

Appendix A

Section 1. Excerpts From “Aerial Helimulching Lessons Learned and Recommendations”

by Annette Mankins, Jeff Paulo, and Jeff Ridley

Key Position Responsibilities

The **contracting officer** is responsible for all operations-connected supply and equipment contracts. An exception is when a helicopter is ordered under a forest-directed exclusive use and/or call when needed (CWN) contract. The helimulching support specialist may function as the contracting officer's representative (COR) for the rice straw mulch supply contracts, as well as COR for the emergency equipment rental agreement (EERA) contracts. Contract inspectors are designated by the COR for each helispot. Contract equipment inspection is conducted pre- and post-use at the helispot.

Helimulching support specialist is responsible for overall aerial straw helimulching application, and reports to the operations section chief or directly to the incident commander. This position is crucial and needs to be filled in the early planning stages of implementation. The helimulching support specialist also coordinates the scheduling and prioritization of helicopter operations with air operations and is responsible for aerial straw mulch activities through the support coordinator, one for each helispot (if more than one helispot is needed).

Support coordinator is responsible for overseeing the work activities of the supply receipt and/or load delivery person(s), and the field observer(s). The responsibilities include conducting and coordinating the day-to-day operations and keeping a daily log using ICS form 214s.

The **supply load tech** responsibilities include (1) keeping detailed records of rice straw deliveries, including bills of lading and certifications (see appendix D for a blank Straw Mulch Delivery Accounting form, as well as tracking load weight of each helicopter flight) and (2) total helicopter turn around times (see appendix E for a blank Helimulch Load Tracking form).

The **straw/equipment manager** is responsible for pre- and post-equipment inspections and can be a significant help with specifications of straw, set up of straw on the helispot, tracking straw delivery, and identifying safe and drivable delivery routes. This position also needs to be filled during the implementation planning stage.

The **field observers** position themselves at a safe observation point, and provide direct radio feedback to pilots and/or support coordinators during operational application as to effectiveness, wind drift, and location of current and future aerial straw drops.

Helimulching air specialist coordinates the helicopter and pilot activities and is also responsible for coordinating the activities of helispot and helicopter managers, and forest cargo-net crews on a daily basis. The helimulching air specialist is also responsible for writing and coordinating forest and regional approval of the aviation safety plan. They are also responsible for conducting the preoperational and daily safety briefings along with the helispot manager. They report directly to the operations section chief or the incident commander. This position is crucial and needs to be filled in the early stages of implementation.

Helispot managers have overall responsibility of the helispot/helibase. This includes safety, daily briefings, personnel, and set up to complete an efficient operation. They work under the direction of the helimulching air specialist and work closely and coordinate daily activities with the support coordinators. They also are responsible for force-account net loading and longline-hooking crews, safety issues, and needs.

Helicopter managers are responsible for all management factors in administration involving the helicopter. The helicopter managers work directly with helicopter pilots and are primarily focused on aerial safety considerations and fuel needs.

Net loading support personnel are responsible for safely loading and hooking up the straw-filled nets to the helicopter long line.

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Organization Recommendations

- Clarify roles, expectations, and lines of authority before initiating work activities.
- Ensure that a qualified COR is available to manage contract and EERA operations.
- Provide a helimulching technical specialist to train net crews in the safe and proper rigging of nets and hooks.
- Ensure all project personnel are properly trained for the position they are filling. **This cannot be overemphasized.**

Activities

Force account aerial straw helimulching can best be described by breaking down the work activities into six separate components, including:

- Helispot design.
- Safety and preoperational meeting.
- Net loading.
- Aerial application.
- Rice straw mulch.
- Oversight/monitoring.

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Helispot Design

The design of the helispot is essential to running a safe and effective operation.

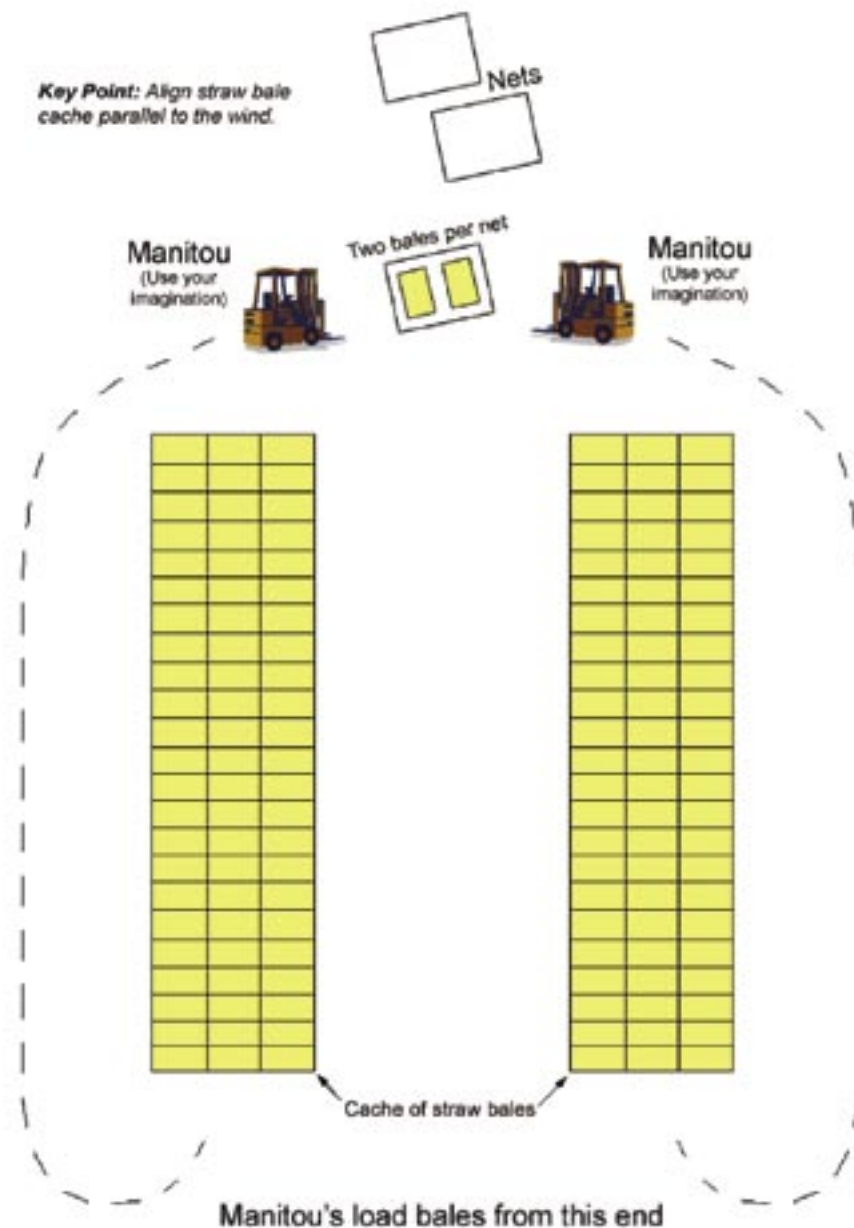


Figure 2 - Example of an efficient, safe and effective helispot straw loading set-up.

Recommended equipment and personnel for the straw loading set up is: two Manitou's (each working their own stack or cache of straw), one helicopter manager, one helispot manager, and seven qualified net loading personnel.

When designing a helispot, ensure fuel trucks and double trailers can access the staging area. Ensure there is an ample area for staging straw and net loading operations. There is a lot of equipment activity and helicopter prop wash for ground crews to contend with. If suitable helispot staging areas are not available

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on National Forest System lands, provide sufficient lead-time to develop Memorandum of Understandings (MOUs) with other agencies or private landowners. Ideally, have a local contact specialist, or a member of the buying team, versed in agreements, available. If possible, locate the helispot within one air mile of the identified mulch units. Locate more than one helispot if the units are further than one air mile.

Involve helicopter operations personnel early in the process to identifying suitable helispot staging areas and service landing areas.

Provide for a water tender on native surface helispots for dust abatement. Identify water sources in advance of operational activities. Water tenders are not needed on asphalt, or well-hardened helispots or staging areas.

A second piece of equipment is not needed to off-load straw trucks. A Manitou (equipment with a large fork on the front end that can move the bales and also lift and fluff straw after placing in the net) works well.

If possible, design helispots with sufficient safe working areas and safe egress and ingress access points for helicopters so that multiple aircraft might use the same helispot concurrently, if necessary. Do this **ONLY** after consultation with the helicopter manager, and with the concurrence of affected aircraft pilots. Weather factors can vary dramatically from site to site. Identify helispots sufficiently large to hold several days of staged straw to allow for such a contingency. Once the pilots establish an orbiting pattern, and ground crews become sufficiently organized, there should be no appreciable drop in operational productivity or safety by using multiple aircraft on the same helispot.

Safety and Preoperational Meeting

A project aviation safety plan is prepared by the helimulching air specialist. The plan is required by Interagency Helicopter Operations Guidelines (IHOG). The final plan is prepared, reviewed, and approved by the forest aviation officer, BAER implementation team incident commander, BAER team safety officer, and regional aviation safety officer. See appendix B - Aviation Safety Plan for further information.

Daily briefings are attended by all personnel every morning. The briefings include the daily objectives, and safety. Topics should include; radio frequencies to use, knowledge of field observers, field locations, traffic control, personal protective equipment (PPE) to be worn by all personnel on helispot, personnel that can be located on the "Hot Deck" of the helispot, air hazards, etc. There is also a briefing at night that everyone attends. During this briefing, the team will talk about the daily events, how things went, concerns, and solutions for concerns. The job hazard analysis is prepared by the BAER safety officer and is presented and signed at each morning briefing.

The preoperational briefing can be held the afternoon before the start date to limit "first day flight delays." The briefing is basically a project overview that includes; safety and identified hazards, communications, emergency crash rescue, call tree phone numbers, schedule timeline, start-stop times, and lines of authority. The pilot can observe units from the air with key personnel, talk about basic goals of the project, organization, maps, etc.

The FAA will not provide temporary flight restrictions (TFR) for aerial straw helimulching as is commonly received for fire emergency aerial operations. It is therefore more imperative that pilots, ground, and work crews are very cognizant of aircraft encroaching within the operational air space, so sightings can be immediately reported to air-borne pilots. Use the project information officer to provide public safety information regarding your operations, as well as sign postings in areas frequented by potential conflicts with operational air space, such as airports and local airports.

Net Loading

The key elements of this activity include the loading of cargo nets with rice straw mulch, and attaching the net to the helicopter long-line. Typically 100-foot long-lines are used. After loading the bales on to the net, the force account ground crews cut and remove the strings. **The bales should then be "fluffed" by a Manitou (or equivalent) to prevent the safety hazard of the bales shifting in the net during transport causing a jarring effect to the pilot.** The fluffing also helps disperse the straw better and create an effective ground cover with less clumping. The ground crews then attach the helicopter long-line to cargo nets.

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Provide for safety first. To spread out the work load, provide for more net-tending personnel than you think is necessary and alternate individuals in and out of rotation. Do not allow crews to become complacent, or overly tired, which can lead to accidents.

Rice Straw

The application material is rice straw for the helimulching treatment under a supply contract. Specifications for the straw are given to the procurement unit. These specifications can include, weed free, stored in a dry environment, delivery needs including dates, times and place, sizes of bales, and double chopped, etc. Specify delivered straw mulch not exceed a moisture content of 20 percent if at all possible. The ideal appears to be in the 11- to 15-percent range. If procurement is done by weight, paying for straw with a high moisture content is undesirable. In addition, “wet” straw does not disperse as well, and the treatment is less effective. This factor may depend on the time of year you are purchasing, critical time limits, and if last years or the new years straw is available. Rice straw is usually baled in late August or early September.

Provide delivery schedule flexibility in the contract. Limited staging space and environmental conditions leading to operational shut-down (excessive winds, fog) can quickly lead to “choking” staging areas with straw if a systematic, set delivery schedule is provided in the contract. Schedule deliveries with a 24- or 48-hour scheduling advance notification window. Also, schedule delivery times to be outside of helispot working hours to alleviate additional congestion. Do this as a contract requirement, unless very large staging areas are available at worksites.

To save on trucking costs, bales are compressed during baling operations to save truckbed space during shipping. Experience shows that bales exceeding baling pressures of over an estimated 450 pounds did not disperse as well during aerial application. Specify a lower maximum cap pressure per pounds/square inch if the straw is still in the field and has not been baled. The baler keeps general records of the baling pressures. Consider making documentation of baling pressure a contract requirement, or at least “cap” acceptable bale pressure. If you use the Manitou equipment to “fluff” the bales then the baling pressure is not as much of a concern.

When designing equipment agreements, provide for fixed hourly and guaranteed minimum daily rates for procured equipment and operators. Establishment of guaranteed minimum daily rates in advance will provide substantial operational flexibility if weather-related and/or nonoperational days occur.

When ordering and working with straw and equipment, a straw manager is essential to guarantee correct straw specifications and delivery options along with equipment prices and abilities to perform as needed.

Aerial Application

Helicopters must come equipped with a load cell to ensure allowable payloads are not exceeded. Load cells will also help the supply load tech to keep track of weight being delivered with each flight. Load cells include not only the weight of the straw in the net but also the weight of the “sling equipment.” Subtract the weight of the sling equipment (approximately 200 pounds) to come up with exact straw mulch pounds being applied in each load.

Loaded external cargo over flights of public highways is prohibited. Carefully identify suitable helispots where traffic control is not needed, if at all possible. If additional personnel for traffic control are required, additional communication needs, an authorization permit from the State highway department, and procurement of safety signing and cones is needed. This will greatly add to overall operational complexity. Avoid this if possible.

When designing your project, carefully consider the payload capacity and average turn around times for the considered aircraft. Safe payload capacity of the Type II ships could roughly double that of the Type III ship, but operational costs for the Type III are approximately half of those of Type II. Operational air speed is roughly comparable. Thus, overall costs per acre are almost equivalent. In general, consider Type III aircraft only for limited, specialized activity, such small capacity helispots, or in a service capacity, or if the availability of Type II aircraft is very limited.

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Oversight and Monitoring

The complexities of operating within two essentially parallel organizations can be initially difficult. The incident commander needs to clarify roles and expectations for primary overhead positions very early in the operation, which will dramatically improve internal communication and lines of authority.

Contract Method

Under the contract method, the contractor provides for all of the logistical needs of the project, including the procurement of helicopters, cargo nets, labor, loading equipment, and straw bales. Treatment areas, unit of measure, technical specifications, payment method, payment units, staging areas, and flight-restrictions are identified. Payment is generally based upon a per acre or job basis.

Organization

The contract is a service contract under Federal Acquisition Regulations (FAR), and entails the use of a contracting officer, COR, and inspectors. The project manager is responsible for the planning phase of the operation. An aviation safety plan and job hazard analysis need to be prepared and approved for the project. Also, air operations and helispot manager positions are needed. Field observers and the supply/load tech positions can be filled if needed.

Activities

See section 3 – Contract Example for BAER Helimulching.

Contract and Force Account Methods

Certain work items must be completed regardless of which method is chosen.

- Aviation safety plan and job hazard analysis must be written and approved.
- Unit boundaries need to be identified on the ground and maps created.
- GPS location of units.
- Helispots/helipads (if more than 1 helicopter is using the site then it is referred to as a helipad) identified and approved.
- Need to improve (cut trees) in support of ingress and egress, before start of project.
- Helispot set-up design.

Wrap-up

There are advantages and disadvantages to each of the treatment methods under consideration. The BAER incident commander will need to select that method most suited to the treatment requirements. The following table compares and contrasts some of the factors to consider in the selection of a treatment method. The comparisons are not absolutes, but are rather on a “relative” scale.

The flexibility of the force account method makes this option a preferred selection if experienced and knowledgeable helimulching personnel are available to implement the project. Also, if the forest or unit does not have a contracting officer available, you may choose the force account method. Time constraints and available personnel are also considerations in the factor of choosing the method of implementing helimulching.

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Table 1: Treatment method selections... factors to consider.

Factor	Contract	Force Account
Implementation	Immediate	Immediate
Cost	Higher than force account	Lower than contract
Scale	Better suited to larger (500+ acres, more than 1 helicopter)	Better suited to smaller (<500 acres, 1 helicopter)
Skills needed	Service contract COR, inspectors, helispot managers, field observers	Supply, service (equipment) COR, inspectors, helimulching air and support, support coordinators, field observers, and net loading support
Preflight with project manager/specialists	N/A	Usually done to check unit boundaries and prescriptions
Lines of authority	Linear (simple)	Multilateral (more complex)
Flexibility	Generally inflexible, changes costly	Generally flexible

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Section 2 – Aviation Safety Plan

Bear Fire Burned Area Emergency Rehabilitation Shasta-Trinity National Forest

Helicopter Mulching

Prepared by: _____ Date: _____

Helimulching Specialist

Reviewed by: _____ Date: _____

BAER Helimulching Leader

Reviewed by: _____ Date: _____

District Ranger

Approved by: _____/s/ Stanley A. Kubota_____ Date: 11/15/2004

Forest Aviation Officer

Reviewed by: _____/s/ Dennis Hulbert_____ Date: 11/16/04__

Regional Aviation Officer

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Introduction and Objectives

The 2004 Bear Fire has created flooding problems around the Jones Valley Resort Marina, Jones Valley Boat Launch area along Shasta Lake. The downstream value at risk is the access road into this area.

The objective of this project is to reduce erosion by treating the area with straw mulch. Approximately 230 acres have been selected for treatment with straw mulch applied by helicopter.

Justification

The area selected for treatment is steep, rocky, and covered with hazard trees. By minimizing ground personnel in the area it will significantly reduce exposure to ground personnel.

Project Description

General

The treatment area is located along the road, which is adjacent to Shasta Lake in the Jones Valley Resort area. This road allows access to Shasta Lake, which is highly used for recreation and employment for the surrounding community.

Elevations for the project site will range from 1,000 to 1,500 feet. The project is scheduled for Thursday November 18 thru November 21, weather permitting.

Landing Area

The site selected for flight operation is the Jones Valley Boat Ramp a 2-acre paved area, elevation 1,114 feet (Lat. 40. 44. 309 x 122. 12. 958). The landing area is in the immediate area of the treatment areas and visual contact with helicopter will be maintained at all times. The access road and boat ramp will be closed off to public access due to public safety. Road guards, boat patrol, and law enforcement will be patrolling to keep public out of the work area. A safe site has been designated in the case of public viewing that is out of the flight operations area. Road guards will allow limited controlled access to authorized personnel and local resort employees on an as need basis. Over flights of buildings, vehicles, people, power lines will not be allowed. A light post stands 40 feet tall in the middle of the parking lot. This pole will be marked and avoided. Small trees will be removed to ensure a proper departure for the helicopter. Helicopter fueling will be conducted at the Jones Valley parking area. A Type 3 engine with crew will be on standby at the site for a fire or medical emergency.

Hazards

The project area has a small section a power lines that run trough it. The lines are below tree-top level and are visible. The power lines will be identified to the pilot in the preoperational briefing on Wednesday, November 17th. Pilot review of the current Shasta-Trinity Flight Hazard map will be reviewed with the pilot. No mulching drops will be made on power lines and a 50-foot buffer on either side of power lines will be maintained. A NOTAM will be issued to avoid this area. Standing trees are present in the area. Flight altitudes of 100 feet above ground level (AGL) will be maintained while drops are being made. Flight operations will be conducted between civil twilight hours and will be shut down earlier if low light conditions exist. Flight operations will stop each day at 1600 hours to ensure debriefing with pilot can be made and ferry of aircraft to Redding Airport can be accomplished.

Project Operation

Unless specifically noted and approved all project operations shall be in compliance with the IHOG.

Daily operational briefings and debriefing will begin and end at the designated project site with helimulching specialist, helicopter manager, and all crucial BAER personnel. Problems encountered will be mitigated

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before the next operational period begins. The project-briefing checklist will be utilized each day of operation before beginning. If needed a reconnaissance flight will be offered to pilot if need to identify targets of hazards.

Straw mulch will be applied by helicopter using aerial mulching methods developed and approved by San Dimas Technology Development Center. These methods of have been used successfully on the Mendocino, Shasta-Trinity, Six Rivers, Stanislaus, San Bernardino, and Uinta National Forests.

Using these methods straw in loaded into cargo nets according to type and capability of aircraft used.

Three rings will be attached to the releasable hard point of the remote hook. The fourth ring will be attached by an approved tether strap to the long line and not to the remote hook cage.

Release of the remote hook by pilot will invert the net, dumping the straw contents. The net will remain attached to the long line by tether strap and returned to straw base for reload.

Strings on the straw bales will be cut after they are loaded into the net. Straw bales will be dropped from 100 feet AGL with appropriated air speed to ensure proper dispersal of straw. Typical airspeeds for dispersal range from 40 - 60 knots at a height of 100 to 150 feet AGL.

In the event the straw bales do not disperse properly with height and airspeed. A "Manitou" (small Kubota-like tractor) used to move bales into the net, will be used to fluff up straw to reduce compaction of straw. To operate the equipment on the straw base, contractor/nonhelitack personnel must be used under full supervision of helitack. These personnel will use proper PPE in accordance to the IHOG on the straw base during helicopter operations.

Straw bales weigh approximately 1,000 pounds each. Nets and 150-foot long line weighs approximately 250 pounds. Two 1,000-pound bales will be flown at a time.

Specifications on Helicopter are 2,500 pound HOG external jettisonable load at 1,500 feet at 30 degrees Celsius. It will be the pilot's responsibility to perform agency helicopter load calculation utilizing appropriate performance charts to ensure maximum weight limitations are not exceeded on aircraft. Payload weight will be documented on agency manifest form.

Required Personnel

BAER helimulching specialist- Jeff Ridley has been designated in this position. He was involved with San Dimas in the development of this project. He is responsible for aviation project implementation, training helitack crew on equipment and procedures, and be present for technical knowledge when needed.

A fully qualified helicopter manager will be required for helicopter. The helicopter manager is responsible for contract administration of the helicopter and the overall safe operation of the helicopter on the project. He will also manage the safe operation of personnel and crew on the straw base.

Helitack crew. Four personnel will be needed to load and hook nets at straw base. They are responsible for proper loading and hooking of nets for the project.

Contract equipment operators must be used. They are nonagency personnel and are nonhelitack qualified. They are responsible for loading nets under helitack supervision, and for the safe operation of equipment. They will comply with PPE requirements required according to the IHOG for helicopter operations.

Field observers will be utilized for this project to assist clearing of area of personnel, assist in identifying targets with helicopter pilot by radio and record data. Field observers will not be located in the drop areas.

Aircraft and Pilot

The aircraft and pilot used to complete this project must be carded and approved for external loads, long line, and mountain flying by the appropriated agency.

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Emergency Crash Rescue

Prestablished incident response plans over the project shall be accordance with the Shasta-Trinity Forest Aviation Plan and the aviation mishap response guide. All aviation mishaps will be coordinated through the Redding ECC by forest repeat tone 13.

Special Considerations and Equipment

Over flights of personnel, populated areas, power lines, boats will not be permitted.

All external load equipment will comply with agency requirements for the specific project outlined. No swivel will be used with long line equipment.

Helicopter and fuel truck will remain overnight at Redding Airport for aircraft security.

Communications

All key ground personnel shall be equipped with a programmed radio for the project. Flight following to and from Redding Airport to project site with be done through Redding ECC on forest repeat tone 13. Redding ECC will be notified of beginning and end of flight operations and all flight following for the project will be done locally by helitack and will be conducted in 15-minute intervals. If communications are lost with helicopter, operations will stop to communications are reestablished.

Purpose	Frequency Name	Frequency
Redding Dispatch	Redding	rx 171.575 tx 169.100
Flight following.		
Emergencies	tone 13 (Consider Tone 2)	
Local Flight Following		
Air-to-Ground Communications	Air to Ground	170.000 simplex
Ground Communications	Crew Net	168.200 simplex

Section 3. Contract Example for BAER Helimulching

Spanish Fire, Mendocino National Forest November 2003

PART 1 – THE SCHEDULE

SECTION C- DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.1 Description of Work:

The intent of this contract is to secure services for aerial application via helicopter of certified weed free, double chopped rice straw on 143 acres of high intensity burned area to control erosion in areas burned by the Spanish Fire on the Mendocino National Forest.

The contractor will be responsible for furnishing, storing, loading, hooking, and applying straw by helicopter on designated areas.

The contractor shall provide everything-including but not limited to all equipment, supplies, transportation, labor, and supervision necessary to complete the project, except for that which the contract clearly states is to be furnished by the Government.

Work is to be completed by November 10, 2003.

C.2 Licenses and Insurance:

Due to the urgency of this procurement, the contractor shall provide the documentation required within one day after contract award, except as provided below. If the contractor fails to provide the documentation within this timeframe, the contract may be terminated for default in accordance with Clause 52.249-8.

Aircraft Inspection: Helicopter does not need to be USDA Forest Service carded. Prior to award of contract, the prospective bidder may be required to make all aircraft and straw delivery systems available for inspection at a location selected by the Government and agreeable to the prospective bidder. Failure of the bidder to make all aircraft and equipment available for inspection or failure to provide all required equipment, or meet FAA inspection requirements will be cause for rejection of bid or termination of contract.

Pilot Certification: Pilot shall be FAA approved FAR 133 and does not need to be USDA Forest Service carded. The prospective bidder shall provide the contracting officer with the names and certifications of all pilots under this contract. Contractor shall provide proof that all pilots are commercially certified by the FAA to operate the aircraft provided for this contract.

Straw: The contractor shall provide a certification of weed free straw to contracting officer prior to the start of work.

C.3 Estimated Start Work Date: November 1, 2003

C.4. Restriction on Work:

Work may be performed at any time during the period of the contract, except as outlined in this part. Nothing in this part shall be construed to take away any of the Government's rights under the Suspension of Work Clause (52.212-12). Restrictions are as follows:

1. In accordance with the fire plan, if included in Section J.
2. When the contracting officer (or designated representative) determines that adverse weather has made access too dangerous or that continued vehicular travel would cause unacceptable road damage.

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3. All aerial mulching operations will be limited to daylight hours. No aerial mulching before FAA official sunrise and after sunset.
4. Wind speed is greater than 15 miles per hour.

C.5 Project Location and Description:

Location: The project is located on the Mendocino National Forest. The purpose of this project is to mulch 143 acres of high intensity burn areas to protect soil productivity and the potential for flooding, sediment, and debris flows in riparian areas following the destructive aftermath of the Spanish wildfire, which burned over 6,000 acres.

The Spanish fire is situated on the Grindstone Ranger District. All of the fire is located in the Spanish Creek watershed that drains into the Black Butte River, an anadromous fish stream.

Treatment areas will be covered with a continuous layer of straw.

Identified Helispots

One staging area is available for a helispot. It is located on private land on Bear Wallow Ridge. The USDA Forest Service has landowner permission to use the site. The County Road will remain open during this contract.

Location 1 staging area is on County Road 311.

Lat. 39° 36' 795" Long. 122° 49' 477"

Helimulching Locations

Area	Acres	Comments
		Apply an even continuous layer of straw at 1.25 tons per acre. Avoid areas where trees have brown or green needles and rock outcrops.
1	16	Unit has two small drainages.
2	20	Two small streams. Start about 100 feet uphill from the main stream.
3	19	Two small streams. Start about 100 feet uphill from the main stream.
4	15	One steep stream channel below road.
5	7	One steep stream channel 150 feet above and below road.
6	7	One steep stream channel 150 feet above and below road.
7	28	From stream confluence upstream to near upper road. Avoid mulching rock outcrops on west side of channel.
8	31	Mulch the main stream and two side streams.

Description: The contractor shall apply mulch onto mountainous terrain ranging from 3,600 to 6,000 feet above sea level. Most work will be between 4,800 and 6,000 feet. Winds are subject to local terrain features and may be unpredictable. Mulching units are not well designated on the ground. Exact latitude/longitude coordinates for locations of mulching units are obtainable from the provided work maps. Mulching areas are certain areas in high intensity burns that are not readily identifiable from the air. The contractor, using the map, unit location, and topography will be responsible for mulching unit boundaries and applying straw within those boundaries. USDA Forest Service ground spotters and some red panel markers will aid the pilot in locating the areas.

Accessibility: The general location of the project area may be viewed by 2-wheel drive vehicle by traveling Forest Highway 7 to Alder Springs and taking County Road 311 to Bear Wallow Ridge (towards Logan Basin).

Road 21N06 (Markham Ridge road) traverses the middle of the project area.

Units 2 through 7 are accessible by 2-wheel drive high-clearance vehicle. Units 1 and 8 mulching areas are only accessible by foot or by aerial reconnaissance.

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C.6 Public Safety:

The contractor shall provide for public safety when operating by installation of warning signs on roads leading to the operation, which shall contain language indicating the type of operation occurring. Warning signs, meeting the Manual of Uniform Traffic Control Devices (MUTCD), shall be posted according to the MUTCD specifications for the given situation so as to be visible to oncoming traffic.

C.7 Government Furnish Property and Personnel:

Maps - Topographic maps with firelines and treatment areas as well as photographs will be provided to the successful bidder.

Radios: The Government will provide a portable radio capable of communicating on national forest frequencies for each aircraft.

COR/Inspector: The Government will supply personnel to administer the contract and count straw bales going to the various locations.

Spotters: The Government will provide spotters to observe the locations and spreading of mulch.

Fire Engine: A USDA Forest Service fire engine and/or water tender will be at the location for dust control during flight operations.

Helibase Manager/ Helicopter Manager: The USDA Forest Service will provide managers for the project.

C.8 Contractor Furnished Equipment:

The contractor shall provide all labor, equipment, and material necessary to load, service and otherwise support the mulching operation at the project site, including the following:

1. All straw required under the terms of this contract.
2. Aircraft pilot(s) and ground crew personnel trained in loading and hooking nets and mulching by aerial application.

Personnel: The contractor shall provide pilots that are commercially certified by the FAA to fly aircraft appropriate to this contract. Proof of certification and flight experience shall be supplied to the contracting officer prior to contract award. The contractor is responsible for providing housing, subsistence, and transportation of contractor's personnel to perform all of the operations related to this contract.

It is recommended that those personnel working near the helicopter should wear nomex clothing, hard hats with chin straps, goggles, leather gloves, and 8-inch top leather boots. The pilot should wear nomex clothing and gloves. If necessary, nomex clothing and hardhats with chinstraps could be supplied by the Forest Service. Contractor to notify Bob Faust (530) 934-1152 three days prior to operations of clothing size for pilot and for crewmembers working around the helicopter.

Helitack crew: The contractor will provide a helitack crew to secure nets to the helicopter hooks and block the public from the operational area.

Straw: The contractor shall supply, for application, certified weed free rice straw. Straw will be finely chopped (double chopped) roughly 5 to 9 inches in length so that releases from cargo nets and spreads evenly.

Straw will meet the following specifications.

1. Rice straw shall be certified weed free by the County Agriculture Department.
2. Straw bales shall be recently baled. No older than 2 months.
3. Straw needs to be flailed chopped twice to produce straw lengths of 5 to 9 inches.
4. Straw shall be baled at a moisture content less than 13 percent.
 - a. Moisture needs to be measured with a moisture gage.

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5. Small bales shall be baled at 60 to 70 pounds per bale or large bales at 800 pounds per bale.
6. Straw shall be stacked on dry ground clear of noxious weeds or tarps/plastic.
7. Straw shall be covered if rain is predicted or occurring

Nets: Cargo nets need to have webbing with rings on each corner. Net size needs to be larger than 15 feet square.

Aircraft: The contractor shall provide helicopters capable of carrying loads in excess of 1,700 pounds and operating at elevations of up to 6,000 feet.

Radios: Radios to interface with victor and forest frequencies.

Straw Application System: The contractor shall provide a helicopter equipped with a long line and remote hook, 15 by 15 feet or larger flat 4-point nets (retrievable net system), and necessary rigging. Multiple hooks are necessary to open one net at a time.

Fuel Truck: FAA approved fuel supply truck. Operator shall have an external load Class B endorsement.

C.9 Technical Requirements/Work Method:

Personnel: The contracting officers representative has the authority to require the contractor to replace any pilot that fails to carry out the specifications of the contract or is operating aircraft or conducting operations in an unsafe manner.

Helibases and/or Landings Sites: The contractor shall be responsible for improving helibases and/or landing sites prior to treatment. The Government shall provide maps of approved heliports and landing sites in the area. Any repairs or rehabilitation of the sites shall be the responsibility of the contractor.

The contractor is responsible for removal and disposal of all debris, which result from the contractors operations. This shall consist of; (but not limited to) baling twine, spilled straw at loading sites or otherwise, pallets and other debris resulting from the mulching operations.

The contractor shall supply a sanitation unit.

The contractor is responsible for all cost incidental to the equipment move-in and move-out.

Straw: Receipts from the straw vendor reflecting tons of straw sold must be presented to the contracting officers representative prior to application. The straw shall be delivered in a manner to facilitate even application and capable of extended storage on site for up to several days under variable weather conditions.

The contractor at its own expense shall replace straw not accepted by the Government.

Straw Delivery and Staging Area: Straw shall be delivered to the selected staging area. The contractor shall supply a squeeze and operator to unload and stack straw. Onsite straw must be protected from rain and not have a moisture content greater than 13 percent. Straw will not be spread if it is wet.

Aircraft: The contractor shall provide helicopters capable of carrying out the terms of the contract. The aircraft shall have the capability of efficiently lifting and operating at speed, and at the altitudes described in C.5. Helicopters should be type II (medium) or equivalent with the same capability.

Helicopters shall be equipped (provided by the contractor) with electronic navigation equipment (GPS) to locate the units. Swath spacing may be done by GPS or visually by the helicopter pilot.

Helicopters shall be equipped with radio communications, air to ground, and shall be maintained during flight operations. The contractor shall provide radio communications equipment in each aircraft for air-to-air communications. The USDA Forest Service will provide a portable radio for air to ground communications with USDA Forest Service personnel. Each aircraft shall also have separate equipment (contractor furnished) for communication between the pilot and the contractors ground personnel.

Contractors operations shall meet industry standards, the approved project aviation safety plan, and the Sequoia National Forest Aviation Management Plan.

Appendix A

The Government or their agent(s) will investigate any accident. Any aircraft involved in any accident shall be deemed to be in sole control of the government and/or its designated agent(s). Access to the accident/incident site and/or aircraft shall be by approval of the contracting officer or designated representative only.

Accidents shall mean destruction or substantial damage to aircraft components and any injury to personnel as defined by the National Transportation Safety Board (NTSB).

Serious incidents shall mean any air to ground mishap, malfunction, or situation involving aircraft or personnel, which results in a deviation from standard procedures and has the potential for resulting in an accident, injury or death.

All wreckage and equipment, which might be involved in an accident related to this contract, shall be under the control of the contracting officer or other persons or agencies designated by the contracting officer until released. Aircraft or pilots involved in any serious incident or accident are suspended from further use until released by the contracting officer.

The contractor agrees to fully cooperate in any investigation and to provide any needed records, statements, or parts in the investigation of any accident of serious incident.

If the Government deems it necessary to disassemble any of the aircraft or its components to detect probable cause of the accident, the Government will be responsible for any costs for disassembling. The contractor will be responsible for any costs involved in reassembly and approval for return-to-service of any item disassembled by the Government.

Straw Application System: The contractor shall provide a helicopter equipped with a 50-foot to 150-foot long-line incorporating an electrically operated remote hook.

Flat, 15- by 15-foot or larger, 4-point cargo nets (no self tightening purse strings) capable of loads in excess of 1,500 pounds. Hook carousel need to accommodate 2 to 4 nets. Straw will be spread by releasing one half of the cargo net while flying over firelines and slope units.

Speed and altitude of the helicopter will be dependent on the slope of the land to get adequate straw coverage on the soil. Generally the helicopter will be flying about 200 feet above the ground and at a speed of 30 to 50 miles per hour.

Rigging to allow three of the four points to be released and forth point remaining attached to remote hook or cage.

Initial calibration of the system will be conducted with Government oversight. Test flights measuring straw coverage will be required to obtain the correct calibration for the coverage depth and swath width. All calibration flights shall be at the contractors expense.

Application Rate Monitoring: The USDA Forest Service will provide personnel to monitor the location and application rate of treatment. Monitors will need to be able to communicate with the helicopter pilot.

Mulch Application: Sequence of areas to be treated and timing for treatment will be determined by the contractor and agreeable to the contracting officer and contracting officer representative. All mulching operations will be limited to daylight hours. No mulching before FAA sunrise or after sunset. Pilots will be restricted to 8 hours of actual flying time per calendar day.

The contracting officer or the COR will use the following criteria to determine when spreading operations will cease.

1. Wind velocity seriously affects normal spreading patterns.
2. Fog, rain or snow making visual inspections inadequate.
3. Surface runoff from rain is excessive.
4. Air turbulence (thermal updrafts, etc.) seriously affects normal spreading patterns.
5. Application being performed under inadequate light conditions.
6. Radio communications not working properly.

Appendix A

7. Rate of application, calibration or coverage are inadequate as determined by the contracting officer or contracting officer representative.
8. The pilot-in-command determines flying conditions are beyond control of the pilot or aircraft capability.

IMPORTANT – PLEASE NOTE THE FOLLOWING DISCLAIMER:

NOTE: “It is not the government’s intent to infer, refer, or influence preferences of sources provided. The following list of known sources is provided for informational purposes only and solely due to the urgency of this procurement.”

Known Straw Suppliers

Thad Rodgers: Ph (530) - Fax: (530) 934-2445

Joe Carrancho: Ph (530)438-2518 - Fax (530)438-2514

Rick Green (530)934-7225 - Fax (530)934-9666

Ron Kampschmidt (530)934-4500 - Fax (530)934-9575

Known Helicopter Services

PJ Helicopters: Ph (530)527-5059 – Fax: (530)527-1730

West Wind Helicopters: Ph (916)645-8117 - Fax: (916)645-9479

Rogers Helicopters: Ph (559)299-4903 - Fax (599)292-5240

Redding Air Service: Ph (530)221-2851

A&P Helicopter: Ph (530) 742-4119

Appendix A

Section 4.
Straw Delivery Accounting Form

Contract Number	Driver	Date	Time	Est. Weight	Weight Tag #	Received By	Remarks

[illegible]