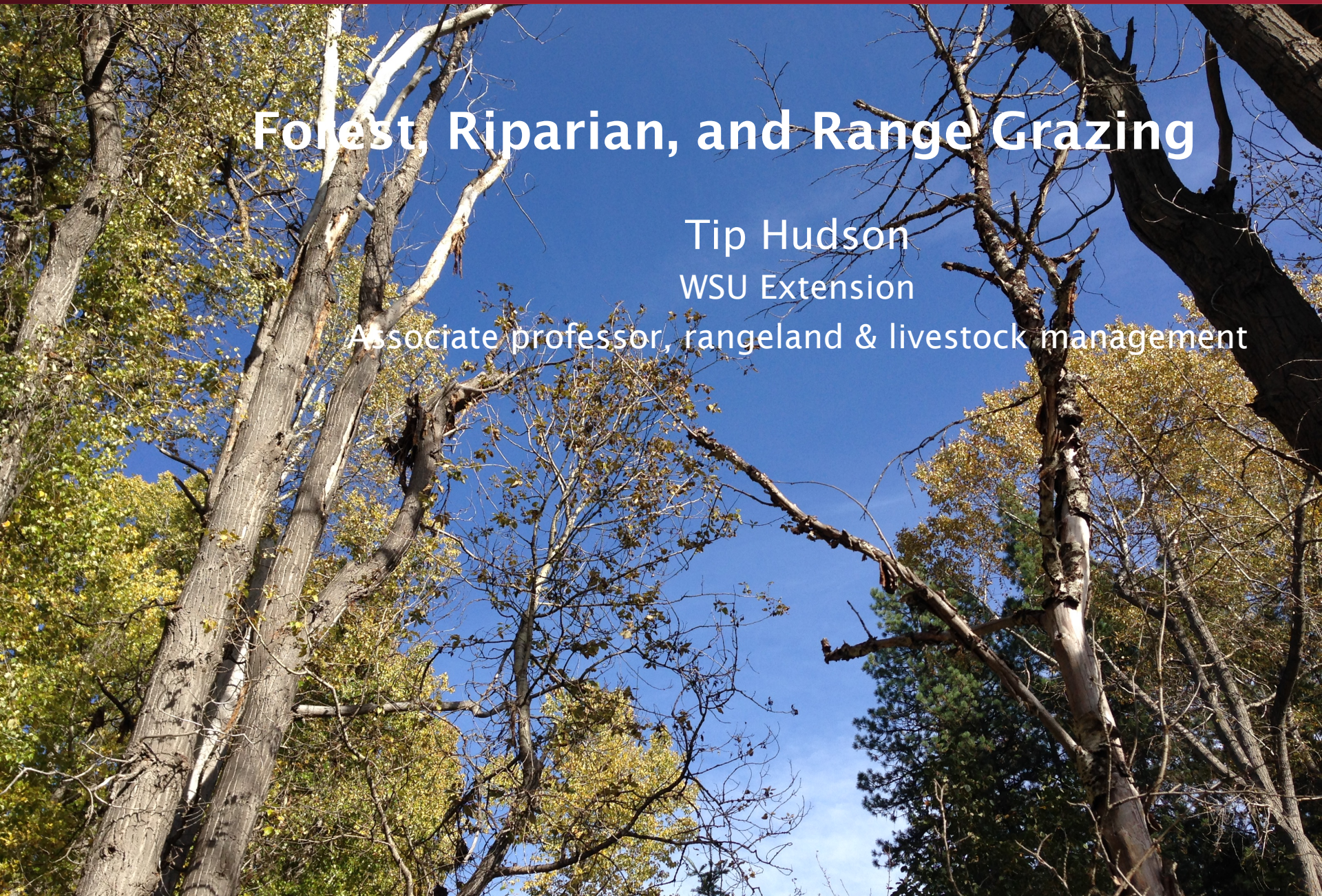
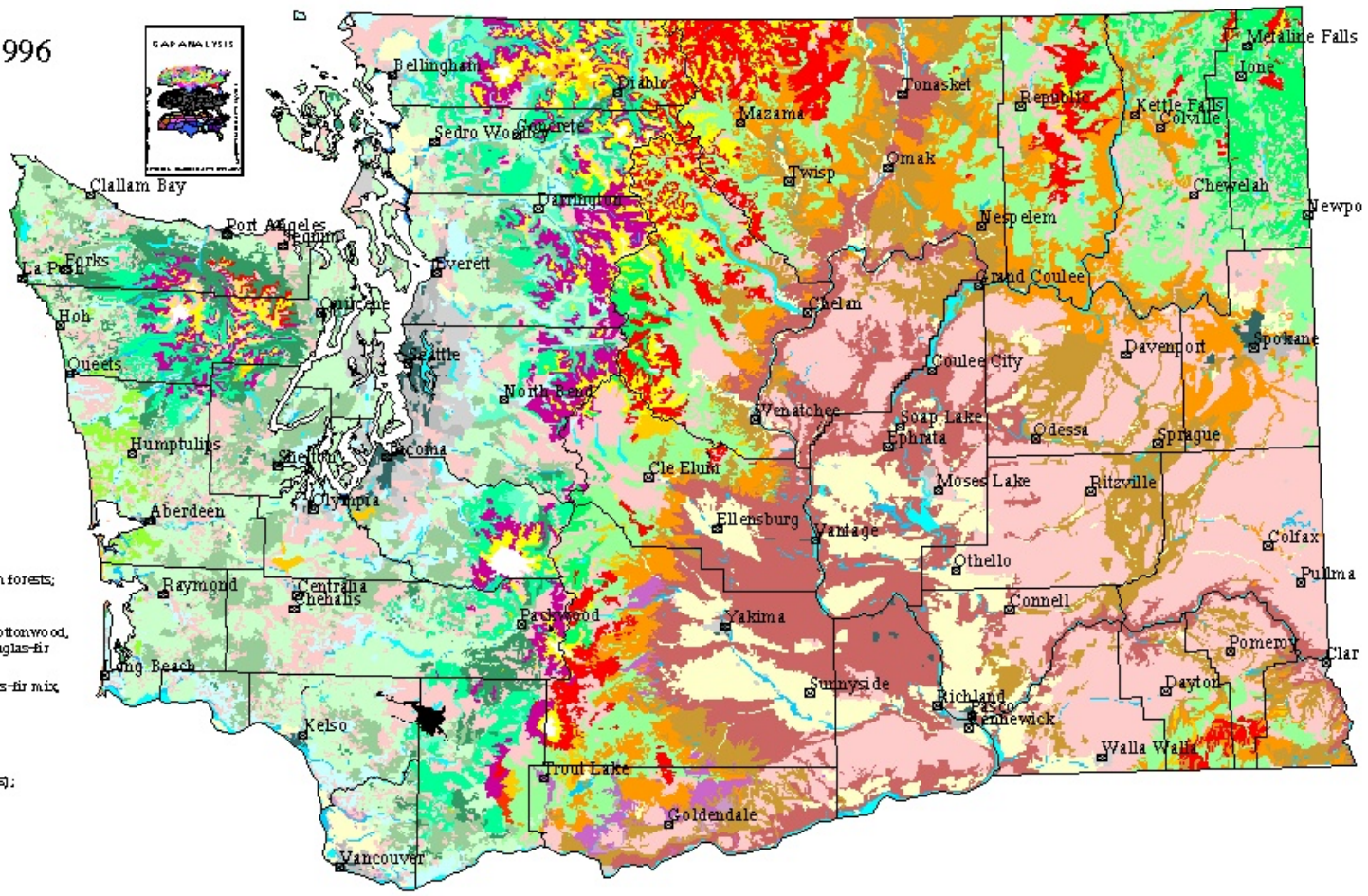


Forest, Riparian, and Range Grazing

Tip Hudson
WSU Extension
Associate professor, rangeland & livestock management

Land Cover, Version 6, August 1996



State-wide Types

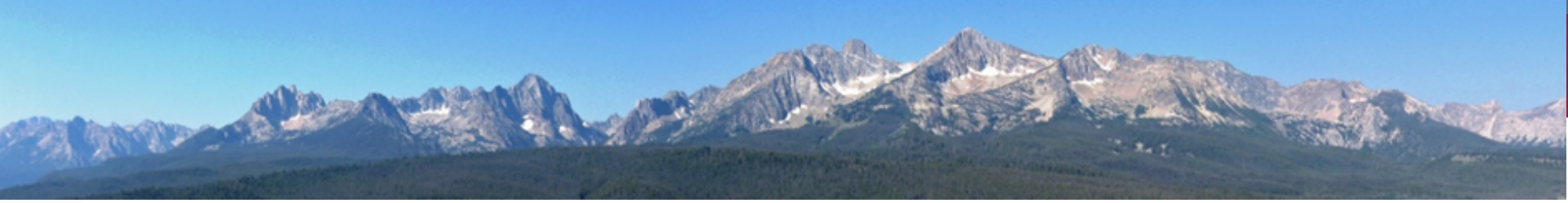
- Bare ground
- Ice, snow
- Developed, high density
- Developed, moderate density
- Developed, low density
- Open fresh water
- Estuary
- Coastline, sandy beaches, rocky islands
- Fresh water riparian and marshes

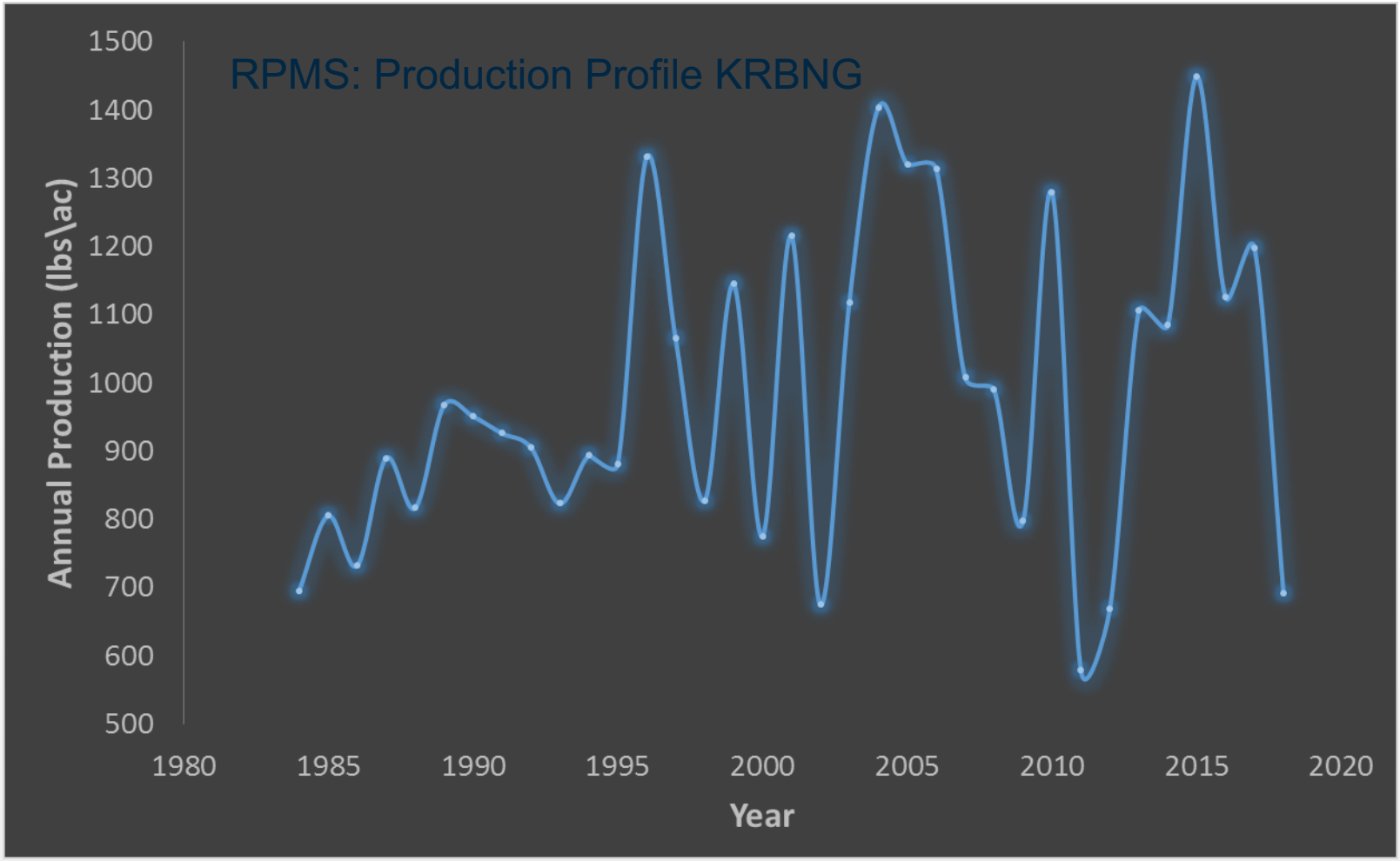
West-side Types

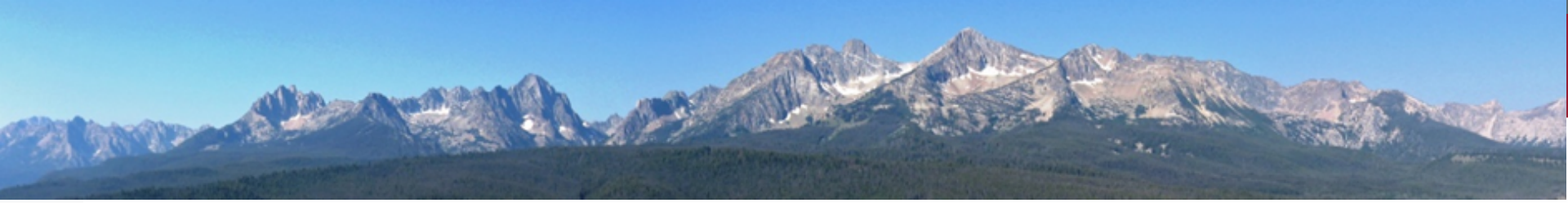
- Agriculture, non-irrigated, mixed/unknown irrigation status
- Agriculture, irrigated
- Non-forested shrubfields and meadows in low to mid elevation forests;
- Non-forested, recent burns, cuts, clearings
- Hardwood forests, mostly Red Alder, Bigleaf Maple, Black Cottonwood, willows, some Garry Oak, Oregon Ash; also some young Douglas-fir mixed with tall brush
- Mixed hardwood/conifer forest, mostly Red Alder and Douglas-fir mix, some Oak, Madrone, and Douglas-fir woodlands
- Mixed harwood/conifer forest, mostly Oak/Douglas-fir, or open dry conifer forest interspersed with dry meadows
- Conifer forest, early seral, in low to mid elevation westside zones (Sitka Spruce, Douglas-fir, and Western Hemlock zones); usually Douglas-fir dominated
- Conifer forest, mid seral, in the Sitka Spruce zone
- Conifer forest, late seral, in the Sitka Spruce zone
- Conifer forest, mid seral, in the west-side Douglas-fir and Western Hemlock zones; usually Douglas-fir or Douglas-fir/Western Hemlock dominated
- Conifer forest, late seral, in the west-side Douglas-fir and Western Hemlock zones usually Douglas-fir or Western Hemlock/Douglas-fir dominated
- Conifer forest, early seral, Silver Fir zone
- Conifer forest, mid and late seral, Silver Fir zone
- Conifer forest, all stages, Mountain Hemlock zone
- Conifer forest, open Lodgepole Pine forest on Low Elevation Lava Flows
- Conifer forest, all stages, Subalpine Fir zone in the Olympics; usually Subalpine Fir dominated
- Open subalpine woodland and parkland subalpine meadows and openings in subalpine forest types
- Alpine, high subalpine meadows

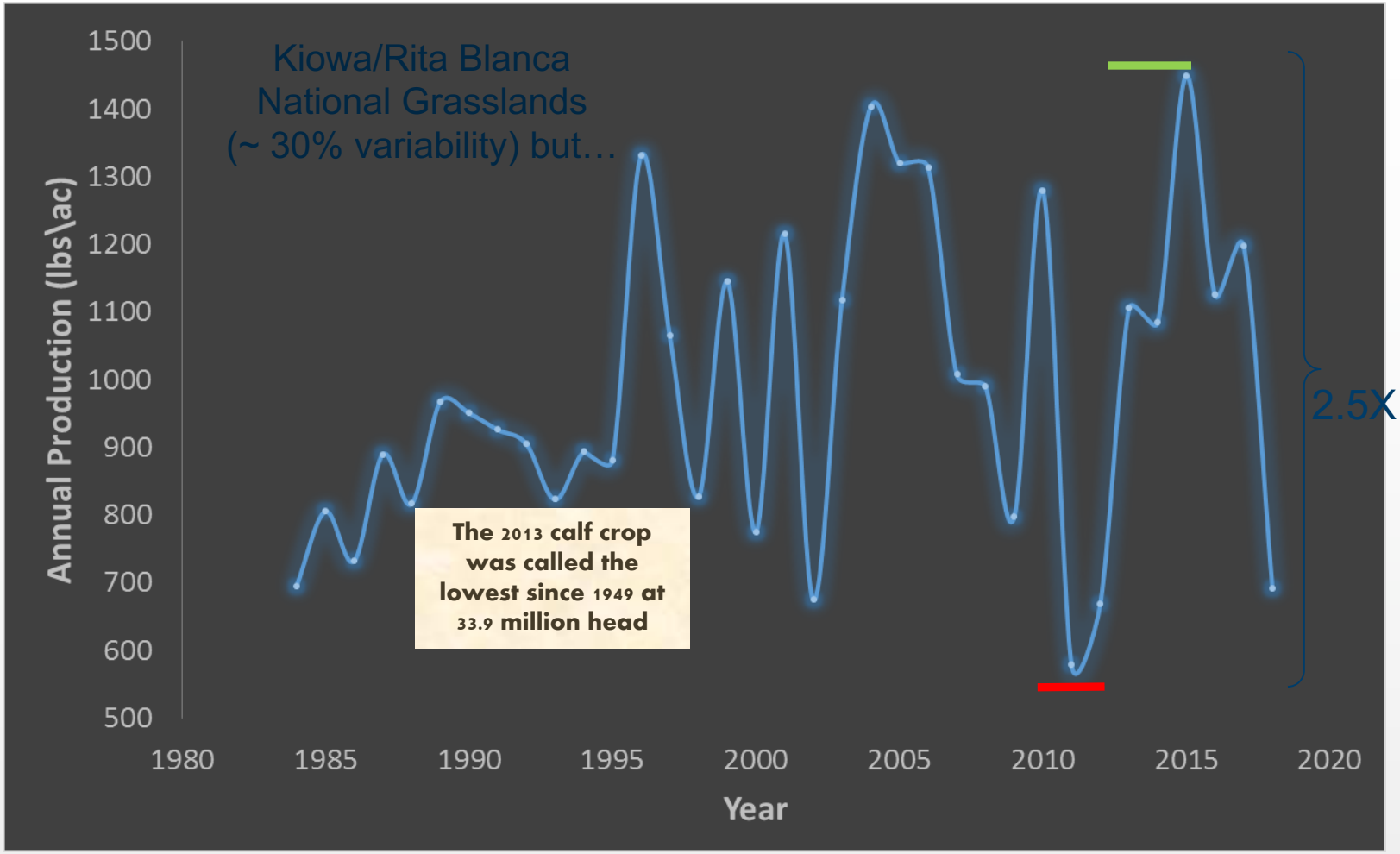
East-side Types

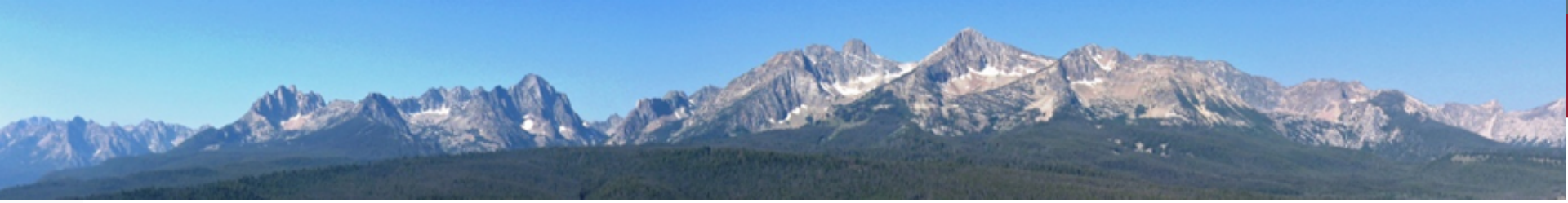
- Agriculture, non-irrigated
- Agriculture, irrigated and mixed irrigation status
- Arid steppe-Includes grassland, shrubland in Central Arid Steppe and Canyon Grassland zones
- Mesic steppe and grass/shrub meadows in low, open forest-Includes grassland, shrubland, tree savanna in Ponderosa Pine and Oak zones, and in all steppe zones except Central Arid and Canyon Grassland
- Non-forested shrubfields and meadows in Interior Douglas-fir, Grand Fir, Interior Western Hemlock, and Interior Redcedar forests;
- Non-forested, recent burns, cuts, clearings in all forest zones
- Hardwood forests, mostly Willows, Black Cottonwood along rivers
- Hardwood forests, Garry Oak dominated
- Mixed hardwood/conifer forest, usually along rivers
- Mixed harwood/conifer forest, mostly Oak/Douglas-fir or Oak/Ponderosa Pine
- Conifer forest, Low elevation, open; usually Ponderosa Pine dominated
- Conifer forest in the Douglas-fir and Grand Fir zones; usually Douglas-fir, Douglas-fir/Grand Fir, Western Larch, Lodgepole Pine, or Douglas-fir/Lodgepole Pine/Western Larch
- Conifer forest in the Interior Western Hemlock and Interior Western Redcedar zones
- Conifer forest, Subalpine Fir zone; usually Subalpine Fir/Lodgepole Pine/Engelmann Spruce
- Open subalpine woodland and parkland and subalpine meadows and openings in subalpine forest types
- Alpine, high subalpine meadows

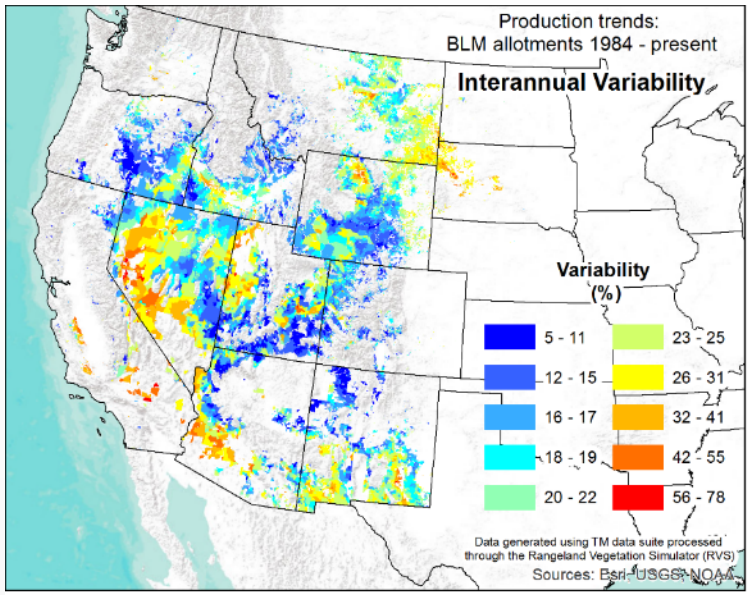


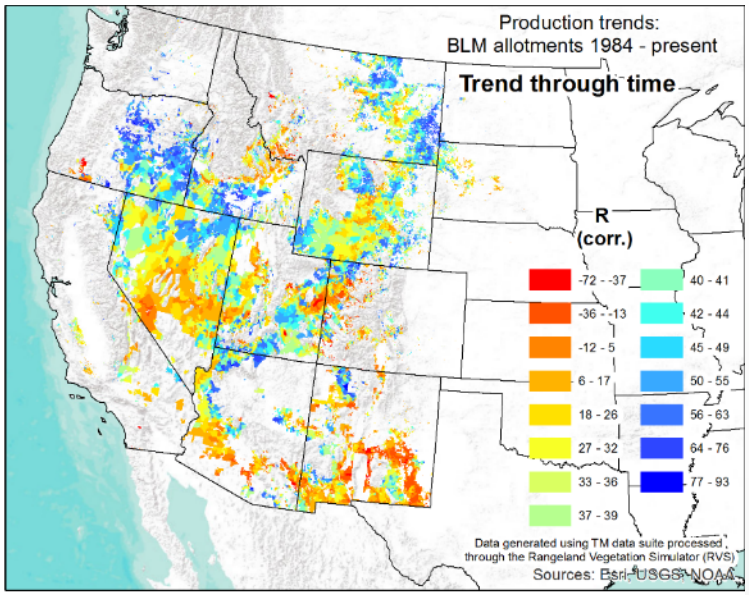

RPMS: Production Profile KRBNG
Annual Production (lbs\ac)
1500
1400
1300
1200
1100
1000
900
800
700
600
500
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

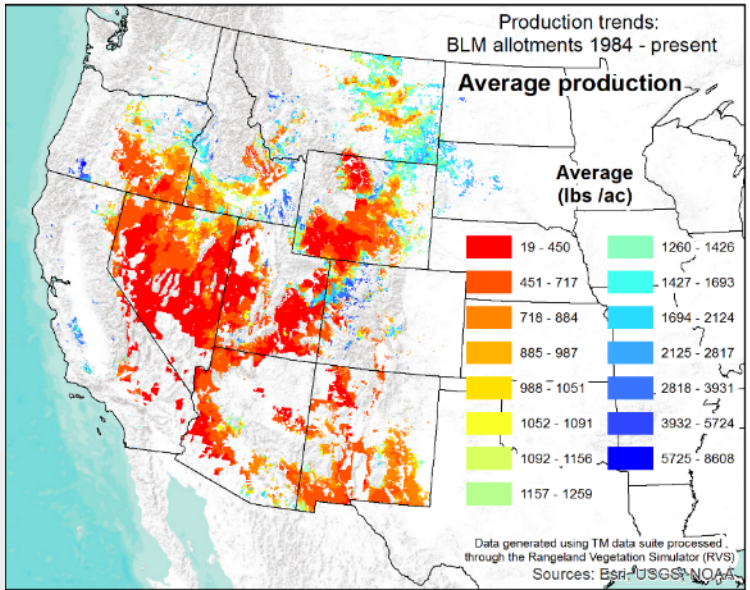


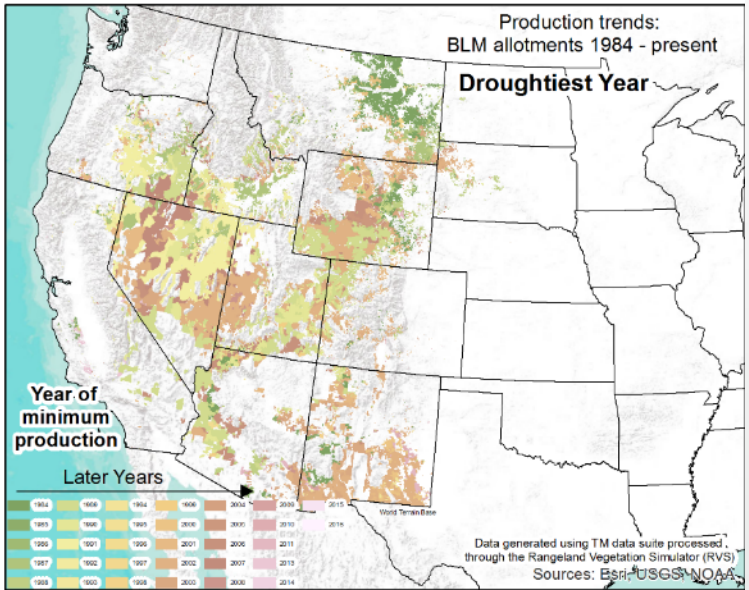

Kiowa/Rita Blanca
National Grasslands
(~ 30% variability) but…
The 2013 calf crop was called the lowest since 1949 at 33.9 million head
2.5X
Annual Production (lbs\ac)
1500
1400
1300
1200
1100
1000
900
800
700
600
500
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

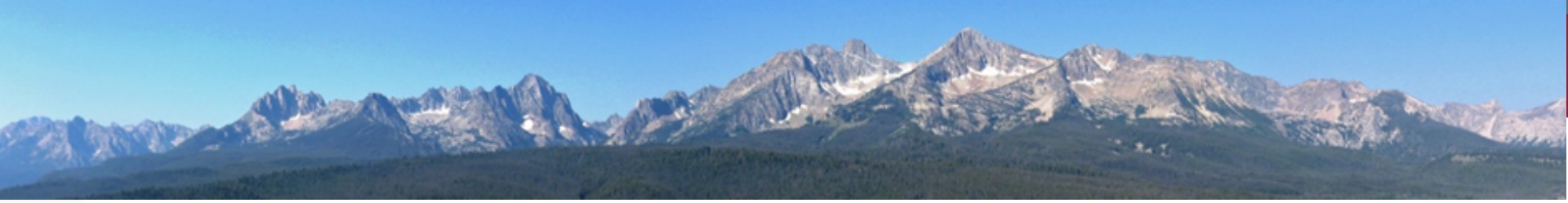


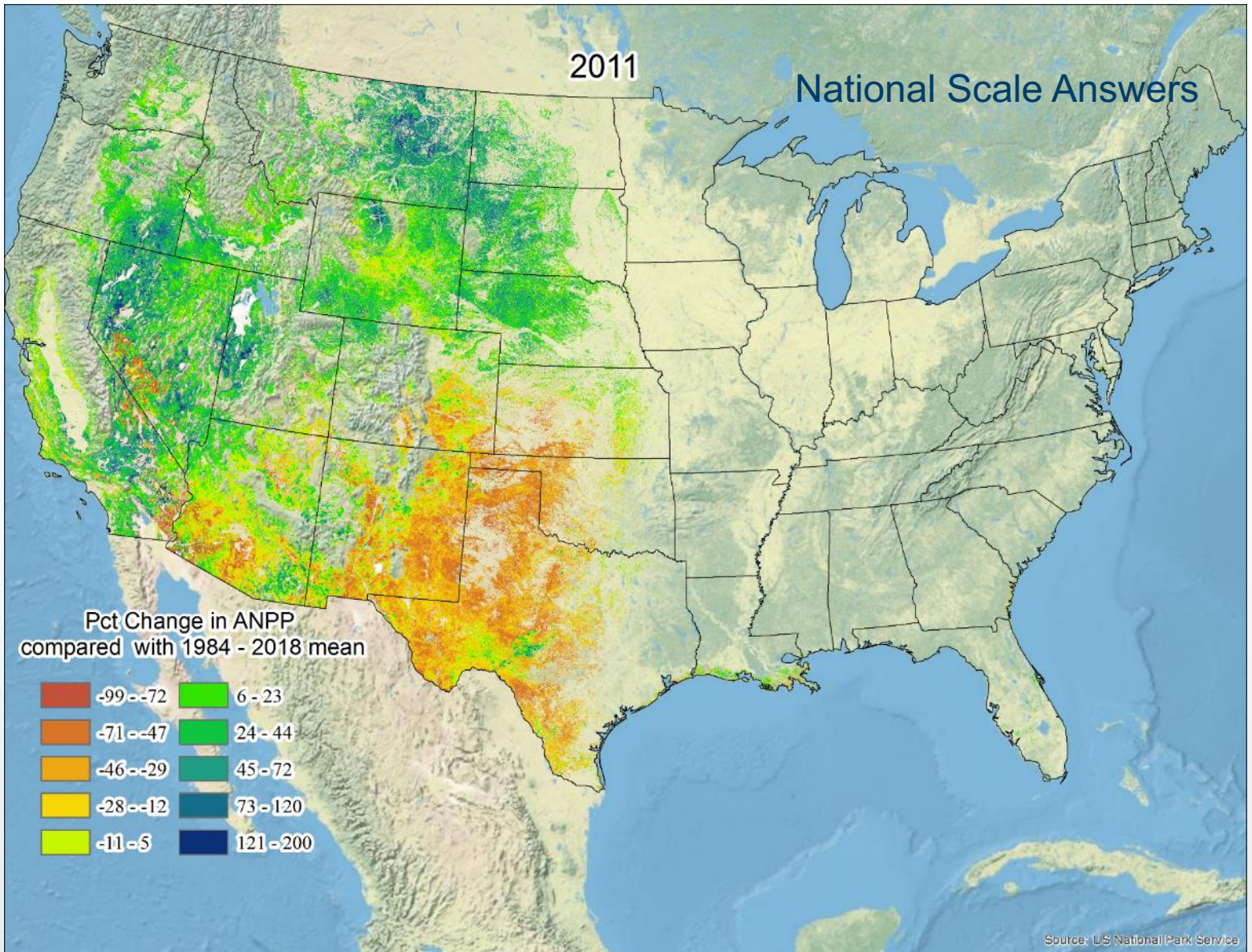

Production trends:
BLM allotments 1984 - present
Interannual Variability
Variability (%)
5 - 11
12 - 15
16 - 17
18 - 19
20 - 22
23 - 25
26 - 31
32 - 41
42 - 55
56 - 78
Data generated using TM data suite processed through the Rangeland Vegetation Simulator (RVS)
Sources: Esri, USGS, NOAA


Production trends:
BLM allotments 1984 - present
Trend through time
R (corr.)
-72 - -37
-36 - -13
-12 - 5
6 - 17
18 - 26
27 - 32
33 - 36
37 - 39
40 - 41
42 - 44
45 - 49
50 - 55
56 - 63
64 - 76
77 - 93
Data generated using TM data suite processed through the Rangeland Vegetation Simulator (RVS)
Sources: Esri, USGS, NOAA


Production trends:
BLM allotments 1984 - present
Average production
Average (lbs /ac)
19 - 450
451 - 717
718 - 884
885 - 987
988 - 1051
1052 - 1091
1092 - 1156
1157 - 1259
1260 - 1426
1427 - 1693
1694 - 2124
2125 - 2817
2818 - 3931
3932 - 5724
5725 - 8608
Data generated using TM data suite processed through the Rangeland Vegetation Simulator (RVS)
Sources: Esri, USGS, NOAA


Production trends:
BLM allotments 1984 - present
Droughtiest Year
Year of minimum production
Later Years
Data generated using TM data suite processed through the Rangeland Vegetation Simulator (RVS)
Sources: Esri, USGS, NOAA




2011
National Scale Answers
Pct Change in ANPP
compared with 1984 - 2018 mean
-99 - -72
-71 - -47
-46 - -29
-28 - -12
-11 - 5
6 - 23
24 - 44
45 - 72
73 - 120
121 - 200
Source: US National Park Service

Rules of thumb collection

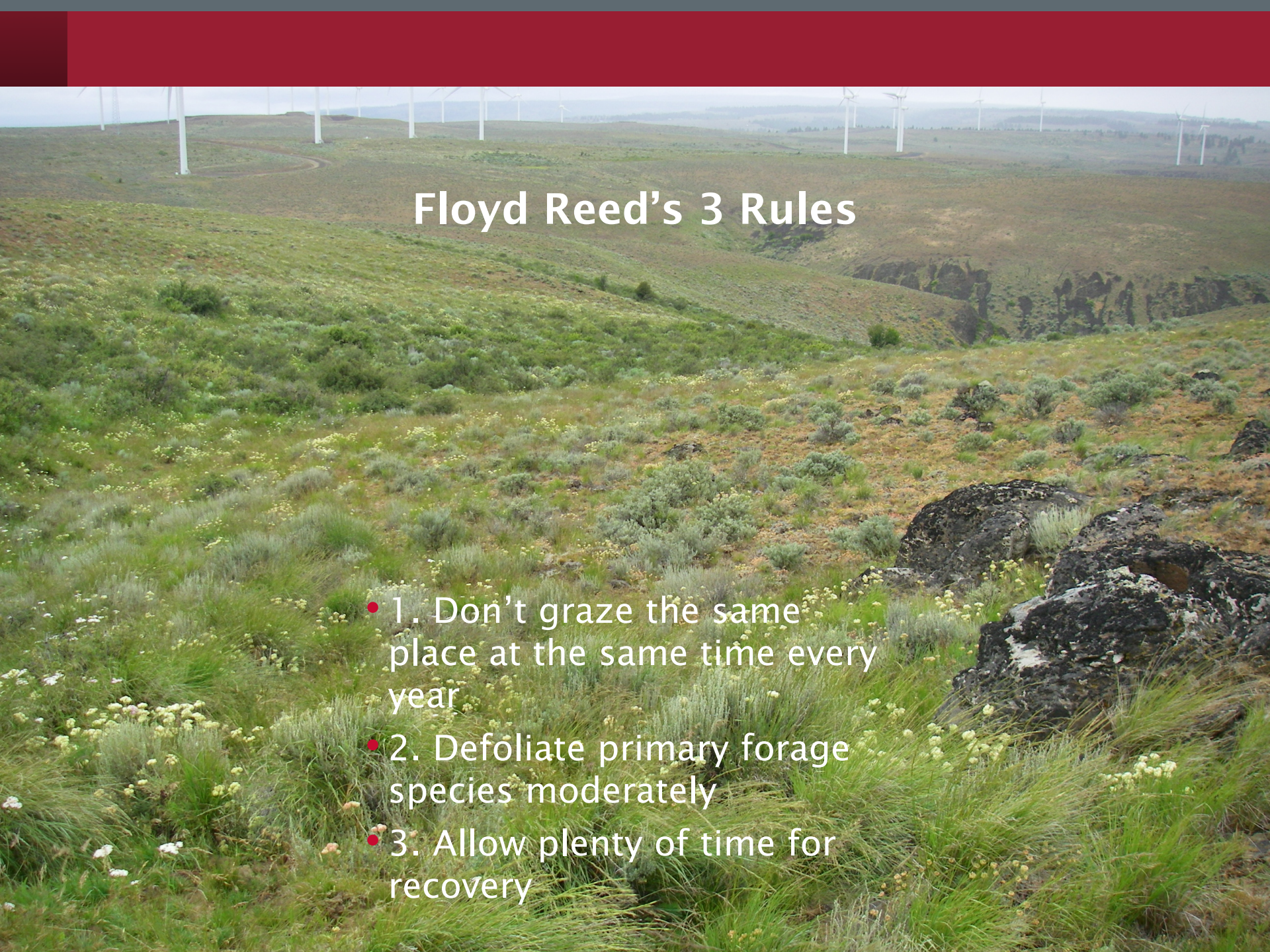
- Take half, leave half
- Stubble height
- Graze half the growing season
- Harvest coefficient at 35% (not utilization)
- ”Defer” grazing every third year

All of these will feel like leaving feed behind

How the West was Lost

- Annual grazing during critical period
- Perennial grass grazed too tight
- Season-long use in many places at moderate to high stocking rate

- **Bad rule of thumb for Western rangelands: "Don't let it go to seed."**



Floyd Reed's 3 Rules

- 1. Don't graze the same place at the same time every year
- 2. Defoliate primary forage species moderately
- 3. Allow plenty of time for recovery


Grazed too close and for most of the growing season


Light grazing intensity

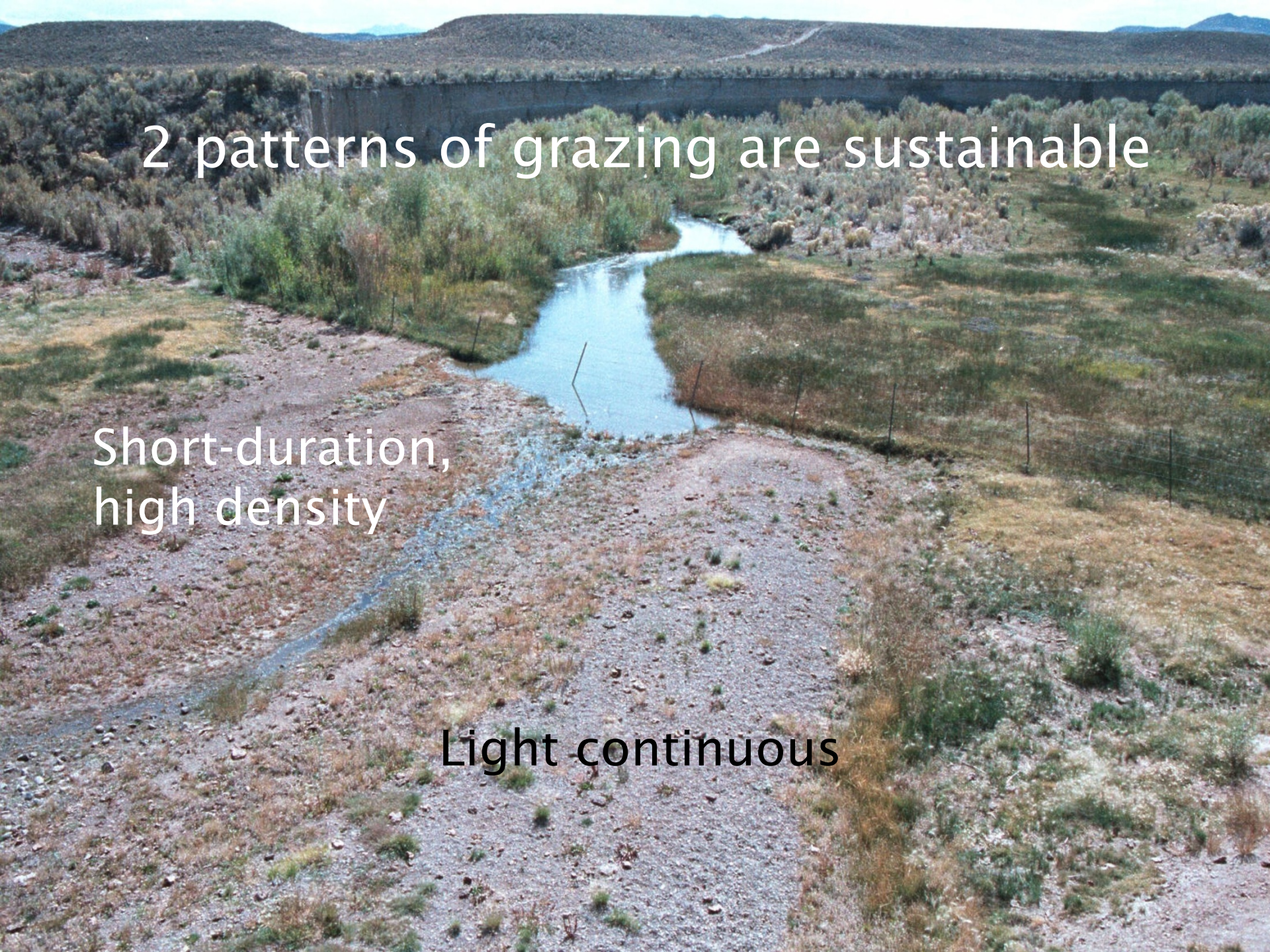

Light grazing intensity

Tip's rules of thumb

1. Let bunchgrasses go to seed periodically (every other year?)
2. Provide growing season recovery by creating shorter grazing periods
3. Leave something behind – don't slick it off – preserve surface roughness and soil cover
4. Use higher stock densities where possible
5. Graze after seed shatter sometimes
6. Stocking rate still matters . . .

Terminology

- Stocking rate
- Carrying capacity
- Animal density
- Grazing intensity
- Animal Unit Month


2 patterns of grazing are sustainable
Short-duration,
high density
Light continuous

Riparian grazing principles

- **Good**
  - Early
  - Short duration
  - Avoid hot season
  - Rotate use areas and timing
  - Light to moderate use
  - Long recovery periods
  - Regrowth before winter
  - Occasional rest
  - Stutter deferred (willows grow taller for two years, then a late year)
  - More offsite water
  - Well scattered salt/supplements
  - Cleaned pastures and closed gates
- **Bad**
  - Season-long
  - Long season of use
  - Hot season grazing in big pastures with limited riparian
  - Few waters and only riparian water
  - Heavy use too often in the system
  - Little or no regrowth before winter
  - Use at same time every year – repeating stress
  - No rest – little recovery with long seasons use
  - Salt on creeks
  - Little or no riding
  - Stragglers

A Management Chain Reaction

Where is the objective?

- Rotation grazing
- A four inch stubble height
- and 85% growing season recovery
- An increase in colonizers
- Deposition there of fine sediments
- An increase in stabilizers
- Narrowing a stream
- Increased floodplain access & aquifer recharge
- Improved base flow etc.
- Improved habitat quality
- Improved water quality
- Increased fish populations
- Increased recreationist satisfaction

Efficiently
Monitored
Actions or tools

Efficiently
Monitored (MIM)
Objectives

PFC

Values
(difficult to monitor)

Topics

1. Landowner communication
2. Animal influences on riparian planting
3. Upland factors driving potential riparian overuse
4. Strategies to keep animals out of planted area
5. Vegetation management goals that may be achieved by controlled grazing
6. Pros and cons of fence options
7. Fence placement principles
8. Frequent fencing faux pas

Physical function

PFC is almost always the management goal

Proper Functioning Condition from TR 1737-15

PFC exists where "adequate vegetation, landform, or woody material is present to dissipate stream energy associated with high waterflow . . ., capture sediment and aid floodplain development, improve floodwater retention and groundwater recharge, develop root masses that stabilize streambanks against erosion, and maintain channel characteristics."


Landowners vary in opinions
To fence or not to fence . . .

Communication

1. Understand first
2. Act like you value the landowner's attachment to, and knowledge of, place
3. Be able to talk grazing management
4. Be prepared to accommodate post-recovery grazing options
5. Understand that livestock exclusion is more than just fence construction

Context matters

Landowners often have context but not the language to communicate it scientifically.

Old Timer Insisted:

Then an area was fenced off . . .

No management change here . . .

Through the 28 year fence . . .

Factors influence livestock pressure on riparian area

1. Forage yield of uplands and riparian area
2. Pasture size
3. Contrast
4. Stockwater
5. Riparian vegetation types
6. Topography

Planting and livestock

Places trees won't grow (and livestock are not to blame)

- Anaerobic soils
- Heavy wildlife use
- Finicky trees
- Unique hydrologic features

How to keep livestock out

- Fence is a psychological barrier
- Not a brick wall . . . Make a yellow brick road
- Riparian planning begins at the ridgeline rather than the greenline

Upland considerations in controlling riparian pressure

- Supplement placement
- Shade
- Drift fence
- Planting
- Water
- Timing of use
- Cross-fencing uplands
- Low-stress handling

Biological control of undesirable plants in riparian enclosure

- Reed canarygrass
- Giant reed (Phragmites australis)
- Broadleaf weeds

Reed canarygrass suppression allows other riparian obligates to be expressed.

Strategies to eliminate or minimize impact in planting areas

- Permanent exclusion
- Temporary or partial barriers
- Non-fence barriers

Temporary fence


Temporary fence

Benefits of permanent fence:

- Greater control over livestock, usually more secure and durable than temporary fence.
- Smooth wire fences that can be electrified or not are more wildlife-friendly
- Where a manager won't change management, this is the only option and it is often necessary!!!

Downsides of permanent fence

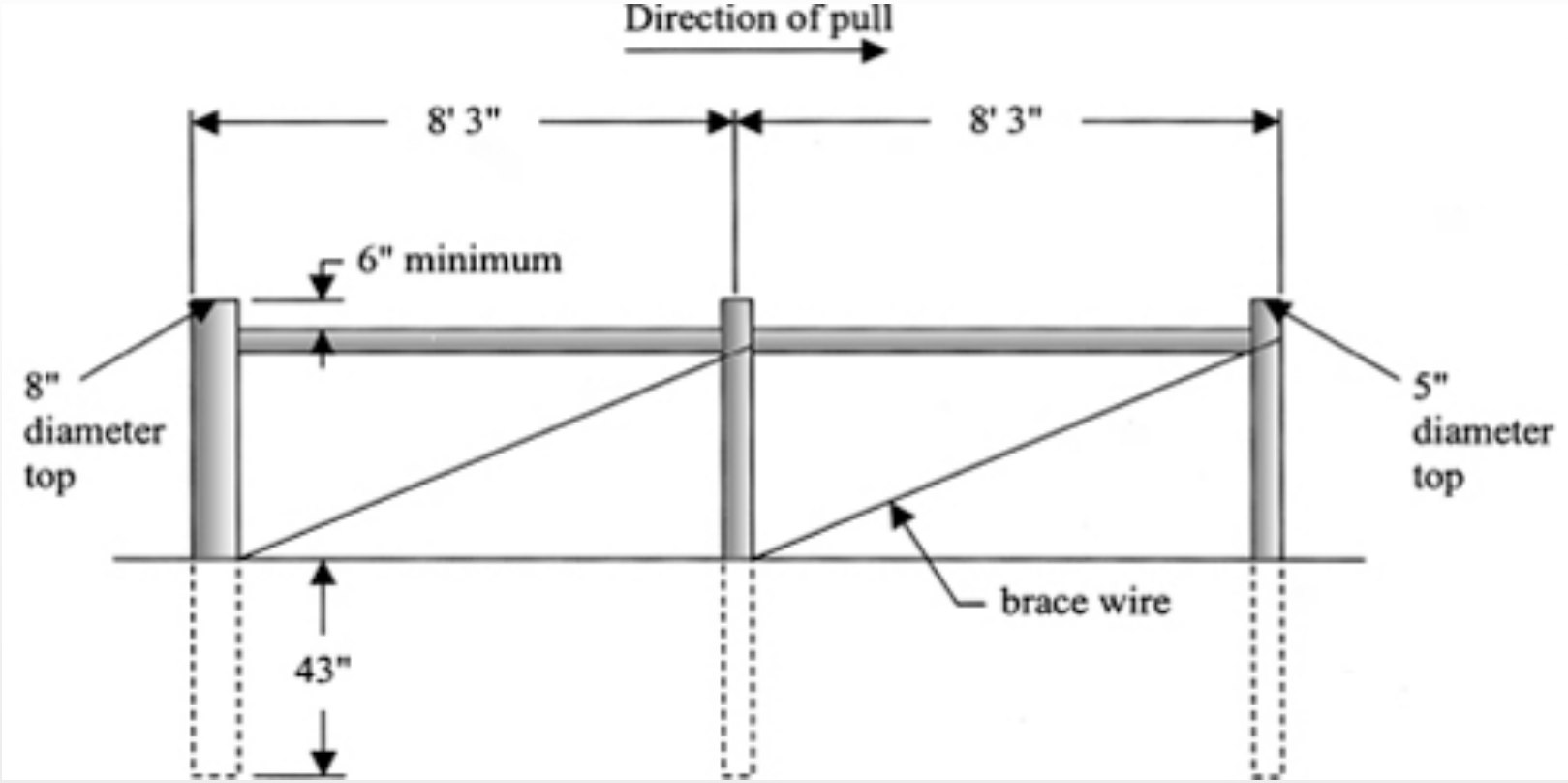
- COST OF CONSTRUCTION
- COST OF MAINTENANCE
- RESPONSIBILITY FOR MAINTENANCE (social cost)
- Restricts wildlife and livestock movement
- Restricts recreationists
- Injures recreationists
- Are damaged by recreationists
- Sometimes traps animals inside the fence; cure can be worse than the problem (ex. elk and cattle both on water development exclosures)
- Must be checked regularly, i.e., more than once per week.

Fence placement principles

- Avoid using the top of the streambank
- Ordinarily, should fence the entire riparian zone unless it's a huge floodplain
- Consider applicability of fence location after recovery objectives are met
- If riparian pasture, should be a viable size with natural edges. A riparian pasture allows complete control of timing, duration, frequency, intensity of grazing regardless of what's going on outside the riparian area.
- When fencing, fence areas of "like" vegetation for consistent effects under the grazing management applied.

Frequent fencing faux pas

- H-brace too narrow
- Electric fence not hot



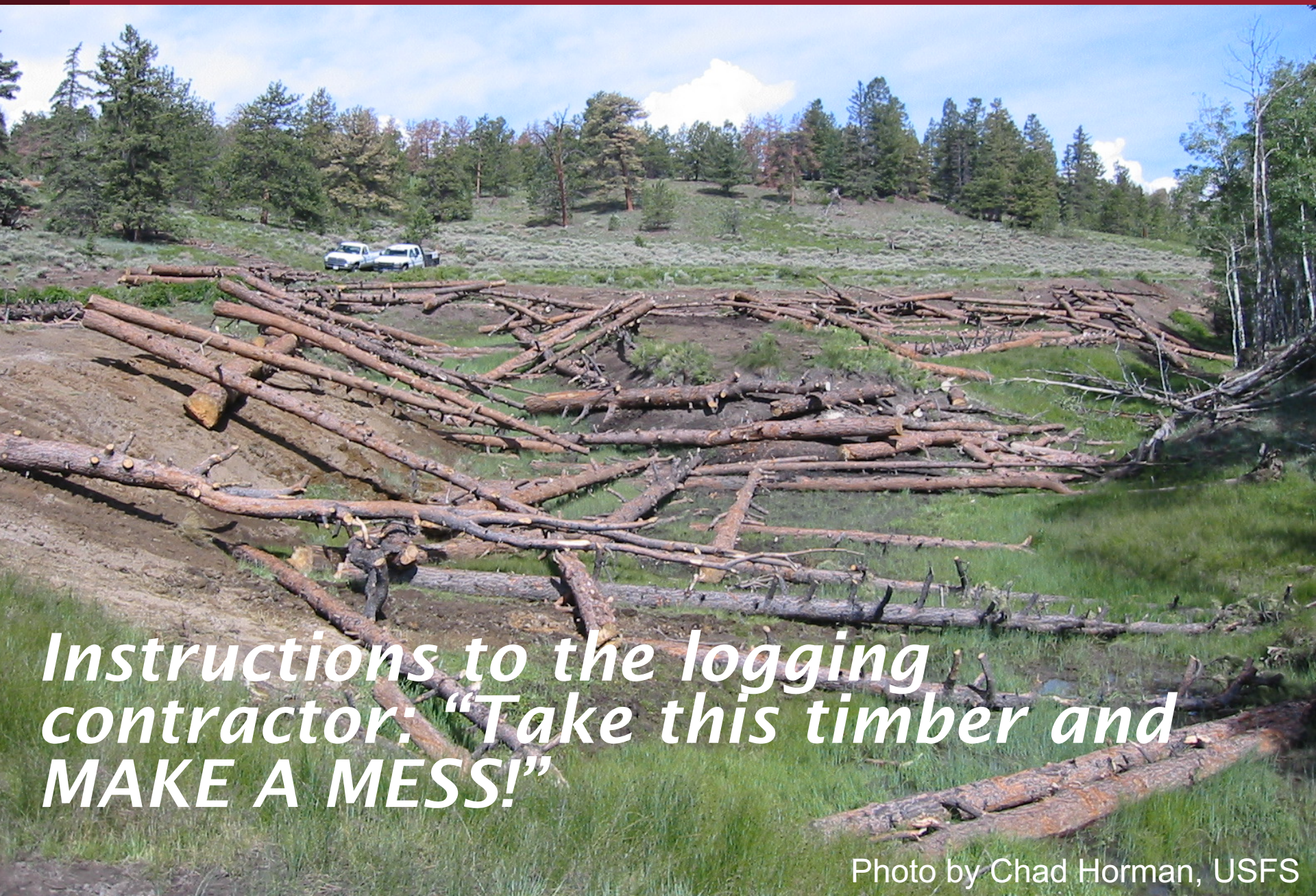
Non-fence barriers, example

Buffalo Peaks Wilderness, central Colorado

USFS rehab. project

USUAL ISSUES

- Livestock – Range Management
- Erosion Control - Prevention
- Mountain Pine Beetle Mitigation
- Historic Erosion Issues
- Balancing Erosion/Deposition
- Riparian Protection
- Soil Stabilization
- Water Developments
- Noxious Weeds


Instructions to the logging contractor: "Take this timber and MAKE A MESS!"
Photo by Chad Horman, USFS


Bushnell


08 11


Bushnell

Photo by Chad Horman, USFS

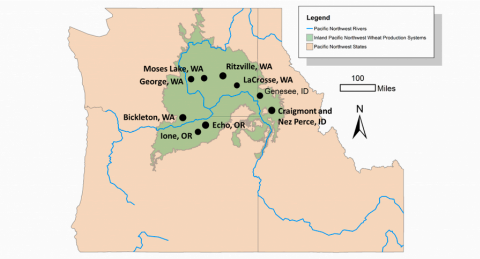
Photo by Chad Horman, USFS

Next steps / for more information . . .

WASHINGTON STATE UNIVERSITY

Case studies to increase resilience among farmers and ranchers in the Pacific Northwest

Many strategies can enhance resilience to climate change and other future challenges – and these strategies often also provide immediate benefits to farming and ranching operations. This case study series explores strategies that innovative farmers and ranchers in our region are already using, and which may be of interest to others. Each case study and its complementary video centers around the experience of a regional producer, and provide summaries of relevant biophysical, economic, and social science that help inform when and how these strategies might work in other places.



LIVESTOCK CASE STUDIES

Grazing for Multiple Use Goals: Russ Stingley

Resilience Through Engagement: Brenda & Tony Richards

Adaptive Rangeland Management: Jack Southworth

Tipton D. Hudson | Extension range & livestock extension specialist | Washington State University | 509-962-7507 | **hudsont@wsu.edu**

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▶ 651 ♥ 1

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▶ 553 ♥ 1

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