

**RESOURCE ADVISORS FIELD GUIDE  
2014**



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ROLES & RESPONSIBILITIES of the  
RESOURCE ADVISOR

RESOURCE ADVISOR NOTES

I. Resource Advisor Position within the Incident Organization:

Resource Advisor is *Appointed* by the Agency Administrator.

Resource Advisor *Reports* to the Incident Commander (IC).

Acts as a *Liaison* between Agency Administrator, the IC, resource users and affected parties during,

Extended Attack Fires

Larger Incidents

Fire Suppression Rehabilitation

Burn Area Emergency Response

Prescribed Fires

II. Role of the READ

Assists in the development and provides overall guidance in the WFDSS. Also participates in any revisions to these decision support documents.

Represents the Agency Administrator and communicated agency resource concerns to the Incident Management Team (IMT).

Identifies areas of concern (environmental, social, political).

May provide costs for resources at risk, as well as costs of mitigation or rehabilitation of suppression efforts.

Provides input to and coordinates with the Incident Command Team (IMT).

Ensures that planned mitigation measures are carried out effectively.

Assists in developing short & long term natural resource and cultural rehabilitation plans.

Provides rehab planning/assessment/coordination along with IMT in fire suppression rehabilitation efforts.

*REHAB Continued...*

LONG TERM MANAGEMENT

- Close new fireline/helipad/helibase permanently.
- Improve existing trail/road used during incident.
- Retain ATV/Motorized Access.
- Other—describe in Notes

REHABILITATION ACTION:     YES     NO

- Cross drainage needed—construct waterbars
- Grade Road / trail
- Pullback windrows / veg
- Seeding / Reseeding
- Recontouring
- Rehab Creek Crossing
- Rehab Private Land within FS jurisdiction.
- Spread slash on rehab areas.
- Rehab handlines
- Rehab Safety Zones
- Repair fencing damaged by suppression actions.
- Rehab staging or parking areas.
- Rehab helispots / helibase areas.
- Remove wrapping & staples from structures.

EQUIPMENT TYPE NEEDED FOR REHAB WORK

- Excavator
- Grader
- Dozer
- Skidder
- Hand Crew
- Other \_\_\_\_\_

MATERIAL / SPECIAL NEEDS

Seed Mixture: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RESOURCE ADVISOR—SAFETY

Communicate with the Incident Management Team.

Get an Overhead Order # (O-#) and CHECK IN with IMT PLANS Section—Carry Redcard!!

Make sure you are listed (with contact information) in the Incident Action Plan.

**CHECK IN AND OUT DAILY WITH YOUR IC/BRANCH/DIVISION SUPERVISOR !!!**

***Carry a map, radio, communication plan, and daily IAP at all times.***

Establish communication with Branch or Division Supervisor and working equipment/hand crews.

***Know the Incident within an Incident Action Plan and the Medical Action/Evacuation Plan .***

Wear Fireline PPE at all times.

If resource advising before fire has been determined confined/controlled—carry a firefighting tool & fire shelter at all times when on the fire line.

Follow the 10 Standard Fire Orders

Be AWARE of the 18 Situations that Shout Watch Out.

Always use LCES.

Custer Gallatin National Forest  
Aquatic Invasive Species Prevention Strategy

June 4, 2007 (*update 07/2013*)

PROBLEM

Aquatic Invasive Species (AIS) are a serious problem throughout North America. The Federal Non-indigenous Aquatic Nuisance Prevention Control Act of 1990 amended by the National Invasive Species act of 1996 calls for the development of State and regional management plans to control AIS. State, Federal, and Private organizations in Montana developed the Montana AIS Management Plan 2002. This prevention strategy complies with and is specific to Forest Service fire suppression activities within Custer Gallatin National Forest protection area.

Introduction and spread of AIS via fire suppression activities is a serious concern. There are many pathways for introduction and spread of AIS, which can result in severe economic and ecological impacts. These operational guidelines focus on the preventative protocols to control the spread of AIS during both aviation and ground fire suppression operations.

*Note: This strategy should not be construed as a roadblock to urgent suppression action when life or property is threatened. When a situation arises, when immediate suppression action requires noncompliance with this strategy, it shall be documented and passed to the land management agency.*

PREVENTION APPROACH

The following protocols were adapted from Region 4 (<http://www.fs.fed.us/r4/resources/aquatic/guidelines/index.shtml>) and are relevant for preventing the spread of multiple forms of AIS (plants, animals, and microbes) known to have a high potential for spread and colonization in Region 1 (as listed in the Montana AIS Management Plan, 2002).

**At a minimum, aviation resources will adhere to the following protocols, as well as all other fire suppression activities where possible.** This will be the most cost effective and efficient way to meet the prevention goals of the Montana AIS Management Plan.

If aircraft or other equipment change water extraction locations (ie. between water bodies), then the prevention standard will be implemented before extracting water from any other water source.

STANDARD PREVENTION GUIDELINES

The Forest has a list of known sources of any AIS — Contact Scott Barndt (SO Fisheries), Clint Sestrich (CZ Fisheries) or Bruce Roberts.(WZ Fisheries).

Fire Suppression Rehabilitation -  
Field Data Collection Sheet (example)

INCIDENT: \_\_\_\_\_ Date: \_\_\_\_\_

DIVISION: \_\_\_\_\_ DIVS: \_\_\_\_\_

ORIGINAL AREA CONDITION

- Undisturbed Native Vegetation
- Managed Forestland
- Walking Trail
- Motorized Use Trail
- Seasonal 4WD Road/Trail
- Unsealed Road
- Sealed Road
- Grazed/Agriculture Lands
- Creek/River
- Other - describe in Notes

TYPE of DISTURBANCE

- New dozer line in previously undisturbed area.
- Dozer line adjacent to existing road or trail.
- Existing road / trail brushed up or widened.
- Existing road/trail compacted and drainage impacted by normal travel.
- Complex of Dozer lines in a small area.
- Scraped off grass across cleared / pasture area.
- New helipad / helibase constructed.
- Other—describe in Notes.

OTHER DISTURBANCE

- |  |  |
|--|--|
| <input type="checkbox"/> Structure Wrapping      | <input type="checkbox"/> Safety Zone Constructed           |
| <input type="checkbox"/> Other—describe in notes | <input type="checkbox"/> Fencing damaged                   |
| <input type="checkbox"/> Handline Constructed    | <input type="checkbox"/> Staging/parking area constructed. |

## Retardant or Foam Use near Streams and Riparian areas

(Forest Service only!)

The aerial application of fire retardant is allowed for fighting fires. Aerial delivered fire retardant should not be applied to any mapped avoidance area, waterway or buffer. **The only exception to using aerially-applied fire retardant in avoidance areas is for the protection of human life and public safety.** The IC is the decision maker.

Information concerning the use of and reporting of Aerial Application of Fire Retardant is available at : <http://www.fs.fed.us/fire/retardant/index.html>

When possible, use only water as a suppressant in riparian areas or areas in close proximity to perennial or intermittent stream courses.

## Batch Plants or Retardant Dip Site Operations

Incoming/outgoing aerial retardant operations can affect an area 100 yards (or 300 ft) from a dip site. Watch incoming and outgoing flight path to determine any retardant wash or spill that needs to be mitigated.

## Archaeological Cultural Resources

- If flint or obsidian artifacts are found, they should be left “in-place” and their general vicinity reported to Division Supervisors and to Planning. The Planning section should notify the Resource Advisor and Forest Archaeologist.
- *For historical mining, logging, grazing, trapping activities and log cabin ruins scattered within the fire perimeter:* These sites will probably be indefensible in terms of prevention activities, but if encountered they should be avoided where possible with hand lines or dozer-lines. Again if these sites types are encountered, their vicinity should be reported.
- Historic and prehistoric sites found in areas requiring rehabilitation should be flagged and avoided until a site-specific rehabilitation planned is approved at each site.

## A. Mobilization/Demobilization

Upon initial arrival to the incident on the CGNF and prior to use, all equipment that will come into contact with or transfer water from non-potable sources (e.g. streams, rivers, ponds, lakes) will be cleaned and sanitized. An exemption to the washing requirement can be granted if documentation is presented to verify that the visiting equipment was treated prior to arrival on the CGNF. After use (demobilization) equipment will also be inspected, cleaned and sanitized.

1. **Inspection:** If mud (wet or dry), plants, or debris are visible on equipment that has contacted “raw” water, proceed to “Cleaning.” If equipment appears clean, proceed to “Sanitizing”
2. **Cleaning:** A pressure washer or a portable weed sprayer will be used to thoroughly clean (remove all dirt and debris) equipment prior to sanitizing.
3. **Sanitizing:** Set up a portable disinfection tank (pumpkin) using a cleaning solution of quaternary ammonium compound (Sanicare Quat 128, Sparquat 256, or Green Solutions High Dilution 256):

Volume of tap water	Volume of Quat128® (4.6%)	Volume of Sparquat 256® (3%)	Volume of Green Solutions High Dilution256® (1.8%)
100 mL water	4.6 mL	3.0 mL	1.8 ml
1 gallon water	6.4 liquid oz	4.1 liquid oz	2.5 liquid oz
1 gallon water	12.7 tbsp	8.2 tbsp	5 tbsp
1 gallon water	0.8 cup	0.5 cup	0.3 cup
100 gallons water	5 gallons	3.2 gallons	1.9 gallons
1000 gallons water	50 gallons	32.2 gallons	19.4 gallons

**Engines and Tenders:** Empty tank, then circulate the cleaning solution for 10 minutes. Float portable pumps in the disinfection tank and pump cleaning solution through for 10 minutes, then rinse with potable water. Pump cleaning solution through hoses, then rinse with water. Discharge cleaning solution into the disinfection tank for reuse.

**Aviation:** Either dip gear or equipment (helicopter buckets) into the cleaning solution or apply cleaning solution with backpack spray pumps. Solution must be in contact with surface being sanitized for at least 10 minutes then rinsed with potable water.

**Testing Effectiveness:** Repeated use and dilution can cause solution to lose effectiveness. Mix 5 cups water with 1 cup solution. Test diluted solution with Quat Chek 1000 test paper to ensure the quat concentration is between 600 to 800 ppm.

### 3. Sanitizing Continued:

**Disposal:** Dispose cleaning solution over open land or on roadways where there is no potential for entry into waterways, storm drains, or sensitive habitats. Quat chemicals are rapidly neutralized by soil. Contact the facility before disposing large quantities into municipal sewer systems.

**Safety:** Wear PPE including unlined rubber gloves and splash goggles. Have eyewash and clean water available on-site to treat accidental exposure. See MSDS for additional information.

#### B. During Suppression Operations

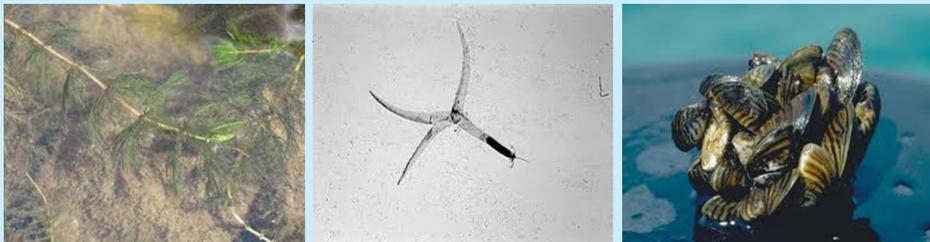
◆ Known AIS sites should be avoided as a first precautionary measure. Refer to the current CGNF AIS distribution map. You can never be certain where AIS are NOT present, but at least you will know ahead of time where they are present. Private ponds will be considered suspect unless tested otherwise.

◆ Avoid contacting and sucking up mud and aquatic plants with drafting/dipping equipment. Use screens. If possible, dip or draft water from the deepest portion of a lake or stream to avoid contact with bottom sediments. *Aircraft operation safety takes precedence.*

◆ If possible, avoid transferring water between drainages or between unconnected waters within the same drainage. Never dump water directly from one stream or lake into another. If using AIS-contaminated waters, aerial drops will occur at a minimum of 300 feet away from any live body of water.

◆ Avoid obtaining water from multiple sources during a single operational period unless drafting/dipping equipment is sanitized between sources.

◆ If contamination of gear with raw water or mud/plants is unavoidable, see 'Sanitizing' above.



### Fuel Spills

- Keep fuel containers/storage and spill containment areas at least 200 feet from streams, lakes and riparian areas.
- Provide for spill prevention and containment measures for all pump operations in or near riparian areas.
- Spilled fuels or other toxic substances should be removed. Contaminated soils may need to be removed. Remove hazardous material containment pads and dispose of properly.
- Develop a HAZMAT Plan for all refueling/fuel storage areas. Have HAZMAT materials and trained personnel at these locations at all times. Remove any oil contaminated soil and dispose of properly.

### Water Drafting

- Strictly adhere to the Preferred Prevention Standard for helibase (bucket work) activities outlined in the Custer Gallatin National Forest Aquatic Nuisance Species Prevention Strategy (2007). This standard is strongly recommended for all non-aviation water drafting and transferring equipment as well.
- If possible, helicopter bucket dip sites should be identified/selected in coordination with the district ranger, local fisheries specialist and/or Resource Advisor before using.
- Avoid dipping from streams.
- All water pump intakes will have screens less than or equal to 3/32<sup>nd</sup> inch pore size.
- Water pumps will have fuel containment storage areas.
- Restore all water sources used during the course of the fire.
- Remove any dams or dikes that were constructed during the suppression of this fire.
- Restore streambed to previous condition. Remove fill dirt while minimizing washing dirt into streams. Remove any devices to pool water.

### Staging Areas and Drop Points

Keep staging areas and drop points clean. Pick up all garbage, cardboard, food, and litter each day. Store extra food in vehicles during the day. When crews are hauled back each day, inspect the area for items, and haul garbage back to main camp. Recycle items if possible.

- **Practice good sanitation** - dig 'catholes' when possible when out on the line and away from camp. Catholes should be 6-8 inches deep. If in a camp longer than five days and the camp is serviced by a helicopter, fly in portable backcountry latrines and fly out human wastes as necessary.
- Toilet Paper needs to be thoroughly burned in a designated spot (in the black), buried in a cathole or packed out.
- **Water sources.** Do not break down fragile stream banks or make numerous trails through riparian areas. For drinking water, use a filter or treat water with iodine. If water is hauled in by cubies, make sure you use this water and ensure the containers are hauled out.
- In spike or coyote camps, carry water and bathe away from lakes and streams. Do not introduce soap, shampoo, or other grooming chemicals into waterways.
- **Obscure unwanted trails or campsites with native materials.** Cover with organic material, break up straight lines and create natural looking patterns. Camouflage campsites with brush, duff, rocks and other native materials. At tent sites, if any clearing was done, return loose rocks or downed logs to site. Leave no trace of suppression activities. Pick up all micro-trash (candy wrappers, gum wrappers, cigarette butts, other paper, rope, etc.).
- Based on Resource Advisor's recommendations, light scarification or ripping to reduce soil compaction may be needed; as well as seeding and/or fertilization.

### Helispots, Helibases

- Do not locate helibases within 200 feet of water (especially in the WSA or wilderness areas).
- If possible, do not cut trees to create new helispots.
- Consider use of explosives to naturalize stump and ends of snag cut during improvement if a platform is built or an area is cleared for landing.
- Special care should be taken to flush cut stumps and roll short cut logs off hillside. Naturalize helispot disturbance by pulling back cut trees and branches, replacing down logs, woody debris, and displaced rocks. Pull all flagging, trash, signs, oil etc.
- Rehabilitation of helispots will be done on a case-by-case basis by the Resource Advisor(s).

## Custer Gallatin National Forest WEED MANAGEMENT PROTOCOL

***Prevention is the preferred option  
to long-term control and management!***

We strive to take a proactive approach to noxious weed management when managing any fire incident on the Custer Gallatin National Forest. A map of known weed infestations should be provided by the local unit for every incident.

Mitigation and preventative measures are as follows (not all inclusive):

- **Require mandatory washing of all vehicles at check-in. If a formal wash station has not been setup for the fire incident — use local commercial carwash operations that provide under-carriage washing or a district engine to wash incoming vehicles.**

\*\* All equipment (pickups, engines, dozers, skidders, skidgins, excavators, ATVs, etc.) should be pressure washed with warm to hot water before being utilized on the fire and upon before demob.

\*\* Equipment should be cleaned at check-in and prior to the inspection process that occurs at Ground Support. Furthermore, vehicles should be washed before leaving the fire incident and heading back to duty stations.

\*\* If weed infestations are concentrated along access routes, all vehicles will be thoroughly cleaned before leaving the incident.

- **Provide GIS information showing known weed populations within the fire area or directly adjacent to the fire area.**

- **Assess current weed infestation when locating ICP, Camps, Drop Points and Staging Areas.**

**AVOID** when possible, placing the ICP or highly used base camps (including aviation base camps) or staging areas in known weed patches! Determine the appropriate weed spread mitigation for each situation. Coordinate with the local Resource Advisor to provide noxious weed identification, awareness and prevention briefings to Incident Personnel.

- **Avoid infestations of noxious weeds during fireline construction by hand or dozer where feasible.** Mineral soil exposure during fire line construction should be to the minimum necessary for containment or control.
- **If possible, locate ICP, Helibase, Camps, Drop Points, and Staging in weed-free areas.** To minimize soil disturbance at ICP, helibases, drop points, spike camps, etc., avoid activity in weed-infested areas. Stay on roads. Designate parking in areas that are weed-free! When avoidance is not possible, contain weeds through mowing or hand pulling and bagging.
- **If it is determined that future weed mitigation (ie. spraying) is needed, request a "S-#" before the visiting IMT leaves and before BAER work begins.**
- **Coordinate with the BAER Rehab Team** to ensure that follow up weed monitoring occurs within the Incident and the Suppression Rehab Team to ensure that monitoring occurs at equipment wash sites, ICP, Camps, Staging Areas, Drop Points, Helibase and Helispots.
- **When the Suppression Rehab Team recommends seeding disturbed areas, ensure that the purchased seed is certified as noxious weed-free.** *If straw is utilized for rehab, it should also be certified as weed-free or weed-seed free.* Refer to the Custer Gallatin NF Seed Mixture Protocol included in this Handbook.

Resource Advisors are available for additional weed awareness, prevention briefings, and species identification.

**Thanks for your cooperation!**

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*Contact Bozeman Interagency Dispatch Center or  
Billings Interagency Dispatch Center  
for local weed washing station vendors*

## Road Stabilization & Closure

- Original road closures that were opened for fire suppression actions should be reconstructed (e.g., this includes road closure berms, 'tank traps', etc.).
- Waterbar all roads behind closure berms that were opened for fire suppression actions. Depending on natural slope breaks and drainage opportunities, waterbar spacing should be approximately every 200 feet.
- Berms on the downslope side of the roads (which developed during the grading) should be pulled back onto the road surface.
- Re-establish stream channel configuration across road beds where temporary culverts, log crossings, and rock crossings have been constructed for fire suppression actions. Supplemental rock may be needed to maintain stable stream channel configuration.

## Fire Camps, Spike Camps, other Camp Related Activities

- Locations for campsites will be discussed with the district ranger and resource advisor to minimize potential resource damage.
- Look for areas that have durable surfaces such as mineral soil, forest duff, hardened clay or gravel surfaces. Select an area on rock for kitchens, gathering areas and tent sites. Do not clear vegetation or trench to create bedding sites.
- Do not build rock campfire rings. If possible dig a pit or a mound fire. If a ring already exists in the camping area, please clean out all trash and scatter rocks upon departure. Cover the impacted fire scar with soil, duff and debris to blend with surrounding cover.
- Use the main trail or fire line for travel when possible. Avoid creating numerous trails for travel between camps and cook area or traveling outside the fire line.
- Minimize the potential human/bear (black bear, grizzly) interactions by adhering to the current Food Storage Order (refer to guidelines in Appendix B).
- Bears and cougars are prevalent throughout the Custer Gallatin National Forest. A clean camp is important. Pack out all trash and used batteries. This includes used fuses. Check all tent sites and travel routes for litter. Rehab all campfire areas. Pack out all flagging, litter, orange peels, peanut shells, etc.
- Cigarette butts and candy wrappers need to be packed out with garbage.

D. Waterbars spacing :

DOZER Fire Line Slope

0-5%  
6-10%  
11-20%  
21-40%  
41-60%

Water Bar Spacing

Every 400 feet  
Every 300 ft.  
Every 200 ft.  
Every 100 ft.  
Every 50 ft.

- Actual location of waterbars should take advantage of natural slope breaks, and minimize drainage on downslope burned areas. Utilize natural rolls and dips wherever possible.
- Waterbars should be constructed approximately 30-45 degrees from horizontal and away from the burned area if possible. Waterbars should be opened on the downhill side to allow water to flow freely off the dozer line.
- Use an excavator to pull large logs over the fireline. In areas with light tree density dozers can be used. Strive to achieve at least 65% ground cover on areas treated with scattered material to prevent soil movement.
- Use handcrews to scatter branches, wood, rock or other material to naturalize the fireline and further retard soil movement. Scattered material should be randomly placed at least every 5 ft. along the handline. In grassy areas or where no material is available, dozer and excavator line rehabilitation should include: pulling back the berm; returning piled soil; constructing waterbars; and scattering a few rocks on the line to minimize the appearance of a 'line'.
- If waterbars cannot be constructed without causing undue damage, utilize hand raking to continuously roughen the line. Soil surface protection measures on slopes less than 15% waterbars may not be necessary if ample slash is available.
- Seed the dozer lines only if absolutely necessary—consult local READ for appropriate seed sources and vendors.

E. Stream crossings. All efforts should be made to avoid disturbance of natural stream banks when constructing dozer line. If stream banks are disturbed they should be reconstructed and rehabilitated by:

- Returning stream channels to a natural gradient and re-establishing full bank discharge capacity.
- Providing debris barriers and waterbars to ensure that water cannot flow down the fireline into the stream during periods of runoff.
- Transporting root masses and slash from elsewhere on the line and scatter that material for 25-50 feet on either side of stream crossings to further retard soil movement into the creek and enhance vegetative re-growth.

**Gallatin National Forest  
Food Storage Order 07-11-00-01**

**BEAR SAFETY AND FOOD STORAGE PROTOCOL**

Southwest Montana and Northwest Wyoming, including the Custer Gallatin National Forest, is home range to over 600 grizzly bears. Grizzlies and black bears are very large omnivores at the top of the food chain, and their actions can be unpredictable. Firefighters assigned to small or large incidents on the Custer Gallatin need to be aware that you share this landscape with the grizzly and black bear, and understand basic procedures which are expected to be followed to protect you and the bear from each other. Appropriate equipment and briefings should be supplied by local district offices during an incident to make sure all camp and fireline activities comply with these regulations. Preventative measures and basic protocols are as follows (not all inclusive).

**Main Fire Camps, ICP, and Helicopter/Aviation Bases**

- If possible ICP and fire camps should be located in areas free of and well away from cover that may allow bears to approach undetected.
- All garbage will be stored in bear resistant containers. No plastic garbage cans or other non bear resistant containers allowed.
- Prepare bear safety and awareness message for morning briefings and shift plans. In addition, information regarding food storage regulations should be posted in visible locations throughout the area.
- Cooking and eating facilities must be located at least 100 yards from sleeping areas.
- Food storage should be in the same area as cooking and eating facilities. Store all food, coolers, toiletries, soda, energy drinks, tobacco, or other attractants inside hard-sided vehicles, metal cages, or other hard-sided secure structures when they are not being used. These items may not be stored in the sleeping areas, in open truck beds, or in otherwise unsecured locations.
- Garbage must be collected daily at sundown and either transported off the forest or stored in a hard-sided vehicle or other approved container. Bear-proof garbage cans are recommended for daily collection.

- There should be no food stored or consumed anywhere outside of the cooking area (i.e. individual tents). Camp crews or camp manager should patrol the camp to ensure that trash is being collected and put in bear resistant dumpsters/ cages, and that no attractants are being left unattended in sleeping areas. This is especially important at night.

### Drop Points

- Acceptable storage must be in a hard-sided vehicle, hung 10 feet high and 4 feet from any supporting branch, or in an IGBC approved bear-proof container. Possible methods of securing bear attractants at drop points include trucks with camper tops, hard-sided utility or horse trailers, 55 gallon drums with locking snap rings, steel job boxes, individual bear-proof backpacking containers, or similar.
- All food items or liquids except water must be acceptably stored while unattended at drop points.

### Spike Camps

- If possible spike camps should be located in areas free of and well away from cover that may allow bears to approach undetected.
- Cooking areas in spike camps should be located at least 100 yards from sleeping areas.
- Bear attractants must be acceptably stored near the cooking area, either by hanging at least 10 feet high and 4 feet from any supporting limbs, or in a heli-portable bear-proof container such as a 55 gallon drum with locking snap ring, steel job box, bear-proof horse pannier, or similar.

### Fireline

- There should be regular safety briefings and/or alerts for all personnel heading to the fireline.
- All food and liquids except water should be kept on firefighting personnel at all times, or otherwise attended.

**All waste should be collected and transported off of the fireline !!!!**

- Actual location of water bars should take advantage of natural slope breaks, and to minimize drainage down slope of burned areas.
- Utilize natural rolls and dips for water bar locations wherever possible.
- Water bars should be oriented across the fireline approximately 30-45 degrees from horizontal and drain away from the burned area if possible. Water should drain onto stable sites.
- To provide a more natural appearance and slow/retard soil movement, scatter branches, wood, rock or other material along the fireline. Scattered material should be randomly placed at least every 5 ft. along the hand line. Strive to achieve at least a 65% ground cover on areas treated with scattered material to prevent soil movement. In grassy areas or where no material is available, fireline rehabilitation should include: pulling back the berm; constructing water bars; and scattering a few rocks on the line to minimize the appearance of a 'line'.
- Seeding hand lines is not usually necessary but may be specified for erosion control in critical areas.

### Dozerlines

- A. Provide any KNOWN CULTURAL SITE LOCATIONS to IMT as soon as possible!!
- B. Dozers, excavators or feller bunchers should only be utilized on slopes less than 35%. Do not use these types of machinery on slopes greater than 35% or in riparian areas. If possible during dozer line construction, keep the dozer blades from cutting through topsoil into subsoil. Retention of topsoil will greatly enhance re-sprouting. Limit the depth and width of dozer line construction to that necessary to stop fire spread. If possible, tip the blade on dozers. Avoid using dozers within 300 feet from live streams.
 

*Please make a concerted effort to not use or minimize use of dozers, excavators or feller bunchers in roadless or wilderness study areas.*
- C. Return soil from berms and piles using a small track-mounted excavator or dozer. Handcrews can be useful to spread fine slash, spread topsoil and sod, and seed. The excavator or dozer can be used to redistribute large berms over the line while re-contouring to original configuration.

Consider using dozers to rehab dozer lines in open timber stands and grasslands.

A track-mounted excavator is recommended for areas with dense forest canopy, followed by Handcrews with rakes to spread topsoil and sod evenly.

## Handlines

A. **Rehabilitation should be done on all hand lines.** Berms, topsoil, and organic material should be pulled back onto the hand line.

- Return dugout soil /duff to fire line where practical and obliterate any berms created during suppression.
- Pull brush and logs (burned and unburned) over the line to visually blend the edge of the fire with the surrounding landscape.
- Disguise visible ends of logs cut along fire line, trails and helispots with dirt, charcoal, rocks, and brush.
- Limit ground disturbance to the degree possible and limit tool scarring.
- Return burned and partially burned fuels to their natural arrangement, wherever possible.
- Make an effort to minimize visual impacts from heavily traveled corridors (system trails and campsites). For heavily used trails and designated or dispersed campsites, remove newly cut tree boles that are visible. Drag other highly visible woody debris created during the suppression effort into timbered areas and disburse. Tree boles that are too large to move should be slant cut. Chop the surface with an ax or pulaski to make it jagged and rough.
- To attain a more natural appearance, leave tops of felled trees attached.

B. Provide adequate drainage by constructing water bars. Table 1 provides the appropriate waterbar spacing depending on the fire line slope. Logs can be used as waterbars, but should be buried deep enough to be stable (**minimum of 12" deep**). The outlet must be open-ended for water to drain, and have at least 1/3 of their diameter above ground. Spread the extra soil to the downhill side of the water bar to help to hold it in place. Extend the uphill portion of the water bar well beyond the edge of the fire line so that runoff does not sneak around the top of the water bar. Do not place water bars perpendicular to the fireline.

Excavate the soil at the bottom end of the bar to allow water to drain away from the fireline.

<u>Fire Hand Line Slope</u>	<u>Water Bar Spacing</u>
0-10%	Every 200 feet
10-30%	Every 100-150 ft.
30-40%	Every 75-100 ft.
>50%	Every 50 ft.

## BEAR SAFETY con't / Food Storage Vendors

**For camps outside the city limits, spike camps with catered food service and/or more than 20 persons, AND remote helispots:**

- Ideally, camps serving 20 people or more should have at least 1 large 30-yard dumpster and 4-5 smaller 4-yard dumpsters. The large dumpster should be placed in a central location away from sleeping areas, preferably near the food area. It should have portable steps or a step ladder so that people can easily get their garbage inside and do not leave it in piles outside the dumpster. The lid should be lowered at night so that trash is unavailable to bears. The smaller dumpsters should be scattered around the camp at various convenient locations, including at a safe distance on the periphery of sleeping areas (approximately 100 yards). Arrangements should be made with Allied Waste Management to have dumpsters emptied before they fill completely. In many cases, this could be on a daily basis.
- Vendors may not be able to service dumpsters during weekends or holidays, and in this case an extra 300-yard dumpster should be ordered in advance. *Vendor for Bear-proof Garbage Dumpsters:*

Allied Waste Management, 406-586-0606, Mon-Fri 0800-1700

- In remote camps or helispots, utilize the heavy metal food storage "bear" cages should be used for storage of food and garbage. When used to store garbage, cages should be emptied daily.

**The Gallatin NF has food storage ("bear") cages located at various districts on the Custer Gallatin National Forest. Contacts for District-owned cages:**

**Yellowstone District / Gardiner - Rachel Feigley 406-823-6064**

**Bozeman - Bev Dixon 406-522-2541**

**West Yellowstone - Courtney Frost 406-823-6961**

**Contacts for Yellowstone National Park cages:**

**Go thru Bozeman Interagency Dispatch 406-587-6719**

**—they will coordinate with YNP Fire cache 307-344-2181**

## Reporting Bear Sightings and/or Encounters

**The Resource Advisor must be IMMEDIATELY NOTIFIED of all bear sightings or encounters.**

**Bear Pepper Spray Issuance/Training:** Carrying bear spray requires a training session as per FSM 6700 on hazardous materials. The Resource Advisor(s) will coordinate training with Safety Officer.

- **Recommended Number of Bear Spray Canisters with holsters, as well as containers to be used when transporting bear spray within vehicles or aviation resources:**

**1-2 bear spray canister & transport container per 5-person crew**

**4 canisters & transport containers per 20-person crew**

**1 canister & transport container per single resource overhead roles working on the fireline**

- **Bear spray should be checked out of Supply Unit at time of check -in and returned at Demob (to the Custer Gallatin National Forest).**

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\*At this time R1 employees are authorized to use 2 bear spray products; Counter Assault 15oz container, or UDAP 15oz or 9oz container.

**\*\*Vendor for Bear Pepper Spray, chest or belt holsters,  
and Transport Carriers  
UDAP Pepper Spray 800-232-7941  
(or 866-BEAR-911)  
PO Box 4872, Butte, MT 59702**

- Helispot locations.
- Locations of remote spike camps; include # days and # personnel that occupied the site.
- Constructed safety zone locations.
- AIS mitigation measures taken, evaluation of success of said mitigation
- See Aviation Reporting Requests (Forest FAO, 2014) - ie. Aerial Retardant Avoidance Reporting, if needed ; helicopter operations within wilderness, etc.
- Structure Protection Actions—wrapping operations (where and have they been removed?) and foaming operations (were structures foamed?).
- Locations of temporary communication repeaters.
- Location of disturbed improvements—cut fences; burned bridges; road/ bridges/trails damaged by equipment; closed roads that were opened for fire management activities, etc.

## Overall Rehabilitation Objectives

1. Reduce or eliminate erosion and sedimentation that could result from fire suppression activities such as fire lines, reopened roads, and localized disturbed areas such as fire camps and helispots.
2. Eliminate unwanted vehicle travel routes that may have been created by reopening roads and/or the construction of dozer lines.
3. Where consistent with watershed protection measures, reduce the effects of fire suppression on the recreational setting and aesthetics by eliminating or minimizing the visual impact of the fire lines. Consider utilizing MIST guidelines on all federal lands, if appropriate.
4. *(If applicable)* Suppression efforts within designated wilderness, wilderness study areas or research natural areas should be consistent with Minimum Impact Suppression Tactics. Please keep these points in mind, as they will aid these special management areas in recovering more quickly from fire suppression impacts. MIST guidelines (included in this field guide) should be given to the planning team.

## Fire Suppression Rehab Responsibility

Fire Suppression rehabilitation is the responsibility of the overhead team assigned to the fire and should start as soon as the areas are "released" by the overhead team.

Coordination or authorization for rehabilitation actions should be outlined in the Wildland Fire Decision Support Document (WFDSS) for the fire incident. Specifically, the WFDSS should outline the coordination that will take place between the overhead team and the agency representative. For example, the WFDSS should include a list of rehabilitation items that the district ranger (or appointed representative) allows the overhead team to make decisions on and those that the district ranger (or appointed representative, such as the Resource Advisor) will make the decisions on and provide approval.

**THE RESOURCE ADVISOR(S) WILL COORDINATE/DRAFT THE FIRE SUPPRESSION REHAB PLAN FOR THE IMT.** The READ will coordinate with the IC, Plans Section Chief and Division Supervisor throughout the fire incident.

The IMT Plans Section Chief should track an inventory of ground disturbance from fire suppression activities with help from the Resource Advisor(s) assigned to the incident. The information is helpful if a unit is going through a fire decision review, lawsuit, or rehab effort. Many managers use this information for trend analysis, safety sessions, cost summaries and environmental review of effects to other resources. During long term fire events in which IMTs rotate in and out, much of this information is lost in the transfer process.

The following is a suggested list of information needed from the IMT, in regards to documentation of fire suppression activities used during large fire events:

- Locations of retardant dropped by large airtanker, seats, and helicopters; and type of retardant used.
- Locations of any portable retardant bases that were mobilized.
- Location where foams and gels were used (ground or aerial application).
- Locations of water pumping operations.
- Locations of general fuel spills by ground-based equipment (if any).
- Location of ground-disturbing actions: dozer lines, hand lines, FLE, fuel break construction, etc.

## **Minimum Impact Strategies & Techniques and Rehabilitation Methods for Wilderness, Wilderness Study Areas, and Other Wildlands**



*Custer Gallatin NF Agency Administrators Expectations for 2014 include minimizing suppression-related impacts to protect natural resources and improvements that occur in the fire area. Follow the intent of M.I.S.T. both within and outside designated wilderness areas, when possible.*

### Fire Mgt Strategies

The goal is to safely manage a wildfire (whether for resource benefits or suppression) using environmentally sensitive methods.

- Fire-related suppression activities can have a detrimental effect on the character of Wilderness and other wildland areas. Fire suppression efforts can alter the Wilderness landscape, disturb the land surface, and disrupt visitor solitude. These negative effects on the wildland resource should be considered in developing fire suppression strategies.
- Fire managers and suppression forces should give preference to methods and equipment that have the least adverse environmental effects.

Use of Retardant - Colored, long-term retardant can be used.

### Logistical support for Fire Operations

- Consider using pack animals.
- Consider using helicopters.

### Helicopter Operations

- When possible, locate helispots outside Wilderness or Wilderness Study Areas.
- Use existing natural landing sites when available.
- Use long-line operations to deliver and retrieve gear instead of helispots if safe.

### Fire Camps

- Locate camps within Wilderness or Wilderness Study Areas only as a last resort.

## RESOURCE GUIDELINES FOR FIRE SUPPRESSION

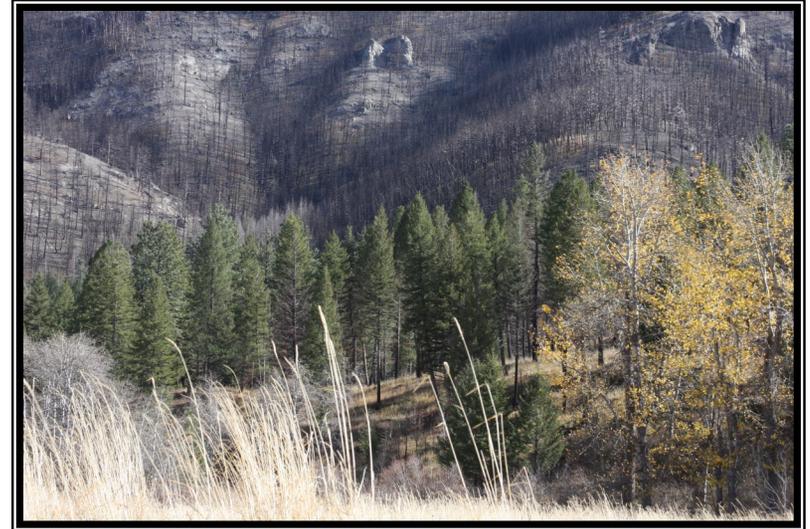
- Select impact-resistant sites such as rocky or sandy soils or small openings within heavy timber.
- Encourage small-scale “coyote-type” camps.
- Do not clear vegetation or trench to create bedding sites.
- Change camp location if ground vegetation in the area shows signs of excessive use.
- Locate toilet sites a minimum of 200 feet from water sources or existing trails.
- Catholes should be least 6-8 inches deep. Dig larger site trenches according to level and duration of use.

### Firelines

- MINIMIZE cutting of trees, burned trees, and snags.
- Use natural barriers such as ridges, meadows, rocky draws, etc.
- Use existing trails to backfire or burnout against or to stop fire spread. Try not to widen or cut trench through their natural barriers.
- If building fireline is necessary, use minimum width and depth to check fire spread.
- Cut brush as close (flush) to the ground as possible when building fireline.
- Limb only what is necessary to prevent fire spread adjacent to fireline.
- Inside fireline, cut only those fuels, which would spread fire across the fireline.
- Do not cut live trees unless they are a safety hazard or will cause fire to spread across the line.
- On the burnout side of the line, fall only those snags that would spread fire over the line, cause risk of spotting, or pose a safety hazard if they should fall over.
- Do not fall snags on the unburned side of the line unless they are an obvious safety hazard to crews or would become firebrand receptacles.

### Mop-Up

- If there is no heat, leave it alone. Use bare hands or infrared equipment to detect hot areas.
- Hand-feel charred logs near fireline. When appropriate, do minimal chopping and scraping to eliminate fire.
- Minimize bucking logs to check for hot spots or to extinguish fire. Roll the logs if possible. Return logs to original position when ground is cool.



*Derby Fire 2006, post-fire*

The following guidelines were developed to assist in completion of rehabilitation efforts of areas disturbed during fire suppression in the Greater Yellowstone Area. Fire suppression rehabilitation work and associated costs are charged to the fire incident (P-code), and usually performed utilizing fire suppression resources (equipment, handcrews). These guidelines were largely modified from the Kootenai NF (8/94), Gallatin NF (2013), and Payette NF (3/94) guidelines, and adjusted from observations made during a fire suppression rehabilitation BMP reviews on the Custer Gallatin NF (2001-2013).

*These guidelines are not for BAER (burned area emergency rehabilitation), which requires a BAER analysis and incident specific funding authorization (FSH 2509.13 and FS 2500-8).*