Prairie 101
Restoration Techniques for a Variety of Starting Conditions

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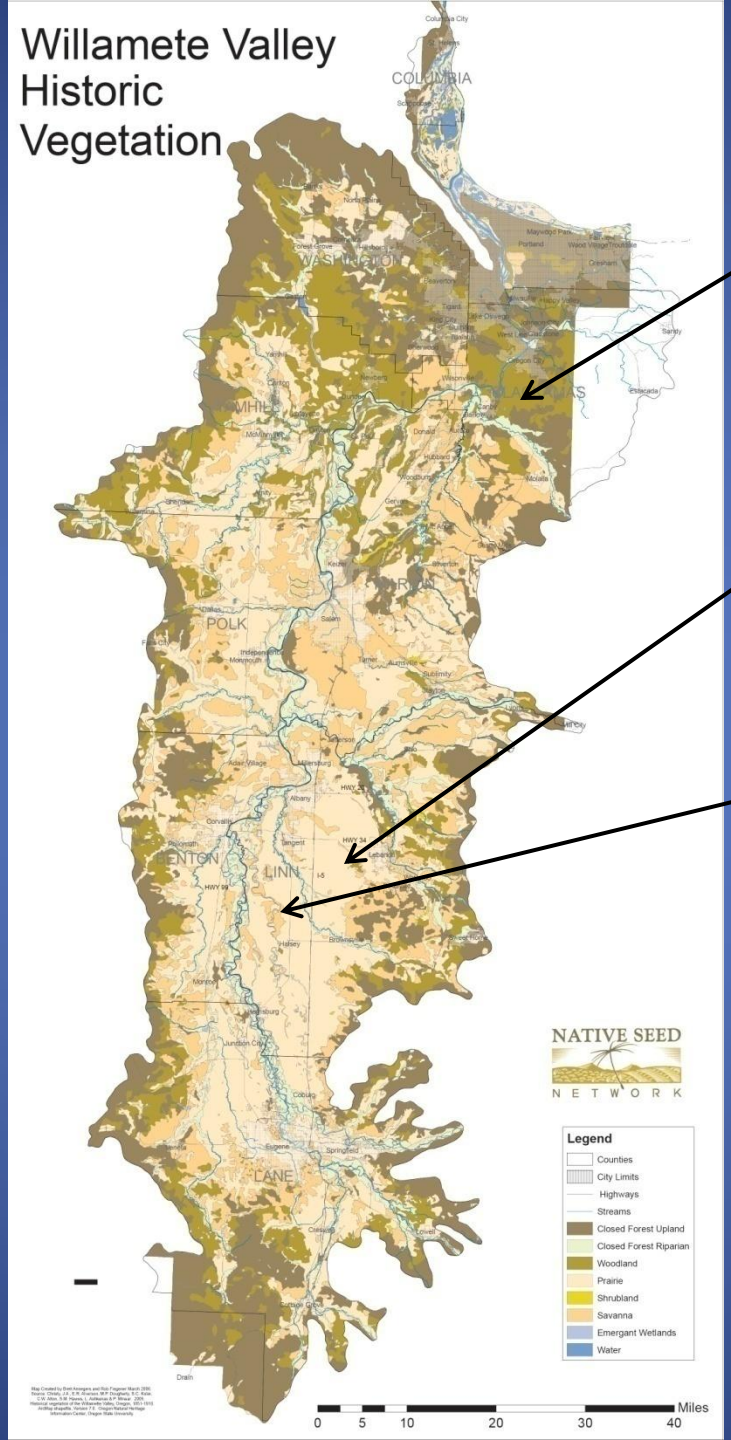
December 5th 2012
ODA Noxious Weed Symposium
Lots of information at: www.heritageseedlings.com

Why Prairie?

Photos by: US Forest Service

Prior to 1850 the Willamette Valley was mostly open prairie

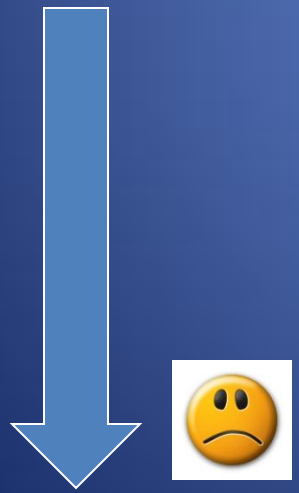


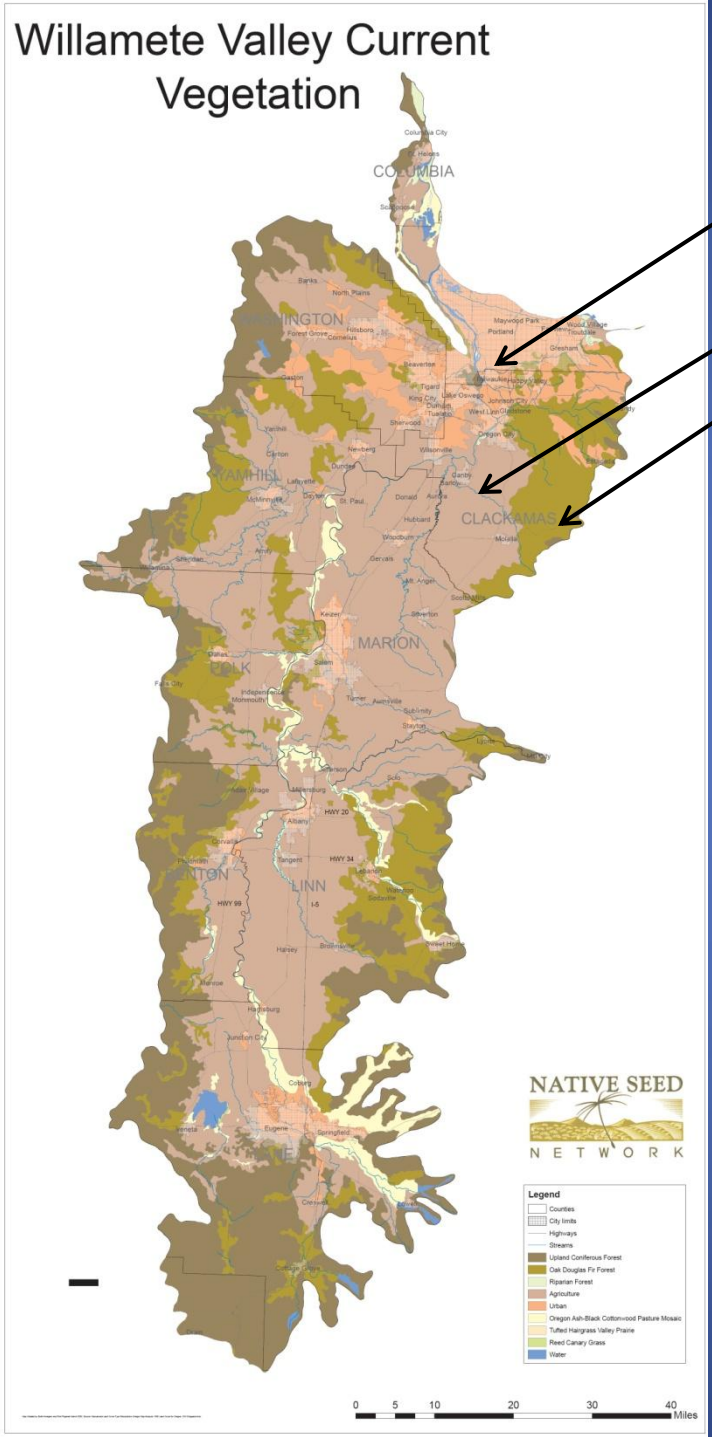
Green = woodland

Light peach = open prairie

Dark peach = oak savanna (large oaks in open prairie)

There is less than 1% Willamette Valley Prairie left!





Pink=Urban

Mauve =Agriculture

Green =Forest

Where's the Peach????

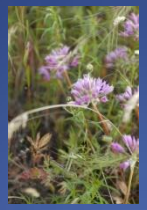
What prairie is left is degraded with lots of non-native species and noxious weeds

In only 150 years we have gone from this……☺

To this ☹

Components of a WV Prairie













And forbs ☺













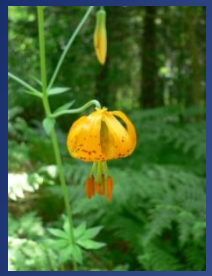













Forbs..












Forbs!

Native Bunchgrasses Provide Structure for Ground Nesting Birds

flutey whistles, gurgling whistle, “Chupp”

…..and

Room for Forbs

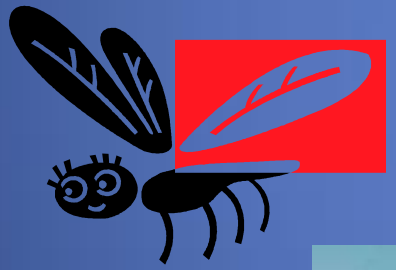
Forbs attract pollinators

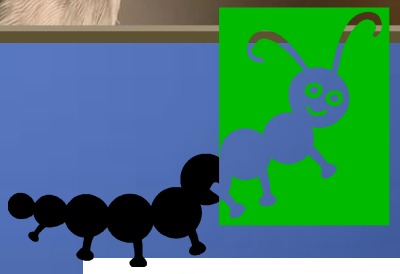
Native Plant Diversity

Insect Diversity

Bird Diversity

96% of terrestrial birds rear young on insects





Native Willamette Valley Prairie Restoration Steps

- Step 1: Define your starting conditions and desired outcome
- Step 2: Write your Management Plan
- Step 3: Site Preparation
- Step 4: What to Plant & When to Plant
- Step 5: Follow up Management

From this…

To this!

From this…

To this!

From this…

Remnant oak savanna choked with brush and trees

To this!

Restored
Remnant Prairie

STEP 1: DEFINE YOUR STARTING CONDITIONS AND DESIRED OUTCOME

Remnant prairie with good native grass and forb component

Increased species richness and/or abundance

Kingston Prairie

Dominant grass Pine bluegrass

Rare plants such as Willamette daisy and Bradshaw's lomatium

Sublimity Prairie

Dominant grass California oatgrass with shooting star, camas, and so much more!

Step 2: Management Recommendations

- Tiptoe around the natives what ever you do!
- Broadcast herbicides where natives are not present or use herbicides that only target the non-native sp (e.g grass herbicides)
- Spot-spray or use mechanical methods (mowing, weed-whacking, pruners etc) where natives are present
- Use fire or mowing to manage brush and thatch
- If area to be used for seed collection, only augment with seed collected from site or add species not on the site
- If not used for seed collection, augment the populations and add species not on site with materials from the appropriate seed transfer zone

STEP 1: DEFINE YOUR STARTING CONDITIONS AND DESIRED OUTCOME

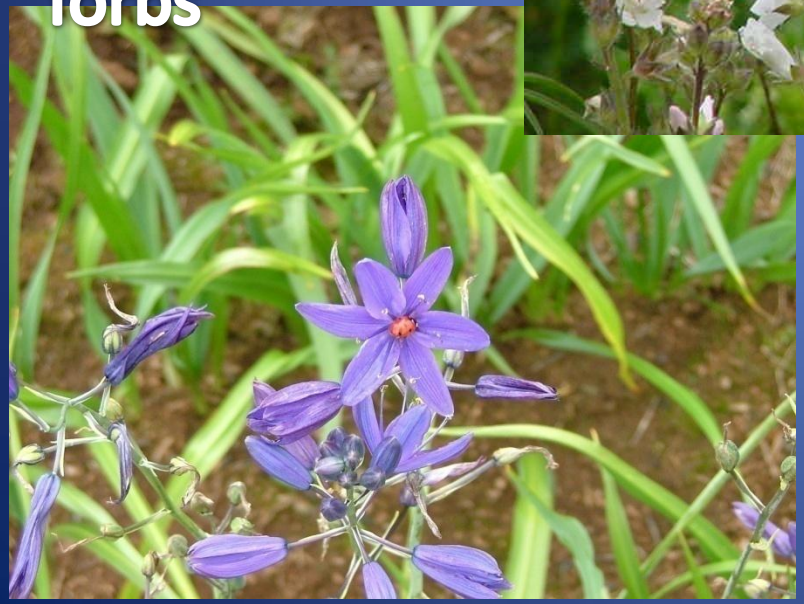
Remnant prairie/meadow with good native forb component but non-native grasses dominate

Reduction of non-natives grasses and an increase in native grasses and forbs

Krautmann Jefferson Farm

Lots of endemic forbs

Lots of endemic forbs



Step 2: Management Recommendations

- Maintain current condition using mowing and/or burning
- Treat with a grass-specific herbicide (Poast or Fusilade)
  - But, most native grasses are susceptible
  - As site opens up, beware of non-native forb species increasing! Know what is on and around your site!
- Burn site and use glyphosate after green-up if you know the natives are *dormant* or *green-up later*
- Spot-spray invasive forbs and shrubs with 2,4-D, triclopyr, clopyralid, or glyphosate
- Re-seed/plant native grasses
- Increase forb diversity post-burn by seeding and/or planting plugs

MID-SEPT BURN

Oregon sunshine

Cinquefoil

Also, yarrow, checkermallow and annuals

EARLY NOV GREENUP

PLANT PLUGS LATE-FALL/EARLY SPRING

More info on grass-herbicide use in prairie remnants

- Roemer's fescue shows greatest tolerance with California oatgrass showing some
- Collins Research Project at Institute for Applied Ecology
  - Please see http://www.appliedeco.org/conservation-research/prairie-restoration-research for more information
- Removing grasses makes room for non-native, invasive forbs – be ready for war!
- Get native grasses back onto site but be careful THEY also take up resources needed by native forbs

STEP 1: DEFINE YOUR STARTING CONDITIONS AND DESIRED OUTCOME

Meadow with only a few patches of natives or natives in low abundance

Increase species richness and/or abundance

Krautmann Joseph St Farm

Krautmann Jefferson Farm Steiwer Hill

Species often found in pastures and old fields

Buttercup

Camas

Yarrow

Foothill sedge

Woodrush

Checkermallow

Thin young oak, mow brush, and remove/snag conifers if needed

Are there natives hiding in all that thatch?

If possible, burn site to gauge response of established natives or in seed bank

Step 2: Management Recommendations

- If response is positive (e.g. lots of natives hiding in the thatch) – plan to *augment* with seed or plants
  - Choice of material limited to those that compete well with non-native species
- If response not positive (e.g. non-native component still dominates) – plan to *start from scratch*
  - Choice of site-preparation determined by site size, time/money constraints, amount of native cover desired
  - Save genetics of native populations by collecting seed, do plant rescue, and/or cut to ground or cover before herbicide application

Augment with Prairie Natives that Compete Well with Non-natives

Perennial forbs

- Yarrow
- Buttercup
- Oregon sunshine
- Self-heal
- Riverside lupine
- Goldenrod

Grasses

- Slender wheatgrass
- Blue wildrye
- California brome (weedy though)
- Tufted hairgrass
- Spiked bentgrass

Annual forbs

- Large-flowered collomia
- Farewell to spring
- Western burnet
- Blue gilia
- Spanish clover
- Tarweed sp
- Rosy plectritis

Step 3: Site Preparation

Broadcast/gun application glyphosate (can add broadleaf herbicide as well)

Starting from Scratch 2-3 years!

Reduce existing vegetation and reduce weed seed bank

No-till! Just digs up weed seed each time

Oops, missed (watch for this and get back to treat them)

<u>2-3 years</u> (really) to reduce non-natives to allow native seed to establish

Step 4: What to Plant and When?

- Grass first, then forbs
  - Recommended for old fields/pastures since non-native forbs often problematic or if time-frame limited
  - Warning! Established native grasses and weedy grasses makes forb establishment difficult due to lack of space
- Forbs first, then grass
  - Recommended for grass seed fields with hydric conditions where residual crop grass might be an issue
  - Warning! The drier the site, the more invasive forb species may take up the space formerly occupied by the grass
- Grass and forbs together ☺
  - Recommended for all sites if you can take the time to do it right
  - Can seed a high diversity mix since everything has the best chance to establish
  - Warning! Use cover crop if erosion a concern and make sure herbicide application is timely

One Part of site:

Drilled native fall germinating Roemer's fescue, Pine bluegrass, and Junegrass

Used 2,4-D to control broadleaf weeds one season

Dense stand of native grass ☺ ☹ (mostly Roemer's)

Broadcast seeded forbs in the fall

Poor establishment of forbs due to competition from native and non-native grasses in many areas!

PLAN B – Treated non-native grasses with grass-specific herbicide

- Mowed spring to reduce thatch
- Applied Fusilade at green-up (does not affect Roemer's)
- Repeated after fall green-up
- Burned to reopen site and DRILLED native forbs

Targets: tall oatgrass, velvet grass, tall fescue, bentgrass, and broadleaved annual grasses (wont work on rattail!)

Rattail fescue – the scourge of upland restorations ☹

- Burn or mow to increase herbicide contact
- Preemergent or annual species burndown herbicide (diquate is amazing!)
- Drill native forbs

Other part of site: Drilled California oatgrass

Doesn’t germinate until March, so one more glyphosate treatment helped reduce weedy forbs and grasses considerably!!!!!

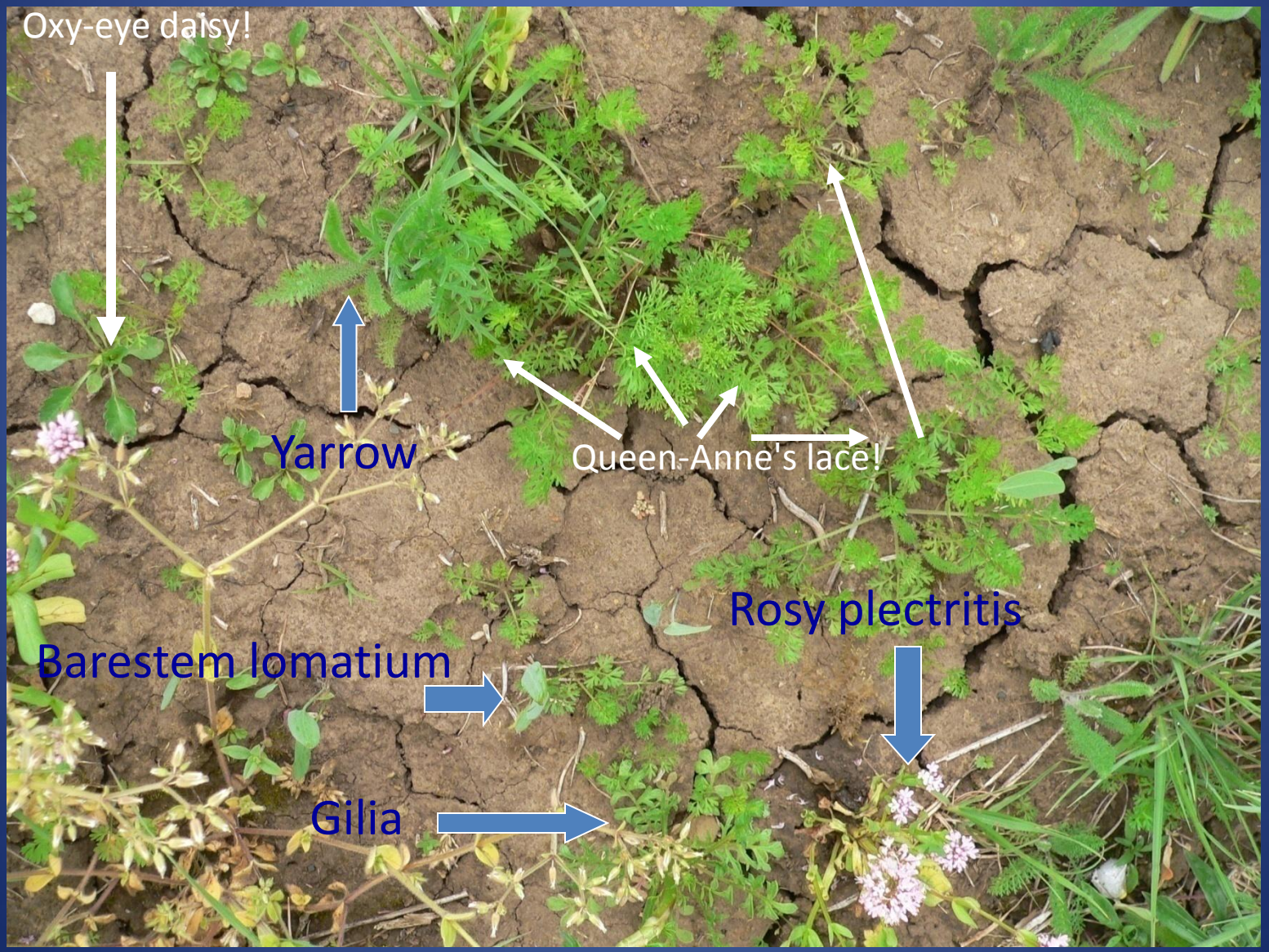
Used a weed wiper with glyphosate foam on tall oatgrass patches

grass and flowers shorter year 1

Worked well!

Native forbs did best in bare areas

(and so did non-native forbs!)



Second year – native forbs show establishment good ☺

Forbs first then grass

Not recommended for upland due to weedy forb species (not enough space taken up by native forbs)

Two projects trying this method –

1) Dragonfly bend wet prairie (WEW)
[Diane Steeck contact]
1) Hutchinson wet and dry prairie (NRCS)
[Kathy Pendergrass contact]

Respect the weed seed bank

Highest Success! – broadcast forbs, drill grasses

*Don’t drill together since some forb seed need to overwinter
*If drill separately, less space taken up by native seed and disturb ground 2x!

Success – Forb only meadow

*High diversity of forbs from seed
*More issues with weeds due to more space

Conversion of fallow bentgrass field to prairie (was I crazy???!!!)

Site Prep and Seeding

- 2008: hayed field fall
- 2009: Applied glyphosate at 3 qts/ac spring; burned summer to reduce thatch, eliminate some surface seed, and improve herbicide contact , applied broadleaf herbicide summer
- 2010: glyphosate/broadleaf mix summer and glyphosate post-seeding fall
- 2010: wet areas broadcast seeded forbs, sedges and rushes only; upland, broadcast forbs and drilled Roemer's fescue

Applied Fusilade 2x (year 1 and 2) for bentgrass control

Sedges and rushes (wet areas) and Roemer's fescue (dry areas) doing great!

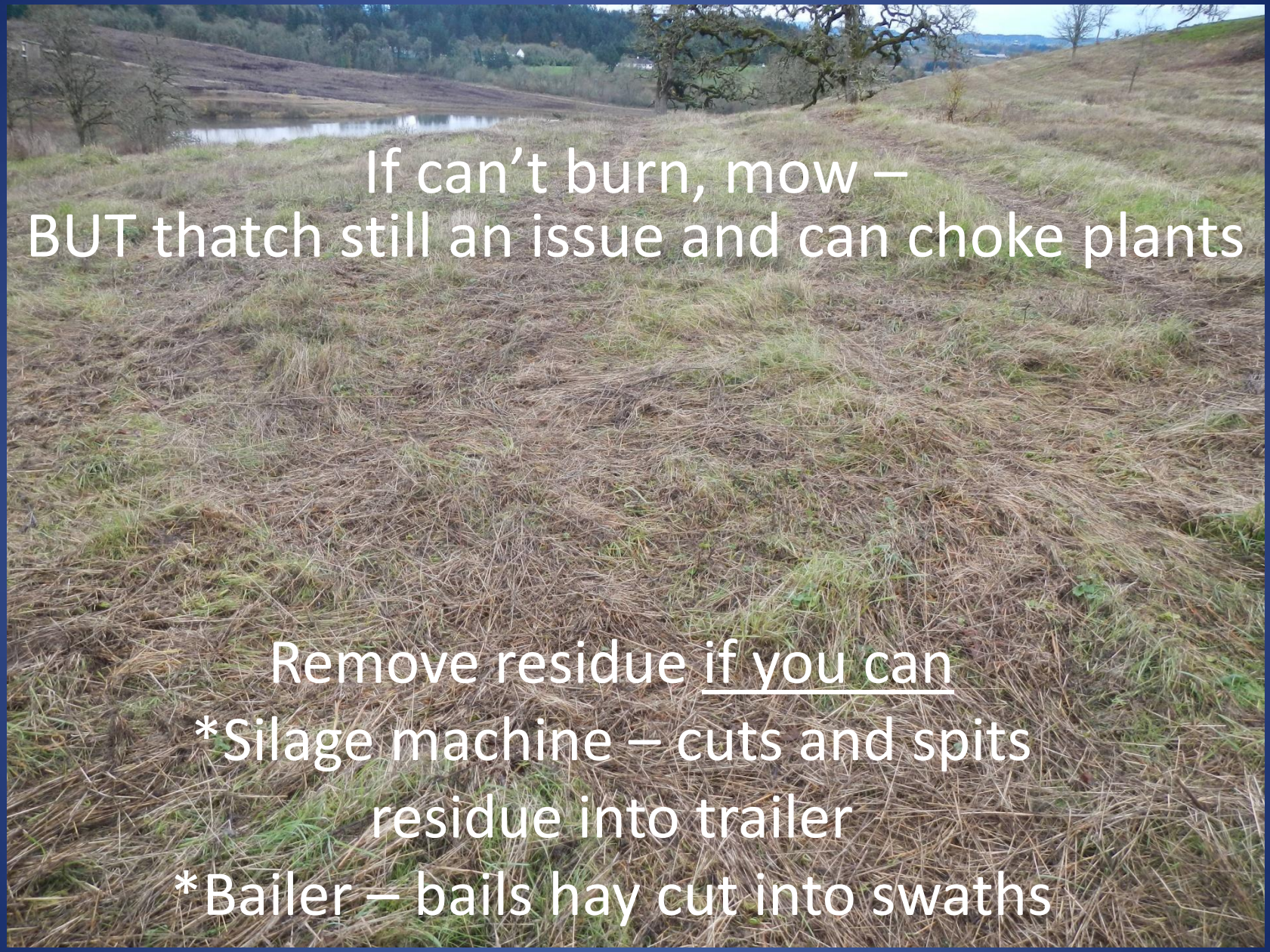
High establishment rate of forbs
12 seeds/ft = plant every 6-8 inches in most areas

Step 5: Follow up Management

Burning best!
September burns - fast, not too hot, reopens the site

*DRILLING BEST INTO BURNED SOD

*BROADCAST SEEDER FOR AREAS OF LITTLE VEGETATION


If can't burn, mow –
BUT thatch still an issue and can choke plants
Remove residue if you can
*Silage machine – cuts and spits residue into trailer
*Bailer – bails hay cut into swaths

Thank you!
QUESTIONS?