AIR WAR COLLEGE

AIR UNIVERSITY

THE AIR NATIONAL GUARD'S ROLE

IN

WILDFIRE EMERGENCY RESPONSE

by

Brett R. Cusker, Col, USAF

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Advisor: Col Kathleen A. Hightaian, USAFR

14 February 2013

DISCLAIMER

The views expressed in this academic research paper are those of the author and do not reflect the official policy or position of the US government, the Department of Defense, or Air University. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

Biography

Colonel Brett Cusker is a U.S. Air Force aviator assigned to the Air War College, Air University, Maxwell AFB, AL. He graduated from Montana State University in 1991 with a Bachelor of Arts degree in Political Science, and the University of Oklahoma in 2001 with a Masters of Human Relations. He earned his Air Battle Manager rating in 1991 and has nearly 2,700 flying hours in the E-3 and E-8. He has served in NATO and is a graduated squadron commander.

Abstract

The US Department of Agriculture's Forest Service is at a decision point with regard to its nation-wide large airtanker strategy for combating wildfires. The Department of Defense is also nearing a decision point for reallocation of capabilities within the Total Force. Both agencies are searching for the right mix of resources to effectively and efficiently meet mission requirements. Due to climate change and population encroachment into the wild land-urban interface, the threat of uncontrolled wildfire in the Western half of the United States is at an all-time high. Unfortunately, the ability of local, state and federal agencies to combat forest fires at initial stages is at a correspondingly all-time low. Therefore, this paper offers an immediate, sustainable solution for a whole of government approach to support the Forest Services' large airtanker strategy. The approach recommended accommodates corporate and governmental needs, as well as justifying force reallocation within the Air Force by assignment of C-130 Air National Guard units, equipped with the MAFFS II fire suppression system, to the Western States that need them most. Aerial tankers provide the quickest means to suppress fires before they encroach on populated areas. States with C-130 MAFFS units could use these resources under Title 32 orders early in the fire season, and still be available to the federal inter-agency forest firefighting bureaucracy once federalized. As the Air Force redistributes roles and missions across the total Force, strong consideration should be given to assigning Western States at least one C-130 group/wing with MAFFS II firefighting capability and tasking.

The National Guard Bureau ensures relevancy of Guard forces in order to meet state and federal needs through continual analysis. This year, the bureau sponsored the following topic: "To ensure that the National Guard possesses the appropriate resources to support civil leadership during a civil emergency, is there a basic 'order of battle,' i.e., a list of the type of units that should be allotted to each state, territory, and District of Columbia? What organic equipment should be in these units and what would be the methodology for employment?"[1] To provide partial analysis of this broad research topic, this paper will specifically gather and assess data to provide thoughtful consideration of, and a strong recommendation for, the decisive capability the Air National Guard provides state emergency managers in the role of wildfire suppression. This topic is especially timely for three reasons. The first, uncontrolled wildfire in the Western United States is the most recurring and destructive natural disaster local, state and federal agencies face today. The second reason is that the Air Force is currently reevaluating force structure and roles across the Total Force (the Total Force includes active duty, reserve and National Guard forces). Finally, the third reason is the US Forest Service is in the process of collecting requests for proposals for their 2012 Large Airtanker Modernization Strategy and in addition, as of June, 2012, Congress passed the bill labeled S 3261, "Contract Award for Large Air Tankers". Signed by President Obama, the bill authorizes $24 Million for the Forest Service to fund exclusive use contracts for wildfire suppression.[2] Therefore, before the Forest Service finalizes our Nation's airtanker strategy for aerial firefighting resources, a stronger inter-agency approach must be given now to include expanding the role the of the Air National Guard in the Western States of Montana, Idaho, Washington, Oregon, Wyoming, Colorado and California by realigning and/or assigning at least one flying Air Guard unit with wildfire fighting capability to those States as part of the Air Force redistribution of roles and missions across the Total Force.

The structure of this paper will provide an overview of the roles and missions of the National Guard, describe the emergency management needs of fire-prone western states, provide a forest firefighting overview and analyze the National Guard's ability to support state wildfire suppression efforts. After establishing justification for wildfire suppression support, the report will provide additional details and options for combining aerial tanker firefighting resources across the whole of government and industry, with specific effort given to address concerns of private airtanker contracting companies regarding the use of National Guard airpower.

The National Guard is charged with important roles and responsibilities in support of both state and federal missions. The National Guard not only provides a large percentage of America's military capability as part of the Total Force concept, it also provides critical support to Homeland Security operations. Today, the Army National Guard comprises 39 % of the Army, and the Air National Guard comprises 24.4 % of the Air Force.[3] In their state roles, National Guard units also play a critical role in Homeland Security operations such as air defense, border patrol and counter drug operations and may also be employed, at state expense, under the authority of their respective Governor and direction of their Adjutant General, to respond to natural disaster, as well as civil strife.[4] State constitutions and statutes provide the authority necessary for quick activation of Guard resources. In order to keep command and control of state-activated National Guard units streamlined, the National Governors' Association has adopted the following position: "Governors believe when National Guard members perform domestic missions they should do so in Title 32 USC status."[5] This way, Governors can maintain direct control over state military forces engaged in emergency response activity through their task force commander.[6] Expedited responsiveness of the Guard in support of civil emergencies provides a crucial advantage for emergency management initial response. Early

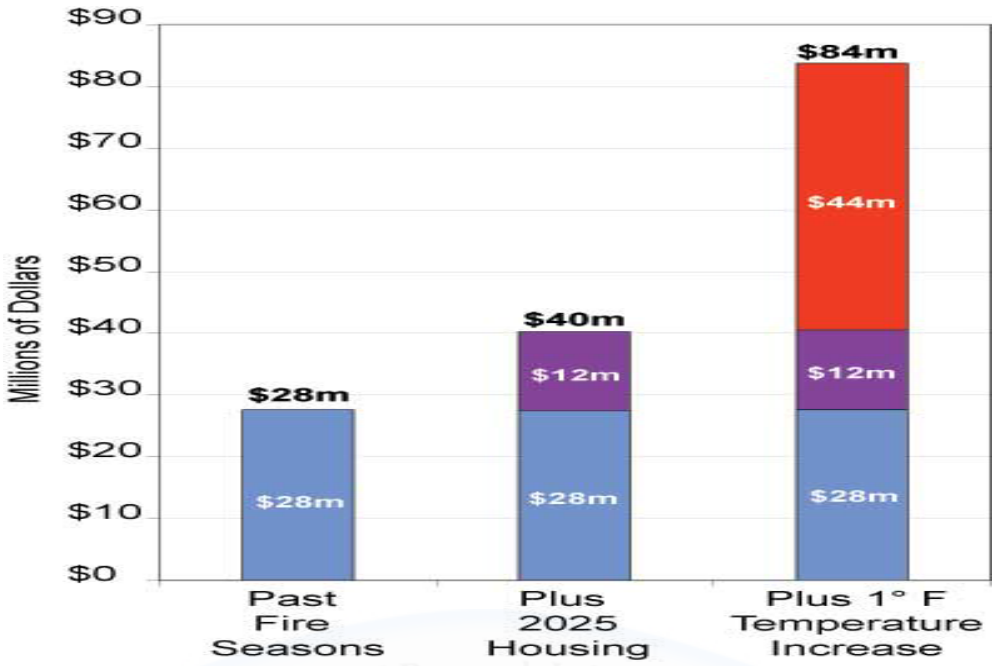
activation of Guard units provide immediate, large scale capabilities which are responsive to emergency managers through direct coordination between state emergency management and the state Joint Forces Command headquarters. The symbiotic relationship between civil and National Guard leadership ensures a comprehensive unity of effort.

Civil emergency management professionals face multidimensional threats. Local, state and federal emergency management agencies must be prepared to respond to everything from low intensity incidents like train derailments to high intensity incidents like major earthquake, floods and fire. In the western states of Montana, Idaho, Washington, Oregon, Wyoming, Colorado and California, wildfire response continues to be the most recurring and destructive emergency situation faced. In January, 2012, the research think-tank organization Headwaters Economics, headquartered in Bozeman, Montana, summarized the problem: "The price of fighting forest fires has been increasing substantially. At the national level, fire costs represent half of the Forest Service's budget and total expenses have exceeded $3 billion annually, more than twice what it cost a decade ago. Unfortunately, this expense is almost certain to grow, and, unless action is taken, firefighting costs could double again in the next 15 years because of expanding residential development on fire-prone lands and increased temperatures associated with climate change."[7] There are three reasons for the escalating costs. The first is fuel build-up in the forests partially due to zero-burn tolerance policies in some areas; the second is hotter, drier weather, especially problematic with longer summers and shorter winters; and the third is more homes are being built in the wildland-urban interface.[8] Analysis shows that the third reason appears to be the main cost driver. Headwaters Economics states in their Montana Wildfire Cost summary: "Firefighting costs are highly correlated with the number of homes threatened by a fire."[9] Federal agencies also understand this to be true. According to the Forest Service's Office

of the Inspector General, between 50 to 95 percent of wildfire suppression costs can be attributed to protecting homes.[10]

To provide specific details of these costs, this paper will focus on and cite the Headwaters Economics Montana case study, where it was discovered that 27% of firefighting efforts in that state had been dedicated to protecting homes built in the wildland interface, at the cost of approximately $8000 per home. On average, it costs $28 Million a year to fight fires in Montana. That amount will continue to grow with increased development and climate change and is expected to reach at least $40 Million per year by 2025.[11] Headwaters Economics also has exhaustive research demonstrating the effect of increased summer temperatures in the state, and has statistically forecast that effect to exacerbate the problem even further – to the tune of an additional $44 Million (totaling $88 Million by 2025).[12] A 35% increase in wildfire areas can be attributed to just a one degree temperature rise. The Headwaters Economics chart below graphically shows this.

Yearly Cost of Protecting Homes from Wildfires in Montana[13]

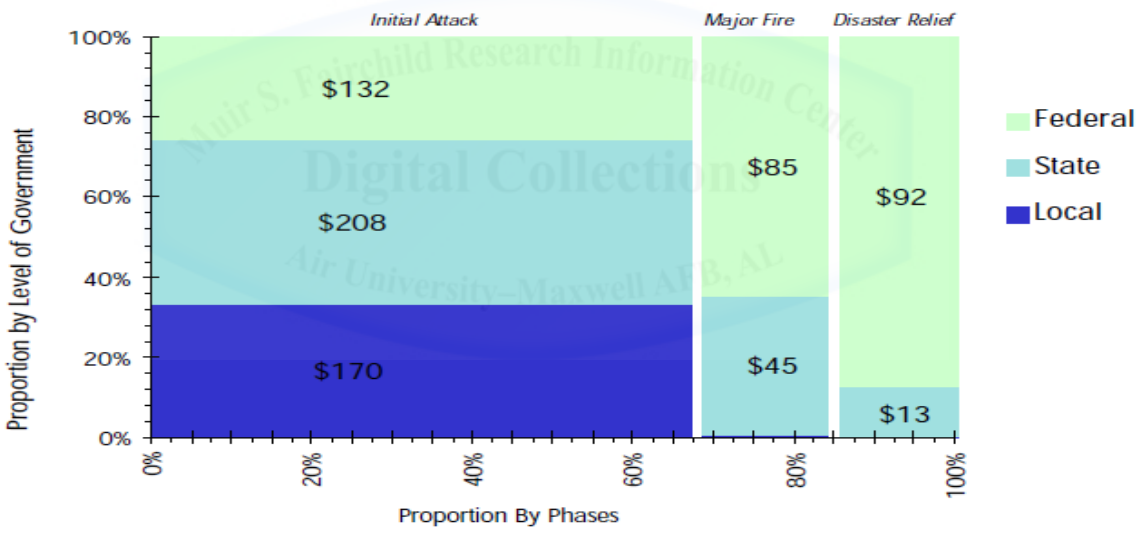


Montana is not alone in this predicament, and in some ways may actually be better off than other Western States because of its low population density. California in particular faces the problems urban sprawl brings at a much higher level. 32% of the firefighting costs in the Sierra Nevada can be attributed to protecting homes, and the state is spending more than $1 billion on fire suppression each year.[14] Local governments permit building expansion into previously uninhabited areas without consideration for the costs associated with protecting those homes from devastating forest fires. Although it is widely understood that new housing development can increase firefighting costs ten-fold and increase suppression costs of a major fire by $2 Million,[15] local and county governments provision their own firefighting forces at minimal levels because of budget pressure and because they just don't have to do more. Under current agreements, once a fire becomes too much for them to handle, they simply request, and almost always receive, support from state firefighting resources, which are in-turn routinely supplemented further by federal resources as fires get out of control. In this way, fire suppression

costs are primarily borne by state and federal tax dollars, and there is no incentive for local governments to slow development into the wildland-urban interface.[16]

Despite the challenges, states attempt to plan for the inevitable wildfire season and develop suppression plans in concert with local, county and federal governments. Each plan's objective is to reduce total costs and losses due to wildfire. The plans depend on an interdependent system of prefire management and suppression capability.[17] The chart below, although dated and reflecting costs from the California '93-94 fire season, demonstrates cost sharing percentages that continue today.[18]

Chart 1. Wildland Fire Protection Agency Budgets



As you can see, the importance of initial attack is paramount in California, due largely to the need to protect urban sprawl. California ranks first among western states in the number of homes built in the wildland urban interface area, despite the risks.[19] As California has experienced in the past ten years, the impact of zero-burn policies over time exacerbates the amount of fuel available for fires in later years. When combined with warmer, longer and drier climate conditions, this resulted in three of the worst fire seasons on record. Each season

demanded more state and federal support than ever.[20] Less populated states like Montana and Idaho also rely heavily on the federal government, because a higher percentage of land in those states is owned by the federal government. For example, the Governor of Idaho in an opinion paper written in October, 2012 reported that 93% of the acres burned in his state that year were on federal land. The 2012 fires he referred to were so massive that suppression efforts required huge supplemental funding from Congress. Senator John Tester from Montana proudly announced "The US Forest Service and the Bureau of Land Management will receive an additional $423 Million to cover the costs of this year's (2012) record wildfires. They will also receive an increase of $429 Million to fight wildfires next year, putting the agencies' firefighting budgets in line with the ten-year average to fight wildfires."[21] While Senator Tester trumpets federal windfalls to his constituents as a way of "doing something" to solve the problem, agencies responsible for actually fighting the fires know the best way to stop fire catastrophes is to put them out well before they get out of control. But, lack of funds and resources during the critical initial attack phase limits response options and often results in small fires becoming large, major fires. These major fires eventually require supplemental funding.

Until supplemental funding is received, fire managers must routinely engage in what's referred to "fire-borrowing" in order to pay the bills. "Fire-borrowing" is the practice of borrowing from other departments in order to pay for ballooning firefighting costs. Between 1999-2003, over $2.7 Billion was transferred in this way, of which only 80% was reimbursed.[22] This means 20% is never returned to the original agency that "lent" the money, causing additional burden on Senator Tester's tax paying constituents. Fire managers know that there is a better, faster and more cost effective way to control fires. Provided with the proper resources, including their own large airtanker fleet, states could put more fires out before they get out of

control and require federal monetary and/or federally contracted airtanker assistance, and thus impede the vicious circle of wildland fire destruction.

The increased wildfire situation described above underscores the dire need for effective government analysis and response to each and every fire incident. The way wildfires are responded to has a lot to do with the resources available to interagency fire stakeholders. While local, state and federal governments may have received emergency funding and increased budget allocations from Congress, allowing them to enlarge their land-based firefighting resources, the same cannot be said about the airtanker fleet. In fact, the number of available airtankers has decreased significantly in the past years, dropping to the point that only 12 contract-provided airtankers are available for fire suppression across the entire country today.[23] There are numerous reasons we face this unfortunate reality.

The first is the federal government has not owned its own fleet of airtankers for years, despite identifying a need for one on several occasions, due to budget priorities and other bureaucratic decisions for budget allocation. Not having robust initial aerial attack options often means at-risk fires are allowed to burn much longer than they should, both on state and federal land. Once those fires become major fires, the costs associated with fighting them dwarf what it would have cost to pursue aerial tanker fleet options with contractor, government and Air Guard resources.

Without adequate resources, the Forest Service and many states had little choice but to contract out the entire requirement for aerial firefighting resources years ago.[24] While contracting out governmental requirements is not without precedent, complete reliance on contractors is often very expensive, especially if there is little to no competition. Today, only a few states own

their own fleets of small to medium sized aerial fire suppression craft, and none own large airtankers.[25] This would not be as critical of a discussion if there were an adequate number of large airtankers available on the civil market.

At one time, the Forest Service could count on at least 40 large airtankers from numerous privately owned companies, but because of catastrophic airframe failures that led to several crashes in the last decade, in 2008 the Forest Service mandated each contract provider fly aircraft that meet airworthiness standards, which is the second main reason so few large aircraft (12 across the country today, as mentioned above) are available.

The third reason is that firefighting has become big business. As a consequence of the decision to rely primarily on contract air support, there are only four remaining contractors for large airtankers, and two of those currently do not own any airworthy aircraft! The four contractors competing for business are Neptune Aviation Services, Minden Air Corporation, Aero Air LLC and Aero Flite, Inc. These businesses have become powerful and influential, so much so that they now have their own lobby, the American Helicopter Services and Aerial Firefighting Association (AHSAFA). AHSAFA does everything it can to garner favor for their benefactors and stymie other solutions, to include legal objections for the use and expansion of the tried and true Air National Guard flown Modular Airborne Firefighting System (MAFFS) capability. From AHSAFA's own website: "By law, a Federal Agency cannot contract with another federal entity for goods or services, unless it can be shown that they cannot be provided by a commercial enterprise as conveniently."[26] The law cited is the antiquated Economy Act of 1932. Federal interpretation of the Economy Act of 1932 is the basis for current Forest Service policies that do not allow the federal government to activate C-130 firefighting aircraft until all of the civilian aerial resources have been used. Despite AHSAFA's objections and restrictions

from a decades old statute, the realities of our fire seasons routinely result in more demand than capacity, just like the fire season experienced in 2012. Fires this last season were so overwhelming, and airtanker resources were so limited, that the situation mandated the activation of all four MAFFS assigned units; the first time since 2008.[27]

Lobbyists can afford to object and delay. States facing catastrophic fire destruction cannot. If states owned MAFFS capable C-130 assets, they would not have to wait for levels of federal bureaucracy for approval to attack wildfire in the critical initial stages. The federal no competition law AHSAFA cites is not applicable to state government. There is hope for change at the federal level, however. From an article written in January, 2013 in the Colorado Springs Gazette, Army Gen. Charles Jacoby, commander of U.S. Northern Command at Peterson Air Force Base, is quoted as saying he's talking with federal authorities about relaxing the requirement that all civilian resources be exhausted before firefighters can tap the Defense Department's fleet of C-130 firefighting tankers. Gen Jacoby appears to have support on Capitol Hill. Sen. Mark Udall, D-Colo has been involved in discussions about tanker use and is proposing re-interpretation of the law on tanker use so administrative changes can be made.[28]

Because fire conditions are not expected to abate in the coming years, the Nation must decide now how to meet the demands. The need for a multidimensional air fleet is without question a high priority. The Director of Fire and Aviation in the USDA Forest Service, Tim Harbour, was recently quoted as saying: "In practical terms the Federal Aerial Fire Fighting Program has relied heavily on industry for aviation assets with the Air National Guard MAFFS representing a surge capacity. But the overall vulnerability is availability, and maintenance costs with aging civil fleets are nearing the tipping point. The challenge is to determine the appropriate mix of government/contractor owned resources."[29] Equally important, it is well understood that

"the most effective use of aerial firefighting is during the initial attack of small wildfires, and to accomplish specific tactical suppression objectives on large wildfires, such as reinforcing fireline and dropping on spot fires outside the fireline."[30] The USDA Forest Service Executive Summary in their detailed *Large Airtanker Modernization Strategy* report emphasized the importance of initial attack by stating: "Airtankers play a key role in successful initial attack, which is one of the most difficult and critical components of wildfire management. Successful initial attack of new and emerging fires that qualify for suppression is a critical part of keeping unwanted wildfires small and less costly."[31] Forest Service analysis provides detailed cost impacts that are compelling. They report that even a small drop (1.5%) in initial attack success is "estimated to represent approximately 150 fires that could escape initial attack, which would cost the Forest service an additional $300 Million to $450 Million to suppress."[32] In other words, this means allowing fires to get out of control is very expensive in the long run.

There is no doubt successful initial attack saves money, and a whole of government approach, to include civilian contractors, is required in order to meet fire suppression needs. Research shows that the multidimensional air fleet the Forest Service seeks cannot solely rely on the ability of civil contractors to rapidly ramp up their inventory of federally approved tankers. Since 2008, only one new airtanker has been federally approved for the demanding role of wildfire suppression.[33] The process is complicated, expensive and time consuming because civil contractors are attempting to modify passenger airline airframes for the wildfire suppression role. As a result, our nation once again faces the 2013 fire season with the average age of contract tankers of over 50 years and will have to pay even higher rates because the cost for maintaining these old airframes is rapidly increasing. The Forest Service reports that "since 2007, contract costs for daily airtanker availability have more than doubled-from just over $15 Million in 2007

to $33 Million in 2010."[34] As a result of Forest Service analysis, the Department of the Interior has concluded that "the large airtanker fleet must be replaced with newer, faster, more cost effective airtankers."[35] In fact, their preferred recommendation is for the acquisition of 25 new C-130Js. Because creating a Forest Service owned C-130 fleet is considered the "high cost" option, the Forest Service is unlikely to get the funding they need to purchase their own fleet of C-130s. Most likely, the Forest Service will have to settle for continued reliance on contractors to reengineer and heavily modify passenger jets like the BAe-146, which is the only newly approved alternative, but this will not be enough to meet demand. Another danger behind this approach is that by doing so, we'll become reliant on just one or two alternative airframes; meaning if one type gets grounded for any reason, the overall availability is reduced in half. Equally concerning is that there are only two vendors offering a contract solution. Even if both received contracts, just one going out of business would create a significant loss in capacity. The likelihood of contractors going out of business is very real. Most concerning and limiting for state fire managers, is that even if the Forest Service gets its own fleet of C-130s and the federal contractors stay in business, the problem remains that these assets are only available via federal means, out of state control, and thus inaccessible at the state level, under state decision, for use in initial attack.

Cost drives everything, and the contract aircraft being primarily considered are very expensive. According to the Forest Service, "the BAe-146 large airtanker cost is $9,983 per flight hour and $19,646 per day for availability costs."[36] The other civil alternative, the proposed and not yet Forest Service approved Bombardier Q400, is even more expensive. "Daily availability was estimated at $28,000 per day with flight costs estimated at $8,000 per hour for the Bombardier."[37] Both have less capacity and are far more expensive than the C-130. The table

below, snipped from the 2012 *Large Airtanker Modernization Strategy* report published by the USDA Forest Service, shows this.[38]

Table 2 - Current and Potential Airtanker Information

Model	Speed (mph)[a]	Load (gal)	Sorties[b]	Estimated Retardant Delivered in 6 hrs (gal)
Next-generation aircraft				
C–130J (Lockheed Martin)	380	4,000	7	28,000
BAe–146 (British Aerospace)	380	3,000	7	21,000
Q400 (Bombardier)	380	2,600	7	18,200
Legacy aircraft				
P–3 (Lockheed Martin)	290	2,550	6	15,300
P–2V (Lockheed Martin)	230	2,082	5	10,400

a. Cruise speed for a 200-mile round trip.

b. The number of initial-attack missions of 100 miles possible within 6 hours, based on cruise speed and reload/taxi times.

As you can see from the table above, the C-130 is the most capable aircraft our nation has in the wildfire suppression fleet. It's also the most cost efficient. Air Force estimates the hourly flight cost of the C-130 to be $6,660 and requires only $13,740 per day for availability.[39] While this is great news, and to the outsider, may seem like the obvious solution to the problem, there are several bureaucratic impediments to overcome before we'll see it go from the preferred, but "high cost" option to our preferred, and "most cost effective and responsive" option. In order for this to become reality, three changes must be enacted. First, the US Forest Service must have more flexibility regarding the use of MAFFS at the federal level based on capability requirements and not as just a last resort (i.e. a federal re-interpretation of the 1932 Economy Act). It just does not make sense to hold back the most capable firefighting system in our Nation's inventory in order to fund contractors who fly less capable, more expensive and less available airframes. Second, States must be assigned and allowed to activate their own MAFFS capable C-130 Air National Guard units at the state level, under Title 32 orders, in order to

provide an immediate initial attack option to local and state emergency managers. Those same units may become federalized later, but at least they had the ability to do their state duty first, at state discretion. Third, as the Nation returns to a more normal and predictable deployment schedule following our return from Iraq and our drawdown in Afghanistan, the DoD must realign capability, reevaluate and assign primary responsibility for MAFFS units to support wildfire fighting efforts and Homeland Defense. Gone are the days civilian bureaucrats from the DoD like Clark R. Lystra of the Office of Secretary of Defense can simply state at wildfire symposiums: "an increase in the use of military assets to combat wildland fires has been rejected."[40] And here are the days that the Commander of US Northern Command, in his Homeland Security role, begins to ask the right questions about military support to the very real and devastating threat of wildfire, as discussed above.

The Iraq mission is over. The Afghanistan mission is ending. The Air Force is realigning the Total Force. A multifaceted airtanker strategy is of vital interest for the suppression of wildfires before they needlessly destroy forests, property and lives. Now is the time for the Air National Guard to take a leading role in response to the most often recurring and destructive natural disaster western states face, wildfire. The MAFFS capability is tried and true. It's extremely effective at fire suppression, and has been the number one option for the Forest Service for decades. The three Air National Guard units and one reserve unit currently authorized to use the system have routinely shown just how effective and responsive the capability can be. The reasons for their success are many. First, the airframe itself is designed for short takeoff and landing, heavy hauling, precision air drop and quick turn-around. As a military system, it is purpose-built to operate in the toughest of environments and has power to spare. The aircraft has a multi-place crew which improves the safety margin of operating at low

altitudes. In the hands of experienced Air National Guard and reserve crews, the rugged airframe is all weather and night capable. Aerial firefighting is the perfect complimentary mission for these units because the basis of dropping aerial fire retardant is air drop. And air drop is a core mission set of the C-130 around the world.

The Guard and reserve units tasked with wildfire suppression are currently the "A" team of the airtanker fleet, but because of current restrictions, they are only allowed to play the game when the civil contract fleet is fully committed. This must change. The Guard has a state responsibility to respond to emergencies. It has the command and control necessary to effectively coordinate with state emergency managers. With Governor authorization, state joint forces command direction, and civil coordination, it has the legal framework needed to be activated quickly and engage decisively in emergency management response activities. While some may see forest firefighting as a business enterprise, most recognize it as a civic duty to protect people, property, resources and the forests themselves. As a civic duty, the Air National Guard, flying MAFFS equipped C-130's, can act as first responders at the state level to extinguish wildfire when it matter most – in the initial stages and get around the federal law that limits their use at the federal level. In the end, states and federal agencies will save lives, property and money. It's the right thing to do and can be done as part of a holistic solution to the US Forest Services' multidimensional aerial firefighting requirement.

In conclusion, ANG C-130 units capable of fighting forest fires support their state mission, the TAG and intergovernmental agencies in a much more tangible and significant way than any other aircraft. As urban development continues to expand into once rural areas, the ability to stop wildfires early is becoming more of a priority. Aerial tankers provide the quickest means to suppress fires before they encroach on populated areas. States with C-130 MAFFS

units could use these resources under Title 32 orders early in the fire season. As the Air Force redistributes roles and missions across the total Force, strong consideration should be given to assigning Western States at least one C-130 group/wing with firefighting capability and tasking. If politics curbs this course of action, I suggest the Forest Service look into buying the C-27 fleet Congress forced the Air Force to purchase just a few years ago. I hear there may be a “fire sale” opportunity there.

From: www.nationalguard.mil/media/factsheets/.../MAFFS

MODULAR AIRBORNE FIREFIGHTING SYSTEM

Elements

- Eight Modular Airborne Fire-Fighting Systems (MAFFS) in three Air National Guard units and one Air Force Reserve unit
- Air National Guard Units:
  - 145th Airlift Wing Charlotte, NC
  - 146th Airlift Wing Channel Islands, CA
  - 153rd Airlift Wing Cheyenne, WY
- Each unit consists of five pressurized tanks and two 18-inch discharge tubes, which can hold and disperse 3,000 gallons of retardant -- in 1,000 gallon increments or all at once
- Aircraft can be rapidly refilled with retardant, allowing operators to spend more time in the air, fighting fires
- Retardant or water is released from the tank in under five seconds, through two tubes at the rear of the plane
- Ability to respond within 48 hours
- MAFFS aircrew receive specialized training and annual refresher training

"Air tankers are a critical component of the fire suppression program"
~Mark Rey, USDA under secretary for natural resources and environment

Current as of March 2011

MAFFS II

Mission: Provides the United States Forest Service with additional aerial fire fighting assets to assist after the capabilities of commercial and contract air tankers have been exhausted.

Overview: In the 1970's Congress established the Modular Airborne Fire Fighting System (MAFFS) to assist in the wildfire suppression program. MAFFS use Air National Guard aircraft to release retardant or water from special tanks in less than five seconds through two tubes at the rear of the plane. Today a total of eight MAFFS units are operated by the Air National Guard and the Air Force Reserve.

MAFFS aircraft loaded with retardants are guided to fire-ravaged areas by United States Forestry Service piloted aircraft. MAFFS units do not require any aircraft modifications and can be loaded or unloaded using specially designed trailers located at each MAFFS operational unit.

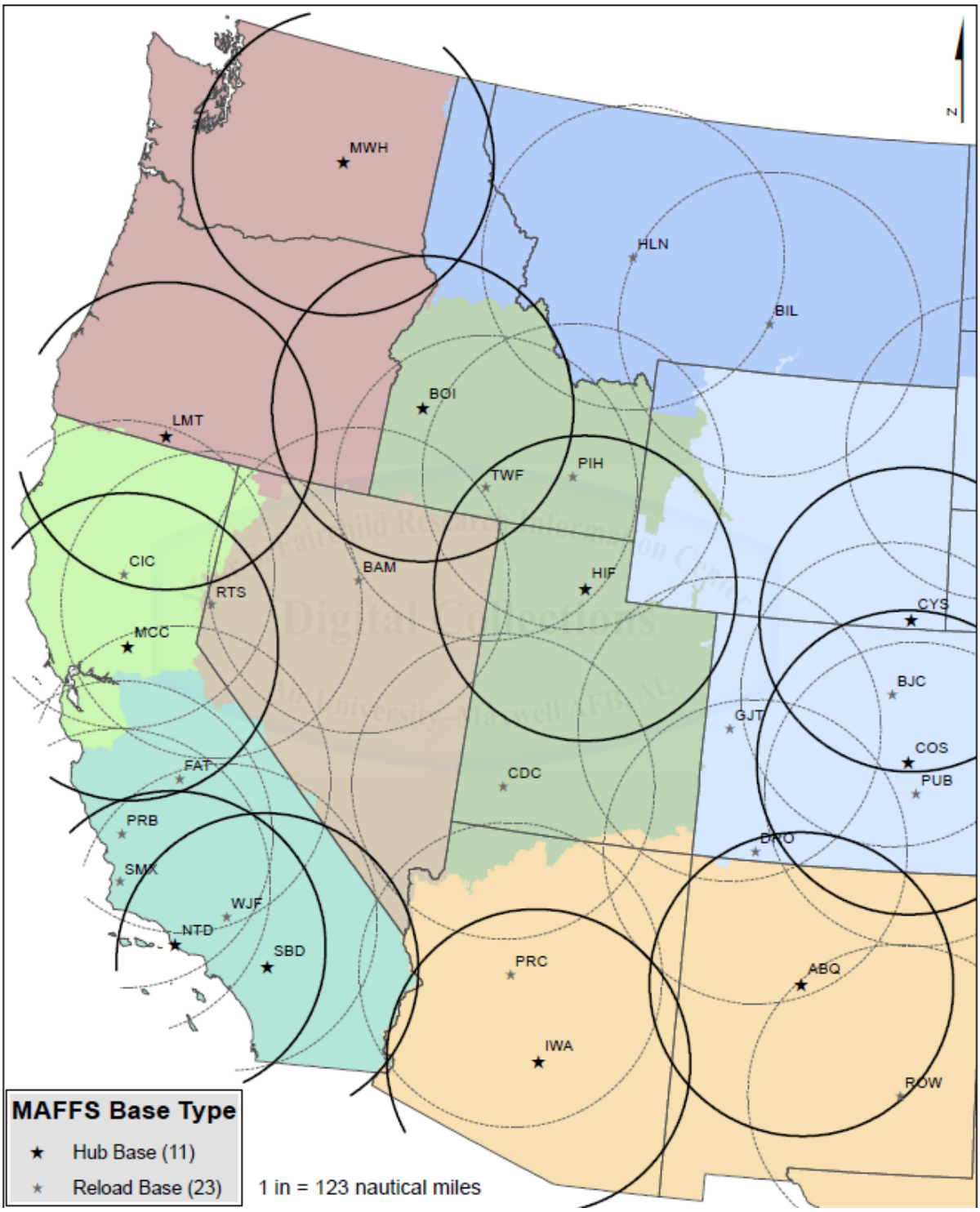
Military Airborne Firefighting System (MAFFS II): A new system implemented in 2011, MAFFS II has several improvements, including less reliance on ground equipment and personnel. Now a self-contained system, its onboard compressor decreases ground time and allows for multiple drops on each mission. MAFFS II provide better coverage and is cleaner and more environmentally-friendly.

The legacy MAFFS will be kept by the U.S. Forest Service as spares until their service life has expired.

Air National Guard MAFFS crews have fought wildfires in the United States, Europe, Africa and Indonesia.

Learn More: www.ng.mil
For more information contact NGB Public Affairs 703-607-2584

2012 MAFFS Bases with 150 Nautical Mile Range



* From: www.nifc.gov/nicc/logistics/aviation/MAFFS_bases.pdf

Endnotes

[1] National Guard Command Sponsored Topics
[2] (AHSAFA | American Helicopter Services & Aerial FireFighting Association 2012)
[3] (Congressional Budget Office 2012)
[4] (Lowenberg n.d.) pg. 2.
[5] Ibid., pg. 3.
[6] Ibid., pg. 6.
[7] (Headwaters Economics 2012), pg. 1.
[8] (Headwaters Economics 2009)
[9] (Headwaters Economics 2008), pg. 18.
[10] Ibid.
[11] (Headwaters Economics 2009)
[12] (Headwaters Economics 2012), pg. 2.
[13] Ibid.
[14] (Gude Spring, 2012)
[15] Ibid.
[16] (Headwaters Economics 2012), pg. 5.
[17] (California Fire Plan, Fiscal Framework Ch 2 2012), pg. 15.
[18] Ibid., pg. 16.
[19] (Headwaters Economics 2011), pg. 2.
[20] (Gude Spring, 2012)
[21] (Tester Hails New Assistance to Fight Wildfires 22 Sep 2012)
[22] (Headwaters Economics 2009)
[23] (USDA Forest Service 2012)
[24] (AHSAFA | American Helicopter Services & Aerial FireFighting Association n.d.)
[25] (AHSAFA | American Helicopter Services & Aerial FireFighting Association n.d.)
[26] (American Helicopter Services & Aerial FireFighting Association 2012)
[27] (C-130 Firefighting Effort Reaches Milestone n.d.)
[28] Colorado Springs Gazette (gazette.com)January 23, 2013
[29] (AHSAFA | American Helicopter Services & Aerial FireFighting Association 2011)
[30] (AHSAFA | American Helicopter Services & Aerial FireFighting Association n.d.)
[31] (USDA Forest Service 2012)
[32] (USDA Forest Service 2012)
[33] (USDA Forest Service 2012), pg. 7.
[34] (USDA Forest Service 2012)
[35] (USDA Forest Service 2012)
[36] (USDA Forest Service 2012)
[37] (USDA Forest Service 2012)
[38] (USDA Forest Service 2012), pg. 11.
[39] (USDA Forest Service 2012), pg. 10.
[40] (AHSAFA | American Helicopter Services & Aerial FireFighting Association 2011)

Bibliography

2012 ARNG Strategic Planning Guidance. July 25, 2011.

AHSAFA | American Helicopter Services & Aerial FireFighting Association. "Aerial Firefighting Tutorial." *AHSAFA | American Helicopter Services & Aerial FireFighting Association.* n.d. 222.ahsafa.org (accessed Nov 22, 2012).

—. "AHSAFA Praises Congress for Funding Aerial Firefighting Fleet Modernization." *AHSAFA | American Helicopter Services & Aerial FireFighting Association.* June 25, 2012. www.ahsafa.org.

—. "Report from the Aerial Firefighting Conference held in Washington, D.C. May 25-26." *AHSAFA | American Helicopter Services & Aerial FireFighting Association.* June 21, 2011. www.ahsafa.org.

—. "Western Fires Stretching Aerial Firefighters Thin." *AHSAFA | American Helicopter Services & Aerial FireFighting Association.* Aug 20, 2012. www.ahsafa.org.

Air National Guard Fact Sheet. 2010.

American Helicopter Services & Aerial FireFighting Association. "Military Involvement in Wildland Firefighting Impacts Commercial Airtanker Fleet Modernization." *AHSAFA | American Helicopter Services & Aerial FireFighting Association.* July 31, 2012. www.ahsafa.org.

Bicksler, Gilroy and Warner. *the All-Volunteer Force: 30 Years of Service.* Washington, D.C.: Brassey's Inc., 2004.

Brown, Lt Col David R. *Relevance of National Guard Units in the Preparation and Response to Natural Disasters.* United States Army War College, n.d.

Brown, William A. *Capability of Heavy Military Aircraft for Fighting Forest Fires.* Maxwell AFB, AL: Air University, 1972.

"C-130 Firefighting Effort Reaches Milestone." *Military.com.* n.d. www.military.com/.../c-130-firefighting-effort-reaches-milestone.htm.

California Fire Plan, Fiscal Framework Ch 2. 2012.

Charles E. Stenner, Lt Gen, Chief of the Air Force Reserve. *Total Force Policy 21: A 21st Century Framework for Military Force Mix Decision.* Air Force Reserve White Paper, 15 July 2010.

"Department of Homeland Security Federal Emergency Management Agency State and Local Programs." 2003.

Department of the Air Force. "USAF Structure Changes: Sustaining Readiness and Modernizing the Total Force." February, 2012.

Federal Emergency Management Agency. *Federal Emergency Management Agency.* n.d. www.fema.gov.

Gude, Patricia. "Wildfire Costs Rise with Rural Development." *California Forests*, Spring, 2012.

Headwaters Economics. *Evidence for the effect of homes on wildfire supression costs.* Bozeman, MT: Headwaters Economics, 2011.

Headwaters Economics. *How Much do Homes Contribute to Wildfire Suppression Costs?* Bozeman, MT: Headwaters Economics, 2012.

Headwaters Economics. *Montana Wildfire Cost Study, Technical Report.* Bozeman, MT: Headwaters Economics, 2008.

Headwaters Economics. *Solutions to the Rising Costs of Fighting Fires in the Wildland-Urban Interface.* Bozeman, MT: Headwaters Economics, 2009.

Headwaters Economics. *Summary, Wildland Fire Research.* Jan 2012.

Lowenberg, Timothy J. Maj Gen. *The Role of the National Guard in National Defense and Homeland Security.* National guard Bureau, n.d.

National Guard Homeland Defense White Paper: September 11, 2001, Hurricane Katrina and Beyond. 2005.

National Guard Regulation 500-1/ANGI 10-8101 "Domestic Operations". June 13, 2008.

National Interagency Fire Center. n.d. www.nifc.gov.

Office of the Vice Chairman of the JCS and Office of Assistant Secretary of Defense for Reserve Affairs. "Comprehensive Review of the Future Role of the Reserve Component, Vol I, Executive Summary and Main report." 5 April 2011.

Sharp, John A. Nagel and Travis. "Operational for What? The Future of the Guard and Reserves." *Joint Forces Quarterly*, Issue 59, 4th Quarter 2010.

State Budgets of MT, ID, WA, CO, WY, OR, CA. n.d.

"State of Idaho General Fund." 2012.

Tester Hails New Assistance to Fight Wildfires. Washington, D.C.: Targeted News Service, 22 Sep 2012.

The True Cost of Idaho Wildfires. Washington, D.C.: Targeted News Services, 4 Oct 2012.

US Army. *ADP 3-28, Defense Support of Civil Authority.* July 2012.

US Forest Service. *NRF-ESF-04 Fire Fighting Annex.* n.d.

US Forest Service, an Overview. n.d.

USDA Forest Service. *Large Airtanker Modernization Strategy.* Washington, D.C.: USDA Forest Service, 2012.

USDA Forest Service. *National Study of Large Airtankers to Support Initial Attack and Large Fire Suppression. Final Report Phase 1.* National Study, Washignton, D.C.: USDA, 1995.

USDA Forest Service. *National Study of Large Airtankers to Support Initial Attack and Large Fire Suppression. Final Report Phase 2.* National report, Washington, D.C.: USDA, 1996.

Velasquez, Andrew. "The State of Northern Border Preparedness: A Review of Federal, State and Local Coordination." 27 Oct 2011.

Western Forestry Leadership Coalition. *The True Cost of Wildfire in the Western US.* April 2010.