

Restoring Savanna Habitats in the Willamette Valley

Lynda Boyer

Heritage Seedlings Inc.

Lots of information at: www.heritageseedlings.com

TO BE ADDED TO RESTORATION TOUR LIST EMAIL US AT
sales@heritageseedlings.com

INTRODUCTION TO NATIVE WILLAMETTE VALLEY PRAIRIE AND SAVANNA



Heritage Seedlings, Jefferson Farm

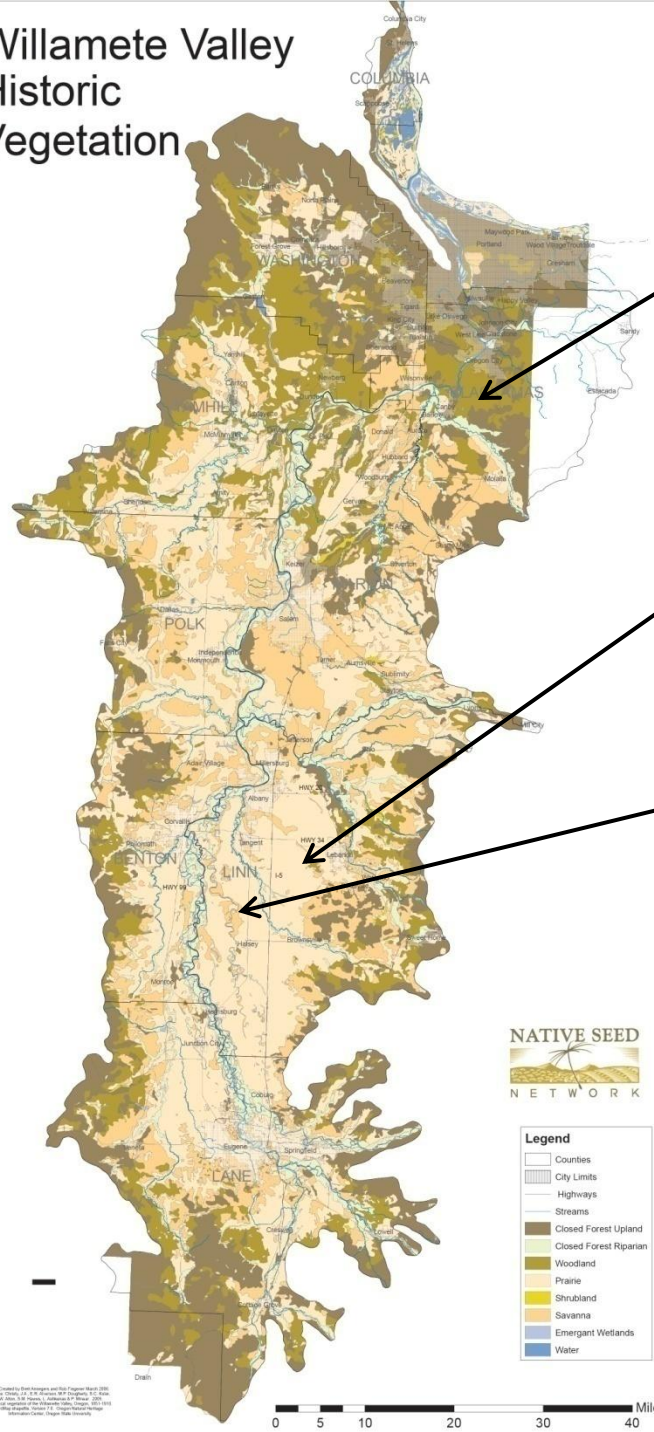
Willamette Valley Historic Vegetation

Green =
woodland

Prior to
1850 the
Willamette
Valley was
mostly
open
prairie

Light peach =
open prairie

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



Map created by Brent Hargrove and Bob Ferguson, August 2006.
Map data: USGS National Wetlands Inventory, 2001; USGS National
Map Accuracy Program, 2001; USGS National Wetlands Inventory, 2001.
Map data provided by the Oregon Department of Geology and Mineral
Industries, Oregon State University, and the Oregon Department of
Agriculture. Oregon State University, Oregon State University
Geographic Center, Oregon State University.

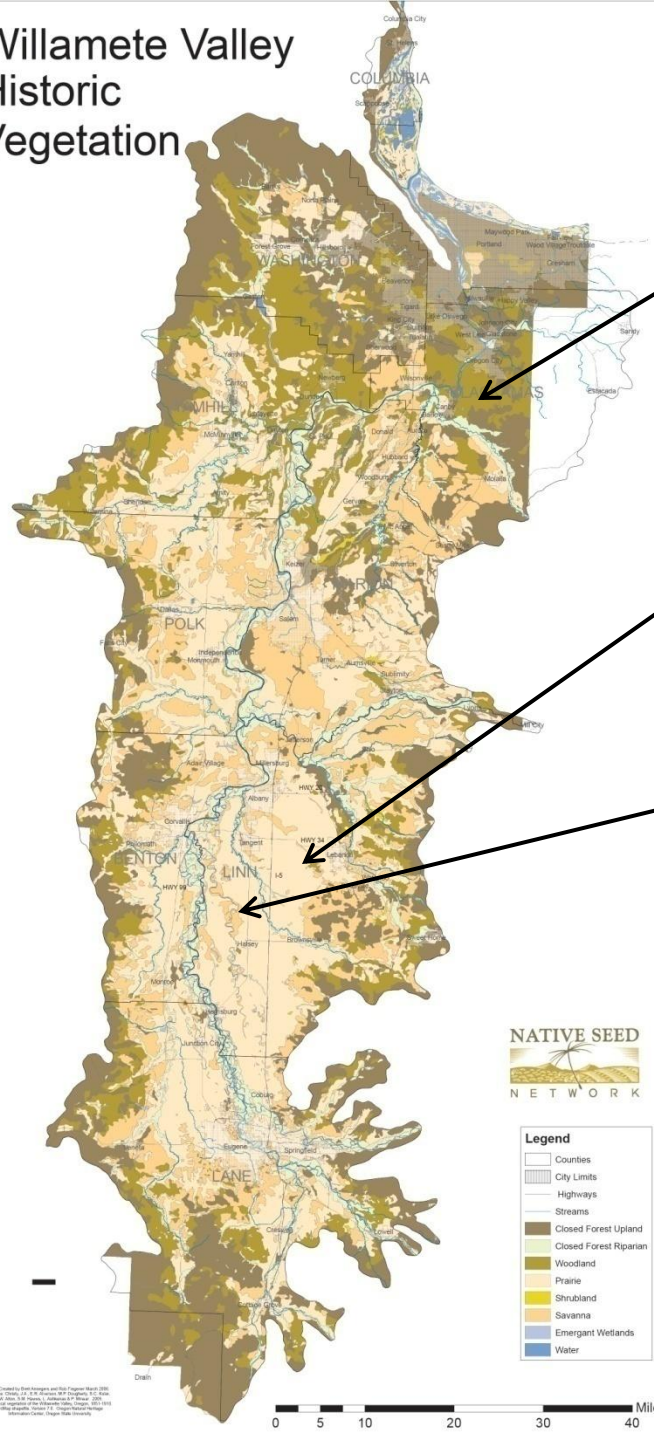
Willamette Valley Historic Vegetation

Green =
woodland

Prior to
1850 the
Willamette
Valley was
mostly
open
prairie

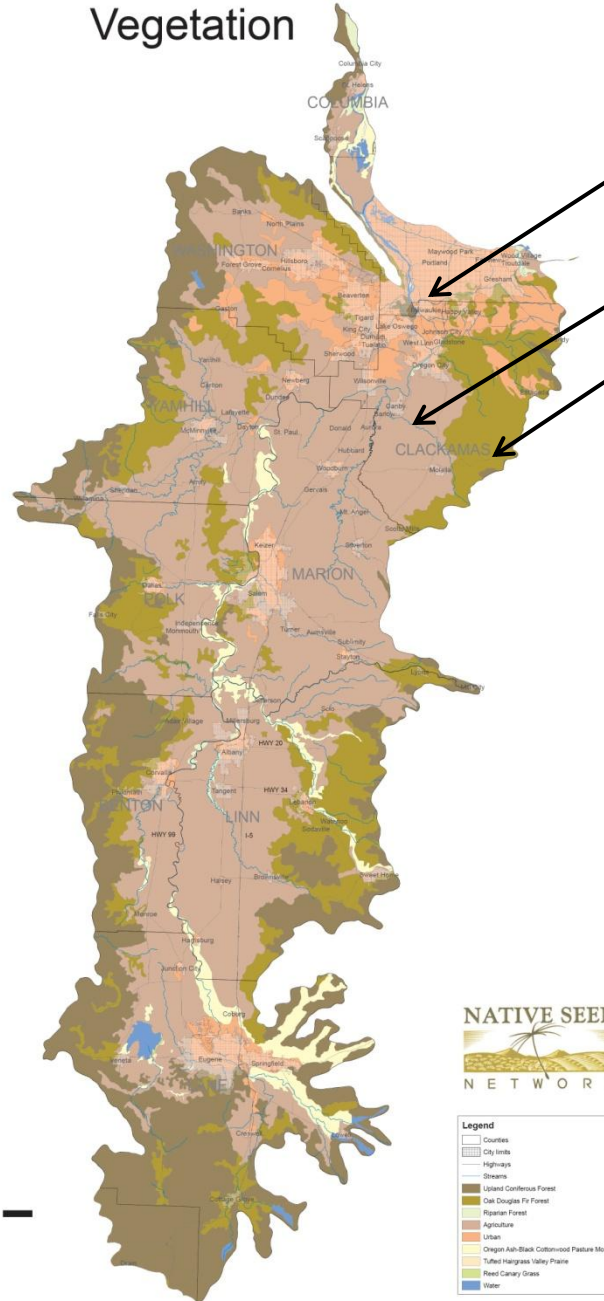
Light peach =
open prairie

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



Map created by Brent Hargrove and Bob Ferguson. Report 2006.
Map data: USGS, National Wetlands Inventory, 2001.
City limits: US Census Bureau, 2000.
Highways: Oregon Department of Transportation, 2005.
Streams: Oregon Department of Geology and Mineral Industries, 2005.
Emergent Wetlands: Oregon Department of Geology and Mineral Industries, 2005.
Water: Oregon Department of Geology and Mineral Industries, 2005.

Willamette Valley Current Vegetation



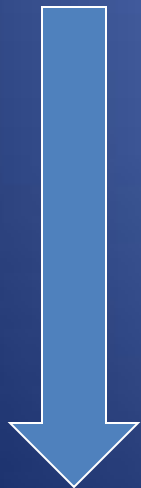
Pink=Urban

Mauve =Agriculture

Green =Forest

Where's the Peach????

There is less than 1% Willamette Valley Prairie left!



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

NATIVE SEED NETWORK

| Legend | |
|--------|--|
| | Counties |
| | City limits |
| | Highways |
| | Streams |
| | Lupine Coniferous Forest |
| | Oak Douglas Fir Forest |
| | Riparian Forest |
| | Agriculture |
| | Urban |
| | Oregon Ash-Black Cottonwood Pasture Mosaic |
| | Tufted Hairgrass Valley Prairie |
| | Reed Canary Grass |
| | Water |

0 5 10 20 30 40 Miles

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



Native camas
and buttercup

To this 😞

Canadian thistle
infestation



UGA1929056



Prairie junegrass



Roemer's fescue

Components of a WV Prairie



California oatgrass



Pine bluegrass



And forbs 😊





Forbs..





Forbs!



Native Bunchgrasses Provide Structure for Ground Nesting Birds

flutey
whistles,
gurgling
whistle,
“Chupp”



U.S. Fish and Wildlife



.....and

Room for Forbs





Forbs
attract
pollinators



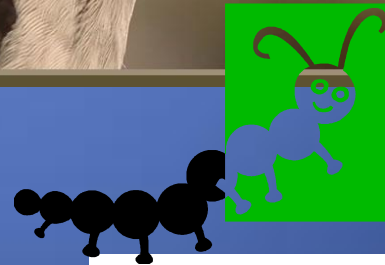
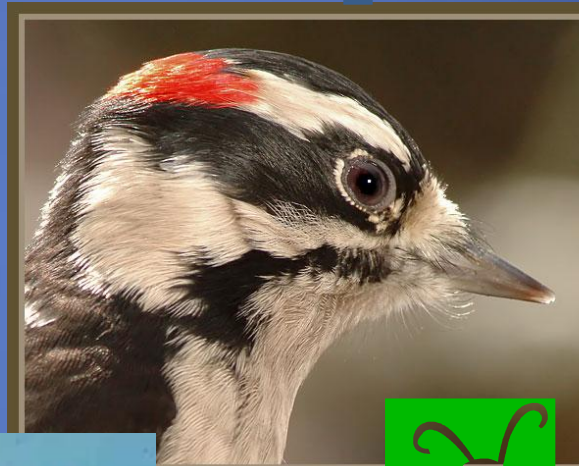
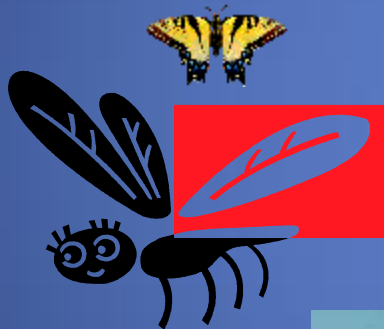
Which provides FOOD FOR BIRDS!

96% of terrestrial birds rear young on insects

Native Plant Diversity

Insect Diversity

Bird Diversity



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

Restoration in Rural Areas –
Private landowner programs are
the key to go from this.....



Cropped field

Heritage Seedlings Joseph
Street Farm 2003

To this!



Reestablished Native Prairie

Heritage Seedlings Joseph
Street Farm 2006

From this...



Fallow pasture choked
with invasive plants

Heritage Seedlings
Jefferson Farm 2005

To this!



Reestablished Native Prairie

Heritage Seedlings
Jefferson Farm 2008

From this...

Remnant oak savanna
choked with brush
and trees



Heritage Seedlings
Jefferson Farm 2005

To this!

Restored Remnant Prairie



Heritage Seedlings
Jefferson Farm 2008

NATIVE HABITAT RESTORATION

DEFINE YOUR STARTING CONDITIONS AND
DESIRED OUTCOME

Remnant prairie with abundant native
grasses and forbs



Manage site to maintain abundance (control
invasive plants and shrubs)

Kingston Prairie – non-profit owned

Dominant grass Pine bluegrass

Rare plants such as Willamette

daisy and Bradshaw's lomatium



Sublimity Prairie – privately owned

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



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, or specific shrubs and weeds)
- 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

NATIVE HABITAT RESTORATION

DEFINE YOUR STARTING CONDITIONS AND DESIRED OUTCOME

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



Increase native grasses and forbs
after disturbance

DO YOU HAVE THESE?????

Species often found in pastures and old fields



Buttercup



Camas



Yarrow

Checkermallow

Foothill sedge



Woodrush





Krautmann Jefferson Farm –
privately owned



Lots of endemic forbs



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!
- Spot-spray invasive species: triclopyr choline for blackberry, clopyralid for thistles, or glyphosate (non-specific so be careful it kills non-target plants too!)
- Treat stumps of invasive shrubs and trees with Garlon 4 (triclopyr)
- Increase forb diversity post-burn by seeding and/or planting plugs



1. Open Areas
BURN MID-SEPT

SEED NATIVES
THAT COME UP
IN THE
FALL/EARLY
WINTER

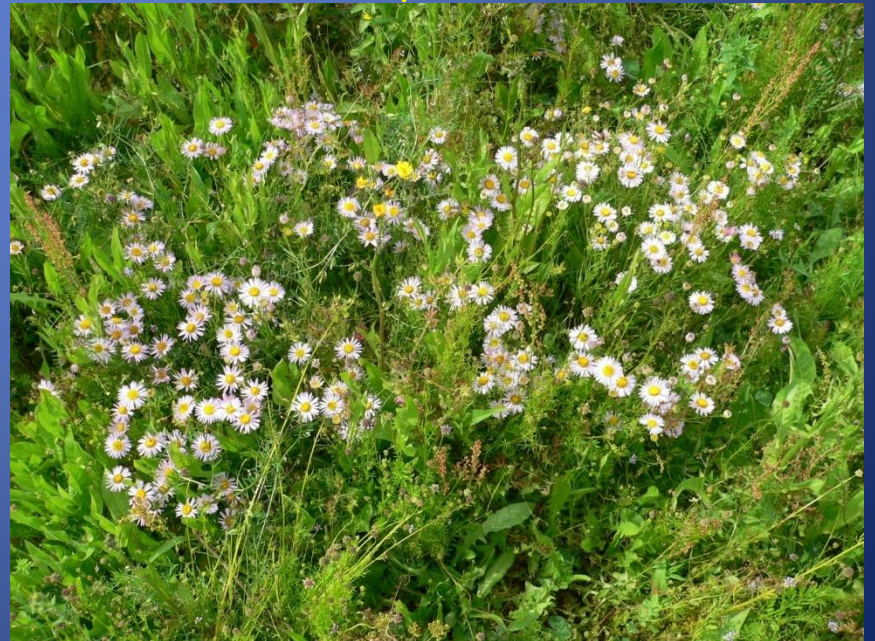


Six years after seeding remnant part of the property with Rose-checkermallow after Burning - WOW!





ADD DIVERSITY BY PLANTING BULB AND PLUGS LATE-FALL/EARLY SPRING



Wooded Areas

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



THINNING BY HAND

SKID-STEER WITH
TREE SHEAR/STUMP
SPRAYING HEAD

MOWING





ADD NATIVE
SEED by
spinning,
hydroseeding
or Jonny Apple
Seeding!!!



Prairie Natives that Compete Well with Non-natives

Perennial forbs

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

Grasses

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

Annual forbs

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

NATIVE HABITAT RESTORATION

DEFINE YOUR STARTING CONDITIONS AND DESIRED OUTCOME

Meadow/Pasture with only a few patches of natives,
natives in low abundance, or no natives left



Recreate Historic Prairie

Management Recommendations

- **Mow/Burn & Survey for Natives** (might be lots of natives hiding in the thatch) – if so - plan to *augment* with seed or plants (similar remnant recommendations)
 - 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

Site Preparation



Starting
from Scratch
2-3 years!

Use short-lived
herbicide glyphosate

- *Collect seed and/or tiptoe around patches of natives
- *Reduce existing vegetation and reduce weed seed bank
- *DO NOT TILL! It just digs up weed seed each time

Respect the weed seed bank

(it's bigger than you are!)

Area just prior to third year of glyphosate - teasel and wild carrot dominate... pretty aint it?



SAME AREA 7 AREAS AFTER SEEDING – I
CAN'T BELIEVE IT!



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 or **what high pollinator diversity!!!**
 - 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

Other part of site: Drilled California oatgrass



Grass
year 1
then
forbs
year 2

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

CALIFORNIA OATGRASS YEAR 1 then FORBS YEAR 2 –



high diversity results

2 years after seeding forbs

CALIFORNIA OATGRASS YEAR 1 + FORBS YEAR 2 –

high diversity results

8 YEARS AFTER SEEDING 😊



Forbs + sedges/rushes first
then sow grass later

It may be an issue for *upland* due to weedy forb species (not enough space taken up by native forbs for weed suppression)

BUT - Many WET PRAIRIE projects using this method for pollinator diversity and LOVE IT!!!

Upland Meadow Success – Forb only meadow



*High
diversity of
forbs from
seed

*More
issues with
weeds due
to more
space

*Non-native
grasses only

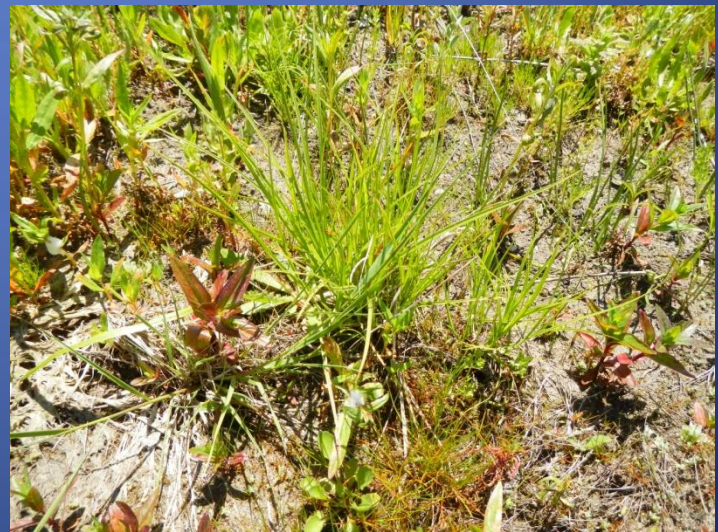
Conversion of fallow bentgrass field to prairie (was I crazy???)!!!



Site Prep and Seeding

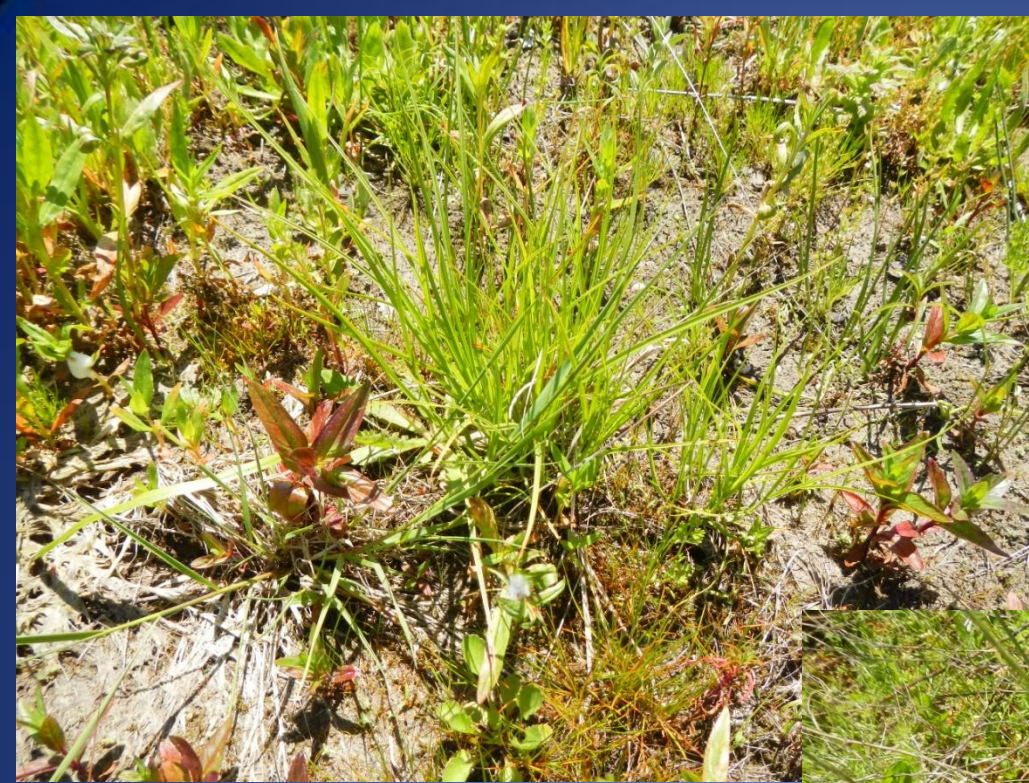
- 2008: hayed field fall
- 2009: Applied glyphosate at 3 qts/ac spring; burned summer to reduce thatch, eliminate some surface seed, and improve herbicide contact , applied broadleaf herbicide summer
- 2010: glyphosate/broadleaf mix summer and glyphosate post-seeding fall
- 2010: wet areas broadcast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

High Success! – broadcast forbs, drill grasses or broadcast all together



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

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



Highest Success! – broadcast forbs,
drill grasses or broadcast all together



4 years after seeding and previous fall burn

Follow up Management



Burning best! But mowing OK too
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

TO LEARN MORE & WHO CAN HELP?

EMAIL ME FOR A COMPREHENSIVE
RESTORATION RESOURCE LIST

CONTACT YOUR LOCATION SWCD, NRCS,
AND WATERSHED COUNCIL OFFICE FOR A
LIST OF PROGRAMS WITH GRANT FUNDING
AND ADVISE



Thank you!
QUESTIONS?