BAER From a Practitioners Viewpoint, Treatment Effectiveness and Lessons Learned
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ABSTRACT: Cost and effectiveness evaluations of BAER treatments such as mulching with and without seeding and wood shred mulching has provided valuable practical lessons for future post wildfire land treatments. In terms of cost, aerial seeding costs $35-$50/acre, aerial straw mulch $500/acre and aerial wood shred application, $1,500-$2,000/acre. Hydromulching with seed is the most expensive at $2,500/acre. Though seeding alone is cheaper and faster to implement than mulching, seeding alone has not been generally effective in pinyon-juniper woodlands and is only slightly effective in ponderosa pine forests in the first two years post fire. Straw mulch without seeding on slopes greater than 35% shows limited success on northern slopes and low success on southern aspects. Straw mulching provides immediate soil protection on slopes up to 40%, and when combined with seeding, germinated plants hold straw in place from runoff and wind. Wood shred mulch is expensive and slowest to implement but is most effective on slopes from 35-70%, allowing native plants to regenerate. Overall, wood shred mulch without seeding on moderate to steep slopes and seeding with mulch over the top on low slopes are the most effective treatments in terms of cost and effectiveness. Observations indicate that seeding does not interfere with native grass regeneration two to four years post treatment. The overall effectiveness of land treatments implemented by BAER sometimes results in unrealistic expectations by the public and local agencies. Long-term rehabilitation and restoration requires patience, commitment and collaboration between agencies, technical experts and the public.
Objectives of Presentation

• You are already familiar with what BAER is and policy so I won’t repeat it

• To familiarize you with BAER land treatment types and their Effectiveness from practical experience

• To Share Lessons Learned in Public Collaboration with outside Stakeholders during burned area emergency response
Natural Recovery

Natural recovery is the preferred, proven BAER treatment
Land Treatments – Seeding & Effectiveness

Seeding in Pinyon Juniper – Jacket Fire, Coconino NF 2006

• Objective: to reduce cheatgrass invasion and soil erosion

Broadcast Seeding High Burn Severity
Low Effectiveness for erosion protection

Hydromulch Seeding - Adjacent Plot
Moderate Effectiveness due to mulch
Very expensive at $2,500/acre

Cheatgrass expansion was not detected in seeded, unseeded or mulched plots so objective is inconclusive
Aerial Seeding Only (Seeding was done in July and shows 4 Weeks Response, August 1st, 2011) – Ponderosa Pine. Wallow Fire. Aerial seeding is about $30-$50/acre.

The Apache-Sitgreaves NF reports seeding was generally effective (germination and cover).
Conclusions:

• Much cheaper and quicker to implement than mulching 2-3 weeks for cereal, longer for natives

• My experience shows seeding alone has not been effective in PJ woodlands and only slightly effective in ponderosa pine forests in first 2 years. However, grass will produce mulch yrs 2-3.

• Observations in years 2-4 indicate seeding does not prevent native grass regeneration but monitoring is lacking.
Mulching

- Provides immediate soil protection up to about 40% slopes
- Provides microclimate (moisture and protection) for favorable condition for plant growth
- When combined with seeding, germinated plants hold straw in place from runoff and wind
- Takes longer for implementation of treatments and costs more than seeding
- Aerial straw mulch costs about $500/acre
HeliMulching with Seeding – Brins Fire, Coconino NF 2006
Aerial seeding $30-$50/acre; aerial straw mulch, $500/acre

Hand Mulching with Seeding – La Barranca Fire, Coconino NF 2006

We compared response of cereal grasses (Quickguard vs barley). Both were non persistent after 2 years.
Helimulching

Helimulching With No Seeding.
Schultz Fire, Coconino NF 2010
The straw was agricultural wheat straw which apparently had a lot of seed in it which sprouted quickly.

Helimulching with Seeding. Wallow Fire, Apache-Sitgreaves NF, 2011

Cereal grasses are near 100% absent after 2 years
Agricultural Straw Helimulching on Slopes Greater than about 35% - Schultz Fire, Coconino National Forest 2010

Limited success on northern slopes

Low success on southern slopes
Wood shred Mulch on Slopes Greater Than 35%
Schultz Fire, Coconino National Forest 2011

Hazard trees cut along roads were the source of the wood shred material which then was aerially applied. Cost ranges from $1,500-2,000/acre
Comparison of Seeding and Mulching Effectiveness

• Seeding by itself is cheapest and quickest to implement but less effective than mulching first year.

• Observations indicate seeding has not interfered with native grass regeneration in years 2-4.

• Agricultural straw mulching is more expensive, slower to implement, good on slopes up to about 35%, provides immediate cover and more effective than seeding alone.

• Seeding followed by mulching may be most effective on slopes < 35%. Plants hold down straw mulch and prevent loss from runoff and wind. No evidence of preventing native grass regeneration but monitoring lacking.

• Wood shred mulching is most expensive, slowest to implement but effective on slopes ranging from about 35-70%. Native plants can regenerate.
Lessons Learned - Public Collaboration & BAER

• Public and Private Collaborators Often are Unfamiliar with BAER and USFS, NRCS Emergency and Long-Term Rehab & Restoration Programs and Deliverables

• Unrealistic Expectations from BAER. Often Times, Goals Differ.

• Collaboration Requires Many Meetings and time to work Collectively to Achieve Rehabilitation Goals (more than 85 - including technical summit - for Schultz Fire alone and counting).

• Collaboration Can Work (eg. Summit) to Achieve Agency and Collaborators Goals.

• It is important to inform Collaborators BAER is Emergency Treatments only. Our goal is slow down and reduce runoff & erosion. Their goal is to stop it and flooding to homes.