



# Flagstaff Watershed Protection Project

## Best Management Practices Used to Minimize Impacts to Soils, Water Resources and Trails

**Background:** In the November 2012 election, City voters overwhelmingly approved (74%) a \$10-million-dollar bond to fund the Flagstaff Watershed Protection Project (FWPP). This forest treatment effort, involving city, state, and the Coconino National Forest, is designed to reduce the risk of severe wildfire and subsequent post-fire flooding in the Rio de Flag (Dry Lake Hills) and Upper Lake Mary (Mormon Mountain) watersheds.

**Introduction:** Ground-based thinning activities using mechanized equipment require the use of existing forest roads and the construction of new temporary roads to facilitate access to timber stands. In addition, whole-tree skidding of harvested trees requires a network of skid trails ending at landings where trees are delimbed and loaded onto trucks for transport to processing sites (mills, bioenergy facilities, etc.). These activities cause various types of disturbance to soils and ground cover that are mitigated through use of best management practices, known as “BMPs.”<sup>1</sup> The best management practices outlined below have been designed for this project and will be implemented for prescribed fire, pile burning, and mechanical thinning activities on federal lands managed by the U.S. Forest Service. Similar practices will be used for these activities occurring on city and state land. Site conditions and considerations for jurisdictional lands will guide specific best management practices.

### **Skid Trails, Cable Logging Corridors and Roads:**<sup>2</sup>

- Upon completion of use, skid trails and temporary roads will be blocked using natural, physical barriers (e.g. slash - tree limbs/branches and boulders) to disguise the line of sight from existing roads open to the public.
- Equipment will not be operated when ground conditions would result in damage to soils from operation of heavy equipment. These conditions typically occur when soils have high moisture content.
- Construction of new clearings for machine piling of logging slash will be minimized by using natural openings, temporary roads and landings.
- Where possible, skid trails and temporary roads will be located on existing roads.
- Skid trails will not contain long, straight downhill segments, which would concentrate runoff. If a long straight downhill segment is necessary, skid trail rehabilitation measures (see next point below) will take place as soon as skidding is completed on the skid trail.
- Preventing concentrated runoff and protecting exposed soils on skid trails, roads, cable logging corridors and landings will be restored to prevent the concentration of runoff and to protect exposed soil by:
  - Reshaping the surface to promote dispersed drainage (i.e. create convex vs. concave cross-sections);
  - Installing drainage features such as water bars, rolling dips, and other run off ditches;
  - Dispersing slash across skid trails and cable logging corridors where mineral soil is exposed;
  - Scarifying areas of exposed soil to promote infiltration and enhance seed germination;If erosion protection measures are not working as expected, a certified weed-free mix of native or naturalized grasses will be spread across the affected area.

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<sup>1</sup> Soil and Watershed Conservation Practices Handbook (USDA, 1990) and the National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide (USDA, 2012).

<sup>2</sup> Best Management Practices outlined in the document will be applied to the greatest extent possible.



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## **Aquatic Management Zones:**

- Streams, wetlands, springs, and other water bodies are protected by designating them as Aquatic Management Zones (AMZs). AMZs, known as buffer strips, are areas that require minimal disturbance around water bodies. Features like temporary roads, log landings, main skid trails, and equipment staging areas are prohibited.

## **Prescribed Fire:**

- In order to minimize high soil burn severity, weather and variables such as topography, soils and fuels will be incorporated into prescribed fire plans.
- To reduce the effects of peak flow change on channels, prescribed fire plans will consider spatial distribution and contiguous size of the burn area within a watershed.
- In areas where piles were burned and native grasses do not return, soil from unburned areas and native seed will be applied to the site to assure regrowth of grasses.
- Prescribed fire containment lines will be located and constructed to minimize erosion and prevent runoff from directly entering water bodies through construction and maintenance of suitable drainage features like water bars.
- Natural fire breaks, such as rock outcrops, will be used instead of ground-disturbing fire containment lines.

## **Trails:**

- Harvesting activities will avoid existing forest system trails where possible. In some cases, forest system trails may be used as a temporary road or skid trail. This occurs where the trail overlaps an old road. All forest system trails used for skidding or as a temporary road will be restored to pre-treatment conditions.
- Trail crossing locations will be designated and flagged with input from the District Trails Coordinator. Crossings of existing forest system trails will be restored to conditions prior to harvesting activities.
- If forest treatments are within close proximity (i.e. 100–200 feet) of existing forest system trails, the treatment might include “feathering.” This will provide visual impacts that are more transitional versus abrupt, which will maintain the character and experience of the trail.
- When trails are designated within the forest system and are closed during forest thinning operations, closures will be communicated to the public prior to treatment. The various forms of outreach might include signs at trailheads, postings at trailhead kiosks, maps on the FWPP website, etc. These areas will be protected and/or restored once treatments are completed.
- Non-Forest Service designated trails will be decommissioned.

For more in-depth information see: “Record of Decision for the Flagstaff Watershed Protection Project EIS,” Appendix B pg. 70 – 74, at the following link:

[http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/92331\\_FSPLT3\\_2578859.pdf](http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/92331_FSPLT3_2578859.pdf)