

## **APPENDIX 1 Minimum Impact Suppression Tactics (MIST)**

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(excerpt from USDA Forest Service Northern Region Minimum Impact Suppression Tactics Guidelines- Fireline Handbook)

#### **Concept of MIST:**

The concept of MIST is to use the minimum amount of force necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It is a mind set on how to suppress a wildfire yet minimize the long-term effects of the suppression action on the land. MIST may also require greater rehabilitation efforts than previously practiced.

#### **Minimum Impact Suppression Tactics Implementation Guidelines:**

Following is a list of considerations for each fire situation.

##### **Hot-Line/Ground Fuels**

- Allow fire to burn to natural barriers.
- Use cold-trail, wet line or combination when appropriate.
- If constructed fireline is necessary, use only width and depth to check fire spread.
- Consider use of fireline explosives for line construction.
- Burn out and use low impact tools like swatter or 'gunny' sack.
- Minimize bucking and cutting of trees to establish fireline; build line around logs when possible.
- Use alternative mechanized equipment such as excavators, rubber tired skidders, etc. rather than tracked vehicles.
- Use high pressure type sprayers on equipment prior to assigning to incident to help prevent spread of noxious weeds.
- Constantly re-check cold trailed fireline.

##### **Hot-Line/Aerial Fuels**

- Limb vegetation adjacent to fireline only as needed to prevent additional fire spread.
- During fireline construction, cut shrubs or small trees only when necessary. Make all cuts flush with the ground.
- Minimize felling of trees and snags unless they threaten the fireline or seriously endanger workers. In lieu of felling, identify hazard trees with a lookout or flagging.
- Scrape around tree bases near fireline if it is likely they will ignite.
- Use fireline explosives for felling when possible to meet the need for more natural appearing stumps.

##### **Mopup/Ground Fuels**

- Do minimal spading; restrict spading to hot areas near fireline.
- Cold-trail charred logs near fireline; do minimal tool scarring.
- Minimize bucking of logs to extinguish fire or to check for hotspots: roll the logs instead if possible.
- Return logs to original position after checking and when ground is cool.
- Refrain from making bone yards; burned and partially burned fuels that were moved should be returned to a natural arrangement.

- Consider allowing large logs to burnout. Use a lever rather than bucking to manage large logs which must be extinguished.
- Use gravity socks in stream sources and/or a combination of water blivets and fold-a-tanks to minimize impacts to streams.
- Consider using infrared detection devices along perimeter to reduce risk
- Personnel should avoid using rehabilitated firelines as travel corridors whenever possible because of potential soil compaction and possible detrimental impacts to rehab work, i.e. water bars.

### **Mopup/Aerial Fuels**

- Remove or limb only those fuels which if ignited have potential to spread fire outside the fireline.
- Before felling consider allowing ignited tree/snag to burn itself out. Ensure adequate safety measures are communicated if this option is chosen.
- Identify hazard trees with a lookout or flagging.
- If burning trees/snag pose a serious threat of spreading fire brands, extinguish fire with water or dirt whenever possible. Consider felling by blasting when feasible. Felling by crosscut or chainsaw should be the last resort.
- Align saw cuts to minimize visual impacts from more heavily traveled corridors. Slope cut away from line of sight when possible.

## **LOGISTICS**

### **Campsite Considerations**

- Locate facilities outside of wilderness whenever possible.
- Coordinate with the Resource Advisor in choosing a site with the most reasonable qualities of resource protection and safety concerns.
- Evaluate short-term low impact camps such as coyote or spike versus use of longer-term higher impact camps.
- Use existing campsites such as reserved sites used by outfitters if possible.
- New site locations should be on impact resistant and naturally draining areas such as rocky or sandy soils, or openings with heavy timber.
- Avoid camps in meadows, along streams or on lakeshores. Locate at least 200 feet from lakes, streams, trails, or other sensitive areas.
- Consider impacts on both present and future users. An agency commitment to wilderness values will promote those values to the public.
- Lay out the camp components carefully from the start. Define cooking, sleeping, latrine, and water supply.
- Minimize the number of trails and ensure adequate marking.
- Consider fabric ground cloth for protection in high use areas such as around cooking facilities.
- Use commercial portable toilet facilities where available. If these cannot be used a latrine hole should be utilized.
- Select latrine sites a minimum of 200 feet from water sources with natural screening.
- Do not use nails in trees.
- Constantly evaluate the impacts which will occur, both short and long term.

### **Personal Camp Conduct**

- Use “leave no trace” camping techniques.
- Minimize disturbance to land when preparing bedding site. Do not clear vegetation or trench to create bedding sites.
- Use stoves for cooking, when possible. If a campfire is used, limit to one site and keep it as small as reasonable. Build either a “pit” or “mound” type fire. Avoid use of rocks to ring fires.
- Use down and dead firewood. Use small diameter wood, which bums down more cleanly.
- Don't burn plastics or aluminum - Apack it out. with other garbage.
- Keep a clean camp and store food and garbage so it is unavailable to bears. Ensure items such as empty food containers are clean and odor free, never bury them.
- Select travel routes between camp and fire and define clearly.
- Carry water and bathe away from lakes and streams. Personnel must not introduce soaps, shampoos or other personal grooming chemicals into waterways.

### **AVIATION MANAGEMENT**

**One of the goals of wilderness managers is to minimize the disturbance caused by air operations during an incident.**

#### **Aviation Use Guidelines**

- Maximize back haul flights as much as possible.
- Use long line remote hook in lieu of constructed helispots for delivery or retrieval of supplies and gear.
- Take precautions to insure noxious weeds are not inadvertently spread through the deployment of cargo nets and other external loads.
- Use natural openings for helispots and paracargo landing zones as far as practical. If construction is necessary, avoid high visitor use areas.
- Consider maintenance of existing helispots over creating new sites.
- Obtain specific instructions for appropriate helispot construction prior to the commencement of any ground work.
- Consider directional falling of trees and snags so they will be in a natural appearing arrangement.
- Buck and limb only what is necessary to achieve safe/practical operating space in and around the landing pad area.

#### **Retardant Use**

- During initial attack, fire managers must weigh the non-use of retardant with the probability of initial attack crews being able to successfully control or contain a wildfire. If it is determined that use of retardant may prevent a larger, more damaging wildfire, then the manager might consider consequences of larger firefighting forces' impact on the land.
- Consider impacts of water drops versus use of foam/ retardant. If foam/retardant is deemed retardant use even in sensitive areas. This decision must take into account all values at risk and the necessary, consider use of foam before retardant use.

## **HAZARDOUS MATERIALS**

### **Flammable/Combustible Liquids**

- Store and dispense aircraft and equipment fuels in accordance with National Fire Protection Association (NFPA) and Health and Safety Handbook requirements. Avoid spilling or leakage of oil or fuel, from sources such as portable pumps, into water sources or soils.
- Store any liquid petroleum gas (propane) downhill and downwind from fire camps and away from ignition sources.

### **Flammable Solids**

- Pick up residual fusees debris from the fireline and dispose of properly.

### **Fire Retardant/Foaming Agents**

- Do not drop retardant or other suppressants near surface waters.
- Use caution when operating pumps or engines with foaming agents to avoid contamination of water sources.

### **Fireline Explosives**

- Remove all undetonated fireline explosives from storage areas and fireline at the conclusion of the incident and dispose of according to Bureau of Alcohol, Tobacco and Firearms (BATF) and Fireline Blaster Handbook requirements. Properly dispose of all packaging materials.

## **FIRE REHABILITATION**

Rehabilitation is a critical need. This need arises primarily because of the impacts associated with fire suppression and the logistics that support it. The process of constructing control lines, transport of personnel and materials, providing food and shelter for personnel and other suppression activities has a significant impact on sensitive resources regardless of the mitigating measures used. Therefore, rehabilitation must be undertaken in a timely, professional manner.

During implementation, the resource advisor should be available for expert advise and support of personnel doing this work as well as quality control.

### **Rehabilitation Guidelines**

- Pick up and remove all flagging, garbage, litter, and equipment. Dispose of trash appropriately.
- Clean fire pit of unburned materials and fill back in.
- Discourage use of newly established trails created during the suppression effort by covering with brush, limbs, small diameter poles, and rotten logs in a naturally appearing arrangement.
- Replace dug-out soil and/or duff and obliterate any berms created during the suppression effort.
- If impacted trails have developed on slopes greater than six percent, construct waterbars according to the following waterbar spacing guide:

<u>Trail Percent Grade</u>	<u>Maximum Spacing Ft.</u>
6-9	400
10-15	200
15-25	100
25+	50

- Where soil has been exposed and compacted, such as in camps, on user-trails, at helispots and pump sites, scarify the top 2-4 inches and scatter with needles, twigs, rocks, and dead branches. It is unlikely that seed and fertilizer for barren areas will be appropriate, in order to maintain the genetic integrity of the area. It may be possible, depending on the time of year and/or possibility of a rainy period, to harvest and scatter nearby seed, or to transplant certain native vegetation.
- Blend campsites with natural surroundings, by filling in and covering latrine with soil, rocks, and other natural material. Naturalize campfire area by scattering ashes in nearby brush (after making sure any sparks are out) and returning site to a natural appearance.
- Where trees were cut or limbed, cut stumps flush with ground, scatter limbs and boles, out of sight in unburned area. Camouflage stumps and tree boles using rocks, dead woody material, fragments of stumps, bolewood, limbs, soil and fallen or broken green branches. Scattered sawdust and shavings will assist in decomposition and be less noticeable. Use native materials from adjacent, unimpacted areas if necessary.
- Remove newly cut tree boles that are visible from trails or meadows. 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 so a minimal amount of the cut surface is exposed to view. Chopping up the surface with an axe or pulaski, to make it jagged and rough, will speed natural decomposition.
- Leave tops of felled trees attached. This will appear more natural than scattering the debris.\* Consider using explosives on some stumps and cut faces of the bolewood for a more natural appearance.
- Consider, if no other alternatives are available, helicopter sling loading rounds and tops from a disturbed site when there has been an excessive amount of bucking, limbing and topping.
- Tear out sumps or dams, where they have been used, and return site to natural condition, Replace any displaced rocks or streambed material that has been moved. Reclaim streambed to its predisturbed state, when appropriate.
- Walk through adjacent undisturbed area and take a look at your rehab efforts to determine your success at returning the area to as natural a state as possible. Good examples should be documented and shared with others.

### **DEMOBILIZATION**

Because demob is often a time when people are tired or when weather conditions are less than ideal, enough time must be allowed to do a good job. When moving people and equipment, choose the most efficient and least impactful method to both the landscape and fire organization mission. An on-the-ground analysis of “How Things Went” will be important.