Fall 2015 Restoration Update, seeding and weed control

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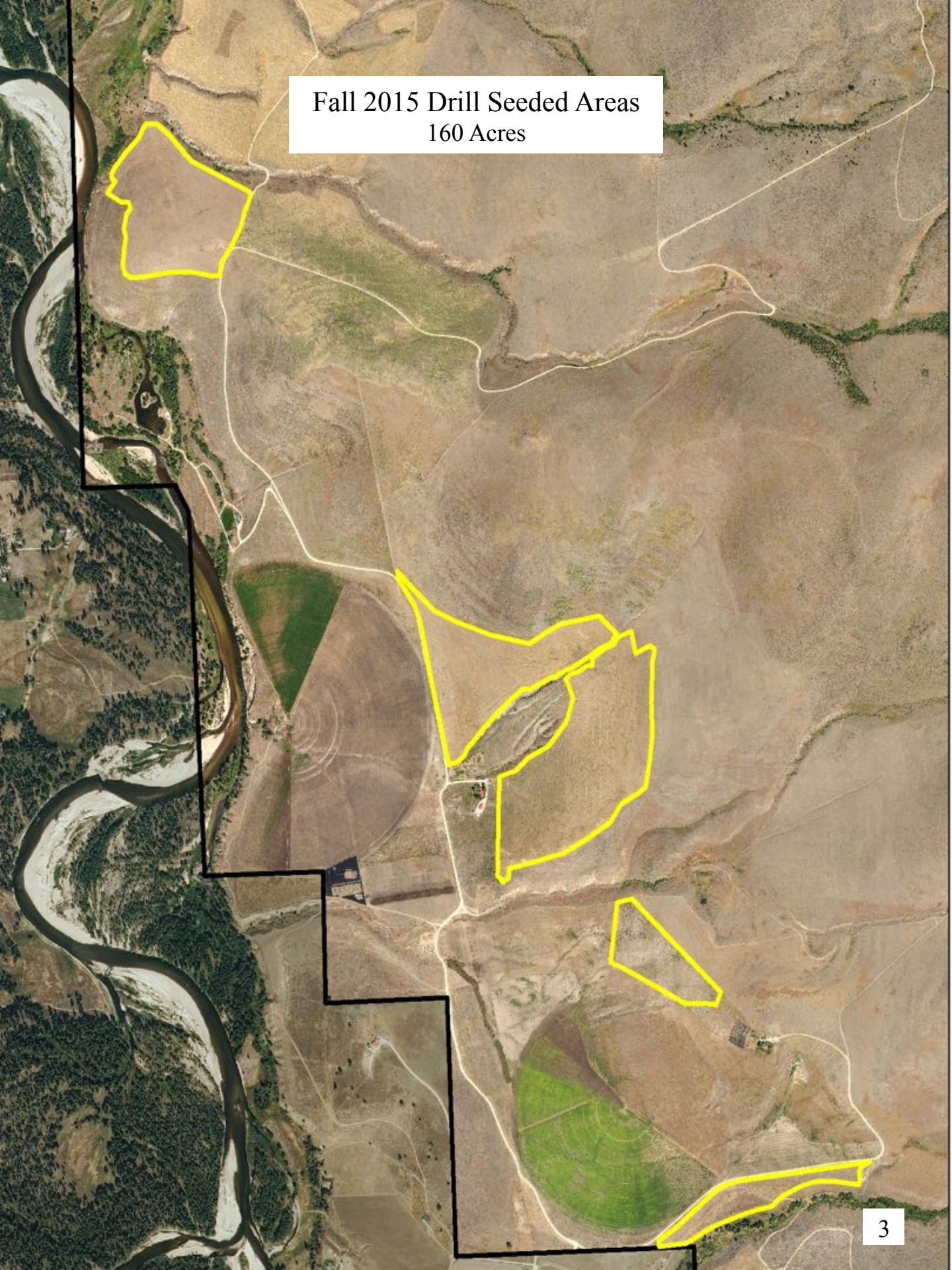
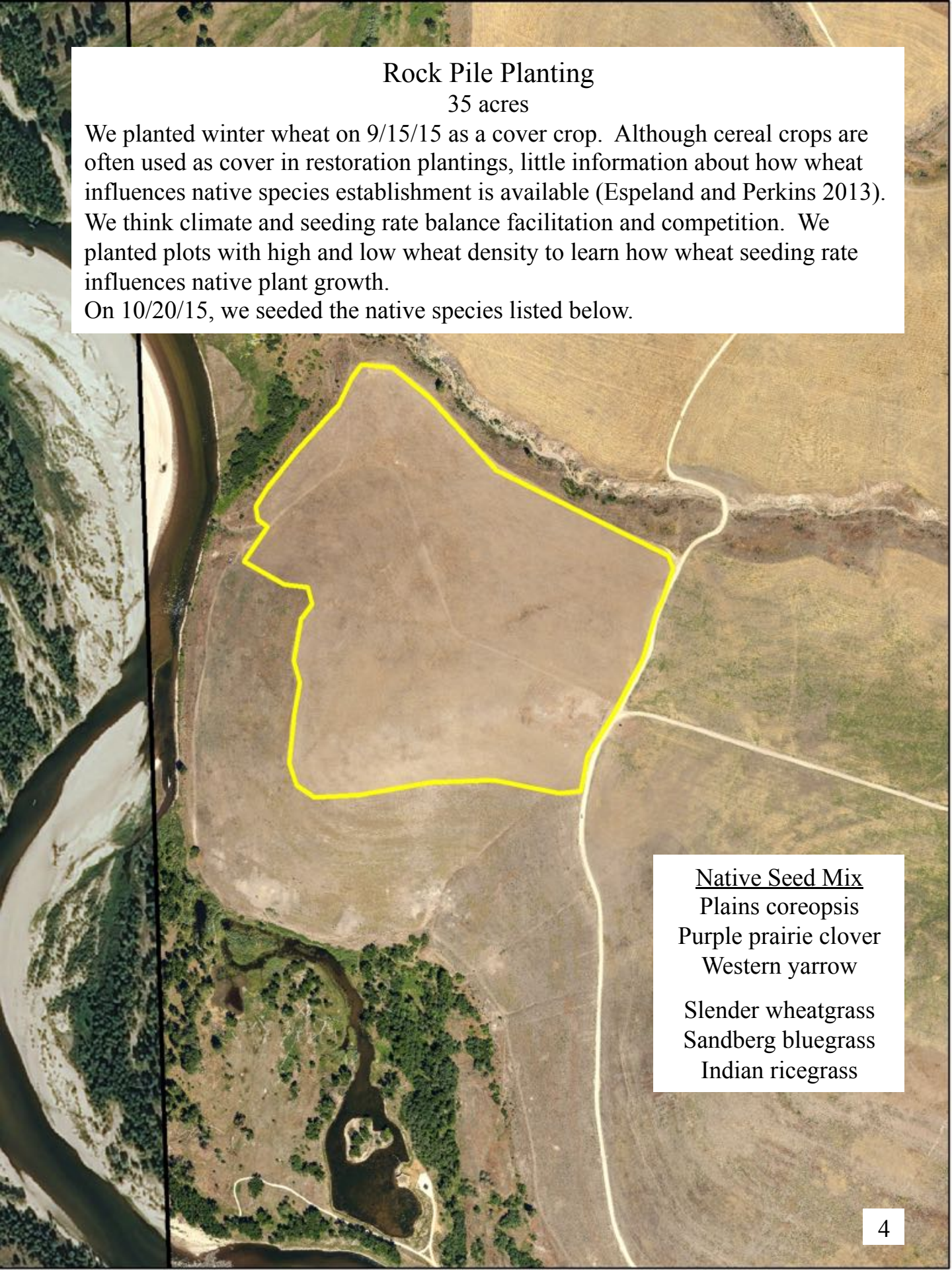

Fall 2015 Drill Seeded Areas
160 Acres

Rock Pile Planting

35 acres

We planted winter wheat on 9/15/15 as a cover crop. Although cereal crops are often used as cover in restoration plantings, little information about how wheat influences native species establishment is available (Espeland and Perkins 2013). We think climate and seeding rate balance facilitation and competition. We planted plots with high and low wheat density to learn how wheat seeding rate influences native plant growth.

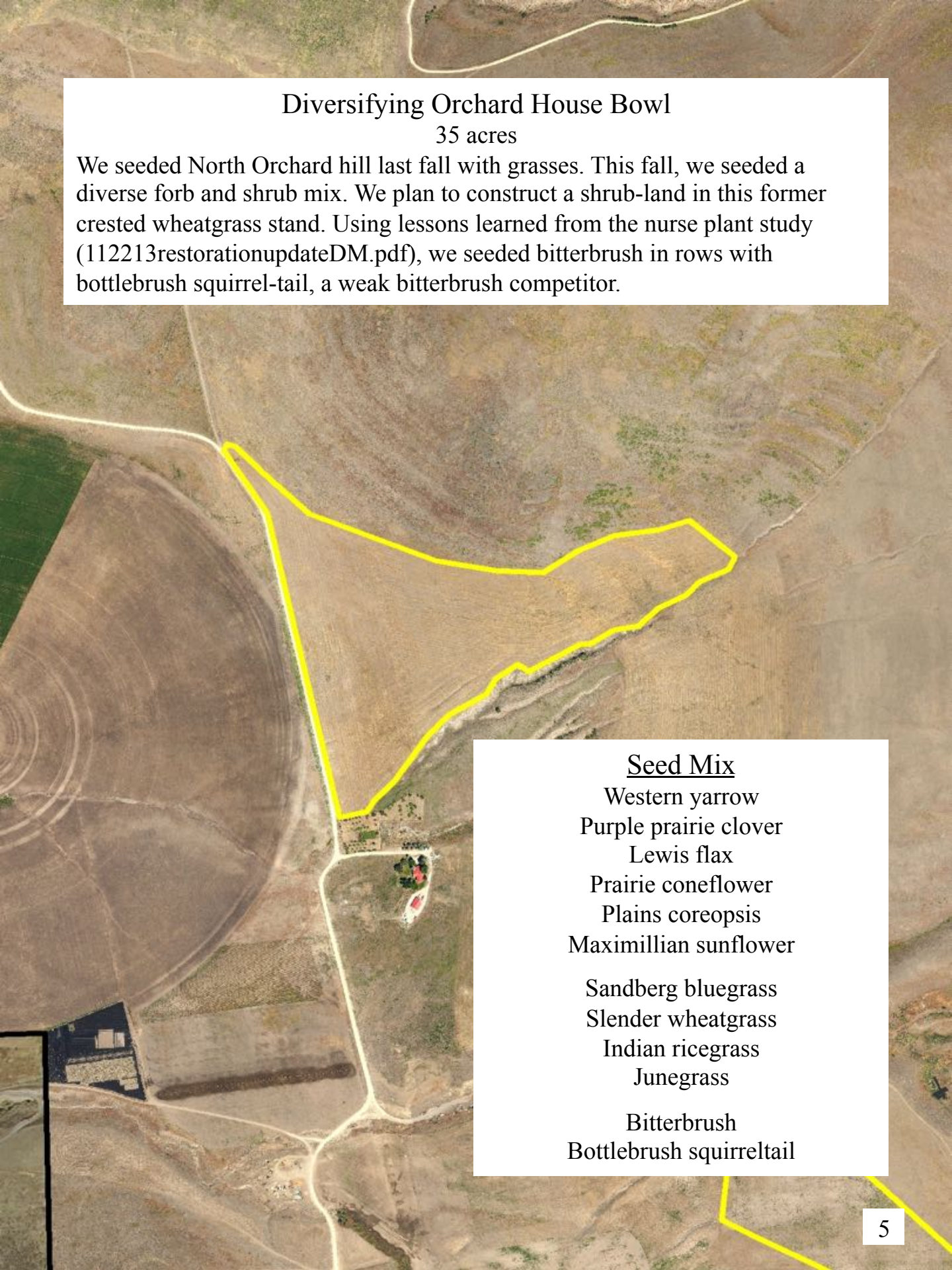
On 10/20/15, we seeded the native species listed below.



<u>Native Seed Mix</u>

Plains coreopsis
Purple prairie clover
Western yarrow

Slender wheatgrass
Sandberg bluegrass
Indian ricegrass



Diversifying Orchard House Bowl

35 acres

We seeded North Orchard hill last fall with grasses. This fall, we seeded a diverse forb and shrub mix. We plan to construct a shrub-land in this former crested wheatgrass stand. Using lessons learned from the nurse plant study (112213restorationupdateDM.pdf), we seeded bitterbrush in rows with bottlebrush squirrel-tail, a weak bitterbrush competitor.

Seed Mix

Western yarrow
Purple prairie clover
Lewis flax
Prairie coneflower
Plains coreopsis
Maximillian sunflower

Sandberg bluegrass
Slender wheatgrass
Indian ricegrass
Junegrass

Bitterbrush
Bottlebrush squirreltail

Diversifying Orchard House Bowl

60 acres

We seeded with grasses in 2014. This fall we inter-seeded a diverse forb mix that included a small amount of grass seed. We seeded to fill spaces between grasses with forbs. We will plant shrub-islands this winter.

<u>Seed Mix</u>

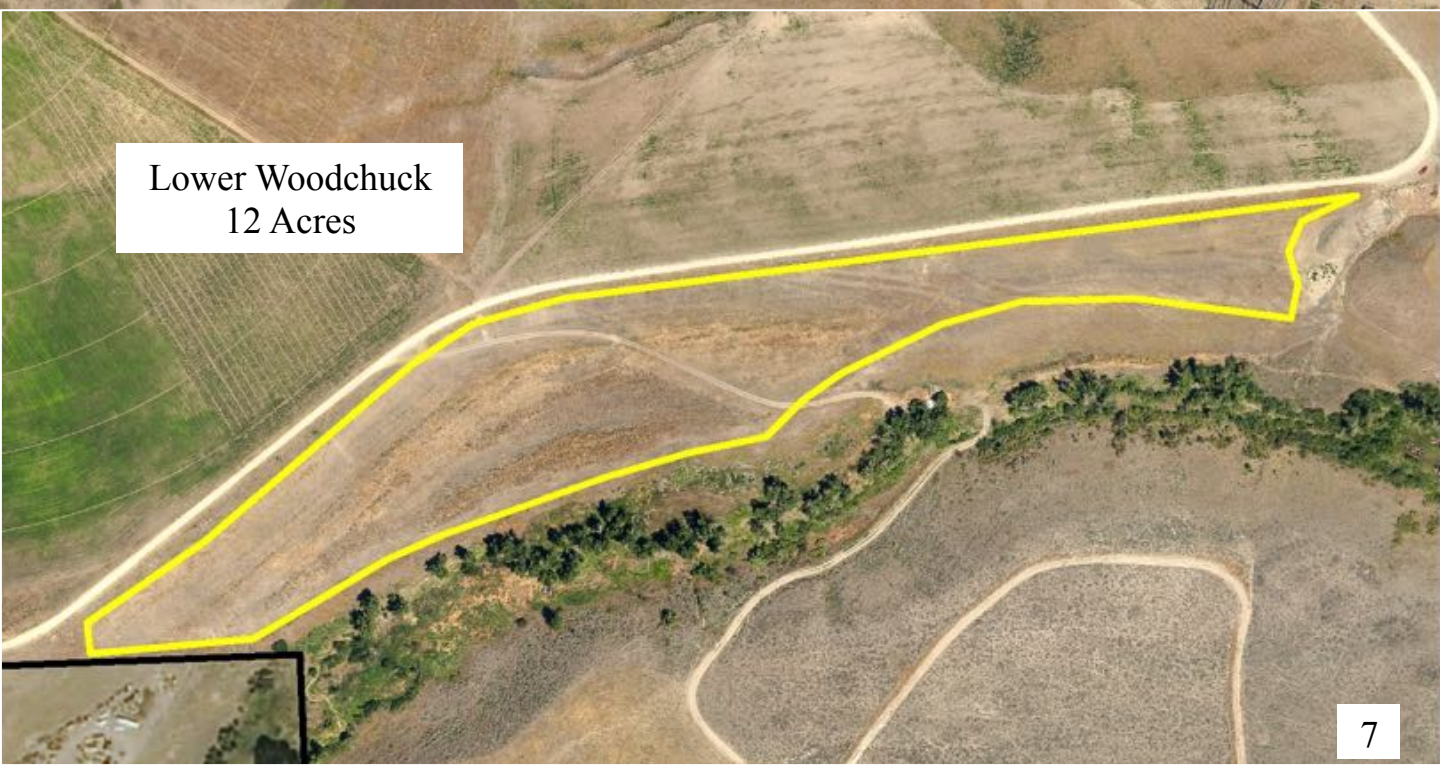
Annual sunflower
Prairie coneflower
Purple prairie clover
Western yarrow
Lewis Flax

Bluebunch wheatgrass
Bottlebrush squirelltail
Basin wildrye
Sandberg bluegrass

Dormant Seeding Indian Ricegrass

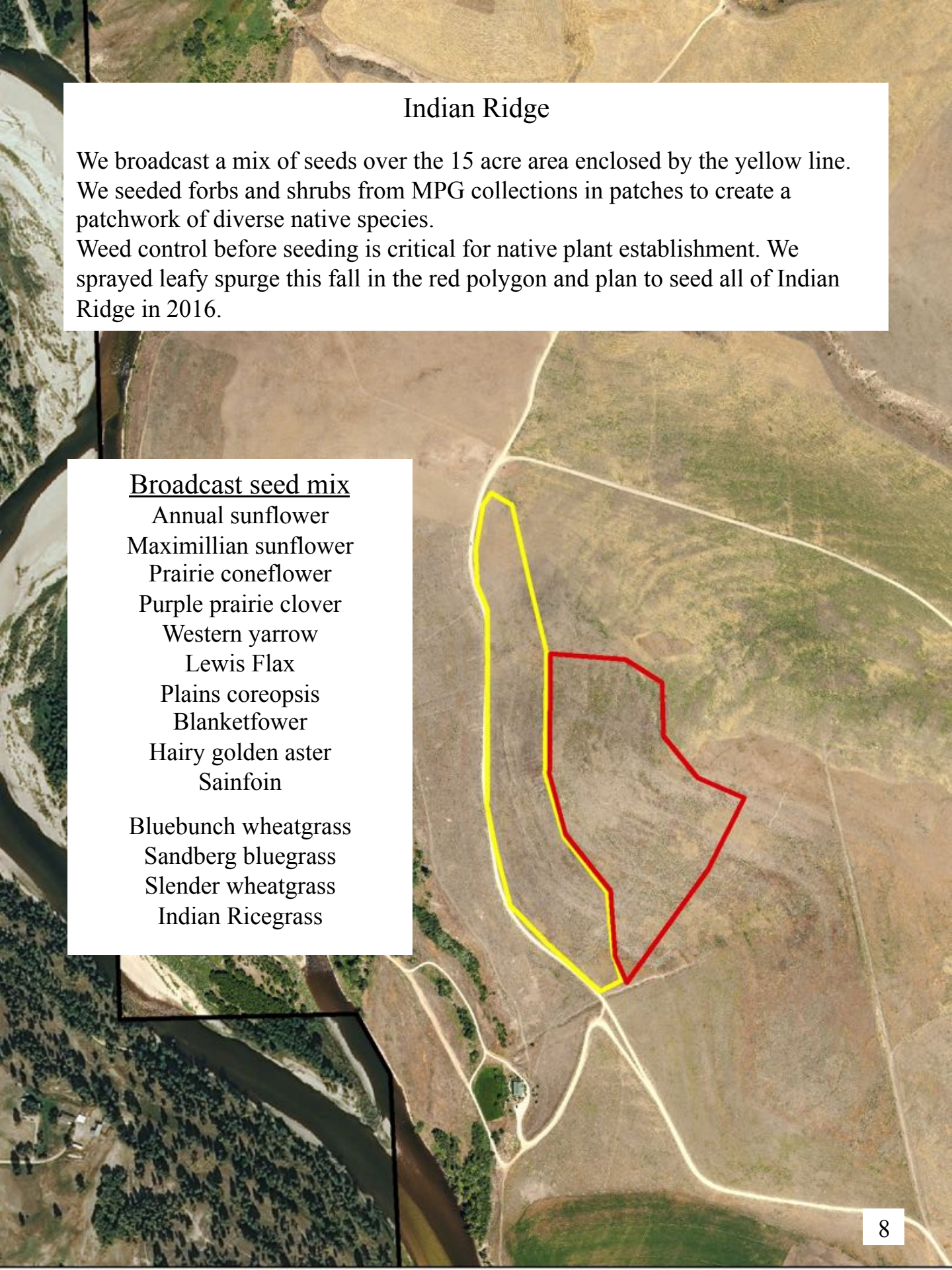
38 acres

Weather can kill all the seedlings of species that germinate at the same time. Indian ricegrass dormancy varies (Jones and Nielson, 1999). Since its seeds don't germinate at the same time, some seed remains available to take advantage of favorable environmental conditions throughout the year. We've found that Indian ricegrass seedlings emerge years after seeding. We over-seeded the areas shown below with Indian ricegrass. Indian ricegrass establishes easily and is compatible with broadleaf weed control.



Indian Ridge

We broadcast a mix of seeds over the 15 acre area enclosed by the yellow line. We seeded forbs and shrubs from MPG collections in patches to create a patchwork of diverse native species.
Weed control before seeding is critical for native plant establishment. We sprayed leafy spurge this fall in the red polygon and plan to seed all of Indian Ridge in 2016.



Broadcast seed mix

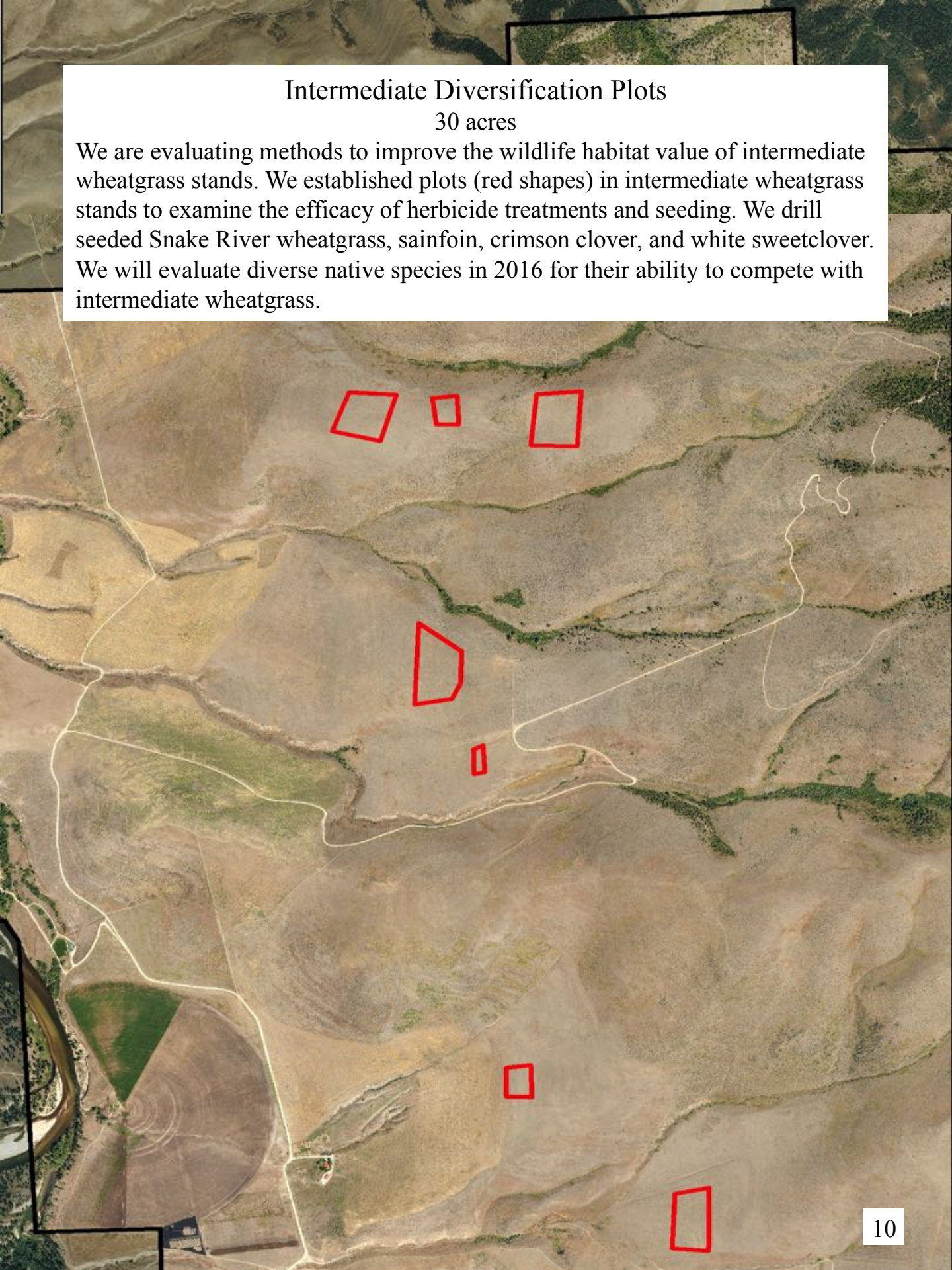
Annual sunflower
Maximillian sunflower
Prairie coneflower
Purple prairie clover
Western yarrow
Lewis Flax
Plains coreopsis
Blanketfower
Hairy golden aster
Sainfoin

Bluebunch wheatgrass
Sandberg bluegrass
Slender wheatgrass
Indian Ricegrass

Indian Ridge

It snowed before we completed seeding. Snow cover will help protect seeds from predation. Seeds will settle into the soil during snowmelt.

We spread straw mulch over steep, bare areas. Straw cover will lower seed predation, help retain spring soil moisture, and provide protection for emerging seedlings.



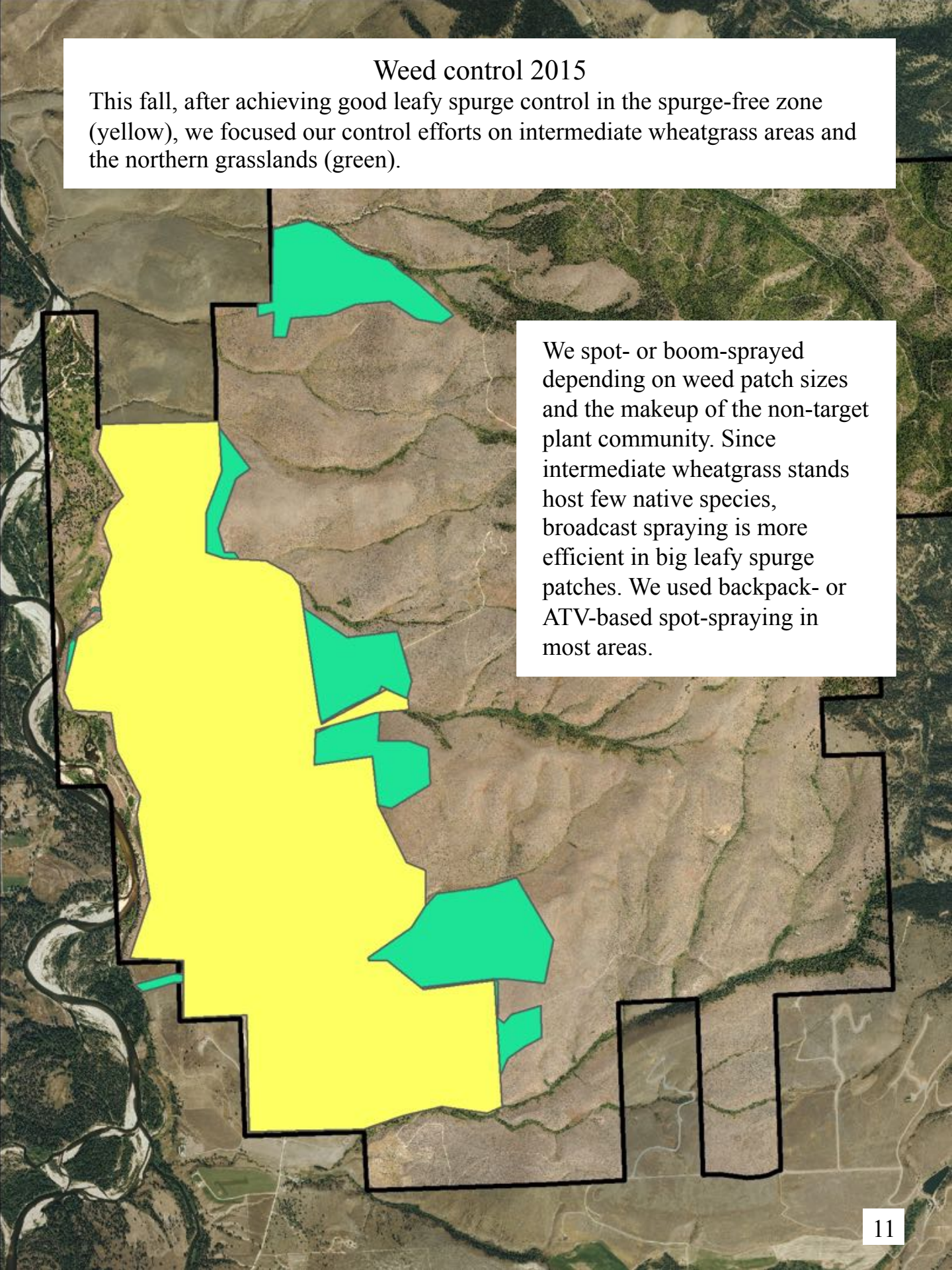
Intermediate Diversification Plots

30 acres

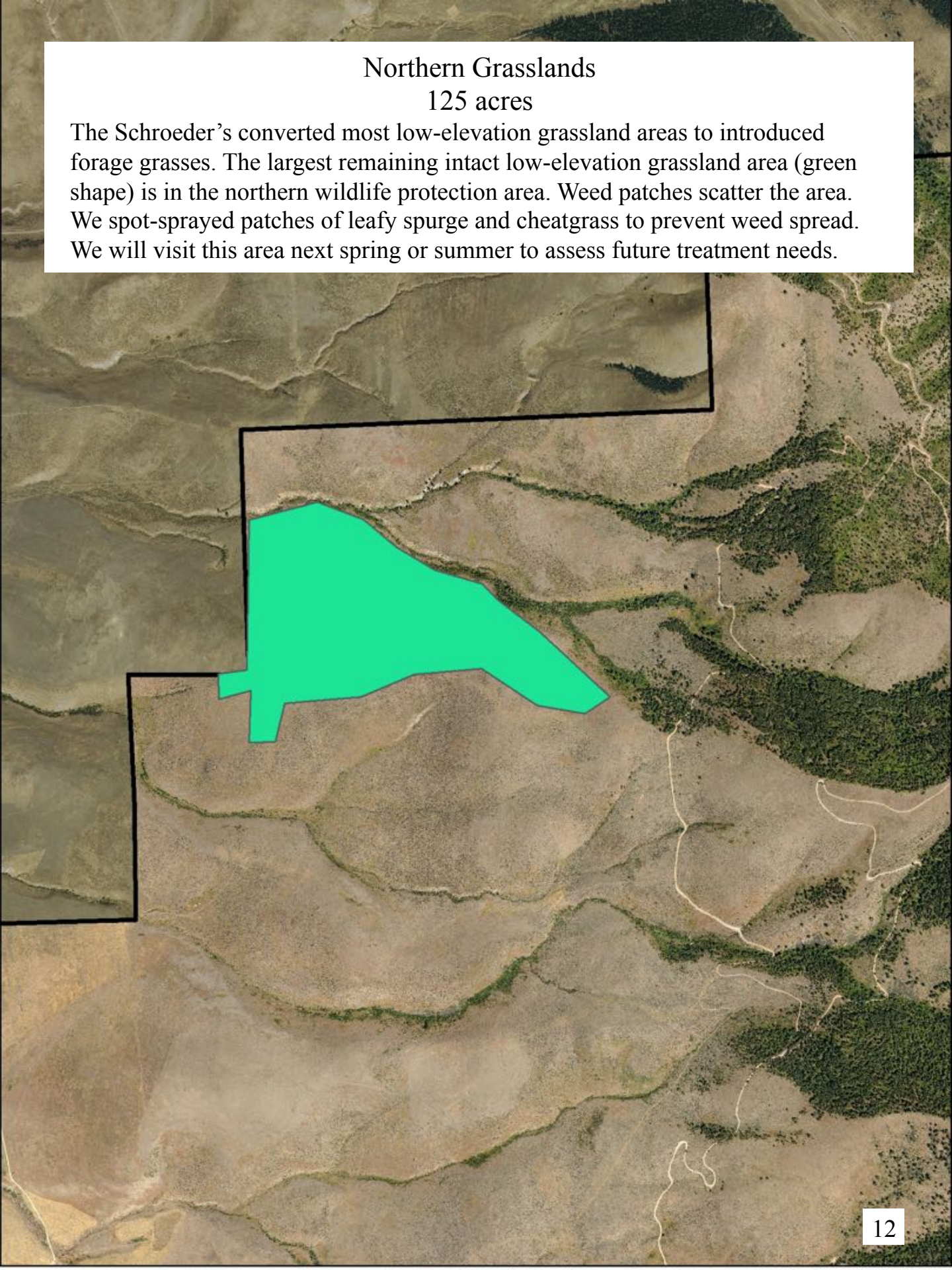
We are evaluating methods to improve the wildlife habitat value of intermediate wheatgrass stands. We established plots (red shapes) in intermediate wheatgrass stands to examine the efficacy of herbicide treatments and seeding. We drill seeded Snake River wheatgrass, sainfoin, crimson clover, and white sweetclover. We will evaluate diverse native species in 2016 for their ability to compete with intermediate wheatgrass.

Weed control 2015

This fall, after achieving good leafy spurge control in the spurge-free zone (yellow), we focused our control efforts on intermediate wheatgrass areas and the northern grasslands (green).

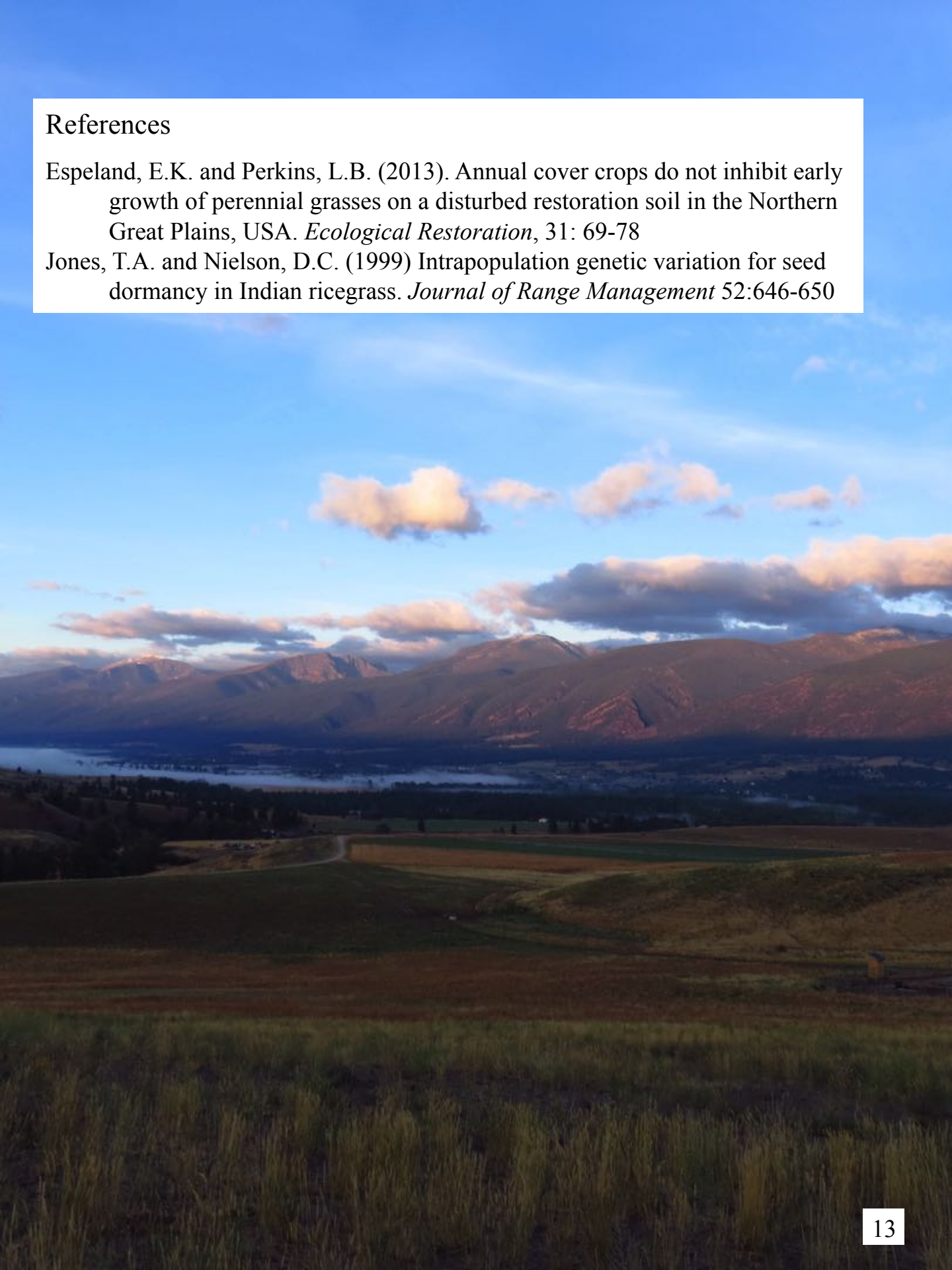


We spot- or boom-sprayed depending on weed patch sizes and the makeup of the non-target plant community. Since intermediate wheatgrass stands host few native species, broadcast spraying is more efficient in big leafy spurge patches. We used backpack- or ATV-based spot-spraying in most areas.



Northern Grasslands
125 acres

The Schroeder's converted most low-elevation grassland areas to introduced forage grasses. The largest remaining intact low-elevation grassland area (green shape) is in the northern wildlife protection area. Weed patches scatter the area. We spot-sprayed patches of leafy spurge and cheatgrass to prevent weed spread. We will visit this area next spring or summer to assess future treatment needs.



References

Espeland, E.K. and Perkins, L.B. (2013). Annual cover crops do not inhibit early growth of perennial grasses on a disturbed restoration soil in the Northern Great Plains, USA. *Ecological Restoration*, 31: 69-78

Jones, T.A. and Nielson, D.C. (1999) Intrapopulation genetic variation for seed dormancy in Indian ricegrass. *Journal of Range Management* 52:646-650