Forest Grazing Revisited

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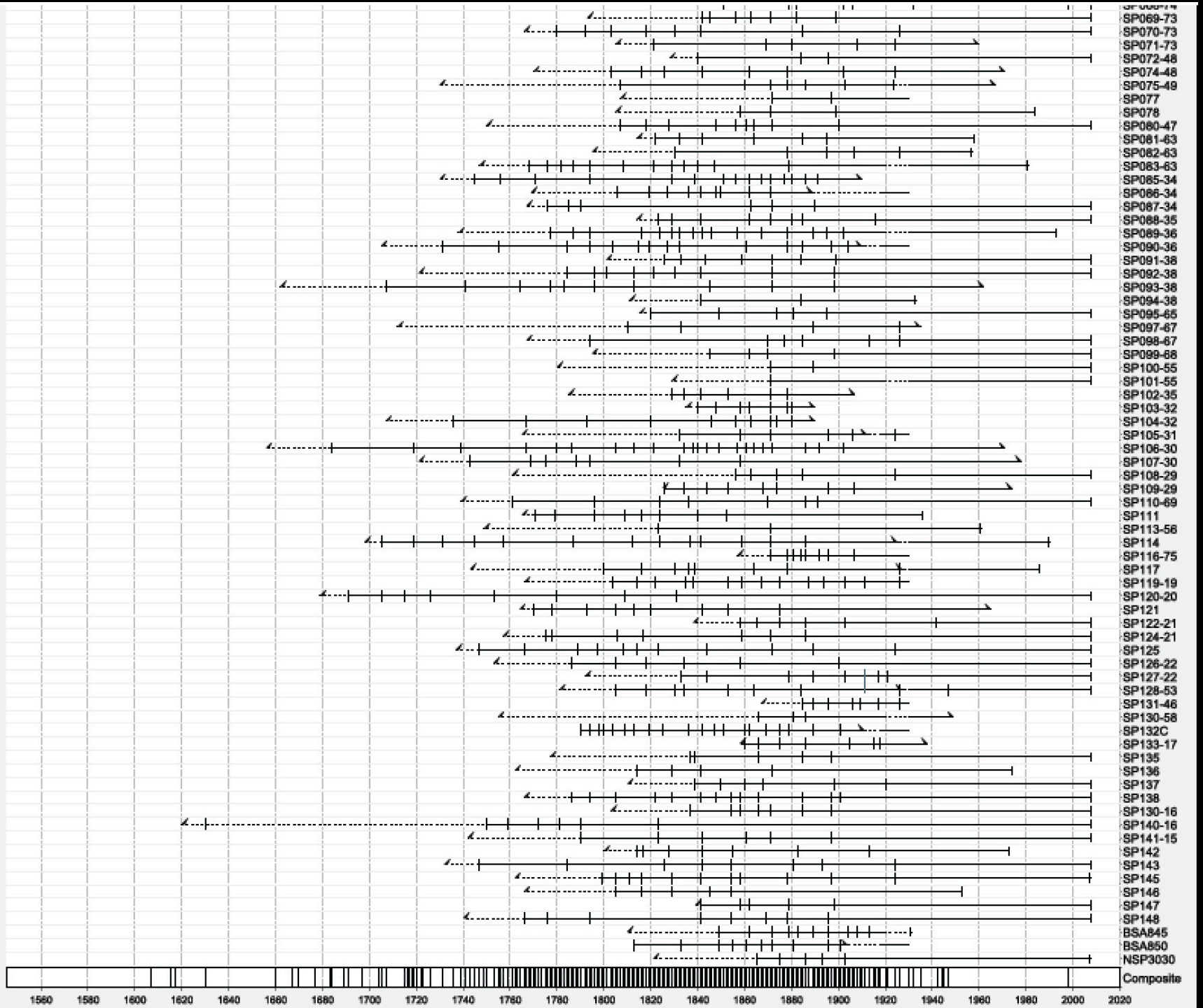
- A brief overview of fire suppression history
- Forest grazing experiment, 1983-86

A brief overview of fire suppression history

Dendrochronology
Measuring and matching tree rings


No recorded fire for the past 111 years!
1897
1885
Mean Fire Return Interval (MFRI) before last fire = 15 years
1868
1839
1837
SP 135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SP131-46
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SP132C
SP133-17
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SP146
SP147
SP148
BSA845
BSA850
NSP3030
Composite
1560
1580
1600
1620
1640
1660
1680
1700
1720
1740
1760
1780
1800
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
2020

Frequent use of fire

Native Californians manipulated the vegetation for thousands of years

Muir: the “Range of Light”

John Muir, 1890, inspired National Park System

- "*Fire, the ax, and wholesale vandalism, have long threatened the forests of the country with utter destruction.*"

- *"Nature sends down fire from heaven every year in the form of lightning, making the care of man all the more necessary.*"

Gifford Pinchot, first Chief of Forest Service

- *“There is no doubt that forest fires encourage a spirit of lawlessness and a disregard for property rights.”*

USFS started managing forests circa 1905, though federal management started in the 1870’s

1890's: Bernhard Fernow: Founded first American forestry school

- *"the whole fire question in the United States is one of bad habits and loose morals"*

- *Trained in Prussian "scientific forestry"*

Letter from Shasta Trinity Forest Supervisor to local stockman during WWI

“Preventable fire is more than a private misfortune. It is a public dereliction.

At a time like this of emergency … it is more than ever a matter of deep and pressing consequences that every means should be taken to prevent this evil …

…400 men working …to suppress man-caused fires, and these men are needed at the front. It is therefore the patriotic duty of the stockman to prevent fire.” (Morrow 1918)

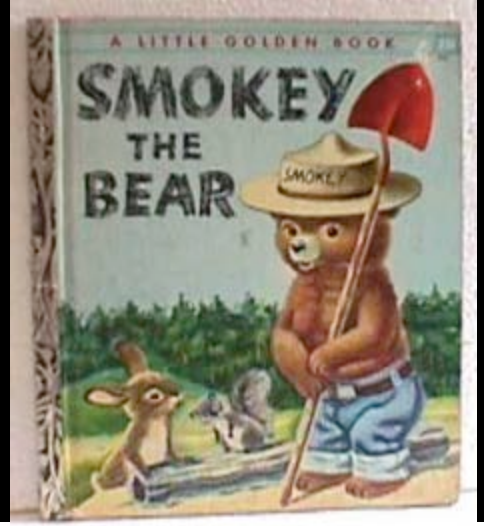
Uncle Sam, 1937

Campaign kicked off by President F.D. Roosevelt

During the war, fire associated with the enemy

Disney allowed use of Bambi for one year in 1944

- Bear cub found in New Mexico in 1950



High frequency, low intensity Native Burning

+

burning by herders, farmers, hunters

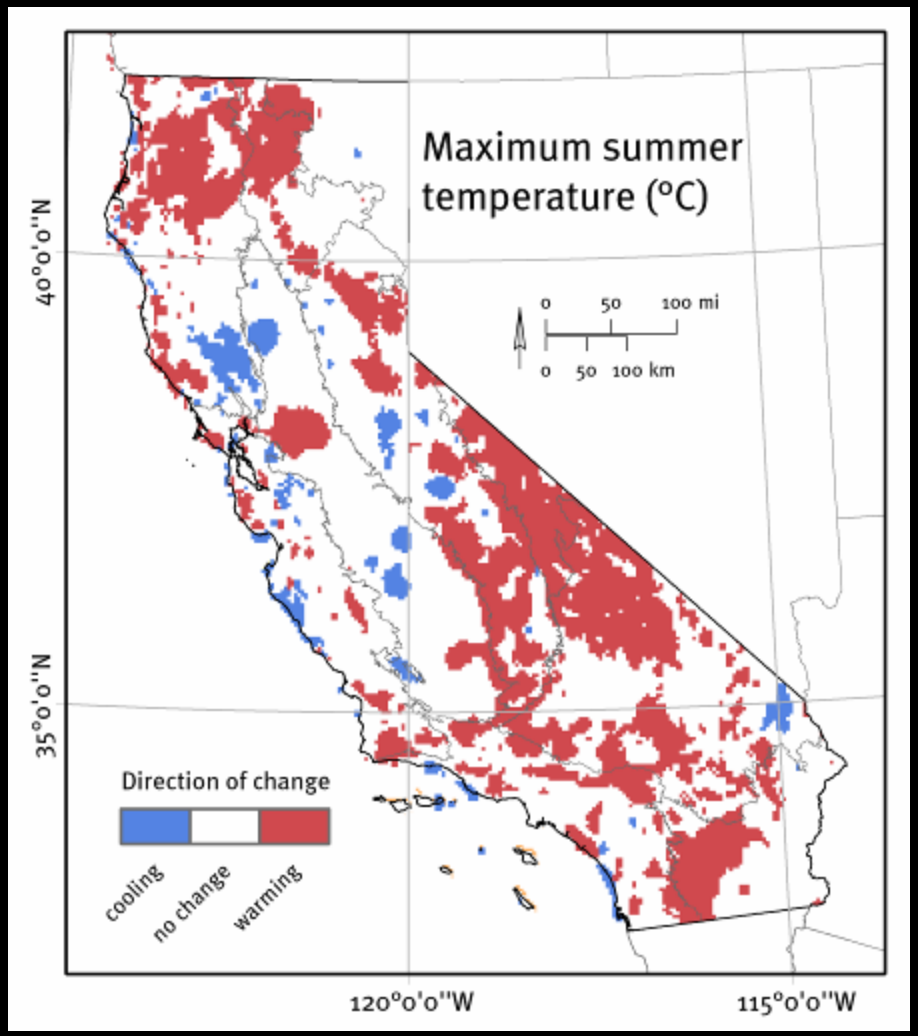
U.S. fire suppression 1900+

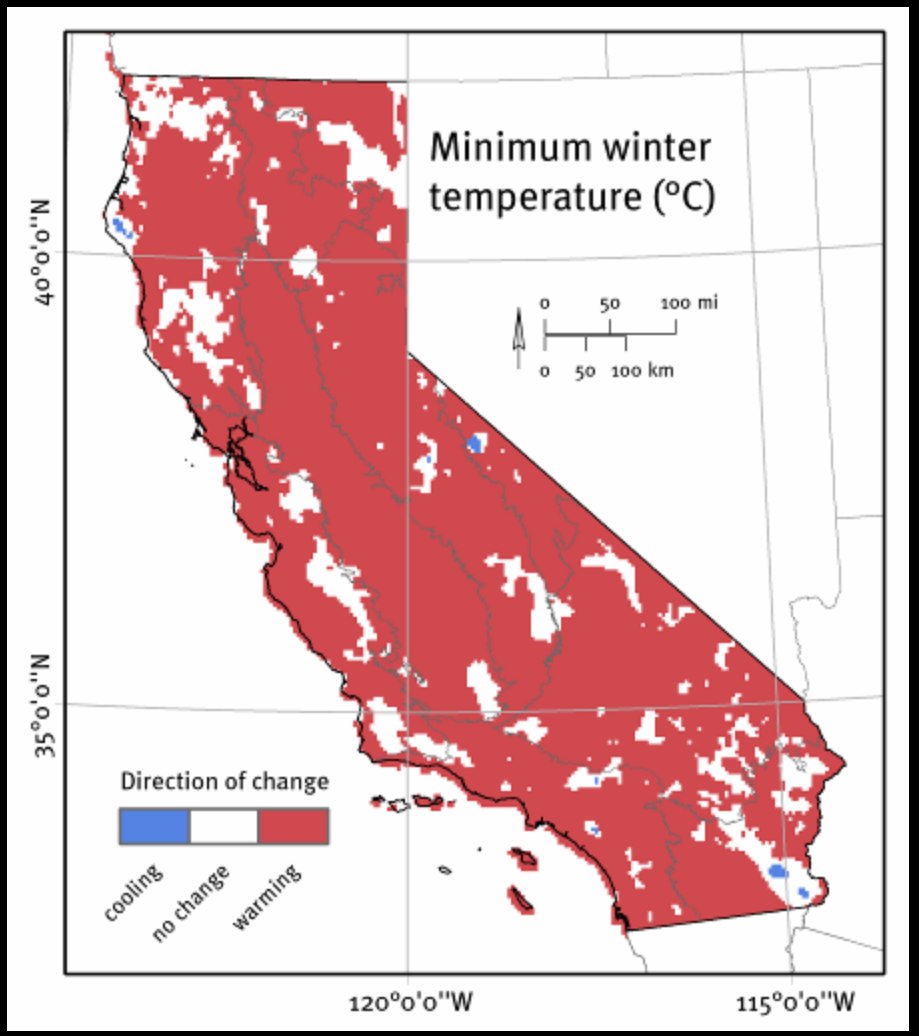
- Fires are set by criminals, immoral, and unpatriotic persons
- Stop Indians, farmers, ranchers, hunters from burning the woods
- Eliminate human use from national parks

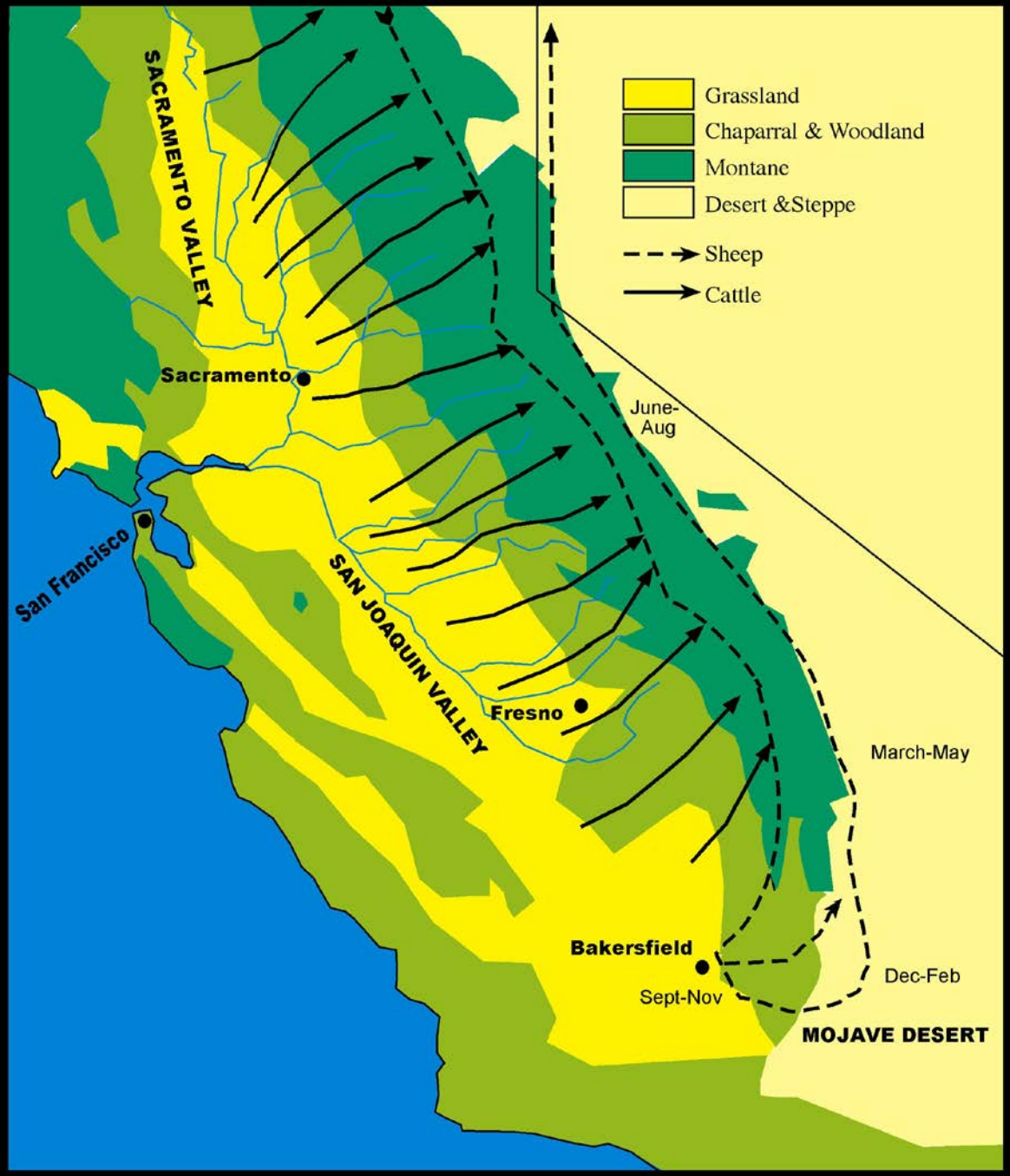
Berkeley Hills 1900

Berkeley Hills, 1990

Climate Trends in California (1960-2000)

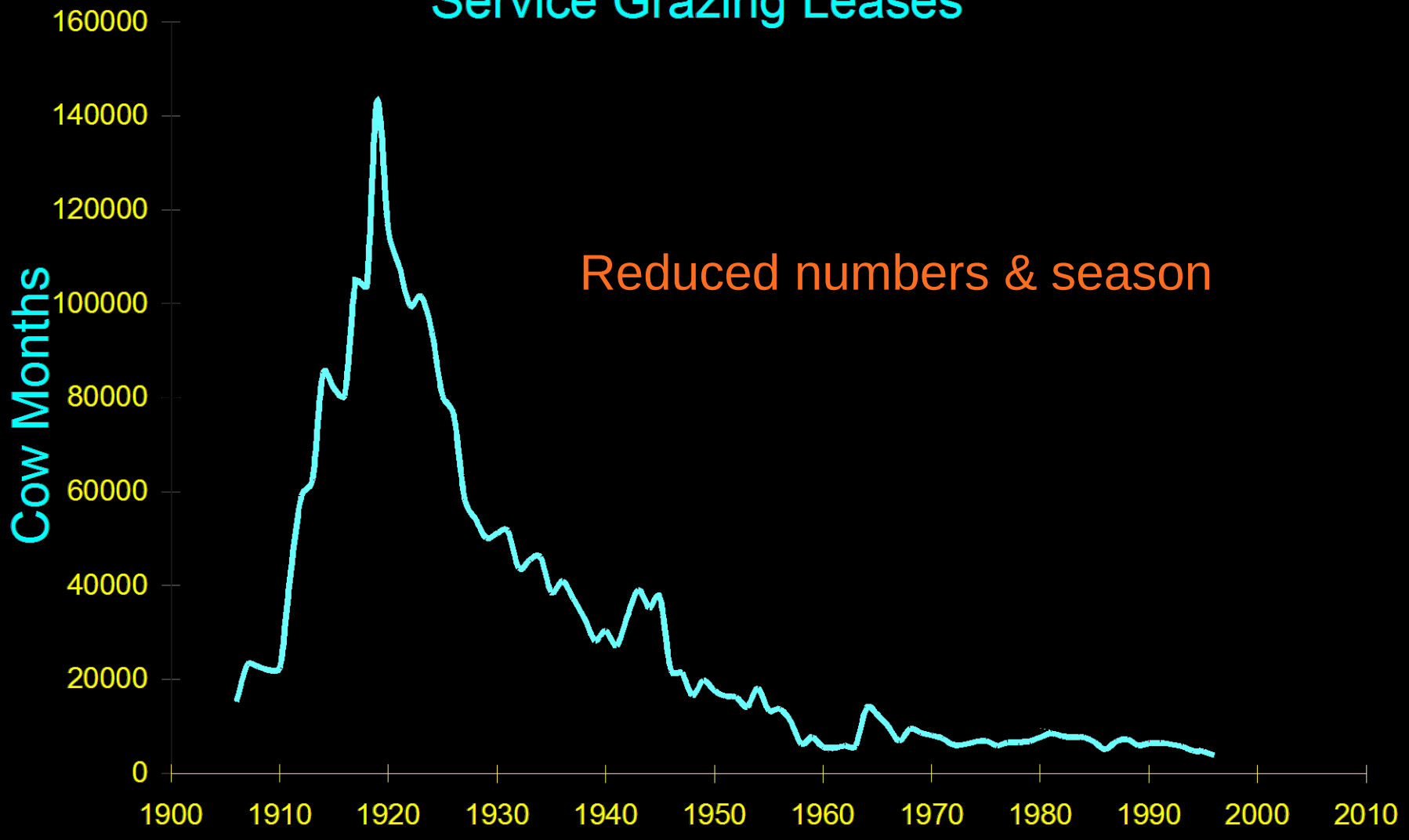






"Transhumance" use of Sierran meadows.

Cow Months of Forage Harvested By Year, Forest Service Grazing Leases



Grazing removes biomass, which is also fuel

“Project Mosaic,” Spain

Before the mountains were clean, because they were the appetite of all kinds of livestock.

The fires are the result of the gradual disappearance of this important partner of the economy and rural culture.

To effectively protect ourselves from fires, we must give cattle the rank of firefighters.

TELL US YOUR IDEA


The abandonment of agricultural activities


Before the mountains were clean


Forestry has been, until now,

II. Forest Grazing Dissertation Research

Study Area: Blodgett Forest Research Station

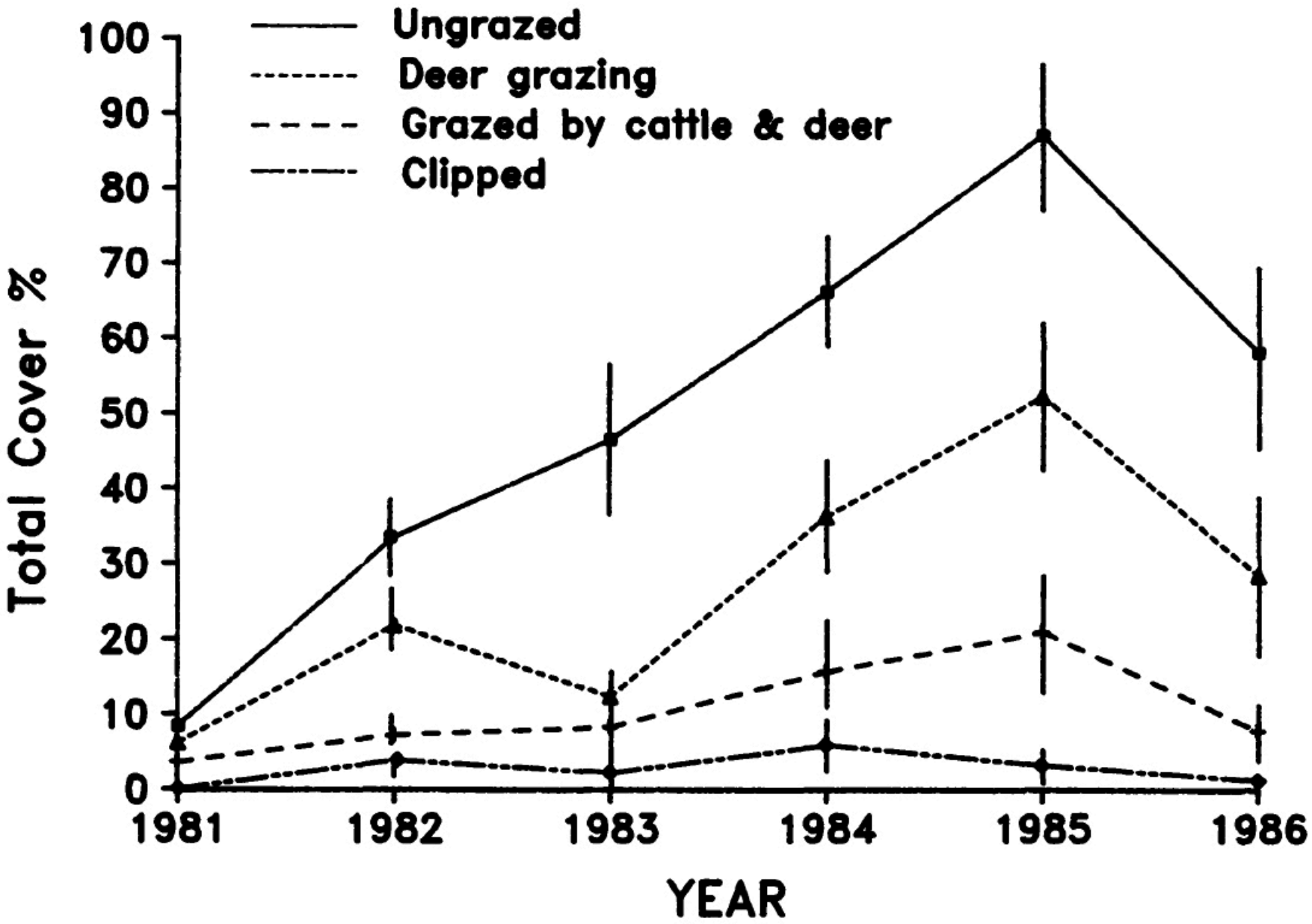
Manager's Goal: to control shrubs to enhance tree growth by suppressing shrubs with cattle grazing

Methods

- Build exclosures on forest plantations, comparing with and without grazing *(B. Allen-Diaz and J. Bartolome)*
- Fence cows onto pastures and see what they eat
- Control timing, intensity, and frequency of grazing with clipping study
- Build model impact of grazing practices

Exclosure Study (Allen-Diaz and Bartolome)

Shrub and Herbaceous Cover on Clearcut 321e
Blodgett Forest Research Station, California



Develop a model for vegetation management:

Deerbrush, *Ceanothus Integerrimus*, edible by cattle and deer.

Competes with regrowing trees

Shelterwood

- Leave sparse large trees to provide seed source, protect the site

Shelterwood study: Three pastures, grazed one month each

Stocking rates: 1983-- 2 AUMs/acre; 1984-- 2.2 AUMS/acre

Cover reduced each year, but vigorous regrowth

But not as big as outside the pastures

Cows escape before eating conifers

Lessons learned

- Cattle spent 1 month in each pasture: deerbrush recovered quickly
- Most trampling occurred the first year, and was not a problem relative to the number of seedlings, softer soil, more damage (10,404 seedlings per ha to start, ideal around 500)
- Cattle did not eat conifers, deer browsed off most of them

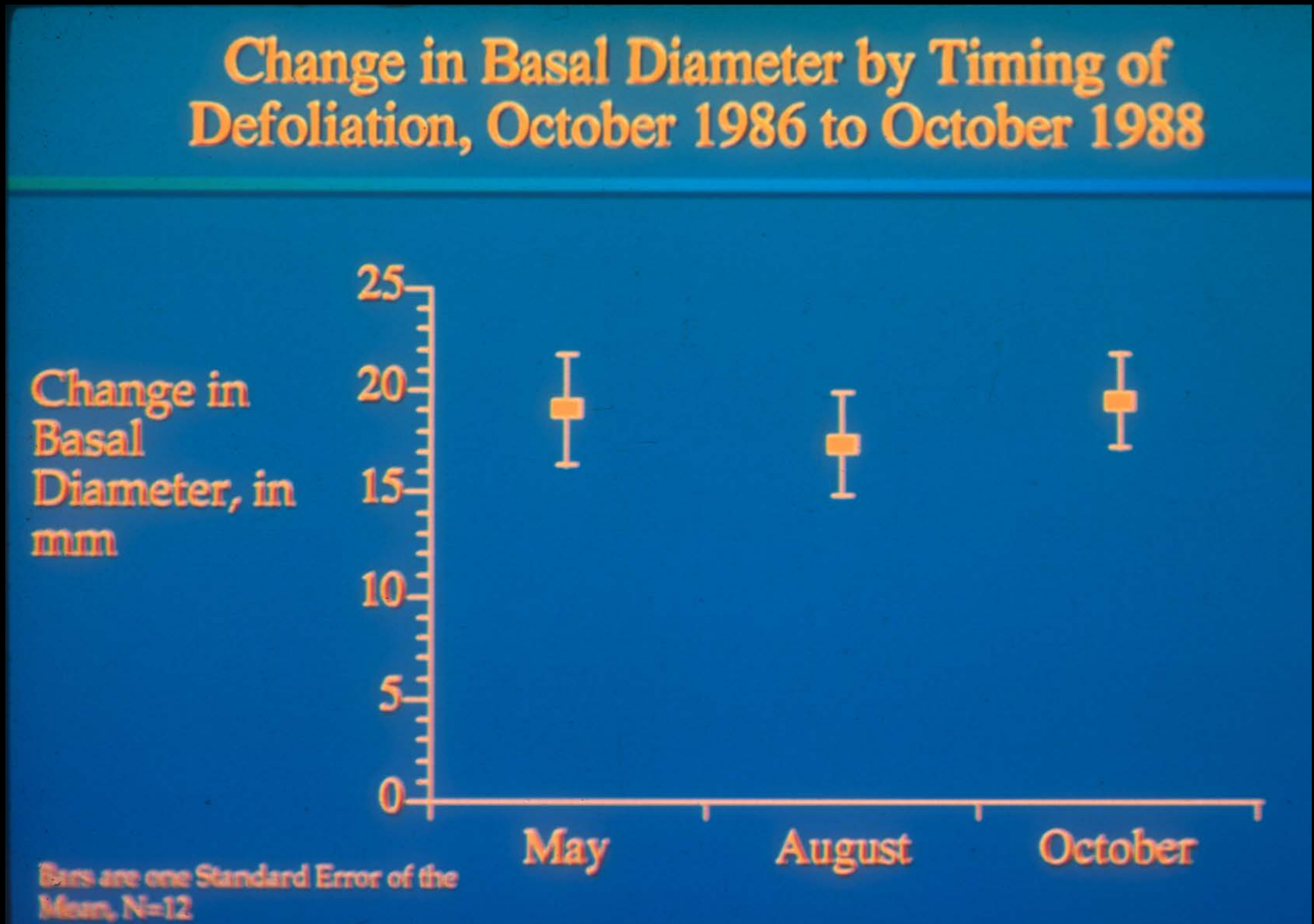
Cattle browsing: Simulate!

Clipping study

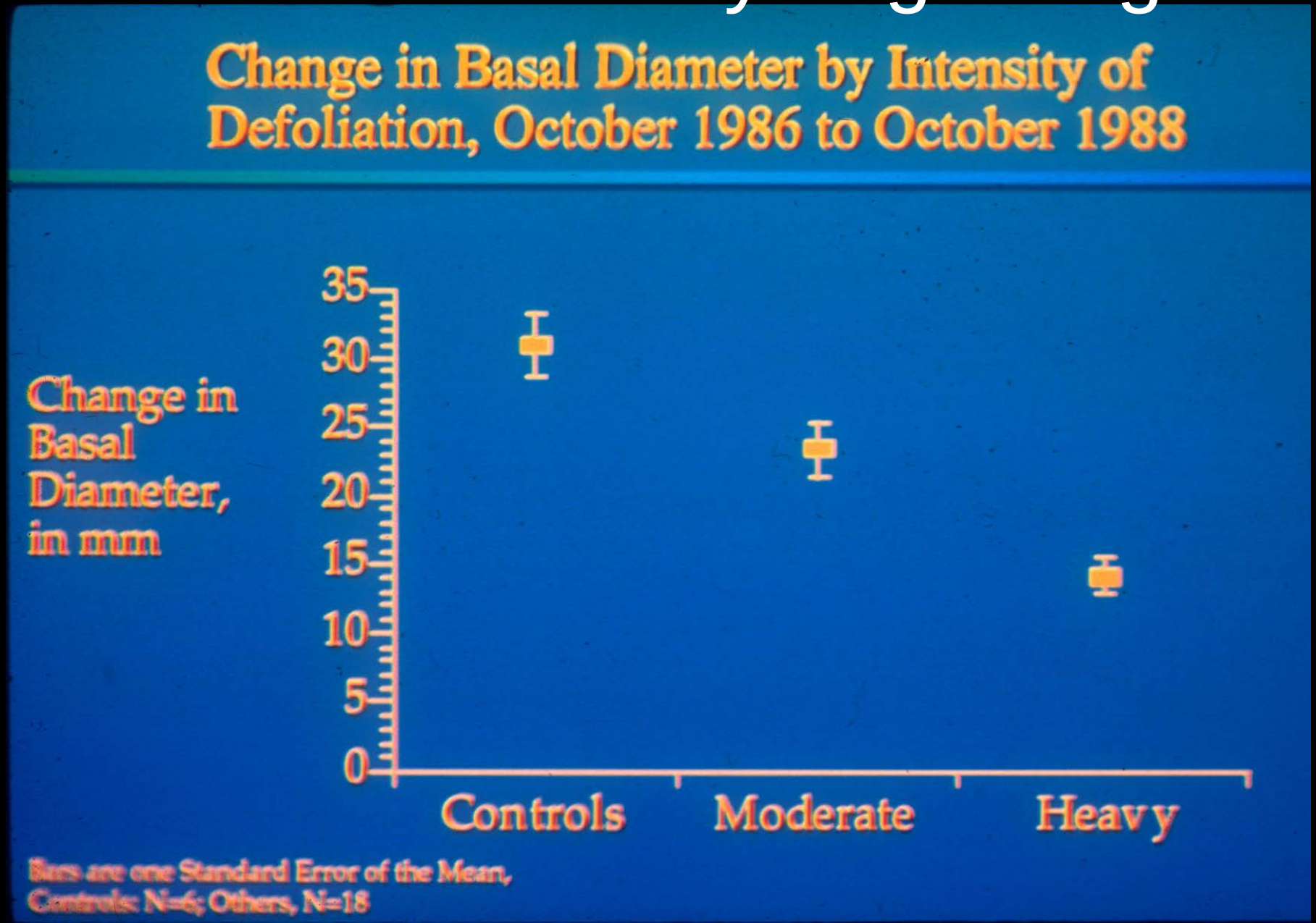
- Clipped deerbrush on two sites once or three times
- Clipped all, half, or no annual growth

Thank You!

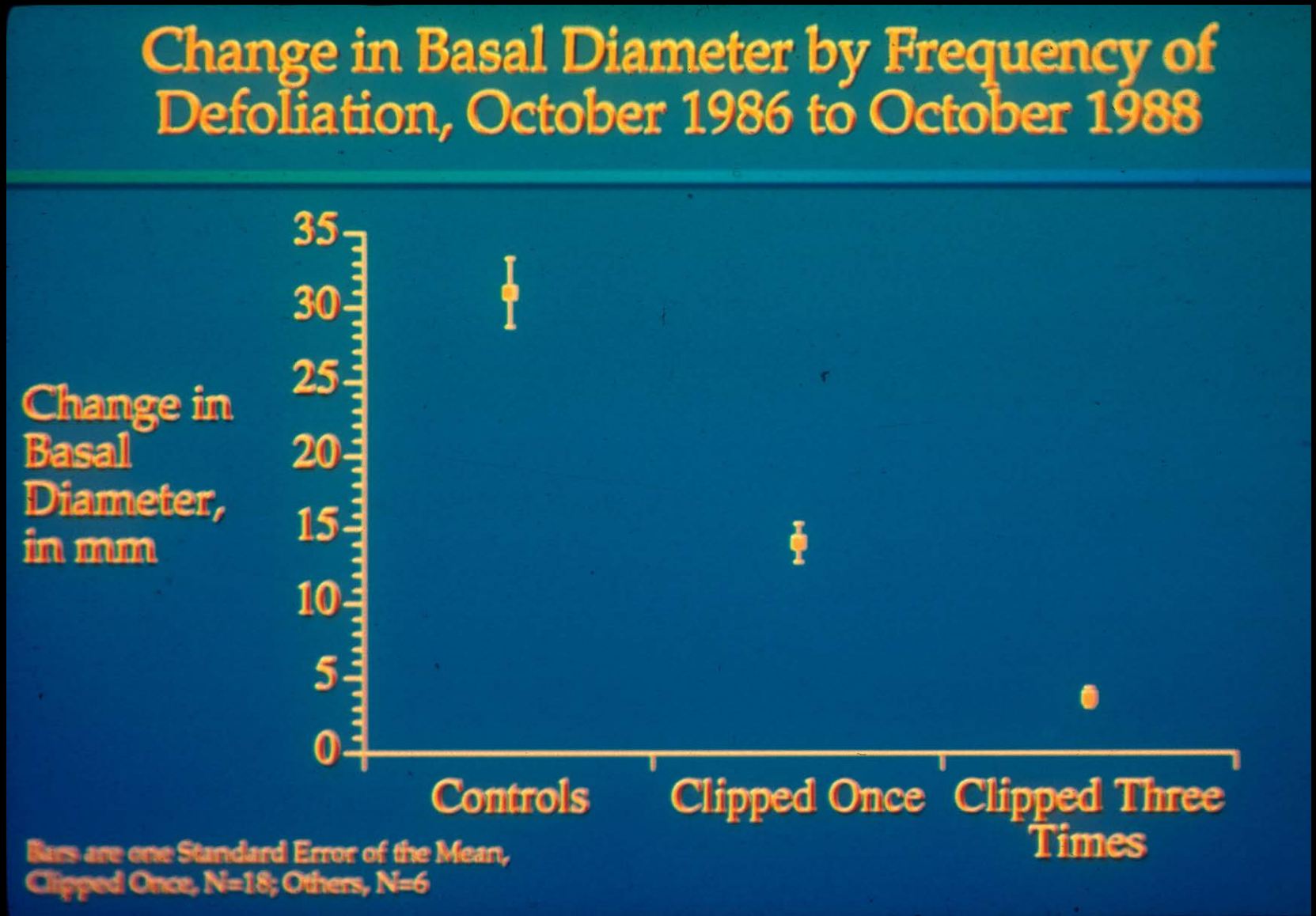
Results: timing of grazing



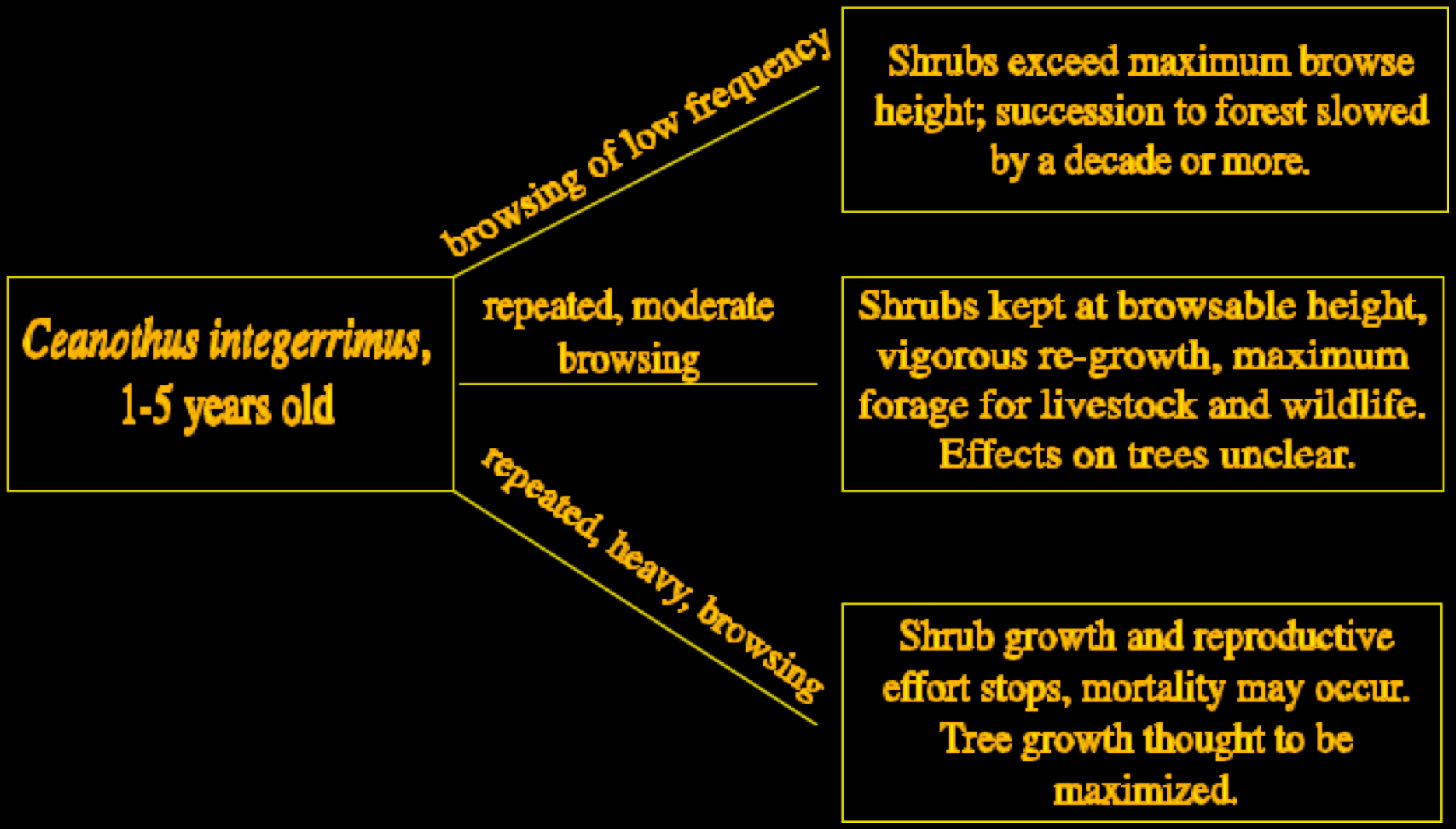
Results: intensity of grazing



Results: frequency of grazing

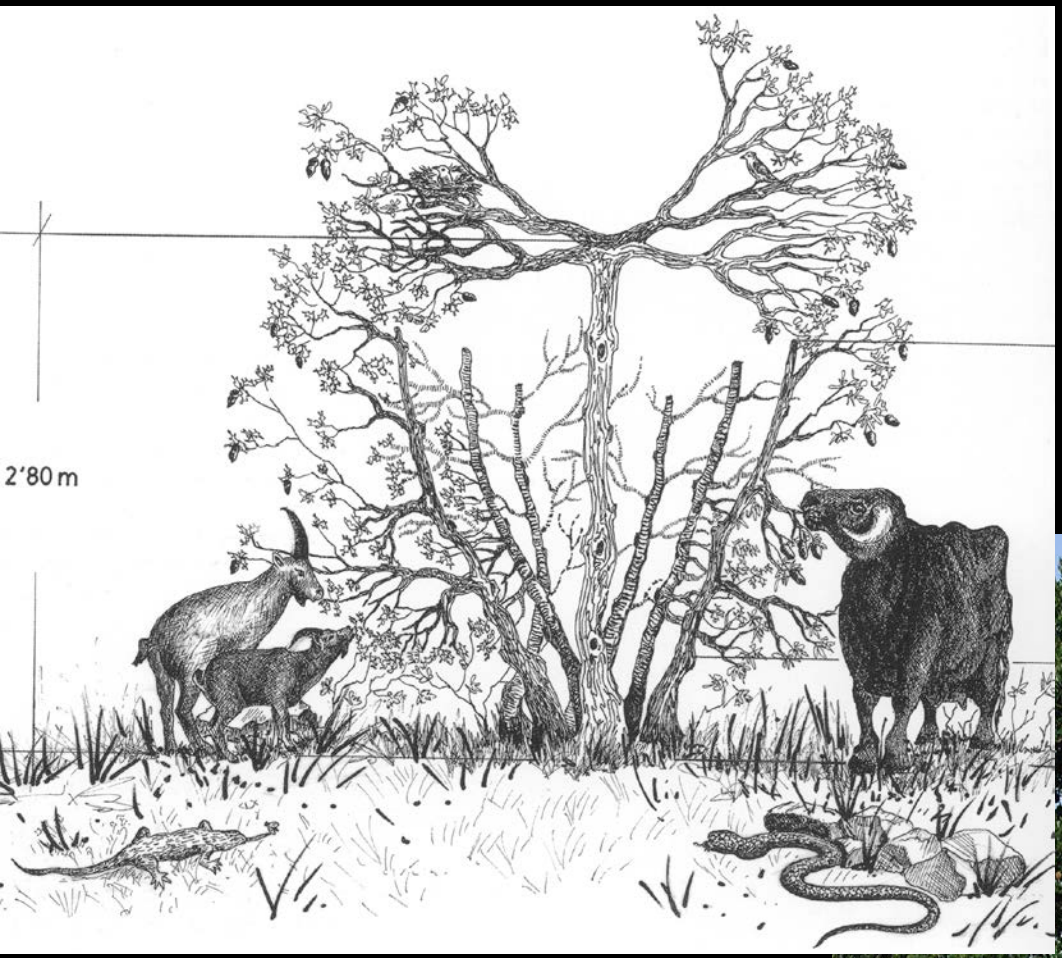


Grazing Influences: a simple model for management



Moderately grazed, grazed repeatedly during the summer: Good for deer, cattle

Vegetation can be manipulated with grazing




Grazing or burning: Can’t start here!


Without grazing or burning:
Flammability is high a few
years after a wildfire

Start as soon as possible

Start when the plants are small

Firefighters?

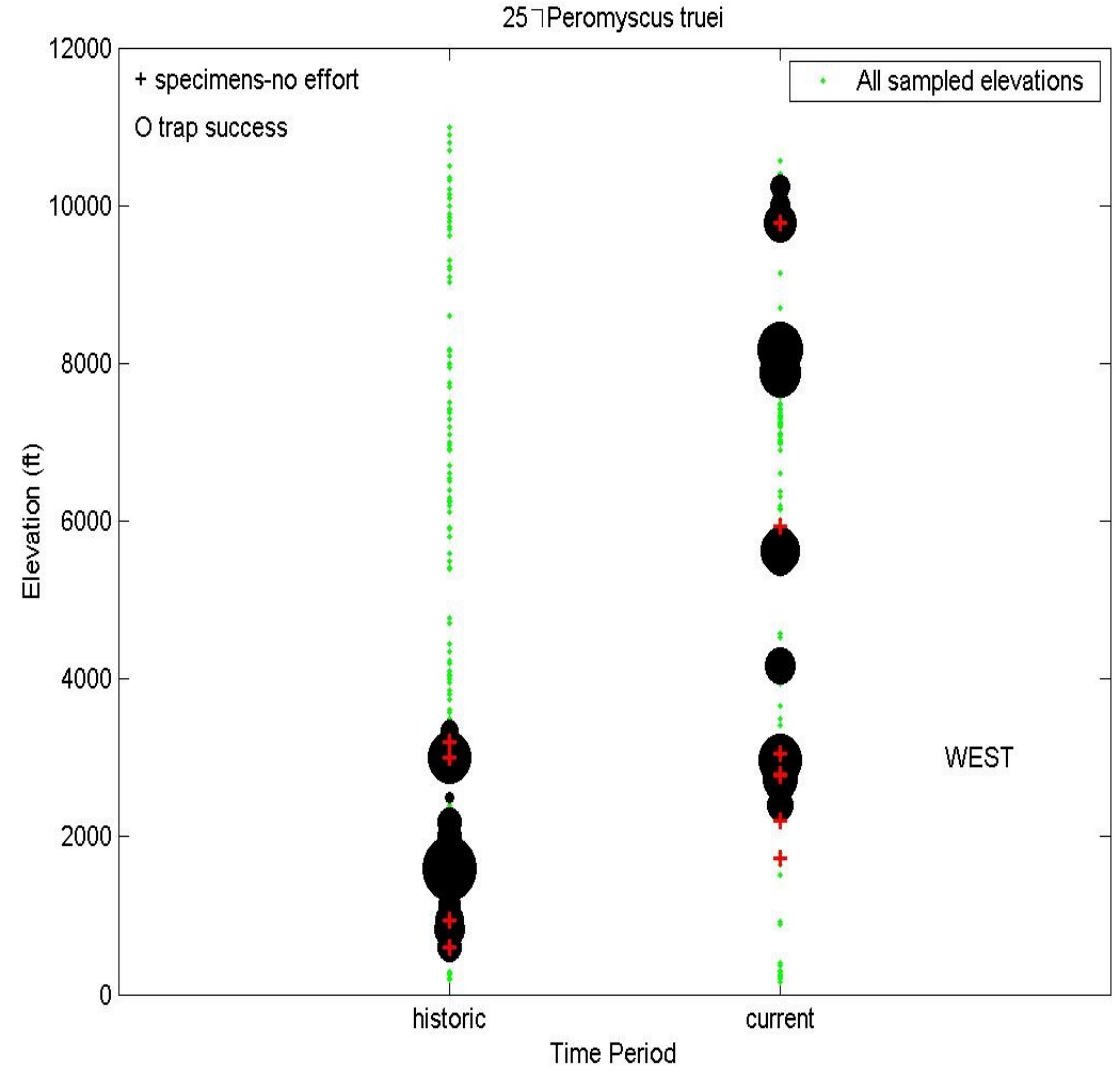
YES!

- Start right away!
- How palatable are the problem plants?
- What do the livestock prefer? (kind, class, history)
- Allow repeated, season long use? Or other system
- Planning: where are important spots for wildfire, potential management issues
- Can combine with other treatments, burning or mechanical.

Forage Value Groups for Primary Understory Plants at Blodgett Research Forest

Desirable	Less desirable	Undesirable
1. Deerbrush *(Ceanothus integerrimus)*	1. Manzanita *(Arctostaphylos patula)*	1. Chinquapin *(Castanopsis chrysophylla)*
2. Squaw carpet *(Ceanothus prostratus)*	2. Mt. whitethorn *(Ceanothus cordulatus)*	2. Tan-oak *(Lithocarpus densiflora)*
3. Sedge *(Carex* sp.*)*	3. Snowberry *(Symphoricarpos acutus)*	3. Azalea *(Rhododendron occidentale)*
4. Bentgrass *(Agrostis* sp.*)*	4. Bitter cherry *(Prunus emarginata)*	4. Mt. misery *(Chamaebatia foliolosa)*
5. 20 additional grasses		5. Bracken fern *(Pteridium aquilinum)*

Distribution Change: Modeling used to estimate change when surveys are done by different people with different methods and effort.



Piñon mouse

Peromyscus truei

Mt. Diablo, 1868

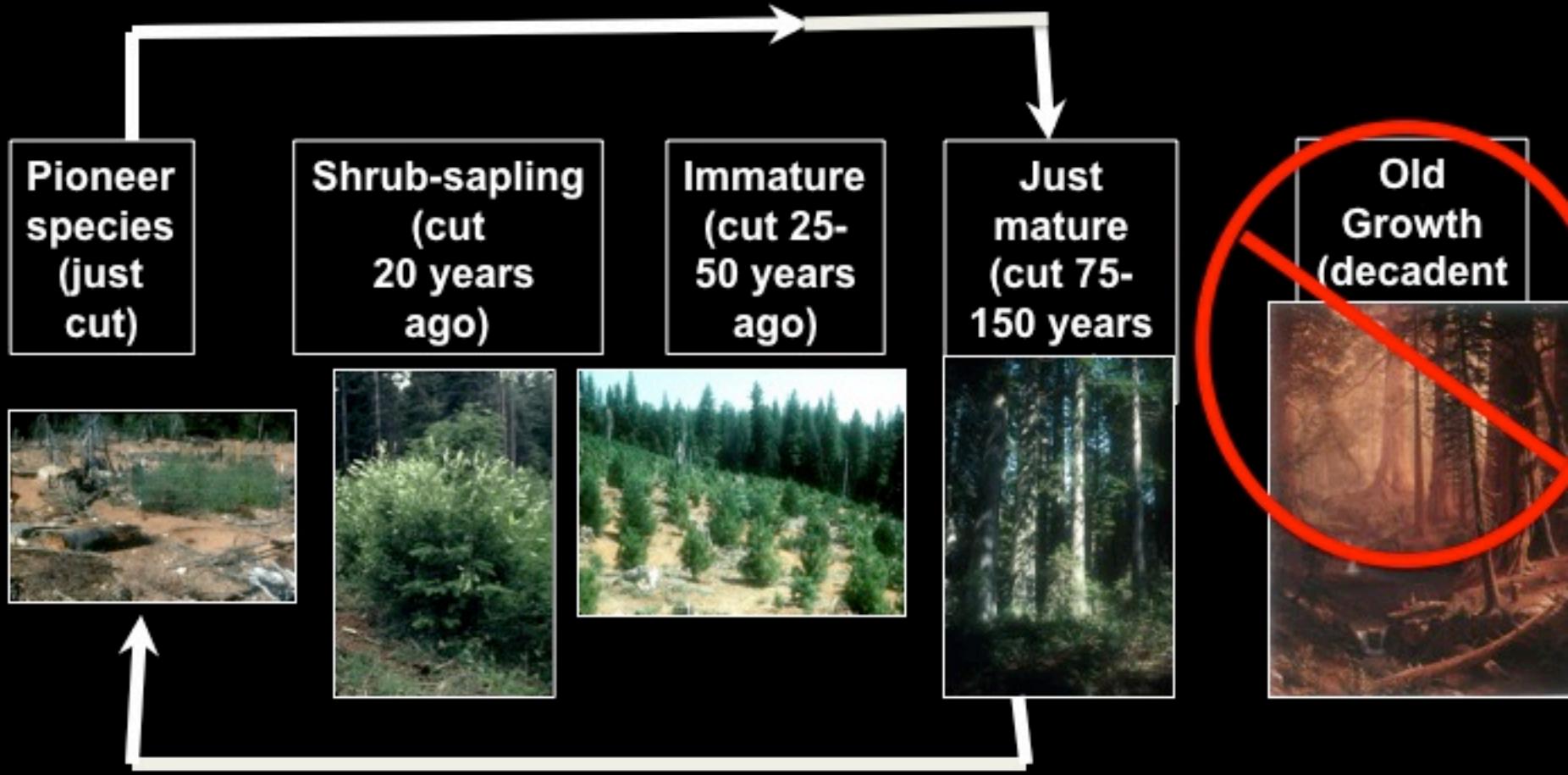
Pre and Post-Settlement Fire Frequency

Means and ranges of fire-return intervals on 3 sites on the Klamath National Forest, California

Location and period	Time interval	Mean (years)	Range (years)
Site 1			
Presettlement	1745-1849	17.3	5 to 41
Settlement	1849-1894	15	8 to 26
Fire exclusion	1894-1987	46.5	43 to 50
Site 2			
Presettlement	1742-1855	10.3	5 to 18
Settlement	1855-1901	9.2	7 to 12
Fire exclusion	1901-1987	28.7	18 to 45
Site 3			
Presettlement	1752-1849	13.9	7 to 25
Settlement	1849-1913	16	5 to 25
Fire exclusion	1913-1987	37	3 to 71

Wills, Robin D.; Stuart, John D. 1994. Fire history and stand development of a Douglas-fir/hardwood forest in northern California. Northwest Science. 68(3): 205-211.

Suppress all disturbance (fire) to create one path, maximum speed



What permittees have done

- Two thirds have increased leased land in last 10 years
- Half have increased stocking rates
- One third have purchased land
- 95% have carried out range improvements
- Of those who lost allotments and kept ranching, one found new lease, one reduced herd.

REUTEBRENNEN.

History: Berkeley Hills, 1990

Berkeley Hills, 1900