Prairie 101
Restoration Techniques for a Variety of Starting Conditions

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Why Prairie?

Photos by: US Forest Service

Light peach = prairie

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

Willamette Valley Prairie and declined by over 99% of it's historic range

What is left is degraded with lots of non-native species

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

Native camas
and buttercup

To this ☹

Components of a Prairie














And forbs…




























Forbs..





























Forbs!









Native Bunchgrasses Provide Structure for

Ground Nesting Birds

…..and

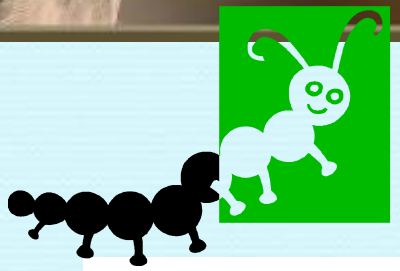
Room for Forbs

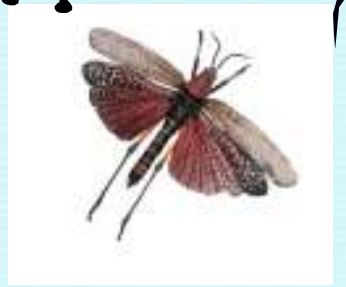
Forbs attract pollinators

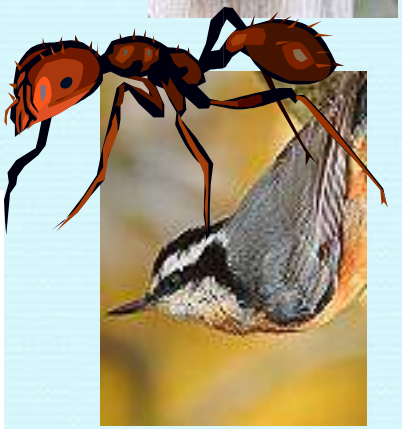
Bird Diversity
Insect Diversity
Native Plant Diversity

96% of terrestrial birds rear young on insects

U.S. Fish and Wildlife







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

To this

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

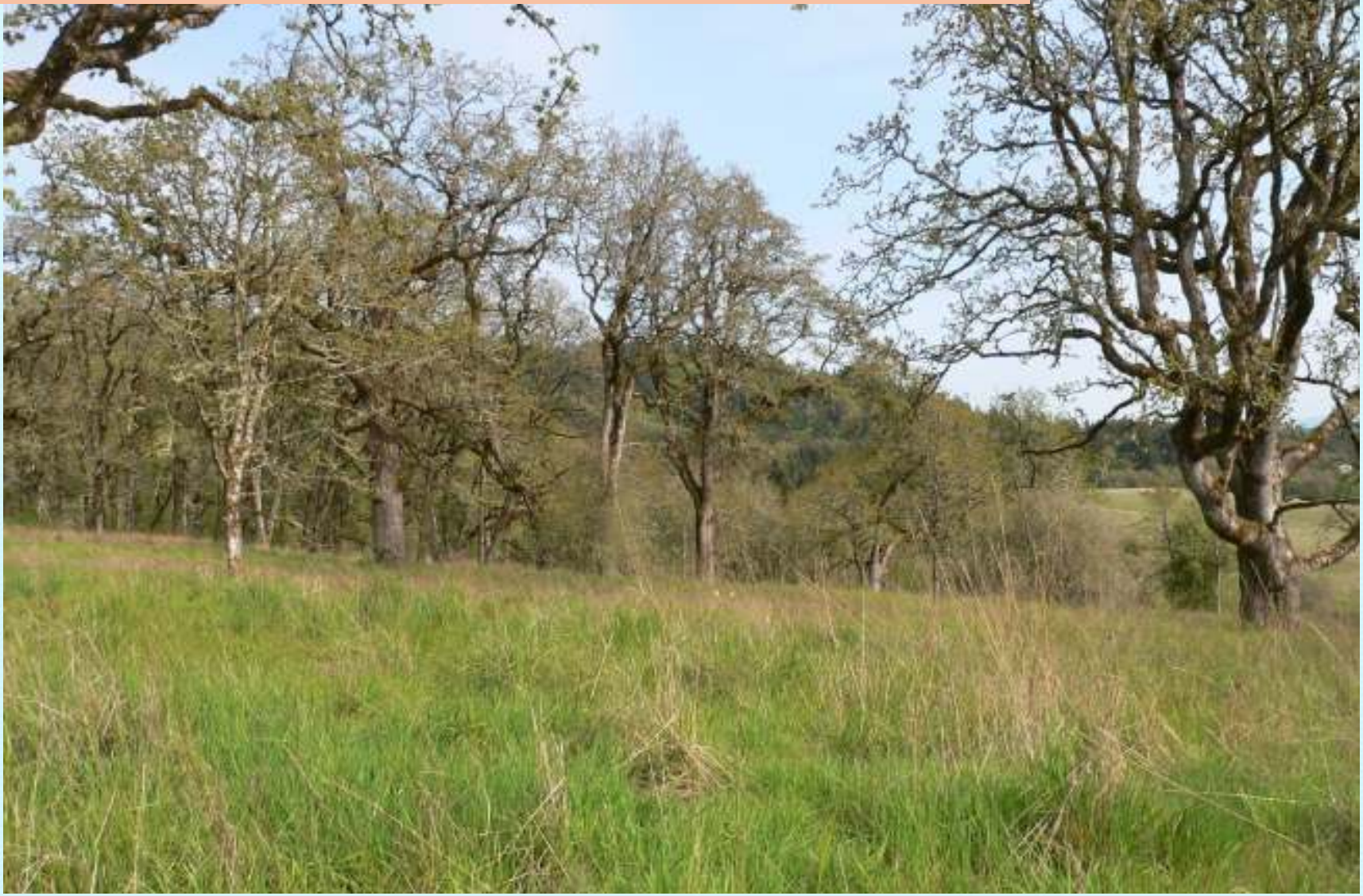
- Tiptoe around the natives what ever you do!
- Broadcast herbicides where natives are not present or use herbicides that only target the non-native sp (e.g grass herbicides)
- Spot-spray or use mechanical methods (mowing, weed-whacking, pruners etc) where natives are present
- Use fire or mowing to 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, add species that were historically present but not on site currently 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 increase in native grasses and forb abundance

Krautmann Jefferson Farm



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)
  - 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 with 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 forbs – be ready for war!
- Get native grasses back onto site but be careful THEY also take up resources needed by native forbs
- I will be using this method 2009 (details coming)

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 (next slide)
- 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

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

Starting from Scratch

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
  - 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

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

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 – Treat non-native grasses with grass-specific herbicide

- Mow spring to reduce thatch
- Apply Fusilade at green-up (does not affect Roemer's)
- Repeat after fall green-up
- Repeat second year if necessary
- Burn to reopen site and DRILL 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
- Use Imazapic (Plateau) fall before bulk of rattail germinates
- Drill native forbs

Drilled California oatgrass in other area

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

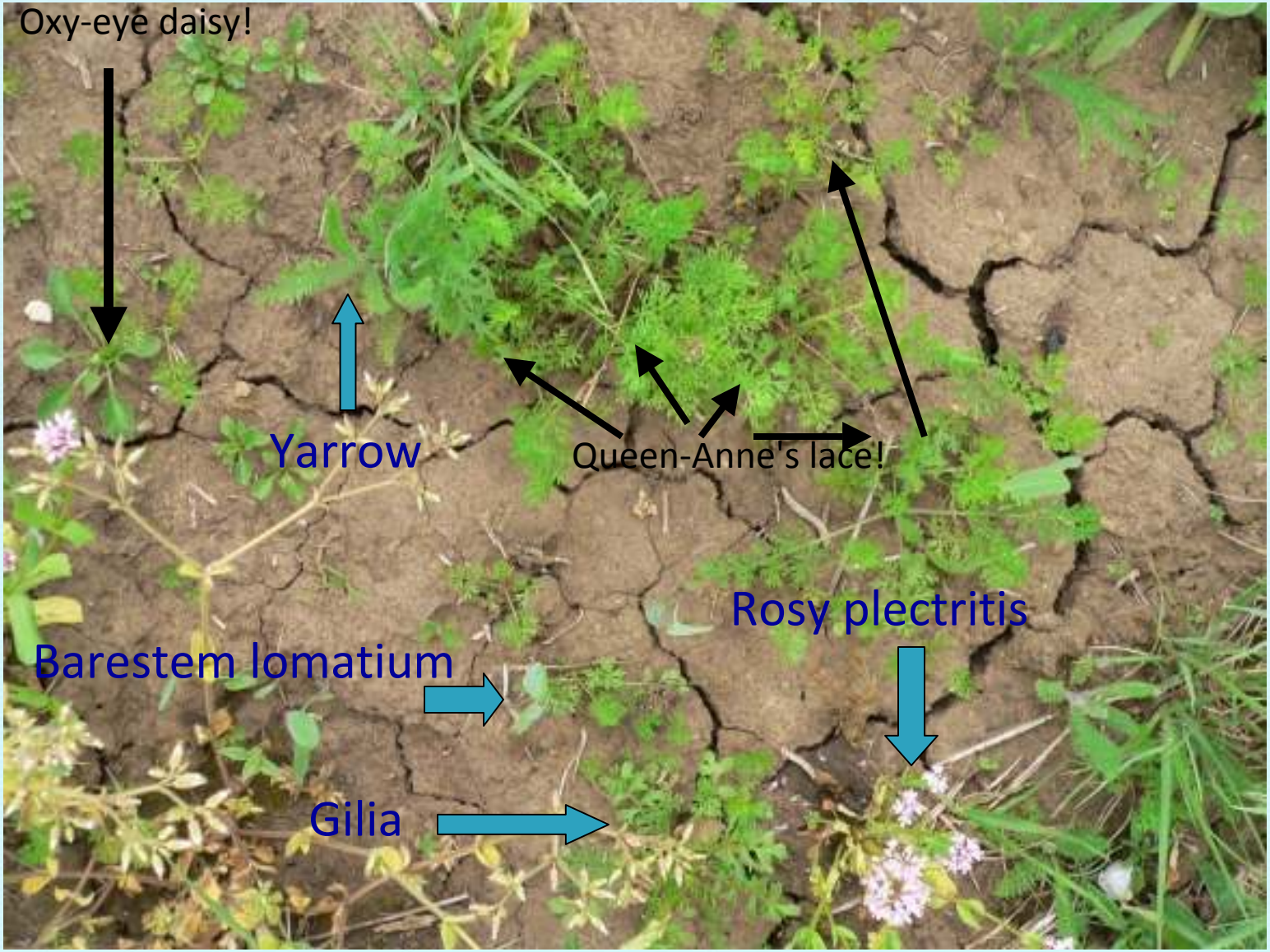
Used a weed wiper with glyphosate foam on tall oatgrass patches

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 in grass areas much more apparent ☺

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

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!

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

Steps 2&3&4

- Hay fall of 2008
- Apply glyphosate at 3 qts/ac spring 09
- Burn summer to reduce thatch, eliminate some surface seed, and improve herbicide contact
- Glyphosate 2 qts/ac 2-3? Years
- Broadcast forbs and drill grasses??
- Stay tuned!

Step 5: Follow up Management

Burning best!

September burns - fast, not too hot, reopens the site

If can't burn, mow – BUT thatch still an issue and can choke plants

Is your head spinning?

……Mine is ☺

Thank you!

Questions?