

Using Mulch in Reclamation - Holistically

RECLAMATION SYMPOSIUM

March 11, 2009

Pinedale, WY



The Little Snake River Watershed “Aspen Conservation Joint Venture”

A local solution for developing a biomass market
and enhancing the environment.

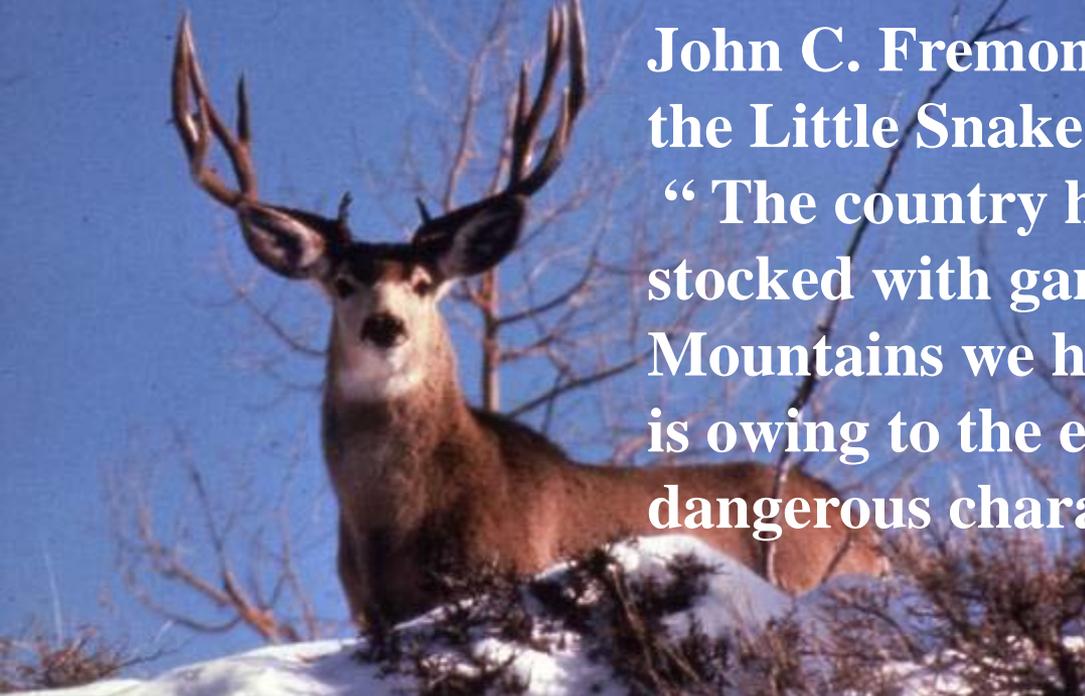
Battle Hazardous Fuels Stewardship Contract,
Aspen Habitat, and Reclamation for oil and
gas development.





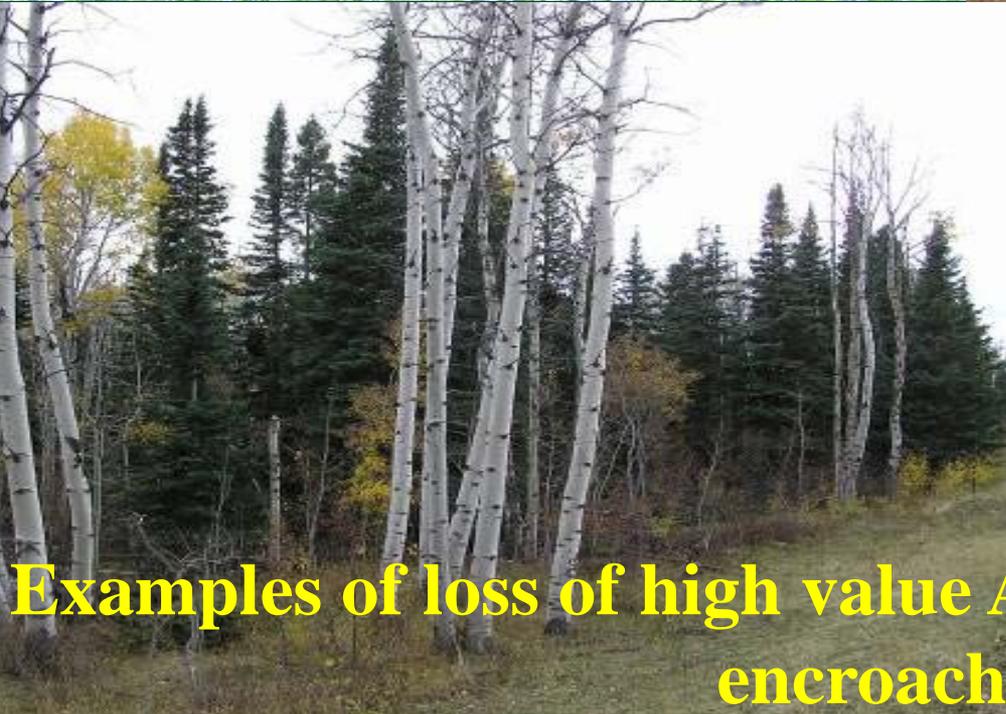
**John C. Fremont (1844) on travels through
the Little Snake Watershed**

**“ The country here appeared more variously
stocked with game than any part of the Rocky
Mountains we had visited: and its abundance
is owing to the excellent pasturage and its
dangerous character as a war ground”.**



Conifer Encroachment in Aspen Stands on a Landscape Scale





Examples of loss of high value Aspen habitat due to conifer encroachment.



RMEF Volunteer cutting
Conifers (mainly sub
alpine fir) in
Stewardship Area - 2005

2006 where
RMEF
Volunteers
conducted
conifer
removal





**2005
TREATMENT-
FALL**

**2006 SAME
AREA AFTER
SNOWPACK**



One
community's
biomass is
another's
ornamental!





2005 prior to thinning
and removal of
marketable and
diseased conifers in
Stewardship Area

Note Photo Marker Tree



2006 After
Thinning and
Removal



2006 SC and Demonstration Project – Aspen Habitat Treatment-Woody Biomass Processing for Reclamation Amendment



2006 Prior to
Conifer
Removal

Please note
photo-marker
Aspen



2007 After
Conifer
Removal

Please
note same
photo-
marker
Aspen





2005 Prior
to Conifer
Removal in
Aspen
Stand
Adjoining
Highway

Please
Notice
Highway
Reflector



2006
Same
Area
After
Removal

Again
Note the
Highway
Reflector



Summer 2008 Mechanical Removal of Conifers in Aspen Stand

110 cubic
yard van



2008-Track hoe feeding whole conifers into
chipping machine with simultaneous
loading to awaiting van – 2,500 tons wet
hauled



Typically we have a high occurrence of saline-sodic and sodic soils in the region of southwest Wyoming. The use of organic material such as wood chips provide the soils positive benefits in:

- reducing soil crusting
- reducing wind and water erosion
- greater nutrient cycling
- increased water holding capacity
- all providing a more successful medium for desired plant species germination and growth

Wood Chips are broadly utilized and accepted as good source of organic mulch world wide.

- Wood chips are used in Canada for reclamation associated with oil and gas development.
 - Wood chips are widely used for reclamation in very difficult sites in the U.S i.e. old hard rock mining sites and bentonite mines.
 - Chips have be used for highway reclamation in N.A.
 - Chips are routinely used by home gardeners in compost.
 - Wood chips have also been used in the bioremediation of heavy metals and hydrocarbons in contaminated soils.
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Wood Chips surface broad cast on drill pad and ripped in on a well pad in Alberta, Canada.



Urad Molybdenum Mine - Colorado



24,000 cubic yards of wood chips in conjunction with municipal sewer sludge and rock were used to reclaim this tailings pond @ 10,400 feet elevation.

Advantages of Whole Tree Wood Chips Over Other Types of Mulch.

- Locally produced.
- Locally available through the Conservation District.
- Provides local economic benefits.
- Can have reduced transportation cost compared to straw.
- Free of all weed seeds.
- Does not blow off site like straw or hay.
- Larger fraction in wood chips are better than straw for reducing wind erosion and better at trapping snow.
- Whole tree chipping has a pH 5.0 – 7.0 may help buffer high pH sodic and saline-sodic soils. (benefit to plant establishment and nutrient cycling)
- Better water holding capacity than straw.
- Whole Tree chips include more soluble component (needles) that assisted in maintaining initial C:N ratio.
- Better at reducing crusting in sodic soils than straw.

Other Major Benefits with the use of Whole Tree Wood Chips vs Straw.

Improved Wildlife Habitat.

- **Conifer trees available for chipping are part of the Little Snake River Watershed “Aspen Conservation Joint Venture”. This effort is aimed at improving aspen habitat on over 5,000 acres in the Little Snake River Watershed.**
- **Aspen habitats are second only to Cottonwood Gallery Forest for utilization by the greatest number of wildlife in Wyoming.**
- **Removal of encroaching conifers and beetle killed trees reduces the risk of catastrophic wildfire and subsequent sever damage to watersheds and wildlife habitat.**

• How Whole Tree Chips Can Work for Reclamation and Habitat Improvement and Community Development.

- Conifer trees will not be chipped unless there is a demand for the mulch. To access whole tree wood chips for reclamation the following steps would have to happen:
- Once a company determines that they would like to use locally derived wood chips. A three way agreement would then be pursued between the Company, the LSRCD, and the WWNRTF.
- After determining their level of participation the company would make an ear-marked contribution to the WWNRTF for the Little Snake River Aspen Conservation Joint Venture. (The WWNRTF then doubles the contribution and the legislature matches that amount to the corpus of the trust). These funds would then be used to defray the cost of chipping and transportation to a central location in the Baggs area for reclamation uses by the participating companies.
- As part of a company's participation a public relations campaign may be developed by the partners highlighting the company's efforts.



- In 2008, Anadarko Petroleum Corporation and Devon Energy Corporation entered into agreements with the LSRCD for 3,500 cubic yards – 750 tons (wet hauled) of whole conifer wood chips (biomass) for use as reclamation amendments associated with their surface disturbing activities.



Local solution and a new market for woody biomass with use of the manure spreader.



Note white color on soil surface -
Gypsum Soil Amendment





**SCIENCE BASED RECLAMATION
PILOT PROJECT FOR THE
DEVON ENERGY CORPORATION**

**EFFECT OF DIFFERENT TREATMENTS ON
PLANT ESTABLISHMENT AT GAS WELL
SITES: COST/BENEFIT**

KC HARVEY
Soil & Water Resource Consulting

 **AN ENERCREST COMPANY**

DEVON ENERGY CORPORATION
2008 RECLAMATION PROGRESS REPORT

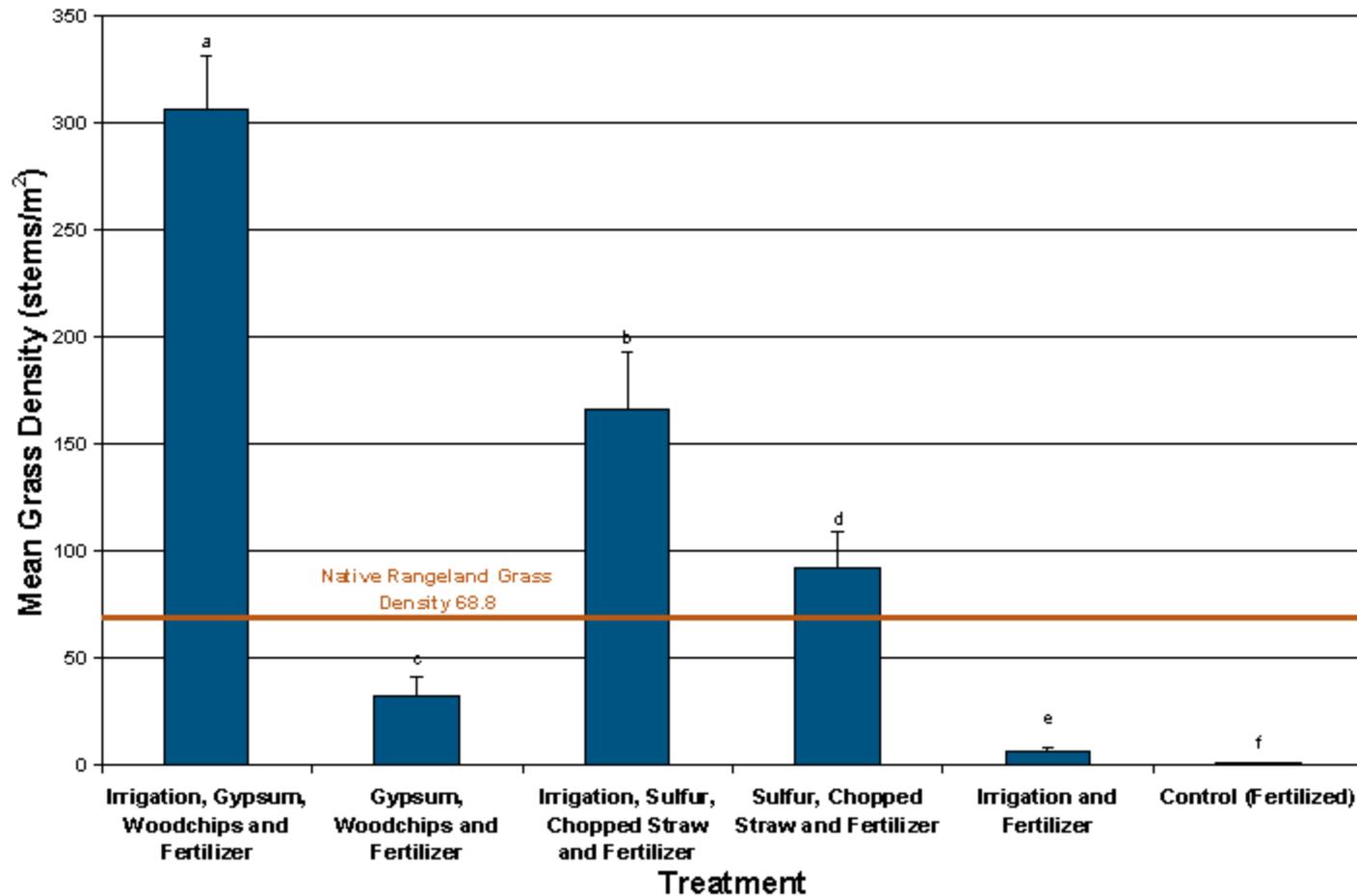


Figure 32. Grass density in July 2008 at Barrel Springs 14-8. Mean values capped by a different letter are significantly different ($p < 0.05$).



Figure 33. Photo (July 2008) of grass establishment on a saline-sodic soil amended with gypsum, woodchips, fertilizer and supplemental irrigation at Barrel Springs 14-4.



Figure 34. Photo (July 2008) of grass establishment on a saline-sodic soil amended with sulfur, straw, fertilizer and supplemental irrigation at Barrel Springs 14-4.

Our District's Position

Forest biomass removal and use should be part of a holistic process that captures the maximum value of wood fiber for all of its possible uses with the ability to withstand changes in policy, technology, and changing economic models.

Economic models based on biomass products alone are dubious and are subject to policy changes, variable energy costs, technological advances,.....etc.

i. e. (Don't put all your whiskey on one pack horse) especially if that horse has a temperament influenced by the whim of ever changing federal policy makers.)



And Our Goal:

Building Sustainable Communities

Creating Biomass Markets & New
Techniques for Harvesting and Using
Forest Residue

Recognize Biomass as a national
imperative, a regional
opportunity, and a local solution.



