Minutes

Groundwater Management Plan (GMP) Committee

March 9, 2017

12pm – 2pm @ CICWCD offices

Committee Members			
~~Joe Melling~~	Brent Hunter	Spencer Jones	Paul Bittmenn
Paul Cozzens	Paul Nelson	Ramon Prestwich	Rob Dotson
Reed Erickson	Paul Monroe		

Members Excused:
Brent Hunter
Ramon Prestwich

Other Attendees:
Chad Reid – USU Extension
Candace Schaible – USU Extension

1. **Review Minuets**

   Minutes were reviewed and approved from the last month's meeting held February 9, 2017.

2. **Discussion of Agricultural Conservation (Presentation attached Below)**

   Chad Reid discussed the role agriculture has played in this area for the better part of 2000 years beginning with the Fremont Indians which diverted water to grow beans and corn. Today, agriculture in Iron county is 17% of our economy. Iron County is #1 or #2, depending on the year, in agricultural production within the State of Utah. We rank first in alfalfa, second in sheep production and not far behind in beef, dairy, hogs, and other crops.

   Water conservation practices were discussed for agricultural moving forward. Within the past two decades' irrigators have become increasingly efficient by switching to circular pivots. The next advancement includes subsurface irrigation and drip-lines which attach to the pivots and drag along the ground reducing the amount of water lost in evaporation by nearly 30-40% per research done in Texas.
   A 30% savings in this basin would amount to nearly 4,000 AF of water.

3. **Discussion of Cedar Valley watershed (Presentation attached Below)**

   Chad has been a part of a large effort which has collected over 2000 thousand images of the western United States dated back to the 1870's and duplicating them with pictures taken today (http://extension.usu.edu/rra). The research shows large increases in woody plants (Pinyon-Juniper, Conifers) which are water intensive.

Vegetation Type	Decrease	0	Increase
Grassland	480	479	71
Sagebrush	261	279	386
Pinyon-Juniper	14	31	962
Mountain Brush	10	21	440
Aspen	545	103	69
Conifers	52	43	1039
Woody Riparian	63	90	247
Plant Cover	56	1156	667
Erosion	533	1315	31

*Summary of vegetation change in Dixie and Fishlake National Forests and surrounding area based on historical photos.

Chad recommended the best way to manage our watersheds and grazing grounds was to reintroduce wildfires, but this was not a reality anymore because of the amount of development and houses that exist within our watersheds. The next best alternative is to work cooperatively with the federal agencies in pursuing the thinning of Conifers and Pinyon-Juniper by the methods of logging, Bulldogging or chaining.

Our local BLM office has been as successful as anywhere in reducing these water intensive woody trees and reestablishing grass lands. A large part of that has been attributed to Vickie Tyler and her expertise in writing NEPA documents and Paul Briggs with his continued drive to eliminate P&J.

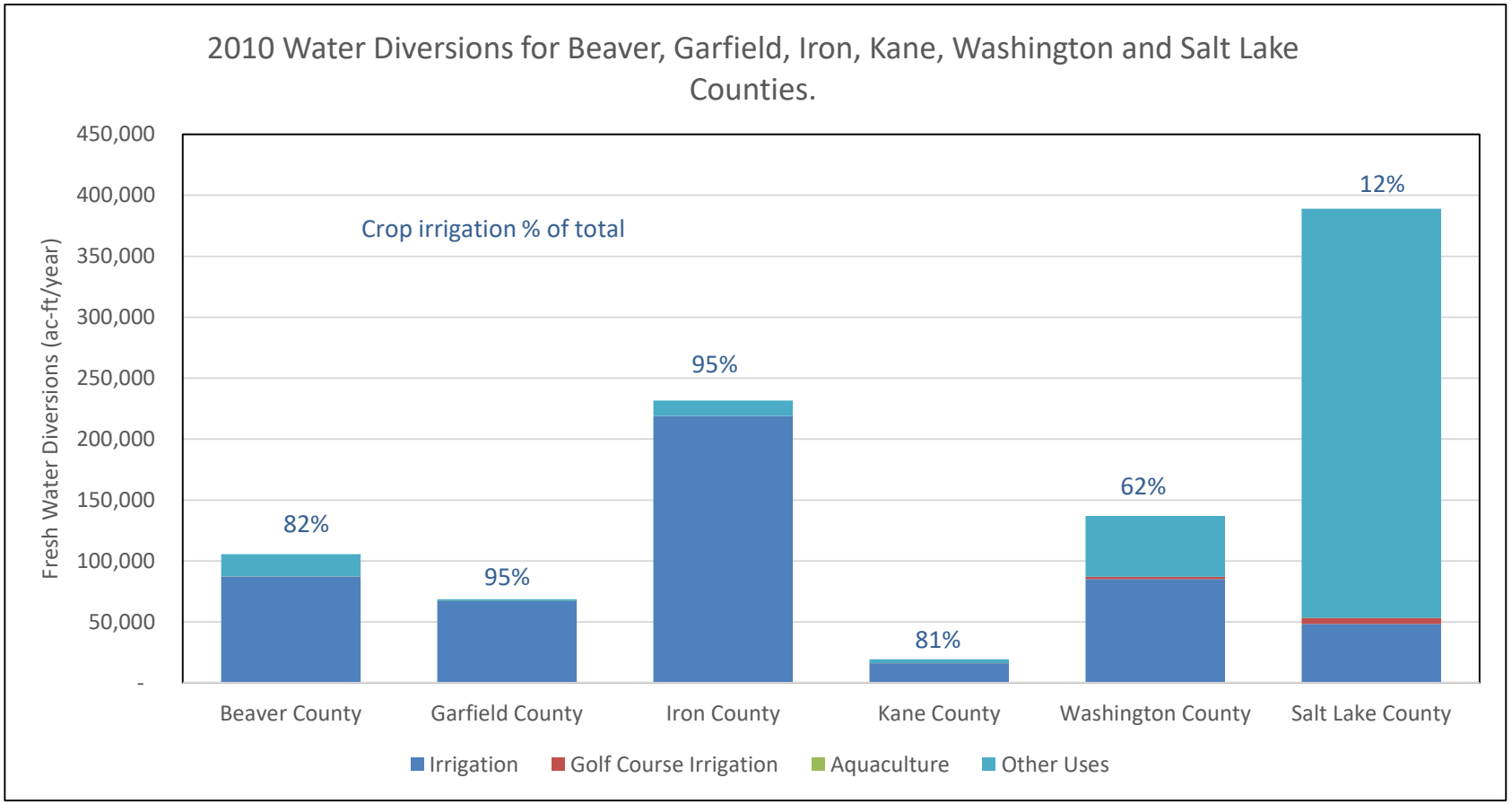
4. **Discussion of outreach and involvement of the GMP Committee.**
   After some discussion, it was agreed upon that the GMP Committee should actively be engaged outreaching our efforts to the public. Paul Bittmenn made a motion to hold the GMP Committee meetings at the Cedar City Council Chambers and that they be open to the public and advertised to the press. The meetings will include a public comment period of three (3) minutes or the option to write in comments that would be address at the following meeting.
5. **Next Meeting Date**
   a. Meeting and recharge tour with Kent Jones March 23, 2017.
   b. April 13, 2017 Joe Melling suggested Nathan Moses be involved in a discussion on beneficial use and consumptive use and how we correct the water right inefficiencies.

Agriculture Water Management

Chad R. Reid Extension Professor

Water Use

Estimated Use of Water in the United States in 2010 (USGS, 2014)



Five Counties divert 12.2 % of State's total diversions. Salt Lake County information is for comparison.

Five County Association of Governments

Five County Area

20.6% of State's Area

12.2% of State's Water Diversions

11% of State's Irrigated Acreage

84% of diversions are for crop irrigation, Utah's is 77.4%

Groundwater Is Important to Agriculture

Irrigation in Utah is 15% from groundwater

Irrigation in Five County is 43% from groundwater

- Beaver County 57% from groundwater
- Iron County 66% from groundwater

Water Management

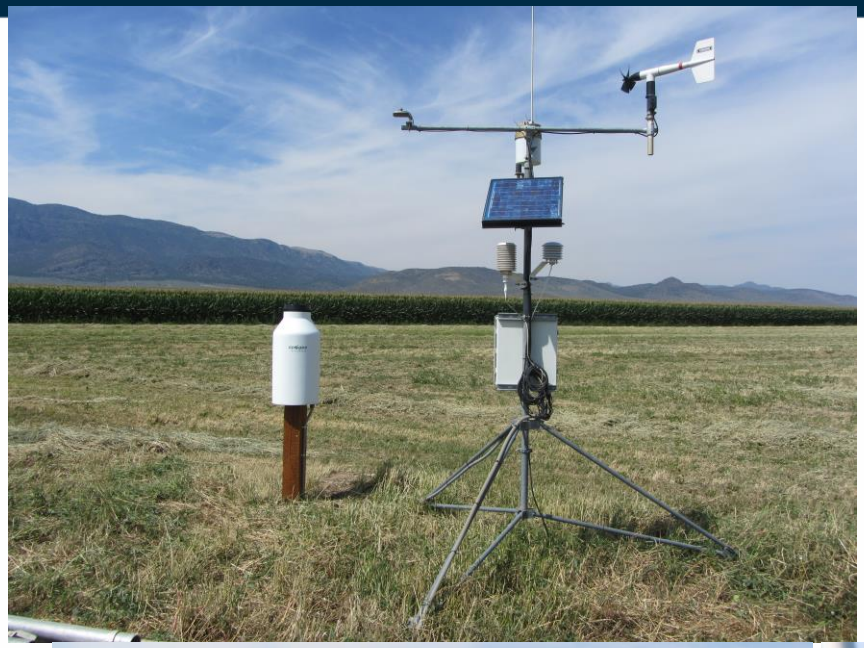
- **Extension Agriculture Water Conservation/Use Expertise**
  - Agronomy – Dr. Earl Creech
  - Vegetables – Dr. Dan Drost
  - Fruit – Dr. Brent Black
  - Weed Management – Dr. Corey Ransom
  - Pest Management – Dr. Ricardo Ramirez and others
  - Soils and Fertility – Dr. Grant Cardon
  - Irrigation – Dr. Niel Allen
  - Extension Agents – Kevin Heaton, Mark Nelson and Chad Reid

Irrigation Management

- Water Management during Drought
- Irrigation System Maintenance
- Irrigation System Improvements
- Irrigation Application Uniformity
- Irrigation Scheduling
- Crop Water Use
- Soil Moisture Measurement
- Water Measurement
- Agriculture Weather Network
- Crop Selection
- Cropping Practice
- Water Measurement and Management
- https://extension.usu.edu/irrigation/
- Utah Climate Center (Ag Weather Network) https://climate.usurf.usu.edu/

Iron County
Irrigation System Uniformity Evaluation

Iron County
Installation of soil water monitoring sensor




WATERMARK
MONITOR

The Nature and Condition of the Land in Iron County at the Time of Settlement

Chad R. Reid, USU Extension Agent
Charles E. Kay, USU Adjunct Professor

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Repeat Photography

- Provides valuable data on long-term vegetation change and land management practices
- Easily Interpreted by General Public
- Random

RRA Website

http://extension.usu.edu/rra

- Currently contains over 2000 photo sets
- Photos are searchable by vegetation type and location

Fish Lake 1899-2000

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Hogan Ranch 1902-1995

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Panguitch Lake 1872-1999

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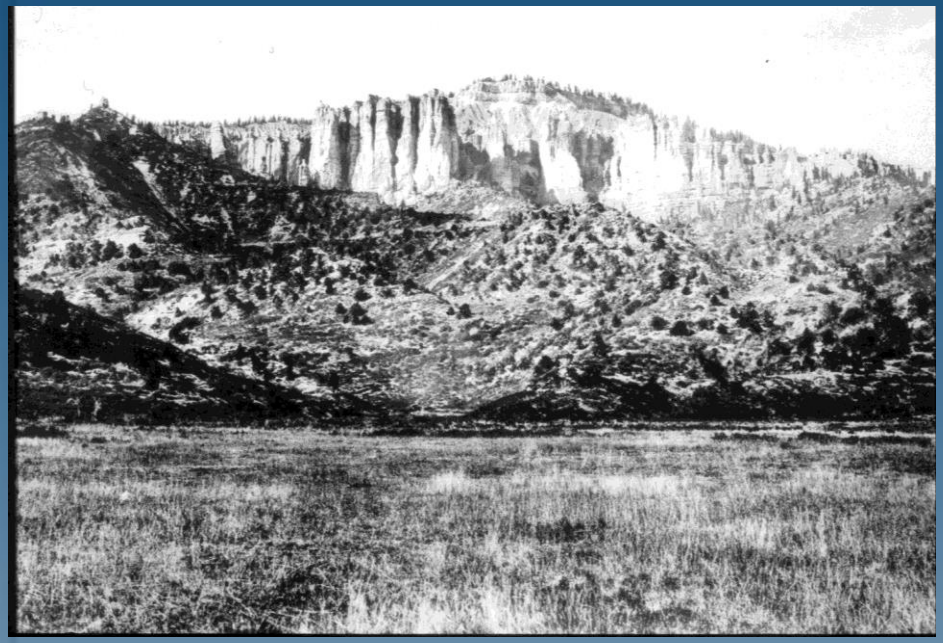
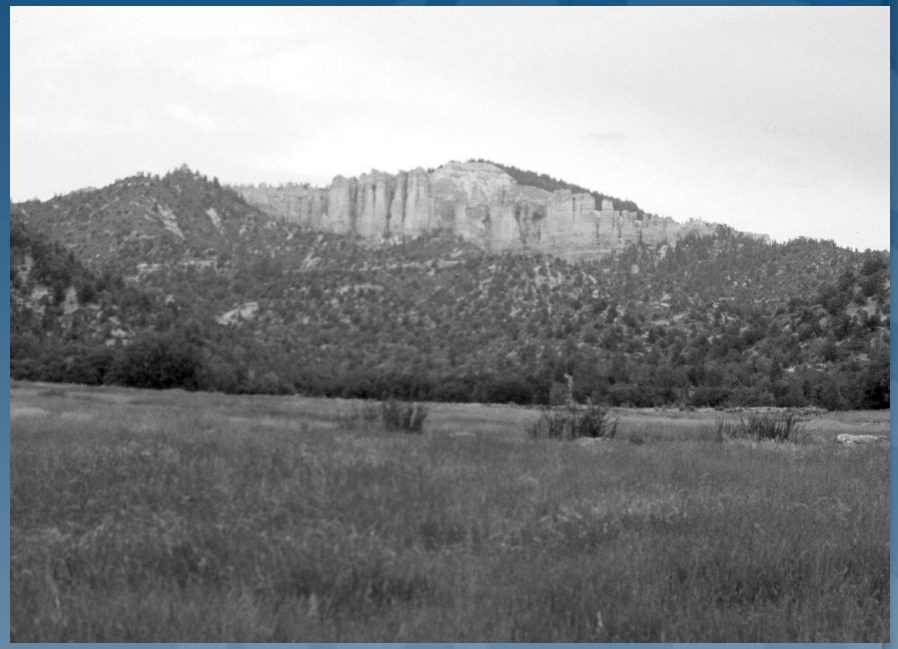
Tenny Creek 1872-2004





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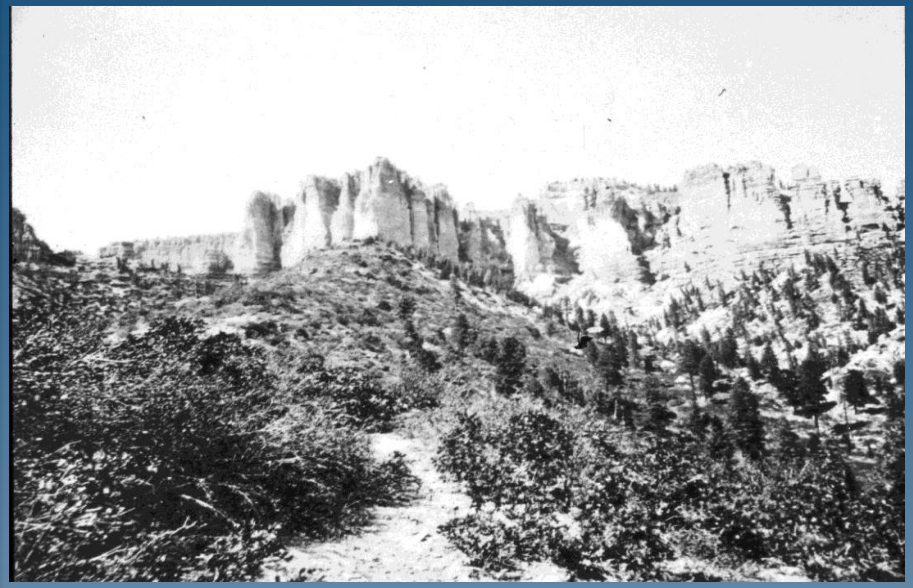
Pink Cliffs 1872-2004



Escalante River 1933-2004

Salina Creek 1912-1999

Escalante, Utah 1918-2004

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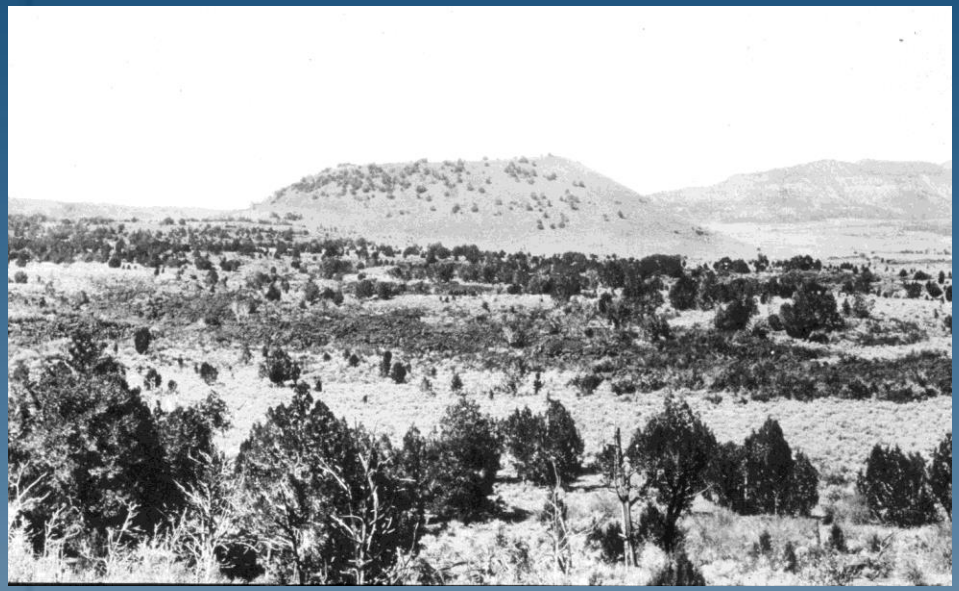
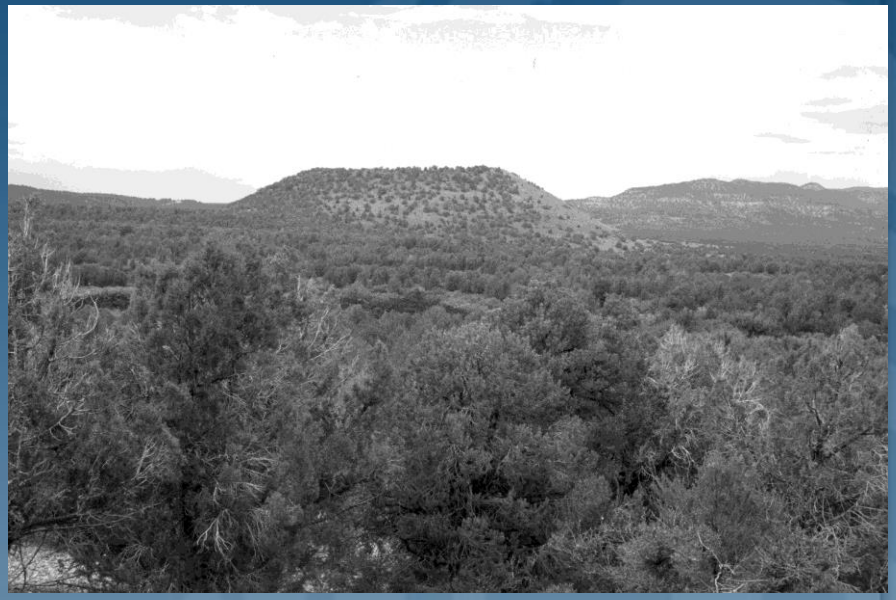
Bald Knoll 1909-2004





Summary of vegetation change in Dixie and Fishlake National Forests and surrounding area

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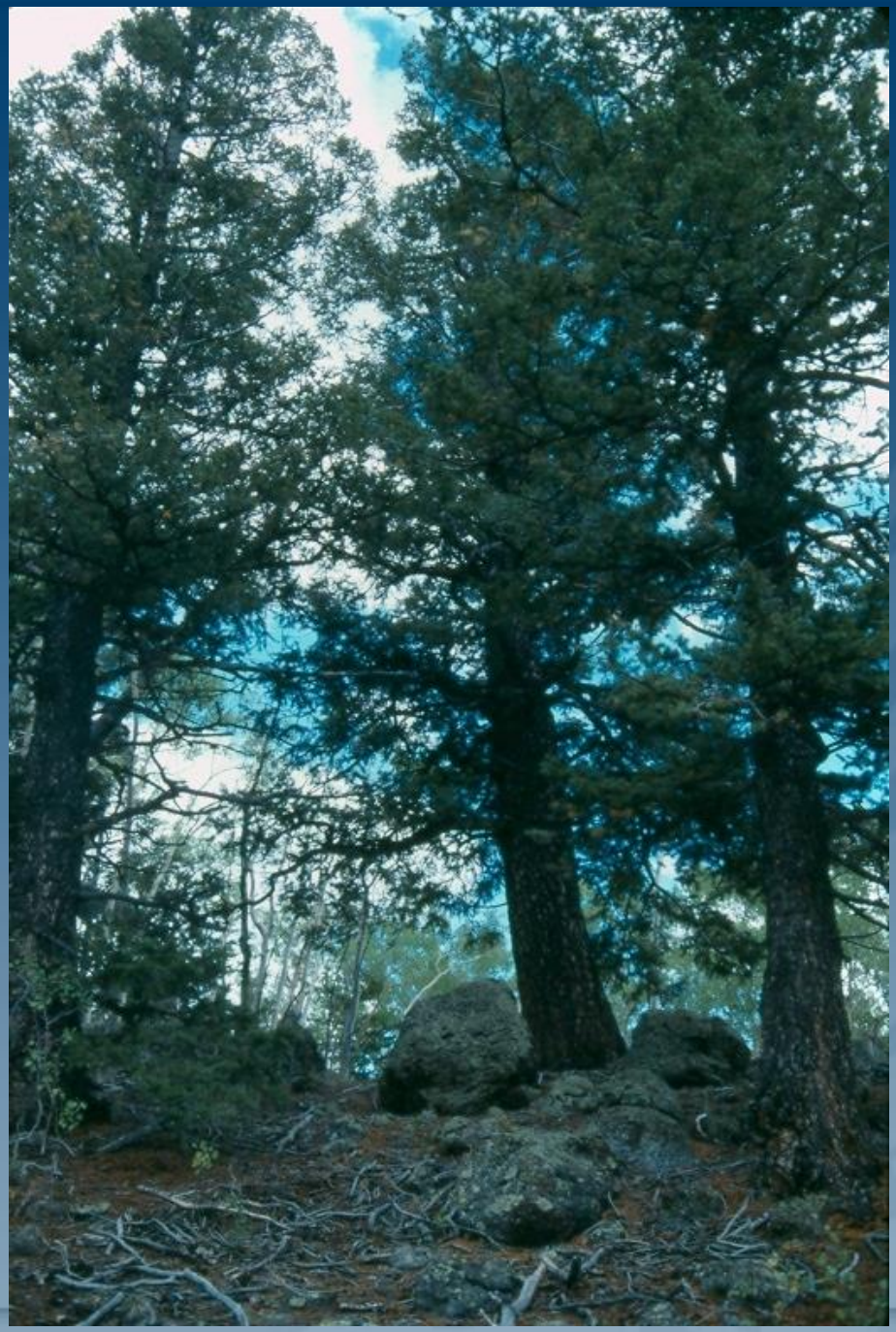

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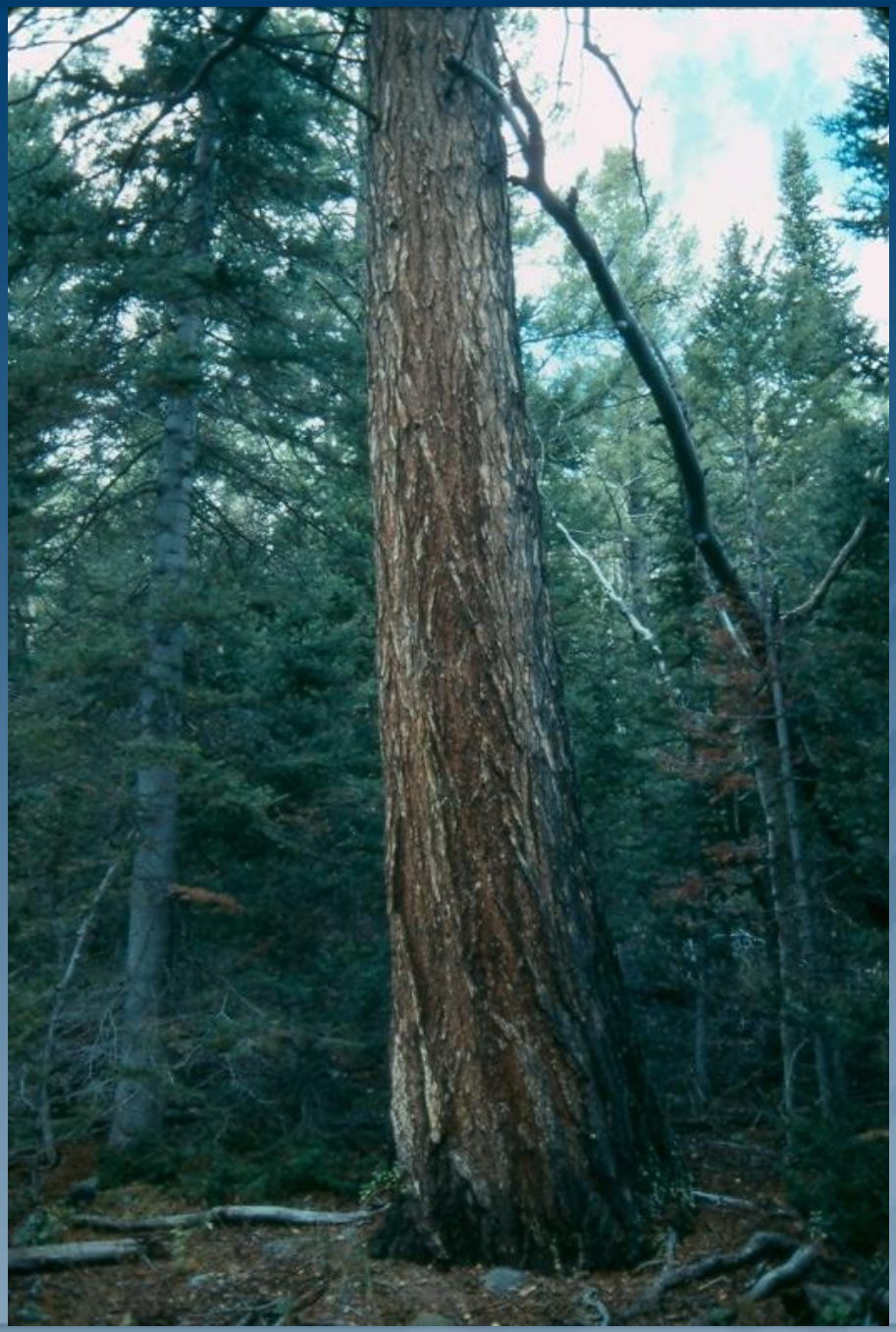

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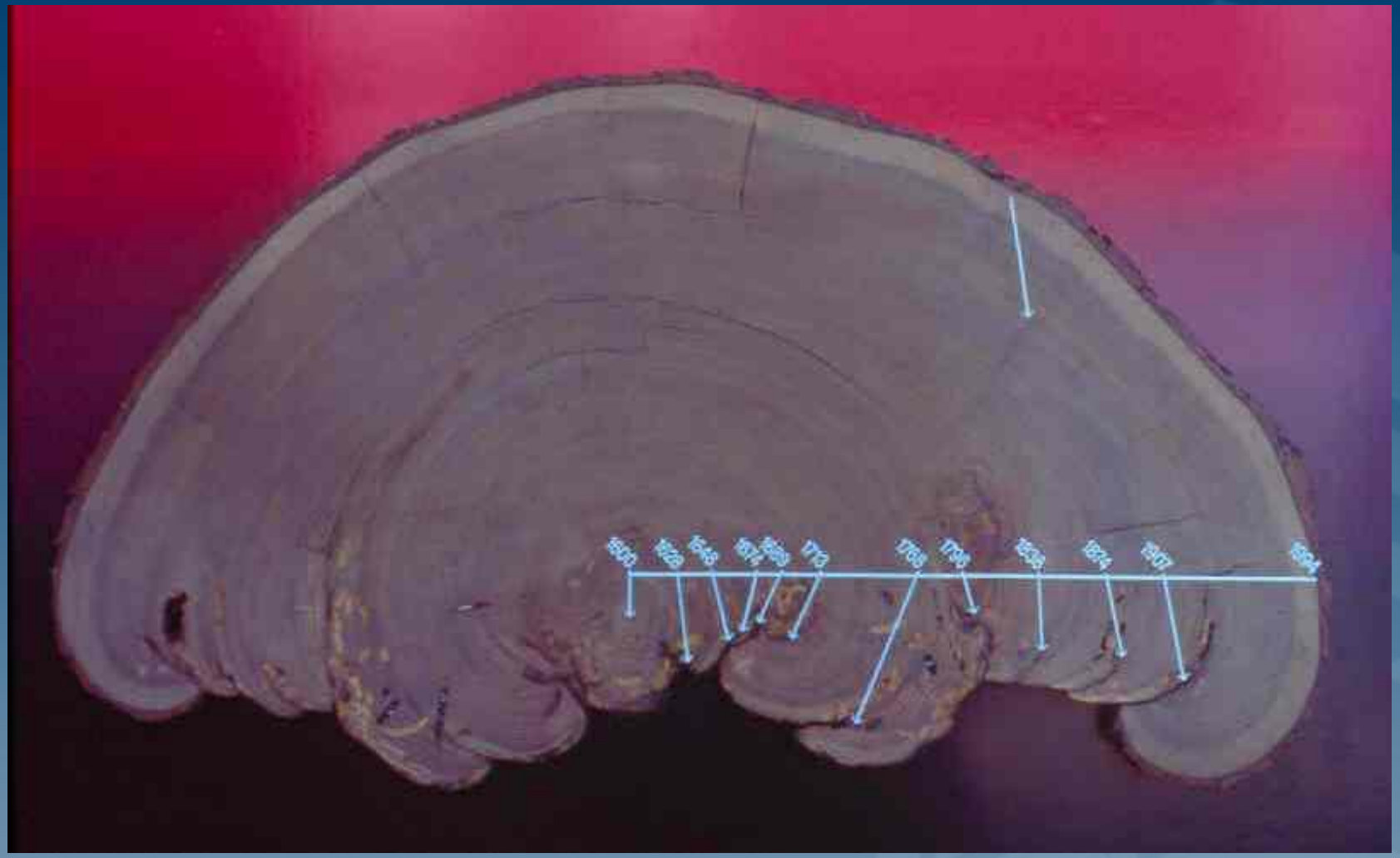

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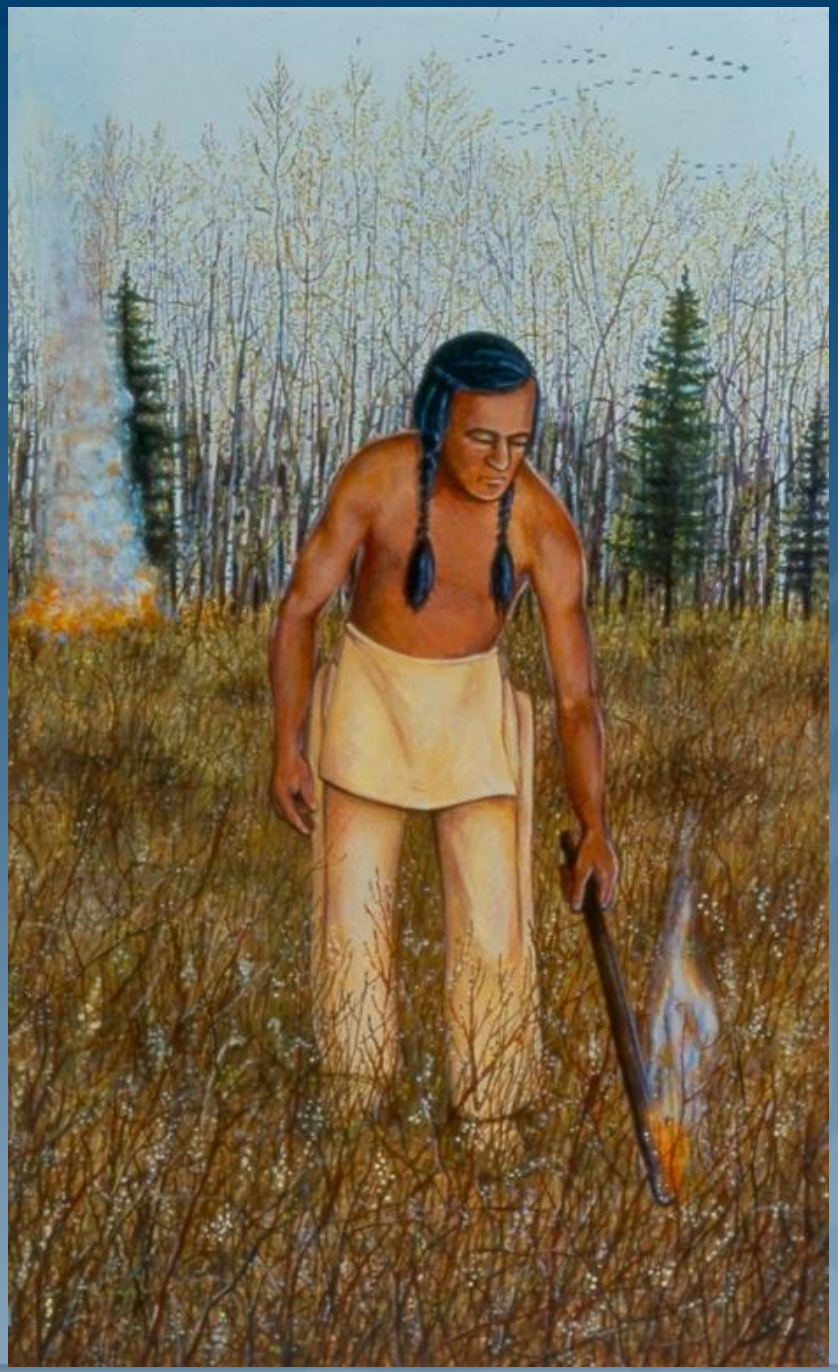

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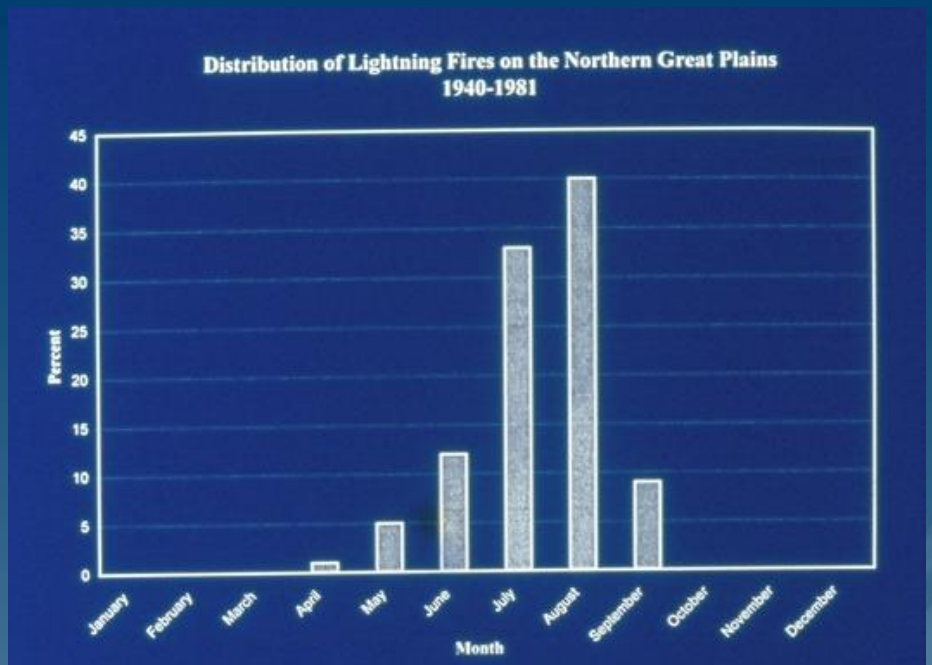

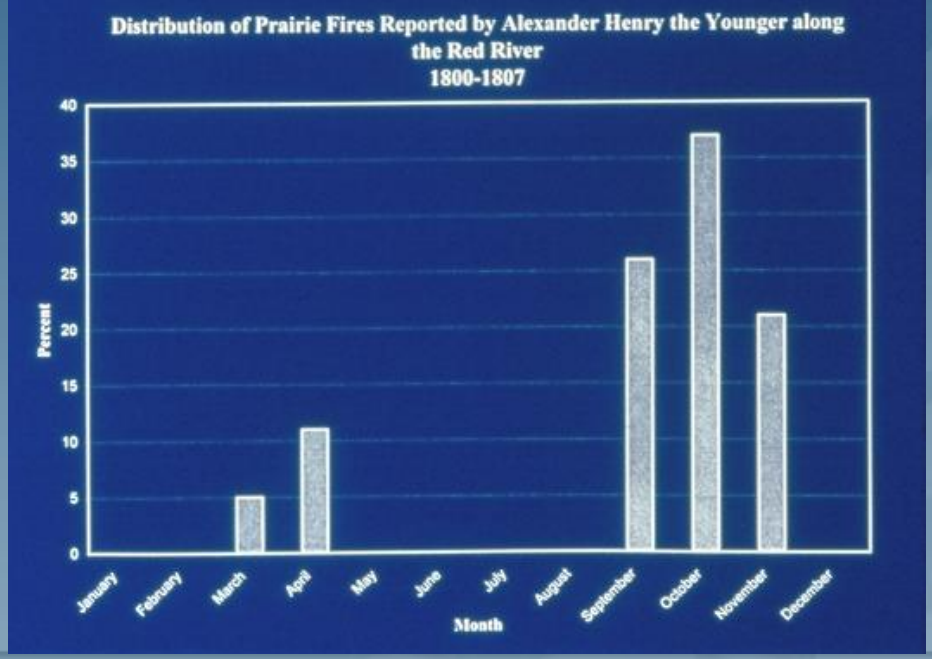

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Fire History

DESERET NEWS WEEKLY October 3, 1855

ELDERS' CORRESPONDENCE

PAROWAN

(From Elder James Lewis to Elder Geo. A. Smith)

Times in this part of the Territory are rather hard, owing to the loss of our crops of grain (however the other crops look well) and the scarcity of money…

There is a general time of health in this county, and as a general thing the people feel well and are doing the best they can; the streams are very low and we have had no rain this summer, the country is very much parched, fires have been raging in the canyons and upon the mountains, destroying much timber and wood, as also destroying our bridges.

The iron works stopped for the want of water, they do not think of building up the new city till they get an engine to run the works, for they cannot divide the water; so I learn the crops at Cedar are light, as also at Harmony, scarcely enough for the people.

Fire History

Desert News September 19, 1855

HARMONY

From Elder S. F. Atwood to Elder E.T. Benson ,Harmony, August 1, 1855

The brethren on the Santa Clara are doing well. The prospects bid fair for a good crop there. The wheat crop at Harmony will average from seven to ten bushels to the acre; the season has been extremely dry, and no prospects for rain soon; the corn and potatoes are suffering for the want of water, and unless we soon have rain, much of those crops will fail.

Peace and union exist among the brethren at present, as it has ever since we have been here; and all are endeavoring to do the best they can; but the labors at Harmony in raising provisions and building the fort, field fence, &c., has kept us very busy.

The Indians here seem to be possessed with the spirit of burning, for there is scarcely a day but what we can see fires both on the mountains and in the valleys. We have talked to them about burning up the grass, and they seem willing to spare it, and do set their fires among the sage brush, but it often gets into the grass, and they have already burned much of it, but they try to clear themselves by saying that it will be very good when the rains come in the fall.

BRIGHAM YOUNG UNIVERSITY
SCIENCE BULLETIN

PRESETTLEMENT VEGETATION AND VEGETATIONAL CHANGE IN THREE VALLEYS IN CENTRAL UTAH

by
Earl M. Christensen and
Hyrum B. Johnson

Published August 1964

The following is an unpublished statement which was given to James Jacobs, Forest Service, in 1947 by Hyrum Bevan Johnson, an early pioneer of Holden:

- My parents, Mr. and Mrs. Richard Johnson, were sent down here to Holden (then Cedar Springs) in February, 1856, and started building the rock fort (Buttermilk). I was born in the corner of the fort where my home now stands on June 5, 1856, I have lived on that same spot all my life.

- I have been around livestock all my life, and worked with them most of it. I remember how the range looked. When I was as a boy the flats were covered with bluegrass in a good sod. There was a little sagebrush in them, but scarcely enough to stake a horse to. (We would often stake a horse which we would use for a wrangle horse.) The foothills were covered with bunchgrass. It was not what we

Continued

- called wheatgrass, but was shorter and much finer. There was also a lot of sand grass *[Oryzopsis].* The foothill bunchgrass grew about two feet high in places. When I rode my pony through it, it was tall enough to tickle my bare feet. There was a little sagebrush, but not much.

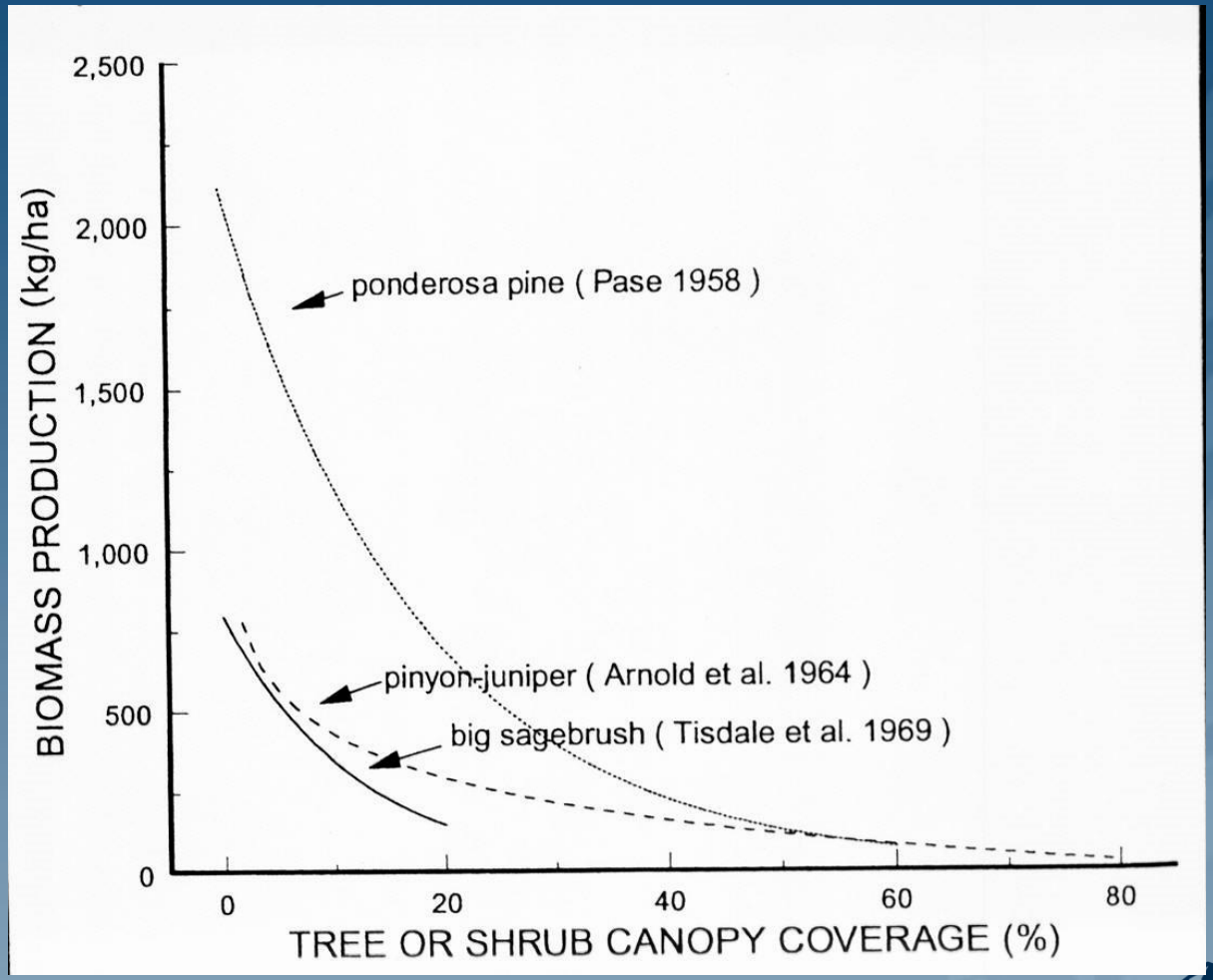
- 'They used to cut hay on the meadows at Clear Lake 20 miles west of Holden, seven miles west of Holden, and over at Scipio Lake. Some bluegrass was cut on flats near Holden, but this did not yield enough. The hay was cut with scythes. There was only a very little hay put up for many years as the grass was so good that the stock could get all the feed they needed,

CHAPTER I.

THEIR COUNTRY.

The more exposed parts of the country are **annually** run over by the fires set by the Indians to kill and roast the crickets which they gather in summer for winter food. These fires ascend the furry hill-sides and penetrate the forest kanyons -- and it is a beautiful but melancholy sight to see the withered vegetation swept away by the curling flames as they leap up the cliffs, lighting up at night the surrounding country with fitful splendours. One of the strenuous efforts making to improve the country, is to arrest this destructive process and convert the prairies into desirable woodlands.

Forage Production



Forage Production Cont.

Thus, in just the aspen type alone, Utah has lost approximately 1,500,000 AUM's during the last 100 years. To put this in perspective, all the national forests in Utah presently allocate just slightly more than 1 million AUM's to livestock. When other vegetation types are considered, Utah may have lost 3-4 million AUM's to encroaching woody species.

Rodeo-Chediski Fire

June 18 – July 7, 2002

Burned 468,638 acres

Destroyed 426 building

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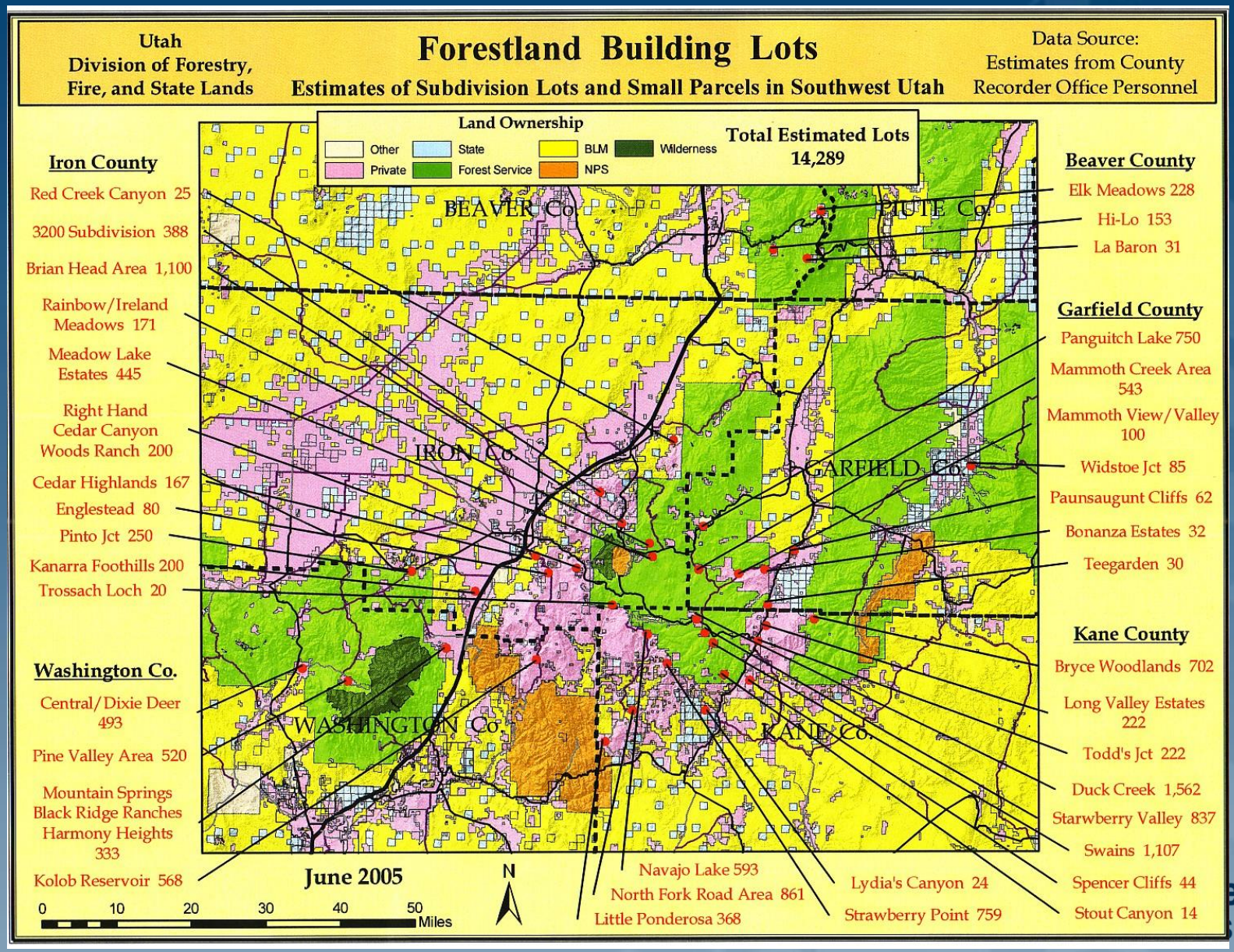
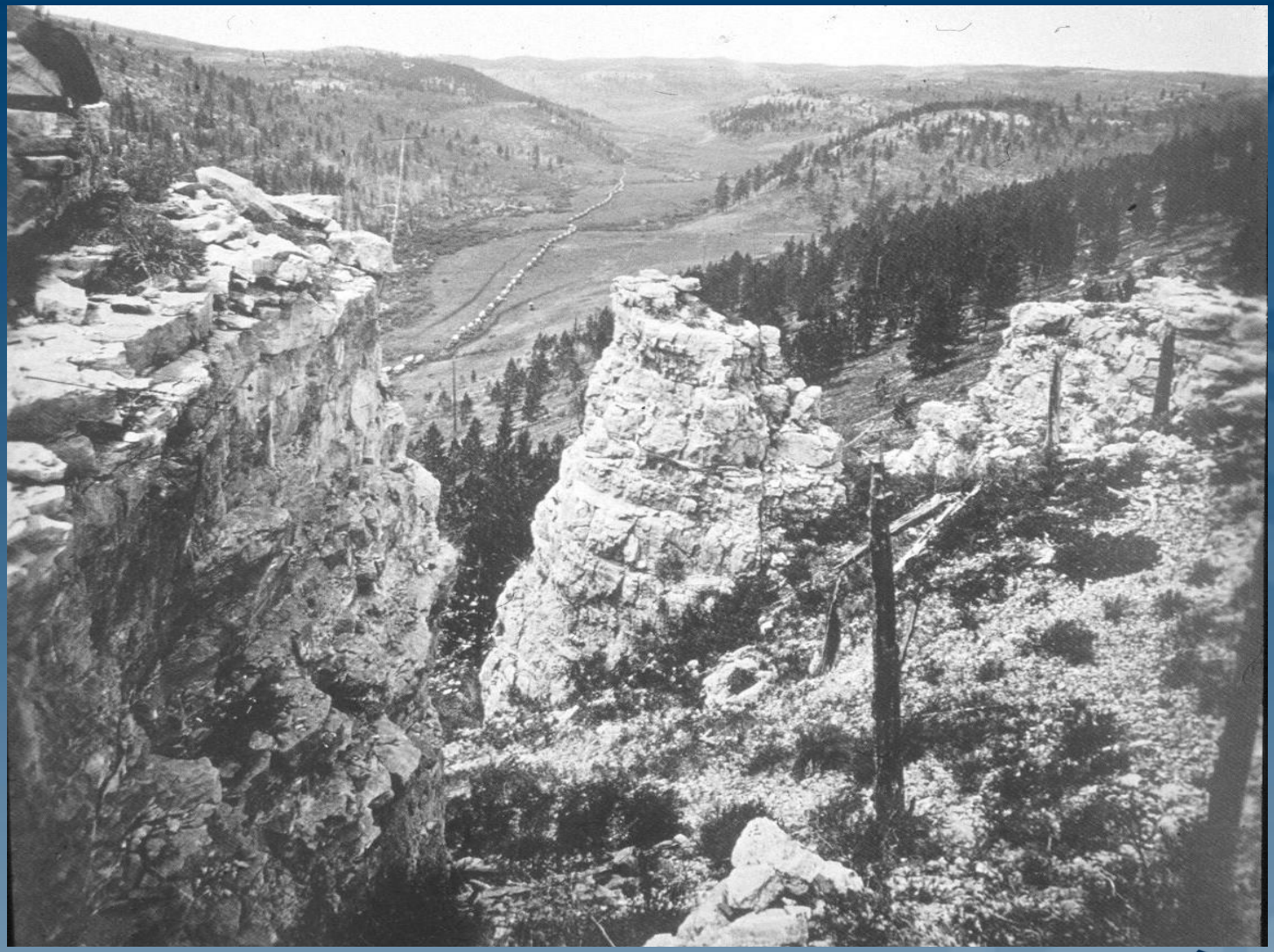



KEEP
Timberjack



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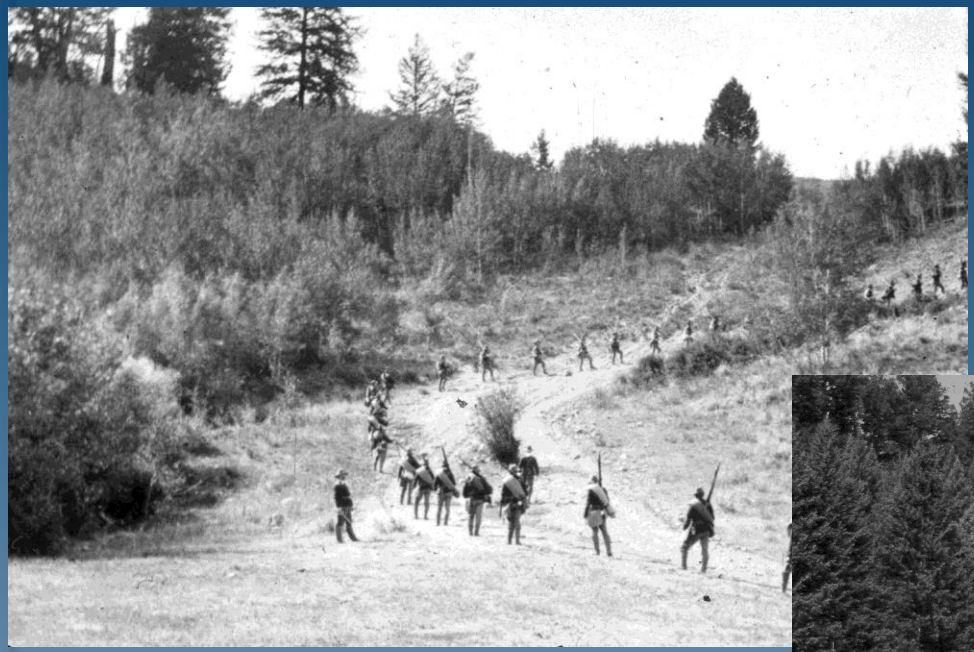
Black Hills 1874 – 2000

Yancy 1884 - 1998



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Vegetation vs Water Yield

Influences of Brush Conversion and Weather Patterns on Runoff from a Northern California Watershed

MICHAEL D. PITT, ROBERT H. BURGY, AND HAROLD F. HEADY

Highlight: Sixteen years of data were evaluated to determine the influence of annual weather patterns and a brush conversion project on subsequent runoff from an 86.2-ha watershed. Grassy vegetation released 39% more total runoff than did woody vegetation. Total runoff for each hydrologic year was directly proportional to total precipitation, regardless of vegetative cover. However, runoff as a proportion of total precipitation increased 59% following conversion of woody to grassy vegetation, and most closely correlated with March cover

The Effect of Timber Harvest on the Fool Creek Watershed After Five Decades

Elder, K.; Porth, L.; Troendle, C. A.

- The Fool Creek Watershed Study at the Fraser Experimental Forest in Colorado is one of the classic paired watershed studies in North America. After a ten year calibration period, 40% of the basin (50% of the forested area) was clear cut in 1956 using a pattern of alternating cut and leave strips, while the East St. Louis control basin remained unaltered. Nearly a half century later (49 years), seasonal streamflow at Fool Creek is still 29% higher on average over the period than pre-treatment conditions.

Parley P. Pratt

Exploring Expedition to Southern Utah 1849-50

- On the 27th, they crossed a stream called the Muddy [Coal Creek], clothed with hundreds of acres of scattering cottonwoods, some of which were large; below these is a handsome expensive plain of very rich land, consisting partly of overflowed wire grass meadows; other portions of this plain were dry, level and inviting to the plow, clothed with meadow grass and rabbit wood, soil mostly black loam, very rich, on which the water could be used, and thereby redeem the swampy parts.

Vegetation Conditions at Settlement

- More Aspen less Conifers in the mountains
- Much less Pinyon and Juniper in the foothills more grass
- More grass and less brush in the valleys
- More water in the valleys with more wet meadows and small streams.
- Almost no Alien species (Weeds)

Dutton wrote of the Kaibab forests in 1887 in his **Tertiary History of the Grand Cañon District**:

- The trees are large and noble in aspect and stand widely apart. … Instead of dense thickets where we are shut in by impenetrable foliage, we can look beyond and see the tree trunks vanishing away like an infinite colonnade. … All is open, and we may look far into the depths of the forest on either hand.

*From SOS Forests - http://www.sosforests.com/

Lt. Edward Beale, commander of the Army's experimental Camel Corps, wrote of central Arizona forests:

- It is the most beautiful region I ever remember to have seen in any part of the world. A vast forest of gigantic pines, intersected frequently with open glades, sprinkled all over with mountains, meadows and wide savannas, and covered with the richest grasses.

*From SOS Forests - http://www.sosforests.com/