BAER Team / Recommendation

Five seed treatments are proposed (see Aerial Seeding Treatment map):

1) Use Seed Mix # 1 for lower areas that will be mulched – 844 acres
2) Use Seed Mix # 1 plus 20 lbs/ac of sterile hybrid for lower areas that will not be mulched – 1,439 acres
3) Use Seed Mix # 2 for higher areas that will be mulched – 4,239 acres
4) Use Seed Mix # 2 plus 20 lbs/ac of sterile hybrid for higher areas that will not be mulched – 7,043 acres
5) Use sterile hybrid triticale at 40 lbs/ac – 1,234 acres

Most of the seed will be applied in areas that receive about 14 to 30 + inches of precipitation annually. Some of the species in these mixes each have the ability to dominate a stand depending on the location. The value of multiple species in the seed mix provides the flexibility for different species in the seed mix to thrive in a microsite that is best suited for that certain species.

Specific ecological attributes valued for some of the species include the following:

Big bluegrass— "when properly managed, will compete with cheatgrass"

Bluebunch and Snake River wheatgrass— "long-lived, drought tolerant, widespread"

Sandberg and Canby bluegrass— "important for soil stabilization…one of the first grasses to green-up in the spring…excellent in low rainfall native mixes - these bluegrasses should be very competitive with cheatgrass)

Slender wheatgrass— "valuable in erosion control because of its rapid development"

Mountain brome— "will establish and grow on rather poor, depleted soils … recommended sites include weedy openings"

Thickspike wheatgrass – rhizomatous / "adapted to disturbed range sites and dry areas subject to erosion"

Crested wheatgrass— "one of the few grasses that has the ability to compete with difficult to control weedy annuals such as cheatgrass"

—Fairway is reported to fade in abundance sooner than other varieties

—Hycrest is "a hybrid between standard and introduced…outstanding seed producer, excellent seedling vigor, easy to establish under harsh conditions"

Sterile hybrid triticale – "hardy and durable – but, not persistent or invasive…adapts to a wide range of soil and moisture conditions"

There may be opportunities to add other species to the seed mix. We suggest that District personnel contact the Utah Division of Wildlife Resources (UDWR) prior to actual purchase of the seed. Depending on seed availability and time of seeding, the Division may have seed for forb and browse species that could be added to the seed mix that would enhance both wildlife habitat and diversity in the area.

We constrained the total number of acres to be seeded by several guiding factors:

Only seed in disturbed areas located on NFS lands.

Generally speaking, seed suitable areas located within some moderate and high / burn severity zones.

Seed areas where pre-burn juniper stands lacked adequate grass seedbank.

The Planting Guide for Utah gives the following information in the " Wildfire Seedings " section. " Steep slopes and rough areas that are not accessible to conventional ground equipment can be aerial seeded … if it is not possible to cover seed, plant late in the fall and increase the seeding rate ... burned sites, including forest and desert ranges are often seeded within a few days or weeks following the fire, in the mistaken belief that the ash will cover the seed … even if an ash residue or a loose seedbed is present, seed only during the appropriate seasons. Do not plant on a loose dry seedbed … plant in the late fall when seedbeds are firm."

MINE ADIT CLOSURES

Purpose of Treatment: As the fire burned the vegetation, mine adits became more visible on the landscape. In some instances wooden barriers at mine entrances were burned and rendered ineffective. The purpose of the closures is to provide public safety and secure the closure of the mine adit.

General Description: Install culvert/rebar grate barriers at 3 mine adit locations in the Mud Flat and Sevier Canyon area to prevent public entry in to these dangerous hazards.

Location: The following mines need immediate attention for public safety.

- Rosebud #1
- Golden Gem
- Jumbo

NOXIOUS WEED EXPANSION MONITORING and SPOT TREATMENT

The Beaver RD weed crew will implement this strategy in 2011 to detect and treat any new infestations of noxious weeds in the burned area. Three aggressive noxious weeds need immediate attention; Scotch thistle, leafy spurge, and musk thistle threaten the area. Several other species on the Utah noxious weed list occur adjacent to the burned area (see Noxious Weed Monitoring and Spot Treatment map). This treatment includes a search for any new individuals of noxious weeds on forest-administered lands along four specific stretches of the fire perimeter, along most of the forest routes in the northeast quadrant of the burned area and the roads in Indian Creek and North Creek. The dozer line in the South Fork of North Creek and also spike camps, drop points, helispots, and some heliwell locations will be monitored. Individuals of noxious weeds generally will be sprayed with herbicide at the same time they are discovered. The search will occur three times during the growing season preferably in May, late-June and early August; about 1,000 acres

CHANNEL TREATMENTS

GRADE CONTROL

Purpose of Treatment: Grade control structures will be constructed slightly higher then current stream elevations to act as low-grade sediment traps. Use of footers and large rock will act as grade control. Cross-vane shape acts to keep thalweg appropriately located. Sills act to prevent down-cutting of floodplains and terraces with subsequent lateral migration of the stream.

General Description: Expected increases in stream peak flows and sediment bedload threatens to cause down-cutting on two streams and aggradation and lateral incision on one stream. Values at risk include a Forest road along one stream with multiple stream crossings and one crossing on each of the other two streams. Habitat for one Bonneville cutthroat trout remnant population will be affected, and two streams in the process of being restored to Bonneville cutthroat trout. Project will install 8 cross-vane structures with sills to help trap and store

excess sediment, act as grade controls to prevent down-cutting, and maintain thalwag location to prevent lateral stream migration that would lead to further erosion, bank mass wasting and debris flows. Besides these measures would reduce address the risk to human safety, risk of loss of trail infrastructure. The Utah Division of Wildlife Resources is proposing to install 20 cross-vanes in addition to the 8 proposed by the USFS with the intent to protect BCT habitat. The Forest would coordinate with the Division on locations and implementation.

Location (Suitable) Sites: About half of the structures would be located in the North Fork of North Creek watershed along Forest Road 591 and the other half would be located along Shingle Creek, Fish Creek, and other portions of the Clear Creek watershed along approximately 4 miles on North Fork of North Creek, 1.5 miles of Shingle Creek, and 1.5 miles of Fish Creek.

ROAD AND TRAIL TREATMENTS

(ROAD STABILIZATION)

HARDENED CROSSINGS

Purpose of Treatment: Direct the drainage flows across the road in a single area and prevent water from running parallel to the road which would increase the chances of the road washing out for a further distance.

General Description: The armor consisting of riprap is placed where runoff could possibly cause erosion to the road surface and fill-slope.

Location (Suitable) Sites: North Fork of North Creek, Indian Creek, Shingle Creek, Mill Creek, and Sevier Canyon.

HARDENED / LOW WATER CROSSINGS

Purpose of Treatment: Concrete low water crossings are proposed in order to prevent complete wash-outs of the road without these improvements these three crossings will become impossible to navigate with a vehicle and these locations will necessitate much more expensive repairs to keep the road in a functional condition. These crossings will also provide grade control to the creek. Without grade control, the flow-line of the stream will likely drop throughout the entire length of the stream corridor. These improvements will also aid in the protection of the sensitive Bonneville Cutthroat Trout in the stream from burned-area runoff.

General Description: Install 3 concrete hardened low water crossings in the North Fork of North Creek. Concrete crossings are installed as a solid apron to direct flows across road in one location. Aprons are designed to catch and direct flow back into the channel.

Location: North Fork of North Creek.

SEDIMENT BASIN

Purpose of Treatment: To catch increased sediment that will be carried by the storm runoff that will plug culverts. Prior to the runoff reaching the inlet of a culvert, the sediment basin will allow the velocity of the flow to drop, as will the flow's sediment load into the basin. The much cleaner flow of water that reaches the pipe will have a much smaller possibility of plugging up the culvert. The sediment basin will also protect downstream waterways by capturing transported sediment and debris.

General Description: Basins constructed in flatter topography within drainages where runoff can be directed through the basin to deposit sediment.

Location (Suitable) Sites: Sevier Canyon, Shingle Creek and Mud Flat areas.

DITCH CONSTRUCTION / RECONSTRUCTION

Purpose of Treatment: Construct or repair/clean ditches along roads to direct runoff and flows off of road surface to the channel.

General Description: In some locations the existing drainage ditch is inadaquate for the anticipated runoff flows. In others there is no drainage ditch and one will be necessary to carry the expected drainage flows. Still, in others, they have filled up with debris and sediment since the last storm that occurred since the fire took place. Excavator time will be necessary to make sure that ditches are available and adequate for the anticipated runoff that will occur with storm events.

Location (Suitable) Sites: North fork of North Creek, Shingle Creek, and Sevier Canyon.

CATTLEGUARD CLEANING

Purpose of Treatment: Clean out silted in cattleguard to prevent further erosion that would cause the structure to fail.

General Description: One cattleguard within the burn perimeter has become silted in and needs to be cleaned out for the safety of the travelling public and to maintain the cattleguards functionality.

Location (Suitable) Sites: Sevier Canyon

CULVERTS

Purpose of Treatment: Cleaning culvert pipes and replacing the missing and damaged lids over the drop inlets will enable the drainage system to convey design flows and will reduce the chance of plugging. This will avoid the expensive possibility of long lengths of road washouts and keep the roads safe to drive by keeping water off the road. In some locations where traffic counts are higher and the road is of a higher standard, hardened drainage crossings are not feasible or the best solution. If the culverts are not replaced or exsting culverts upsized, probability of road failure is high and the magnitude of losses could be substantial, since flows often find the edge of road and wash out long portions of the road itself.

General Description: Cleaning includes the cleanout of catch basin culvert inlets, outlets, and the drop inlets. Replacement of existing culverts with larger culverts is the best solution in cases where existing culverts are too small. On higher traveled roads, culverts provide a cost effective way to maintain traffic flow while also passing the drainage flows.

Location (Suitable) Sites: Culvert cleaning will occur within all drainages of the fire along associated roads. Culvert replacement is being recommended for Indian Creek, Mill Creek, Sevier Canyon, and Shingle Creek.

ROAD FILL MATERIAL

Purpose of Treatmetnt: In some cases the road needs to be built up so that the adjacent stream will not wash out long lengths of the road. Without this treatment, the probability of this occuring is high and the cost of repair of such an event is equally high.

General Description: Bring in road fill material to build up road.

Location (Suitable) Sites: Indian Creek, Mill Creek, and Sevier Canyon have been identified as areas needing additional road fill material.

ROAD RECONDITIONING / GRADER AND DOZER

Purpose of Treatment: Several roads are located immediately downhill from burned-areass. Runoff from these areas will directly impact the road for continuous entire longitudinal lengths. Treatment will ensure drainage flow is directed to the nearest drainage structure as necessary so that the flow will sheet off of the road effeciently. This will prevent the the predictable higher flows off of burned-areas from washing out large areas of roads which will be much more costly to repair in the future if that happens.

General Description: Grader reconditioning will remove wheel ruts, re-establish the appropriate cross-slope or out-slope, and install rolling drainage dips where necessary. In those areas where terrian dictates the need for a dozer in leiu of a grader the equipment will be applied as appropriate.

Location: North Creek, Mill Creek, Shingle Creek, Sevier Canyon, and Indian Creek.

(TRAIL STABILIZATION)

Purpose of Treatment: Grade dips, and waterbars will divert water off of the trail preventing erosion and debris flows from degrading the trail. These methods will keep the trail from becoming a stream channel and prevent the loss of the trail.

General Description: Install drainage structures to prevent erosion, mass wasting and debris flows that are predicted to occur following the burn. These measures would also address the risk to human safety, risk of loss of trail infrastructure.

Location (Suitable) Sites: Locate drainage structures along 16.4 miles trails within the Twitchell Canyon fire perimeter. These include: FS trails 048, 049, 050, 054, 058, 202, 203, 208, 211, 281, and 3085.

TRAILHEAD BARRIER RECONSTRUCTION AND HAZARD TREE REMOVAL

Purpose of Treatment: The fire burned through the recreation area around Manderfield Reservoir resulting in the mortality of over 25 % of the trees in and around the reservoir. A dead tree is considered a hazard tree in a high use area setting. Falling and removal of these trees will prevent further damage to improvements (undamaged by the fire) and also prevent unnecessary injury to the public or their property. Replace the post and pole fencing associated with trailheads will restrict use of the trail system and maintain the use rating of the trails.

General Description: The fire burned through the Manderfield Reservoir day use recreational area, and 8 trailheads, leaving several hazard trees. The treatment is to fall and remove the hazard trees in the day use area and contour fall the hazard trees at trailheads.

Location (Suitable) Sites: Dispersed recreation area around Manderfield Reservoir and 8 trailhead entry points around the fire perimeter.

Design / Construction Specifications: Fall and/or remove all hazard trees which have the potential of striking any Improvement, trailhead sign, or bridges when they fall. Replace the post and pole barriers at trailheads with materials that meet Forest design standards in the same location or a location that is effective in maintaining trail use specifications.

TRAIL HAZARD SIGNS

Purpose of Treatment: The purpose of Burned-Area Warning Signs is to inform the public land users about the potential hazardous conditions associated with the fire.

General Description: This treatment is for the installation of, burned-area warning signs. Burned-area signs consist of a warning to the public identifying of the possible dangers associated with a burned-area. It shall contain language specifying of items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, and flash floods.

Location (Suitable) Sites: Burned Area Signs - These signs shall be installed at all entries into the fire perimeter. The location of these signs shall be along roads and trails. The field perimeter map shall be used to identify those roads and trails that enter into the fire burn area.

PROTECTION AND SAFETY MEASURES

FOREST ENTRY GATES

Purpose of Treatment: These gates are needed at several locations to prevent traveling public from entering the burned area when it is not safe to do so. The gates will be closed and locked as deemed prudent by FS personnel to protect the public from increased unnecesary risk.

General Description: 8 gates are to be installed at various access points around the fire perimeter.

Location (Suitable) Sites: FS Roads 471, 591, 119, 114, 115, 116, and 1131.

ROAD AND TRAIL / BURNED-AREA WARNING SIGNS

Purpose of Treatment: The purpose of the BURNED-AREA signs is to warn the public of potential hazards resulting from the effects of the fire, such as rolling rocks, falling trees, road washouts, and flash floods.

General Description: This treatment is for the installation of burned-area warning signs. Burned-area signs consist of a warning to the public identifying of the possible dangers associated with a burned-area. It shall contain language listing items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, and flash floods.

Location (Suitable) Sites: These signs shall be installed at all entries into the fire perimeter. The location of these signs shall be along roads. All signs will be placed facing the direction of travel entering the burn area. Other signs will also be placed within the burn perimeter at key locations.

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