$65,000 to utilize these SEATS. This same concept was also applied to the large airtanker contract. Prior to 2004, the BLM acquired four airtankers off the Forest Service contract. This practice ensures a degree of standardization that translates into operational efficiencies.

### **8.24.3. Savings**

Savings would be anticipated by not having duplicate contracts between agencies. The lack of current comparison data precludes quantifying savings at this time.

## **8.25. Recommendation – Utilize National Shared Resources More Efficiently**

Utilize National Shared Resources more efficiently by establishing two specific resource coordinator roles (Helicopter and Fixed-wing) to work with the National Interagency Coordination Center during fire season.

### **8.25.1. Cost**

- The helicopter coordinator role should be filled by a detail assignment for 3-4 months filled at the GS-09 to GS-11 level. One helicopter coordinator detailed for four months equates to approximately 0.33 FTE. At the GS-09 level, the annual cost for this position is approximately \$24,474. At the GS-11 level, the annual cost of this position is approximately \$29,020. Note that these cost estimates were developed using FY 2006 pay rates and will be inflated depending on the year in which the position is actually established.
- It is assumed that travel costs will be incurred if this position is filled with an Agency employee detailed to support this requirement. While systems do exist to track Forest Service travel costs, this data is currently unavailable to quantify this cost. Therefore, a technical estimate of \$20,000 will be assumed for associated annual travel costs if this recommendation is implemented.
- The Fixed-wing coordinator role should be filled by a detail assignment or AD hire for 3-4 months. This position has been classified as an AD-K pay rate. One Fixed-wing coordinator detailed for 4 months equates to approximately 0.33 FTE. At the AD-K level, the annual cost of this position is approximately \$29,628. Note that this cost estimate was developed using FY 2006 pay rates and will be inflated depending on the year in which the position is actually established.
- If the position is filled with an AD hire, no travel costs will be incurred.

- Salary and travel expenses are the only costs associated with this function. Therefore, the total cost for this recommendation will range from approximately \$74,102 to \$78,648 depending on which grade level is chosen for the helicopter coordinator position.

### 8.25.2. Benefit

- Expensive and limited aviation resources are assigned for maximum cost efficiency and effective utilization.
- The Fixed-wing coordinator position tracks the status and position of leadplane and airtanker assets, monitors flight and duty limitations, scheduled maintenance intervals, aircraft availability and mandatory days off. The coordinator uses this information to develop a national duty schedule to ensure aircraft are staffed for optimum utilization. Achieving maximum availability of leadplane assets is critical because certain airtanker operations such as MAFFS, working in congested airspace, in urban interface areas and with mixed resource types require a leadplane.
- The helicopter coordinator tracks the status, position and usage of all exclusive use and CWN Type I and II helicopters. The coordinator advises on the assignment of available or under-utilized exclusive use helicopters to replace more expensive CWN aircraft on going incidents.
- The recommendation would increase the efficiency of the available NSR through national coordination. For example, the Fixed-wing coordinator identifies when a leadplane will not be staffed due to mandatory days off for the pilot and assigns another pilot to ensure that the leadplane resource remains available. Coordinating this at the national level avoids regional constraints and ensures maximum use of the resource. The helicopter coordinator achieves the same efficiency by being knowledgeable of activity levels and resource availability at multiple incidents across a national scale and advising on reallocation of these expensive resources for maximum cost efficiency.

### 8.25.3. Savings

- Millions of dollars are saved in direct contract costs by maximum utilization of exclusive use contract assets prior to call-when-needed contract assets.
- The helicopter coordinator position has been used for several years and has provided significant savings in contract costs by tracking and prioritizing contract helicopter use.
- The 2004, 2005, and 2006 NMAC Efficiency Helicopter Coordinator Savings reports showed approximately \$5.9 million in savings through the use of helicopter coordinators to properly manage the utilization of exclusive use versus CWN helicopters. This report does not take into account additional savings that could be realized through the use of an ASM/airtanker coordinator. The following is a specific example from the report that illustrates how these savings can be realized:
- A copy of the Coordinator Log for each study is included at Appendix Q – Helicopter Coordinator Log of NMAC Efficiencies.
  - In 2005, the National Helicopter Coordinator moved two exclusive use helitankers to the Northwest for fires on the Okanogan/Wenatchee National Forests. CWN aircraft were available at closer locations, but proved to be more costly. On a seven day run, the CWN aircraft cost \$446,652 (\$32,618/day x 7 days x 2 helicopters), while the exclusive use aircraft cost \$180,922 (\$12,923/day x 7 days x 2 helicopters). Using the exclusive use aircraft in this case saved the Forest Service \$275,730 over seven days.

The cost of implementing this recommendation is estimated at between \$72,824 and \$77,248. With historical savings of over \$5.9 million and the potential for greater savings in the future, the Forest Service would benefit from the implementation of this recommendation.

## **8.26. Recommendation – Create a More Centralized Management Structure through Realignment**

Create a more centralized management structure through realigning supervisory functions and program administration to improve coordination, scheduling, and operational efficiency.

### **8.26.1. Cost**

There is no significant additional cost associated with implementing this recommendation.

### **8.26.2. Benefit**

- Better utilization of regionally based pilots across a national scope of work.
- Enhanced national coordination of aviation resources and response to national program direction.
- Reduced duplication of effort in aviation program management.

### **8.26.3. Savings**

- Currently, organization charts reflect staffing levels adequate to meet the needs of each individual region. By managing them as a single group within the context of a national scope of work efficiencies can be obtained. In addition, improved management, coordination, and scheduling would lead to efficiencies by utilizing pilots across regional boundaries.
- Through a centralized management structure and improved scheduling and coordination, it is estimated that the number of pilots performing non-quality assurance duties could be reduced by approximately 30 percent. In 2005, there were 47 pilot positions (43.40 FTE) within the Forest Service with no quality assurance duties. A reduction of 30 percent equates to 14 positions. Assuming that each of these positions is equivalent to 1.0 FTE, implementing this recommendation could save the Forest Service approximately \$1,557,681 in personnel costs.

## **8.27. Recommendation – Explore Possibility of Centralizing Aviation Management through Consolidation**

In the longer term further explore the possibility of centralizing aviation management by consolidating certain Regional aviation management roles into four geographic hubs. National aviation management staff will be responsible for overall program management. Oversight and administration of aircraft maintenance contracts is one example.

A visual representation of the four hubs is displayed in Appendix E-4 – Proposed Aviation Program Management Hubs.

### **8.27.1. Cost**

The initial cost of implementing this recommendation would be the cost of exploring the feasibility of this model. It is assumed that a management team of two Regional Aviation Officers and one Deputy Regional Forester could be assigned to complete this exploration in 6 months at a cost of approximately \$68,255.

- It is assumed that each position will spend approximately 10 hours per week performing duties related to this recommendation. This equates to approximately 0.135 FTE per position ( $[24 \text{ weeks} \times 10 \text{ hrs/week}] / 1,776 \text{ productive hrs/year}$ ).
- It is assumed that minimal travel costs will be incurred. A factor of 5% has been applied to the total personnel cost to account for any associated travel.

Additional costs would be incurred if it is determined that implementing this model is both feasible and beneficial. These costs would include travel costs for hub personnel to service regional needs, startup costs for facilities, personnel relocation costs, and the potential cost of early termination of existing leases. In addition, establishment of geographic hubs would require relocation of WCF aircraft to a more consolidated basis that would require modification of current maintenance contracts. However, the consolidation may result in a total reduction in costs due to the reduction in the total number of contracts.

#### **8.27.2. Benefit**

- Reduction of duplication of functions at regional levels. Reduction of regional staff levels.
- More efficient and effective use of employee time.
- Consolidated WCF aircraft at the Hubs would enable balancing of aircraft resources among the regional needs.

#### **8.27.3. Savings**

- This recommendation may lead to the possible reduction of two GS-13 Supervisory Pilots (2.0 FTE). The annual cost of these positions is approximately \$131,832 per FTE. Therefore, the elimination of these FTE will save the Forest Service approximately \$263,664 per year.
- Implementing this recommendation may also lead to the re-classification of approximately 10 Program Managers from the GS-13 to the GS-12 level. The annual cost of one GS-13 position is approximately \$123,208 while the annual cost of one GS-12 position is approximately \$103,649, a difference of \$19,559. This results in a savings of \$195,590 per year for the 10 Program Managers.
- Efficiencies through aviation maintenance contract consolidation.

#### **8.27.4. Cost Estimate – N/A**

#### **8.27.5. Benefits Estimate – N/A**

#### **8.27.6. Savings Analysis – N/A**

### **8.28. Civil Rights Impact Assessment**

A Civil Rights Impact Assessment (CRIA) is required to identify and categorize the civil rights impacts of implementing any realignment initiative that will potentially affect employees. A CRIA for Forest Service employees will be developed if the Fire Executive Council recommends changes to staffing during their follow on studies.

### **8.29. Systems**

An overview of the systems used by this Business Area to complete the tasks and activities under review is as follows:

- FAIRS (Federal Aviation Interactive Reporting System)
- AMIS (Aviation Management Information System)
- PROP (Personal Property Management Information System)
- WCF (Working Capital Fund Accounting Database)
- PCMS (Purchase Card Management System)
- IAS (Integrated Acquisition System)
- EaTIS (Equipment and Training Inventory System)
- ROSS (Resource Order and Status System)
- NFC Inquiry System (National Finance Center)
- FFIS (Foundational Financial Information System)
- IWEB (a web-enabled suite of applications for various business areas)
- AgLearn (a web-based training system)
- IBM Network (electronic records)
- FS Lotus Notes (agency email system)
- FS Travel (travel voucher creation and submission system)
- FedTraveler (web-based travel reservation system)
- Paycheck

These systems will not be affected by the recommendations within this Business Area.

### **8.30. Acquisition Strategy**

Acquisition strategy is not applicable for this Business Area.

### **8.31. Project Lifecycle Schedule**

Project lifecycle schedule is not applicable.

### **8.32. Requirements**

The standards and performance measures for requirements are not applicable for this Business Area.



## **8.33. Summary of Recommendations**

### **8.33.1. Short-term Recommendations & Efficiencies**

- Continue to participate in the ongoing effort to develop interagency strategy and align operational policies.
- Utilize National Shared Resources more efficiently by establishing two specific resource coordinator roles (helicopter and fixed-wing) to work with the National Interagency Coordination Center during fire season.
- Create a more centralized management structure through realignment of supervisory functions and program administration to improve coordination, scheduling, and operational efficiency.

### **8.33.2. Long-term Recommendations**

In the longer term further explore the possibility of centralizing aviation management by consolidating certain Regional aviation management roles into four geographic hubs. National aviation management staff will be responsible for overall program management. Oversight and administration of aircraft maintenance contracts is one example.

## **8.34. Alternative Solution Analysis**

To be used to analyze when the recommendations identify an alternative solution or combinations of recommendations require additional analysis to preclude conflicts not previously analyzed. All recommendations are discussed in the Master Management Efficiency Assessment or the individual Business Areas, and there are no conflicts that have not been previously analyzed.

## Appendix A - List of Acronyms

Acronym	Definition
ACO	Administrative Contracting Officer (appointed in each using region)
ADFF	Aerial Delivered Firefighter
AMD	Aviation Management Directorate DOI (formerly Office of Aircraft Services (OAS))
AMR	Appropriate Management Response
ASM	Air Tactical Supervision Module (Aerial Supervision Module)
ATGS	Air Tactical Group Supervisor
ATP	Air Tactical Pilot
ATS	Air Tactical Supervisor
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CO	Contracting Officer
COCO	Contractor Owned and Contractor Operated
GOCO	Government Owned and Contractor Operated
COTR	Contracting Officer's Technical Representative
CWN	Call-when-needed
DoD	Department of Defense
DOI	Department of the Interior
EaTIS	Equipment and Training Inventory System
FAA	Federal Aviation Administration
FAM	Fire and Aviation Management
FEMA	Federal Emergency Management Agency
FEPP	Federal Excess Personal Property
FOR	Fixed Operating Rate
FS	Forest Service
FSM	Forest Service Manual
FWS	Fish and Wildlife Service
GACC	Geographic Area Coordination Center
GMAC	Geographic Multi-Agency Coordination Group
GOGO	Government Owned and Government Operated
HIP	Helicopter Inspector Pilot
HOS	Helicopter Operations Specialist
IC	Incident Commander
ICS	Incident Command System
IAIG	Interagency Aerial Ignition Guide.
IAB	Interagency Airtanker Board
IHOG	Interagency Helicopter Operations Guide
IHRG	Interagency Helicopter Rappel Guide
ISMOG	The Interagency Smokejumper Operations Guide
ISPOG	Interagency Smokejumper Pilots Operations Guide

<b>Acronym</b>	<b>Definition</b>
MAFFS	Modular Airborne Firefighting System
MAP	Mandatory Availability Period
MOU	Memorandum of Understanding
MTDC	Missoula Technology and Development Center
NAOO-O	National Aviation Operations Officer – Operations
NAOO-A/L	National Aviation Operations Officer- Airworthiness and Logistics
NATS I, II, III	National Airtanker Study
NIAC	National Interagency Aviation Council
NICC	National Interagency Coordination Center
NIFC	National Interagency Fire Center
NMAC	National Multi-Agency Coordinating Group
NPS	National Park Service
NSR	National Shared Resource
NTSB	National Transportation Safety Board
OAS	Office of Aircraft Services –DOI (now Aviation Management Directorate (AMD))
NWCG	National Wildland fire Coordinating Group
QFFR	Quadrennial Fire and Fuels Review
RAO	Regional Aviation Officer
ROSS	Resource Status Ordering System
SAFE	Situational Aware Firefighting Equipment
SEATS	Single Engine Air Tanker
SASEB	Smokejumper Aircraft Screening and Evaluation Board
TARMS	Tactical Aerial Resource Management Study
TFR	Temporary Fire Restrictions
TMO	TARMS Management Options Team
UAV	Unmanned Aerial Vehicle
USAID	United States Agency for International Development
WUI	Wildland Urban Interface
AHSAFA	The American Helicopter Services and Aerial Firefighting Association
WCF	Working Capital Fund
WFPR	Wildland Fire Preparedness Resources (Funding)
WIMS	Weather Information and Management System

## Appendix B - List of Definitions

Term	Definition
Administrative Unit	An organizational unit of the Forest Service below the level of a Region or Area such as Field Office, Supervisor's Office, and/or a District Office, and Research Lab Office
Airtanker	An aerial delivery system that consists of an aircraft configured for the dispensing of fire retardant or fire suppressant material.
Aerial Supervision Module (ASM).	An aircraft that contains both a qualified Air Tactical Pilot and Air Tactical Group Supervisor on board as a complete module. This module can perform aerial supervision and may be authorized to perform low-level leadplane operations.
Airtanker Bases	Facilities located on a strategically located airfield of sufficient size for airtankers to land and receive the chemical retardants for suppressing wildland fire.
Airworthiness	Being in a fit condition to fly for the mission specified.
Air Tactical Group Supervisor	The individual responsible for coordination of aircraft operations, safety of ground personnel and assisting in developing strategy on an incident.
Aviation Management Information System	A management information software program that allows users to enter aviation usage and cost reporting information for utilization and accountability tracking.
Aviation Operations	Any activity involving the use of aircraft.
All Risk Emergency Management	The management of any all risk incidents that necessitates immediate action.
All Hazard Incidents	Any incident or event, natural or human-caused, that warrants action to protect life, property, environment, public health or safety and minimize disruption of government, social, or economic activities
Bucket Drops	The dropping of fire retardants or suppressants from specially designed buckets slung below a helicopter.
Command and Control	Ensuring the safe, operationally effective, and cost efficient application of firefighting resources (aerial and ground) and airspace management. (ASM ATGS and leadplane). Provide direct feedback to ground forces to situational fire activity and personnel safety.
Contract Aviation Services	Aviation activities involving the use of contract aircraft and flight crews certified by the Federal Aviation Administration (FAA) and approved by the Forest Service for specific missions.
Contracting Officer (CO)	See FAR 2.101.
Controlling Platform	An Air Tactical Group Supervisor aircraft, leadplane, or Aerial Supervision Module that has established on-scene aerial command and control over aviation resources committed to an incident.
Core Commercial	A minimum core capability of specialized, scientific or technical in-house employees and related commercial workload, maintained, without cost comparison, to ensure that the Government has the necessary capabilities to fulfill its mission responsibilities "pursuant to a written determination by the CSO."
Crewmember	Any person whose presence aboard an aircraft is essential to performance of mission or administrative flights or is otherwise required. This definition includes bona fide trainees for crewmember positions.
De-confliction	The process of separating aircraft within the airspace management system.

<b>Term</b>	<b>Definition</b>
End-Product Contract	A means of procuring a service for a site and time specific event, (such as the use of spray, dusting, application of fertilizers, prescribed burning, and so forth), where the contractor is self sufficient to perform the full extent of the specified service by whatever means the contractor deems most appropriate.
Exclusive Use	Aircraft that are contracted and ready to respond at the direction of the contracting officer within the time prescribed in the contract. Aircraft is to be in a ready condition and not used for other purposes.
Exhibit 300	The Exhibit 300 process is established by OMB for use by federal agencies to develop a business case for the utilization of capital assets in the most cost effective manner.
Extended Attack	Suppression activity for a wildland fire that has not been contained or controlled by initial attack or contingency forces and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander.
FedBizOpps	FedBizOpps.gov is the single government point-of-entry (GPE) for Federal government procurement opportunities over \$25,000.
Fire Compacts	Multi-State organization mandated by legislative statute to manage and administers fire business operation
Firefighting Missions	Aviation operations involving the use of either working capital fund (WCF) aircraft or contract aviation services to perform specific firefighting missions such as leadplane, air tactical, smokejumper/paracargo, reconnaissance, or survey that involve only necessary crewmembers.
Fire Mutual Aid Agreements	Agreements between various firefighting organizations or activities to assist each other during periods of support need that identifies the methods of support, communications, and control.
Fixed Wing	Powered airplanes for the delivery of personnel and cargo. Requires a runway for takeoff and landing or large body of water for floatplanes.
Flight Services Contract	An aircraft use contract in which the Forest Service maintains operational control.
Force Multiplier	An external action that provides a positive impact on a firefighting force that significantly improves the capability of the firefighting force.
Forest Health	The status of a forest that enables proper growth, resistance to disease, and ability to resist the spread of wildland fire on the forest floor to include sustaining a diverse ecosystem.
Fuel	Fuel (fire-related): Combustible material. Includes, vegetation, such as grass, leaves, ground litter, plants, shrubs and trees that feed a fire. When describing "fuel" as it is related to fire, the term must be defined within the parameters of a fuel bed (material) and fuel moisture content, shown in the following table.
Geographic Multi-Agency Coordination Group (GMAC)	Group of decision makers composed of the Fire Directors of the four agencies represented in the National Inter-agency Coordination Center with the Forest Service NAOO Operations Officer as the aviation advisor
Government Aircraft	Any aircraft owned, leased, contracted, rented or chartered, and used by a Federal Government agency. Commercial airline aircraft operating on their scheduled routes are not Government aircraft.
Grant of Exemption (GE)	A formal written authority granted to the Chief of the Forest Service to allow deviations from specific FARs provided that certain specified conditions are adhered to.
Ground Forces	Personnel fighting a fire on the ground using individual firefighters, engine crews, and dozers.
Helitack	The use of helicopters to transport crews, equipment, and fire retardants or suppressants to the fire line during the initial stages of a fire.
Helicopter Crewmember	A helitack firefighter or other Forest Service member trained in helicopter operations and safety in order to perform their assigned mission using a helicopter
Human-aiding Technology	The use of technology to provide clear information to enable effective decisions by individuals in a stressed environment. Includes radio hardware systems, cockpit displays, and other media with human interface capabilities.
Helitanker	A helicopter equipped with a fixed tank, Airtanker Board certified, capable of delivering a minimum of 1,100 gallons of water, foam, or retardant.

<b>Term</b>	<b>Definition</b>
Infrared	Remote sensing to map the fire intensity, specific location, perimeter, spot fires, for intelligence to incident management teams
Initial Attack	The actions taken by the first resources to arrive at a wildland fire to protect lives and property, and prevent further extension of the fire.
Interagency	More than one agency working together for a common cause or mission through communication and coordination.
Large Fire	1) For statistical purposes, a fire burning more than a specified area of land e.g., 300 acres. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.
Leadplane	Aircraft with pilot used to make dry runs over the target area to check wing and smoke conditions and topography and to lead airtankers to targets and supervise their drops.
Light Aircraft	Small fixed wing airplanes powered by a single or twin engine capable of carrying one to five passengers.
Management Fires	Fires ignited on purpose to reduce fuels within the wildlands.
Militia	Forest Service personnel other than those who work in the Fire and Aviation Management Program that are trained and called upon to support the firefighting mission, e.g. recreation management, business operations, timber management, etc.
Multi use Platform	An aircraft that has more than one mission capability such as carrying passengers, cargo, or buckets for fire suppression.
Non-Fire	Aviation activities that are in support of the Forest Service mission but not related to fighting fires.
Operations Base	A location permanent or temporary where firefighting operations are controlled or logistically supported for aviation includes either an airfield or helipad with facilities to support a firefighting operation.
Paracargo	Anything intentionally dropped, or intended for dropping, from any aircraft by parachute, by other retarding devices, or by free fall.
Payload	Weight of passengers and/or cargo being carried by an aircraft.
Pilot Inspector	Pilots that are designated by Regional Aviation Officers or the National Aviation Officer Operations Officer for Operations to inspect and approve contract pilots. They are sometimes referred to as inspector pilots.
Platforms	An aircraft configured for a specific mission
Point-to-Point	Aviation operations between any two geographic locations operationally suitable for takeoff and landing (airport-to-airport).
Predictive Services	Moving firefighting assets to a new area based upon fire predictions to be located closer for any anticipated firefighting mission.
Preparedness dollars	Appropriated dollars that are allocated to Regions for the purpose of funding the Fire and Aviation Program for the purpose of being ready for a fire. In contrast, suppression funding is additional dollars available to Federal agencies to supplement preparedness dollars that are used to fund the unbudgeted wildland fires.
Preparedness Training	Training conducted prior to an incident for personnel based upon anticipated requirements to ensure that personnel are ready to conduct an operation in the most effective and safe manner to accomplish the predicted mission.
Prescribed Fire	Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met, prior to ignition.
Protection Offset Agreements	An agreement between two government entities whereby one organization delegates responsibility and reimburses for fire suppression to another organization.

<b>Term</b>	<b>Definition</b>
Public Aircraft	An aircraft used only for the United States Government, or an aircraft owned and operated (except for commercial purposes) or exclusively leased for at least 90 days by a state government, the District of Columbia, a territory or possession of the United States, or a political subdivision of that government. Comprehensive definitions can be found in Title 14, Code of Federal Regulations, Part 1.1 and 49 CFR part 830.2.
Quality Assurance	A planned and systematic pattern of actions, performed by the Government, necessary to provide confidence that adequate technical requirements are established; products and services conform to established technical requirements; and satisfactory performance is achieved.
Quality Control	Those actions taken by a Contractor to control the production of service outputs to ensure that they conform to the contract requirements.
Rappel	Technique of landing specifically trained and certified firefighters from hovering helicopters; involves sliding down ropes with the aid of friction-producing devices.
Remote Sensing	An apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which the data is re-transmitted to an earth-receiving station for use in the National Fire Danger Rating System.
Performance Standards	The results-oriented measure that describes the level of performance expected for a particular job element. It prescribes what the Contractor is expected to produce in such dimensions as quality and timeliness.
Retardants	A substance or chemical agent which reduced the flammability of combustibles.
SAFECOM	The agency Form FS 5700-14, SAFECOM: Aviation Safety Communiqué, used to report aviation mishaps or hazards; this form also is approved for interagency use as Form OAS-34.
Service Provider	An entity, public or private, providing the services specified by the Government and described in the Contract or any other resultant award document administered by the Government.
Single Resource	An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.
Sky Geny	Decent control devise used by rappellers to control their decent from a helicopter.
Smokejumper	A firefighter who travels to fires by aircraft and parachute.
Special-Use	Aviation resource mission in direct support of incidents, such as leadplane and aerial supervision module flights, smokejumper/paracargo flights, reconnaissance, infrared, aerial photo/survey, and other missions requiring special training and/or equipment. (See the definition of mission use in 5705.)
Stick	A group of smokejumpers leaving the aircraft over the target at the same general time (all leaving aircraft sequentially on the same flight pass)
Super Tanker	An airplane configured as an airtanker larger than a Type I and generally associated with a large aircraft i.e., jumbo jet.
Suppressants	An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.
Suppression dollars	Funding provided for all the work of extinguishing or confining a fire beginning with its discovery.
Temporary Flight Restriction	A temporary order, in accordance with CFR 91.137, that limits or restricts the passage of aircraft through a specifically identified airspace over an incident, disaster, or other special event.
Type I	Size of Airplanes or Helicopters – generally the largest
Type II	Size of Airplanes or Helicopters – medium
Type III	Size of Airplanes or Helicopters – generally the small aircraft
Unmanned Aerial Vehicle	Aircraft that are flown with no personnel in the aircraft. Pilot/controllers are remotely located on the ground using technology to fly the aircraft that can be flown in hazardous areas or conditions without exposing personnel to the dangers.

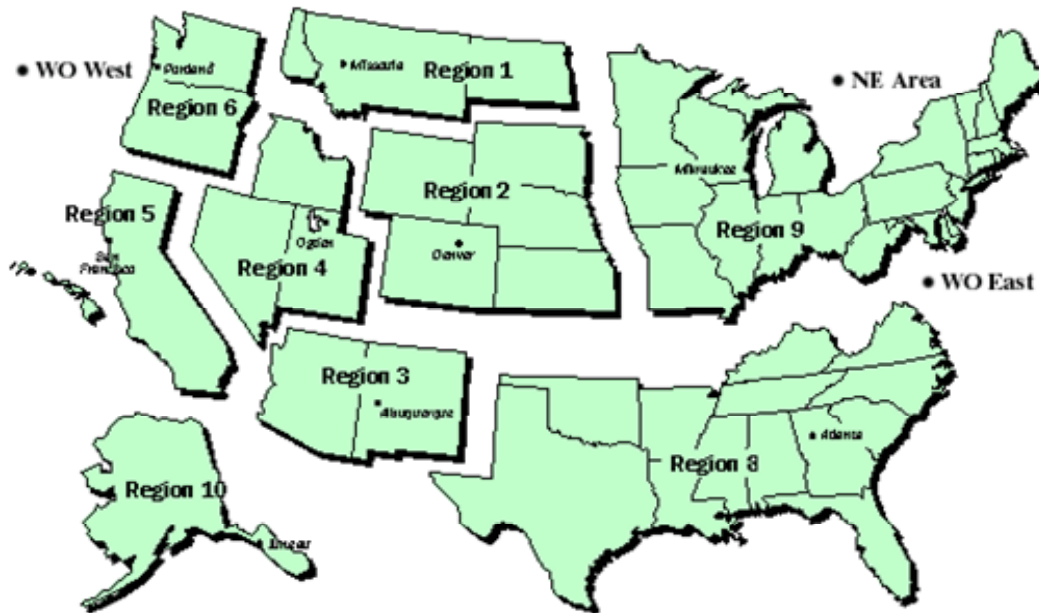
Term	Definition
Unsatisfactory Performance	Performance by the Contractor that does not meet the performance standards in the Performance Work Statement. Any instance when the mission of the Forest Service has been hindered by an action or inaction of the Contractor in the performance of the Contract or personnel or facilities have been exposed to risk or harm.
Wildland Fire Use	The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.
Working Capital Fund	A revolving-type fund established for the Forest Service by the WCF act of August 3, 1956 (16 U.S.C. 579b) that allows the agency to purchase and maintain goods and services on a break-even basis (FSH 6509.11f).



## Appendix C - References

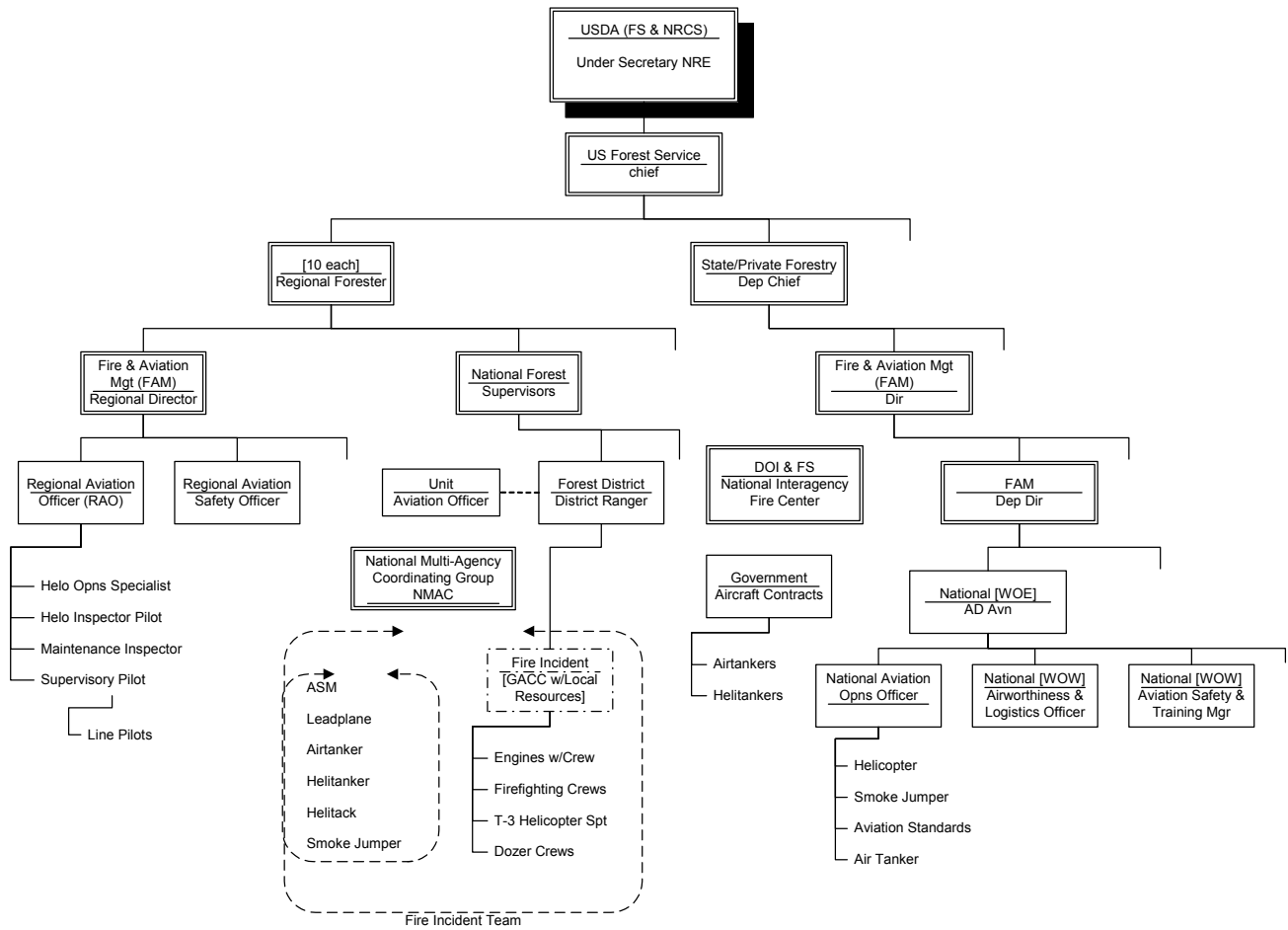
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- Forest Service Handbook 5709.14, Smokejumper and Paracargo Handbook Oct 1988, Amendment No. 8
- Gonzales Act – US Code Section 10 USC 2456 – Prohibition of contracts for performance of firefighting or security guard functions. Applies only to Department of Defense contracts subsequent to September 24, 1983 (funding for contracts)
- Interagency Aerial Ignition Guide (IAIG).
- Interagency Airtanker Base Operations Guide, NFES 2271 May 2003 USDA and USDI
- Interagency Call-When-Needed Helicopters – 2005-2007 contract guidance
- Interagency Helicopter Operations Guide (IHOG)
- Interagency Smokejumper Pilots Operations Guide (ISPOG)
- Interagency Standards for Fire and Fire Aviation Operation, NIFC January 2006
- National Aviation Management Plan, USDA – Forest Service [Draft]
- National Multi-Agency Coordinating Group Preparedness Strategy 2006, NIFC May 2006
- The Aerial Firefighting Industry Association (AFIA) is a nonprofit trade association organized for the purpose of promoting and advancing the common interests and welfare of companies engaged in forest and wildland firefighting utilizing multi-engine airtankers, helitankers, and single engine airtankers.
- The Interagency Smokejumper Operations Guide (ISMOG)
- Wildland Fire Management Aerial Application Study (NATS III), Final Report October 17, 2005.
- Aviation Doctrine
- National Aviation Strategic Plan
- National Aviation Operations Plan
- Blue Ribbon Panel Report (large tanker wings)
- Aviation Assets

## Appendix D - Forest Service Regions



# Appendix E - Organization Descriptions

## Appendix E-1 – Administrative Organization of Fire and Aviation Management



## Appendix E-2 – Position Descriptions and Responsibilities of National Staff

**National - Director, Fire and Aviation Management Staff, Washington Office East (WOE)** - The Director of Fire and Aviation Management, Washington Office, has the following responsibilities and may delegate some of them to the Assistant Director Aviation:

- Provide liaison for aviation planning and program coordination with other Government entities, including the Department of Transportation (Federal Aviation Administration), Department of Defense, Department of Interior, the Interagency Committee for Aviation Policy, National Fire Aviation Coordination Group, and State Foresters.
- Develop and maintain an Aviation Management Plan that is updated and supplemented annually at the Regional/Area and Forests/Stations levels (FSM 5711.04).
- Ensure appropriate financial management and support for Forest Service aviation program and resources.
- Provide service-wide technical requirements and standards for aircraft services.
- Provide aviation management assistance to State Foresters including:
  - Reviews of State Aviation Operations Plans for compliance with Forest Service and State Federal Excess Personal Property (FEPP) direction (FSH 3109.12).
  - Establishing, when requested, minimum standards for pilot qualifications and maintenance support for FEPP aircraft on loan to States.
  - Coordination and/or establishment of an approved source of parts for FEPP aircraft, such as the United States Army Aviation Command (FSH 3109.12).
- Maintain an aviation management role in the Cooperative Fire Protection Program by:
  - Providing assistance in the selection, identification, and acquisition of FEPP aircraft used for fire management by State forestry agencies.
  - When requested, assisting in the management of State aviation operations and aviation safety programs.
  - Determining if the State's aviation programs meet comparable aviation safety standards for Forest Service use.
  - Approving State pilots and aircraft for Forest Service missions (FSM 5712).
- Develop and administer a national aviation safety program, including, but not limited to, service-wide requirements for pilots and for aircraft approval, training, and accident prevention.
- Provide national-level advanced aviation training.
- Develop and maintain mission flight training standards (FSM 5710).
- Maintain national lists of aviation employee qualifications and approvals.
- Manage the Modular Airborne Firefighting System (MAFFS).
- Provide an aerial infrared remote-sensing service.
- Plan for procurement of Forest Service owned aircraft and the upgrading of components. Coordinate Forest Service aircraft procurement and property accountability with the Director of Acquisition Management, Washington Office.
- Coordinate with the Director of Acquisition Management on contract procurement plans for multi-engine airtankers, large and medium helicopters, and large transport aircraft services.

- Conduct and monitor aviation management reviews and follow-up (FSM 1410 and FSM 5710.41).
- Provide a security plan for agency owned and operated aircraft.

**Assistant Director, Aviation – Washington Office East (WOE)** - The Assistant Director (Aviation) of Fire and Aviation Management, WOE is responsible to the Director of Fire and Aviation Management for national aviation program administration and may delegate some of these responsibilities to the National Aviation Operations Officer for Operations (NAOO-O) and the National Aviation Operations Officer for Airworthiness and Logistics (NAOO-A&L) for leadership and management of the Forest Service aviation program, including coordination of aviation activities and aviation security policies and procedures with other staffs, agencies, and groups. The Assistant Director has a staff of two Aviation Management Specialists and one developmental Aviation Management Specialist.

### **National – Aviation Operations Officer for Operations Washington Office West (WOW)**

**National Aviation Operations Officer for Operations** is responsible to the Assistant Director for the management and supervision of operations at the National Interagency Fire Center (NIFC) detached unit functions of the Forest Service National Headquarters Office. The NAOO-O has the responsibility to:

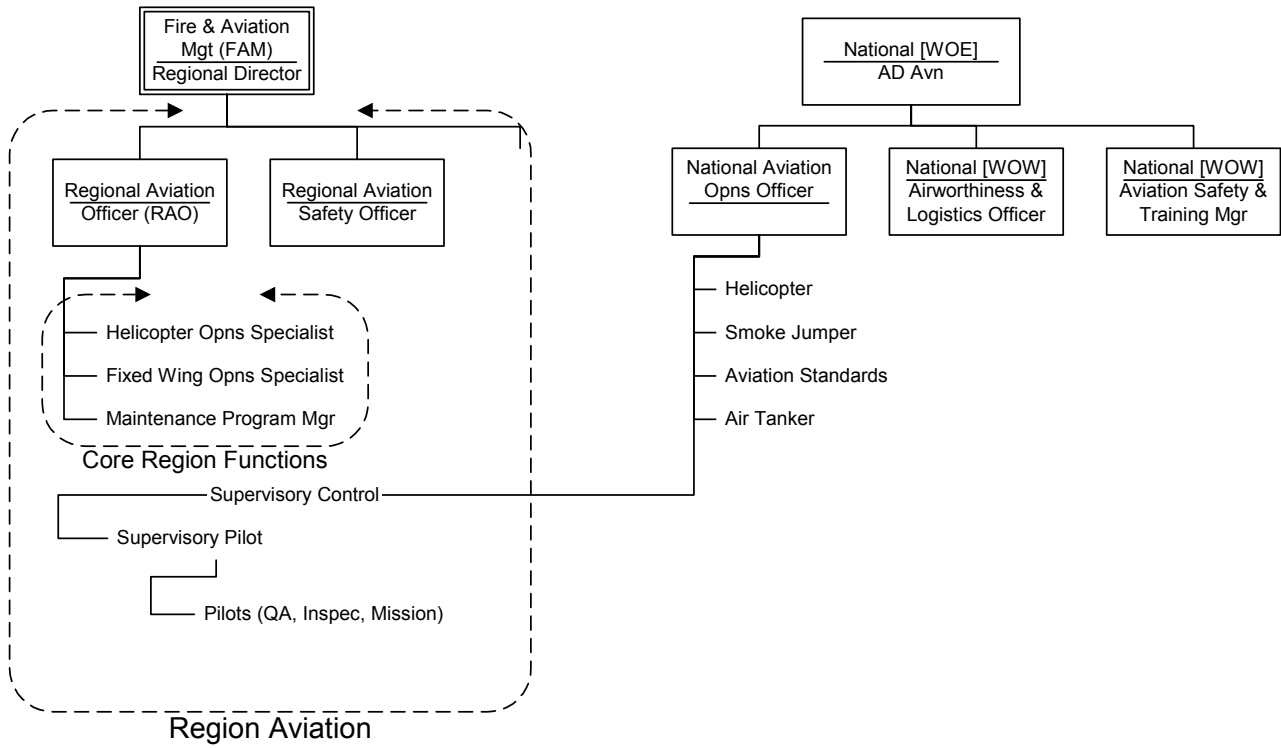
- Ensure national program leadership, coordination, and support for the national aviation operations programs located at NIFC in Boise, Idaho.
- Supervises the National Aviation Operations and Program Management staff.
- Provide leadership, oversight, technical expertise, and coordination for national aviation operations.
- Assist the Regions with technical support, coordination, and oversight to ensure standardization within pilot requirements.
- Coordinate interagency cooperation and leadership to ensure compatible and standardized aviation operations.

**National Aviation Operations Officer for Airworthiness and Logistics** is responsible to the Assistant Director for the management and supervision of airworthiness and logistics at the National Interagency Fire Center (NIFC) detached unit functions of the Forest Service National Headquarters Office. The NAOO-A&L has the responsibility to:

- Ensure national program leadership, coordination, and support for the national aviation airworthiness and logistics programs and supervise the Aviation Maintenance Specialists located at NIFC in Boise, Idaho.
- Provide leadership, oversight, technical expertise, and coordination for national aviation airworthiness and logistics.
- Assist the Regions with technical support, coordination, and oversight to ensure standardization within the national aircraft fleet requirements.
- Coordinate interagency cooperation and leadership to ensure compatible and standardized aviation airworthiness and logistics.
- Supervises Aviation Maintenance Specialist

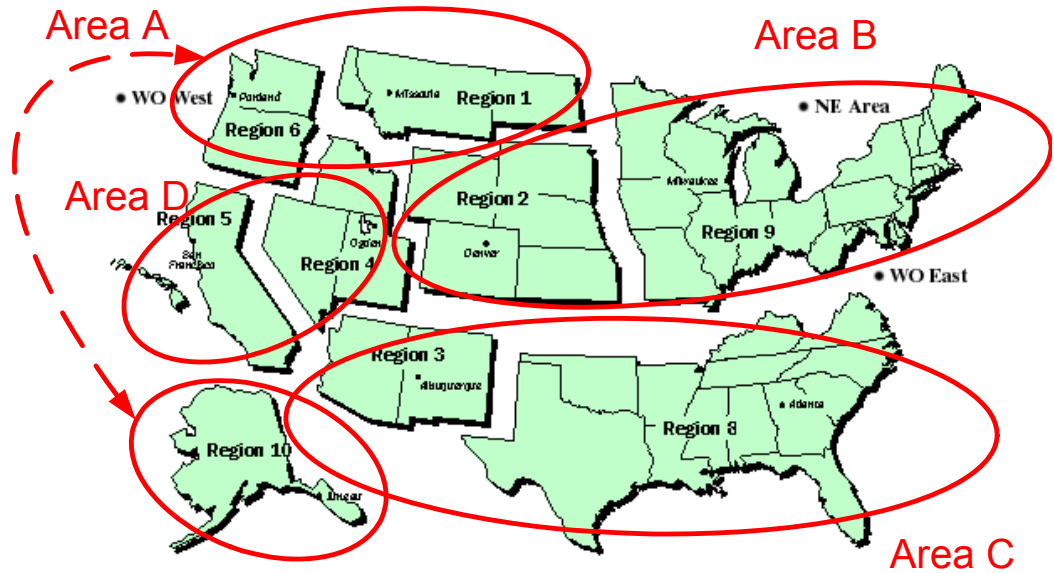
**The Washington Office West** is responsible for participating in the interagency aircraft contract development and negotiation process, inspection and approval of national contract aircraft and pilots, and overall coordination of the technical aspects of the aviation program including liaison with Department of Interior (DOI)-Aviation Management Directorate (AMD).

## Appendix E-3 – Centralized Program Management



## Appendix E-4 – Proposed Aviation Program Management Hubs

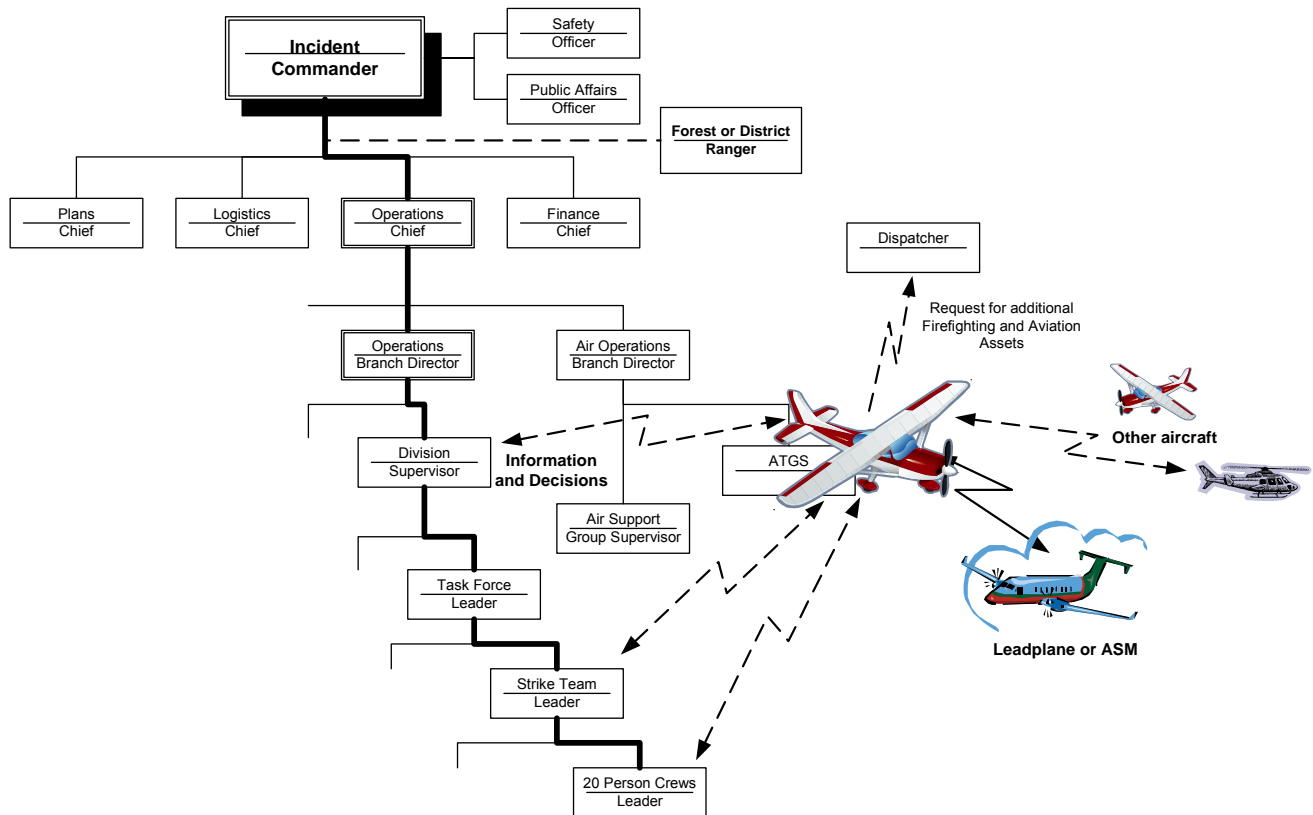
### Centralized Aviation Program Management with 4 Hubs



### Centralized Management Under Four Hubs

Area A: Regions 1,6, & 10	Area B: Regions 2 & 9
Area D: Regions 4 & 5	Area C: Regions 3 & 8

## Appendix E-5 – Incident Command and Communication Organization – During a Fire





## Appendix F - Government Personnel Summary by Region

### Total FTE (non-Militia) – All Aviation Activities

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	257	156.7	19	116	43.2	16
R-2	24	20.6	7	0	0.0	0
R-3	54	46.7	17	72	22.2	12
R-4	275	185.6	20	123	49.0	21
R-5	350	280.3	35	0	0.0	0
R-6	300	165.7	20	167	54.1	15
R-8	47	31.0	14	10	3.5	1
R-9	31	28.5	14	13	5.8	4
R-10	28	24.7	6	0	0.0	0
WOE	4	4.0	1	0	0.0	0
WOW	11	11.0	1	0	0.0	0
<b>TOTAL</b>	<b>1381</b>	<b>954.8</b>	<b>154</b>	<b>501</b>	<b>177.7</b>	<b>69</b>

### Total FTE (Militia) – All Aviation Activities

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	494	27.25	15	13	0.91	7
R-2	107	10.05	1	107	9.10	1
R-3	209	19.25	12	37	7.90	12
R-4	31	21.50	5	18	6.68	4
R-5	5	5.00	3	78	38.15	10
R-6	65	39.62	13	27	4.45	5
R-8	336	52.05	13	6	0.96	3
R-9	79	76.62	11	61	31.52	5
R-10	2	0.90	2	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>1328</b>	<b>252.2</b>	<b>75</b>	<b>347</b>	<b>99.7</b>	<b>47</b>

### Appendix F-1 – Aerial Delivery of FF (non-Militia) – All Positions

Region	Permanent			Temporary		
	Number of Personnel Positions	Number of FTE	Number of Locations	Number of Personnel Positions	Number of FTE	Number of Locations
R-1	218	95.16	19	108	33.13	15
R-2	16	5.06	7	0	0.00	0
R-3	35	25.45	11	70	21.54	10
R-4	241	80.60	18	117	24.32	20
R-5	350	87.40	35	0	0.00	0
R-6	207	81.81	17	149	44.16	14
R-8	16	2.54	7	2	0.31	1
R-9	15	6.19	6	12	4.14	4
R-10	2	0.24	2	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>1100</b>	<b>384.45</b>	<b>122</b>	<b>458</b>	<b>127.60</b>	<b>64</b>

### Aerial Delivery of FF (Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	2	0.10	1	0	0.00	0
R-2	84	0.68	1	84	0.52	1
R-3	0	0.00	0	0	0.00	0
R-4	183	1.74	3	20	2.63	4
R-5	5	0.28	3	78	3.82	10
R-6	31	2.46	11	21	0.30	4
R-8	62	1.45	11	0	0.00	0
R-9	67	4.83	11	61	3.12	5
R-10	1	0.01	1	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>435</b>	<b>11.55</b>	<b>42</b>	<b>264</b>	<b>10.39</b>	<b>24</b>

**Appendix F-2 – Aerial Fire Detection / C & C (non-Militia) – All Positions**

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	69	7.22	16	0	0.00	0
R-2	6	1.00	1	0	0.00	0
R-3	6	1.25	1	0	0.00	0
R-4	146	21.77	17	23	0.67	9
R-5	350	26.92	35	0	0.00	0
R-6	95	10.64	15	12	3.52	5
R-8	11	1.91	7	0	0.00	0
R-9	5	1.05	3	4	0.63	1
R-10	1	0.03	1	0	0.00	0
WOE	1	0.10	1	0	0.00	0
WOW	1	0.15	1	0	0.00	0
<b>TOTAL</b>	<b>691</b>	<b>72.03</b>	<b>98</b>	<b>39</b>	<b>4.81</b>	<b>15</b>

**Aerial Fire Detection C & C (Militia) – All Positions**

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	1	0.00	1	11	0.55	5
R-2	12	0.24	1	12	0.15	1
R-3	2	0.03	2	0	0.00	0
R-4	82	0.64	4	2	0.00	0
R-5	5	0.18	3	78	3.82	10
R-6	26	1.77	9	6	0.18	4
R-8	32	1.35	10	0	0.00	0
R-9	10	0.79	4	0	0.00	0
R-10	0	0.00	0	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>170</b>	<b>5.00</b>	<b>34</b>	<b>109</b>	<b>4.69</b>	<b>20</b>

### Appendix F-3 – Aerial Fire Suppression (non-Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	74	13.04	14	8	2.65	3
R-2	22	7.21	7	0	0.00	0
R-3	22	12.65	8	2	0.62	2
R-4	102	20.65	15	48	12.58	7
R-5	350	38.29	35	0	0.00	0
R-6	138	19.19	17	68	5.40	11
R-8	23	5.21	9	8	1.55	1
R-9	4	0.80	2	1	0.25	1
R-10	1	0.02	1	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>736</b>	<b>117.06</b>	<b>108</b>	<b>135</b>	<b>23.04</b>	<b>25</b>

### Aerial Fire Suppression (Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	488	1.36	14	1	0.05	1
R-2	19	0.11	1	19	0.03	1
R-3	198	2.62	12	37	2.43	12
R-4	278	0.10	3	2	0.00	0
R-5	5	0.88	3	78	3.82	10
R-6	30	1.92	11	7	0.21	5
R-8	234	7.43	13	6	0.12	3
R-9	5	0.60	3	0	0.00	0
R-10	0	0.00	0	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>1257</b>	<b>15.02</b>	<b>60</b>	<b>150</b>	<b>6.65</b>	<b>32</b>

**Appendix F-4 – Aviation Support to Natural Resources & Fuel Mgt. (non-Militia) – All Positions**

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	110	9.65	16	55	2.21	12
R-2	23	4.47	7	0	0.00	0
R-3	4	0.30	1	0	0.00	0
R-4	202	17.24	18	102	4.51	19
R-5	350	27.50	35	0	0.00	0
R-6	97	5.20	15	59	0.32	4
R-8	15	3.34	6	2	0.69	1
R-9	7	1.13	2	0	0.00	0
R-10	28	12.96	6	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>836</b>	<b>81.80</b>	<b>106</b>	<b>218</b>	<b>7.73</b>	<b>36</b>

**Aviation Support to Natural Resources & Fuel Mgt. (Militia) – All Positions**

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	0	0.00	0	0	0.00	0
R-2	0	0.00	0	0	0.00	0
R-3	0	0.00	0	0	0.00	0
R-4	123	0.25	2	2	0.00	0
R-5	5	0.23	3	78	3.82	10
R-6	21	0.87	8	1	0.04	1
R-8	94	1.98	11	1	0.18	1
R-9	1	0.10	1	0	0.00	0
R-10	2	0.23	2	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>246</b>	<b>3.66</b>	<b>27</b>	<b>82</b>	<b>4.03</b>	<b>12</b>

### Appendix F-5 – Aviation Contract Management and QA (non-Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	111	18.11	16	9	0.85	3
R-2	18	2.22	7	0	0.00	0
R-3	51	5.04	17	0	0.00	0
R-4	132	16.43	20	2	0.07	2
R-5	350	28.95	35	0	0.00	0
R-6	97	9.75	16	11	0.40	5
R-8	13	3.58	5	4	0.37	1
R-9	10	3.58	4	0	0.00	0
R-10	27	6.40	5	0	0.00	0
WOE	4	0.60	1	0	0.00	0
WOW	10	4.70	1	0	0.00	0
<b>TOTAL</b>	<b>823</b>	<b>99.36</b>	<b>127</b>	<b>26</b>	<b>1.69</b>	<b>11</b>

### Aviation Contract Management and QA (Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	1	0.05	1	0	0.00	0
R-2	0	0.00	0	0	0.00	0
R-3	0	0.00	0	0	0.00	0
R-4	50	0.30	1	0	0.00	0
R-5	5	0.33	3	0	0.00	0
R-6	24	0.89	8	1	0.04	1
R-8	19	1.16	8	0	0.00	0
R-9	1	0.10	1	0	0.00	0
R-10	2	0.16	2	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>102</b>	<b>2.99</b>	<b>24</b>	<b>1</b>	<b>0.04</b>	<b>1</b>

### Appendix F-6 – FS Aviation Program Management (non-Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	7	2.15	2	0	0.00	0
R-2	3	0.65	1	0	0.00	0
R-3	9	2.00	1	0	0.00	0
R-4	46	6.08	14	0	0.00	0
R-5	54	6.05	13	0	0.00	0
R-6	80	8.07	16	0	0.00	0
R-8	26	6.25	14	0	0.00	0
R-9	18	5.73	11	0	0.00	0
R-10	10	2.55	4	0	0.00	0
WOE	4	3.20	1	0	0.00	0
WOW	11	6.15	1	0	0.00	0
<b>TOTAL</b>	<b>268</b>	<b>48.89</b>	<b>78</b>	<b>0</b>	<b>0.00</b>	<b>0</b>
<b>% of Total</b>	<b>7</b>	<b>2.15</b>	<b>2</b>	<b>0</b>	<b>0.00</b>	<b>0</b>

### FS Aviation Program Management (Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	0	0.00	0	0	0.00	0
R-2	0	0.00	0	0	0.00	0
R-3	0	0.00	0	0	0.00	0
R-4	0	0.00	0	0	0.00	0
R-5	0	0.00	0	0	0.00	0
R-6	1	0.10	1	0	0.00	0
R-8	0	0.00	0	0	0.00	0
R-9	0	0.00	0	0	0.00	0
R-10	0	0.00	0	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>1</b>	<b>0.10</b>	<b>1</b>	<b>0</b>	<b>0.00</b>	<b>0</b>

### Appendix F-7 – Non-aviation Related Forestry Duties (non-Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	104	11.35	16	55	4.37	12
R-2	0	0.00	0	0	0.00	0
R-3	0	0.00	0	0	0.00	0
R-4	217	22.86	19	105	6.80	18
R-5	350	65.16	35	0	0.00	0
R-6	75	31.07	14	1	0.08	1
R-8	36	8.12	14	2	0.54	1
R-9	17	10.01	12	4	0.82	2
R-10	7	2.50	3	0	0.00	0
WOE	1	0.10	1	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>807</b>	<b>151.17</b>	<b>114</b>	<b>167</b>	<b>12.59</b>	<b>34</b>

### Non-Aviation Related Forestry Duties (Militia) – All Positions

Region	Permanent			Temporary		
	Number of Positions	Number of FTE	Number of Locations	Number of Positions	Number of FTE	Number of Locations
R-1	490	25.73	15	1	0.31	1
R-2	107	9.02	1	107	8.39	1
R-3	198	16.60	12	37	5.48	12
R-4	516	18.47	5	20	4.05	4
R-5	5	3.10	3	78	22.89	10
R-6	65	31.61	13	27	3.69	5
R-8	336	38.69	13	6	0.66	3
R-9	79	70.20	11	61	28.40	5
R-10	2	0.50	2	0	0.00	0
WOE	0	0.00	0	0	0.00	0
WOW	0	0.00	0	0	0.00	0
<b>TOTAL</b>	<b>1798</b>	<b>213.92</b>	<b>75</b>	<b>337</b>	<b>73.87</b>	<b>41</b>



**Appendix F-8 – Personnel Grade Distribution – Permanent FTE (non-Militia)**

Region	Grade									Total
	AD 2,3,4,5	GS 3,4	GS 5,6	GS 7,8	GS 9,10	GS 11,12	GS 13,14,15	WG 5,8,9,10	Unknown or Other	
R-1	0.0	1.0	42.5	33.6	38.5	38.1	2.0	1.0	0.0	156.7
R-10	0.0	0.0	0.0	9.8	3.9	8.0	3.0	0.0	0.0	24.7
R-2	0.0	0.0	3.0	4.9	5.7	4.0	3.0	0.0	0.0	20.6
R-3	0.5	1.0	7.0	13.2	16.0	6.0	3.0	0.0	0.0	46.7
R-4	0.0	4.9	59.9	37.4	32.8	34.2	10.5	0.0	6.0	185.6
R-5	0.0	33.0	85.3	83.7	35.3	37.5	5.5	0.0	0.0	280.3
R-6	1.5	0.0	34.9	32.3	30.4	56.5	10.3	0.0	0.0	165.7
R-8	0.0	0.7	1.5	6.6	6.6	13.1	2.5	0.0	0.0	31.0
R-9	0.0	0.0	0.0	1.5	5.8	17.5	3.7	0.0	0.0	28.5
WOE	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.0
WOW	0.0	0.0	0.0	1.0	0.0	1.0	9.0	0.0	0.0	11.0
<b>Grand Total</b>	<b>2.0</b>	<b>40.6</b>	<b>234.0</b>	<b>223.9</b>	<b>174.9</b>	<b>215.9</b>	<b>56.5</b>	<b>1.0</b>	<b>6.0</b>	<b>954.8</b>

**Personnel Grade Distribution – Permanent FTE (Militia)**

Region	Grade									Total
	AD 2,3,4,5	GS 3,4	GS 5,6	GS 7,8	GS 9,10	GS 11,12	GS 13,14,15	WG 5,8,9,10	Unknown or Other	
R-1	0.0	9.1	9.1	5.5	2.4	0.9	0.0	0.3	0.0	27.2
R-10	0.0	0.0	4.2	2.3	2.4	1.1	0.0	0.0	0.0	10.0
R-2	0.0	6.1	3.8	2.0	4.3	2.9	0.3	0.0	0.0	19.3
R-3	0.0	0.0	0.6	4.4	8.2	6.2	0.0	0.0	2.1	21.5
R-4	0.0	1.0	1.0	2.0	1.0	0.0	0.0	0.0	0.0	5.0
R-5	0.0	0.5	8.3	10.6	6.7	12.5	0.0	1.0	0.1	39.6
R-6	0.0	2.8	12.4	16.6	11.9	7.9	0.1	0.5	0.0	52.1
R-8	0.0	0.0	15.5	23.3	24.0	11.8	1.0	1.0	0.0	76.6
R-9	0.0	0.0	0.0	0.0	0.8	0.2	0.0	0.0	0.0	0.9
WOE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WOW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Grand Total</b>	<b>0.0</b>	<b>19.5</b>	<b>54.8</b>	<b>66.6</b>	<b>61.6</b>	<b>43.4</b>	<b>1.3</b>	<b>2.8</b>	<b>2.2</b>	<b>252.2</b>

**Appendix F-9 – Personnel Grade Distribution – Seasonal FTE (non-Militia)**

Region	Grade									Total
	AD 2,3,4,5	AD 9,11,12	GS 3,4	GS 5,6	GS 7,8	GS 9,10	GS 11,12	WG 5,8,9,10	Unknown or Other	
R-1	0.0	0.0	9.0	29.3	0.0	0.0	0.0	0.2	4.6	43.2
R-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R-2	0.0	0.0	21.2	0.9	0.0	0.0	0.0	0.0	0.0	22.2
R-3	0.0	0.0	27.2	18.5	0.0	0.0	0.0	0.0	3.2	49.0
R-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R-5	0.7	0.0	8.1	37.6	6.6	0.7	0.4	0.0	0.0	54.1
R-6	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5
R-8	0.0	0.0	1.0	4.3	0.5	0.0	0.0	0.0	0.0	5.8
R-9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WOE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WOW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Grand Total</b>	<b>4.2</b>	<b>0.0</b>	<b>66.6</b>	<b>90.7</b>	<b>7.1</b>	<b>0.7</b>	<b>0.4</b>	<b>0.2</b>	<b>7.8</b>	<b>177.7</b>

**Appendix F-10 – Personnel Grade Distribution – Seasonal FTE (Militia)**

Region	Grade									Total
	AD 2,3,4,5	AD 9,11,12	GS 3,4	GS 5,6	GS 7,8	GS 9,10	GS 11,12	WG 5,8,9,10	Unknown or Other	
R-1	0.6	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.9
R-10	0.0	0.0	0.0	4.2	1.9	2.2	0.8	0.0	0.0	9.1
R-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	7.9
R-3	0.0	0.0	5.9	0.8	0.0	0.0	0.0	0.0	0.0	6.7
R-4	0.0	0.0	19.0	17.7	0.0	0.5	1.0	0.0	0.0	38.2
R-5	0.0	0.5	0.0	1.6	2.5	0.0	0.0	0.0	0.0	4.5
R-6	0.0	0.0	0.7	0.0	0.2	0.2	0.0	0.0	0.0	1.0
R-8	0.0	0.0	3.7	24.8	3.0	0.0	0.0	0.0	0.0	31.5
R-9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WOE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WOW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Grand Total</b>	<b>0.6</b>	<b>0.5</b>	<b>29.5</b>	<b>49.1</b>	<b>7.5</b>	<b>2.8</b>	<b>1.8</b>	<b>0.0</b>	<b>7.9</b>	<b>99.7</b>

### Appendix F-11 – Pilots by Region

Region	Pilots*		Pilots with Some QA Duties*		Pilots with No QA Duties
	Number of Positions	Total FTE	Number of Positions	Total FTE	
R-1	12	11.5	11	2.86	1
R-2	4	4	4	0.3	
R-3	4	4	4	0.6	
R-4	19	19	12	2.55	7
R-5	20	17	20	1.175	
R-6	12	10.9	11	2.165	1
R-8	3	3	3	0.8	
R-9	6	5.2	3	1.1	3
R-10	3	3	2	0.5	1
WOE	0	0	0	0	
WOW	5	5	5	2.4	
<b>TOTAL</b>	<b>88</b>	<b>82.60</b>	<b>75</b>	<b>70.60</b>	<b>13</b>

\*Positions that have “pilot” in their position title.  
 These positions do not necessarily have 100% pilot duties.

**Appendix F-12 – Example of Data Call – [Region 10 FTE]**

Region/Forest	State	Position	Mission FTE or Seasonal FTE	FT, PT, or Vacant	Grade	FTE (number or fraction of year worked)	% of work supporting Aerial Delivery of FF	% of work supporting Aerial Fire Detection/C&C	% of work supporting Aerial Fire Suppression	% of work supporting Avn Support to Non-fire Natural Resources & Fuel Management	% of work supporting Avn Contract Mgmt and QA	% of work supporting FS Avn Program Mgmt	% of time devoted to non-aviation related Forestry duties	Comments
PNW Station	AK	Aviation Officer - Unit	Mission	FT	GS-12	1.00	0%	0%	0%	10%	5%	5%	80%	
Regional	AK	Aviation Maintenance Insp.	Mission	FT	GS-12	1.00	0%	0%	0%	20%	60%	10%	10%	
Regional	AK	Aviation Officer - Unit	Mission	PT	GS-13	1.00	0%	0%	0%	10%	5%	15%	70%	
Tongass	AK	Aircraft Dispatcher	Seasonal	FT	GS-8	2.10	<1%	0%	0%	80%	20%	0%	0%	18/8 Full-time Seasonal; 1 position (0.70 FTE) is Vacant
Tongass	AK	Helicopter Manager	Seasonal	FT	GS-9	2.40	<1%	0%	0%	70%	30%	0%	0%	20/6 Full-time Seasonal; 1 position (0.8 FTE) is Vacant

## Appendix G –Aircraft

### Appendix G-1 – Forest Service WCF Aircraft

	Region(s)	Type of Aircraft	Tail Number	Manufacture Date	Acquisition Cost (FAIRS)	Aviation Activities Business Areas	Primary Use	Total FY05 Flight Cost (AMIS)
1	8	Bell 206B JetRangers	106Z	2000	\$109,543	unkn	Training/ Utility	\$40,278
2	1,6,WO	Cessna TU206F	111Z	1975	\$47,295	B	Leadplane	\$47,831
3	2	Cessna TU206F	126Z	1974	\$65,900	D	Photo	\$29,587
4	3	Cessna TU206G	136Z	1985	\$35,200	D	Photo	\$24,000
5	9	DeHavilland DCH-2 Beaver I	191Z	1956	\$56,683	A,B, &D	Natural Resource Survey, Resupply, Waterdrop, etc	\$90,265
6	9	DeHavilland DCH-2 Beaver I	192Z	1959	\$62,650	A,B, &D	Natural Resource Survey, Resupply, Waterdrop, etc	\$76,782
7	9	DeHavilland DCH-2 Beaver I	197Z	1957	\$25,119	A,B, &D	Natural Resource Survey, Resupply, Waterdrop, etc	\$89,351
8	4	Twin (Aero) Commander 500B	147Z	1964	\$107,320	D, F	Photo	\$42,785
9	6	Twin (Aero) Commander 500B	171Z	1964	\$102,728	D	Photo	\$9,813
10	1,2,3,4,W O	Beech King Air B90	148Z	1969	\$1,476,882	B, D	Infrared	\$141,059
11	2	Beech King Air A100	127Z	1974	\$897,763	D	Photo	\$54,690
12	8,WO	Beech King Air E90	181Z	1973	\$576,870	B, D, E	Leadplane, Emergency Response	\$149,499
13	1,2,4,5,6, WO	Beech King Air B200C	149Z	1985	\$2,359,508	B, C, F	Infrared	\$155,950
14	2,3,4,6,8, WO	Beech King Air 200	182Z	1978	\$1,000,000	B, D, E	Detection, Photo, Emergency Response	\$303,611
15	1,2,4,5,6	DeHavilland DHC-6 Twin Otter 300	141Z	1984	\$1,775,673	A, F	Smokejumper	\$104,241
16	1,3,4,WO	DeHavilland DHC-6 Twin Otter 300	143Z	1984	\$848,592	A, F	Smokejumper	\$100,457
17	1,2,3,4,5, 6,WO	Cessna 550 Citation	144Z	2000	not available	B, D	Infrared	\$204,403
18	6	Shorts SD330-200	173Z	1985	\$292,000	A	Smokejumper	\$299,382
19	4,5,6,WO	Shorts SD330-200	175Z	1985	\$292,000	A	Smokejumper	\$131,103
20	5,6	Shorts SD330-200	178Z	1985	\$292,000	A	Smokejumper	\$173,880
21	1,4,6,WO	Shorts SD330-200	179Z	1985	\$292,000	A	Smokejumper	\$133,373
22	1,4,6,WO	Douglas DC3C	115Z	1944	\$2,593,220	A	Smokejumper	\$199,045
23	1,4,5,8	Douglas DC3C	142Z	1949	\$2,608,456	A, F	Smokejumper	\$151,414
24	5	Bell AH-1F/209 Cobra	107Z	1983	\$334,000	B, C, D	Firewatch	\$353,123
25	1,5,WO	Bell AH-1F/209 Cobra	109Z	1969	\$334,000	B, C, D	Firewatch	\$353,123
26	10	DeHavilland Beaver 1	106FS	Pre '67	not available	D	Project - Law Enforcement & Investigations	\$61,250
Note: The listing under the Region(s) column indicates the Region(s) where the aircraft was utilized in 2005. The Region in which the aircraft was primarily used is in <b>bold</b> .								<b>\$3,520,294</b>

## Appendix G-2 – Leased Aircraft & WCF Cost Summary

Region	Leased Aircraft			FS Owned Aircraft		
	# of Vendors	# of Aircraft	Total Cost	# of Vendors	# of Aircraft	Total Cost
R-1	1	2	\$954,400	n/a	2	\$332,418
R-2	1	3	\$1,250,000	n/a	2	\$84,277
R-3	0	0	\$0	n/a	1	\$24,000
R-4	2	3	\$278,327	n/a	6	\$695,906
R-5	1	2	\$840,000	n/a	3	\$837,349
R-6	0	2	\$1,107,045	n/a	5	\$735,309
R-8	0	0	\$0	n/a	3	\$493,388
R-9	0	0	\$0	n/a	3	\$256,398
R-10	1	1	\$41,611	n/a	1	\$61,250
WOE	0	0	\$0	n/a	0	\$0
WOW	0	0	\$0	n/a	0	\$0
	<b>6</b>	<b>13</b>	<b>\$4,471,383</b>		<b>26</b>	<b>\$3,520,294</b>

## Appendix G-3 – NTSB Recommendation Extract

The Forest Service continues to work toward implementation of the NTSB's recommendations regarding airworthiness of our fire fighting aircraft.

### Aircraft Inspection Program and Service Life for USFS Special Mission Environment

The Secretary of Agriculture and the Secretary of Interior have agreed to comply with National Transportation Safety Board (NTSB) safety recommendations A-04-29 and A-04-30, dated April 23, 2004. These recommendations are the result of an investigation of three fatal airtanker accidents that occurred in 1994 and 2002 and apply to all firefighting aircraft, including ASM aircraft. Specific recommendations include:

#### A-04-29:

- 1.) The airplane's original design requirements and intended mission;
- 2.) Operational life used before fire fighting operations;
- 3.) Magnitude of maneuver loading and turbulence in the fire environment;
- 4.) Impact of previous flight hours on remaining operational life and;
- 5.) Engineering analysis for preventing fatigue separations.

A-04-30: Require aircraft in firefighting operations to be maintained according to the maintenance and inspection programs developed in response to A-04-29.

Aircraft shall be in full compliance with NTSB recommendations A-04-29 and A-04-30. The *USFS Special Mission Aircraft Specification and Structural Criteria*.

### Mission Environment

The FAA has published a report titled, Consolidation and Analysis of Loading Data in Firefighting Operations-Analysis of Existing Data and Definition of Preliminary Airtanker and Lead Aircraft Spectra, (DOT/FAA/AR-05/35) dated October 2005 that states: "at best, the loads spectrum experienced by lead aircraft is at least as severe as loads spectrum experienced by an airtanker and, at worst, far more severe. Unlike the airtankers, the lead aircraft do not experience drastic changes in their in-flight weight and, therefore, the corresponding stress levels at critical locations in their structure may well be significantly higher than was anticipated during their original design." The aircraft shall be capable of sustained operations under the conditions identified in this report for lead aircraft without the loss of structural strength.

## Appendix H – Forest Service Contracts

### Appendix H-1 – Aircraft Contracts by Region

Region	Administrative Unit			Regional Contracts			National Contracts		
	# of Vendors	# of Aircraft	Total Contract Cost	# of Vendors	# of Aircraft	Total Contract Cost	# of Vendors	# of Aircraft	Total Contract Cost
R1	36	121	\$8,112,369	3	3	\$1,016,850	0	0	\$0
R2	16	18	\$1,857,917	0	0	\$0	0	0	\$0
R3	23	44	\$10,576,100	5	10	\$329,127	0	0	\$0
R4	45	71	\$10,837,304	13	34	\$482,789	0	0	\$0
R5	13	24	\$15,698,294	18	25	\$3,475,772	0	0	\$0
R6	24	33	\$4,903,985	20	24	\$2,979,011	0	0	\$0
R8	28	49	\$7,923,761	0	0	\$0	0	0	\$0
R9	7	8	\$1,271,339	10	15	\$448,852	0	0	\$0
R10	25	87	\$2,783,725	0	0		0	0	\$0
WOE	0	0	\$0.00	0	0	\$0.00	0	0	\$0
WOW	0	0	\$0.00	0	0	\$0.00	55	77	\$97,726,154
	<b>217</b>	<b>455</b>	<b>\$63,964,795</b>	<b>69</b>	<b>111</b>	<b>\$8,732,401</b>	<b>55</b>	<b>77</b>	<b>\$97,726,154</b>

### Appendix H-2 – Contracted Fixed Wing Aircraft and Helicopters

	Administrative Unit		Regional		National	
	# of Aircraft	FY05 Contract Cost	# of Aircraft	FY05 Contract Cost	# of Aircraft	FY05 Contract Cost
<b>Fixed Wing</b>	<b>276</b>	<b>\$14,318,566</b>	<b>32</b>	<b>\$3,155,308</b>	<b>11</b>	<b>\$21,061,120</b>
<b>Type I Helicopters</b>	<b>9</b>	<b>\$6,410,833</b>	<b>1</b>	<b>\$156,441</b>	<b>34</b>	<b>\$62,299,942</b>
<i>Exclusive Use</i>	1	\$2,225,453	0	\$0	16	\$40,529,911
CWN	8	\$4,185,380	1	\$156,441	18	\$21,770,030
<i>Other (Coop/Agreement)</i>	0	\$0	0	\$0	0	\$0
					<i>Other (Coop/Agreement)</i>	
<b>Type II Helicopters</b>	<b>35</b>	<b>\$17,777,966</b>	<b>8</b>	<b>\$484,323</b>	<b>32</b>	<b>\$14,365,092</b>
<i>Exclusive Use</i>	24	\$17,305,750	0	\$0	7	\$5,626,532
CWN	10	\$440,216	8	\$484,323	25	\$8,738,561
<i>Other (Coop/Agreement)</i>	1	\$32,000	0	\$0	0	\$0
<b>Type III Helicopters</b>	<b>136</b>	<b>\$23,823,953</b>	<b>69</b>	<b>\$4,838,604</b>	<b>0</b>	<b>\$0</b>
<i>Exclusive Use</i>	51	\$13,794,373	0	\$0	0	\$0
CWN	85	\$10,029,580	68	\$4,562,604	0	\$0
<i>Other (Coop/Agreement)</i>	1	\$41,542	1	\$276,000	0	\$0
<b>unknown</b>	<b>1</b>	<b>\$32,000</b>	<b>1</b>	<b>\$97,724</b>	<b>0</b>	<b>\$0</b>
	<b>455</b>	<b>\$63,964,795</b>	<b>111</b>	<b>\$8,732,401</b>	<b>77</b>	<b>\$97,726,154</b>
	Total Aircraft		<b>643</b>			
	Total Cost					<b>\$170,423,350</b>

Note: The 11 National Fixed Wing aircraft are Airtankers.



### Appendix H-3 –Equipment Contracts

Region	Forest	Reason for Contract (i.e. MAFFS; Support Equipment; Aircraft Maintenance; Maintenance of Support Equipment)	Vendor	Type of Contract (i.e. BPA, CWN, Exclusive Use)	Total FY 05 Contract Cost	Comments (Include all major services within the contract)
WOW		Modular Airborne Fire Fighting System (MAFFS) maintenance	FS Owned	BPA	\$337,142	
R2	Rocky Mountain Region	Aircraft Maintenance Contract	Legacy Air	BPA	\$25,000	King Air A100
R2	Rocky Mountain Region	Aircraft Maintenance Contract	Stevens Aviation	BPA	\$35,000	C206
R9	Superior	Chase vehicle	WCF		\$9,600	FOR
R9	Mark Twain	Chase vehicle	WCF		\$9,600	FOR
					\$416,342	

**Appendix H-4 – Base Support and Facilities Contracts**

Region	Forest	Type of Facility	Hangar Space				Administrative Space			
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments
1	AFD	Hangar	27,000	L	\$176,000	Vendor	1,200	L	\$22,000	Vendor Lease
1	AFD						10,800	L	\$45,000	Vendor Lease
1	Beaverhead-Deerlodge NF						1,200	L	\$4,500	\$1500.00/ 3 months
1	Beaverhead-Deerlodge NF						120	L	\$6,900	6900
1	Beaverhead-Deerlodge NF						1,200	L	\$34,000	34000
1	R-1;Bitterroot N.F.						2,600	L	\$33,000	Forest Helibase/Dispatch; Leased from Ravalli County at the airport. 2 pads plus add. space
1	CNF						200	L	\$2,000	Est \$2000/year
1	Nez Perce NF-Grangeville Air Center	Hangar	1,000	L	\$16,000	1000 SQ FT HANGER-LEASE	500	L	\$8,000	Pilot Lounge/Sleeping Area; Retardant Plant, Mixing Facilities, Storage.
1	Nez Perce NF-Grangeville Air Center						4.4 Acres	L	\$20,000	Acreage For Facilities, Parking And Ramp; 4.44 Acres Of Leased Land ;Lease In Perpetuity With USFS
1	Nez Perce NF-Grangeville Air Center						6.4 Acres	L	\$3,100	Helipads, Parking, Facilities; 6.4 Acres Of Leased Land; Long-term Lease With USFS
1	Flathead NF	Helibase	2,546	O	\$34,000	FS Own HB				
1	Flathead NF						1,500	L	\$31,000	Leased ATB
1	Flathead NF						225	L	\$14,500	Leased FAOO
1	R1, Idaho Panhandle National Forests Coeur d'Alene Wildland Fire Center						174,240	L	\$32,500	174,240 FS lease; Airtanker Base airport ramp (4 acres) lease.
1	KOOTNAI NF	Hangar	2,500	O	\$35,000		3,200	L	\$2,500	Budget in WFPR Q11; Estimate \$2,500 for land lease

Region	Forest	Type of Facility	Hangar Space				Administrative Space			
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments
1	Lewis & Clark NF						10,000	L	\$21,500	10,000 sq. ft. ~
1	Lewis & Clark NF						384	L	\$10,000	384 sq. ft. each office
1	Lolo NF	Hangar	704	O	\$12,000	For avn staff				
10	Regional Office Aviation Staff						500	GSA	\$12,000	GSA Building, 500 sq ft
10	PWW Stat.-AK						150	GSA	\$3,600	UAO Office space. GSA Lease
10	PWW Stat.-AK						150	GSA	\$3,600	HEMG Office Space. GSA L
10	PWW Stat.-AK	Hangar	2,400	L	\$12,000					
10	PWW Stat.-AK						125	GSA	\$3,000	GSA Building 125 sf.
10	R-10, Tongass NF	Ketchikan Supervisors Office					168	GSA	\$4,032	Office Space for FAO, 68 sq ft
10	R-10, Tongass NF	Ketchikan Supervisors Office					280	GSA	\$6,720	Office space for A/C Dispatchers
10	R-10, Tongass NF	Ketchikan Supervisors Office					135	GSA	\$3,240	Radio room,
10	R-10, Tongass NF	Ketchikan Supervisors Office					120	GSA	\$2,880	Office space for Helicopter managers,
10	R-10, Tongass NF	Sitka Supervisors Office					70	GSA	\$1,680	Office space for Assistant FAO
10	R-10, Tongass NF	Sitka Supervisors Office					182	GSA	\$4,368	Office space for A/C dispatchers
10	R-10, Tongass NF	Sitka Supervisors Office					70	GSA	\$1,680	Office space for helicopter mgr
10	R-10, Tongass NF	Sitka Supervisors Office					32	GSA	\$768	Radio room
2	Durango Tanker Base						1800	L	\$55,000	Office, Contractor, Helitack, ATGS
2	Rapid City Tanker Base						1,800	L	\$45,000	Office, Contractor, ATGS
2	Pueblo Re-Load Facility						1000	L	\$20,000	Office, Contractor, ATGS
2	Rocky Mountain Region	Hangar	5,100	L	\$75,000					
2	Rocky Mountain Region	Hangar	5,100	L	\$25,000					
2	Rocky Mountain Region						8,500	L	\$245,000	Office space - Jeffco Tanker Base, Helitack, ATGS, Leadplane
2	Regional Office						300	L	\$20,000	Office space - RO

Region	Forest	Type of Facility	Hangar Space				Administrative Space			
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments
3	0316 Regional Office	Hangar	2,500	L	\$1,620	7Bar Aviation Inc.	800	L	\$6,600	Lease Pilot Office 7 Bar Aviation, Used during fire season for pilot standby.
3	0316 Regional Office						600	L	\$7,480	Columbia Building Offices. 6 Offices, Shared with FAM & BIA
3	0316 Regional Office						400	GSA	\$7,300	Building for RAO, RASM, FWOS.
3	0301 Apache-Sitgraves N.F.						2,500	L	\$2,500	Office and Storage; located at Springerville Airport, leased from the city. Lease also includes ramp space for D15 helicopter and ramp space for SEAT and retardant storage. 4 acres of land leased for Springerville helibase.
3	0301 Apache-Sitgraves N.F.	Land	7.53 acres	L	\$1,800	Land leased for Winslow Airtanker Base	6,000	O	\$4,000	The Winslow Airtanker Base Buildings and most of the tank farms are owned by the Forest Service. Airtanker Base office and storage approx 4500 sq. feet. Pilot ready room approx. 1500 sq. feet.
3	0303 Cibola National Forest	Helipad	1.7 acres	O	\$0	Sandia Helitack. 3 helipads F.S. Owned	2,200	O	\$2,000	Sandia Helitack office and storage. FS owned office, approx. 1200 sq. feet. Storage approx. 1000 sq. feet.
3	0303 Cibola National Forest	Ramp	5 acres	L	\$0	Albuquerque Airtanker Base lease ramp space.	2,600	O	\$13,650	Albuquerque Airtanker Base leased from Kirtland Air Force Base. Office building 1000 sq. feet. Pilot ready-room approx. 1000 sq. feet. Storage buildings approx. 600 sq. feet, all owned by F.S.
3	0305 Coronado N.F.	Helipad	0.177 acres	L	\$3,000	Land for 3 helipads at Tucson Airport.	2,500	L	\$49,697	Tucson Helitack lease from the city of Tucson. Office and storage approx. 2500 sq. feet.

Region	Forest	Type of Facility	Hangar Space				Administrative Space				
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments	
3	0305 Coronado N.F.										BDI crew leasing from Bisbee /Douglas International airport office and storage approx.1500 square feet. Lease includes ramp space. Lease ramp space for helicopter at BDI and lease ramp and pits for Airtanker base.
3	0305 Coronado N.F.	Land	3.55 ac	L	\$0	Land leased at Wilcox Airport					
3	0305 Coronado N.F.	Land	4500 SF	L	\$0	Land leased for Libby Airtanker Base?	3,200	L	\$0		Ft. Huachuca Tanker Base leased from Ft. Huachuca Army base. Office and storage building approx. 4500 sq.feet.
3	0306 Gila National Forest										Reserve Helitack crew office space, GSA building, approx 800 sq.feet. Storage approx 500 sq.feet.
3	0310 Santa Fe N.F.	Helipad	1200 SF	DOE O	\$0	Helipads on DOE land.	2,200	DOE O	\$4,894		Los Alamos helitack office 1200 sq. feet storage. 1000 sq feet buildings on TA-49 DOE
3	0311 Tonto N.F.	Ramp	4 acres	L	\$12,000	Ramps and pits leased from Williams Gateway airport.	2160 SF	L	\$155,000		Williams Gateway Airtanker Base office/storage, leased trailers 1800 sq. feet.
3	0311 Tonto N.F.										Tonto Helitack located at Payson airport, leased from the city of Payson. Office and storage 1400 sq. feet leased trailer. 2 acre helipads leased from the city of Payson.

Region	Forest	Type of Facility	Hangar Space				Administrative Space			
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments
4	RO	Hangar	11,550	L			5,953	L		Old Ogden Main Hangar ( lease ended 2/26/06) <b>7 positions included in 31 were relocated from Boise to Ogden at that time</b> Total "Office Space" - 1953 sq ft Total "Hangar Space" - 11,550 sq. ft. Total Storage Space - 4,000 sq. ft. Total Ramp Space - 28,900 sq. ft.
4	RO	Hangar	25,450	L			8,500	L		New Ogden Main Hangar (effective 2/27/06) Total "Office Space" - 4500 sq. ft. Total "Hangar Space" - 25,450 sq. ft. Total "Storage" - 4,000 sq. ft. Total " Ramp" - 40,500 sq. ft.
4	RO	Hangar	5,851	R*		Hangar Area 5851 sq.ft.	964			*Rented space.
4	RO-FHP-Boise Field Office						300	L		Office space for aerial surveyors/entomologists/coordinator/manager adjusted by % of time in aviation activities. Cost unobtainable, comes out of cost pool.
4	RO-FHP-Ogden Field Office						50	L		Office space for aerial surveyor adjusted by % of time in aviation activities. Cost unobtainable, comes out of cost pool.

Region	Forest	Type of Facility	Hangar Space				Administrative Space				
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments	
4	Ashley N.F.										The Ashley NF rents airport offices, supply/equipment storage, and restrooms for the Uintah Basin Interagency (FS, BLM, NPS) helicopter and crew from Vernal City and Uintah County. This space is temporarily being rented until a long-term lease for a facility can be negotiated and built at the Vernal A/P by Vernal City and Uintah County. The current rent of \$4,160 is for 4 months (June, July, August, and September).
4	Caribou-Targhee NF										Building lease- large office space, standby area, two bathrooms, storage room, kitchen, four garage bays, (4010 sq ft) helipad on lighted flight line, multiple aircraft parking; Pocatello Helibase, Pocatello Regional Airport
4	Caribou-Targhee NF										Westside Ranger District Office, GSA lease, (500 sq ft); FAO, ATGS, Helicopter Mgr, Asst Mgr, Lead crew
4	Humbolt-Toiyabe NF										Vendor Building Lease FAO Office 125 sq.ft. ; S.O.
4	Humbolt-Toiyabe NF - BP										Coop Lease(County) 2400 sq.ft.; Bridgeport HB
4	Payette NF										Winter Office
4	Payette NF										Seid Cr. Air Strip
4	Salmon-Challis NF										2032 Sq. Ft. Office, Restrooms, Storage, Communication Room FS Owned; 840 Sq. Ft. FS Owned

Region	Forest	Type of Facility	Hangar Space				Administrative Space			
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments
R	Wasatch-Cache NF		4,000	L	\$40,250	Houses both Wasatch local and National Program helicopters, cost of the lease is split between the two	500	L	\$5,750	4000 + 500 - Vendor Building Lease
4	Wasatch-Cache NF	Ramp	0	L	\$0.00	2.8 Acres of tarmac with three landing pads(20'X20') included in lease	0	L	\$0	Cost of 2.8 acres included in Lease
4	Uinta NF						800	L	\$9,546	750sqft + 50sqft - Building Lease
4	Uinta NF						100	L	\$4,200	Aviation Dispatcher
4	Uinta NF						600	MOU/UFRA	\$0	Rappel Tower
5	Klamath NF						3,400	L	\$5,100	FS owned Scott Valley Helibase
5	Los Padres NF						2,500	L	\$50,000	Santa Barbara Air Attack & Tanker Base. Subject to closure due to environmental issues and high costs.
5	Inyo NF						650	L	\$20,000	Independence Helibase, Rented land at Independence airport. Agency trailers on site.
5	Los Padres NF						3,200	L	\$75,000	Santa Ynez helibase. Air attack 07 will soon be moving from Santa Barbara to this location.
5	Sierra NF						2,200	L	\$50,000	Mariposa Helibase



Region	Forest	Type of Facility	Hangar Space				Administrative Space							
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments				
5	Angeles										3,000	L	\$50,000	Van Nuys Helibase
5	Cleveland NF										900	L	\$1,300	Hemet Helibase
6	R-6 Wallowa-Whitman NF										1,200	L	\$6,000	Northeast Oregon Interagency Fire Center (NOIFC) Leased Building (1200 sq ft), Ramp, and Property
6	R-6 Wallowa-Whitman NF										1,600	L	\$8,000	Forest wide Office space Leased Buildings (1600 sq ft), and office space
6	R-6 Wallowa Fire Zone												\$400	Sled Springs Rappel Base Permanent Helipads (400 sq ft), FS owned; 1 improved pad
6	R-6 Wallowa-Whitman NF												\$3,000	NOIFC Light Fixed Wing ramp space - leased property; 3 paved parking areas
6	R-6 Wallowa-Whitman NF												\$6,000	Tanker Base Ramp - Loading, leased property; 3 loading pits
6	R-6 Wallowa-Whitman NF												\$2,000	Backcountry Airstrips - FS Owned Property; 7 airstrips
6	R-6 Wallowa - Whitman NF												\$1,500	Misc. Permanent Helipads 2- FS Owned, 3-leased Property; 5 total helipads
6	R-6 Umatilla NF												\$400	SEAT Ramp - Loading pit Leased Ramp Space; 1 Aircraft loading pit
6	R-6 Umatilla NF										800	L	\$800	Misc. permanent helipads - Leased Property - 800 sq ft; 2 improved pads
6	R-6 Malheur NF										1,600	L	\$8,000	Forest wide Offices - Leased Building, and Office Space
6	R-6 Malheur NF												\$400	John Day SEAT Ramp - Loading Pit - Leased Ramp Space; Aircraft Loading Pit
6	R-6 Malheur NF										800	L	\$800	JD Airbase Permanent Helipads Leased Property - 800 sq ft; 2 improved pads
6	R-6 RAG	Hangar	25,419	L	\$161,351									
6	R-6 RAG	Hangar	3,600	L	\$9,360									
6	Umpqua												\$500	Tiller Helibase FS- Owned; Tiller Helibase: Cost associated with maintenance. (3 helipads)

Region	Forest	Type of Facility	Hangar Space				Administrative Space			
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments
6	Umpqua							\$500	Runway strip= Dirt strip 6000 ft. in length and 75 ft. wide - FS owned); Tokettee/ Clearwater Airstrip: Cost associated with maintenance and with administration of a special use permit granted to the State of Oregon Aviation Department	
6	Region 6, Okanagan and Wenatchee NF					6,501	L	\$60,000	Wenatchee Rappel Base	
6	Region 6, Okanagan and Wenatchee NF					4,438	O	\$13,800	Moses Lake Airtanker Base main building and warehouse.	
6	Region 6, Okanagan and Wenatchee NF					3,140	L	\$5,000	Central Washington Interagency Communication Center (CWICC), \$5,000 for aviation.	
6	Region 6, Okanagan and Wenatchee NF					328	L	\$6,104	Lead Plane Pilot, Tackman, 100 sq.ft., \$2,000/year; OWF UAO Office Space, 228 sq.ft., \$18/sq.ft.=\$4,104; Foster Field, \$1000/da, 20 days/fire season, \$20,000 total cost	
6	Region 6, Okanagan and Wenatchee NF					200	L	\$3,600	District Aviation Officers (DAO), Office Space, 200 sq.ft., \$18/sq.ft.=\$3,600 for 26 pp, for 1 PP=\$140 X 11 DAOs=\$1,540; From, \$1000/da, 20 days/fire season, \$20,000 total cost	
8	Region 8 R.O.									
8	Region 8 R.O.		5,184	L	\$40,000				A/C Hangar 2 Fixed wing 1 Helicopter VBL	
8	Region 8 R.O.		435,600	L	\$109,000				Chattanooga ATB building site; 108000	

Region	Forest	Type of Facility	Hangar Space			Administrative Space			
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space
8	Region 8 R.O.		200,000	L	\$30,000				Lake City ATB
8	Region 8 R.O.					374	L	\$4,000	Vendor Building Lease 374sq. Ft; Vendor Building Lease 1689sq ft
8	Region 8 R.O.					400	L	\$3,000	aircraft dispatch ...400 est.; 6200
8	Ozark-St. Francis					1,077	L	\$35,000	Clarksville Airport land Lease area 635,976 Sq. Ft. and 1077 Sq. Ft. office space; 3 Forest Service and 2 contractor
8	Ozark-St. Francis					4,341	L	\$25,000	Drake Field ATB land Lease area 55582 Sq. Ft., with 4341 sq. ft. office and storage space under construction; Locations of new facility plan to occupy FY 06, Buildings will not be constructed until FY 07, \$28,160
8	Ozark-St. Francis					1,888	L	\$20,000	Ft. Smith ATB Land Lease 4,000 Sq. Ft, office and storage space 1888 Sq. Ft; Old facility plan to vacate FY 06
8	R8, Chattahoochee-Oconee NF					1,500	L	\$15,000	Vendor Building Lease: 1500 Square FT
8	R8, GW/Jeff					900	L	\$11,000	Office for pilots - 140 square feet; Helibase - 760 square feet - Land and building owned by County; \$3000 per year Abingdon Helibase
8	R8, GW/Jeff								
8	R8 - Pisgah					200	L	\$900	Woodlawn Helibase - Leased - 100 sq. feet; Vendor Lease - 100 sq. ft.
9	R9 - RO					500	L	\$5,000	Gas light building-Vendor lease, 500/Sq ft
9	R9 - RO								Ogden (completed by R4)
9	R9 - RO					300	GSA	\$3,000	Minneapolis - GSA 300/Sq Ft
9	R9 - RO								Missoula (completed by R1)
9	Huron-Manistee-R9					875	L	\$6,000	Dispatch 875 Vendor leased
9	Huron-Manistee-R9						L	\$1,500	FAO Office 96 Vendor leased
9	Superior - R9					1,574	L	\$6,000	

Region	Forest	Type of Facility	Hangar Space				Administrative Space			
			Hangar Space (SF)	Hangar Space Ownership (i.e. FS Owned (O), Leased (L), Leased to Purchase LTP), etc.)	Annual Cost of Hangar (\$)	Comments	Administrative Space (SF)	Administrative Space Ownership (i.e. FS owned, Leased, Leased to Purchase, etc.)	Annual Cost of Administrative Space	Comments
9	Superior - R9						672	L	\$3,000	
9	Superior - R9						32	L	\$1,500	
9	Allegheny - R9						120	L	\$3,000	
9	Hiawatha - R9						64	L	\$2,500	
9	Hoosier NF	Hangar	4,000	L	\$10,000					
9	Shawnee NF									
9	Chequamegon-Nicolet	Hangar	1,000	L	\$1,000		900	L	\$6,000	Airport FBO, 400 sq ft, Vendor leased (county); Leased office trailer, 500 sq ft, temporary, 30 days.
9	Chequamegon-Nicolet	Hangar					100	GSA	\$3,000	
9	Mark Twain NF	Hangar	2,400	L	\$10,000					
9	Mark Twain NF						1,180	L	\$2,000	vendor leased 440 Sq Ft; & Vendor leased - Office = 610 sq ft included in the hangar lease of \$10K
WO	NIFC						2,686	GSA	\$83,878	NIFC – NORTH
WO	NIFC	Hangar	6,896	FS	\$14,482	NIFC-HANGER				

## Appendix I - Helitack Bases and Satellites

	Region	Helitack Base		Region	Helitack Base		Region	Helitack Base
1	R-1	Clearwater, Nez	33	R-4	Krassel	65	R-5	Trinity
2	R-1	Coeur d'Alene	34	R-4	Lucky Peak	66	R-5	Van Nuys 1
3	R-1	Dillon NTNL	35	R-4	Minden	67	R-5	White Cloud
4	R-1	Flathead	36	R-4	Moyer	68	R-6	Frazier
5	R-1	Gallatin	37	R-4	Mt. Green	69	R-6	John Day
6	R-1	Grangeville	38	R-4	Pocatello	70	R-6	LaGrande 1
7	R-1	Hamilton	39	R-4	Price Valley	71	R-6	Oakridge
8	R-1	Helena	40	R-4	Provo	72	R-6	Siskiyou
9	R-1	Lewis & Clark	41	R-4	Swan Valley	73	R-6	Sled Springs RGN
10	R-1	Libby	42	R-4	Teton	74	R-6	Wenatchee
11	R-1	Missoula NTNL	43	R-4	Vernal	75	R-8	Abingdon
12	R-1	Ronan	44	R-5	Arroyo Grande	76	R-8	Alexandria
13	R-2	Custer II	45	R-5	Bald Mountain	77	R-8	Big Swag
14	R-2	Durango NTNL	46	R-5	Big Hill	78	R-8	Clarksville
15	R-2	Fremont City	47	R-5	Casitas	79	R-8	Copperhill
16	R-2	Monument	48	R-5	Chester	80	R-8	Glassy Mtn
17	R-3	BDI	49	R-5	Chilao	81	R-8	Lufkin
18	R-3	Los Alamos	50	R-5	Chuchupate	82	R-8	Lufkin/Brainerd
19	R-3	Payson	51	R-5	Happy Camp	83	R-8	Mena
20	R-3	Pittman Valley	52	R-5	Heaps Peak	84	R-8	Moncks Cor
21	R-3	Prescott	53	R-5	Hemet Valley	85	R-8	New Bern
22	R-3	Reserve	54	R-5	Independence	86	R-8	Ocala
23	R-3	Round Valley	55	R-5	Keenwild	87	R-8	Oxford
24	R-3	Sandia	56	R-5	Kernville	88	R-8	Papillion/Forest
25	R-3	Silver City	57	R-5	Mariposa	89	R-8	Skyplane/Forest
26	R-3	Tucson	58	R-5	Peppermint	90	R-8	Tallahassee
27	R-4	Bridgeport	59	R-5	Quincy	91	R-8	Weyers Cave
28	R-4	Cedar City	60	R-5	Ramona	92	R-8	Wiggins
29	R-4	Challis	61	R-5	San Bernardino	93	R-9	Rolla/Mio
30	R-4	Garden Valley	62	R-5	Santa Ynez	94	R-9	Superior
31	R-4	Hailey	63	R-5	Scott Valley	95	R-9/R-2	Ely/Jeffco
32	R-4	Indianola	64	R-5	Trimmer			

## Appendix J - Smokejumper Bases and Satellites

Region	Smokejumper Base Location	Region	Smokejumper Base Location
Region 1 - Northern Rockies Area	Missoula, MT West Yellowstone, MT Grangeville, ID	Region 5 - Pacific Southwest Area	Redding, CA
Region 2 - Rocky Mountain Area		Region 6 - Northwest Area	Redmond, OR
Region 3 - Southwest Area	Silver City, NM	Region 8 - Southern Area	
Region 4 - Great Basin Area	McCall, ID	Region 9 - Eastern Area	
		Region 10 - Alaska Area	

## Appendix K - Airtanker/Helitanker Bases and Satellites

### Forest Service Airtanker Bases

Region	Airtanker Base	Region	Airtanker Base
Region 1 - Northern Rockies Area	Missoula, MT* Helena, MT* Glacier, MT West Yellowstone, MT* Grangeville, ID* <b>Coeur d' Alene, ID</b>	Region 5 - Pacific Southwest Area	Siskiyou County, CA Redding, CA** (CDF) Chester, CA* Stockton, CA* Fresno, CA* (CDF) Porterville, CA (CDF) Santa Barbara, CA* San Bernardino, CA* Fox Field, CA* Ramona, CA* (CDF) Chico, CA (CDF) <b>Bishop, CA* (Re-load only)</b>
Region 2 - Rocky Mountain Area	Rapid City, SD Jeffco, CO <b>Durango, CO*</b>	Region 6 - Northwest Area	Moses Lake, WA* Troutdale, OR LaGrande, OR Redmond, OR** Medford, OR* (ODF) <b>Klamath Falls, OR*</b>
Region 3 - Southwest Area	Albuquerque, NM* Alamogordo, NM Silver City, NM* Prescott, AZ* Fort Huachuca, AZ* Winslow, AZ* <b>Williams Gateway, AZ</b>	Region 8 - Southern Area	Weyers Cave, VA (closed) Asheville, NC (closed) London, KY (closed) Knoxville/Chattanooga, TN Fort Smith/Fayetteville, AR <b>Lake City, FL</b>
Region 4 - Great Basin Area	Hill AFB, UT* Boise, ID* <b>McCall, ID*</b>	Region 9 - Eastern Area	<b>Ely, MN</b>
		Region 10 - Alaska Area	n/a

\* Smokejumper Base

\* Full Service Base

(CDF) CDF staff with Forest Service dollars

Forest Service SEAT Bases	
Redmond, OR	John Day, OR
Grangeville, ID	Pendleton, OR

Summary of Forest Service Airtanker Bases	
Number of FS Airtanker Bases	44
Full Service FS Airtanker Bases	20
FS SEAT Bases	4

## Appendix L - Types of Contracts

### **Exclusive Use and CWN Contracts and Rental Agreements**

Exclusive use contracts are used to obtain crewed aircraft and support at specific locations and for specific periods of time, during which the Forest Service has exclusive use of the aircraft. This contract type is used when the immediate availability of the crewed and supported aircraft, when and where contracted, is essential to meet fire initial attack time response requirements. Examples are all multi-engine airtankers (except MAFFS), and helicopters serving helitack crews in specified forests justified in the Fire Program Analysis (FPA) process.

CWN contracts are used to obtain additional aircraft when exclusive use contract aircraft are insufficient to meet needs during severe fire situations or other emergency conditions.

Rental agreements are used to obtain light fixed-wing crewed aircraft meeting Forest Service technical requirements for individual flights as needed. Typically these agreements are executed by National Forest/Grasslands with local commercial operators. As with CWN contracts, the essence is the operator will provide the aircraft and pilot as specified in the agreement when requested if available.

Forest Service pilot, aircraft and avionics inspectors, acting on behalf of contracting officers, must inspect and approve pilots, aircraft and support elements against contract and rental agreement stipulations prior to use by the Forest Service. Crews of contract aircraft and support personnel are directed and supervised while providing services by Forest Service helitack crew supervisors, helicopter managers, leadplane pilots, dispatchers or other personnel, rather than by the contractor. For contracts issued by WO contracting officers at NIFC, regional Administrative Contracting Officers (ACO) are appointed in each using region and local unit Contracting Officer's Representatives (COR) are assigned.

### **End Product Contracts**

Almost all Forest Service use of commercially owned aircraft involves procurement of vendor crewed and maintained aircraft for the Forest Service to use for fire and resource management work. However there is one significant exception, this is the "end product" contract. End product contracts may involve fixed-wing, helicopters, or both.

Aerial application and sometimes other types of projects may be contracted out in a manner, which requires the contractor to provide an end product; for example, a specified area of land sprayed with a given chemical at a particular rate of coverage. The Forest Service can often obtain favorable contract prices with end product contracts because the aviation related technical specifications can be kept to a minimum. Aircraft related technical specifications only require the contractor be FAA-certificated for the activity (FAR Part 137- Agricultural Operations) and have state operating certificates.

All End Product contracts require a regionally reviewed Project Aviation Safety Plan. The Forest Service participation in end product contracts is limited to quality assurance of the end product goals only, with no internal operational controls. Forest Service personnel are not permitted to ride in the contractor's aircraft. If contract administration requires Forest Service personnel to fly, aircraft, pilots and support elements used for this purpose must meet the standard requirements for regular contract of rental agreement aircraft use.

The Forest Service must identify and report hours flown and costs of aircraft use in end product contracts. The requirement for the contractor to furnish this information must be specified in the contract. Accidents and incidents involving aircraft being used in an end product contract must be reported and investigated under the same procedures applicable to other Forest Service aviation mishaps. Refer to FSM 5710.5 and 5711.21.

### **Flight Services Contracts**

Flight Services Contracts require the Forest Service to maintain operational control when the contractor provides the aircraft, crew, and operational support for the aircraft in accomplishing a specific task or project. Forest Service personnel are actively involved in the project. Refer to FSM 5711.22.

## Appendix M – Interagency Committees and Groups

**Interagency Committee on Aviation Policy (ICAP)** - Composed of representatives of federal Departments and chaired by a General Services Administration official, this group is mandated by OMB Circular A-126. The USDA representative is the Director of USDA Office of Operations. The Forest Service representative is the Assistant Director - Aviation. The group's mandate is to establish coordinated aviation policies applicable to all federal civilian agencies.

The work of the committee is accomplished through standing subcommittees made up of agency representatives who formulate and recommend policies to the parent committee. At present there are four subcommittees specializing in: (1) safety, standards and training, (2) management data systems, (3) law enforcement and (4) communications.

**Aviation Management Council (AMC)** - The Assistant Director leads the AMC for Aviation, USDA Forest Service and the Director, USDI Aviation Management Directorate.. The AMC is the focal point for policy coordination between the departments. Under the AMC are an operations oversight group and a business practices oversight group. These two groups direct the efforts of committees and work groups that focus on the various aspects of aviation management and operations. They develop policies, standards, techniques, procedures and contract specifications for the oversight group to recommend to the AMC.

### **National Interagency Aviation Committee (NIAC)**

**Memorandums of Understanding (MOU)** - MOU's are long-term formal agreements between two or more agencies. Aviation related MOU's reflect agreements between the Forest Service and:

- Aviation Management Directorate, Department of the Interior. This agreement sets up the basic framework for coordination of aviation policies, standards and procedures and cooperation in operations..
- U.S. Army and U.S. Air Force. This is the umbrella agreement obligating these military services and their Reserve/National Guard components to provide military assets in support of wildland fire operations. The basic understanding is that such assets are not already committed to a military operation or defense related standby, and that all other agency and commercial resources have been committed. The MAFFS program mentioned above and its Operation Plan are sub agreements under this MOU..
- U.S. Armed Forces Special Forces MOU. Encompasses a mutual agreement for the Forest Service and BLM to provide aircraft for paratrooper jump training and smokejumper rough terrain jump training..
- U.S. Navy. Recently an MOU was negotiated with the Naval Strike Warfare Center at NAS Fallon under which Forest Service helicopter pilots provide mountain flying training to Navy helicopter pilots and proficiency in Navy/FS helicopter types is exchanged..
- Federal Emergency Management Agency (FEMA). This agreement obligates the Forest Service to provide resources when available through FEMA in response to natural disasters or other emergency incidents. Resources provided usually include aircraft and aviation managers..
- All interagency agreements involving use of another Federal agency's resources or an exchange of resources on a reimbursable basis come under the basic authority of Section 601 of the Economy Act of June 30, 1932 (31 USC 1535).

### **International Aviation Activities and Coordination**

A long-term formal agency level aviation-related agreement exists with Canada. This is an exchange of resources agreement for firefighting activities. The agreement is in the form of an "Exchange of Notes" between the respective Governments. The most common exercise of this mini-treaty involves Forest Service infrared mapping aircraft supporting Provincial firefighting efforts.

In addition, mutual aid border agreements are in place between Regions 1, 6, 9, and 10 with adjoining Canadian provinces, and between Region 3 and the State of Sonora, Mexico, for reciprocal fire protection.

The above notwithstanding, Forest Service aviation and other resources have been used in the past under US State Department/FEMA agreements with foreign governments for natural disaster assistance. In addition, Forest Service MAFFS equipment and specialists are available to assist foreign governments.

Civilian owned aircraft listed on the Munitions List (PB4Y, P2V, C-130 and P-3) must have a temporary export license issued by the State Department prior to crossing the U.S. border. This is an operator responsibility.



## Appendix N – Public Aircraft, P.L. 106-181

### Definition of Public Aircraft, P.L. 106-181

Public Law 106-181, codified in Title 49 U.S.C., Chapter 401, Sections 40102(a)(37) and 40125, contains the latest version of the definition of "public aircraft." This law was signed in April 2000.

TITLE 49 - TRANSPORTATION SUBTITLE VII - AVIATION PROGRAMS

PART A - AIR COMMERCE AND SAFETY subpart i - general

CHAPTER 401 - GENERAL PROVISIONS

-HEAD-

Sec. 40102. Definitions

-STATUTE-

(a) General Definitions. - In this part -

(37) "public aircraft" means any of the following:

(A) Except with respect to an aircraft described in subparagraph (E), an aircraft used only for the United States Government, except as provided in section 40125(b).

(B) An aircraft owned by the Government and operated by any person for purposes related to crew training, equipment development, or demonstration, except as provided in section 40125(b).

(C) An aircraft owned and operated by the government of a State, the District of Columbia, or a territory or possession of the United States or a political subdivision of one of these governments, except as provided in section 40125(b).

(D) An aircraft exclusively leased for at least 90 continuous days by the government of a State, the District of Columbia, or a territory or possession of the United States or a political subdivision of one of these governments, except as provided in section 40125(b).

(E) An aircraft owned or operated by the armed forces or chartered to provide transportation to the armed forces under the conditions specified by section 40125(c).

TITLE 49 - TRANSPORTATION SUBTITLE VII - AVIATION PROGRAMS

PART A - AIR COMMERCE AND SAFETY

subpart i - general

CHAPTER 401 - GENERAL PROVISIONS

-HEAD- 01/02/01

Sec. 40125. Qualifications for public aircraft status

-STATUTE-

(a) Definitions. - In this section, the following definitions apply:

(1) Commercial purposes. - The term "commercial purposes" means the transportation of persons or property for compensation or hire, but does not include the operation of an aircraft by the armed forces for reimbursement when that reimbursement is required by any federal statute, regulation, or directive, in effect on November 1, 1999, or by one government on behalf of another government under a cost reimbursement agreement if the government on whose behalf the operation is conducted certifies to the Administrator of the Federal Aviation Administration that the operation is necessary to respond to a significant and imminent threat to life or property (including natural resources) and that no service by a private operator is reasonably available to meet the threat.

(2) Governmental function. - The term "governmental function" means an activity undertaken by a government, such as national defense, intelligence missions, firefighting, search and rescue, law enforcement (including transport of prisoners, detainees, and illegal aliens), aeronautical research, or biological or geological resource management.

(3) Qualified non-crewmember. - The term "qualified non-crewmember" means an individual, other than a member of the crew, aboard an aircraft –

(A) operated by the armed forces or an intelligence agency of the United States Government; or

(B) whose presence is required to perform, or is associated with the performance of, a governmental function.

(4) Armed forces. - The term "armed forces" has the meaning given such term by section 101 of title 10.

(b) Aircraft Owned by Governments. - An aircraft described in subparagraph (A), (B), (C), or (D) of section 40102(a)(37) does not qualify as a public aircraft under such section when the aircraft is used for commercial purposes or to carry an individual other than a crewmember or a qualified non-crewmember.

(c) Aircraft Owned or Operated by the Armed Forces. –

(1) In general. - Subject to paragraph (2), an aircraft described in section 40102(a)(37)(E) qualifies as a public aircraft if –

(A) the aircraft is operated in accordance with title 10;

(B) the aircraft is operated in the performance of a governmental function under title 14, 31, 32, or 50 and the aircraft is not used for commercial purposes; or

(C) the aircraft is chartered to provide transportation to the armed forces and the Secretary of Defense (or the Secretary of the department in which the Coast Guard is operating) designates the operation of the aircraft as being required in the national interest.

(2) Limitation. - An aircraft that meets the criteria set forth in paragraph (1) and that is owned or operated by the National Guard of a State, the District of Columbia, or any territory or possession of the United States, qualifies as a public aircraft only to the extent that it is operated under the direct control of the Department of Defense.

-SOURCE-

(Added Pub. L. 106-181, title VII, Sec. 702(b)(1), Apr. 5, 2000, 114 Stat. 155.)

-MISC1-

EFFECTIVE DATE

Section applicable only to fiscal years beginning after Sept. 30, 1999, see section 3 of Pub. L. 106-181, set out as an Effective Date of 2000 Amendments note under section 106 of this title.

-SECREP-

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in section 40102 of this title.

Last Reviewed 9/27/2006

## Appendix O – Incident Command

### Appendix O-1 – ICS Description

Every section of ICS can be divided into sub-sections as needed, and ICS has the ability to grow and shrink along with the incident. The basic guiding idea in ICS is that a person at the top of the command structure is the responsible party until the task is delegated. This allows for small incidents to be handled by a single or few people who fill multiple roles, or large incidents to have many people working towards a common goal, but all on different tasks.

The major management activities that always apply and are always [filled](#), no matter the size of the incident, are made up of the following 5 sections in the general staff: Command, Operations, Planning, Logistics, and Finance/Administration. In addition there are three positions in the command staff that report directly to the Incident Commander: Information Officer, Safety Officer, Liaison Officer. The general staff positions can be performed by the same person, or multiple people.

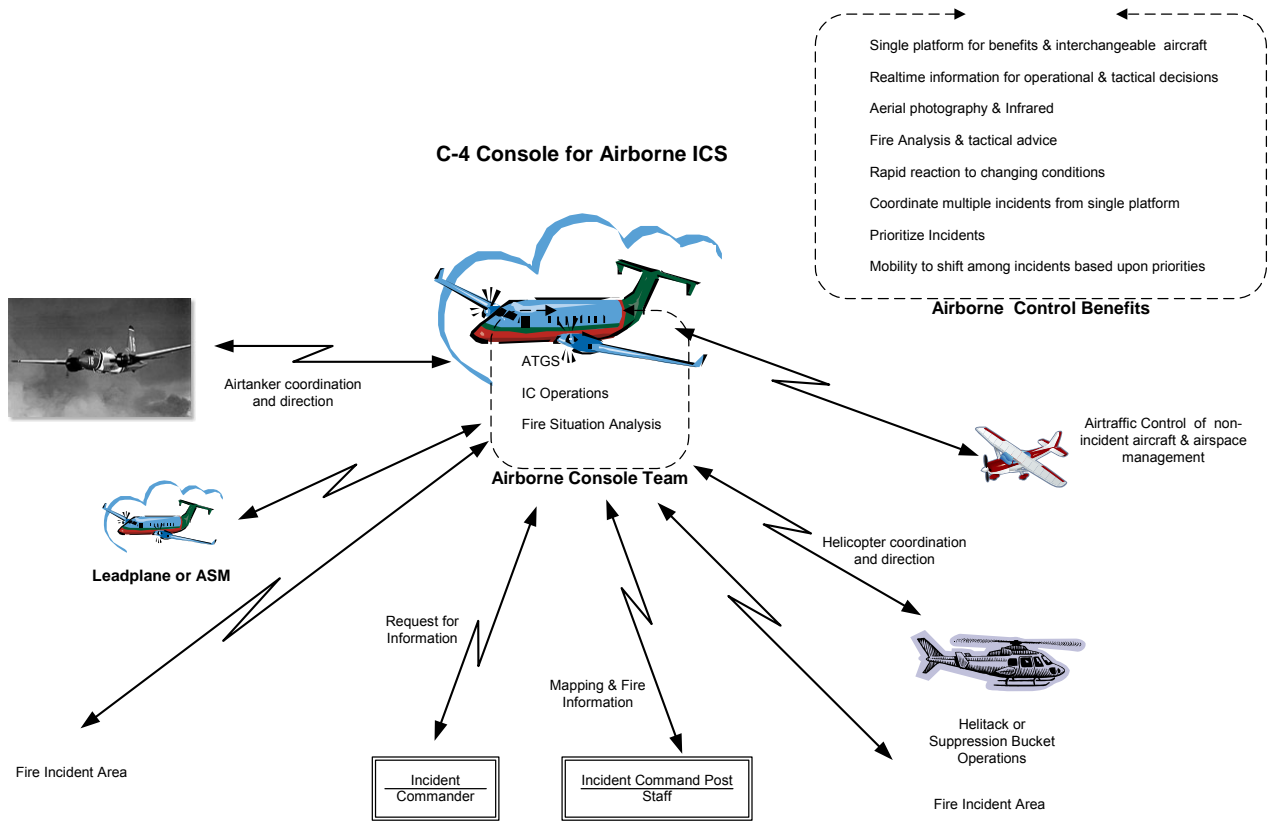
**Command** - The Incident Commander (IC) is the single person in charge at the incident, and initially fills all 5 command staff positions. As the incident grows the tasks covered by other sections can be delegated, and those new positions take the title of Section Chief. The IC is responsible for all activity on the incident as well as creating the overall incident objectives. In certain cases to ease multi-agency coordination this may be a [Unified Command](#) where multiple agencies share command.

- **Operations** - The Operations Section Chief is tasked with directing all actions to meet the incident objectives.
- **Planning** - The Planning Section Chief is tasked with the collection and display of incident information, primarily consisting of the status of all resources and overall status of the incident.
- **Logistics** - The Logistics Section Chief is tasked with providing all resources, services, and support required by the incident.
- **Finance/Administration** - The Finance Section Chief is tasked with tracking incident related costs, personnel records, requisitions, and administrating procurement contracts required by Logistics.
- **Public Information Officer**, who serves as the conduit for information to internal and external stakeholders, including the media or other organizations seeking information directly from the incident or event.
- **Safety Officer**, who monitors safety conditions and develops measures for assuring the safety of all assigned personnel.
- **Liaison Officer** who serves as the primary contact for supporting agencies assisting at an incident.

## Appendix O-2 – ATGS Description

- The ATGS is responsible for maintaining records and developing operational program standards for incident aerial supervision. The ATGS must be knowledgeable in the integration of ground fire suppression tactics with aerial delivered fire suppressants. It is essential that ATGS' have a minimum qualification of NWCG Division Group Supervisor (DIVS). Experience and knowledge in many firefighting positions (Smokejumping, Hotshots, Helitack, Engines, Bulldozers, etc...) of fire suppression is necessary for an individual to effectively coordinate aerial firefighting resources to support the tactics of ground firefighters.
- The presence of an ATGS is often requested by ground firefighters to provide intelligence to determine situational awareness and personal safety. The ATGS' high competency in wildland fire suppression is trusted to make accurate assessments of situations to avoid potentially life threatening situations. Protection and preservation of life, property and resources is the order in which ATGS' are trained to establish incident priorities. ATGS' are tasked to construct accurate maps using conventional mapping techniques and/or computers with sophisticated mapping software with GPS interface. Some ATGS are equipped to deliver the mapping information wirelessly. Often the ATGS is the first resource on scene of an incident. The aerial perspective of the ATGS can be the best vantage point to make critical strategic decisions and set operational priorities. Incident Commanders and Fire Operations personnel often rely on the ATGS to determine the proper fire suppression tactics to implement and make suggestions of the most effective resource compliment to suppress the fire. ATGS' are instrumental in the application of aircraft and conduct frequency management for air to ground communications over an incident. On complex incidents, ATGS' are often required to monitor and communicate on as many as six radios simultaneously. ATGS' are the key communication point for the application of all aerial resources.
- Acute attention to detail, in consideration of environmental concerns, firefighter safety and tactical situational awareness is paramount to the command and control position of the ATGS. The application of fire suppressants can be detrimental to sensitive ecological areas. The application and the appropriate placement of the fire chemical options that exist, within various arrangements of delivery systems are a key component of the ATGS role. Knowledge specific to fire chemicals, expertise in analysis is ongoing to determine appropriate application of various fire retardants, water enhancers, fire suppressants and water in the ongoing fire suppression action.
- ATGS' are assigned to monitor management fires that are used to enhance Forest resource objectives. Often these management fires are located in remote, hard to access forest areas or wilderness areas. The ATGS' skills in mapping and description of fire activity may be the only information available to fire managers to make decisions on whether management objectives were met or other actions will need to be implemented.
- Knowledge of aircraft capability to best determine appropriate resource allocation: With broad understanding and working knowledge of aircraft performance and capability, the ATGS is constantly evaluating best value in application of aviation resource capability, including fixed wing and rotor wing in chemical delivery, or use of specialized aviation resources such as smokejumpers, helitack, helirappellers, short haul, hoist and fast rope programs.
- The ATGS' are responsible for coordinating and conducting ATGS training both in the classroom and with on-the-job training and mentoring for participants in the Air Tactical Group Supervisor program. ATGS' directly supervise trainees on actual incidents with a high standard of performance. Certification of ATGS' is accomplished through the National Wildland Fire Coordinating Group Task Book/Qualification process. ATGS' provide input to National policy through representation in the Interagency Aerial Supervision Steering Committee.

# Appendix O-3 – Airborne C4 Communications – Operations Graphic



## Appendix P

### Appendix P-1 – General Comments and Suggestions from Vendors

The following are the Comment/Suggestion provided by the vendors through the on-line Research survey:

1. The USFS needs to recognize the looming factors facing their contractors and understand the economic impact these forces will eventually have on their operations. The costs of labor and equipment are escalating and must be passed onto the customer if safe, efficient operations are to continue. The pool of qualified pilots and mechanics is shrinking and a source of replacement is being sought by industry as we strive to fulfill customer needs. While we all strive to reduce costs, the continuous pressure on contractors to reduce costs has driven availability rates to those previously seen decades ago. The revenue rates in the rotorcraft wildland fire industry are not tracking with historic inflation rates. There are no magic bullets in this business - Bell and Eurocopter continue to raise the costs of aircraft and parts - labor continues to desire raises all the while our daily rates reduce. One of the things USFS can do to mitigate this trend is to provide longer contracts (in terms of days/year). This will allow a contractor to reduce the daily availability and provide the government a safe product. I have several more ideas if interested but the provided space is not adequate for these.
2. IHOG needs revision. CWN use seems to fare better than Exclusive Use. Managers and crew are not always compatible.
3. Blue Ribbon report of 2002 and studies of effectiveness of airtankers not adopted.
4. Great concern for the RFP. To great an opportunity for personal opinions or bias to prevail. Contracting does well before and after. Government officials have little or no concept what the contractor goes through. I imagine this is true with other than just aircraft type contracts. Forty+ years ago the aircraft where \$40,000 equipped. Today they will top \$2,000,000 Plus an additional \$100,000 for radios and other specified equipment, for essentially the same amount of flying, and many more restrictions.
5. The USDA Forest Service would benefit from an external safety review program that would provide scheduled and unscheduled on-scene evaluations of contractor flight operations and maintenance both in the field and at home based facilities.
6. A few years back when we almost lost the large aircraft fire tankers, the FS turned to SEATs and more helicopters. It seems to me that it has become entirely obvious that smaller quantities of water/retardant with shorter turn times in the answer. It seems to me the emphasis in the future should be on more SEAT aircraft and more helicopters.
7. In addition, the accounting procedure used to pay for a fire should be streamlined and all fires regardless of what causes them should be treated exactly the same. The closest resources should be immediately put on the fire regardless of jurisdiction and the fire should always be put out when it is still small and manageable. There should be no fires that are allowed to burn as a controlled burn. Do the control burns in the wet months with the money you will save by not fighting large fires. The Derby Fire is a good example of letting the fire develop when it could have been put out when it was only seven acres. Controlled burning in August doesn't make sense.

## Appendix P-2 – American Helicopter Services and Aerial Firefighting Association

The following are information searches performed by web search for organizations and commercial firms providing aerial firefighting services and wildland firefighting:

### Fact Sheet (From website) for the American Helicopter Services and Aerial Firefighting Association

Name: American Helicopter Services and Aerial Firefighting Association  
 Address: 8602 Falkstone Lane  
 City: Alexandria, VA 22309-4009  
 Phone/Fax: (703) 799-1932/fax (703) 799-5971

The AHSFAFA was incorporated in 1998 to advance the common interests and welfare of aviation companies engaged in forest and wildland firefighting.

### Association Description:

The AHSFAFA is responsible for establishing and maintaining effective communications between airtanker operators and the Department of Agriculture (USDA), Department of Interior, and state government firefighting agencies to ensure the firefighting industry is prepared to meet current and future aerial firefighting needs. The AHSFAFA member companies contract with the USDA-Forest Service and the state firefighting agencies to provide aerial firefighting support to wildland suppression efforts throughout the continental United States and Alaska. Several large helicopter companies contract to provide aerial firefighting services to foreign governments in Europe, Asia, and the South Pacific. Over the years, these support services have proven to be a key element in fighting wildland fires, both in an initial attack role during early fire detection and as a major contributor in large fire suppression efforts. The AHSFAFA is also instrumental in informing federal and state government agencies, legislators, and the general public about airtanker industry objectives and contributions to the well being of the country's citizens and economy.

### Members/Facilities:

Company	Location
Air Tractor, Inc.	Olney, Texas
Basler Turbo Conversion	Oshkosh, Wisconsin
Butler Aircraft Company	Redmond, Oregon
Columbia Helicopters, Inc.	Portland, Oregon
Construction Helicopters, Inc.	Ypsilanti, Michigan
Erickson Air-Crane Incorporated	Central Point, Oregon
Evergreen Helicopters, Inc.	McMinnville, Oregon
Heavy Lift Helicopters	Clovis, California

Company	Location
Helicopter Express, Inc.	Lawrenceville, Georgia
Hillcrest Aircraft Company, Inc.	Lewiston, Idaho
Hillsboro Aircraft, Inc.	Hillsboro, Oregon
Intermountain Helicopters, Inc.	Sonora, California
Lane Aviation, Inc.	Rosenberg, Texas
Minden Air Corporation	Minden, Nevada
Neptune Aviation Services, Inc.	Missoula, Montana

## Appendix P-3 – Associated Airtanker Pilots

AAP/Aerial Firefighters  
P.O. Box 136  
Woodacre, CA 94973

### AAP Safety Committee To-Do list

The AAP Safety Committee attempts to identify hazards and deficiencies (equipment, practices) in aerial fire suppression operations, and to bring them to the attention of agencies, contractors, and aircrews. Although we lack the resources, manpower, support, and authority to implement solutions to most of these problems on our own, we do what we can to mitigate dangers and to promote improvements. Members are encouraged to become involved in any of these projects, and/or to identify additional SEE (Safety-Effectiveness-Efficiency) related items.

#### \*\*\* Priority Items!

- \*\*\*Monitor implementation of TCAD/TCAS hardware and procedures, and upgraded aircraft inspections (monitoring) and maintenance standards.
- \*\*\*Establish a safety program partnership between agencies, contractors, and crews; the current system tends to be a one-way top-down hierarchy flow.
- \*\*\* Minimize “Mission Mentality”. Treat fire-suppression as a profession, not an emergency. It is too important to get excited about.
- \*\*\*Improve communication, including direct contacts between agencies and aircrews on items of an operational or safety-related nature, expanded/interactive (two-way) use of the Internet with wireless routers on airbase computer systems that allow laptop connection to broadband Internet, enhanced and sanitized SAFECOM/FC-119 incident/hazard reporting with feedback (similar to NASA ACRS and FAA ASAP programs), line pilot and mechanic participation in agency review and planning functions, and periodic tailgate sessions. Get managers out in the field, ideally flying or observing airtanker/leadplane missions occasionally.
- \*\*\*Provide training and support for active line pilot and mechanic participation in all aviation fire suppression incident/accident investigations. Scholarships to the U.C.Davis Emergency Response Aviation Safety Management Course would be a great start.
- \*\*\*Establish, monitor, and enforce minimum training requirements and standards for contractors, and include bid/contract incentives for contractors who provide appropriate enhancements. Agencies should request, then respond to, unfiltered direct feedback from trainees. Consider training outsourcing for increased objectivity and specialized expertise (IFR simulators, USFS/MCC FireSim, upset recovery/advanced maneuvering courses in appropriate aircraft such as AirCombatUSA.com), and to ease pressure on pre-season maintenance of airtankers. Institute pre-season TEAM TRAINING with ATGS/ACMs, leadplanes, and airtankers, including scored drops (batting practice).
- Eliminate "silent intimidation"; institute a response and appeal process for complaints about aircrews by agency personnel, and vice versa.
- Establish AAP/CFPA Professional Standards Committees to deal with questionable crew performance internally, pro-actively, expeditiously.
- Evaluate short- and long-term effects on proficiency from not flying for 6-8 months each year, year after year, especially for pilots on low-time contracts. Identify and support opportunities for off-season proficiency flying and continuing education related to aerial fire suppression (on-line courses?).
- Establish objective, appropriate medical requirements for aircrews of all ages to ensure safe operations and to preclude arbitrary age discrimination.



- Establish, in conjunction with FAA and NASA, airtanker certification standards based on typical operational usage and stresses, including a comprehensive study of cumulative effects of airtankers landing loaded and sitting loaded, and aerodynamic/structural analysis of retardant-drops and other typical operational stresses on airtankers.
- Install cockpit voice recorders and flight data recorders with data download capability, or cockpit video recorders, to assist in accident investigations, trend analysis, ASIP (Aircraft Stress Inspection Program), training/checkride debriefs, and FOQA (Flight Operation Quality Assurance) programs.
- Establish FOQA programs to deal with training, inspection/maintenance, work rules, and operational procedures.
- Identify and promulgate procedures for high-density airports and congested areas that mitigate environmental effects and potential hazards on the ground in the event of a jettison, and that do not expose aircrews to potential legal actions (there is currently an FAA review of FAR 137).
- Petition agencies to define the legal rights, obligations, and liabilities of tactical pilots acting for government agencies, and provide liability insurance, and/or a waiver, for aircrews. Currently, the potential effects on a flight crewmember and their family from a lawsuit or certificate action resulting from fire suppression activities could be devastating.
- Establish formal communication between fixed-wing, rotor-wing, SEAT, MAFFS, ATGS, and lead-plane aircrew representatives. We work in very close proximity on fires but have separate training, and it is extremely rare that we ever brief or debrief together. We are not always on the same frequency or the same page. NAFA is a start. A secure and protected (sterile) internet site might help.
- Continually assess and publicize operational fatigue factors (mental, emotional and physical), including dehydration (cold bottled drinking water readily available at all bases at all times, not just on "busts"), aircraft environmental systems, base rest facilities, and requirements for pilots to wash airtankers (assign loaders/firefighters to help?).
- Monitor meal provisions for guest crews at AABs; nutritious, timely, and appropriate (cold, greasy, breaded chicken or Mexican specials, or make-it-yourself plastic sandwiches do not fill the bill).
- Establish dispatching procedures and work rules that recognize and address the safety and morale consequences of extended duty hours over extended periods (days/weeks), especially away from home, and that compensate with extra time off, at home, during slack periods. Award bid points to contractors that provide aircrews and mechanics relief and time at home equivalent to that of agency personnel.
- Provide paid sick leave for aircrews, and sufficient relief pilots to realistically cover assigned aircraft. Otherwise, there are incentives to "press".
- "Liquidated damages" is also an incentive to fake it when aircraft (or aircrew) maintenance is needed. Also, consider the pressures inherent in an over-emphasis on flight pay for contractors and/or pilots. Both conditions are unquestionably an encouragement to "press".
- Monitor the FAA Capstone project, multistatic dependent surveillance for in-flight tracking and diverts, TARMS, HUD, EVS (IR), SVS, and similar technologies that offer enhanced safety, effectiveness, and/or efficiency in airtanker operations. Promote their acquisition and utilization where appropriate.
- Evaluate risks and loss of effectiveness inherent in using tankers close to sunset. What is the risk/reward tradeoff? If low-light/restricted visibility operations are to be conducted, conduct an in-depth study, with line airtanker pilot participation, of military low-level night ops procedures and state-of-the-art NVG and associated equipment. The new Synthetic Vision Systems may be only a fantasy for us, but what an application!

- If airtanker crews are allowed to operate IFR/IMC, require aircraft to be adequately equipped and fully functional for IFR flight, with appropriate current charts and publications. Insure crews have received adequate realistic IFR recurrent training in type, and are legally current and proficient for IFR/IMC flight in type.
- Evaluate cockpit workload (task saturation), especially in single-pilot aircraft without autopilots. ACARS would be a tremendous asset in our operation.
- Publish a "user-friendly" (intelligible) Interagency Airtanker Operations Manual, consolidating applicable FARs, agency requirements, standardized operational procedures, and an "open" section for individual contractor notes. This, along with AFMs, should be a "living" document, subject to regular (at least annual) review, with easy updating. Availability on the internet would be a huge plus.
- Push for concise and up-to-date AFMs (Aircraft Flight Manuals), with simplified and logical procedures conforming to basic human factor principles (flow, minimal memory items, etc). There are many items of technique, procedure, and system operation that have been learned in fire operations over the years that would dictate appropriate changes to a 30-50 year-old military or airline AFM, although few of them have been published.
- Evaluate safety advantages of "boat shoes" with non-skid soles compared to boots with street or hiking soles. There have been several airtanker crew injuries caused by slipping on wet surfaces (including wings and ramps, while washing). Realistically, what is the purpose for boots and gloves, or even NOMEX, in our operation, other than "tradition"? Evaluate heat stress/dehydration effects of full-length heavy-weight Nomex flight suits.
- Evaluate a basic smoke hood for aircrews.
- Evaluate appropriate supplemental oxygen breathing systems for aircrews.
- Evaluate fuel tank inserting systems appropriate for airtanker operations.
- Equip all bases with MicroMotion monitors, and load tankers by weight, not gallons (with volumetric overflow/safety valve backup).
- Provide Density Altitude information for each takeoff to alert crews to performance degradation. Could be included with an acknowledgement of the "rolling" call.

*Walt Darran, AAP Safety Committee*

## Appendix Q – Helicopter Coordinator Log of NMAC Efficiencies

### Appendix Q-1 – 2004 Coordinator NMAC Log

2004 Savings

#### NMAC Efficiency Helicopter Coordinator Savings

##### June

1. Removal of 1- Type 1 and 1- Type 2 CWN from incidents in SW. Replaced with 1-each from NMAC/Nat'l. base locations (Plains T-1/Dillon T-2). - **Approximate savings = \$48,050.00**
2. Movement of 2 NMAC Type 2 for AK request vs CWN. - **Approximate savings = \$93,800.00**
3. Contracted Helicopters for AK State fire request vs CWN. - **Approximate initial savings = \$70,280.00,**
4. **Season Savings = 469,260.00**

July 14, 2004 - We cancelled 3 Type I CWN orders and filled with NMACS. - Total savings of: \$105,000.00

July 15<sup>th</sup>, 2004 - We cancelled one Type II helicopter and filled with an NMAC. - Total saving of: \$80,000.00

July 16<sup>th</sup>, 2004 - Were able to fill a CWN fire order with a add on NMAC (Columbia 192CH) - Total savings of: \$23,000.00

July 17<sup>th</sup>, 2004 - Were able to fill a CWN with a add on NMAC (Columbia 234CH) - Total savings of: \$45,000.00

July 20<sup>th</sup>, 2004 - Were able to release a CWN on Severity at LMT and replace with a add on NMAC (Columbia 192CH) - Total savings of \$100,000.00

Aug. 3<sup>rd</sup>, 2004 - Were able to eliminate CWN on Severity order at Troutdale and replace it with a CWN/NMAC (San Joaquin 212SJ) returning from AK. Savings in Daily Availability is \$3720 a day. Total Savings estimated at \$37,200+ 8/20 – 9/17/04

On 8/20, 18 CWN helicopters were on incidents throughout the Regions. Within the first week, all were released and if needed replaced by exclusive use aircraft. Weather had turned wet and with assistance from the Helicopter coordinator, demob of the CWN's were expedited saving an undisclosed amount.

Frank Gomez (CO), Melinda Draper (CO), Doug Shinn (Assistant Center Manager), Bill Fletcher (Emergency Operations Coordinator), and Vince Welbaum (Helicopter Coordinator) met and discussed the feasibility of keeping exclusive use contract helicopters on the exclusive use rates throughout the duration of the contracts (365 days). This would keep them at the lower availability rates for all hazard incidents throughout the fall and spring seasons in other parts of the US when their fire seasons start and if CWN's are called up they would fill in with the contract ships. In other words the aircraft going off their MAP contract dates would not automatically roll over to the CWN rate which is double the cost. It was agreed that it could and should be done. Doing this will save hundreds of thousands of dollars in the future.

**Total Actual identified savings = \$964,110.00**

So for the sake of discussion, for this position to be a productive, highly effective resource, I am proposing a cost incentive program for the helicopter coordinator.

At 3% for total savings,  $964,110 \times .03 = \$28,923.30$  would be distributed to the personnel that filled this position.

## Appendix Q-2 – 2005 Coordinator NMAC Log

### Savings

#### NMAC Efficiency Helicopter Coordinator Savings

Helicopter Coordinator came in on Thursday the 28<sup>th</sup> of July.

Updated spread sheet with new helicopter information for 2005 of all exclusive use helicopters.

July 29<sup>th</sup> - Contacted regional HOS'S and aviation folks for information on helicopter use and availability. R-8 has available personnel HCWN, HECM, HELCO (T) ASGS, etc. List in folder.

July 30<sup>th</sup>, 2005 - We Moved in two type 1 exclusive use helitankers to the Northwest for fires on the Okanogan/Wenatchee from the RM, and GB GACCS. CWN were available at closer locations but on a seven day run at:

$\$32,618 \times 7 \text{ Day's} = \$228,326 \times 2 \text{ helicopters} = \$446,652$

We found exclusive use that where available.

The Exclusive Use Helitankers that were hired at an average of  $\$12,923 \times 7 \text{ Days} = \$90,462 \times 2 \text{ helicopters} = \$180,922$

A savings of \$275,730 over a seven day average

Aug 1<sup>st</sup> 2005

Moved two type 3 exclusive use helicopter and modules form Southwest to the NW Fires, Cost Savings.

CWN type three at  $\$4,900 \text{-day} \times 7 = \$34,300 \times 2 \text{ helicopters} = \$68,600$

Exclusive use @  $\$2,400 \times 7 = 16,800 \times 2 \text{ helicopters} = \$33,600$

Savings of \$35,000 on a seven day run.

Moved two type 2 exclusive to a fire on the Salmon Challis for I.A when they wanted a CWN type 1.

CWN type 1 Helicopter at Twin Falls, ID at a cost of \$31,248 a day on a 3 day run=\$93,744.

Two type two exclusive use from Boise and McCall at \$4,340 and \$2,520 a day not counting flight time =  $\$6,860 \times \text{a three day run} = \$20,580$

Savings of \$73,164

Moved a type 1 exclusive use for I.A on the Shady Fire as shared with the Dirty Face Fire.

CWN type 1 helicopter sitting in Portland, OR. CH-234 @ \$29,680 a seven day run = \$207,760

Exclusive use S-64 @ \$ 12,923 x seven day run \$90,461

Savings of \$ 117,299

Aug 2<sup>nd</sup>, 2005 - Operations of exclusive use being moved were normal today. Not much as far as fire activity.

Aug 3<sup>rd</sup> 2005 - Misc. aircraft movement. Not much to report.

Aug 6<sup>th</sup>, 2005 - Fire activity has now picked up so we are moving CWN aircraft to fires with a good mix.

Aug 9<sup>th</sup>, 2005 - Dave Glose is transitioning with me and all is good.

Aug 11<sup>th</sup>, 2005 - Increased need for standard category type II helicopters, few available. Have several outstanding orders for HCWN and HECMs. Have beaten the bushes for managers and have gotten responses from the SW and South areas. Not a lot of movement of helicopters from incident to incident at this time.

Aug 12<sup>th</sup>, 2005 - Moved two exclusive use type II's and one exclusive use type I rappel helicopter from California to north central Idaho. Request for Type II EU with rappellers for Tryon was filled with a CWN type II because EGB would not give up Lucky Peak or the Salmon National Type II.

Aug 14<sup>th</sup>, 2005 - Lacking standard category type IIs. Placed one CWN type II on the Long Ruggles Complex.

Aug 16<sup>th</sup>, 2005 - Shortage of standard category type IIs remains. Placed one EU type II helicopter from SO and one EU type I from WB in Northern Rockies. Selected a type 1 CWN for a fire in NR 4.6 hours away at \$148,770 over another, 30 minutes away at \$188,639 on a 7 day run. Savings = \$39,869.

Aug 17<sup>th</sup>, 2005 - Instead of reassigning a CWN Type I H-3H from one fire to another, filled the order with an EU tanked S-61 with composite blades from Troutdale, OR, where it was on standby for IA. By doing so, put to work a higher performance EU helicopter on an active fire and released a lower performance CWN helicopter. By not paying for both, the cost savings is that which would have been paid for the H-3H. On a 7 day run, that comes out to a savings of \$103,488.

Aug 18<sup>th</sup>, 2005 - Replaced a CWN S61 for an EU S61 on the Prospect Fire. Daily savings for availability equals \$19,040. A 7 day run savings of \$133,280.

Aug 19<sup>th</sup>, 2005 - Replaced a CWN CH-54B for an EU *CH-54A*. Cost for the CWN helicopter per day is \$31,248. On a 7 day run, savings of \$218,736

Aug 20<sup>th</sup>, 2005 - NW and NR made some moves with EU helicopters, replacing CWN helicopters. NR released N718HT CWN and replaced with N715HT EU. NW released a 58T from Blossom and moved an EU B212HP to replace it.

Aug 21<sup>st</sup>, 2005 - Moved an EU S-64 from Wenatchee, WA to Hamilton, MT. canceling the order for a CWN CH-54, which was sitting in Hamilton. Three day cost for the *CH-54* = \$94,736. Three day cost for EU S-64, including mobilization cost = \$17,319. Total savings of \$77,417.

Aug 22<sup>nd</sup>, 2005 - Transition with Jill McCurdy. Slow day. Just demob of T1s & T2s from NR & NW.

August 23, 2005 - Another slow day. Demob of CWNs from NW & NR. Some R5 resources are being released home as well.

Aug 24, 2005 - Government Creek Fire, Utah, State Land out of Provo. Ordered 2 T2s. Spoke with Softich (HEB1) & he said they had changed the order to accept T3s if available. Sent MSO National T2 & Swan Valley Ex Use T3. For some reason EGBCC was not informed of Swan Valleys availability Nationally. Saving of \$4,031/day for closest National Add on T2 (28HJ in Nampa) plus additional cost of transport for CWN crew from Southern Area.

Savings of \$3,402/day on equivalent T3 CWN Costs, out of Nampa, ID

Talked with FAO on PAF about T2 Restricted helicopter they are utilizing on WFUs.

Tried to sell him on the Salmon National that is listed as Available Nationally. He will get with the WFU Team & back to me.

Demob of CWNs from NW & NR. Some R5 resources are being released home as well.

Aug 25, 2005 - Got with Glenn on HELB/HCWN/HELM issues.

T1 ordered for Government Creek Fire. Checked with BILC on availability of HT-719 @ Lucky Peak. They said they could let it go for a few days. Statused as "Available-GACC".

Savings of \$32,618 vs closest CWN T1.

354EV (Monument AS 350B3) will be released from Clear Red @ EOS tonight. Look for work. Blossom may take it as a replacement for a Ex Use T2 that is timing out.

1100 hrs-HTNF (R4) ordered their own T2 CWN yesterday w/o going through NICC. Wanted to push order through today back dated. Contacted RAO & Frank Gomez. Helicopter was ordered under Severity. RAO said HTNF Severity request for helicopter had been cancelled & they needed to get rid of the helicopter- might have to pay out of their own pockets!

1330 hrs-HTNF again tried to push back dated order through for T2 they have had since yesterday. This time charging it to Sherman Support. Contacted RAO again & he contacted the Forest Fire Staff. NICC did not fill order.

August 26, 2005 - 354 EV relocated to Blossom Complex. Replaced CA Ex Use T2 that was timed out. National Ex Use N224HT (SMN) to PAF to replace Restricted T2 CWN assigned to WFU. Savings of \$4,424/day on helicopter plus Manager expenses.

August 27, 2005 - 7011M Nat Ex Use reassigned from Grangeville to LNF-CA for Fire. Savings of \$18,200/day over closest T1 CWN (K-Max) plus transportation of HCWN from Southern Area. Slow day. Tracking Hurricane.

\*\*\*Noted in accounting above that previous Heli Coords were figuring in the daily cost of the National & EU helicopters. This should not be figured in since it is covered out of SU this year and not charged to the Fires. The savings will be considerably more when those adjustments are made.

August 28, 2005 - Slow day. Tracking Hurricane. It's a Category 5 now & building strength. Could be one of Top 3 or 4 on record.

0900 hrs-Spoke with UBIFC about the North Neola Fire. They are having "issues" with being able to keep the local ship assigned to the fire. I let them know that the National ship N66HJ was being released from NUIFC today & they could look at that as a cost effective & close option.

1200 hrs-Mike Workman-Mgr N66HJ called to say they are going to North Neola Fire.

Savings of \$4031/day for closest CWN.

1400-S CA checking on availability of T3 Ex Use. N407PB is available @ Bridgeport. Local Unit would not send it to Independence, CA to sit for IA. They said it could IA that area from Bridgeport.

Checked R1 for T3. Possibly YNP ship & crew. They got committed to something else. Checking with NW to see if they can let anything loose.

No Ex Use T2s available-filled order for Hamilton MT with CWN.

## Appendix Q-3 – 2006 Coordinator NMAC Log

### 2006 National Helicopter Coordinator Annual Savings Report

Due to the unusually high fire activity and prolonged season in 2006, there was not much opportunity for management efficiencies until mid-September. All Type I and II Exclusive Use and available CWN helicopters were assigned to incidents and all Type III Exclusive Use helicopters were assigned or not available for off-unit dispatches. Aircraft started to become available again with releases from EB, NR and NW. The helicopter coordinator position at NICC was de-activated on September 23.

September 14

Moved N179AC National Type I to Minnesota from Wyoming to the East Zone Fire  
CWN Five day run:  $\$33,936 \times 5 = \$169,680$  - EU Five day run:  $\$13,390 \times 5 = \$848,400$   
Savings:  $\$678,720$

Moved Monument Helitack EU TIII to Uncle Fire:

CWN 14 day run:  $\$3,500 \times 14 = \$49,000$  - EU 14 day run:  $\$2,688 \times 14 = \$37,362$   
Savings:  $\$11,638$

September 15

Moved N212HP AK exclusive use to Uncle Fire:

CWN 14 day run:  $\$6,000 \times 14 = \$84,000$  - EU 14 day run:  $\$3,036 \times 14 = \$42,504$   
Savings:  $\$41,496$

September 16

Moved N7011M National Type 1 to SO from Montana.

CWN 14 day run  $\$20,000 \times 14 = \$280,000$  - EU 14 day run:  $\$14,280 \times 7 = \$99,960$   
Savings:  $\$180,040$

Moved N356EV Black Hills Helitack to Minnesota

CWN 10day run:  $\$3,800 \times 10 = \$38,000$  - EU 10 day run:  $\$2,744 \times 10 = \$27,440$   
Savings:  $\$10,560$

Moved N228HT National Type II Missoula Helitack to SO from Grangeville ID

Provided a HEB1, two HEB2s, HELMs etc.

CWN 14 day run:  $\$6,000 \times 14 = \$144,000$  - EU 14 day run:  $\$3976 \times 14 = \$55,664$   
Savings:  $\$88,336$

September 17

Moved Price Valley Rappel Crew Type II N205HQ with two HEB1s, HEB2s, HELMs HRAPs etc. to SO.  
SO had a critical need of HELMs and HEB1s.

CWN 14 day run:  $\$6,000 \times 14 = \$144,000$  - EU 14 day run:  $\$3,920 \times 14 = \$54,880$   
Savings:  $\$89,120$

Moved Hungry Horse Helitack N49MA Type III to Minnesota

CWN 14 day run:  $\$3,800 \times 14 = \$53,200$  - EU 14 day run:  $\$2,464 \times 14 = \$35,896$   
Savings:  $\$17,304$

Lakeview Helitack Type II N223HT replacing CWN 205 for ID panhandle IA

CWN 8 day run:  $\$6,000 \times 8 = \$48,000$  - EU 8 day run:  $\$3,100 \times 8 = \$24,800$   
Savings:  $\$23,200$

N171KA Fort Washakie Helitack Type III sent to SO

CWN 14 day run:  $\$3,800 \times 14 = \$53,200$  - EU 14 day run:  $\$1,700 \times 14 = \$23,800$

Savings:  $\$29,400$

N215 KA Moyer Rappel Crew Type II with HRAPs, HELMs etc. to SO

CWN 14 day run:  $\$6,000 \times 14 = \$84,000$  - EU 14 day run:  $\$2,825 \times 14 = \$39,550$

Savings:  $\$44,450$

September 18,

N1217S Provo Helitack moved to NO with HRAPs, HEB2, HELM

CWN 8 day run:  $\$3,800 \times 8 = \$30,400$  - EU 8 day run:  $\$2,524 \times 8 = \$20,192$

Savings:  $\$10,208$

N223 HT Lakeview Helitack moved to SO

CWN 14 day run:  $\$6,000 \times 14 = \$84,000$  - EU 14 day run:  $\$3,100 \times 14 = \$43,400$

Savings:  $\$40,600$

N54HL Type I National to the Day fire

CWN 14 day run:  $\$32,500 \times 14 = \$455,000$  - EU 14 day run:  $\$9,300 \times 14 = \$130,200$

Savings:  $\$324,000$

September 19

N53SH Type III EU Las Vegas Helitack sent to NO

CWN 14 day run:  $\$3,800 \times 14 = \$53,200$  - EU 14 day run:  $\$2,002 \times 14 = \$28,028$

Savings:  $\$25,172$

N189AC Wenatchee Type I EU to day fire

CWN 14 day run:  $\$33,936 \times 14 = \$475,104$  - EU 14 day run:  $\$14,336 \times 14 = \$200,704$

Savings:  $\$274,400$

N17HX John Day Malheur Rappel Crew sent to the Day fire

CWN 14 day run:  $\$6,000 \times 14 = \$84,000$  - EU 14 day run:  $\$4,032 \times 14 = \$56,448$

Savings:  $\$27,552$

N910VR EU Type III Mesa Verde Helitack to Derby fire replacing CWN

CWN 14 day run:  $\$3,800 \times 14 = \$53,200$  - EU 14 day run:  $\$1,849 \times 14 = \$25,886$

Savings:  $\$27,314$

N700EA Helena Helitack to Paradise fire replacing CWN

CWN 14 day run:  $\$3,800 \times 14 = \$53,200$  - EU 14 day run:  $\$1,334 \times 14 = \$18,676$

Savings:  $\$34,524$

September 20

N189AC Ex. Use National Type I moved to Day Fire South Ops from Minnesota

CWN 14 day run:  $\$33,936 \times 14 = \$475,105$  - EU 14 day run:  $\$13,390 \times 14 = \$187,460$

Savings:  $\$287,465$

CGYAA Wasatch Helitack to Rattlesnake fire

CWN 14 day run:  $\$3,800 \times 14 = \$53,200$  - EU 14 day run:  $\$2,240 \times 14 = \$31,360$

Savings:  $\$21,840$



N6979R TI EU to preposition in SO

CWN 14 day run: \$ 32,500 x 14 = \$455,000 - EU 14 day run: \$16,576 x 14 = \$232,064

Savings: \$222,936

Durango Helitack National N2773H to Kernville CA S. Ops

CWN 14 day run: \$6,000 x 14 = \$84,000 - EU 14 day run: \$3,080 x 14 = \$43,120

Savings: \$40,880

N350CR Elko NV Helitack to Basset fire

CWN 14 day run: \$3,800 x 14 = \$53,200 - EU 14 day run: \$1,990 x 14 = \$27,860

Savings: \$25,340

N1957Z Type III EU Moab Helitack to Richfield to replace severity CWN

CWN 14 day run: \$3,800 x 14 = \$53,200 - EU 14 day run: \$1,795 x 14 = \$25,130

Savings: \$28,070

N718HT Type I sent to Basset Fire from EB

CWN 14 day run: \$33,936 x 14 = \$475,104 - EU 14 day run: \$15,008 x 14 = \$210,112

Savings: \$264,992

N239CH sent to Basset Fire

CWN 14 day run: \$30,240 x 14 = \$423,360 - EU 14 day run: \$17,584 x 14 = \$246,176

Savings: \$177,184

September 22

N16HX Type II National Wasatch Helitack to Day Fire

CWN 14 day run: \$6,000 x 14 = \$84,000 - EU 14 day run: \$1,394 x 14 = \$19,560

Savings: \$64,440

Total Savings: \$3,111,181

There are assumptions made with these costs and benefits that are not readily apparent. For instance, when you fill an order with a well qualified Exclusive Use crew, they will often have Helicopter Managers and Helibase Managers on board. With an almost ever present UTF list of HELMs, HEB1 and HEB2s this provides a great service to the fire. This provides instant overhead management for the helibase and the crew can fill other outstanding orders such as HELM, DECK, ABRO etc. This provides a cost savings by eliminating the need to mobilize overhead outside of the GACC.

These self-sufficient crews also provide a number of things that allow them to handle all of their own logistics (transportation, meals, lodging) and are often able to staff their helicopters 7 days a week for endless weeks through internal crew rotations.

## Appendix R – Pilot Positions

### Appendix R-1 - Pilots with Quality Assurance Responsibilities (41 Positions)

Region	Region/Forest	County	State	Position	Revised for Pilot Redistribution								Revised FTE for Pilot Redistribution							SUM
					FTE (number of fraction of year worked)	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Detection / C & C	% of Work Supporting Aerial Fire Suppression	% of Work Avn. Support to Non-Fire Natural Resources and Fuel Management	% of Work Supporting Aviation Contract Mgmt & QA	% of Work Supporting FS Avn Program Mgmt	% of Time Devoted to non-Aviation Related Forestry Duties	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Detection / C & C	% of Work Supporting Aerial Fire Suppression	% of Work Avn. Support to Non-Fire Natural Resources and Fuel Management	% of Work Supporting Aviation Contract Mgmt & QA	% of Work Supporting FS Avn Program Mgmt	% of Time Devoted to non-Aviation Related Forestry Duties	
1	AFD	Missoula	MT	FWOS / Pilot	1.00	10	10	10	10	60			0.10	0.10	0.10	0.10	0.60	0.00	0.00	1.00
1	AFD	Missoula	MT	Pilot – Leadplane	1.00		65			35			0.00	0.65	0.00	0.00	0.35	0.00	0.00	1.00
1	AFD	Missoula	MT	Pilot – Leadplane	1.00		65			35			0.00	0.65	0.00	0.00	0.35	0.00	0.00	1.00
1	AFD	Missoula	MT	Pilot - Smokejumper	1.00	70				30			0.70	0.00	0.00	0.00	0.30	0.00	0.00	1.00
1	AFD	Missoula	MT	Pilot - Supervisory	1.00	70				30			0.70	0.00	0.00	0.00	0.30	0.00	0.00	1.00
1	AFD	Missoula	MT	Vacant–Pilot–Helicopter	1.00	10		10	10	50	20		0.10	0.00	0.10	0.10	0.50	0.20	0.00	1.00
10	RO	Juneau	AK	Aviation Officer–Regional Pilot	1.00				30	40	30		0.00	0.00	0.00	0.30	0.40	0.30	0.00	1.00
2	RO	Jefferson	CO	Aviation Officer–Regional Pilot	1.00		10	10	10	30	40		0.00	0.10	0.10	0.10	0.30	0.40	0.00	1.00
2	RO	Jefferson	CO	Pilot	1.00		10	50	10	30			0.00	0.10	0.50	0.10	0.30	0.00	0.00	1.00
3	RO	Bernalillo	NM	Helicopter Supervisory Pilot	1.00	60		5		30	5		0.60	0.00	0.05	0.00	0.30	0.05	0.00	1.00
3	RO	Bernalillo	NM	Pilot – Supervisory Pilot	1.00		20	20	10	40	10		0.00	0.20	0.20	0.10	0.40	0.10	0.00	1.00

Region	Region/Forest	County	State	Position	Revised for Pilot Redistribution								Revised FTE for Pilot Redistribution							
					FTE (number of fraction of year worked)	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Detection / C & C	% of Work Supporting Aerial Fire Suppression	% of Work Avn. Support to Non-Fire Natural Resources and Fuel Management	% of Work Supporting Aviation Contract Mgmt & QA	% of Work Supporting FS Avn Program Mgmt	% of Time Devoted to non-Aviation Related Forestry Duties	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Detection / C & C	% of Work Supporting Aerial Fire Suppression	% of Work Avn. Support to Non-Fire Natural Resources and Fuel Management	% of Work Supporting Aviation Contract Mgmt & QA	% of Work Supporting FS Avn Program Mgmt	% of Time Devoted to non-Aviation Related Forestry Duties	SUM
4	RO	Weber	UT	Helicopter Prgm Manager/Pilot	1.00	20			15	35	20	10	0.20	0.00	0.00	0.15	0.35	0.20	0.10	1.00
4	RO	Weber	UT	Pilot-Infrared/Supervisory	1.00		45		15	25	5	10	0.00	0.45	0.00	0.15	0.25	0.05	0.10	1.00
4	RO	Weber	UT	Pilot-Leadplane	1.00		50		15	35			0.00	0.50	0.00	0.15	0.35	0.00	0.00	1.00
4	RO	Weber	UT	Pilot-Leadplane	1.00		60		10	20		10	0.00	0.60	0.00	0.10	0.20	0.00	0.10	1.00
4	RO	Weber	UT	Pilot-Leadplane/Supervisory Pilot	1.00		40		10	40	10		0.00	0.40	0.00	0.10	0.40	0.10	0.00	1.00
4	RO	Weber	UT	Pilot-Smokejumper	1.00	50			15	35			0.50	0.00	0.00	0.15	0.35	0.00	0.00	1.00
4	RO	Weber	UT	Pilot-Smokejumper Supervisory	1.00	50			10	40			0.50	0.00	0.00	0.10	0.40	0.00	0.00	1.00
5	RO	Shasta	CA	Pilot-Airplane	1.00	5	30	20	15	30			0.05	0.30	0.20	0.15	0.30	0.00	0.00	1.00
5	RO	Shasta	CA	Pilot-Airplane	1.00	5	30	20	15	30			0.05	0.30	0.20	0.15	0.30	0.00	0.00	1.00
5	RO	Shasta	CA	Pilot-Helicopter Inspector	0.50	10	10	20	15	35	10		0.05	0.05	0.10	0.08	0.18	0.05	0.00	0.50
5	RO	Los Angeles	CA	Pilot-Supervisory Airplane	1.00	10	20	20	10	35	5		0.10	0.20	0.20	0.10	0.35	0.05	0.00	1.00
5	RO	Shasta	CA	Pilot-Supervisory Airplane	1.00	10	20	20	10	35	5		0.10	0.20	0.20	0.10	0.35	0.05	0.00	1.00
5	RO	Sacramento	CA	Pilot-Supervisory Helicopter	1.00	10	10	20	15	35	10		0.10	0.10	0.20	0.15	0.35	0.10	0.00	1.00
6	PNW/ RAG	Deschutes	OR	Helicopter Inspector Pilot	1.00	25			5	60	10		0.25	0.00	0.00	0.05	0.60	0.10	0.00	1.00
6	PNW/ RAG	Deschutes	OR	Heli Program Manager/Pilot	1.00	50		5		35	10		0.50	0.00	0.05	0.00	0.35	0.10	0.00	1.00
6	PNW/ RAG	Douglas	WA	Light F/W Program Mgr/Pilot	1.00		40			50	10		0.0	0.40	0.00	0.00	0.50	0.10	0.00	1.00

Region	Region/Forest	County	State	Position	Revised for Pilot Redistribution								Revised FTE for Pilot Redistribution							SUM
					FTE (number of fraction of year worked)	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Detection / C & C	% of Work Supporting Aerial Fire Suppression	% of Work Avn. Support to Non-Fire Natural Resources and Fuel Management	% of Work Supporting Aviation Contract Mgmt & QA	% of Work Supporting FS Avn Program Mgmt	% of Time Devoted to non-Aviation Related Forestry Duties	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Detection / C & C	% of Work Supporting Aerial Fire Suppression	% of Work Avn. Support to Non-Fire Natural Resources and Fuel Management	% of Work Supporting Aviation Contract Mgmt & QA	% of Work Supporting FS Avn Program Mgmt	% of Time Devoted to non-Aviation Related Forestry Duties	
6	PNW/RAG	Deschutes	OR	Pilot-Airplane	1.00	5	60		5	30			0.05	0.60	0.00	0.05	0.30	0.00	0.00	1.00
6	PNW/RAG	Deschutes	OR	Pilot-Airplane	1.00	65			5	30			0.65	0.00	0.00	0.05	0.30	0.00	0.00	1.00
6	PNW/RAG	Deschutes	OR	Pilot-Airplane	0.70	65			5	30			0.46	0.00	0.00	0.04	0.21	0.00	0.00	0.70
8	RO	Gwinnett	GA	Heli Inspector Pilot	1.00			20	10	50	20		0.00	0.00	0.20	0.10	0.50	0.20	0.00	1.00
8	RO	Gwinnett	GA	Inspector Pilot – F/W	1.00	10	10	30	15	35			0.10	0.10	0.30	0.15	0.35	0.00	0.00	1.00
8	RO	White	GA	VACANT Inspector Pilot – F/W	1.00	10	10	30	15	35			0.10	0.10	0.30	0.15	0.35	0.00	0.00	1.00
9	RO	Milwaukee	WI	Pilot – Helicopter Inspector	0.20	25				60	15		0.05	0.00	0.00	0.00	0.12	0.03	0.00	0.20
9	RO	Milwaukee	WI	VACANT-F/W Prgm Mgr/Pilot Inspector	1.00		25	25		25	25		0.00	0.25	0.25	0.00	0.25	0.25	0.00	1.00
9	Superior	St. Louis	MN	Pilot - Airplane	1.00	20	20	20	20	20			0.20	0.20	0.20	0.20	0.20	0.00	0.00	1.00
WO	NIFC	Ada	ID	N Fixed Wing Std. Pilot	1.00					50	50		0.00	0.00	0.00	0.00	0.50	0.50	0.00	1.00
WO	NIFC	Ada	ID	N Helo Stand. Pilot	1.00					50	50		0.00	0.00	0.00	0.00	0.50	0.50	0.00	1.00
WO	NIFC	Ada	ID	N SJ Program Mgr / Pilot	1.00					50	50		0.00	0.00	0.00	0.00	0.50	0.50	0.00	1.00
WO	NIFC	Ada	ID	National F/Wecialist/Pilot	1.00					25	75		0.00	0.00	0.00	0.00	0.25	0.75	0.00	1.00
WO	NIFC	Ada	ID	NHIP / Pilot	1.00		20			50	30		0.00	0.20	0.00	0.00	0.50	0.30	0.00	1.00
													6.21	6.75	3.45	3.21	14.51	4.98	0.30	39.40

**Appendix R-2 - Aircraft Maintenance Quality Assurance Personnel (18 Positions)**

Region/Forest	County	State	Position	FT, PT, or Vacant	Grade for Consolidation	FTE (Number or Fraction of Year Worked)	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Fire Detection / C&C	% of Work Supporting Aerial Fire Suppression	% of Work Supporting Avn Support to Non-Fire Natural Resources & Fuel Management	% of Work Supporting Avn Contract Mgmt & QA	% of Work Supporting FS Avn Pgm Mgmt	% of Time Devoted to Non-Aviation Related Forestry Duties	FTE Supporting Aerial Delivery of FF	FTE Supporting Aerial Fire Detection / C&C	FTE Supporting Aerial Fire Suppression	% FTE Supporting Avn Support to Non-Fire Natural Resources & Fuel Management	% FTE Supporting Avn Contract Mgmt and QA	FTE Supporting FS Avn Pgm Mgmt	% FTE Devoted to Non-Aviation Related Forestry Duties	Sum
AFD Regional	Missoula	MT	Maintenance Inspector	FT	GS-12	1.00				100				0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00
AFD Regional	Missoula	MT	Maintenance Inspector	FT	GS-11	1.00				100				0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00
R10 RO	Juneau	AK	Aviation Maintenance Inspector	FT	GS-12	1.00			20	60	10	10	0.00	0.00	0.00	0.20	0.60	0.10	0.10	1.00	
RO	Jefferson	CO	Maintenance Officer	FT	GS-12	1.00		35	35	10	20			0.00	0.35	0.35	0.10	0.20	0.00	0.00	1.00
RO	Bernalillo	NM	Maintenance Inspector	FT	GS-12	1.00	25	25	25	20	5			0.25	0.25	0.25	0.00	0.20	0.05	0.00	1.00

Region/Forest	County	State	Position	FT, PT, or Vacant	Grade for Consolidation	FTE (Number or Fraction of Year Worked)	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Fire Detection / C&C	% of Work Supporting Aerial Fire Suppression	% of Work Supporting Avn Support to Non-Fire Natural Resources & Fuel Management	% of Work Supporting Avn Contract Mgmt & QA	% of Work Supporting FS Avn Pgm Mgmt	% of Time Devoted to Non-Aviation Related Forestry Duties	FTE Supporting Aerial Delivery of FF	FTE Supporting Aerial Fire Detection / C&C	FTE Supporting Aerial Fire Suppression	% FTE Supporting AVN Support to Non-Fire Natural Resources & Fuel Management	% FTE Supporting Avn Contract Mgmt and QA	FTE Supporting FS Avn Pgm Mgmt	% FTE Devoted to Non-Aviation Related Forestry Duties	Sum
R4 RO	Weber	UT	Aviation Maintenance Program Manager	FT	GS-13	1.00	5	10	10	5	55	15		0.05	0.10	0.10	0.05	0.55	0.15	0.00	1.00
R4 RO	Weber	UT	Avionics Inspector – Regional	FT	GS-12	1.00	10	10	10	10	50	10		0.10	0.10	0.10	0.10	0.50	0.10	0.00	1.00
R5 RO	San Bernardino	CA	Aircraft Inspector	FT	GS-12	1.00	10	10	10	10	40	10	10	0.10	0.10	0.10	0.10	0.40	0.10	0.10	1.00
R5 RO	Shasta	CA	Aircraft inspector	FT	GS-12	1.00	10	10	10	10	40	10	10	0.10	0.10	0.10	0.10	0.40	0.10	0.10	1.00
R5 RO	Los Angeles	CA	Aviation Inspector	FT	GS-12	1.00	10	10	10	10	40	10	10	0.10	0.10	0.10	0.10	0.40	0.10	0.10	1.00
R5 RO	Los Angeles	CA	Aviation Inspector	FT	GS-12	1.00	10	10	10	10	40	10	10	0.10	0.10	0.10	0.10	0.40	0.10	0.10	1.00
R6 PNW/RAG	Deschutes	OR	Aircraft Avionics Inspector	FT	GS-12	1.00	18	17		10	50	5		0.18	0.17	0.00	0.10	0.50	0.05	0.00	1.00

Region/Forest	County	State	Position	FT, PT, or Vacant	Grade for Consolidation	FTE (Number or Fraction of Year Worked)	% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Fire Detection / C&C	% of Work Supporting Aerial Fire Suppression	% of Work Supporting Avn Support to Non-Fire Natural Resources & Fuel Management	% of Work Supporting Avn Contract Mgmt & QA	% of Work Supporting FS Avn Pgm Mgmt	% of Time Devoted to Non-Aviation Related Forestry Duties	FTE Supporting Aerial Delivery of FF	FTE Supporting Aerial Fire Detection / C&C	FTE Supporting Aerial Fire Suppression	% FTE Supporting AVN Support to Non-Fire Natural Resources & Fuel Management	% FTE Supporting Avn Contract Mgmt and QA	FTE Supporting FS Avn Pgm Mgmt	% FTE Devoted to Non-Aviation Related Forestry Duties	Sum
R6 PNW/RAG	Deschutes	OR	Aircraft Maintenance Inspector	FT	GS-12	1.00	5	5		5	60	25		0.05	0.05	0.00	0.05	0.60	0.25	0.00	1.00
R6 PNW/RAG	Deschutes	OR	Aircraft Maintenance Inspector	FT	GS-12	1.00	45				30	25		0.45	0.00	0.00	0.00	0.30	0.25	0.00	1.00
R6 PNW/RAG	Deschutes	OR	Aviation Maintenance Program Manager	FT	GS-13	1.00	1		24		25	50		0.01	0.00	0.24	0.00	0.25	0.50	0.00	1.00
R8 RO	Gwinnett	GA	Maintenance Inspector	FT	GS-12	1.00	20				75	5		0.20	0.00	0.00	0.00	0.75	0.05	0.00	1.00
R9 RO MKE	Milwaukee	WI	Maintenance Inspector / Aviation Security	FT	GS-12	0.50					100			0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.50
R9 Superior NF	St. Louis	MN	Airplane Mechanic	FT	GS-11	1.00					100			0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00
			<b>Total</b>											1.69	1.42	1.44	1.00	9.55	1.90	0.50	17.50

### Appendix R-3 – Pilots with NO Quality Assurance Responsibilities (47 Positions)

Region/Forest	County	State	Position	FT, PT, or Vacant	Grade for Consolidation	FTE (Number or Fraction of Year Worked)	Revised for Pilot Redistribution`							Revised FTE for Pilot Redistribution							
							% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Fire Detection / C&C	% of Work Supporting Aerial Fire Suppression	% of Work Supporting Avn Support to Non-Fire Natural Resources & Fuel Management	% of Work Supporting Avn Contract Mgmt & QA	% of Work Supporting FS Avn Pgm Mgmt	% of Time Devoted to Non-Aviation Related Forestry Duties	FTE Supporting Aerial Delivery of FF	FTE Supporting Aerial Fire Detection / C&C	FTE Supporting Aerial Fire Suppression	% FTE Supporting AVN Support to Non-Fire Natural Resources & Fuel Management	% FTE Supporting Avn Contract Mgmt and QA	FTE Supporting FS Avn Pgm Mgmt	% FTE Devoted to Non-Aviation Related Forestry Duties	Sum
<b>Region 1</b>																					
AFD Regional	Missoula	MT	Pilot – Leadplane	V	GS-12	1.00		80		20	0			0.00	0.80	0.00	0.20	0.00	0.00	0.00	1.00
AFD Regional	Missoula	MT	Pilot – Smokejumper	FT	GS-12	1.00	80				0	20		0.80	0.00	0.00	0.00	0.00	0.20	0.00	1.00
AFD Regional	Missoula	MT	Pilot – Smokejumper	FT	GS-12	1.00	80			20	0			0.80	0.00	0.00	0.20	0.00	0.00	0.00	1.00
AFD Regional	Missoula	MT	VACANT Pilot – Smokejumper	V	GS-12	1.00	80			20	0			0.80	0.00	0.00	0.20	0.00	0.00	0.00	1.00
AFD Regional	Missoula	MT	VACANT Pilot – Smokejumper	V	GS-12	1.00	80			20	0			0.80	0.00	0.00	0.20	0.00	0.00	0.00	1.00
AFD Regional	Missoula	MT	VACANT Pilot – Trainee	V	GS-09	0.50	50	50			0			0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.50
<b>Region 10</b>																					
RO	Juneau	AK	Aviation Safety Manager / Pilot	FT	GS-13	1.00		15	15	30	0	40		0.00	0.15	0.15	0.30	0.00	0.40	0.00	1.00
RO	Juneau	AK	Pilot	PT	GS-11	1.00				90	0	10		0.00	0.00	0.00	0.90	0.00	0.10	0.00	1.00
<b>Region 2</b>																					
RO	Jefferson	CO	Pilot	FT	GS-12	1.00		15	15	70	0			0.00	0.15	0.15	0.70	0.00	0.00	0.00	1.00
RO	Jefferson	CO	Pilot	FT	GS-12	1.00		15	15	70	0			0.00	0.15	0.15	0.70	0.00	0.00	0.00	1.00
<b>Region 3</b>																					
RO	Bernalillo	NM	VACANT Pilot	V	GS-12	1.00		20	60	10	0	10		0.00	0.20	0.60	0.10	0.00	0.10	0.00	1.00
RO	Bernalillo	NM	VACANT Pilot	V	GS-12	1.00		20	60	10	0	10		0.00	0.20	0.60	0.10	0.00	0.10	0.00	1.00
<b>Region 4</b>																					
RO	Weber	UT	Pilot – Infrared	FT	GS-13	1.00		60		20	0	10	10	0.00	0.60	0.00	0.20	0.00	0.10	0.10	1.00
RO	Weber	UT	Pilot – Infrared	FT	GS-13	1.00		60		20	0	10	10	0.00	0.60	0.00	0.20	0.00	0.10	0.10	1.00
RO	Weber	UT	Pilot – Infrared	FT	GS-12/13	1.00		60		20	0	10	10	0.00	0.60	0.00	0.20	0.00	0.10	0.10	1.00
RO	Weber	UT	Pilot – Infrared	FT	GS-12/13	1.00		60		20	0	10	10	0.00	0.60	0.00	0.20	0.00	0.10	0.10	1.00
RO	Weber	UT	Pilot – Infrared	FT	GS-12/13	1.00		60		20	0	10	10	0.00	0.60	0.00	0.20	0.00	0.10	0.10	1.00



Region/Forest	County	State	Position	FT, PT, or Vacant	Grade for Consolidation	FTE (Number or Fraction of Year Worked)	Revised for Pilot Redistribution`						Revised FTE for Pilot Redistribution							
							% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Fire Detection / C&C	% of Work Supporting Aerial Fire Suppression	% of Work Supporting Avn Support to Non-Fire Natural Resources & Fuel Management	% of Work Supporting Avn Contract Mgmt & QA	% of Work Supporting FS Avn Pgm Mgmt	% of Time Devoted to Non-Aviation Related Forestry Duties	FTE Supporting Aerial Delivery of FF	FTE Supporting Aerial Fire Detection / C&C	FTE Supporting Aerial Fire Suppression	% FTE Supporting AVN Support to Non-Fire Natural Resources & Fuel Management	% FTE Supporting Avn Contract Mgmt and QA	FTE Supporting FS Avn Pgm Mgmt	% FTE Devoted to Non-Aviation Related Forestry Duties
RO	Weber	UT	Pilot - Leadplane	FT	GS-12	1.00		70		30	0		0.00	0.70	0.00	0.30	0.00	0.00	0.00	1.00
RO	Weber	UT	Pilot - Smokejumper	FT	GS-12	1.00	70		20	0		10	0.70	0.00	0.00	0.20	0.00	0.00	0.10	1.00
RO	Weber	UT	Pilot - Smokejumper	FT	GS-12	1.00	70		20	0		10	0.70	0.00	0.00	0.20	0.00	0.00	0.10	1.00
RO	Weber	UT	Pilot - Smokejumper	FT	GS-12	1.00	70		20	0		10	0.70	0.00	0.00	0.20	0.00	0.00	0.10	1.00
RO	Weber	UT	Pilot - Smokejumper	FT	GS-12	1.00	70		20	0		10	0.70	0.00	0.00	0.20	0.00	0.00	0.10	1.00
RO	Weber	UT	Pilot - Smokejumper	PT	GS-12	1.00	70		20	0		10	0.70	0.00	0.00	0.20	0.00	0.00	0.10	1.00
RO	Weber	UT	Pilot - Smokejumper (Development)	FT	GS-11/12	1.00	70		20	0		10	0.70	0.00	0.00	0.20	0.00	0.00	0.10	1.00
<b>Region 5</b>																				
RO	Los Angeles	CA	Pilot - Airplane	FT	GS-12	0.50	5	30	40	15	0	10	0.03	0.15	0.20	0.08	0.00	0.05	0.00	0.50
RO	Los Angeles	CA	Pilot - Airplane	FT	GS-12	0.50	5	30	40	15	0	10	0.03	0.15	0.20	0.08	0.00	0.05	0.00	0.50
RO	Los Angeles	CA	Pilot - Airplane	FT	GS-12	0.50	5	30	40	15	0	10	0.03	0.15	0.20	0.08	0.00	0.05	0.00	0.50
RO	Shasta	CA	Pilot - Airplane	FT	GS-12	1.00	5	30	40	15	0	10	0.05	0.30	0.40	0.15	0.00	0.10	0.00	1.00
RO	Shasta	CA	Pilot - Airplane	FT	GS-12	1.00	5	30	40	15	0	10	0.05	0.30	0.40	0.15	0.00	0.10	0.00	1.00
RO	Los Angeles	CA	VACANT Pilot - Airplane	V	GS-12	1.00	10	30	30	20	0	10	0.10	0.30	0.30	0.20	0.00	0.00	0.10	1.00
RO	Los Angeles	CA	VACANT Pilot - Airplane	V	GS-12	0.50	10	30	30	20	0	10	0.05	0.15	0.15	0.10	0.00	0.00	0.05	0.50
RO	Shasta	CA	VACANT Pilot - Airplane	V	GS-12	0.50	10	30	30	20	0	10	0.05	0.15	0.15	0.10	0.00	0.00	0.05	0.50
RO	Shasta	CA	VACANT Pilot - Airplane	V	GS-12	1.00	10	30	30	20	0	10	0.10	0.30	0.30	0.20	0.00	0.00	0.10	1.00
RO	Shasta	CA	VACANT Pilot - Airplane	V	GS-12	1.00	10	30	30	20	0	10	0.10	0.30	0.30	0.20	0.00	0.00	0.10	1.00
RO	Shasta	CA	VACANT Pilot - Airplane	V	GS-12	1.00	10	30	30	20	0	10	0.10	0.30	0.30	0.20	0.00	0.00	0.10	1.00
RO	Shasta	CA	VACANT Pilot - Airplane	V	GS-12	1.00	10	30	30	20	0	10	0.10	0.30	0.30	0.20	0.00	0.00	0.10	1.00
RO	Los Angeles	CA	VACANT Pilot - Airplane	V	GS-12	1.00	10	30	30	20	0	10	0.10	0.30	0.30	0.20	0.00	0.00	0.10	1.00
<b>Region 6</b>																				
PNW/RAG	Deschutes	OR	Pilot - Airplane	FT	GS-12	0.50	90			10	0		0.45	0.00	0.00	0.05	0.00	0.00	0.00	0.50
PNW/RAG	Deschutes	OR	Pilot - Airplane	FT	GS-12	1.00	60	30		10	0		0.60	0.30	0.00	0.10	0.00	0.00	0.00	1.00
PNW/RAG	Deschutes	OR	Pilot - Airplane	FT	GS-12	1.00	30	55	5	10	0		0.30	0.55	0.05	0.10	0.00	0.00	0.00	1.00

Region/Forest	County	State	Position	FT, PT, or Vacant	Grade for Consolidation	FTE (Number or Fraction of Year Worked)	Revised for Pilot Redistribution`							Revised FTE for Pilot Redistribution						
							% of Work Supporting Aerial Delivery of FF	% of Work Supporting Aerial Fire Detection / C&C	% of Work Supporting Aerial Fire Suppression	% of Work Supporting Avn Support to Non-Fire Natural Resources & Fuel Management	% of Work Supporting Avn Contract Mgmt & QA	% of Work Supporting FS Avn Pgm Mgmt	% of Time Devoted to Non-Aviation Related Forestry Duties	FTE Supporting Aerial Delivery of FF	FTE Supporting Aerial Fire Detection / C&C	FTE Supporting Aerial Fire Suppression	% FTE Supporting AVN Support to Non-Fire Natural Resources & Fuel Management	% FTE Supporting Avn Contract Mgmt and QA	FTE Supporting FS Avn Pgm Mgmt	% FTE Devoted to Non-Aviation Related Forestry Duties
PNW/RAG	Deschutes	OR	VACANT Pilot - Airplane	V	GS-12	1.00		50		50	0		0.00	0.50	0.00	0.50	0.00	0.00	0.00	1.00
PNW/RAG	Deschutes	OR	VACANT Pilot - Airplane	V	GS-12	1.00		50		50	0		0.00	0.50	0.00	0.50	0.00	0.00	0.00	1.00
PNW/RAG	Deschutes	OR	VACANT Pilot - Airplane	V	GS-12	0.70		50		50	0		0.00	0.35	0.00	0.35	0.00	0.00	0.00	0.70
<b>Region 9</b>																				
RO	Milwaukee	WI	Aviation Safety / Pilot Inspector	FT	GS-12	1.00	25	25	25	0	25		0.25	0.25	0.25	0.00	0.00	0.25	0.00	1.00
Superior NF	St. Louis	MN	Pilot – Airplane	FT	GS-12	1.00	20	20	20	0		20	0.20	0.20	0.20	0.20	0.00	0.00	0.20	1.00
Superior NF	St. Louis	MN	Pilot – Airplane	FT	GS-12	1.00	20	20	20	0		20	0.20	0.20	0.20	0.20	0.00	0.00	0.20	1.00
			TOTAL										10.58	11.90	6.25	10.18	0.00	2.10	2.20	43.20

## Appendix S – Cost Analysis Summary Information

The following is a summary of the cost analysis performed for each of the Business Areas of the Aviation Activities Management Efficiency Assessment.

### Appendix S-1 – Cost Analysis Summary

#### COST ESTIMATE METHODOLOGY USDA Forest Service Aviation Activities Management Efficiency Assessment

#### INTRODUCTION

A consistent methodology was used for each of the six business areas within this assessment. Costs are calculated for six conceptual performance periods. The first performance period, designated as the phase-in period, begins April 1, 2008 and ends September 30, 2008. The subsequent performance period dates are October 1, 2008 – September 30, 2009, October 1, 2009 - September 30, 2010, October 1, 2010 - September 30, 2011, October 1, 2011 - September 30, 2012, and October 1, 2012 - September 30, 2013.

**Exhibit 1 – Documentation for AD Rates of Pay** - Per FSH 5109.34 – Interagency Incident Business Management Handbook [http://www.fs.fed.us/im/directives/fsh/5109.34/id\\_5109.34-2006-1.doc](http://www.fs.fed.us/im/directives/fsh/5109.34/id_5109.34-2006-1.doc)

#### Rates per Hour for AD-A through AD-L

FS Classification	For Costing	48 Contiguous States	Alaska	Hawaii
A	01	10.68	12.36	11.60
B	02	11.72	13.64	12.88
C	03	13.00	16.60*	14.84*
D	04	14.40	18.24*	16.28*
E	05	15.80	18.60	17.84
F	06	17.28	20.44*	19.64
G	07	21.00*	22.28	21.48
H	08	24.00*	26.40	28.80
I	09	24.52*	29.16	28.48
J	10	25.72	32.12	31.36
K	11	28.24	35.28	34.44
L	12	33.84	42.32	41.28

#### AD Positions included in Management Efficiency Assessment

Position	FS AD Classification	Position	FS AD Classification
Aerial Observer	AD-F	Helibase Manager, Type II	AD-H
Air Operations Branch Director	AD-K	Helicopter Crewmember	AD-D
ASGS – Air Support Group Supervisor	AD-J	Helicopter Manager	AD-G
Assistant Manager	AD-H	Retired AD/Helibase & HCWN	AD-I
ATGS – Air Tactical Group Supervisor	AD-J	Retired AD/ATGS	AD-J
Dispatcher	AD-J	SEAT Manager	AD-G
Fixed Wing Base Mgr	AD-E	THSP - airspace	AD-J
Helibase Manager, Type I	AD-J		

## Exhibit 2 – Other Pay Costs by Position Category

	Position Categories										
	Administrative (Timekeeper, Training, Office Assist.)	Airbase (Managers, Support, Ramp Mgr)	Aviation / Mgmt Officers (JAO, RAO, FMO, etc.)	ATGS / ASM	Observers	Helicopter Crew, Foreman, Managers	Helitack / SMKJ (Crew, Foreman, Manager)	Pilots	Inspectors	Dispatchers	Forestry Tech
For FWS Positions:											
2 <sup>nd</sup> Shift Hrs (3pm-12am)*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3 <sup>rd</sup> Shift Hrs (11pm-8am)*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Environmental Differential Pay **	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
For GS Positions:											
Night Pay Differential (6pm-6am) ***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hazardous Duty Pay (hrs/yr @ % haz pay)****	n/a	n/a	n/a	n/a	n/a	15% of annual hrs (266.4 hrs) @25%	25% of annual hrs (444 hrs) @ 25%	n/a	n/a	n/a	5% of annual hrs (88.8 hrs) @25%
For All Positions:											
Overtime Pay (hours/year)	100	350	200	400	250	450	450	400	300	400	400
Sunday Pay (hours/year) *****	n/a	32	n/a	32	32	32	32	32	n/a	32	32
Awards for Special Acts	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
On-Call Pay Hours *****	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

\* It was determined that 2<sup>nd</sup> and 3<sup>rd</sup> shift hours do not apply to this assessment.

\*\* There is no environmental pay associated with positions in this assessment.

\*\*\* Night differential does not apply to positions associated with this assessment as it is not part of the regular tour of duty. \*\*\*\* Hazardous Pay based on 1776 productive hours/year

For applicable positions assume:

15% of 1776 = 266.4 hrs/yr

25% of 1776 = 444 hrs/yr

5% of 1776 = 88.8 hrs/yr

\*\*\*\*\* For positions in this assessment, it is assumed that on-call hours are built into a position's overtime hours.

\*\*\*\*\* Sunday Pay

For applicable positions assume: 1/5<sup>th</sup> of the # of positions @ 160 hrs/year (5 months x 4 Sundays/month x 8hrs/Sunday) 32 hrs/year/position

## Appendix S-2 – Cost Summary for all Business Areas

<b>SUMMARY - All Business Areas</b>
<b>Total Cost for Base Year (10/1/2008 - 9/30/2009)</b>

Business Area	Personnel Costs	Material and Supply Costs	Other Specifically Attributable Costs	Overhead Costs	Additional Costs	Total Cost of Agency Performance
A - Aerial Delivery	39,825,977	0	1,703,948	4,779,117	0	<b>46,309,042</b>
B - Aerial Detection C&C	7,463,635	0	761,444	895,636	0	<b>9,120,715</b>
C - Aerial Fire Suppression	11,470,292	0	1,682,278	1,376,435	0	<b>14,529,005</b>
D - Aviation Support to Nat Resources	7,855,914	0	604,781	942,710	0	<b>9,403,405</b>
E - Contract Management & AQ	10,248,298	0	317,498	1,229,796	0	<b>11,795,592</b>
F - Aviation Program Management	6,002,855	0	50,906	720,343	0	<b>6,774,104</b>
<b>Totals</b>	<b>82,866,971</b>	<b>0</b>	<b>5,120,855</b>	<b>9,944,037</b>	<b>0</b>	<b>97,931,863</b>

## Supporting Cost Information for Dedicated National Coordinators During Fire Season

Position Title	FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Salary/Wages	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	***Annual Total Personnel Costs per FTE# (without inflation)
Helicopter	0.330	FT	GS-9	\$ 48,684	200	\$ 74,164.66	\$ 24,474.34
Helicopter	0.330	FT	GS-11	\$ 58,903	200	\$ 87,938.53	\$ 29,019.71
Fixed Wing	0.330	FT	AD-11	\$ 58,937	200	\$ 89,782.68	\$ 29,628.29
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
Pilot	1.000	FT	GS-12	\$ 70,595	400		\$ 111,262.93
SUBTOTAL	14.000						
Supervisory Pilot	1.000	FT	GS-13	\$ 83,949	400		\$ 131,831.67
Program	1.000	FT	GS-13	\$ 83,949	200		\$ 123,207.78
Program	1.000	FT	GS-12	\$ 70,595	200		\$ 103,649.23
Reg. Aviation	0.135	FT	GS-12	\$ 70,595	200		\$ 13,992.65
Reg. Aviation	0.135	FT	GS-12	\$ 70,595	200		\$ 13,992.65
Reg. Aviation	0.135	FT	GS-12	\$ 70,595	200		\$ 13,992.65
Dep.	0.135	FT	GS-15	\$116,691	200		\$ 23,026.82
SUBTOTAL	0.540						\$ 65,004.75
add 5% travel							\$3,250.24
							\$ 68,254.99

**Appendix S-3 – Cost of 59 Quality Assurance Personnel (Pilots & Airworthiness)**

Position Title	FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Fringe Benefits (Basic Pay * Rate: 36.45% FT/PT, 7.65% Int, Temp) (per 1 FTE)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Sunday Shift Hrs (per 1 FTE)	Annual Total Other Costs (per 1 FTE)	Cost of Living Allowance (COLA)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 1</b>											
FWOS/Pilot	0.600	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$66,758</b>
Pilot - Leadplane	0.350	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$38,942</b>
Pilot - Leadplane	0.350	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$38,942</b>
Pilot - Smokejumper	0.300	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$33,379</b>
Pilot - Supervisory Pilot	0.300	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$39,550</b>
VACANT Pilot - Helicopter Inspector	0.500	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$55,631</b>
Maintenance Inspector	1.000	FT	GS-12	\$25,732	\$96,327	300		\$10,984		\$107,310	<b>\$107,310</b>
Maintenance Inspector	1.000	FT	GS-11	\$21,470	\$80,373	300		\$10,984		\$91,357	<b>\$91,357</b>
<b>REGION 10</b>											
Aviation Officer - Regional / Pilot	0.400	FT	GS-13	\$27,195	\$101,803	400	32	\$15,702	\$17,906	\$135,410	<b>\$54,164</b>
Aviation Maintenance Inspector	0.600	FT	GS-12	\$22,869	\$85,609	300		\$9,756	\$15,058	\$110,423	<b>\$66,254</b>
<b>REGION 2</b>											
Aviation Officer - Regional / Pilot	0.300	FT	GS-13	\$32,495	\$121,644	400	32	\$17,996		\$139,639	<b>\$41,892</b>
Pilot	0.300	FT	GS-13	\$32,495	\$121,644	400	32	\$17,996		\$139,639	<b>\$41,892</b>
Maintenance Officer	0.200	FT	GS-12	\$25,732	\$96,327	200		\$7,322		\$103,649	<b>\$20,730</b>
<b>REGION 3</b>											
Helicopter Supervisory Pilot	0.300	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$39,550</b>
Pilot - Supervisory Pilot	0.400	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$52,733</b>
Maintenance Inspector	0.200	FT	GS-12	\$25,732	\$96,327	300		\$10,984		\$107,310	<b>\$21,462</b>
<b>REGION 4</b>											
Helicopter Program Manager/Pilot	0.350	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$46,141</b>
Pilot - Infrared/Supervisory	0.250	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$32,958</b>
Pilot - Leadplane	0.350	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$38,942</b>
Pilot - Leadplane	0.200	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$22,253</b>
Pilot – Leadplane / Supervisory Pilot	0.400	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$52,733</b>
Pilot - Smokejumper	0.350	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$38,942</b>
Pilot - Smokejumper Supervisory	0.400	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$52,733</b>
Aviation Maintenance Program Manager	0.550	FT	GS-13	\$30,599	\$114,548	200		\$8,659		\$123,208	<b>\$67,764</b>
Avionics Inspector - Regional	0.500	FT	GS-12	\$25,732	\$96,327	300		\$10,984		\$107,310	<b>\$53,655</b>

<b>REGION 5</b>											
Pilot - Airplane	0.300	FT	GS-12	\$28,170	\$105,453	400	32	\$16,346		\$121,798	<b>\$36,540</b>
Pilot - Airplane	0.300	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$33,379</b>
Pilot - Helicopter Inspector	0.180	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$20,027</b>
Pilot - Supervisory Airplane	0.350	FT	GS-13	\$33,498	\$125,400	400	32	\$18,371		\$143,772	<b>\$50,320</b>
Pilot - Supervisory Airplane	0.350	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$46,141</b>
Pilot - Supervisory Helicopter	0.350	FT	GS-13	\$32,065	\$120,035	400	32	\$17,833		\$137,868	<b>\$48,254</b>
Aircraft Inspector	0.400	FT	GS-12	\$25,732	\$96,327	300		\$10,984		\$107,310	<b>\$42,924</b>
Aircraft Inspector	0.400	FT	GS-12	\$28,170	\$105,453	300		\$12,020		\$117,473	<b>\$46,989</b>
Aviation Inspector	0.400	FT	GS-12	\$25,732	\$96,327	300		\$10,984		\$107,310	<b>\$42,924</b>
Aviation Inspector	0.400	FT	GS-12	\$28,170	\$105,453	300		\$12,020		\$117,473	<b>\$46,989</b>
<b>REGION 6</b>											
Helicopter Inspector Pilot	0.600	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$79,099</b>
Helicopter Program Manager/Pilot	0.350	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$46,141</b>
Light Fixed-Wing Program Manager/Pilot	0.500	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$65,916</b>
Pilot - Airplane	0.300	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$33,379</b>
Pilot - Airplane	0.300	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$33,379</b>
Pilot - Airplane	0.210	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$23,365</b>
Aircraft Avionics Inspector	0.500	FT	GS-12	\$25,732	\$96,327	300		\$10,984		\$107,310	<b>\$53,655</b>
Aircraft Maintenance Inspector	0.600	FT	GS-12	\$25,732	\$96,327	300		\$10,984		\$107,310	<b>\$64,386</b>
Aircraft Maintenance Inspector	0.300	FT	GS-12	\$25,732	\$96,327	300		\$10,984		\$107,310	<b>\$32,193</b>
Aviation Maintenance Program Manager	0.250	FT	GS-13	\$30,599	\$114,548	200		\$8,659		\$123,208	<b>\$30,802</b>
<b>REGION 8</b>											
Helicopter Inspector Pilot	0.500	FT	GS-12	\$26,322	\$98,536	400	32	\$15,279		\$113,815	<b>\$56,907</b>
Inspector Pilot - Fixed Wing	0.350	FT	GS-12	\$26,322	\$98,536	400	32	\$15,279		\$113,815	<b>\$39,835</b>
VACANT Inspector Pilot - Fixed Wing	0.350	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$38,942</b>
Maintenance Inspector	0.750	FT	GS-12	\$26,322	\$98,536	300		\$11,235		\$109,771	<b>\$82,329</b>
<b>REGION 9</b>											
Pilot - Helicopter Inspector	0.120	FT	GS-13	\$31,203	\$116,808	400	32	\$17,512		\$134,320	<b>\$16,118</b>
VACANT Fixed Wing Prgm Mgr / Pilot Inspector	0.250	FT	GS-12	\$26,240	\$98,228	400	32	\$15,226		\$113,454	<b>\$28,363</b>
Pilot - Airplane	0.200	FT	GS-12	\$25,732	\$96,327	400	32	\$14,936		\$111,263	<b>\$22,253</b>
Maintenance Inspector/Aviation Security	0.500	FT	GS-12	\$26,827	\$100,427	300		\$11,449		\$111,876	<b>\$55,938</b>
Airplane Mechanic	1.000	FT	GS-11	\$21,470	\$80,373	300		\$10,984		\$91,357	<b>\$91,357</b>
<b>WOW</b>											
N FIXED WING STD. PILOT	0.500	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$65,916</b>
N HELO STAND. PILOT	0.500	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$65,916</b>
N SJ PROGRAM MNGR / Pilot	0.500	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$65,916</b>
National Fixed Wing Specialist / Pilot	0.250	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$32,958</b>
NHIP / Pilot	0.500	FT	GS-13	\$30,599	\$114,548	400	32	\$17,283		\$131,832	<b>\$65,916</b>
	<b>24.06</b>										<b>\$2,822,130.53</b>



### Appendix S-4 – Cost of Aerial Fire Suppression Recommendations

Position Title	FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	***Annual Total Personnel Costs per FTE# (without inflation)
Airtanker Base Manager	0.18	FT	GS-9	350	\$ 79,815.48	\$ 14,366.79
Airtanker Base Manager - Assistant	0.18	PT	GS-7	350	\$ 65,244.89	\$ 11,744.08
Aviation Officer - Regional	0.09	FT	GS-14	200	\$ 145,006.33	\$ 13,050.57
						\$ 39,161.44
add 10% for travel						\$3,916.14
						\$ 43,077.58
Helicopter Monitoring Staff	10.81	FT	GS-9	400	\$ 81,699.08	\$ 883,167.09
add 10% for training and vehicles						\$ 88,316.71
						\$ 971,483.80
Helicopter Monitoring Staff	4.00	FT	GS-9	448	\$ 83,032.31	\$ 332,129.23
Helicopter Monitoring Staff	5.68	FT	GS-9	448	\$ 83,032.31	\$ 471,623.50
Helicopter Monitoring Staff	1.14	FT	GS-9	448	\$ 83,032.31	\$ 94,324.70
						\$ 898,077.43

## Appendix S-5 – Airtanker Base Cost Calculations

Airtanker Base Calculations (FY 2005)

Cost to Government per Base: 300,000 gallons/year

	Bulk	Full Service Government	Full Service Vendor
<b>Contract Administration</b>			
CO	Same	Same	Same
COR	Same	Same	Same
ACOR	\$ 2,000	\$ 5,000	\$ 5,000
Inspector	\$ 500	\$ 2,000	\$ 2,000
	<b>\$ 2,500</b>	<b>\$ 7,000</b>	<b>\$ 7,000</b>
<b>Personnel</b>			
Base Manager	Same	Same	Same
Asst. Manager	Same	Same	Same
CWN	\$ 35,000	\$ 5,000	\$ 5,000
Contractor Standby		\$ 2,000	\$ 2,000
	<b>\$ 35,000</b>	<b>\$ 7,000</b>	<b>\$ 7,000</b>
<b>Facilities</b>			
Acquisition 10 yr Amort.	\$ 10,000	\$ 10,000	
Square Footage	Same	Same	Same
Maintenance	\$ 10,000	\$ 10,000	
	<b>\$ 20,000</b>	<b>\$ 20,000</b>	
<b>Retardant</b>			
First 100,000	\$ 79,300	\$214,900	\$214,900
Second 100,000	\$ 79,300	\$117,200	\$117,200
Third 100,000	\$ 79,300	\$ 89,200	\$ 89,200
	<b>\$237,900</b>	<b>\$421,300</b>	<b>\$421,300</b>
<b>TOTALS</b>	<b>\$295,400</b>	<b>\$455,300</b>	<b>\$435,300</b>

**Appendix S-6 – MAFFS Activation Cost (2005 & 2006)**

<b>MAFFS Activation 2005 July 20, 2005 to September 10, 2005</b>		
MAFFS Equipment Expenses		\$87,207
	Supply Expenses	\$330,508
	Agency Personnel	\$442,409
	ANG Military Personnel	\$1,309,350
	AFR Military Personnel	\$57,050
MAFFS Mechanics		\$150,000
Mission Flight Hours		\$1,575,200
Support Flight Hours		\$512,400
Landing Fees and A/C RON		\$47,284
Retardant Cost		\$1,500,000
		<b>\$6,011,408</b>
Sorties	368	
Landings	360	
Gallons of Retardant	879034	
Fires	47	

**MAFFS 2006 Activation Costs and Users**

**Boise Airtanker Base, Boise, ID  
August 3- September 16, 2006**

<b>Summary of Costs</b>	
Retardant Costs	\$501,493
Miscellaneous Support Costs	\$329,812
Military Costs	\$2,047,800
Federal Personnel	\$356,360
<b>Total</b>	<b>\$3,235,465</b>

**Klamath Falls Airtanker Base, Klamath Falls, OR  
July 20 – September 13, 2006**

<b>Summary of Costs</b>	
Retardant Costs	\$643,963
Miscellaneous Support Costs	\$292,054
Military Costs	\$2,692,900
Federal Personnel	\$376,850
<b>Total</b>	<b>\$4,005,767</b>

**Albuquerque Airtanker Base, Albuquerque, NM  
March 16- March 27, 2006**

<b>Summary of Costs</b>	
Retardant Costs	\$0
Miscellaneous Support Costs	\$58,594
Military Costs	\$548,700
Federal Personnel	\$126,390
<b>Total</b>	<b>\$733,684</b>

**William Gateway Airport, Mesa, AZ  
June 25 – July 7, 2006**

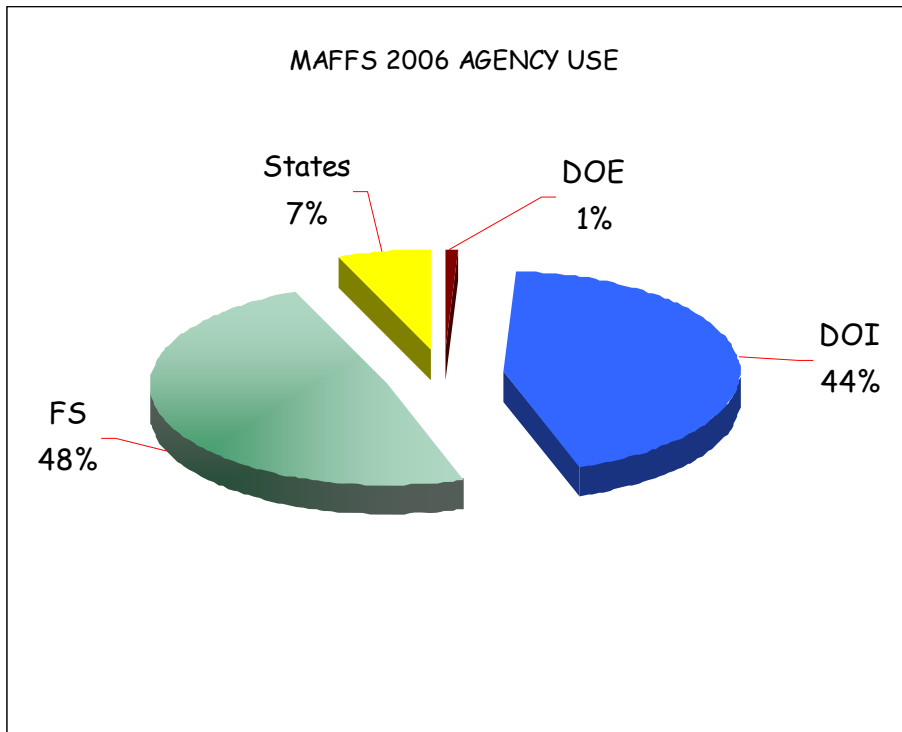
<b>Summary of Costs</b>	
Retardant Costs	\$84,942
Miscellaneous Support Costs	\$71,214
Military Costs	\$629,900
Federal Personnel	\$109,480
<b>Total</b>	<b>\$895,536</b>

**Total 2006 MAFFS Activation costs = \$8,870,452**

<b>MAFFS Training 2006</b>	
Leadplanes	\$112,768.54
Site Visit – November	\$19,642.91
Site Visit – March	\$7,228.00
Cadre 7-day training estimated per diem, travel, OT, and car rental	\$75,000.00
Facilities, water, support and services	\$30,000.00
<b>MAFFS Total Training Costs</b>	<b>\$244,639.45</b>

This cost included 5 additional days of training due to refurbishment and lack of four MAFFS tanks.

**Breakdown of Costs**



## Appendix S-7 – Airtanker Base Permanent Personnel

Position Title	Total FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 1</b>							
Airtanker Base Manager	0.500	PT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 32,622.44</b>
Airtanker Base Manager - Assistant	1.000	FT	WG-8	\$61,425.14	350	\$ 73,801.45	<b>\$ 73,801.45</b>
Ramp Manager	0.500	PT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 32,622.44</b>
Airtanker Base Manager	0.500	PT	GS-6	\$48,868.20	350	\$ 58,714.17	<b>\$ 29,357.09</b>
Airbase Manager	1.000	FT	GS-12	\$96,326.88	350	\$115,737.67	<b>\$115,737.67</b>
Airbase Manager - Assistant	1.000	FT	GS-11	\$80,373.14	350	\$ 96,565.06	<b>\$ 96,565.06</b>
Airtanker Base Manager	0.269	FT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 17,565.93</b>
Airtanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 79,815.48</b>
Airtanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 79,815.48</b>
Airtanker Base Manager - Assistant	0.500	PT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 32,622.44</b>
Ramp Manager	1.000	FT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 65,244.89</b>
Airtanker Base Manager	0.692	PT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 55,256.87</b>
Airtanker Base Manager	0.692	PT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 55,256.87</b>
Timekeeper	0.200	FT	GS-5	\$43,841.39	350	\$ 52,677.51	<b>\$ 10,535.50</b>
Timekeeper	0.200	FT	GS-5	\$43,841.39	350	\$ 52,677.51	<b>\$ 10,535.50</b>
Timekeeper	0.200	FT	GS-5	\$43,841.39	350	\$ 52,677.51	<b>\$ 10,535.50</b>
Timekeeper	0.200	FT	GS-5	\$43,841.39	350	\$ 52,677.51	<b>\$ 10,535.50</b>
VACANT Tanker Base Manager - Asst.	0.462	FT	GS-5	\$43,841.39	350	\$ 52,677.51	<b>\$ 24,312.70</b>
VACANT Tanker Base Manager - Asst.	0.462	FT	GS-5	\$43,841.39	350	\$ 52,677.51	<b>\$ 24,312.70</b>
A/C Timekeeper	0.462	PT	GS-5	\$43,841.39	350	\$ 52,677.51	<b>\$ 24,312.70</b>
A/C Timekeeper	0.462	PT	GS-3	\$34,908.00	350	\$ 41,942.48	<b>\$ 19,358.07</b>
Mixmaster/Aerial Observer	0.231	PT	WG-5	\$46,645.51	350	\$ 56,043.94	<b>\$ 12,933.22</b>
<b>REGION 2</b>							
Airtanker Base Manager	1.000	FT	GS-9	\$70,544.65	350	\$ 84,757.04	<b>\$ 84,757.04</b>
Airtanker base Manager - Asst.	0.500	FT	GS-7	\$57,666.50	350	\$ 69,285.43	<b>\$ 34,642.72</b>
Tanker Base Mgr.	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 79,815.48</b>

Position Title	Total FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	***Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 3</b>							
Airbase Manager - Assistant	0.500	PT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 32,622.44
Airtanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
Airtanker Base Manager	0.500	PT	GS-5	\$43,841.39	350	\$ 52,677.51	\$ 26,338.76
Airtanker Base Manager - Assistant	0.692	PT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 45,169.54
Airtanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
Airbase Manager - Assistant	1.000	FT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 65,244.89
Airtanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
Airbase Lead	0.500	PT	GS-5	\$43,841.39	350	\$ 52,677.51	\$ 26,338.76
Airtanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
Airtanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
Airtanker Base Manager	1.000	FT	GS-9	\$66,505.73	350	\$ 79,903.36	\$ 79,903.36
Tanker Base - Asst.	0.308	PT	GS-5	\$43,841.39	350	\$ 52,677.51	\$ 16,208.47
Tanker Base - Lead	0.308	PT	GS-5	\$43,841.39	350	\$ 52,677.51	\$ 16,208.47
<b>REGION 4</b>							
Airtanker Base Manager - Assistant	0.500	PT	GS-6	\$48,868.20	350	\$ 58,714.17	\$ 29,357.09
Tanker Base Manager	0.730	PT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 58,265.30
Airtanker Base Manager	0.692	PT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 45,169.54
Airtanker Base Manager	0.690	PT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 55,072.68
Airtanker Base Manager - Assistant	0.690	PT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 45,018.97
Smokejumper Base Manager	1.000	FT	GS-12	\$96,326.88	350	\$115,737.67	\$115,737.67
Airtanker Base Manager	0.962	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 76,745.65
Airtanker Base Manager - Assistant	0.500	FT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 32,622.44
Timekeeper	0.731	PT	GS-4	\$39,185.71	350	\$ 47,080.85	\$ 34,405.24

Position Title	Total FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	***Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 5</b>							
Airbase Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 79,815.48</b>
Airbase Manager	1.000	FT	GS-9	\$72,722.39	350	\$ 87,376.59	<b>\$ 87,376.59</b>
Airbase Technician	1.000	FT	GS-7	\$59,448.54	350	\$ 71,428.95	<b>\$ 71,428.95</b>
Smokejumper Base Manager	1.000	FT	GS-12	\$96,326.88	350	\$115,737.67	<b>\$115,737.67</b>
Airbase Manager	1.000	FT	GS-9	\$72,722.39	350	\$ 87,376.59	<b>\$ 87,376.59</b>
Airbase Technician	1.000	FT	GS-7	\$59,448.54	350	\$ 71,428.95	<b>\$ 71,428.95</b>
Airbase Technician	1.000	FT	GS-5	\$47,994.92	350	\$ 57,663.02	<b>\$ 57,663.02</b>
Airbase Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 79,815.48</b>
Airbase Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 79,815.48</b>
Airbase Technician	1.000	FT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 65,244.89</b>
Airbase Technician	1.000	FT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 65,244.89</b>
Airbase Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 79,815.48</b>
Airbase Technician	1.000	PT	GS-5	\$43,841.39	350	\$ 52,677.51	<b>\$ 52,677.51</b>
<b>REGION 6</b>							
Airtanker Base Manager	0.500	PT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 39,907.74</b>
Airtanker Base Manager - Assistant	0.500	PT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 32,622.44</b>
Smokejumper Base Manager	1.000	FT	GS-12	\$96,326.88	350	\$115,737.67	<b>\$115,737.67</b>
Airtanker Base Manager	0.500	PT	GS-9	\$66,429.32	350	\$ 79,815.48	<b>\$ 39,907.74</b>
Airtanker Base Manager - Assistant	0.500	PT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 32,622.44</b>
Smokejumper Base Manager	1.000	FT	GS-12	\$96,326.88	350	\$115,737.67	<b>\$115,737.67</b>
Airtanker Base Manager	1.000	FT	GS-11	\$80,373.14	350	\$ 96,565.06	<b>\$ 96,565.06</b>
Airtanker Base Manager - Assistant	0.500	PT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 32,622.44</b>
Air Base Manager	1.000	FT	GS-11	\$80,373.14	350	\$ 96,565.06	<b>\$ 96,565.06</b>
SEAT Base Manager	1.000	FT	GS-7	\$54,303.01	350	\$ 65,244.89	<b>\$ 65,244.89</b>
Airtanker Base Manager	0.500	FT	GS-7	\$56,542.15	350	\$ 67,937.31	<b>\$ 33,968.66</b>
Airtanker Ramp	0.040	FT	GS-11	\$83,687.51	350	\$100,550.75	<b>\$ 4,022.03</b>
Airtanker Ramp	0.040	FT	GS-11	\$83,687.51	350	\$100,550.75	<b>\$ 4,022.03</b>
Airtanker Ramp	0.040	FT	GS-9	\$69,169.23	350	\$ 83,106.22	<b>\$ 3,324.25</b>
Airtanker Ramp	0.040	FT	GS-9	\$69,169.23	350	\$ 83,106.22	<b>\$ 3,324.25</b>
Airtanker Ramp	0.040	FT	GS-9	\$69,169.23	350	\$ 83,106.22	<b>\$ 3,324.25</b>
Airtanker Ramp	0.040	FT	GS-11	\$83,687.51	350	\$100,550.75	<b>\$ 4,022.03</b>
Airtanker Ramp	0.040	FT	GS-11	\$83,687.51	350	\$100,550.75	<b>\$ 4,022.03</b>
Airtanker Ramp	0.040	FT	GS-9	\$69,169.23	350	\$ 83,106.22	<b>\$ 3,324.25</b>
Airtanker Ramp	0.040	FT	GS-9	\$69,169.23	350	\$ 83,106.22	<b>\$ 3,324.25</b>
Airtanker Ramp	0.040	FT	GS-11	\$83,687.51	350	\$100,550.75	<b>\$ 4,022.03</b>
Airtanker Ramp	0.040	FT	GS-11	\$83,687.51	350	\$100,550.75	<b>\$ 4,022.03</b>

Position Title	Total FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	***Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 6 (con't)</b>							
Airbase Manager	0.050	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 3,990.77
AirTanker Base Manager	0.750	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 59,861.61
Airtanker Base Manager	0.050	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 3,990.77
Airtanker Base Manager - Assistant	0.500	FT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 32,622.44
Smokejumper Base Manager	1.000	FT	GS-12	\$96,326.88	350	\$115,737.67	\$115,737.67
Airtanker Base Manager	0.960	PT	GS-8	\$60,140.34	350	\$ 72,258.45	\$ 69,368.12
Airtanker Base Manager - Assistant	0.700	PT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 45,671.42
Rappel Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
SEAT Base Manager	1.000	FT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 65,244.89
SEAT Base Manager - Assistant	1.000	FT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 65,244.89
Airbase Manager - Assistant	1.000	FT	GS-8	\$60,140.34	350	\$ 72,258.45	\$ 72,258.45
Airtanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
Airtanker Base Manager - Assistant	0.500	FT	GS-7	\$54,303.01	350	\$ 65,244.89	\$ 32,622.44
Airtanker Base Support Personnel	0.250	FT	GS-5	\$43,841.39	350	\$ 52,677.51	\$ 13,169.38
Helitanker Base Manager	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
Rappel Base Mgr	1.000	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 79,815.48
Facilities Manager	0.040	FT	GS-11	\$80,373.14	350	\$ 96,565.06	\$ 3,862.60
Fleet Manager	0.040	FT	GS-11	\$80,373.14	350	\$ 96,565.06	\$ 3,862.60
Airtanker Base STEP Employee	0.231	PT	GS-4	\$39,185.71	350	\$ 47,080.85	\$ 10,864.81
Airtanker Base STEP Employee	0.231	PT	GS-4	\$39,185.71	350	\$ 47,080.85	\$ 10,864.81
SEAT Base Support Personnel	0.250	PT	GS-5	\$43,841.39	350	\$ 52,677.51	\$ 13,169.38
SEAT Base Support Personnel	0.250	PT	GS-5	\$43,841.39	350	\$ 52,677.51	\$ 13,169.38
Retired AD / Helibase & HCWN	0.231	PT	AD-09	\$69,825.89	350	\$ 83,894.84	\$ 19,360.35
<b>REGION 8</b>							
Airtanker Base Manager	0.700	FT	GS-9	\$66,429.32	350	\$ 79,815.48	\$ 55,870.83
Fixed Wing Base Mgr	0.077	PT	AD-05	\$44,993.84	350	\$ 54,059.48	\$ 4,158.42
	<b>66.582</b>					<b>\$</b>	<b>5,082,301.50</b>



## Appendix S-8 – Airtanker Base Militia Personnel

Position Title	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	***Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 2</b>				
Airtanker Base Manager	\$ 70,544.65	350	\$ 84,363.31	\$ 2,153.42
Airtanker Base Manager	\$ 70,544.65	350	\$ 84,363.31	\$ 2,153.42
Airtanker Base Manager	\$ 70,544.65	350	\$ 84,363.31	\$ 2,153.42
Ramp Manager	\$ 57,666.50	350	\$ 69,287.32	\$ 2,184.74
Ramp Manager	\$ 57,666.50	350	\$ 69,287.32	\$ 2,184.74
Mixmaster	\$ 57,666.50	350	\$ 69,287.32	\$ 4,057.37
Mixmaster	\$ 57,666.50	350	\$ 69,287.32	\$ 4,057.37
Airtanker Base Manager	\$ 70,544.65	350	\$ 84,363.31	\$ 2,153.42
Airtanker Base Manager	\$ 70,544.65	350	\$ 84,363.31	\$ 2,153.42
Airtanker Base Manager	\$ 70,544.65	350	\$ 84,363.31	\$ 2,153.42
Ramp Manager	\$ 57,666.50	350	\$ 69,287.32	\$ 2,184.74
Ramp Manager	\$ 57,666.50	350	\$ 69,287.32	\$ 2,184.74
Mixmaster	\$ 57,666.50	350	\$ 69,287.32	\$ 4,057.37
Mixmaster	\$ 57,666.50	350	\$ 69,287.32	\$ 4,057.37
<b>REGION 3</b>				
Helibase Manager, Type I	\$ 48,868.20	350	\$ 58,714.17	\$ 8,807.13
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 7,944.44
Helibase Manager, Type II	\$ 80,373.14	350	\$ 93,430.29	\$ 4,671.51
Helibase Manager, Type II	\$ 60,140.34	350	\$ 72,258.45	\$ 7,225.85
Helibase Manager, Type II	\$ 66,429.32	350	\$ 79,444.35	\$ 3,972.22
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 11,916.65
Helibase Manager, Type II	\$ 60,140.34	350	\$ 72,258.45	\$ 7,225.85
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 7,944.44
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 15,888.87
Helibase Manager, Type I	\$ 80,373.14	350	\$ 93,430.29	\$ 4,671.51
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 11,916.65
Helibase Manager, Type II	\$ 48,868.20	350	\$ 58,714.17	\$ 5,871.42
Helibase Manager, Type II	\$ 48,868.20	350	\$ 58,714.17	\$ 5,871.42
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 7,944.44
Helibase Manager, Type I	\$ 60,140.34	350	\$ 72,258.45	\$ 10,838.77
Helibase Manager, Type II	\$ 60,140.34	350	\$ 72,258.45	\$ 7,225.85
Helibase Manager, Type I	\$ 80,373.14	350	\$ 93,430.29	\$ 9,343.03
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 15,888.87
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 11,916.65
Helibase Manager, Type I	\$ 60,140.34	350	\$ 72,258.45	\$ 10,838.77
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 11,916.65
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 3,972.22
Helibase Manager, Type I	\$ 96,326.88	350	\$109,432.34	\$ 5,471.62
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 11,916.65

Position Title	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 3 (con't)</b>				
Helibase Manager, Type II	\$ 60,140.34	350	\$ 72,258.45	\$ 7,225.85
Helibase Manager, Type I	\$ 60,140.34	350	\$ 72,258.45	\$ 3,612.92
Helibase Manager, Type I	\$ 66,429.32	350	\$ 79,444.35	\$ 3,972.22
Helibase Manager, Type II	\$ 68,345.08	350	\$ 82,115.66	\$ 4,105.78
Helibase Manager, Type I	\$ 73,243.14	350	\$ 88,000.62	\$ 17,600.12
Helibase Manager, Type I	\$ 69,825.89	350	\$ 83,894.84	\$ 8,389.48
<b>REGION 4</b>				
Airtanker Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 45,672.74
MXMS	\$ 66,429.32	350	\$ 79,444.35	\$ 7,944.44
<b>REGION 5</b>				
Airbase Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 79,444.35
Airbase Manager - Assistant	\$ 60,140.34	350	\$ 72,258.45	\$ 72,258.45
Airbase Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 65,246.77
<b>REGION 6</b>				
SEAT Base Support Personnel	\$ 43,841.39	350	\$ 52,677.51	\$ 52,677.51
SEAT Base Support Personnel	\$ 43,841.39	350	\$ 52,677.51	\$ 52,677.51
Forester / CWN Asst. Tanker Base Manager	\$ 80,373.14	350	\$ 93,430.29	\$ 93,430.29
SEAT Base Support Personnel	\$ 43,841.39	350	\$ 52,677.51	\$ 52,677.51
Facilities/Maintenance Mgr.	\$ 66,429.32	350	\$ 79,444.35	\$ 19,861.09
Facilities/Maintenance Mgr.	\$ 66,429.32	350	\$ 79,444.35	\$ 79,444.35
Engineering & Facilities	\$ 96,326.88	350	\$109,432.34	\$ 109,432.34
<b>REGION 8</b>				
SEAT Base Manager	\$ 80,373.14	350	\$ 93,430.29	\$ 14,014.54
Fixed Wing Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 23,833.31
Helicopter Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 39,722.18
SEAT Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 3,262.34
Helicopter Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 39,722.18
Helicopter Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 39,722.18
Helicopter Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 15,888.87
Airtanker Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 11,916.65
Airtanker Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 11,916.65
Helicopter Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 6,524.68
Helicopter Base manager	\$ 60,140.34	350	\$ 72,258.45	\$ 7,225.85
Ramp Manager (T)	\$ 43,841.39	350	\$ 52,677.51	\$ 7,901.63
Airtanker Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 19,861.09
Helicopter Base Manager	\$ 66,429.32	350	\$ 79,444.35	\$ 7,944.44
SEAT Base Manager	\$ 80,373.14	350	\$ 93,430.29	\$ 18,686.06
SEAT Base Manager	\$ 80,373.14	350	\$ 93,430.29	\$ 18,686.06
Helicopter Base Manager (HEB1)	\$ 68,713.49	350	\$ 82,176.24	\$ 24,652.87
Helicopter Base Manager (HEB2)	\$ 49,237.98	350	\$ 59,160.43	\$ 14,790.11
SEAT Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 13,049.35

Position Title	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 8 (con't)</b>				
Airtanker Base Manager	\$ 80,373.14	350	\$ 93,430.29	\$ 28,029.09
Airtanker Base Manager	\$ 80,373.14	350	\$ 93,430.29	\$ 28,029.09
Airtanker Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 19,574.03
Airtanker Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 19,574.03
Airtanker Base Manager	\$ 48,868.20	350	\$ 58,714.17	\$ 17,614.25
Airtanker Base Manager	\$ 48,868.20	350	\$ 58,714.17	\$ 17,614.25
Helicopter Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 16,311.69
Helicopter Base Manager	\$ 55,074.74	350	\$ 55,241.30	\$ 13,810.32
Mixmaster	\$ 48,868.20	350	\$ 58,714.17	\$ 14,678.54
Mixmaster	\$ 66,429.32	350	\$ 79,444.35	\$ 3,972.22
Mixmaster	\$ 43,841.39	350	\$ 52,677.51	\$ 15,803.25
Mixmaster	\$ 43,841.39	350	\$ 52,677.51	\$ 7,901.63
Mixmaster	\$ 43,841.39	350	\$ 52,677.51	\$ 7,901.63
Mixmaster	\$ 43,841.39	350	\$ 52,677.51	\$ 15,803.25
Mixmaster	\$ 43,841.39	350	\$ 52,677.51	\$ 15,803.25
<b>REGION 9</b>				
Aircraft Base Radio Operator	\$ 80,373.14	350	\$ 93,430.29	\$ 93,430.29
Airtanker Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 65,246.77
Airtanker Base Manager	\$ 54,303.01	350	\$ 65,246.77	\$ 65,246.77
Ramp	\$ 66,429.32	350	\$ 79,444.35	\$ 79,444.35
				<b>\$1,909,873.85</b>

## Appendix S-9 – Cost of Pilots NOT Performing Quality Assurance

Position Title	Total FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Basic Pay (Annual Salary + Other Entitlements) (per 1 FTE)	Annual Fringe Benefits (Basic Pay * Rate: 32.85% FT/PT, 7.65% Int, Temp) (per 1 FTE)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Sunday Shift Hrs (per 1 FTE)	* Annual Subtotal Other Pay (per 1 FTE)	Annual Other Pay Fringe (per 1 FTE)	Annual Total Other Costs (per 1 FTE)	Cost of Living Allowance (COLA)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 1</b>														
Pilot - Leadplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Trainee	0.5	FT	GS-9	\$48,684	\$17,745	\$66,429	400	32	\$13,791	\$1,055	\$14,846		\$81,275	<b>\$40,637</b>
<b>REGION 10</b>														
Aviation Safety Manager / Pilot	1.0	FT	GS-13	\$74,608	\$27,195	\$101,803	400	32	\$14,586	\$1,116	\$15,702	\$17,906	\$135,410	<b>\$135,410</b>
Pilot	1.0	FT	GS-11	\$52,349	\$19,081	\$71,430	400	32	\$12,285	\$940	\$13,224	\$12,564	\$97,218	<b>\$97,218</b>
<b>REGION 2</b>														
Pilot	1.0	FT	GS-12	\$74,968	\$27,326	\$102,294	400	32	\$14,731	\$1,127	\$15,858		\$118,152	<b>\$118,152</b>
Pilot	1.0	FT	GS-12	\$74,968	\$27,326	\$102,294	400	32	\$14,731	\$1,127	\$15,858		\$118,152	<b>\$118,152</b>
<b>REGION 3</b>														
VACANT Pilot	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>

Position Title	Total FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Basic Pay (Annual Salary + Other Entitlements) (per 1 FTE)	Annual Fringe Benefits (Basic Pay * Rate: 32.85% FT/PT, 7.65% Int, Temp) (per 1 FTE)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Sunday Shift Hrs (per 1 FTE)	* Annual Subtotal Other Pay (per 1 FTE)	Annual Other Pay Fringe (per 1 FTE)	Annual Total Other Costs (per 1 FTE)	Cost of Living Allowance (COLA)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 4</b>														
Pilot - Infrared	1.0	FT	GS-13	\$83,949	\$30,599	\$114,548	400	32	\$16,410	\$874	\$17,283		\$131,832	<b>\$131,832</b>
Pilot - Infrared	1.0	FT	GS-13	\$83,949	\$30,599	\$114,548	400	32	\$16,410	\$874	\$17,283		\$131,832	<b>\$131,832</b>
Pilot - Infrared	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Infrared	1.0	FT	GS-13	\$83,949	\$30,599	\$114,548	400	32	\$16,410	\$874	\$17,283		\$131,832	<b>\$131,832</b>
Pilot - Infrared	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Infrared	1.0	FT	GS-13	\$83,949	\$30,599	\$114,548	400	32	\$16,410	\$874	\$17,283		\$131,832	<b>\$131,832</b>
Pilot - Infrared	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Infrared	1.0	FT	GS-13	\$83,949	\$30,599	\$114,548	400	32	\$16,410	\$874	\$17,283		\$131,832	<b>\$131,832</b>
Pilot - Leadplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Smokejumper	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Smokejumper (Developmental)	1.0	FT	GS-11	\$58,903	\$21,470	\$80,373	400	32	\$13,830	\$1,058	\$14,888		\$95,261	<b>\$95,261</b>
Pilot - Smokejumper (Developmental)	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>

Position Title	Total FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Basic Pay (Annual Salary + Other Entitlements) (per 1 FTE)	Annual Fringe Benefits (Basic Pay * Rate: 32.85% FT/PT, 7.65% Int, Temp) (per 1 FTE)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Sunday Shift Hrs (per 1 FTE)	* Annual Subtotal Other Pay (per 1 FTE)	Annual Other Pay Fringe (per 1 FTE)	Annual Total Other Costs (per 1 FTE)	Cost of Living Allowance (COLA)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 5</b>														
Pilot - Airplane	0.5	FT	GS-12	\$77,283	\$28,170	\$105,453	400	32	\$15,184	\$1,162	\$16,346		\$121,798	<b>\$60,899</b>
Pilot - Airplane	0.5	FT	GS-12	\$77,283	\$28,170	\$105,453	400	32	\$15,184	\$1,162	\$16,346		\$121,798	<b>\$60,899</b>
Pilot - Airplane	0.5	FT	GS-12	\$77,283	\$28,170	\$105,453	400	32	\$15,184	\$1,162	\$16,346		\$121,798	<b>\$60,899</b>
Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$77,283	\$28,170	\$105,453	400	32	\$15,184	\$1,162	\$16,346		\$121,798	<b>\$121,798</b>
VACANT Pilot - Airplane	0.5	FT	GS-12	\$77,283	\$28,170	\$105,453	400	32	\$15,184	\$1,162	\$16,346		\$121,798	<b>\$60,899</b>
VACANT Pilot - Airplane	0.5	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$55,631</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$77,283	\$28,170	\$105,453	400	32	\$15,184	\$1,162	\$16,346		\$121,798	<b>\$121,798</b>

Position Title	Total FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Basic Pay (Annual Salary + Other Entitlements) (per 1 FTE)	Annual Fringe Benefits (Basic Pay * Rate: 32.85% FT/PT, 7.65% Int, Temp) (per 1 FTE)	Annual Total Costs (Basic + Fringe) (per 1 FTE)	Annual Overtime Hrs (per 1 FTE)	Annual Sunday Shift Hrs (per 1 FTE)	* Annual Subtotal Other Pay (per 1 FTE)	Annual Other Pay Fringe (per 1 FTE)	Annual Total Other Costs (per 1 FTE)	Cost of Living Allowance (COLA)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 6</b>														
Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Airplane	0.7	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$77,884</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
VACANT Pilot - Airplane	0.7	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$77,884</b>
<b>REGION 9</b>														
Aviation Safety/Pilot Inspector	1.0	FT	GS-13	\$85,605	\$31,203	\$116,808	400	32	\$16,736	\$776	\$17,512		\$134,320	<b>\$134,320</b>
Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
Pilot - Airplane	1.0	FT	GS-12	\$70,595	\$25,732	\$96,327	400	32	\$13,875	\$1,061	\$14,936		\$111,263	<b>\$111,263</b>
	<b>43.4</b>													<b>\$4,928,033</b>

\*\*\*\*Step positions are shown below. The FTE below are used for PP's 2, 3, 4, and 5 as appropriate.

### Appendix S-10 – Cost of Natural Resource Personnel

Position Title	FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Salary/Wages	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
Unit Aviation Officer	0.324	FT	GS-9	\$ 48,684	200	\$ 73,963.74	\$ 23,964.25
Unit Aviation Officer	0.324	FT	GS-9	\$ 48,684	200	\$ 73,963.74	\$ 23,964.25
Unit Aviation Officer	0.324	FT	GS-9	\$ 48,684	200	\$ 73,963.74	\$ 23,964.25
Unit Aviation Officer	0.324	FT	GS-9	\$ 48,684	200	\$ 73,963.74	\$ 23,964.25
Unit Aviation Officer	0.324	FT	GS-9	\$ 48,684	200	\$ 73,963.74	\$ 23,964.25
Unit Aviation Officer	0.324	FT	GS-9	\$ 48,684	200	\$ 73,963.74	\$ 23,964.25
	<b>1.944</b>						\$ 143,785.51
<b>add Travel:</b>							\$ 66,060.00
<b>add Training:</b>							\$ 7,170.00
							\$ 217,015.51

Travel Costs per UAO	
Mileage (@ \$0.445/mile):	\$2,670
Per Diem:	\$8,340
	\$11,010

Training Costs per UAO (5-Day ACE Seminar)	
Seminar Cost:	\$ 100.00
Travel:	\$ 400.00
Per Diem:	\$ 695.00
	\$1,195.00



## Appendix S-11 – Cost of Quality Assurance Pilot Personnel

Position Title	FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Salary/Wages	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	*** Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 1</b>							
FWOS/Pilot	0.600	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$66,757.76</b>
Pilot - Leadplane	0.350	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$38,942.02</b>
Pilot - Leadplane	0.350	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$38,942.02</b>
Pilot - Smokejumper	0.300	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$33,378.88</b>
Pilot - Supervisory Pilot	0.300	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$39,549.50</b>
VACANT Pilot - Helicopter Inspector	0.500	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$55,631.46</b>
<b>REGION 10</b>							
Aviation Officer - Regional / Pilot	0.400	FT	GS-13	\$74,608	400	\$135,410.37	<b>\$54,164.15</b>
<b>REGION 2</b>							
Aviation Officer - Regional / Pilot	0.300	FT	GS-13	\$89,149	400	\$139,639.46	<b>\$41,891.84</b>
Pilot	0.300	FT	GS-13	\$89,149	400	\$139,639.46	<b>\$41,891.84</b>
<b>REGION 3</b>							
Helicopter Supervisory Pilot	0.300	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$39,549.50</b>
Pilot - Supervisory Pilot	0.400	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$52,732.67</b>
<b>REGION 4</b>							
Helicopter Program Manager/Pilot	0.350	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$46,141.09</b>
Pilot - Infrared/Supervisory	0.250	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$32,957.92</b>
Pilot - Leadplane	0.350	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$38,942.02</b>
Pilot - Leadplane	0.200	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$22,252.59</b>
Pilot - Leadplane/Supervisory Pilot	0.400	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$52,732.67</b>
Pilot - Smokejumper	0.350	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$38,942.02</b>
Pilot - Smokejumper Supervisory	0.400	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$52,732.67</b>

Position Title	FTEs	Position Type (FT, PT, Int, Temp, Seasonal)	Grade (GS-xx, WG-xx, O-xx)	Annual Salary/Wages	Annual Overtime Hrs (per 1 FTE)	Annual Personnel Costs for 1 FTE (without inflation)	***Annual Total Personnel Costs per FTE# (without inflation)
<b>REGION 5</b>							
Pilot - Airplane	0.300	FT	GS-12	\$77,283	400	\$121,798.49	<b>\$36,539.55</b>
Pilot - Airplane	0.300	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$33,378.88</b>
Pilot - Helicopter Inspector	0.180	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$20,027.33</b>
Pilot - Supervisory Airplane	0.350	FT	GS-13	\$91,902	400	\$143,771.62	<b>\$50,320.07</b>
Pilot - Supervisory Airplane	0.350	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$46,141.09</b>
Pilot - Supervisory Helicopter	0.350	FT	GS-13	\$87,970	400	\$137,867.88	<b>\$48,253.76</b>
<b>REGION 6</b>							
Helicopter Inspector Pilot	0.600	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$79,099.00</b>
Helicopter Program Manager/Pilot	0.350	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$46,141.09</b>
Light Fixed-Wing Program Manager/Pilot	0.500	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$65,915.84</b>
Pilot - Airplane	0.300	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$33,378.88</b>
Pilot - Airplane	0.300	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$33,378.88</b>
Pilot - Airplane	0.210	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$23,365.21</b>
<b>REGION 8</b>							
Helicopter Inspector Pilot	0.500	FT	GS-12	\$72,214	400	\$113,814.55	<b>\$56,907.28</b>
Inspector Pilot - Fixed Wing	0.350	FT	GS-12	\$72,214	400	\$113,814.55	<b>\$39,835.09</b>
VACANT Inspector Pilot - Fixed Wing	0.350	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$38,942.02</b>
<b>REGION 9</b>							
Pilot - Helicopter Inspector	0.120	FT	GS-13	\$85,605	400	\$134,319.75	<b>\$16,118.37</b>
VACANT Fixed Wing Prgm Mgr / Pilot Inspector	0.250	FT	GS-12	\$71,988	400	\$113,453.56	<b>\$28,363.39</b>
Pilot - Airplane	0.200	FT	GS-12	\$70,595	400	\$111,262.93	<b>\$22,252.59</b>
<b>WOW</b>							
N FIXED WING STD. PILOT	0.500	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$65,915.84</b>
N HELO STAND. PILOT	0.500	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$65,915.84</b>
N SJ PROGRAM MNGR / Pilot	0.500	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$65,915.84</b>
National Fixed Wing Specialist / Pilot	0.250	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$32,957.92</b>
NHIP / Pilot	0.500	FT	GS-13	\$83,949	400	\$131,831.67	<b>\$65,915.84</b>
	<b>14.51</b>						<b>\$1,803,112.19</b>

**Appendix S-12 – Cost of Quality Assurance Non-Pilot Personnel**

<b>Region</b>	<b>Position Title</b>	<b>FTEs</b>	<b>Position Type (FT, PT, Int, Temp, Seasonal)</b>	<b>Grade (GS-xx, WG-xx, O-xx)</b>	<b>Annual Salary/Wages</b>	<b>Annual Personnel Costs for 1 FTE (without inflation)</b>	<b>***Annual Total Personnel Costs per FTE# (without inflation)</b>
1	Maintenance Inspector	1.000	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 96,326.88</b>
1	Maintenance Inspector	1.000	FT	GS-11	\$ 58,903	\$ 80,373.14	<b>\$ 80,373.14</b>
10	Aviation Maintenance Inspector	0.600	FT	GS-12	\$ 62,740	\$100,666.33	<b>\$ 60,399.80</b>
2	Maintenance Officer	0.200	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 19,265.38</b>
3	Maintenance Inspector	0.200	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 19,265.38</b>
4	Aviation Maintenance Program Manager	0.550	FT	GS-13	\$ 83,949	\$114,548.41	<b>\$ 63,001.63</b>
4	Avionics Inspector - Regional	0.500	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 48,163.44</b>
5	Aircraft Inspector	0.400	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 38,530.75</b>
5	Aircraft Inspector	0.400	FT	GS-12	\$ 77,283	\$105,452.65	<b>\$ 42,181.06</b>
5	Aviation Inspector	0.400	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 38,530.75</b>
5	Aviation Inspector	0.400	FT	GS-12	\$ 77,283	\$105,452.65	<b>\$ 42,181.06</b>
6	Aircraft Avionics Inspector	0.500	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 48,163.44</b>
6	Aircraft Maintenance Inspector	0.600	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 57,796.13</b>
6	Aircraft Maintenance Inspector	0.300	FT	GS-12	\$ 70,595	\$ 96,326.88	<b>\$ 28,898.06</b>
6	Aviation Maintenance Program Manager	0.250	FT	GS-13	\$ 83,949	\$114,548.41	<b>\$ 28,637.10</b>
8	Maintenance Inspector	0.750	FT	GS-12	\$ 72,214	\$ 98,536.00	<b>\$ 73,902.00</b>
9	Maintenance Inspector/ Aviation Security	0.500	FT	GS-12	\$ 73,600	\$100,427.20	<b>\$ 50,213.60</b>
9	Airplane Mechanic	1.000	FT	GS-11	\$ 58,903	\$ 80,373.14	<b>\$ 80,373.14</b>
		<b>9.55</b>					<b>\$916,202.74</b>

## **Appendix T – Civil Rights Impact Analysis (CRIA)**

A Civil Rights Impact Assessment (CRIA) is required to identify and categorize the civil rights impacts of implementing any realignment initiative that will potentially affect employees. A CRIA for Forest Service employees will be developed if the Fire Executive Council recommends changes to staffing during their follow on studies.