NRI Pastureland Resource Assessment

Overview

This report presents summary results from National Resources Inventory (NRI) on-site data collected on non-Federal pastureland. The survey is conducted by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) as a part of the NRI survey program. The findings reported here focus on key issues in grazing land science, including forage species cover, resource concerns, and conservation practices. NRI pastureland on-site data collected 2013-2016 are used to provide estimates of pastureland conditions.

Background

The United States Department of Agriculture Natural Resources Conservation Service (NRCS) conducts the National Resources Inventory (NRI) Grazing Land On-site Data Collection on non-Federal pasturelands. These data are used to in this report to provide information about plant functional groups.

There are nearly 121 million acres of pastureland in the contiguous 48 states, making up 6 percent of the non-Federal surface area (Figures 1-2; USDA-NRCS, 2015). NRI pastureland on-site data are collected at a scientifically selected subset of NRI sample points, allowing the NRI pastureland on-site data to be linked to broader estimates of surface area and land cover use provided in the NRI.

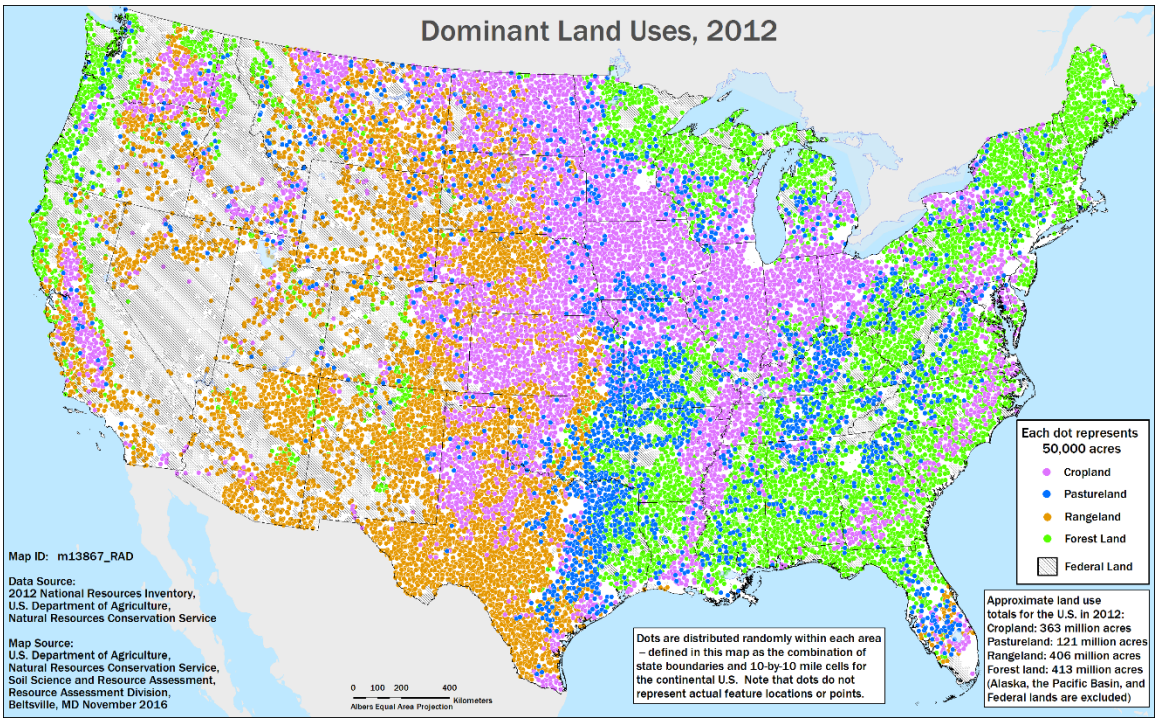

Figure 1- Dominant Land Uses, 2012

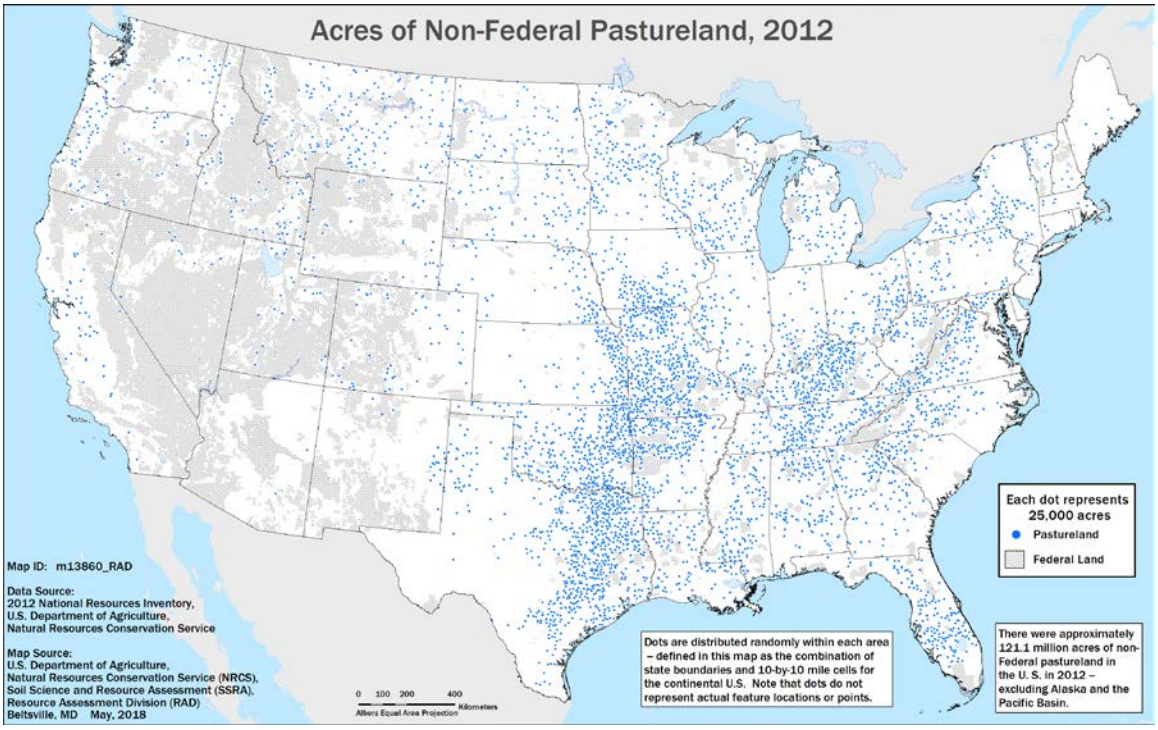

Figure 2 - Acres of Non-Federal Pastureland, 2012

NRI data have been collected on nearly sixteen hundred non-Federal pastureland sites during 2013-2016. Data from the four years were aggregated by six regions to conduct analysis (Figure 3, Table 1, Appendix A).

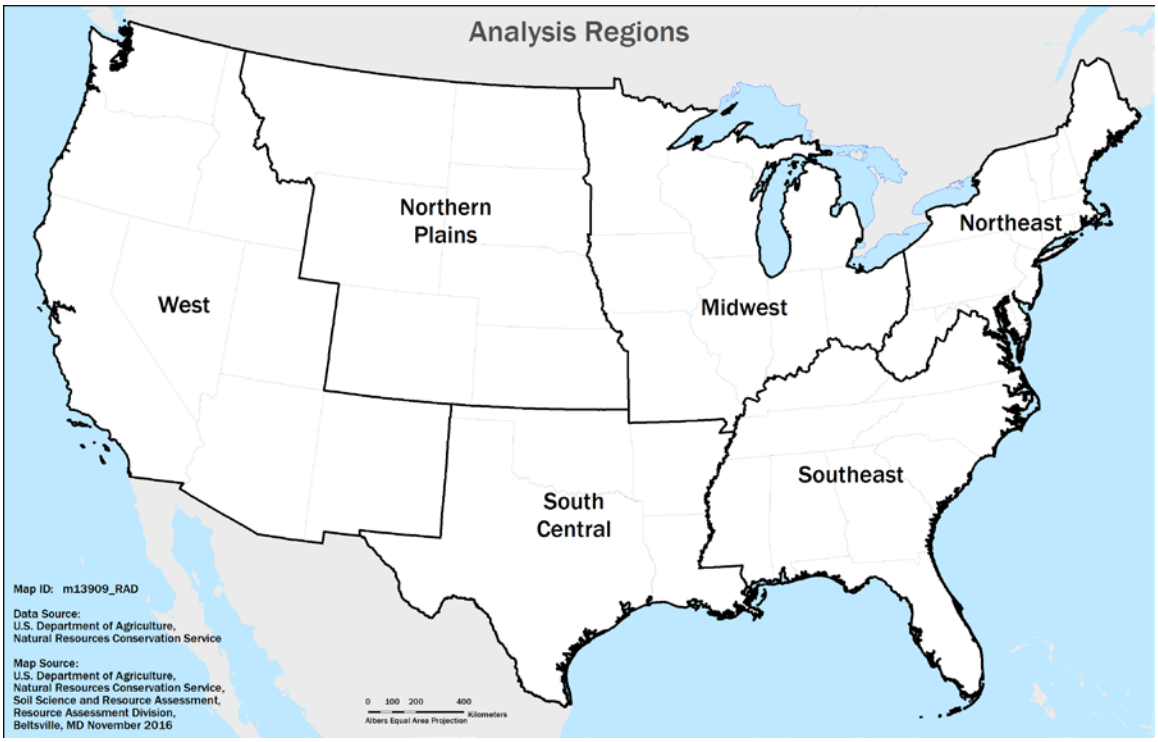

Figure 3 - Analysis Regions

Key Findings

About 75 percent of non-Federal pastureland is located in the South Central, Midwest, and Southeast regions (Figure 4, Table 1). While most non-Federal pastureland is not irrigated, in the West only 53.4 ±13.7 percent of these lands are rainfed (not irrigated). Grazing on non-Federal pastureland ranges from 77.2 ±18.4 percent in the South Central region to 43.0 ±14.8 percent in the Northeast (Figure 5, Table 1).

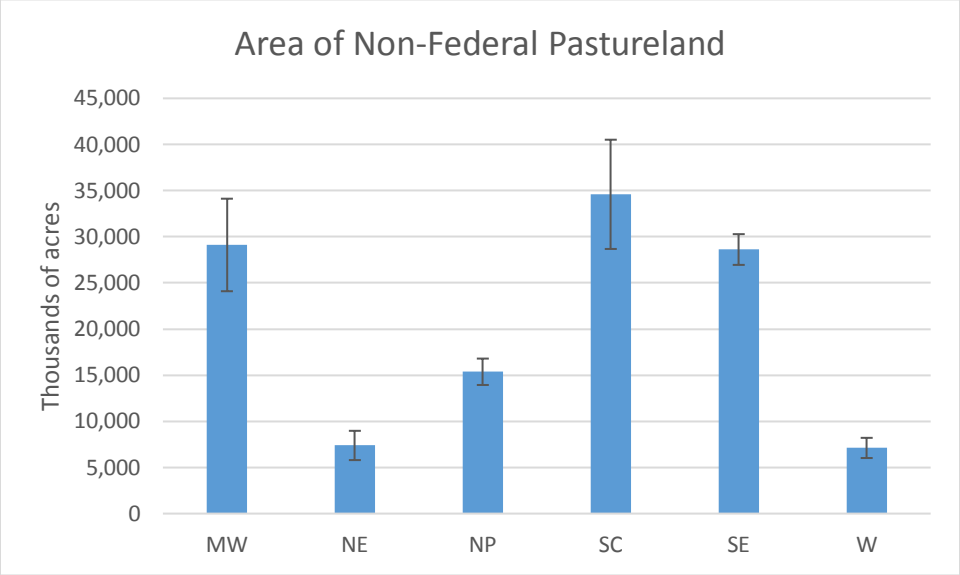

Figure 4 –All non-Federal pastureland by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 1)

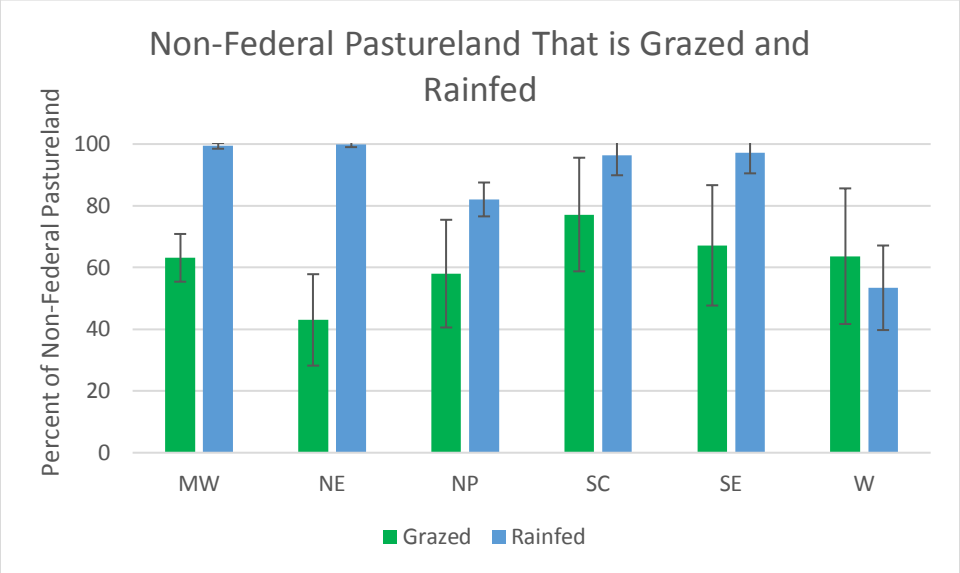

Figure 5 – Non-Federal pastureland that is grazed and rainfed (not irrigated) by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 1)

Foliar Cover of Forage Functional Groups

Line point intercept data are utilized in relative plant canopy cover summaries for this report. Line point intercept data are collected along two intersecting 150-foot transects centered on each sample location. Data collectors record plant species, litter, lichen, moss, rock fragment, bedrock, and/or bare soil present at each 3-foot interval (mark). Relative foliar canopy cover is an indicator of species composition and is calculated for each sample site as the percent of plant foliar observations that were in the plant functional group.

Five plant species functional groups (leguminous forbs, non-leguminous forbs, cool season (C3) grasses, warm season (C4) grasses, and woody species) are included in this report. Plants observed are listed by functional group and region in Appendix B. Note that in this report *Carex*, a sedge, is grouped with non-leguminous forbs. The mean percent relative foliar cover (composition) for functional groups on all non-Federal pastureland is provided in Table 2 and Figure 6. Similar results are given for only grazed and rainfed (not irrigated) non-Federal pastureland (Table 3, Figure 7).

Leguminous forbs make up on average 11.0 ± 1.9 percent of the relative foliar cover (composition) on non-Federal pastureland in the Midwest, but only 3.3 ± 0.8 percent in the South Central region (Table 2, Figure 6). Relative foliar cover for non-leguminous forbs is highest in the Northeast (29.0 ± 4.2 percent) and West (19.5 ± 6.0 percent). Cool season (C3) grasses have highest relative foliar cover in the Northern Plains (68.9 ±7.5 percent), West (61.9 ± 11.4 percent), Midwest (60.1 ± 3.4 percent), and Northeast (47.0 ± 6.0 percent), while warm season (C4) grasses have highest relative foliar cover in the South Central (65.6 ± 6.4 percent) and Southeast (38.6 ± 7.3 percent). Table 3 and Figure 7 present similar trends on for only grazed and rainfed non-Federal pastureland.

In this report we are using 15 percent of the relative foliar cover (composition) as the level for dominance, both for pooled functional groups (one or more species) in Table 4-5 and Figure 8-9 and for individual gerera (Table 6 and Figures 10-15).

Dominant leguminous forbs (at least 15 percent of the relative foliar cover (composition)) are present on 30.6 ± 6.6 percent of non-Federal pastureland in the Midwest, Northeast (24.9 ± 10.5 percent), Southeast (22.9 ± 4.2 percent), and Northern Plains (20.1 ± 8.1 percent). Dominant non-leguminous forbs (at least 15 percent of the relative foliar cover (composition)) are present on 77.6 ± 7.5 percent of non-Federal pastureland in the Northeast, and in the other regions between 37.2 ± 11.9 percent (West) and 22.8 ± 6.3 percent (Northern Plains). The Midwest (96.3 ± 2.3 percent), Nothern Plains (93.7 ± 9.0 percent), Northeast (90.1 ± 7.4 percent), and West (89.5 ± 14.0 percent) have highest percentages of non-Federal pastureland where cool season (C3) grasses are dominant (at least 15 percent of the relative foliar cover (composition)). Dominant warm season (C4) grasses (at least 15 percent of the relative foliar cover (composition)) are present on 93.2 ± 11.2 percent of non-Federal pastureland in the South Central and on 65.3 ± 12.5 percent in the Southeast. Table 5 and Figure 9 provide similar results for grazed and rainfed non-Federal pastureland.

Table 6 and Figures 10-15 provide, by region, the proportion of non-Federal pastureland where various genera are dominant (at least 15 percent of the relative foliar cover (composition)). In the Midwest region the greatest percentages of non-Federal pastureland where dominant genera are present include cool season grasses *Poa* (51.7 ± 7.9 percent), *Schedonorus* (34.9 ± 7.0 percent), *Bromus* (12.8 ± 4.8 percent), and *Festuca* (10.4 ± 4.7 percent); leguminous forb *Trifolium* (19.8 ± 5.6 percent); and warm season grass *Digitaria* (8.7 ± 4.3 percent) (Table 6, Figure 10). In the Northeast region, cool season grasses *Poa* (36.3 ± 10.1 percent), *Dactylis* (21.6 ± 10.7 percent), *Festuca* (17.5 ± 7.9 percent), and *Schedonorus* (12.0 ± 6.1 percent); leguminous forb *Trifolium* (22.4 ± 9.3 percent); and Carex (11.8 ± 9.3 percent) and non-leguminous forb *Solidago* (9.1 ± 7.0 percent) are dominant (at least 15 percent of the relative foliar cover (composition)) on the greatest proportion of non-Federal pastureland (Table 6, Figure 11). In the Northern Plains, the greatest percentages of non-Federal pastureland where dominant genera are present include cool season grasses *Poa* (38.0 ± 7.7 percent), *Bromus* (37.8 ± 7.8 percent), *Agropyron* (24.4 ± 6.5 percent), and *Schedonorus* (11.6 ± 5.7 percent); and leguminous forb *Medicago* (12.6 ± 7.6 percent) (Table 6, Figure 12). Warm season grasses *Cynodon* (54.6 ± 6.8 percent), *Paspalu*m (18.3 ± 5.8 percent), and *Bothriochloa* (14.3 ± 4.6 percent) are dominant on the largest areas of non-Fedaral pastureland in the South Central region (Table 6, Figure 13). Warm season grasses *Paspalu*m (32.2 ± 5.6 percent) and *Cynodon* (13.7 ± 3.2 percent); cool season grasses *Schedonorus* (31.3 ± 4.5 percent) and *Poa* (12.2 ± 3.2 percent); and leguminous forb *Trifolium* (15.7 ± 3.5 percent) are dominant on the largest areas of non-Fedaral pastureland in the Southeast region (Table 6, Figure 14). While in the West, cool season grasses *Poa* (27.9 ± 9.8 percent), *Bromus* (17.4 ± 9.1 percent), *Alopecurus* (12.9 ± 8.4 percent), *Schedonorus* (11.2 ± 7.3 percent), and *Agrostis* (8.8 ± 6.0 percent); and leguminous forb *Trifolium* (8.7 ± 6.7 percent) are dominant on the largest areas of non-Fedaral pastureland (Table 6, Figure 15).

Average biomass estimates were calculated for functional groups (leguminous forbs, non-leguminous forbs, cool season (C3) grasses, and warm season (C4) grasses) using linear regression models applied to absolute foliar cover (number of marks where species was observed divided by total marks) by species. Average biomass for cool season (C3) grasses on non-Federal pastureland was greatest in the Midwest (1,632.2 ± 105.9 lbs/ac), Northern Plains (1,398.5 ± 212.7 lbs/ac), Northeast (1,285.2 ± 172.6 lbs/ac), and West (1,252.1 ± 308.3 lbs/ac). Average warm season grass biomass is highest in the South Central (1,299.4 ± 128.4 lbs/ac) and Southeast (771.4 ± 145.9 lbs/ac). Non-leguminous forb biomass on non-Federal pastureland averages 810.3 ± 125.1 lbs/ac in the Northeast (Table 7, Figure 16). Average biomass on grazed and rainfed non-Federal pastureland is similar to that on non-Federal pastureland (Table 8, Figure 17).

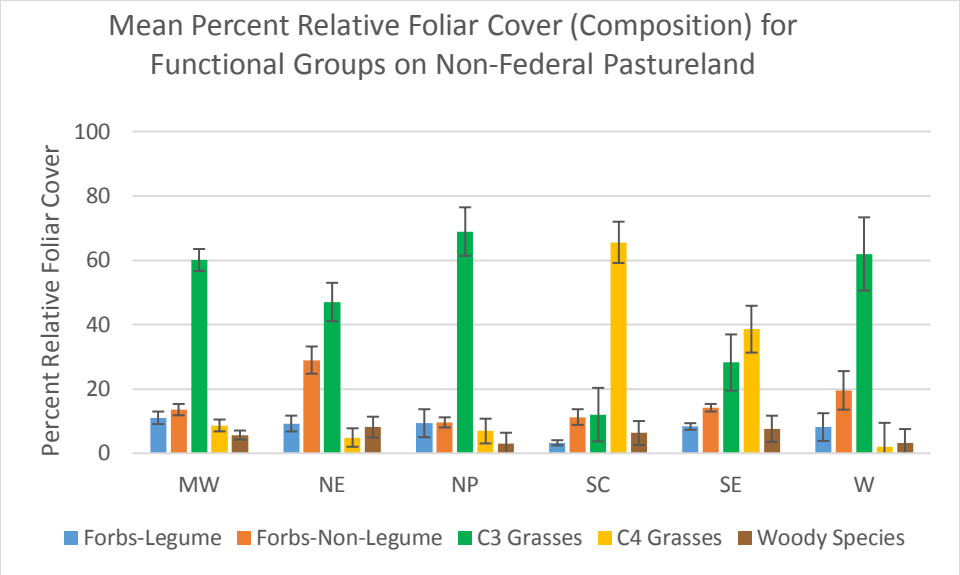

Figure 6 – Mean percent relative foliar cover (composition) for functional groups on all non-Federal pastureland by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 2)

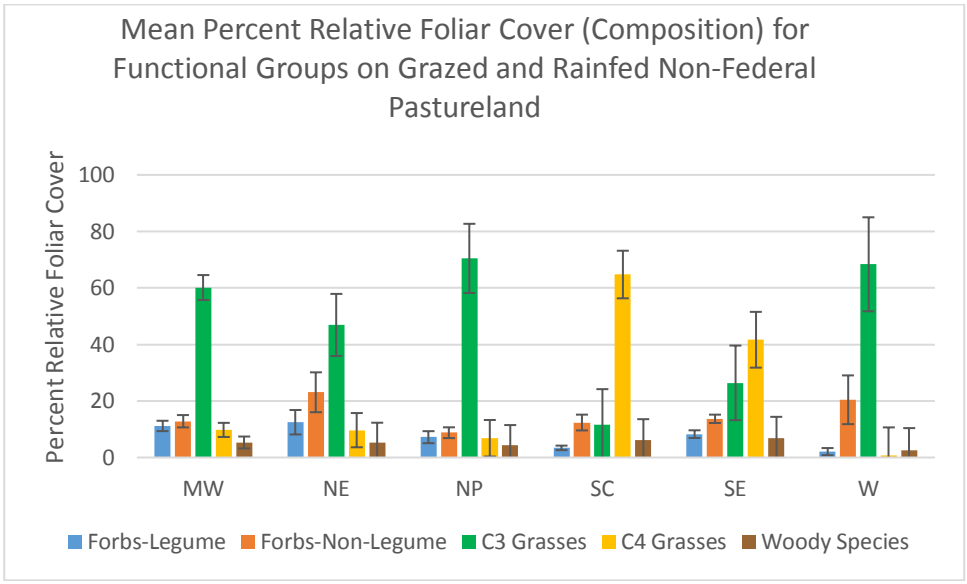

Figure 7 – Mean percent relative foliar cover for functional groups on grazed and rainfed (not irrigated) non-Federal pastureland by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 3)

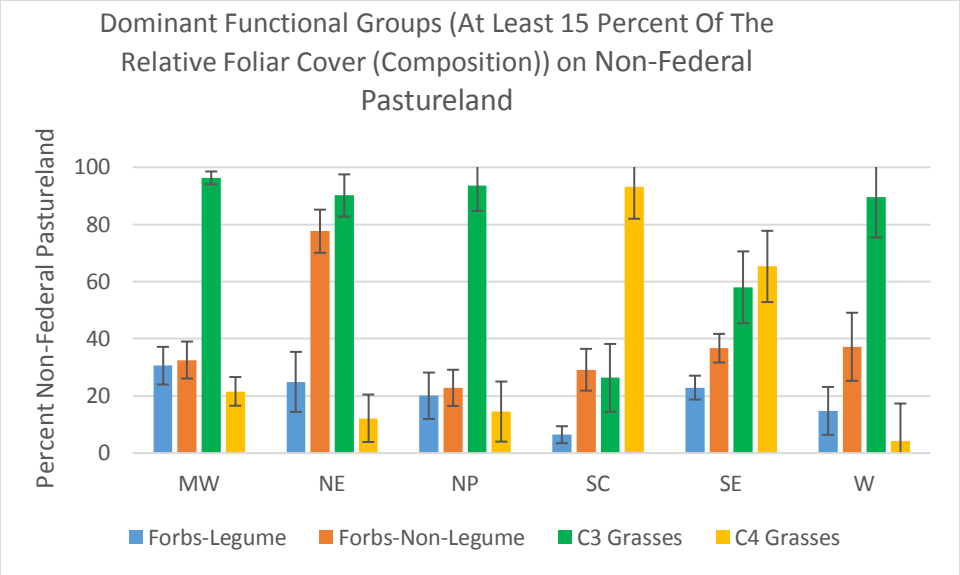

Figure 8 – Dominant functional groups (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 4)

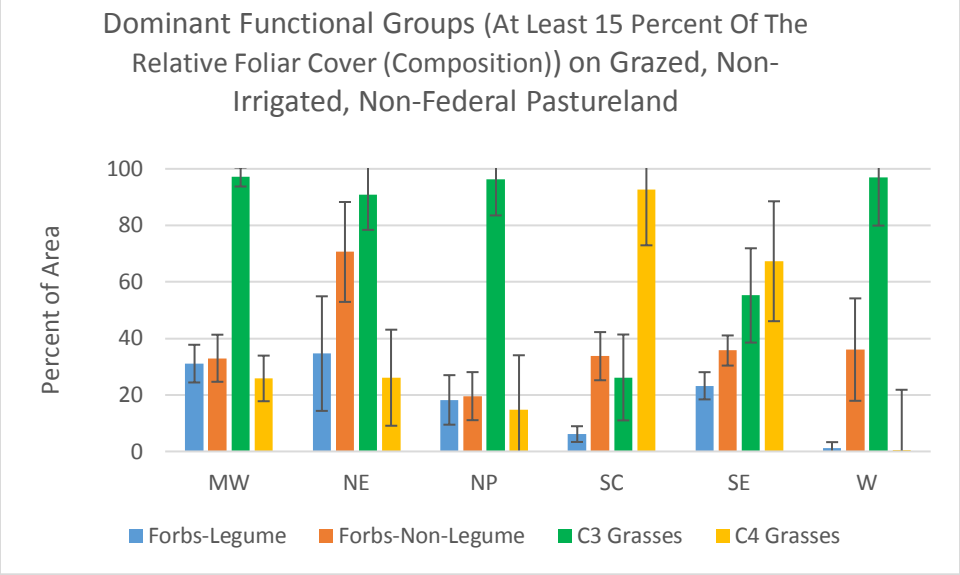

Figure 9 – Dominant functional groups (at least 15 percent of the relative foliar cover (composition)) on grazed and rainfed (not irrigated) non-Federal pastureland by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 5)

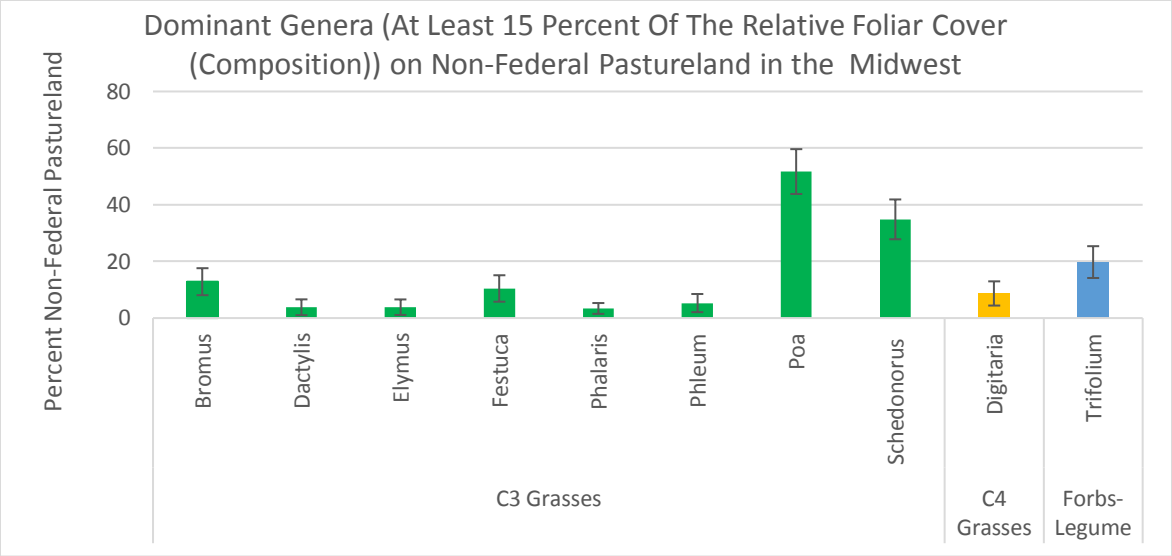

Figure 10 – Dominant genera (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland in the Midwest. Error bars represent margins of error. (Source: Table 6)

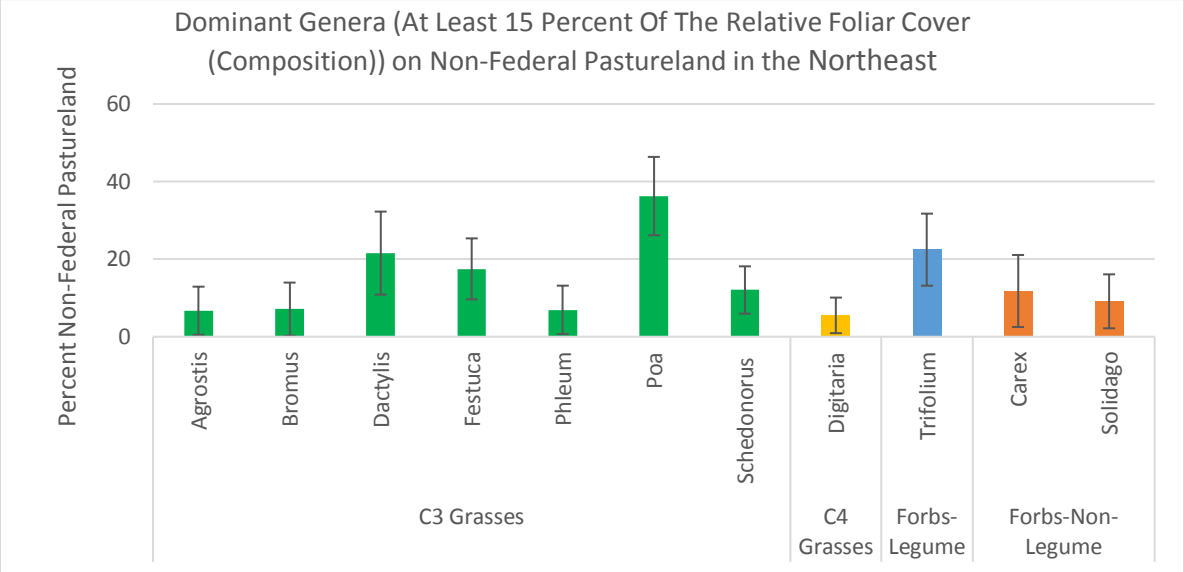

Figure 11 – Dominant genera (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland in the Northeast. Error bars represent margins of error. (Source: Table 6)

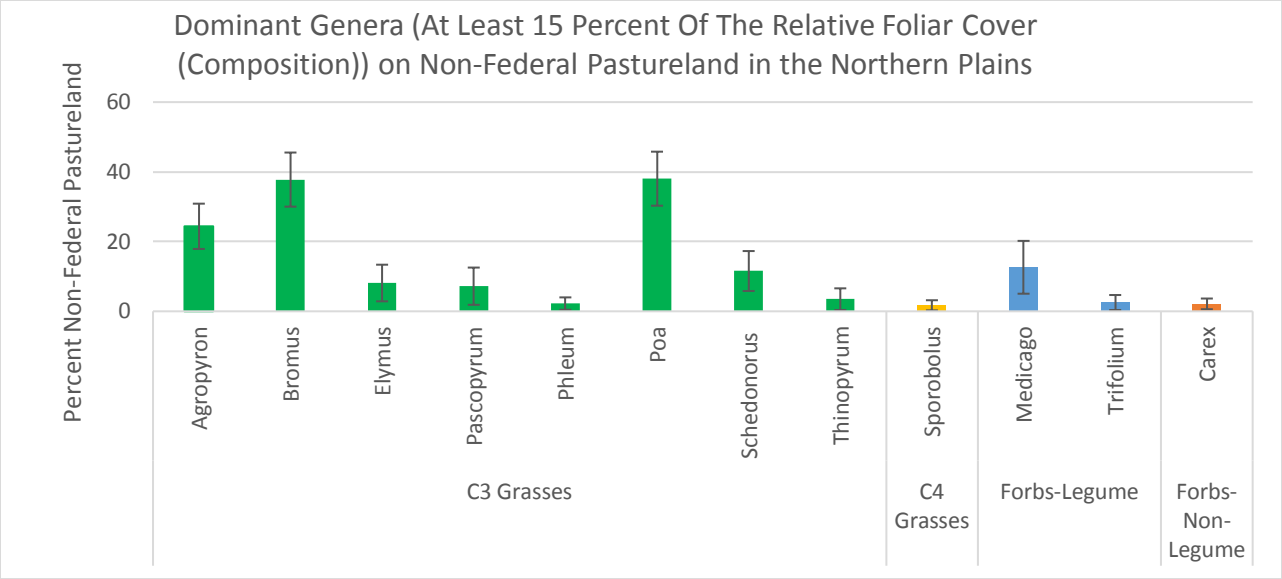

Figure 12 – Dominant genera (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland in the Northern Plains. Error bars represent margins of error. (Source: Table 6)

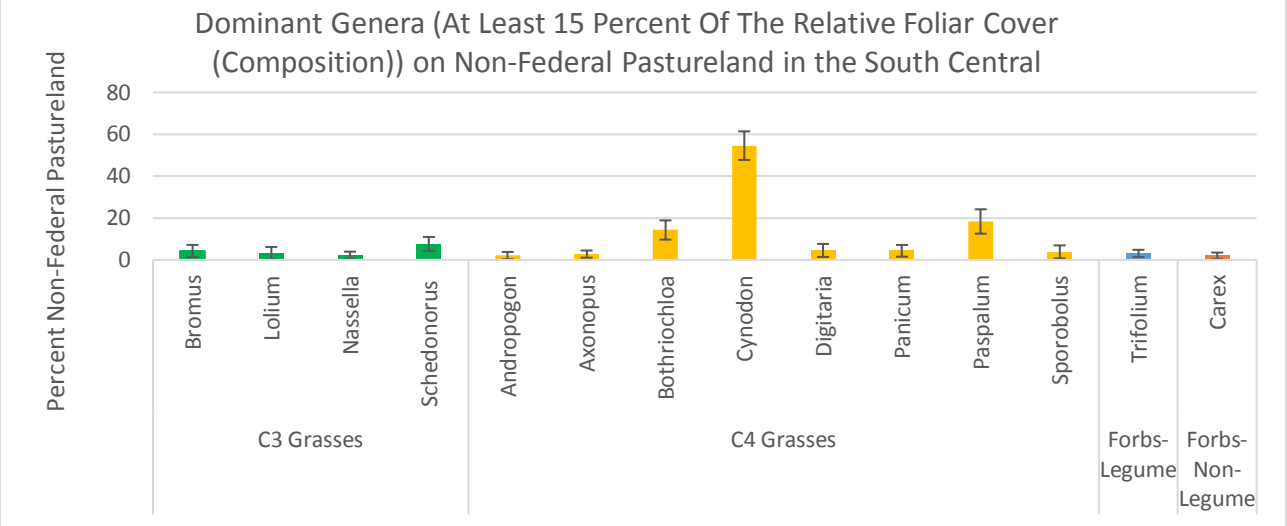

Figure 13 – Dominant genera (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland in the South Central. Error bars represent margins of error. (Source: Table 6)

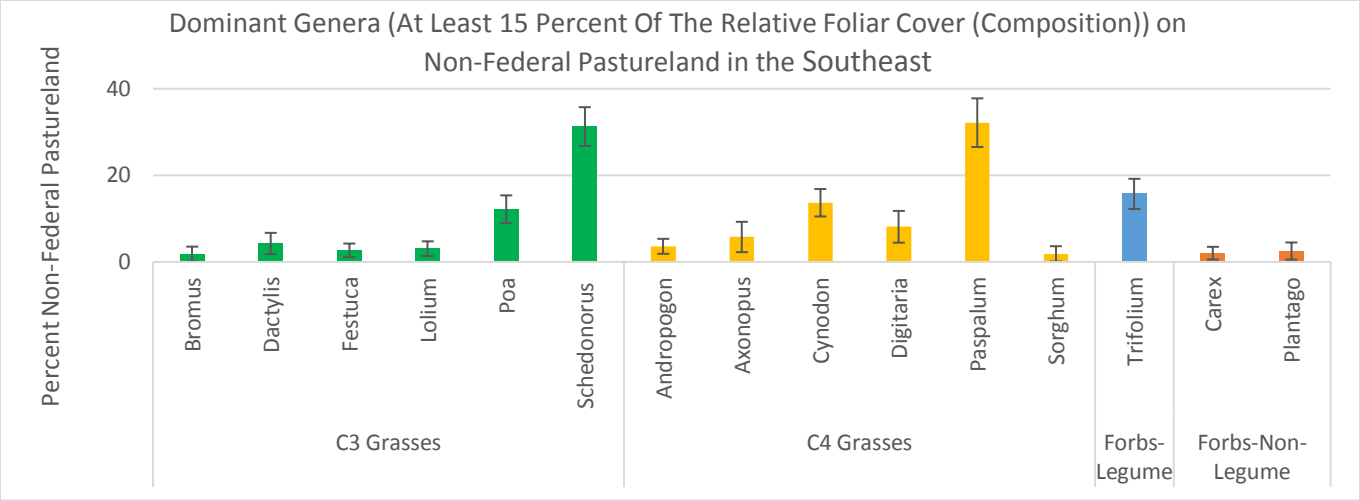

Figure 14 – Dominant genera (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland in the Southeast. Error bars represent margins of error. (Source: Table 6)

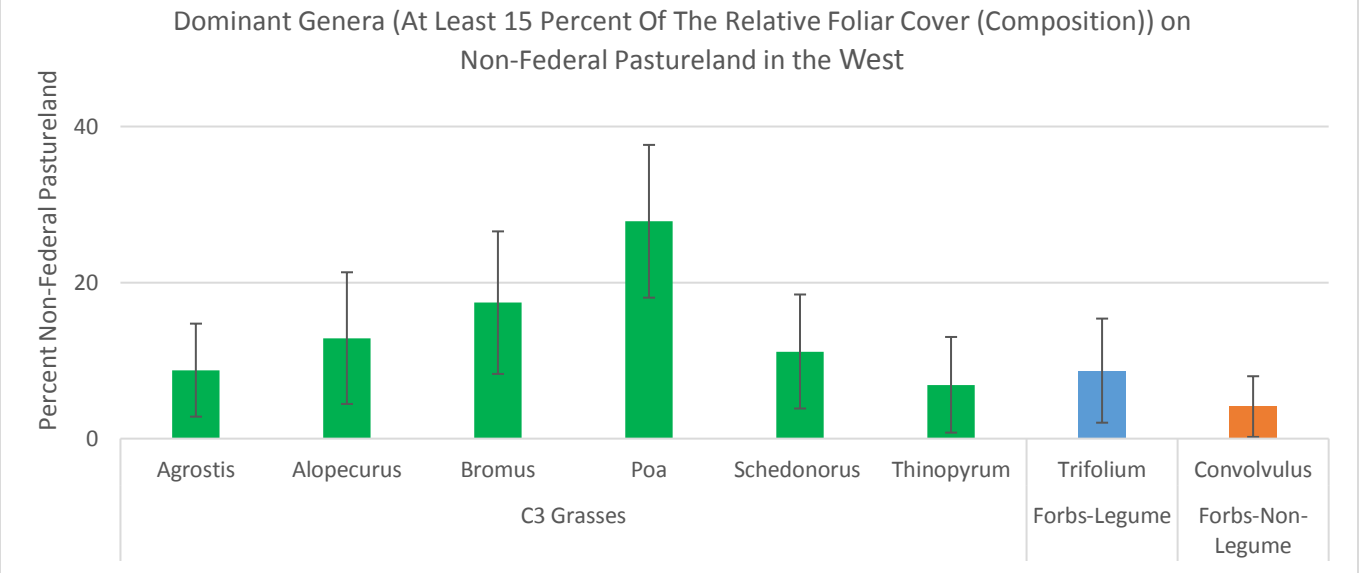

Figure 15 – Dominant genera (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland in the West. Error bars represent margins of error. (Source: Table 6)

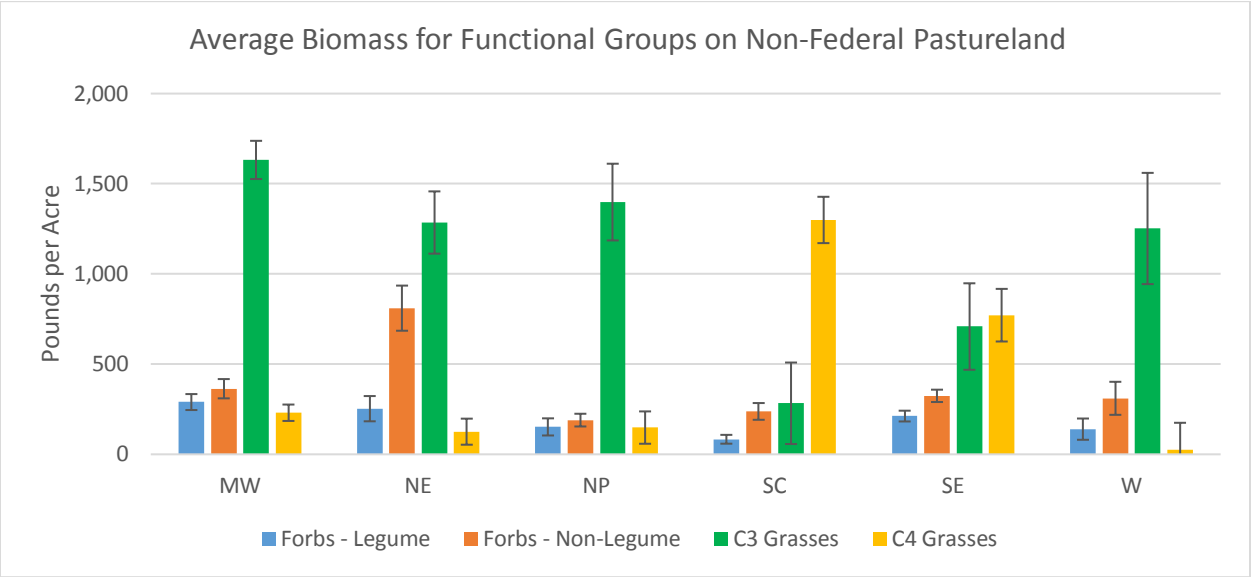

Figure 16 – Average estimated biomass for functional groups on all non-Federal pastureland by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 7)

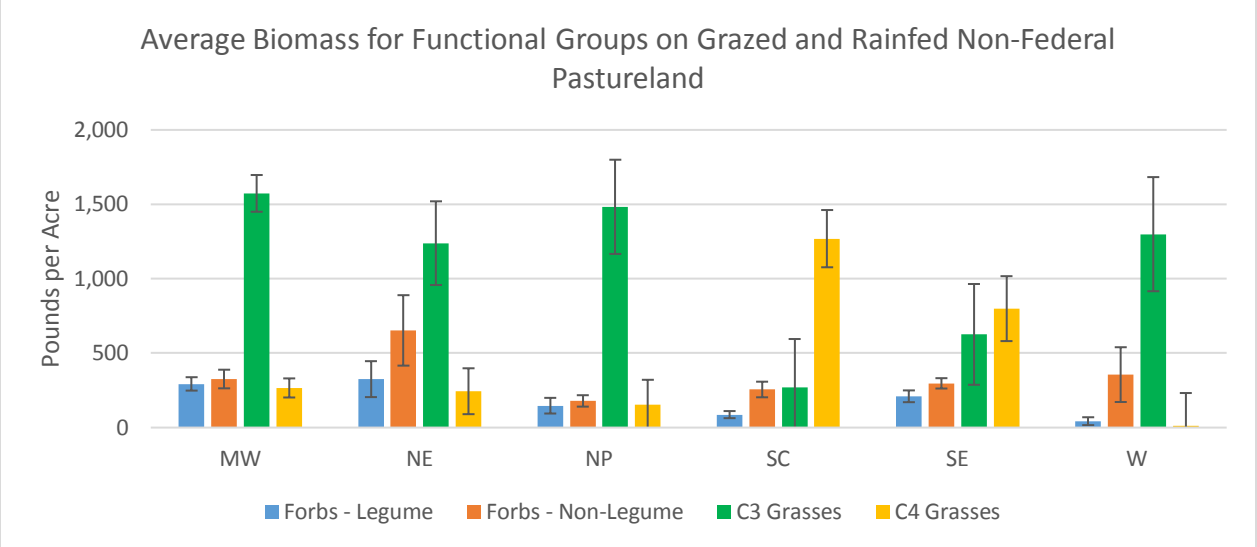

Figure 17 – Average estimated biomass for functional groups on grazed and rainfed (not irrigated) non-Federal pastureland by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 8)

Resource Concerns on Pastureland

A resource concern is defined as an identified conservation problem used to set quality criteria and treatment needs for a resource management system. Appendix C lists twenty resource concerns documented on site (USDA-NRCS, 2018). Table 9 and Figures 18-21 summarize the percent of non-Federal pastureland by region where each of these resource concerns is present.

Among the types of soil erosion concerns on non-Federal pastureland, sheet and rill erosion concern is highest in the Midwest (15.0 ± 5.0 percent), South Central (14.2 ± 5.1 percent), and Southeast (14.2 ± 5.1 percent). Classic gully erosion is is a concern in the Midwest (9.1 ± 3.6 percent), South Central (8.2 ± 4.3 percent), Southeast (7.9 ± 3.7 percent), and West (7.6 ± 9.6 percent). In the West streambank erosion is a concern on 14.5 ± 7.7 percent of non-Federal pastureland, followed by the South Central (7.5 ± 3.5 percent), Midwest (7.4 ± 3.3 percent), and Northeast (7.3 ± 6.3 percent) (Table 9, Figure18).

Two major soil condition concerns on non-Federal pastureland are soil compaction and organic matter depletion (Table 9, Figure 19). Soil compation is a concern in the West (36.8 ± 11.6 percent), Midwest (34.6 ± 7.6 percent), Southeast (28.7 ± 3.5 percent), South Central (24.5 ± 6.2, and Northeast (22.6 ± 9.8 percent). Organic matter depletion is a concern in the South Central (26.6 ± 8.0 percent) and Midwest (24. 7± 5.7 percent). Excess water runoff, flooding, or ponding is a soil resource concern in the South Central (10.7 ± 4.7 percent), West (10.6 ± 6.8 percent), and Midwest (9.7 ± 4.8 percent) (Table 8, Figure 13). Excessive nutrients and organics in surface water is a water resource concern in the Southeast (9.3 ± 2.7 percent), West (9.0 ± 7.0 percent), and Midwest (8.7 ± 3.3 percent) and excessive suspended sediment and turbidity in surface water are concerns in the Midwest (8.0 ± 4.0 percent), West (7.2 ± 5.8 percent), and Southeast (6.8 ± 3.0 percent) (Table 9, Figure 20).

Noxious and invasive plants are resource concerns in all regions (West 66.9 ± 11.8 percent; Northern Plains 57.1 ± 8.3 percent; Midwest 54.7 ± 7.2 percent; Northeast 45.9 ± 11.2 percent; Southeast 43.0 ± 5.4 percent; and South Central 38.4 ± 6.4 percent). Forage quality and palatability is a concern in the Midwest (49.7 ± 7.2 percent), Northeast (44.6 ± 9.6 percent), West (43.6 ± 12.6 percent), and Southeast (40.5 ± 61 percent), and plant productivity, health and vigor is a resource concern in the Midwest (45.4 ± 8.0 percent), West (45.1 ± 13.2 percent), South Central (36.0 ± 6.7 percent), Northeast (35.7 ± 11.5 percent), and Southeast (35.1 ± 5.3 percent). Inadequate stock water is a concern in the Midwest (54.1 ± 6.8 percent), Northeast (44.7 ± 14.4 percent) and Southeast (43.0 ± 6.1 percent) (Table 9, Figure 21).

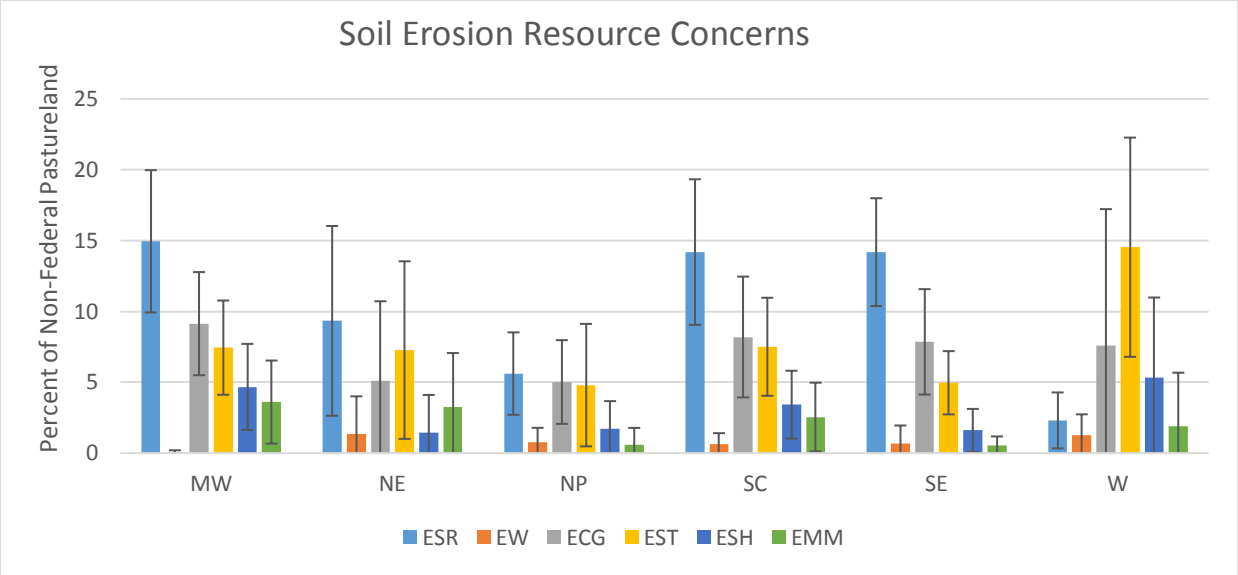

Figure 18 – Soil erosion concerns (ESR=Sheet and Rill, EW=Wind, ECG=Classic Gully, EST=Streambank, ESH=Shoreline, EMM=Mass Movement) by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 9)

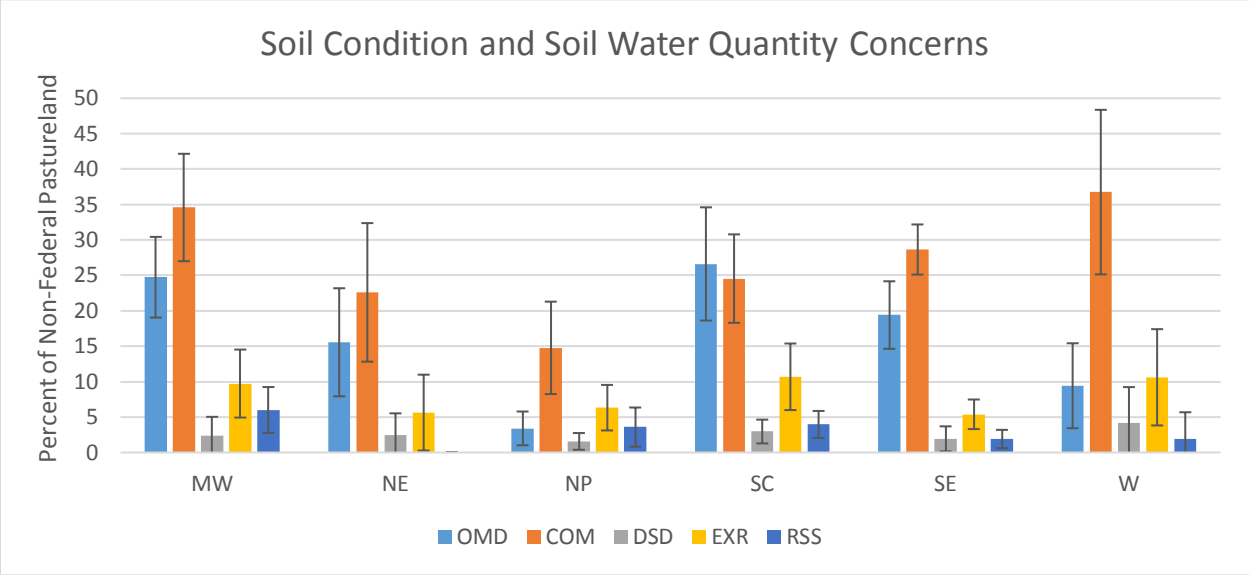

Figure 19 – Soil condition concerns (OMD= Organic Matter Depletion, COM=Compaction, DSD=Damage from Soil Deposition) and soil water quantity concerns (EXR=Excessive Runoff, Flooding, or Ponding, RSS=Reduced Storage of Waterbodies by Sediment Accumulation) by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 9)

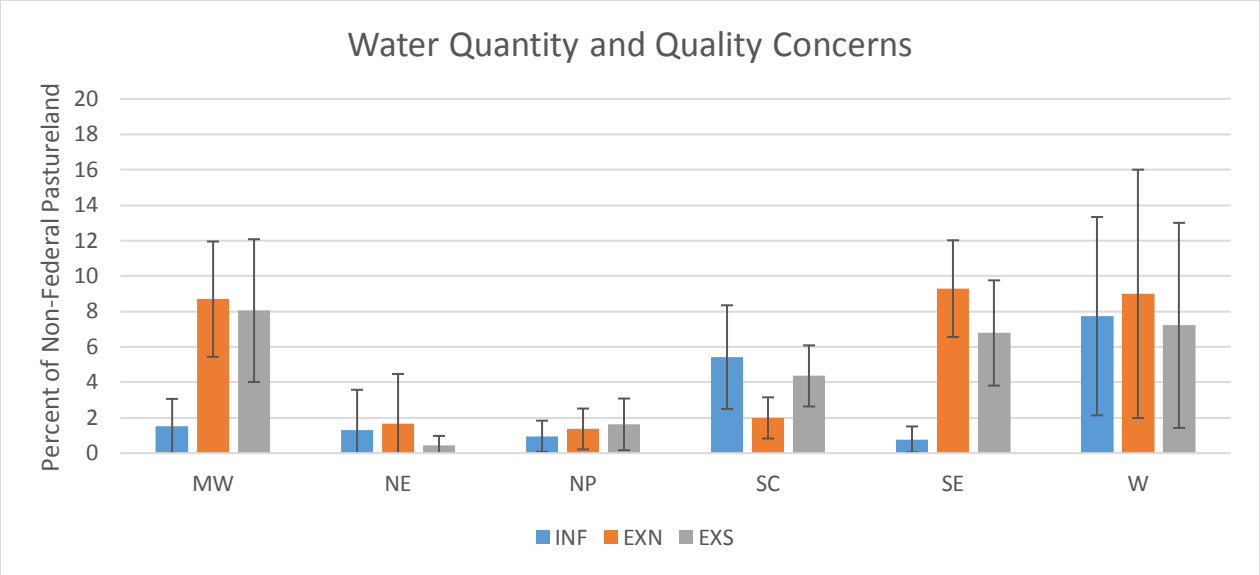

Figure 20 – Water quantity and quality concerns (INF=Insufficient flows, EXN=Excessive Nutrients and Organics in Surface Water, EXS=Excessive Suspended Sediment and Turbidity in Surface Water) by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 9)

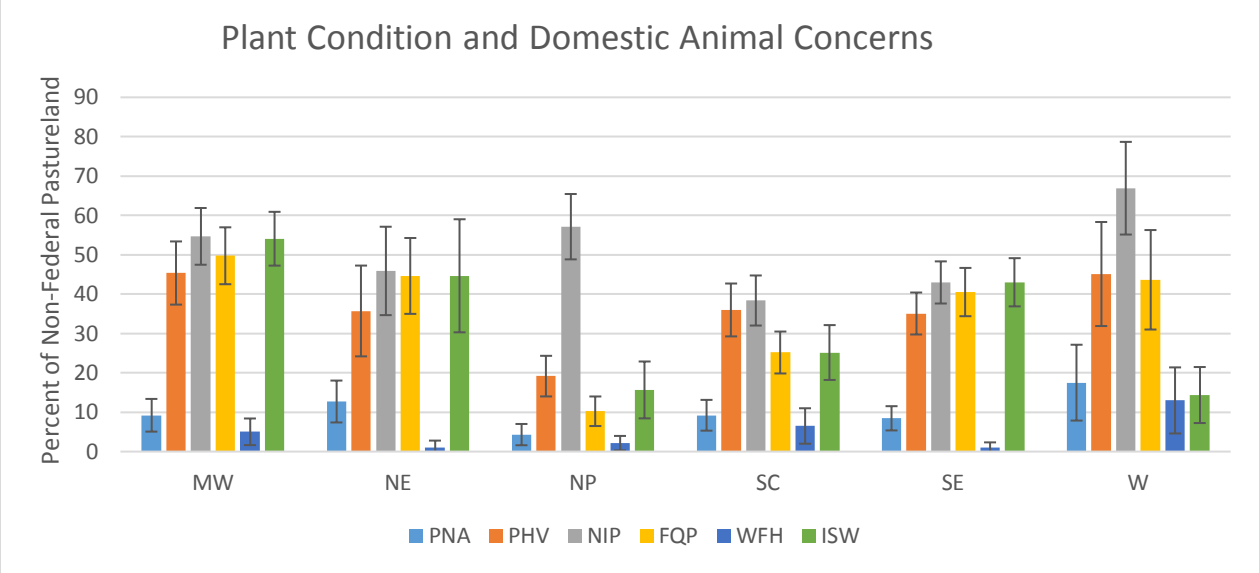

Figure 21 – Plant condition (PNA=Plant Not Adapted or Suited, PHV=Productivity, Health and Vigor, NIP=Noxious and Invasive Plants, FQP=Forage Quality and Palatability, WFH=Wildfire Hazard) and Domestic Animal Concerns (ISW=Inadequate Stock Water) by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 9)

Conservation Practices

A conservation practice is defined as a specific treatment, such as a structural or vegetative measure, or management technique commonly used to meet specific needs in planning and implementing conservation for which standards and specifications have been developed. Conservation practices are in the Natural Resources Conservation Service's Field Office Technical Guide, Section IV, which is based on the National Handbook of Conservation Practices [NPPH-98]. The practices recorded for NRI have been applied to the area of land in which the NRI point falls or the portion of the field that would be used in conservation planning (CMU). The point need not fall on a specific practice. [NRI–97]

Each state determines which national practice standards will be adapted for use in their state and issues them as state conservation practice standards in Section IV of the Field Office Technical Guide. The state adds technical details and minimum standards for practice application. This guide should be referenced for state-specific practice information. Practices reported as applied for the point must meet the minimum standards established in the published state practice standards.

For each pastureland site, data collectors visually identify applied conservation practices from a list of seventeen (Appendix D). To be applied, a conservation practice must be visually apparent on the site, meet the national standard definition and the minimum state standard, and be functioning and maintained according to the intended purpose. If a conservation practice is not applied at the site, the data collector determines if the practice is needed. The results are summarized in Table 10 and Figures 22-27.

It is not surprising that fences are the most commonly applied conservation practice, ranging in presence from 70.3 ± 5.9 percent of non-Federal pastureland in the South Central region to 42.9 ± 10.2 percent in the Northeast. Fences are needed on 31.0 ± 11.5 percent of non-Federal pastureland in the Northeast, but on only15.4 ± 8.1 percent in the Northern Plains. Prescribed grazing is applied on 46.4 ± 7.4 percent of non-Federal pastureland in the South Central region and on only 12.3 ± 8.8 percent in the Northeast. The greatest need for prescribed grazing is in the Midwest (58.5 ± 9.1 percent), compared with the least (34.2 ±6.5 percent) in the South Central. Watering facility needs are greatest in the Midwest (50.5 ± 8.8 percent) and lowest in the Northern Plains (19.3 ± 8.5 percent). Forage and biomass planting is applied on 39.6 ± 8.0 percent of non-Federal pastureland in the South Central region and lowest in the West (16.8 ± 9.8 percent). Forage and biomass planting is needed in 34.2 ± 10.8 percent of non-Federal pastureland in the Northeast, 31.4 ± 7.2 percent in the Midwest, and 29.6 ± 11.3 percent in the West (Table 10 and Figures 22-27).

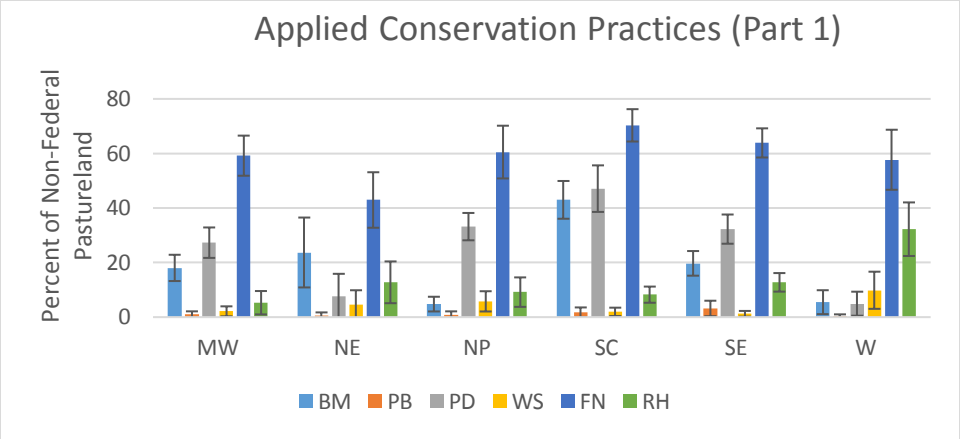

Figure 22 – Applied conservation practices (BM= Brush Management, PB= Prescribed Burning, PD=Pond, WS= Windbreak/Shelterbelt Establishment, FN=Fence, RH= Riparian Herbaceous Cover) by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 10)

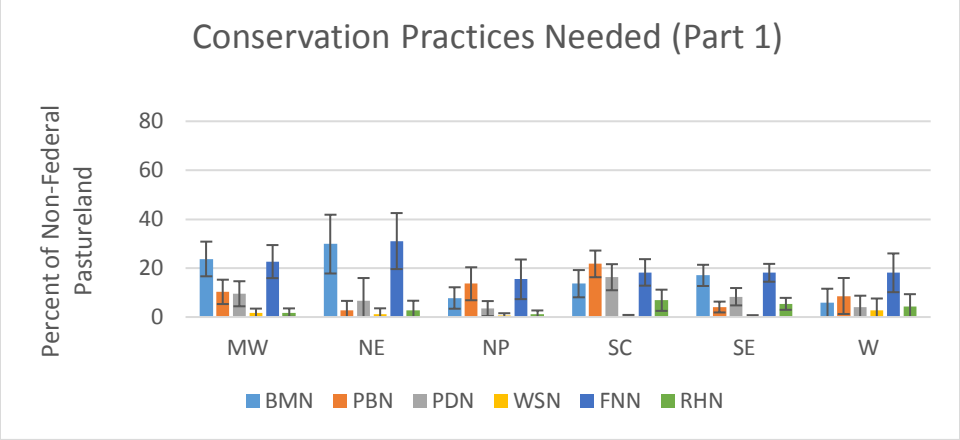

Figure 23 – Conservation practices (BMN= Brush Management, PBN= Prescribed Burning, PDN=Pond, WSN= Windbreak/Shelterbelt Establishment, FNN=Fence, RHN= Riparian Herbaceous Cover) that are needed, but not currently applied, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 10)

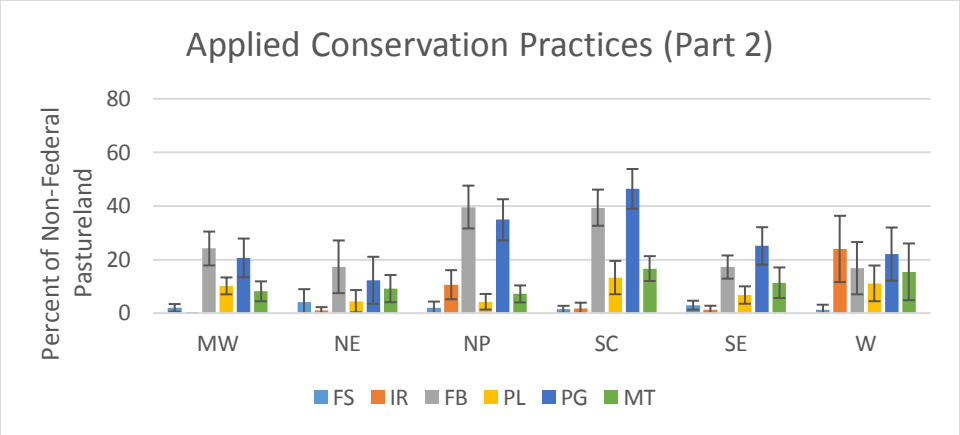

Figure 24 – Applied conservation practices (FS= Filter Strip, IR= Irrigation Water Management, FB= Forage and Biomass Planting, PL=Pipeline, PG= Prescribed Grazing, MT= Grazing Land Mechanical Treatment) by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 10)

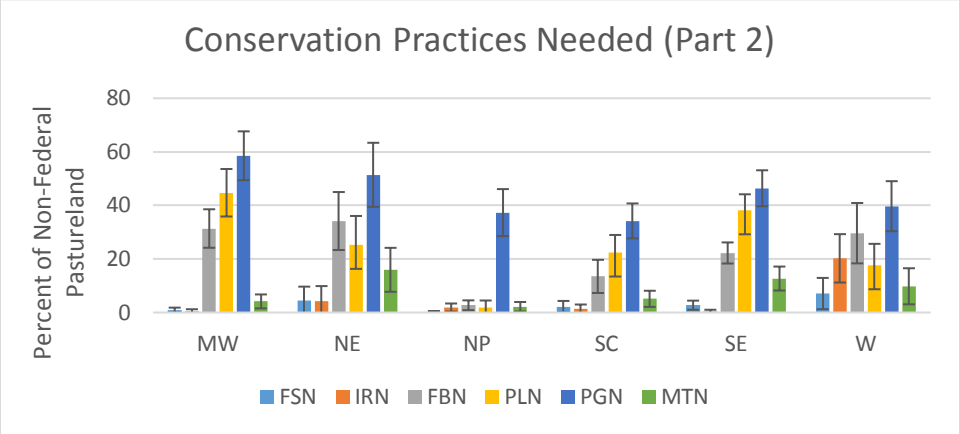

Figure 25 – Conservation practices (FSN= Filter Strip, IRN= Irrigation Water Management, FBN= Forage and Biomass Planting, PLN=Pipeline, PGN= Prescribed Grazing, MTN= Grazing Land Mechanical Treatment) that are needed, but not currently applied, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 10)

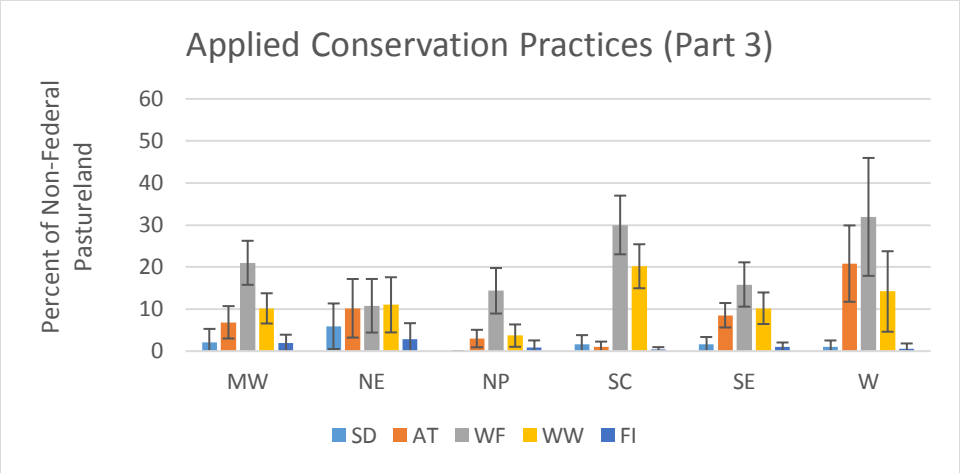

Figure 26 – Applied conservation practices (SD= Spring Development, AT= Watering Facility *Animal Trails and Walkways, WF= Watering Facility, WW=Water Well, FI=Forest Stand Improvement) by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 10)*

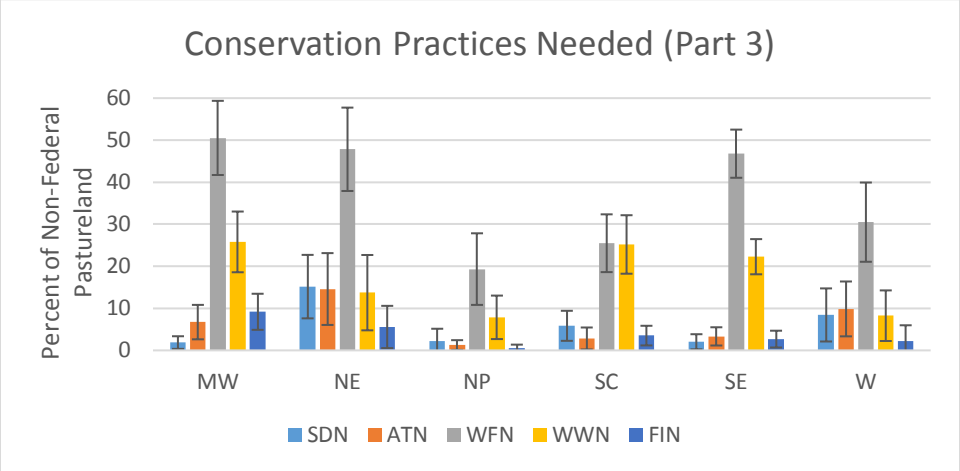

Figure 27 – Conservation practices (SDN= Spring Development, ATN= Watering Facility *Animal Trails and Walkways, WFN= Watering Facility, WWN=Water Well, FIN=Forest Stand Improvement) that are needed, but not currently applied, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Error bars represent margins of error. (Source: Table 10)*

Regional Summaries

Midwest

The Midwest region (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin) has 29,112.6 ± 5,014.0 thousand acres of non-Federal pastureland (Table 1, Figure 4). Most (99.4 ± 0.9 percent) of this pastureland is rainfed (not irrigated) and 63.1 ± 7.7 percent is grazed by domestic livestock (Table 1, Figure 5).

Cool season (C3) grasses have the largest average percent (60.1 ± 3.4) relative foliar cover (composition) for functional groups on all non-Federal pastureland, followed by non-leguminous forbs (13.6 ± 1.8 percent), leguminous forbs (11.0 ± 1.9 percent), and warm season (C4) grasses (8.6 ± 1.8 percent) (Table 2, Figure 6). On grazed and rainfed (not irrigated) non-Federal pastureland, cool season (C3) grasses have the largest average percent (60.2 ± 4.4) relative foliar cover (composition) for functional groups, followed by non-leguminous forbs (12.8 ± 2.2 percent), leguminous forbs (11.2 ± 1.8 percent), and warm season (C4) grasses (9.8 ± 2.5 percent) (Table 3, Figure 7).

Cool season (C3) grasses are dominant (at least 15 percent of the relative foliar cover (composition)) on 96.3 ± 2.3 percent of all non-Federal pastureland in the region, followed by non-leguminous forbs (32.6 ± 6.5 percent), leguminous forbs (30.6 ± 6.6 percent), and warm season (C4) grasses (21.6 ± 5.0 percent) (Table 4, Figure 8). On grazed and rainfed (not irrigated) non-Federal pastureland, cool season (C3) grasses are dominant (at least 15 percent of the relative foliar cover (composition)) on 97.1 ± 3.4 percent of all non-Federal pastureland in the region, followed by non-leguminous forbs (33.0 ± 8.3 percent), leguminous forbs (31.1 ± 6.7 percent), and warm season (C4) grasses (25.8 ± 8.1 percent) (Table 5, Figure 9). Within the *Bromus* genus, *Bromus inermis* is dominant on 11.1 ± 4.2 percent of all non-Federal pastureland in the region (Table 6).

In the Midwest region, the greatest percentages of all non-Federal pastureland where genera are dominant (at least 15 percent of the relative foliar cover (composition)) include cool season grasses *Poa* (51.7 ± 7.9 percent), *Schedonorus* (34.9 ± 7.0 percent), *Bromus* (12.8 ± 4.8 percent), and *Festuca* (10.4 ± 4.7 percent); leguminous forb *Trifolium* (19.8 ± 5.6 percent); and warm season grass *Digitaria* (8.7 ± 4.3 percent) (Table 6, Figure 10).

Average biomass estimates for functional groups on all non-Federal pastureland in this region are greatest for cool season (C3) grasses (1,632.2 ± 105.9 lbs/ac), with smaller amounts for non-leguminous forbs (363.7 ± 53.5 lbs/ac), leguminous forbs (289.8 ± 44.2 lbs/ac), and warm season (C4) grasses (230.5 ± 45.4 lbs/ac) (Table 7, Figure 16). On grazed and rainfed non-Federal pastureland, average biomass is 1,573.5 ± 123.4 lbs/ac for cool season (C3) grasses, 326.2 ± 62.6 lbs/ac for non-leguminous forbs, 293.4 ± 45.0 lbs/ac for leguminous forbs, and 266.3 ± 64.1 lbs/ac for warm season (C4) grasses (Table 8, Figure 17).

Among the soil erosion resource concerns on all non-Federal pastureland in the Midwest, sheet and rill erosion is a concern on 15.0 ± 5.0 percent of the land, followed by classic gully erosion 9.1 ± 3.6 percent. Compaction (34.6 ± 7.6 percent) and organic matter depletion (24.7 ± 5.7 percent) are soil condition concerns on all non-Federal pastureland. Excessive runoff, flooding, and ponding is a concern on 9.7 ± 4.8 percent of all non-Federal pastureland and excessive nutrients and organics affecting water quality is a concern on 8.7 ± 3.3 percent. Of the plant condition concerns, noxious and invasive plants are a concern on 54.7 ± 7.2 percent of all non-Federal pastureland; followed by forage quality and palatability (49.7 ± 7.2 percent); plant productivity, health and vigor (45.4 ± 8.0 percent); and plants not adapted or suited (9.2 ± 4.2 percent). Inadequate stock water is a concern on 54.1 ± 6.8 percent of all non-Federal pastureland in the region (Table 9, Figures 18-21).

Fences are the conservation practice applied on the greatest amount (59.2 ± 7.4 percent) of non-Federal pastureland in the region and needed on another 22.7 ± 6.8 percent. Conservation practices, pond (27.3 ± 5.6 percent), watering facility (21.0 ± 5.2 percent), water well (10.2 ± 3.6 percent), and pipeline (10.2 ± 3.2 percent), are applied to provide water, but are needed on much of the land (watering facility 50.5 ± 8.8 percent, pipeline 44.7 ± 8.9 percent, water well 25.8 ± 7.2 percent, and pond 9.5 ± 5.1 percent). Forage and biomass planting is applied on 24.1 ± 6.3 percent of non-Federal pastureland in the region and needed on 31.4 ± 7.2 percent. Pescribed grazing is applied on 20.6 percent of the land and needed on another 58.5 ± 9.1 percent. Brush management is applied on 18.0 ± 4.8 percent of the land and needed on 23.7 ± 7.1 percent. Prescribed burning is needed on 10.3 ± 5.0 percent (Table 10 and Figures 22-27).

Northeast

The Northeast region (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia) has 7,384.4 ± 1,586.2 thousand acres of non-Federal pastureland (Table 1, Figure 4). Nearly all (99.9 ± 0.9 percent) of this pastureland is rainfed (not irrigated), but only 43.0 ± 14.8 percent is grazed by domestic livestock (Table 1, Figure 5).

Cool season (C3) grasses have the largest average percent (47.0 ± 6.0) relative foliar cover (composition) for functional groups on all non-Federal pastureland, followed by non-leguminous forbs (29.0 ± 4.2 percent), leguminous forbs (9.2 ± 2.5 percent), and warm season (C4) grasses (4.9 ± 2.9 percent) (Table 2, Figure 6). On grazed and rainfed (not irrigated) non-Federal pastureland, cool season (C3) grasses have the largest average percent (46.9 ± 11.0) relative foliar cover (composition) for functional groups, followed by non-leguminous forbs (23.1 ± 7.1 percent), leguminous forbs (12.5 ± 4.3 percent), and warm season (C4) grasses (9.7 ± 6.1 percent) (Table 3, Figure 7).

Cool season (C3) grasses are dominant (at least 15 percent of the relative foliar cover (composition)) on 90.1 ± 7.4 percent of all non-Federal pastureland in the region, followed by non-leguminous forbs (77.6 ± 7.5 percent), leguminous forbs (24.0 ± 10.5 percent), and warm season (C4) grasses (12.2 ± 8.3 percent) (Table 4, Figure 8). On grazed and rainfed (not

irrigated) non-Federal pastureland, cool season (C3) grasses are dominant on 90.8 ± 12.4 percent of the land, followed by non-leguminous forbs 70.6 ± 17.7 percent), leguminous forbs (34.6 ± 20.3 percent), and warm season (C4) grasses (26.1 ± 17.0 percent) (Table 5, Figure 9).

In the Northeast region, cool season grasses *Poa* (36.3 ± 10.1 percent), *Dactylis* (21.6 ± 10.7 percent), *Festuca* (17.5 ± 7.9 percent), and *Schedonorus* (12.0 ± 6.1 percent); leguminous forb *Trifolium* (22.4 ± 9.3 percent); and non-leguminous forbs *Carex* (11.8 ± 9.3 percent) and *Solidago* (9.1 ± 7.0 percent) are the genera dominant on the greatest proportion of all non-Federal pastureland (Table 6, Figure 11).

Average biomass estimates for functional groups on all non-Federal pastureland in this region is greatest for cool season (C3) grasses (1,285.2 ± 172.6 lbs/ac), with smaller amounts for non-leguminous forbs (819.3 ± 125.1 lbs/ac), leguminous forbs (253.1 ± 70.0 lbs/ac), and warm season (C4) grasses (125.5 ± 72.2 lbs/ac) (Table 7, Figure 16). Average biomass estimates for functional groups on all non-Federal pastureland in this region is greatest for cool season (C3) grasses (1,632.2 ± 105.9 lbs/ac), with smaller amounts for non-leguminous forbs (363.7 ± 53.5 lbs/ac), leguminous forbs (289.8 ± 44.2 lbs/ac), and warm season (C4) grasses (230.5 ± 45.4 lbs/ac) (Table 7, Figure 16). On grazed and rainfed non-Federal pastureland, average biomass is 1,239.0 ± 281.2 lbs/ac for cool season (C3) grasses, 652.9 ± 236.6 lbs/ac for non-leguminous forbs, 325.4 ± 120.7 lbs/ac for leguminous forbs, and 244.2 ± 154.2 lbs/ac for warm season (C4) grasses (Table 8, Figure 17).

Among the soil erosion resource concerns on all non-Federal pastureland in the Northeast, sheet and rill erosion is a concern on 9.30 ± 6.7 percent of the land. Compaction (22.6 ± 9.8 percent) and organic matter depletion (15.6 ± 7.6 percent) are soil condition concerns on all non-Federal pastureland. Of the plant condition concerns, noxious and invasive plants are a concern on 45.9 ± 11.2 percent of all non-Federal pastureland; followed by forage quality and palatability (44.6 ± 9.6 percent); plant productivity, health and vigor (35.7 ± 11.5 percent); and plants not adapted or suited (12.7 ± 5.3 percent). Inadequate stock water is a concern on 44.7 ± 14.4 percent of all non-Federal pastureland in the region (Table 9, Figures 18-21).

Fences are the conservation practice applied on the greatest amount (42.9 ± 10.2 percent) of non-Federal pastureland in the region and needed on another 31.0 ± 11.5 percent. Conservation practices, water well (11.0 ± 6.6 percent), watering facility (10.8 ± 6.4 percent), spring development (5.9 ± 5.4 percent), and pipeline (4.4 ± 4.2 percent), are applied to provide water, but are needed on much of the land (watering facility 47.8 ± 9.9 percent, pipeline 25.2 ± 10.9 percent, spring development 15.2 ± 7.6 percent, and water well 13.7 ± 9.0 percent). Forage and biomass planting is applied on 17.3 ± 9.8 percent of non-Federal pastureland in the region and needed on 34.2 ± 10.8 percent. Prescribed grazing is applied on 12.3 ± 8.8 percent of the land and needed on 51.4 ± 12.0 percent. Brush management is applied on 23.7 ± 12.8 percent of the land and needed on 29.8 ± 12.1 percent (Table 10 and Figures 22-27).

Northern Plains

The Northern Plains region (Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming) has 15,368.4 ± 1,430.3 thousand acres of non-Federal pastureland (Table 1, Figure 4). 82.1 ± 5.5 percent of this pastureland is rainfed (not irrigated) and 58.0 ± 17.4 percent is grazed by domestic livestock (Table 1, Figure 5).

Cool season (C3) grasses have the largest average percent (68.9 ± 7.5) relative foliar cover (composition) for functional groups on all non-Federal pastureland, followed by non-leguminous forbs (9.6 ± 1.6 percent), leguminous forbs (9.3 ± 4.3 percent), and warm season (C4) grasses (6.9 ± 3.8 percent) (Table 2, Figure 6). On grazed and rainfed (not irrigated) non-Federal pastureland, cool season (C3) grasses have the largest average percent (70.5 ± 12.2) relative foliar cover (composition) for functional groups, followed by non-leguminous forbs (8.8 ± 1.9 percent), leguminous forbs (7.2 ± 2.1 percent), and warm season (C4) grasses (6.8 ± 6.5 percent) (Table 3, Figure 7).

Cool season (C3) grasses are dominant (at least 15 percent of the relative foliar cover (composition)) on 93.7 ± 9.0 percent of all non-Federal pastureland in the region, followed by non-leguminous forbs (22.8 ± 6.3 percent), leguminous forbs (20.1 ± 8.1 percent), and warm season (C4) grasses (14.5 ± 10.5 percent) (Table 4, Figure 8). On grazed and rainfed (not irrigated) non-Federal pastureland, cool season (C3) grasses are dominant on 96.4 ± 12.9 percent of the land, followed by non-leguminous forbs 19.6 ± 8.5 percent), and leguminous forbs (18.2 ± 8.8 percent) (Table 5, Figure 9).

In the Northern Plains, the greatest percentages of all non-Federal pastureland where genera are dominant (at least 15 percent of the relative foliar cover (composition)) include cool season grasses *Poa* (38.0 ± 7.7 percent), *Bromus* (37.8 ± 7.8 percent), *Agropyron* (24.4 ± 6.5 percent), and *Schedonorus* (11.6 ± 5.7 percent); and leguminous forb *Medicago* (12.6 ± 7.6 percent) (Table 6, Figure 12). Within the *Bromus* genus, *Bromus inermis* is dominant on 34.4 ± 7.7 percent of all non-Federal pastureland in the region and *Bromus tectorum* is dominant on 2.6 ± 2.5 percent (Table 6).

Average biomass estimates for functional groups on all non-Federal pastureland in this region is greatest for cool season (C3) grasses (1,398.5 ± 212.7 lbs/ac), with smaller amounts for non-leguminous forbs (189.7 ± 35.3 lbs/ac), leguminous forbs (152.0 ± 47.5 lbs/ac), and warm season (C4) grasses (148.3 ± 89.7 lbs/ac) (Table 7, Figure 16). On grazed and rainfed non-Federal pastureland, average biomass is 1,483.2 ± 316.5 lbs/ac for cool season (C3) grasses, 179.1 ± 38.3 lbs/ac for non-leguminous forbs, and 147.0 ± 52.6 lbs/ac for leguminous forbs (Table 8, Figure 17).

Compaction is a soil condition concern on 14.8 ± 6.5 percent of all non-Federal pastureland in the Northern Plains. Of the plant condition concerns, noxious and invasive plants are a concern on 57.1 ± 8.3 percent of all non-Federal pastureland; followed by plant productivity, health and vigor (19.2 ± 5.2 percent); and forage quality and palatability (10.2 ± 3.8 percent). Inadequate

stock water is a concern on 15.7 ± 7.2 percent of all non-Federal pastureland in the region (Table 9, Figures 18-21).

Fences are the conservation practice applied on the greatest amount (60.5 ± 9.7 percent) of non-Federal pastureland in the region and needed on another 15.4 ± 8.1 percent. Conservation practices, pond (33.2 ± 5.0 percent), watering facility (14.4 ± 5.4 percent), irrigation water management (10.6 ± 5.4), pipeline (4.2 ± 2.9 percent), and water well (3.7 ± 2.7 percent), are applied to provide water for livestock and forage, but are needed on much of the land (watering facility 19.3 ± 8.5 percent, and water well 7.9 ± 5.2 percent), and pond (5.0 ± 3.5 percent). Forage and biomass planting is applied on 39.6 ± 8.0 percent of non-Federal pastureland in the region and needed on 2.7 ± 1.8 percent. Prescribed grazing is applied on 34.8 ± 7.7 percent of the land and needed on 37.3 ± 8.8 percent. Brush management is applied on 4.8 ± 2.7 percent of the land and needed on 7.8 ± 4.4 percent of the land, while prescribed burning is needed on 13.6 ± 6.7 percent (Table 10 and Figures 22-27).

South Central

The South Central region (Arkansas, Louisiana, Oklahoma, and Texas) has 34,599.5 ± 5,919.3 thousand acres of non-Federal pastureland (Table 1, Figure 4). 96.3 ± 6.4 percent of this pastureland is rainfed (not irrigated) and 77.2 ± 18.4 percent is grazed by domestic livestock (Table 1, Figure 5).

Warm season (C4) grasses have the largest average percent (65.6 ± 6.4) relative foliar cover (composition) for functional groups on all non-Federal pastureland, followed by cool season (C3) grasses (12.0 ± 8.3 percent), non-leguminous forbs (11.3 ± 2.4 percent), and leguminous forbs (3.3 ± 0.8 percent) (Table 2, Figure 6). On grazed and rainfed (not irrigated) non-Federal pastureland, warm season (C4) grasses have the largest average percent (64.8 ± 8.4) relative foliar cover (composition) for functional groups, followed by non-leguminous forbs (12.4 ± 2.8 percent), and leguminous forbs (3.4 ± 0.8 percent) (Table 3, Figure 7).

Warm season (C4) grasses are dominant (at least 15 percent of the relative foliar cover (composition)) on 93.2 ± 11.2 percent of all non-Federal pastureland in the region, followed by non-leguminous forbs (29.2 ± 7.3 percent), cool season (C3) grasses (26.3 ± 11.9 percent), and leguminous forbs (6.4 ± 3.0 percent) (Table 4, Figure 8). On grazed and rainfed (not irrigated) non-Federal pastureland, warm season (C4) grasses are dominant on 92.7 ± 19.8 percent of the land, followed by non-leguminous forbs 33.7 ± 8.5 percent), cool season (C3) grasses (26.2 ± 15.2 percent), and leguminous forbs (6.1 ± 2.8 percent) (Table 5, Figure 9).

Warm season grasses *Cynodon* (54.6 ± 6.8 percent), *Paspalu*m (18.3 ± 5.8 percent), and *Bothriochloa* (14.3 ± 4.6 percent) are dominant on the largest areas of all non-Federal pastureland in the South Central region (Table 6, Figure 13).

Average biomass estimates for functional groups on all non-Federal pastureland in this region is greatest for warm season (C4) grasses (1,299.4 ± 128.4 lbs/ac), with smaller amounts for cool

season (C3) grasses (283.0 ± 225.9 lbs/ac), non-leguminous forbs (237.8 ± 46.4 lbs/ac), and leguminous forbs (83.4 ± 24.5 lbs/ac), and (Table 7, Figure 16). On grazed and rainfed non-Federal pastureland, average biomass is 1,269.3 ± 192.3 lbs/ac for warm season (C4) grasses, 255.9 ± 52.5 lbs/ac for non-leguminous forbs, and 87.1 ± 23.8 lbs/ac for leguminous forbs (Table 8, Figure 17).

Among the soil erosion resource concerns on all non-Federal pastureland in the South Central region, sheet and rill erosion is a concern on 14.2 ± 5.1 percent of the land, followed by classic gully erosion 8.2 ± 4.3 percent. Organic matter depletion (26.6 ± 8.0 percent) and compaction (24.5 ± 6.2 percent) are soil condition concerns on all non-Federal pastureland. Excessive runoff, flooding, and ponding is a concern on 10.7 ± 4.7 percent of all non-Federal pastureland. Of the plant condition concerns, noxious and invasive plants are a concern on 38.4 ± 6.7 percent of all non-Federal pastureland; followed by plant productivity, health and vigor (36.0 ± 6.7 percent); forage quality and palatability (25.2 ± 5.3 percent); and plants not adapted or suited (9.2 ± 3.9 percent). Inadequate stock water is a concern on 25.2 ± 7.0 percent of all non-Federal pastureland in the region (Table 9, Figures 18-21).

Fences are the conservation practice applied on the greatest amount (70.3 ± 5.9 percent) of non-Federal pastureland in the region and needed on another 18.2 ± 3.6 percent. Conservation practices, pond (47.1 ± 8.5 percent), watering facility (30.0 ± 7.0 percent), pipeline (13.3 ± 6.2 percent), and water well (20.2 ± 5.2 percent), are applied to provide water, but are needed on much of the land (watering facility 25.5 ± 6.9 percent, and water well 25.2 ± 7.0 percent), pipeline 22.3 ± 6.7 percent, and pond (16.3 ± 5.3 percent). Forage and biomass planting is applied on 39.4 ± 6.8 percent of non-Federal pastureland in the region and needed on 13.5 ± 6.2 percent. Prescribed grazing is applied on 46.4 ± 7.4 percent of the land and needed on 34.2 ± 6.5 percent. Grazing land mechanical treatment is applied on 16.6 ± 4.6 percent of the land and needed on 5.1 ±3.0 percent. Brush management is applied on 43.0 ± 6.9 percent of the land and needed on 13.6 ± 5.6 percent of the land, while prescribed burning is needed on 21.7 ± 5.4 percent (Table 10 and Figures 22-27).

Southeast

The Southeast region (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia) has 28,618.6 ± 1,665.9 thousand acres of non-Federal pastureland (Table 1, Figure 4). 97.2 ± 6.7 percent of this pastureland is rainfed (not irrigated) and 67.2 ± 19.5 percent is grazed by domestic livestock (Table 1, Figure 5).

Warm season (C4) grasses have the largest average percent (38.6 ± 7.3) relative foliar cover (composition) for functional groups on all non-Federal pastureland, followed by cool season (C3) grasses (28.2 ± 8.7 percent), non-leguminous forbs (14.1 ± 1.2 percent), and leguminous forbs (8.3 ± 1.0 percent) (Table 2, Figure 6). On grazed and rainfed (not irrigated) non-Federal pastureland, warm season (C4) grasses have the largest average percent (41.7 ± 9.9) relative foliar cover (composition) for functional groups, followed by cool season (C3) grasses (26.4 ±

13.2 percent), non-leguminous forbs (13.7 ± 1.5 percent), and leguminous forbs (8.3 ± 1.4 percent) (Table 3, Figure 7).

Warm season (C4) grasses are doiminant (at least 15 percent of the relative foliar cover (composition)) on 65.3 ± 12.5 percent of all non-Federal pastureland in the region, followed by cool season (C3) grasses (58.0 ± 12.6 percent), non-leguminous forbs (36.7 ± 5.0 percent), and leguminous forbs (22.9 ± 4.2 percent) (Table 4, Figure 8). On grazed and rainfed (not irrigated) non-Federal pastureland, warm season (C4) grasses are dominant on 67.3 ± 21.2 percent of the land, followed by cool season (C3) grasses (55.2 ± 16.7 percent), non-leguminous forbs 35.7 ± 5.3 percent), and leguminous forbs (23.2 ± 4.8 percent) (Table 5, Figure 9).

Warm season grasses *Paspalu*m (32.2 ± 5.6 percent) and *Cynodon* (13.7 ± 3.2 percent); cool season grasses *Schedonorus* (31.3 ± 4.5 percent) and *Poa* (12.2 ± 3.2 percent); and leguminous forb *Trifolium* (15.7 ± 3.5 percent) are dominant on the largest areas of all non-Fedaral pastureland in the Southeast region (Table 6, Figure 14).

Average biomass estimates for functional groups on all non-Federal pastureland in this region is greatest for warm season (C4) grasses (771.4 ± 145.9 lbs/ac), with smaller amounts for cool season (C3) grasses (708.5 ± 239.7 lbs/ac) non-leguminous forbs (324.2 ± 34.2 lbs/ac), leguminous forbs (212.0 ± 29.9 lbs/ac), and (Table 7, Figure 16). On grazed and rainfed non-Federal pastureland, average biomass is 799.1 ± 218.1 lbs/ac for warm season (C4) grasses, 626.1 ± 338.6 lbs/ac for cool season (C3) grasses, 297.2 ± 34.7 lbs/ac for non-leguminous forbs, and 210.2 ± 39.6 lbs/ac for leguminous forbs (Table 8, Figure 17).

Among the soil erosion resource concerns on all non-Federal pastureland in the Southeast, sheet and rill erosion is a concern on 14.2 ± 3.8 percent of the land, followed by classic gully erosion 7.9 ± 3.7 percent. Compaction (28.7 ± 3.5 percent) and organic matter depletion (19.4 ± 4.8 percent) are soil condition concerns on all non-Federal pastureland. Excessive nutrients and organics affecting water quality is a concern on 9.3 ± 2.7 percent of all non-Federal pastureland in the region. Of the plant condition concerns, noxious and invasive plants are a concern on 43.0 ± 5.4 percent of all non-Federal pastureland; followed by forage quality and palatability (40.5 ± 6.1 percent); plant productivity, health and vigor (35.1 ± 5.3 percent); and plants not adapted or suited (8.5 ± 3.1 percent). Inadequate stock water is a concern on 43.0 ± 6.1 percent of all non-Federal pastureland in the region (Table 9, Figures 18-21).

Fences are the conservation practice applied on the greatest amount (63.9 ± 5.3 percent) of non-Federal pastureland in the region and needed on another 18.1 ± 3.6 percent. Conservation practices, pond (32.3 ± 5.4 percent), watering facility (15.9 ± 5.3 percent), water well (10.2 ± 3.8 percent), and pipeline (6.8 ± 3.2 percent), are applied to provide water, but are needed on much of the land (watering facility 46.8 ± 5.7 percent, pipeline 38.1 ± 6.1 percent, water well 22.3 ± 4.2 percent, and pond 8.3 ± 3.5 percent). Forage and biomass planting is applied on 17.2 ± 4.3 percent of non-Federal pastureland in the region and needed on 22.2 ± 3.9 percent. Prescribed grazing is applied on 25.1 ± 7.0 percent of the land and needed on 46.4 ± 6.7 percent. Grazing land mechanical treatment is applied on 11.4 ± 5.7 percent of the land and

needed on 12.7 ± 4.5 percent. Brush management is applied on 19.7 ± 4.5 percent of the land and needed on 17.0 ± 4.3 percent of the land, while prescribed burning is applied on 3.2 ± 2.8 percent and needed on 4.1 ± 2.2 percent (Table 10 and Figures 22-27).

West

The West region (Arizona, California, Idaho, Nevada, New Mexico, Oregon, Utah, and Washington) has 7,115.0 ± 1,093.7 thousand acres of non-Federal pastureland (Table 1, Figure 4). Only 53.4 ± 13.7 percent of this pastureland is rainfed (not irrigated), while 63.7 ± 22.0 percent is grazed by domestic livestock (Table 1, Figure 5).

Cool season (C3) grasses have the largest average percent (61.9 ± 11.4) relative foliar cover (composition) for functional groups on all non-Federal pastureland, followed by non-leguminous forbs (19.5 ± 6.0 percent) and leguminous forbs (8.1 ± 4.3 percent) (Table 2, Figure 6). On grazed and rainfed (not irrigated) non-Federal pastureland, Cool season (C3) grasses have the largest average percent (68.4 ± 16.6) relative foliar cover (composition) for functional groups, followed by non-leguminous forbs (20.4 ± 8.6 percent) and leguminous forbs (2.1 ± 1.3 percent) (Table 3, Figure 7).

Cool season (C3) grasses are dominant (at least 15 percent of the relative foliar cover (composition)) on 89.5 ± 14.0 percent of all non-Federal pastureland in the region, followed by non-leguminous forbs (37.2 ± 11.9 percent), and leguminous forbs (14.8 ± 8.4 percent) (Table 4, Figure 8). On grazed and rainfed (not irrigated) non-Federal pastureland, cool season (C3) grasses are dominant on 96.9 ± 17.0 percent of the land, followed by non-leguminous forbs 36.0 ± 18.1 percent) (Table 5, Figure 9).

In the West, cool season grasses *Poa* (27.9 ± 9.8 percent), *Bromus* (17.4 ± 9.1 percent), *Alopecurus* (12.9 ± 8.4 percent), *Schedonorus* (11.2 ± 7.3 percent), and *Agrostis* (8.8 ± 6.0 percent); and leguminous forb *Trifolium* (8.7 ± 6.7 percent) are dominant on the largest areas of all non-Fedaral pastureland (Table 6, Figure 15). Within the *Bromus* genus, *Bromus tectorum* is dominant on 10.4 ± 5.9 percent of non-Federal pastureland in the region and *Bromus inermis* is dominant on 5.8 ± 5.5 percent (Table 6).

Average biomass estimates for functional groups on all non-Federal pastureland in this region is greatest for cool season (C3) grasses (1,252.1 ± 308.3 lbs/ac), with smaller amounts for non-leguminous forbs (310.5 ± 91.6 lbs/ac), and leguminous forbs (139.6 ± 58.9 lbs/ac) (Table 7, Figure 16). On grazed and rainfed non-Federal pastureland, average biomass is 1,299.5 ± 383.4 lbs/ac for cool season (C3) grasses, 355.8 ± 184.0 lbs/ac for non-leguminous forbs, and 42.9 ± 26.5 lbs/ac for leguminous forbs (Table 8, Figure 17).

Among the soil erosion resource concerns on all non-Federal pastureland in the West, streambank erosion is a concern on 14.5 ± 7.7 percent of the land. Compaction (36.8 ± 11.6 percent) and organic matter depletion (9.4 ± 6.1 percent) are soil condition concerns on all non-Federal pastureland. Excessive runoff, flooding, and ponding is a concern on 10.6 ± 6.8 percent

of all non-Federal pastureland and excessive nutrients and organics affecting water quality is a concern on 9.0 ± 7.0 percent. Of the plant condition concerns, noxious and invasive plants are a concern on 66.9 ± 11.8 percent of all non-Federal pastureland; followed by plant productivity, health and vigor (45.1 ± 13.2 percent); forage quality and palatability (43.6 ± 12.6 percent); plants not adapted or suited (17.5 ± 9.6 percent); and plant wildfire hazard (13.0 ± 8.4). Inadequate stock water is a concern on 14.4 ± 7.1 percent of all non-Federal pastureland in the region (Table 9, Figures 18-21).

Fences are the conservation practice applied on the greatest amount (57.7 ± 11.0 percent) of non-Federal pastureland in the region and needed on another 18.1 ± 7.9 percent. Conservation practices, watering facility (31.9 ± 14.0 percent), irrigation water management (24.0 ± 12.4 percent), water well (14.2 ± 9.6 percent), pipeline (11.1 ± 8.1 percent), and pond (4.9 ± 4.4 percent), are applied to provide water for livestock and forage, but are needed on much of the land (watering facility 30.5 ± 9.4 percent, irrigation water management 20.2 ± 9.0 percent, pipeline 17.5 ± 6.1 percent, and water well 8.3 ± 6.0 percent. Forage and biomass planting is applied on 16.8 ± 9.8 percent of non-Federal pastureland in the region and needed on 29.6 ± 11.3 percent. Prescribed grazing is applied on 22.1 ± 9.9 percent of the land and needed on 39.7 ± 9.3 percent. Grazing land mechanical treatment is applied on 15.4 ± 10.6 percent of the land and needed on 9.8 ± 6.7 percent. Brush management is applied on 5.5 ± 4.4 percent of the land, while prescribed burning is needed on 8.6 ± 7.4 percent (Table 10 and Figures 22-27).

Tables and Results

Estimates presented here are based upon pastureland data collected on-site as part of the National Resources Inventory (NRI), a sample survey using scientific statistical principles and procedures. These results, based upon NRI pastureland data collected in the field on pastureland during the periods 2013 to 2016, address status of conditions. These estimates cover non-Federal pastureland.

Margins of error are reported for each NRI estimate and must be considered at all scales of analysis.

The margin of error is used to construct the 95 percent confidence interval for the estimate. The lower bound of the interval is obtained by subtracting the margin of error from the estimate; the upper bound is obtained by adding the margin of error to the estimate. A 95 percent confidence interval means that in repeated samples from the same population, 95 percent of the time the true underlying population parameter will be contained within the lower and upper bounds of the interval.

In the following tables, estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 1 - Area of non-Federal pastureland by region. Margins of error in parentheses.

REGION	NON-FEDERAL PASTURELAND	MARGIN OF ERROR	PERCENT RAINFED (NOT IRRIGATED)	MARGIN OF ERROR	PERCENT GRAZED	MARGIN OF ERROR
	1000 ac	*1000 ac*	*Percent*	*Percent*	*Percent*	*Percent*
MIDWEST	29,112.6	(5,014.0)	99.4	(0.9)	63.1	(7.7)
NORTHEAST	7,384.4	(1,586.2)	99.9	(0.9)	43.0	(14.8)
NORTHERN PLAINS	15,368.4	(1,430.3)	82.1	(5.5)	58.0	(17.4)
SOUTH CENTRAL	34,599.5	(5,919.3)	96.3	(6.4)	77.2	(18.4)
SOUTHEAST	28,618.6	(1,665.9)	97.2	(6.7)	67.2	(19.5)
WEST	7,115.0	(1,093.7)	53.4	(13.7)	63.7	(22.0)

Table 2 – Mean percent relative foliar cover (composition) for functional groups on all non-Federal pastureland, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Margins of error in parentheses.

FUNCTIONAL GROUP	REGION					
	Midwest	**Northeast**	**Northern Plains**	**South Central**	**Southeast**	**West**
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
FORBS-LEGUME	11.0	9.2	9.3	3.3	8.3	8.1
	(1.9)	(2.5)	(4.3)	(0.8)	(1.0)	(4.3)
FORBS-NON-LEGUME	13.6	29.0	9.6	11.3	14.1	19.5
	(1.8)	(4.2)	(1.6)	(2.4)	(1.2)	(6.0)
C3 GRASSES	60.1	47.0	68.9	12.0	28.2	61.9
	(3.4)	(6.0)	(7.5)	(8.3)	(8.7)	(11.4)
C4 GRASSES	8.6	4.9	6.9	65.6	38.6	2.0
	(1.8)	(2.9)	(3.8)	(6.4)	(7.3)	(7.5)
WOODY SPECIES	5.7	8.1	3.0	6.3	7.6	3.2
	(1.4)	(3.2)	(3.4)	(3.7)	(4.1)	(4.4)

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 3 – Mean percent relative foliar cover (composition) for functional groups on grazed and rainfed (not irrigated) non-Federal pastureland, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Margins of error in parentheses.

FUNCTIONAL GROUP	REGION					
	Midwest	**Northeast**	**Northern Plains**	**South Central**	**Southeast**	**West**
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
FORBS-LEGUME	11.2	12.5	7.2	3.4	8.3	2.1
	(1.8)	(4.3)	(2.1)	(0.8)	(1.4)	(1.3)
FORBS-NON-LEGUME	12.8	23.1	8.8	12.4	13.7	20.4
	(2.2)	(7.1)	(1.9)	(2.8)	(1.5)	(8.6)
C3 GRASSES	60.2	46.9	70.5	11.6	26.4	68.4
	(4.4)	(11.0)	(12.2)	(12.6)	(13.2)	(16.6)
C4 GRASSES	9.8	9.7	6.8	64.8	41.7	0.8
	(2.5)	(6.1)	(6.5)	(8.4)	(9.9)	(9.9)
WOODY SPECIES	5.3	5.4	4.4	6.3	6.8	2.6
	(2.1)	(7.0)	(7.1)	(7.3)	(7.6)	(7.8)

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 4 – Dominant functional groups (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland, by region (Midwest, Northeast, Northern Plains, SouthCentral, Southeast, and West). Margins of error in parentheses.

FUNCTIONAL GROUP	REGION					
	Midwest	**Northeast**	**Northern Plains**	**South Central**	**Southeast**	**West**
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
FORBS-LEGUME	30.6	24.9	20.1	6.4	22.9	14.8
	(6.6)	(10.5)	(8.1)	(3.0)	(4.2)	(8.4)
FORBS-NON-LEGUME	32.6	77.6	22.8	29.2	36.7	37.2
	(6.5)	(7.5)	(6.3)	(7.3)	(5.)	(11.9)
C3 GRASSES	96.3	90.1	93.7	26.3	58.0	89.5
	(2.3)	(7.4)	(9.)	(11.9)	(12.6)	(14.)
C4 GRASSES	21.6	12.2	14.5	93.2	65.3	4.2
	(5.)	(8.3)	(10.5)	(11.2)	(12.5)	(13.2)

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 5 – Dominant functional groups (at least 15 percent of the relative foliar cover (composition)) on grazed, non-irrigated, non-Federal pastureland, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Margins of error in parentheses.

FUNCTIONAL GROUP	REGION					
	Midwest	**Northeast**	**Northern Plains**	**South Central**	**Southeast**	**West**
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
FORBS-LEGUME	31.1	34.6	18.2	6.1	23.2	1.2
	(6.7)	(20.3)	(8.8)	(2.8)	(4.8)	(2.1)
FORBS-NON-LEGUME	33.0	70.6	19.6	33.7	35.7	36.0
	(8.3)	(17.7)	(8.5)	(8.5)	(5.3)	(18.1)
C3 GRASSES	97.1	90.8	96.4	26.2	55.2	96.9
	(3.4)	(12.4)	(12.9)	(15.2)	(16.7)	(17.)
C4 GRASSES	25.8	26.1	14.8	92.7	67.3	0.6
	(8.1)	(17.0)	(19.3)	(19.8)	(21.2)	(21.2)

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 6 – Dominant genera (at least 15 percent of the relative foliar cover (composition)) on non-Federal pastureland, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Margins of error in parentheses.

FUNCTIONAL GROUP	GENUS	REGION					
		Midwest	Northeast	Northern Plains	South Central	Southeast	West
		Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
C3 GRASSES	*Agropyron*	0	0	24.4 (6.5)	0	0	9.3 (9.3)
	Agrostis	2.7 (3.1)	6.7 (6.2)	0.3 (0.4)	0	0.1 (0.2)	8.8 (6.0)
	Alopecurus	0.9 (1.3)	1.3 (2.5)	2.4 (2.4)	0.4 (0.9)	0	12.9 (8.4)
	Anthoxanthum	0	1.1 (1.8)	0	0.1 (0.2)	1.0 (1.5)	0.5 (.8)
	Bromus	12.8 (4.8)	7.1 (6.9)	37.8 (7.8)	4.2 (2.9)	1.8 (1.7)	17.4 (9.1)
	(Bromus tectorum)	0.5 (0.7)	0 0	2.6 (2.5)	1.9 (2.4)	0.5 (0.7)	10.4 (5.9)
	(Bromus inermis)	11.1 (4.2)	2.4 (4.5)	34.4 (7.7)	0	0.2 (0.5)	5.8 (5.5)
	Dactylis	3.8 (2.8)	21.6 (10.7)	1.8 (2.2)	0	4.3 (2.5)	4.4 (7.1)
	Deschampsia	0	0	0.2 (0.4)	0	0	0
	Elymus	3.8 (2.7)	0 0	8.1 (5.3)	0	0	2.6 (3.1)
	Festuca	10.4 (4.7)	17.5 (7.9)	0	0	2.7 (1.6)	0.8 (1.2)
	Hesperostipa	0	0	1.0 (1.4)	0	0	0
	Holcus	0	0	0	0	0.2 (0.2)	3.8 (4.1)
	Hordeum	0	0	0.6 (0.7)	0.5 (0.8)	0.3 (0.4)	0.2 (0.3)
	Leymus	0	0	0	0	0	0.7 (1.0)
	Lolium	2.2 (2.4)	1.1 (1.6)	0	3.2 (2.9)	3.1 (1.7)	1.8 (2.9)

	Nassella	0	0	1.1 (2.2)	2.3 (1.6)	0 0	0 0
	Pascopyrum	0	0	7.2 (5.3)	0.2 (0.5)	0	0
	Phalaris	3.4 (1.9)	5.4 (8.7)	1.9 (2.1)	0	0	3.7 (4.0)
	Phleum	5.3 (3.2)	6.9 (6.2)	2.2 (1.8)	0	0.2 (.5)	3.9 (4.6)
	Poa	51.7 (7.9)	36.3 (10.1)	38.0 (7.7)	0	12.2 (3.2)	27.9 (9.8)
	Schedonorus	34.9 (7.0)	12.0 (6.1)	11.6 (5.7)	7.6 (3.4)	31.3 (4.5)	11.2 (7.3)
	Secale	0	0	0	0	0.7 (1.3)	1.7 (2.1)
	Taeniatherum	0	0	0	0	0	1.2 (1.7)
	Thinopyrum	0	0	3.5 (3.1)	0	0	6.9 (6.1)
	Trisetum	0	0	0	1.3 (2.2)	0 0	0 0
	Ventenata	0	0	0	0	0	2.5 (3.9)
C4 GRASSES	*Andropogon*	0.7 (1.0)	0 0	1.7 (2.5)	2.1 (1.7)	3.6 (1.7)	0
	Aristida	0	0	0	0.9 (1.0)	0	0
	Axonopus	0	0	0	2.8 (1.7)	5.8 (3.5)	0
	Bothriochloa	0	0	0	14.3 (4.6)	0	0
	Bouteloua	0.1 (0.2)	0	3.8 (4.6)	0.9 (1.0)	0	0.1 (0.2)
	Cenchrus	0	0	0	1.6 (2.2)	0	0
	Cynodon	1.5 (1.7)	0	1.2 (1.9)	54.6 (6.8)	13.7 (3.2)	0
	Dichanthelium	0.5 (1.0)	0	0	2.3 (1.9)	0.7 (0.7)	0
	Digitaria	8.7 (4.3)	5.5 (4.6)	0	4.5 (3.1)	8.1 (3.7)	1.9 (3.8)
	Distichlis	0	0	0.3 (0.6)	0	0	0.3 (0.4)
	Echinochloa	1.0	0	0	0	0.4	0

		(1.5)				(0.7)	
	Eragrostis	0	0	0	0.7	0	0
					(1.0)	0	0
	Eremochloa	0	0	0	0	0.9	0
						(0.9)	
	Muhlenbergia	0	2.7	0.3	0	0.7	0.1
			(3.8)	(0.5)		(0.9)	(0.2)
	Panicum	0.2	0.9	2.4	4.3	0.8	0
		(0.4)	(1.7)	(3.2)	(2.8)	(1.0)	
	Paspalum	0.6	0	0	18.3	32.2	0
		(1.2)			(5.8)	(5.6)	
	Schizachyrium	0.1	0	0.3	0.5	1.2	0
		(0.2)		(0.4)	(0.9)	(1.4)	
	Setaria	1.8	1.0	0.4	0.6	0.7	0
		(2.1)	(1.8)	(0.6)	(1.0)	(0.9)	
	Sorghastrum	0.8	0	0.2	0	0	0
		(1.0)	0	(0.4)	0	0	0
	Sorghum	0.5	0	0	2.2	1.9	0.9
		(0.7)			(2.6)	(1.8)	(1.8)
	Sporobolus	0	0	1.7	3.8	1.0	0.5
				(1.5)	(3.1)	(1.2)	(0.7)
	Tridens	0.6	2.1	0	0.3	0.1	0
		(.9)	(3.6)		(0.5)	(0.2)	
	Urochloa	0	0	0	0	0.8	0
						(1.3)	
FORBS-LEGUME	*Astragalus*	0	0	0	0	0	0.1
							(0.1)
	Coronilla	0	0.8	0	0	0	0
			(1.5)				
	Kummerowia	0	0	0.8	0.7	0.8	0
				(1.1)	(0.9)	(1.5)	
	Lotus	4.9	0	0	0	0.3	2.4
		(6.8)				(0.7)	(4.8)
	Medicago	0.9	2.5	12.6	0	0.3	3.6
		(.9)	(4.9)	(7.6)		(.5)	(3.9)
	Melilotus	0	0	1.9	0.8	0	0
				(2.6)	(1.6)	0	0
	Trifolium	19.8	22.4	2.5	3.1	15.7	8.7
		(5.6)	(9.3)	(2.2)	(1.7)	(3.5)	(6.7)
	Vicia	0	0	0	0.2	0.7	0
					(0.3)	(1.)	
FORBS-NON-LEGUME	*Amaranthus*	0	0	0	0.2	0.1	0.5

				(0.4)	(0.2)	(1.0)
Ambrosia	1.2 (1.4)	0	0.5 (0.7)	0.8 (1.0)	0.8 (0.7)	0
Amphiachyris	0	0	0	0.2 (0.4)	0	0
Bassia	0	0	1.1 (2.2)	0	0	0.1 (0.2)
Carex	2.1 (2.3)	11.8 (9.3)	2.1 (1.5)	2.0 (1.5)	2.0 (1.5)	2.4 (2.8)
Centaurea	0.2 (0.4)	0.9 (1.9)	0	0	0.3 (0.5)	0.8 (1.7)
Cerastium	0.4 (0.7)	0 0	0 0	0 0	0 0	0 0
Cichorium	0	1.7 (3.3)	0	0	0	0
Cirsium	0.0 (0.1)	0	0	0	0	0.3 (0.6)
Convolvulus	0	0	0.3 (0.5)	0	0	4.1 (3.9)
Crepis	0	0	0	0	0	1.5 (2.9)
Croton	0	0	0	1.0 (1.4)	0	0
Cruciata	0	1.8 (3.6)	0	0	0	0
Cuscuta	0.0 (0.1)	0	0	0	0	0
Daucus	0.5 (1.0)	0	0	0	0	0.4 (0.8)
Descurainia	0	0	0	0	0	0.9 (1.3)
Dyssodia	0 0	1.7 (3.3)	0	0	0	0
Erodium	0	0	0.5 (1.0)	0 0	0 0	0.9 (1.3)
Euphorbia	0.1 (.2)	0	0.5 (1.0)	0.1 (.2)	0	0
Evax	0	0	0	1.1 (2.2)	0	0
Galium	0	3.3 (5.1)	0	0	0.3 (0.6)	0
Hymenoxys	0	0	0	1.2 (1.7)	0	0

Hypochaeris	0	0	0	0	0	1.9 (3.8)
Impatiens	0.2 (0.4)	0	0	0	0	0
Lamium	0.2 (0.4)	0.7 (1.4)	0	0	0	0
Linum	0	0	0	0	0	0.9 (1.8)
Mollugo	0	1.3 (2.5)	0	0	0	0
Monarda	0	0	0	1.0 (2.1)	0	0
Pastinaca	0.6 (1.2)	0	0	0	0	0
Perilla	0	0	0	0.3 (0.5)	0	0
Plantago	0.5 (0.7)	2.7 (3.0)	0	0	2.5 (2.)	6.5 (7.1)
Polygonum	1.2 (1.5)	0 0	0.2 (0.4)	0	0.7 (0.7)	0
Potentilla	0	3.1 (4.6)	0	0	0	1.9 (3.8)
Rubus	0.5 (0.8)	1.8 (3.6)	0	0.3 (0.5)	1.6 (2.0)	0
Salsola	0	0	0.3 (0.6)	0	0	4.4 (5.4)
Smilax	0	0	0	0.2 (0.3)	0	0
Solidago	1.8 (2.0)	9.1 (7.0)	0	0	0.4 (0.5)	0
Stellaria	0.3 (0.5)	0	0	0	0	0
Taraxacum	2.0 (2.5)	0.3 (0.6)	0.7 (0.7)	0	0	0.3 (0.6)
Thelesperma	0	0	0	0.2 (0.4)	0 0	0 0
Thelypodiopsis	0	0	0	0	0	1.9 (2.9)
Verbena	0	0	0	0.2 (0.4)	0.4 (0.8)	0

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 7 – Average biomass (lbs/ac) for funcitonal groups on all non-Federal pastureland, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Margins of error in parentheses.

FUNCTIONAL GROUP	REGION					
	Midwest	**Northeast**	**Northern Plains**	**South Central**	**Southeast**	**West**
	lbs/ac	*lbs/ac*	*lbs/ac*	*lbs/ac*	*lbs/ac*	*lbs/ac*
FORBS-LEGUME	289.8	253.1	152.0	83.4	212.0	139.6
	(44.2)	(70.0)	(47.5)	(24.5)	(29.9)	(58.9)
FORBS-NON-LEGUME	363.7	810.3	189.7	237.8	324.2	310.5
	(53.5)	(125.1)	(35.3)	(46.4)	(34.2)	(91.6)
C3 GRASSES	1,632.2	1,285.2	1,398.5	283.0	708.5	1,252.1
	(105.9)	(172.6)	(212.7)	(225.9)	(239.7)	(308.3)
C4 GRASSES	230.5	125.5	148.3	1,299.4	771.4	27.0
	(45.4)	(72.2)	(89.7)	(128.4)	(145.9)	(147.9)

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 8 – *Average biomass (lbs/ac) for functional groups on grazed and rainfed (not irrigated) non-Federal pastureland, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Margins of error in parentheses.*

FUNCTIONAL GROUP	**REGION**					
	Midwest	**Northeast**	**Northern Plains**	**South Central**	**Southeast**	**West**
	lbs/ac	*lbs/ac*	*lbs/ac*	*lbs/ac*	*lbs/ac*	*lbs/ac*
FORBS-LEGUME	293.4	325.4	147.0	87.1	210.2	42.9
	(45.0)	(120.7)	(52.6)	(23.8)	(39.6)	(26.5)
FORBS-NON-LEGUME	326.2	652.9	179.1	255.9	297.2	355.8
	(62.6)	(236.6)	(38.3)	(52.5)	(34.7)	(184.0)
C3 GRASSES	1,573.5	1,239.0	1,483.2	271.5	626.1	1,299.5
	(123.4)	(281.2)	(316.5)	(323.5)	(338.6)	(383.4)
C4 GRASSES	266.3	244.2	155.8	1,269.3	799.1	13.5
	(64.1)	(154.2)	(165.2)	(192.3)	(218.1)	(218.7)

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 9 - Non-Federal pastureland with resource concerns, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Margins of error in parentheses.

		Region					
Resource	**Resource Concern**	**Midwest**	**Northeast**	**Northern Plains**	**South Central**	**Southeast**	**West**
		Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Soil	Erosion - sheet and rill	15.0 (5.0)	9.3 (6.7)	5.6 (2.9)	14.2 (5.1)	14.2 (3.8)	2.3 (2.0)
	Erosion - wind	0.1 (0.1)	1.3 (2.7)	0.8 (1.0)	0.6 (0.8)	0.7 (1.3)	1.3 (1.5)
	Erosion - classic gully	9.1 (3.6)	5.1 (5.6)	5.0 (3.0)	8.2 (4.3)	7.9 (3.7)	7.6 (9.6)
	Erosion - streambank	7.4 (3.3)	7.3 (6.3)	4.8 (4.3)	7.5 (3.5)	5.0 (2.2)	14.5 (7.7)
	Erosion - shoreline	4.7 (3.)	1.4 (2.7)	1.7 (2.0)	3.4 (2.4)	1.6 (1.5)	5.3 (5.7)
	Erosion - mass movement	3.6 (2.9)	3.3 (3.8)	0.6 (1.2)	2.5 (2.4)	0.6 (0.6)	1.9 (3.8)
	Condition - organic matter depletion	24.7 (5.7)	15.6 (7.6)	3.4 (2.4)	26.6 (8.0)	19.4 (4.8)	9.4 (6.0)
	Condition - compaction	34.6 (7.6)	22.6 (9.8)	14.8 (6.5)	24.5 (6.2)	28.7 (3.5)	36.8 (11.6)
	Condition - damage from soil deposition	2.4 (2.6)	2.5 (3.1)	1.6 (1.2)	3.0 (1.7)	1.9 (1.8)	4.2 (5.0)
	Quantity - excessive runoff flooding pond	9.7 (4.8)	5.6 (5.4)	6.3 (3.2)	10.7 (4.7)	5.4 (2.1)	10.6 (6.8)
	Quantity - Reduced Storage of Waterbodies by Sediment Accumulation	6.0 (3.2)	0 (NA)	3.6 (2.8)	4.0 (1.9)	1.9 (1.3)	1.9 (3.8)
Water	Quantity - Insufficient	1.5 (1.5)	1.3 (2.3)	1.0 (0.9)	5.4 (2.9)	0.8 (0.7)	7.7 (5.6)

	Flows in Water Courses						
	Quality - Excessive Nutrients and Organics in Surface Water	8.7	1.7	1.4	2.0	9.3	9.0
		(3.3)	(2.8)	(1.2)	(1.2)	(2.7)	(7.0)
	Quality – Excessive Suspended Sediment and Turbidity in Surface Water	8.0	0.4	1.6	4.4	6.8	7.2
		(4.0)	(0.5)	(1.5)	(1.7)	(3.0)	(5.8)
Plant	Condition - plant not adapted or suited	9.2	12.7	4.3	9.2	8.5	17.5
		(4.2)	(5.3)	(2.7)	(3.9)	(3.1)	(9.6)
	Condition - productivity health and vigor	45.4	35.7	19.2	36.0	35.1	45.1
		(8.)	(11.5)	(5.2)	(6.7)	(5.3)	(13.2)
	Condition - noxious and invasive plants	54.7	45.9	57.1	38.4	43.0	66.9
		(7.2)	(11.2)	(8.3)	(6.4)	(5.4)	(11.8)
	Condition - forage quality palatability	49.7	44.6	10.2	25.2	40.5	43.6
		(7.2)	(9.6)	(3.8)	(5.3)	(6.1)	(12.6)
	Condition - wildfire hazard	5.0	0.9	2.1	6.5	1.1	13.0
		(3.4)	(1.8)	(1.8)	(4.5)	(1.3)	(8.4)
Animals	Domestic animal - inadequate stock water	54.1	44.7	15.7	25.2	43.0	14.4
		(6.8)	(14.4)	(7.2)	(7.0)	(6.1)	(7.1)

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

Table 10 - Non-Federal pastureland where conservation practices are applied or needed, by region (Midwest, Northeast, Northern Plains, South Central, Southeast, and West). Margins of error in parentheses.

Conservation Practice	Region					
	Midwest	**Northeast**	**Northern Plains**	**South Central**	**Southeast**	**West**
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Brush Management (Applied)	18.0	23.7	4.8	43.0	19.7	5.5
	(4.8)	(12.8)	(2.7)	(6.9)	(4.5)	(4.4)
Brush Management (Needed)	23.7	29.8	7.8	13.6	17.0	5.8
	(7.1)	(12.)	(4.4)	(5.6)	(4.3)	(5.8)
Prescribed Burning (Applied)	1.0	0.6	0.7	1.8	3.2	0.3
	(1.2)	(1.2)	(1.4)	(1.8)	(2.8)	(0.7)
Prescribed Burning (Needed)	10.3	2.7	13.6	21.7	4.1	8.6
	(5.)	(3.9)	(6.7)	(5.4)	(2.2)	(7.4)
Pond (Applied)	27.3	7.7	33.2	47.1	32.3	4.9
	(5.6)	(8.2)	(5.)	(8.5)	(5.4)	(4.4)
Pond (Needed)	9.5	6.7	3.5	16.3	8.3	4.0
	(5.1)	(9.2)	(3.1)	(5.3)	(3.5)	(4.7)
Windbreak/Shelterbelt Establishment (Applied)	2.1	4.5	5.8	1.9	1.2	9.8
	(1.8)	(5.3)	(3.7)	(1.5)	(1.1)	(6.8)
Windbreak/Shelterbelt Establishment (Needed)	1.6	1.3	0.7	0.5	0.3	2.9
	(1.8)	(2.3)	(0.9)	(.4)	(0.5)	(4.7)
Fence (Applied)	59.2	42.9	60.5	70.3	63.9	57.7
	(7.4)	(10.2)	(9.7)	(5.9)	(5.3)	(11.)
Fence (Needed)	22.7	31.0	15.4	18.2	18.1	18.1
	(6.8)	(11.5)	(8.1)	(5.4)	(3.6)	(7.9)
Riparian Herbaceous Cover (Applied)	5.3	12.8	9.2	8.2	12.8	32.2
	(4.3)	(7.7)	(5.4)	(3.)	(3.4)	(9.8)
Riparian Herbaceous Cover (Needed)	1.8	2.8	1.2	6.9	5.4	4.2
	(1.7)	(3.9)	(1.5)	(4.3)	(2.4)	(5.1)
Filter Strip (Applied)	2.0	4.0	1.9	1.4	3.0	1.4
	(1.4)	(4.9)	(2.4)	(1.3)	(1.7)	(1.8)
Filter Strip (Needed)	0.9	4.4	0.2	2.2	2.7	7.1

	(0.9)	(5.2)	(0.3)	(2.1)	(1.7)	(5.8)
Irrigation Water Management (Applied)	0	0.9	10.6	1.9	1.4	24.0
		(1.3)	(5.4)	(2.)	(1.4)	(12.4)
Irrigation Water Management (Needed)	0.4	4.4	1.9	1.3	0.3	20.2
	(0.8)	(5.5)	(1.5)	(1.7)	(0.7)	(9.0)
Forage and Biomass Planting (Applied)	24.1	17.3	39.6	39.4	17.2	16.8
	(6.3)	(9.8)	(8.0)	(6.8)	(4.3)	(9.8)
Forage and Biomass Planting Needed)	31.4	34.2	2.7	13.5	22.2	29.6
	(7.2)	(10.8)	(1.8)	(6.2)	(3.9)	(11.3)
Pipeline (Applied)	10.2	4.4	4.2	13.3	6.8	11.1
	(3.2)	(4.2)	(2.9)	(6.2)	(3.2)	(6.7)
Pipeline (Needed)	44.7	25.2	1.8	22.3	38.1	17.5
	(8.9)	(10.9)	(2.6)	(6.7)	(6.1)	(8.1)
Prescribed Grazing (Applied)	20.6	12.3	34.8	46.4	25.1	22.1
	(7.2)	(8.8)	(7.7)	(7.4)	(7.)	(9.9)
Prescribed Grazing (Needed)	58.5	51.4	37.3	34.2	46.4	39.7
	(9.1)	(12.)	(8.8)	(6.5)	(6.7)	(9.3)
Grazing Land Mechanical Treatment (Applied)	8.2	9.2	7.2	16.6	11.4	15.4
	(3.7)	(5.1)	(3.2)	(4.6)	(5.7)	(10.6)
Grazing Land Mechanical Treatment (Needed)	4.1	15.9	2.1	5.1	12.7	9.8
	(2.6)	(8.2)	(1.8)	(3.0)	(4.5)	(6.7)
Spring Development (Applied)	2.0	5.9	0	1.6	1.7	1.0
	(3.3)	(5.4)		(2.2)	(1.7)	(1.5)
Spring Development (Needed)	1.9	15.2	2.2	5.8	2.0	8.4
	(1.5)	(7.6)	(2.9)	(3.6)	(1.8)	(6.3)
Animal Trails and Walkways (Applied)	6.9	10.2	3.0	1.0	8.5	20.8
	(3.9)	(7.0)	(2.1)	(1.2)	(2.9)	(9.1)
Animal Trails and Walkways (Needed)	6.7	14.6	1.3	2.8	3.3	9.9
	(4.1)	(8.5)	(1.2)	(2.6)	(2.2)	(6.5)
Watering Facility (Applied)	21.0	10.8	14.4	30.0	15.9	31.9
	(5.2)	(6.4)	(5.4)	(7.0)	(5.3)	(14.0)
Watering Facility (Needed)	50.5	47.8	19.3	25.5	46.8	30.5
	(8.8)	(9.9)	(8.5)	(6.9)	(5.7)	(9.4)
Water Well (Applied)	10.2	11.0	3.7	20.2	10.2	14.2

	(3.6)	(6.6)	(2.7)	(5.2)	(3.8)	(9.6)
Water Well (Needed)	25.8	13.7	7.9	25.2	22.3	8.3
	(7.2)	(9.0)	(5.2)	(7.0)	(4.2)	(6.0)
Forest Stand Improvement (Applied)	2.0	2.8	0.9	0.4	1.0	0.6
	(1.9)	(3.8)	(1.7)	(0.5)	(1.1)	(1.2)
Forest Stand Improvement (Needed)	9.2	5.6	0.6	3.5	2.7	2.2
	(4.3)	(5.0)	(0.8)	(2.3)	(2.0)	(3.8)

*Estimates in red have a large margin of error in relation to the estimate. They are usually based on very few observations. The lower bound of the confidence interval may also be inappropriately negative.

More Information

USDA-NRCS. (2018). *NRI Grazing Land On-Site Data Collection Handbook of Instructions.* https://grazingland.cssm.iastate.edu/site-data-collection-handbook-instructions.

Appendix A. Definition of Regions

NRI pastureland on-site data have been collected since 2013. These data are aggregated by region to provide estimates. Note that Alaska and Hawaii are not included among the regions in this report. The six regions are:

Midwest - Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin

Northeast -Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia

Northern Plains - Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming

South Central -Arkansas, Louisiana, Oklahoma, and Texas

South East -Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia

West -Arizona, California, Idaho, Nevada, New Mexico, Oregon, Utah, and Washington

Appendix B. Observed Plants by Plant Functional Group and Region

Leguminous Forbs

Leguminous forbs observed (1=observed, 0=not observed) on non-Federal pasturelands during 2013-2016 by region (MW=Midwest, NE=Northeast, NP=Northern Plains, SC=South Central, SE=Southeast, W=West).

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ACACI	1	0	0	0	0	0	Acacia	acacia
AESCH	0	0	0	0	1	0	Aeschynomene	jointvetch
ALOV	1	0	0	0	0	0	Alysicarpus ovalifolius	alyce clover
ALYSI	0	1	0	0	0	0	Alysicarpus	moneywort
ASCH4	0	0	1	0	0	0	Astragalus chamaeleuce	cicada milkvetch
ASCR2	0	0	1	0	0	0	Astragalus crassicarpus	groundplum milkvetch
ASGR3	0	0	1	0	0	0	Astragalus gracilis	slender milkvetch
ASLA27	0	0	1	0	0	0	Astragalus laxmannii	Laxmann's milkvetch
ASNU4	0	0	0	0	0	1	Astragalus nuttallianus	smallflowered milkvetch
ASTRA	0	0	1	0	0	1	Astragalus	milkvetch
BAPTI	0	0	0	1	0	0	Baptisia	wild indigo
BATI	1	0	0	0	0	0	Baptisia tinctoria	horseflyweed
CENTR2	0	0	0	0	1	0	Centrosema	butterfly pea
CHFA2	1	0	1	0	1	0	Chamaecrista fasciculata	partridge pea
CLMA4	0	0	0	0	1	0	Clitoria mariana	Atlantic pigeonwings
CORON	1	1	0	0	0	0	Coronilla	crownvetch
CRSP2	0	0	0	0	1	0	Crotalaria spectabilis	showy rattlebox
CULLE	0	0	0	1	0	0	Cullen	scurfpea
DALEA	0	0	0	1	0	0	Dalea	prairie clover
DECA7	1	0	0	0	0	0	Desmodium canadense	showy ticktrefoil
DECA8	1	0	0	0	0	0	Desmodium canescens	hoary ticktrefoil
DEGL5	1	0	0	0	0	0	Desmodium glutinosum	pointedleaf ticktrefoil
DEIL2	1	0	1	0	0	0	Desmodium illinoense	Illinois ticktrefoil
DELA2	1	0	0	0	1	0	Desmodium laevigatum	smooth ticktrefoil
DESMA	0	0	0	1	0	0	Desmanthus	bundleflower
DESMO	1	0	0	1	1	0	Desmodium	ticktrefoil
GALAC	0	0	0	0	1	0	Galactia	milkpea
GLLE3	0	0	1	0	0	0	Glycyrrhiza lepidota	American licorice
GLMA4	1	1	0	0	1	0	Glycine max	soybean
INDIG	1	0	0	0	1	0	Indigofera	indigo
KUST	1	1	1	1	1	0	Kummerowia stipulacea	Korean clover
KUST2	1	0	1	1	1	0	Kummerowia striata	Japanese clover
LAHI2	0	0	0	0	1	0	Lathyrus hirsutus	Caley pea
LALA4	0	0	0	0	0	1	Lathyrus latifolius	perennial pea

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
LASY	0	0	0	0	1	0	Lathyrus sylvestris	flat pea
LECA8	1	0	0	0	0	0	Lespedeza capitata	roundhead lespedeza
LEPR	0	0	1	1	1	0	Lespedeza procumbens	trailing lespedeza
LESPE	1	1	0	1	1	0	Lespedeza	lespedeza
LEST5	0	0	0	0	1	0	Lespedeza stuevei	tall lespedeza
LEVI7	1	0	0	1	0	0	Lespedeza virginica	slender lespedeza
LOCO6	1	1	0	0	1	1	Lotus corniculatus	bird's-foot trefoil
LOPE80	0	0	0	0	0	1	Lotus pedunculatus	big trefoil
LOSA	0	0	0	0	1	0	Lotus salsuginosus	coastal bird's-foot trefoil
LOTUS	1	1	0	0	0	0	Lotus	trefoil
LOUN	0	0	1	0	0	1	Lotus unifoliolatus	American bird's-foot trefoil
LUCA	0	0	0	0	0	1	Lupinus caudatus	tailcup lupine
LUPIN	0	1	0	0	0	0	Lupinus	lupine
LUSU	0	0	0	1	0	0	Lupinus subcarnosus	Texas bluebonnet
MEAL3	1	0	0	0	0	0	Melilotus altissimus	tall yellow sweetclover
MEDIC	1	1	1	0	1	1	Medicago	alfalfa
MEIN2	1	0	0	0	0	0	Melilotus indicus	annual yellow sweetclover
MELIL	1	1	1	1	1	1	Melilotus	sweetclover
MELU	1	1	1	1	1	1	Medicago lupulina	black medick
MEMO10	1	0	0	0	1	0	Medicago monantha	medick
MEOF	1	0	1	1	1	1	Melilotus officinalis	sweetclover
MEPO3	0	0	1	1	0	1	Medicago polymorpha	burclover
MESA	1	1	1	0	1	1	Medicago sativa	alfalfa
MIHY2	0	0	0	1	0	0	Mimosa hystricina	porcupine mimosa
MIMI22	0	0	0	1	1	0	Mimosa microphylla	littleleaf sensitive-briar
MIMOS	1	0	0	1	0	0	Mimosa	sensitive plant
MINU6	0	0	0	1	0	0	Mimosa nuttallii	Nuttall's sensitive-briar
NELU2	0	0	0	1	0	0	Neptunia lutea	yellow puff
ORNIT2	1	0	0	0	0	0	Ornithopus	bird's-foot
OXLA3	0	0	1	0	0	0	Oxytropis lambertii	purple locoweed
PEAR6	1	0	1	0	0	0	Pediomelum argophyllum	silverleaf Indian breadroot
PHASE	0	0	0	0	1	0	Phaseolus	bean
PSTE5	0	0	1	0	0	0	Psoralidium tenuiflorum	slimflower scurfpea
PUERA	0	0	0	0	1	0	Pueraria	kudzu
RHRE	0	0	0	0	1	0	Rhynchosia reniformis	dollarleaf
SEOB4	0	0	0	0	1	0	Senna obtusifolia	Java-bean

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
STBI2	0	0	0	0	1	0	Stylosanthes biflora	
STHE9	0	0	0	1	0	0	Strophostyles helvola	amberique-bean
STROP	0	0	1	1	0	0	Strophostyles	fuzzybean
STYLO4	1	0	0	0	1	0	Stylosanthes	pencilflower
TRAR4	1	1	0	0	1	0	Trifolium arvense	rabbitfoot clover
TRAU2	1	1	0	0	0	0	Trifolium aureum	golden clover
TRCA5	1	1	0	1	1	0	Trifolium campestre	field clover
TRDU2	1	1	0	1	1	0	Trifolium dubium	suckling clover
TRFR2	0	0	0	0	0	1	Trifolium fragiferum	strawberry clover
TRHI4	0	0	0	1	0	1	Trifolium hirtum	rose clover
TRHY	1	1	1	0	0	1	Trifolium hybridum	alsike clover
TRIFO	1	1	1	1	1	1	Trifolium	clover
TRIN3	0	0	0	1	1	0	Trifolium incarnatum	crimson clover
TRNE3	1	0	0	0	0	0	Trifolium neurophyllum	White Mountain clover
TRNI3	0	0	0	0	1	0	Trifolium nigrescens	small white clover
TRPR2	1	1	1	1	1	1	Trifolium pratense	red clover
TRRE3	1	1	1	1	1	1	Trifolium repens	white clover
TRRE4	0	0	0	1	1	0	Trifolium resupinatum	reversed clover
TRSU3	0	0	0	0	0	1	Trifolium subterraneum	subterranean clover
TRVE	0	0	0	1	0	0	Trifolium vesiculosum	arrowleaf clover
VIAM	0	0	1	0	0	1	Vicia americana	American vetch
VIBE	0	1	0	0	1	0	Vicia benghalensis	purple vetch
VICA2	0	0	0	0	1	0	Vicia caroliniana	Carolina vetch
VICIA	0	1	0	1	1	1	Vicia	vetch
VICR	0	0	1	0	0	0	Vicia cracca	bird vetch
VIGNA	0	0	0	0	1	0	Vigna	cowpea
VILU	0	0	0	1	0	0	Vicia ludoviciana	Louisiana vetch
VISA	0	1	0	1	1	1	Vicia sativa	garden vetch
VIVI	1	0	0	1	1	0	Vicia villosa	winter vetch

Non-leguminous Forbs

Non-leguminous forbs observed (1=observed, 0=not observed) on non-Federal pasturelands during 2013-2016 by region (MW=Midwest, NE=Northeast, NP=Northern Plains, SC=South Central, SE=Southeast, W=West).

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ABRON	0	0	0	1	0	0	Abronia	sand verbena
ABTH	0	1	0	1	0	0	Abutilon theophrasti	velvetleaf
ACAG	1	1	1	1	1	0	Achillea ageratifolia	yarrow
ACALY	1	1	0	0	1	0	Acalypha	copperleaf
ACGR2	0	0	0	0	1	0	Acalypha gracilens	slender threeseed mercury
ACHIL	1	1	1	1	1	1	Achillea	yarrow
ACMI2	1	0	1	1	1	1	Achillea millefolium	common yarrow
ACORU	0	1	0	0	0	0	Acorus	sweetflag
ACRH	0	0	0	0	1	0	Acalypha rhomboidea	common threeseed mercury
ACVI	0	0	0	1	1	0	Acalypha virginica	Virginia threeseed mercury
ADONI	0	0	0	0	0	1	Adonis	pheasant's eye
ADVI	0	0	0	1	0	0	Adiantum villosum	woolly maidenhair
AGAL5	1	0	0	0	1	0	Ageratina altissima	white snakeroot
AGALI	0	0	0	0	1	0	Agalinis	false foxglove
AGERA2	1	0	0	0	0	0	Ageratina	snakeroot
AGGL	0	0	1	0	0	0	Agoseris glauca	pale agoseris
AGGR2	1	0	0	0	1	0	Agrimonia gryposepala	tall hairy agrimony
AGPA6	1	0	0	0	0	0	Agrimonia parviflora	harvestlice
AGPU	1	0	0	0	0	0	Agrimonia pubescens	soft agrimony
AGRIM	1	0	0	0	0	0	Agrimonia	agrimony
AGROS	0	1	0	0	0	0	Agrostemma	corncockle
AGST	1	0	0	0	0	0	Agrimonia striata	roadside agrimony
AJRE	1	0	0	0	0	0	Ajuga reptans	common bugle
AJUGA	0	1	0	0	0	0	Ajuga	bugle
ALAL3	0	0	1	0	0	0	Alyssum alyssoides	pale madwort
ALAS2	1	0	0	0	1	0	Allium ascalonicum	wild onion
ALCHE	0	0	0	0	1	0	Alchemilla	lady's mantle
ALDE	0	0	1	0	0	0	Alyssum desertorum	desert madwort
ALISM	1	0	0	0	0	0	Alisma	water plantain
ALLIU	0	1	0	0	1	0	Allium	onion
ALPE4	1	0	0	0	0	0	Alliaria petiolata	garlic mustard
ALPH	0	0	0	1	1	0	Alternanthera philoxeroides	alligatorweed
ALTER2	0	1	0	0	0	0	Alternanthera	joyweed
ALVI	1	1	0	0	1	0	Allium vineale	wild garlic

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ALYSS	0	0	1	0	0	0	Alyssum	madwort
AMAL	1	0	0	0	1	0	Amaranthus albus	prostrate pigweed
AMAR2	1	1	1	1	1	0	Ambrosia artemisiifolia	annual ragweed
AMARA	1	1	1	1	1	1	Amaranthus	pigweed
AMBI2	1	0	1	1	1	0	Ambrosia bidentata	lanceleaf ragweed
AMBRO	1	1	1	1	1	1	Ambrosia	ragweed
AMDR	0	0	1	1	0	0	Amphiachyris dracunculoides	prairie broomweed
AMGR5	0	0	1	0	0	0	Ambrosia grayi	woollyleaf bur ragweed
AMHY	1	0	0	0	0	0	Amaranthus hybridus	slim amaranth
AMPA	0	0	1	0	0	0	Amaranthus palmeri	carelessweed
AMPHI8	0	0	0	1	0	0	Amphiachyris	broomweed
AMPS	0	0	1	1	0	0	Ambrosia psilostachya	Cuman ragweed
AMRE	1	0	1	1	1	0	Amaranthus retroflexus	redroot amaranth
AMSP	1	1	0	1	1	0	Amaranthus spinosus	spiny amaranth
ANBL2	0	0	0	1	0	0	Anemone blanda	Greek thimbleweed
ANCA8	1	0	1	0	0	0	Anemone canadensis	Canadian anemone
ANCO2	0	0	0	1	1	0	Anthemis cotula	stinking chamomile
ANCY	1	0	0	0	0	0	Anemone cylindrica	candle anemone
ANEMO	1	0	0	0	0	0	Anemone	anemone
ANLI8	1	0	0	0	0	0	Antrophyum lineatum	narrow lineleaf fern
ANNE	1	0	1	0	0	0	Antennaria neglecta	field pussytoes
ANSY	0	1	0	0	0	0	Anthriscus sylvestris	wild chervil
ANTEN	1	0	1	0	0	0	Antennaria	pussytoes
ANTHE	0	0	0	0	1	0	Anthemis	chamomile
ANVI3	0	0	0	1	0	0	Anemone virginiana	tall thimbleweed
APCA	1	1	1	1	1	0	Apocynum cannabinum	Indianhemp
APHAN3	0	0	0	1	0	0	Aphanostephus	dozedaisy
APOCY	1	1	1	0	1	0	Apocynum	dogbane
APRA	0	0	0	1	0	0	Aphanostephus ramosissimus	plains dozedaisy
APSK	0	0	0	1	0	0	Aphanostephus skirrhobasis	Arkansas dozedaisy
ARBI2	0	0	1	0	0	0	Artemisia biennis	biennial wormwood
ARBU	0	1	0	0	0	0	Arethusa bulbosa	dragon's mouth
ARCH3	0	0	1	0	0	0	Arnica chamissonis	Chamisso arnica
ARCTI	1	1	0	0	1	1	Arctium	burdock
ARENA	0	0	1	0	0	0	Arenaria	sandwort
ARGYT	0	0	0	1	0	0	Argythamnia	silverbush
ARHI	1	0	0	0	0	0	Arabis hirsuta	hairy rockcress

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ARLA3	1	0	0	0	0	0	Arctium lappa	greater burdock
ARMI2	0	0	0	0	1	0	Arctium minus	lesser burdock
ARTEM	0	1	0	0	0	0	Artemisia	sagebrush
ASCLE	1	1	1	1	1	1	Asclepias	milkweed
ASEX	0	0	0	0	1	0	Asclepias exaltata	poke milkweed
ASIN	1	0	0	0	0	0	Asclepias incarnata	swamp milkweed
ASOV	1	1	0	0	0	0	Asclepias ovalifolia	oval-leaf milkweed
ASPAR	0	0	0	0	1	0	Asparagus	asparagus
ASSP	0	0	1	0	0	1	Asclepias speciosa	showy milkweed
ASSY	1	1	1	0	1	0	Asclepias syriaca	common milkweed
ASTER	1	1	1	1	1	1	Aster	aster
ASTU	1	0	0	1	1	0	Asclepias tuberosa	butterfly milkweed
ASVE	1	0	0	0	0	0	Asclepias verticillata	whorled milkweed
ASVI	0	0	0	1	0	0	Asclepias viridiflora	green comet milkweed
ASVI2	0	0	1	0	0	0	Asclepias viridis	green antelopehorn
ATFI	0	0	0	0	1	0	Athyrium filix-femina	common ladyfern
ATHYR	0	0	0	0	1	0	Athyrium	ladyfern
ATRIP	0	0	1	0	0	0	Atriplex	saltbush
BAHIA	0	0	0	0	1	0	Bahia	bahia
BAHO	0	0	0	0	0	1	Balsamorhiza hookeri	Hooker's balsamroot
BAHOL	0	0	0	0	1	0	Balsamorhiza hookeri var. lagocephala	rabbithead balsamroot
BALLO	0	0	0	1	0	0	Ballota	horehound
BAOR	1	0	0	0	0	0	Barbarea orthoceras	American yellowrocket
BARBA	1	1	0	0	1	0	Barbarea	yellowrocket
BASC5	0	0	1	0	0	1	Bassia scoparia	burningbush
BASSI	0	0	1	0	0	0	Bassia	smotherweed
BEIN2	1	0	0	0	0	0	Berteroa incana	hoary alyssum
BIAL	0	0	0	0	1	0	Bidens alba	romerillo
BIBI7	0	0	0	0	1	0	Bidens bipinnata	Spanish needles
BICO	1	0	0	0	0	0	Bidens coronata	crowned beggarticks
BIDEN	1	1	1	0	1	0	Bidens	beggarticks
BIFR	0	0	0	1	1	0	Bidens frondosa	devil's beggartick
BIPI	1	0	0	0	0	0	Bidens pilosa	hairy beggarticks
BRAR	0	0	0	1	0	0	Brazoria arenaria	sand Brazos-mint
BRASS2	1	0	1	1	1	1	Brassica	mustard
BRJU	1	0	0	0	0	0	Brassica juncea	brown mustard
BRNA	1	0	0	0	0	0	Brassica napus	rape
BRNI	1	0	1	0	0	0	Brassica nigra	black mustard
BROME	0	0	1	1	1	0	Bromelia	bromelia
BUAM	0	0	0	0	1	0	Buchnera americana	American bluehearts
BUAR3	0	1	0	0	0	0	Buglossoides arvensis	corn gromwell

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
CAAC	1	0	0	0	0	0	Carduus acanthoides	spiny plumeless thistle
CABU2	1	1	0	0	1	0	Capsella bursa-pastoris	shepherd's purse
CACA	0	0	0	1	0	0	Cabomba caroliniana	Carolina fanwort
CACA19	1	0	0	0	0	0	Carum carvi	caraway
CADI2	0	0	0	1	0	0	Callirhoe digitata	winecup
CADR	1	0	1	0	0	1	Cardaria draba	whitetop
CAHI3	0	0	0	0	1	0	Cardamine hirsuta	hairy bittercress
CAIN2	0	0	0	1	0	0	Callirhoe involucrata	purple poppymallow
CALYL	0	0	0	1	0	0	Calylophus	sundrops
CALYS	1	0	0	0	1	0	Calystegia	false bindweed
CAMEL	1	0	0	0	0	0	Camelina	false flax
CANNA	1	0	0	1	0	0	Cannabis	hemp
CANU4	1	0	1	1	1	1	Carduus nutans	nodding plumeless thistle
CARDU	1	0	0	0	0	0	Carduus	plumeless thistle
CAREX	1	1	1	1	1	1	Carex	sedge
CASA3	0	0	1	0	0	0	Cannabis sativa	marijuana
CASE13	0	0	0	0	1	0	Calystegia sepium	hedge false bindweed
CASTI2	0	1	0	1	0	0	Castilleja	Indian paintbrush
CAULO	1	0	0	0	0	0	Caulophyllum	cohosh
CAVI2	0	0	0	1	0	0	Calyptocarpus vialis	straggler daisy
CEAR4	0	0	0	0	1	0	Cerastium arvense	field chickweed
CEAS	0	0	0	1	1	0	Centella asiatica	spadeleaf
CEBE2	0	1	0	0	0	0	Cerastium beeringianum	Bering chickweed
CEDI3	0	0	1	0	0	1	Centaurea diffusa	diffuse knapweed
CEER2	0	0	0	1	0	0	Centella erecta	erect centella
CEFO2	0	0	0	0	1	0	Cerastium fontanum	common mouse-ear chickweed
CEGL2	0	0	0	1	0	0	Cerastium glomeratum	sticky chickweed
CENTA	0	1	0	0	1	0	Centaurea	knapweed
CENTE	0	0	0	1	0	0	Centella	centella
CENTI	0	0	0	0	1	0	Centipeda	centipeda
CERAS	1	1	1	0	1	0	Cerastium	mouse-ear chickweed
CESO3	0	0	0	0	0	1	Centaurea solstitialis	yellow star-thistle
CEST8	1	1	1	0	1	0	Centaurea stoebe	spotted knapweed
CETE5	0	0	0	0	0	1	Ceratocephala testiculata	curveseed butterwort
CHAL7	1	1	1	1	1	1	Chenopodium album	lambsquarters
CHAM	0	0	0	1	1	0	Chenopodium ambrosioides	Mexican tea
CHAMA15	0	0	1	1	1	0	Chamaesyce	sandmat
CHAME2	0	1	0	0	0	0	Chamerion	fireweed

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
CHBE4	0	0	1	0	0	0	Chenopodium berlandieri	pitseed goosefoot
CHENO	0	0	1	0	0	1	Chenopodium	goosefoot
CHFR3	0	0	1	0	0	0	Chenopodium fremontii	Fremont's goosefoot
CHHU3	0	1	0	0	0	0	Chamaesyce humistrata	spreading sandmat
CHHY3	0	0	0	0	1	0	Chamaesyce hyssopifolia	hyssopleaf sandmat
CHJU	0	0	0	0	0	1	Chondrilla juncea	rush skeletonweed
CHMA15	1	0	0	1	1	0	Chamaesyce maculata	spotted sandmat
CHMA17	0	1	1	0	0	0	Chrysanthemum majus	daisy
CHMU2	0	0	1	0	0	0	Chenopodium murale	nettleleaf goosefoot
CHNU9	0	0	0	0	1	0	Chamaesyce nutans	eyebane
CHPR6	1	0	1	0	0	0	Chamaesyce prostrata	prostrate sandmat
CHRYS2	0	1	0	0	1	0	Chrysanthemum	daisy
CHRYS7	0	0	0	1	1	0	Chrysopsis	goldenaster
CHTE2	0	0	0	0	0	1	Chorispora tenella	crossflower
CIAL2	1	0	1	0	0	0	Cirsium altissimum	tall thistle
CIAR4	1	1	1	0	1	1	Cirsium arvense	Canada thistle
CICHO	1	1	1	0	1	1	Cichorium	chicory
CICUT	1	0	0	0	0	0	Cicuta	water hemlock
CIDI	0	0	0	0	1	0	Cirsium discolor	field thistle
CIFL	0	0	1	0	0	0	Cirsium flodmanii	Flodman's thistle
CIIN	1	1	0	1	1	0	Cichorium intybus	chicory
CIMA2	1	0	0	0	0	0	Cicuta maculata	spotted water hemlock
CIRSI	1	1	1	1	1	1	Cirsium	thistle
CITE2	0	0	0	1	0	0	Cirsium texanum	Texas thistle
CIUN	0	0	1	1	0	0	Cirsium undulatum	wavyleaf thistle
CIVU	1	1	0	1	1	1	Cirsium vulgare	bull thistle
CLINO	0	1	0	0	0	0	Clinopodium	clinopodium
CLSE	0	0	0	0	0	1	Cleome serrulata	Rocky Mountain beeplant
CLVU	0	1	0	0	1	0	Clinopodium vulgare	wild basil
CNTE	0	0	0	1	0	0	Cnidoscolus texanus	Texas bullnettle
COAR4	1	1	1	1	1	1	Convolvulus arvensis	field bindweed
COCA5	1	0	1	1	1	0	Conyza canadensis	Canadian horseweed
COCO13	1	1	0	0	1	0	Conoclinium coelestinum	blue mistflower
COCO3	0	0	0	0	1	0	Commelina communis	Asiatic dayflower
CODI5	0	0	0	1	1	0	Commelina diffusa	climbing dayflower
COEQ	0	0	0	1	0	0	Convolvulus equitans	Texas bindweed
COGR5	1	0	0	0	0	0	Coreopsis grandiflora	largeflower tickseed

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
COLA5	1	0	0	1	0	0	Coreopsis lanceolata	lanceleaf tickseed
COLI2	0	0	0	0	0	1	Collomia linearis	tiny trumpet
COMA2	1	0	1	0	1	1	Conium maculatum	poison hemlock
COMME	1	0	0	1	1	0	Commelina	dayflower
CONIU	0	0	0	0	1	0	Conium	poison hemlock
CONVO	1	1	1	1	1	1	Convolvulus	bindweed
CONYZ	1	1	0	1	1	0	Conyza	horseweed
COPA3	0	0	0	0	0	1	Collinsia parviflora	maiden blue eyed Mary
COREO2	1	0	0	0	0	0	Coreopsis	tickseed
CORNU	1	1	0	1	1	0	Cornus	dogwood
COTI3	0	0	1	1	1	0	Coreopsis tinctoria	golden tickseed
COVI3	1	0	0	0	0	0	Commelina virginica	Virginia dayflower
CRAC2	0	0	0	0	0	1	Crepis acuminata	tapertip hawksbeard
CRCA6	1	0	0	1	1	0	Croton capitatus	hogwort
CRCR3	0	1	0	0	1	0	Cryptantha crassisepala	thicksepal cryptantha
CREPI	0	0	0	0	0	1	Crepis	hawksbeard
CRESS	1	0	0	0	0	0	Cressa	alkaliweed
CRMO6	0	0	1	0	0	0	Croton monanthogynus	prairie tea
CROTO	1	0	0	1	1	0	Croton	croton
CRRU3	0	0	1	0	0	1	Crepis runcinata	fiddleleaf hawksbeard
CRSE11	0	0	0	1	0	0	Croton setigerus	dove weed
CRTE4	1	0	1	1	0	0	Croton texensis	Texas croton
CRTI	0	0	0	1	0	0	Crassula tillaea	moss pygmyweed
CRUCI2	1	1	0	1	1	0	Cruciata	bedstraw
CRVE4	1	0	0	0	0	0	Crocus vernus	dutch crocus
CUME	0	0	0	0	1	0	Cucumis melo	cantaloupe
CUPO	1	0	0	0	1	0	Cuscuta polygonorum	smartweed dodder
CUSCU	1	0	1	1	0	0	Cuscuta	dodder
CYANT2	1	1	0	0	1	0	Cyanthillium	ironweed
CYDA3	0	0	0	1	0	0	Cymopterus davisii	Davis' springparsley
CYLA	0	0	1	0	0	0	Cynanchum laeve	honeyvine
CYLE7	0	0	0	0	1	0	Cyclospermum leptophyllum	marsh parsley
CYNAN	0	1	0	0	0	0	Cynanchum	swallow-wort
CYNOG	0	0	0	0	0	1	Cynoglossum	hound's tongue
DACA6	1	1	1	1	1	1	Daucus carota	Queen Anne's lace
DAPU3	0	0	0	1	0	0	Daucus pusillus	American wild carrot
DAST	0	0	0	1	0	0	Datura stramonium	jimsonweed
DAUCU	1	1	0	1	1	0	Daucus	wild carrot

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
DECA	0	0	0	0	1	0	Delphinium californicum	California larkspur
DELPH	0	0	1	0	0	1	Delphinium	larkspur
DENNS	0	1	0	0	0	0	Dennstaedtia	hayscented fern
DEPI	0	0	1	0	1	1	Descurainia pinnata	western tansymustard
DESO2	0	0	1	0	0	1	Descurainia sophia	herb sophia
DIANT	1	0	0	0	0	0	Dianthus	pink
DIAR	1	0	1	1	1	0	Dianthus armeria	Deptford pink
DICA	1	0	0	0	0	0	Dicentra canadensis	squirrel corn
DICA3	0	0	0	1	0	0	Dichondra carolinensis	Carolina ponysfoot
DICHO	1	0	0	1	1	0	Dichondra	ponysfoot
DICI3	0	0	0	1	0	0	Dichromanthus cinnabarinus	scarlet lady's tresses
DIODI	0	1	0	1	1	0	Diodia	buttonweed
DIPSA	1	0	0	0	0	1	Dipsacus	teasel
DITE2	1	0	0	1	1	0	Diodia teres	poorjoe
DIVI4	0	0	0	0	1	0	Dioscorea villosa	wild yam
DRABA	0	0	1	0	0	0	Draba	draba
DROSE	0	0	0	0	1	0	Drosera	sundew
DRYOP	0	1	0	0	0	0	Dryopteris	woodfern
DUIN	1	0	0	0	1	0	Duchesnea indica	Indian strawberry
DYSOD	0	0	0	0	1	0	Dysodiopsis	dogfennel
DYSSO	0	1	0	0	0	0	Dyssodia	dyssodia
ECAN2	1	0	1	0	0	0	Echinacea angustifolia	blacksamson echinacea
ECEX	0	0	1	0	0	0	Echinops exaltatus	tall globethistle
ECLO	1	0	0	0	0	0	Echinocystis lobata	wild cucumber
ECPA	1	0	0	0	0	0	Echinacea pallida	pale purple coneflower
ECPR	0	0	0	1	0	0	Eclipta prostrata	false daisy
ELCA3	0	1	0	1	1	0	Elephantopus carolinianus	Carolina elephantsfoot
ELEL3	0	0	0	0	1	0	Elephantopus elatus	tall elephantsfoot
ELEPH	0	1	0	0	1	0	Elephantopus	elephantsfoot
ELTO2	0	0	0	0	1	0	Elephantopus tomentosus	devil's grandmother
ENPE4	0	0	0	1	0	0	Engelmannia peristenia	Engelmann's daisy
EPBR3	0	0	1	0	0	0	Epilobium brachycarpum	tall annual willowherb
EPILO	0	0	0	0	1	1	Epilobium	willowherb
EQAR	1	0	0	0	0	1	Equisetum arvense	field horsetail
EQLA	0	0	1	0	0	1	Equisetum laevigatum	smooth horsetail
EQPR	1	0	0	0	0	0	Equisetum pratense	meadow horsetail
EQUIS	1	1	1	0	0	1	Equisetum	horsetail

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ERAN	1	1	1	1	1	0	Erigeron annuus	eastern daisy fleabane
ERAS3	1	0	0	0	0	0	Erigeron asper	rough fleabane
ERBA6	0	0	0	0	1	0	Eryngium baldwinii	Baldwin's eryngo
ERCI6	0	0	1	0	1	1	Erodium cicutarium	redstem stork's bill
ERDE5	0	0	0	0	1	0	Eriocaulon decangulare	tenangle pipewort
EREL4	0	0	0	0	0	1	Erigeron elegantulus	blue dwarf fleabane
ERHI2	0	0	0	1	1	0	Erechtites hieraciifolia	American burnweed
ERIGE2	1	1	1	0	1	1	Erigeron	fleabane
ERIOG	0	0	1	0	0	0	Eriogonum	buckwheat
EROX4	1	1	0	0	1	0	Erigeron oxyodontus	fleabane
ERPH	0	0	0	0	1	0	Erigeron philadelphicus	Philadelphia fleabane
ERPO4	0	0	0	1	0	0	Eriogonum polycladon	sorrel buckwheat
ERPR5	0	0	0	1	0	0	Eryngium prostratum	creeping eryngo
ERPU10	0	1	0	0	0	0	Erigeron pubescens	hairy fleabane
ERQU	0	0	0	0	1	0	Erigeron quercifolius	oakleaf fleabane
ERST3	1	1	1	1	1	0	Erigeron strigosus	prairie fleabane
ERTE13	0	0	0	0	0	1	Erodium texanum	Texas stork's bill
ERYTH4	0	1	0	0	0	0	Erythranthe	monkeyflower
EUAL3	1	0	0	1	0	0	Eupatorium altissimum	tall thoroughwort
EUAM9	0	0	0	0	1	0	Euonymus americanus	bursting-heart
EUCA26	0	1	0	0	0	0	Euthamia caroliniana	slender goldentop
EUCA5	0	0	0	1	1	0	Eupatorium capillifolium	dogfennel
EUCO10	1	0	0	0	0	0	Euphorbia corollata	flowering spurge
EUCO7	0	0	0	1	0	0	Eupatorium compositifolium	yankeeweed
EUES	1	0	1	0	1	0	Euphorbia esula	leafy spurge
EUGA2	1	0	0	0	0	0	Euthamia galetorum	slender goldentop
EUGA6	1	0	0	1	0	0	Euphorbia gaudichaudii	spurge
EUGL18	1	0	0	0	0	0	Eucephalus glabratus	smooth aster
EUGR5	0	1	0	0	1	0	Euthamia graminifolia	flat-top goldentop
EUMA8	0	0	0	1	0	0	Euphorbia marginata	snow on the mountain
EUPAT	0	1	1	0	1	0	Eupatorium	thoroughwort
EUPE3	1	1	0	1	1	0	Eupatorium perfoliatum	common boneset
EUPHO	1	0	1	1	1	0	Euphorbia	spurge
EUSE2	1	0	0	1	1	0	Eupatorium serotinum	lateflowering thoroughwort
EUTHA	0	1	0	0	1	0	Euthamia	goldentop
EUTRO	1	0	0	0	1	0	Eutrochium	
EVCA	0	0	0	1	0	0	Evax candida	silver pygmycudweed

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
EVCO	0	0	1	0	0	0	Evolvulus convolvuloides	bindweed dwarf morning-glory
EVPR	0	0	0	0	1	0	Evax prolifera	bighead pygmycudweed
FAES2	0	1	0	0	0	0	Fagopyrum esculentum	buckwheat
FILIP	0	1	0	0	0	0	Filipendula	queen
FRAGA	1	1	1	0	1	0	Fragaria	strawberry
FRDR	0	0	0	1	0	0	Froelichia drummondii	Drummond's snakecotton
FRVI	1	1	0	1	1	1	Fragaria virginiana	Virginia strawberry
GAAP2	0	0	0	1	1	0	Galium aparine	stickywilly
GALA4	0	0	0	0	1	0	Galium latifolium	purple bedstraw
GALIU	1	1	1	1	1	0	Galium	bedstraw
GAMO	0	1	0	0	1	0	Galium mollugo	false baby's breath
GAPU3	0	0	0	0	1	0	Gamochaeta purpurea	spoonleaf purple everlasting
GAQU	0	0	0	0	1	0	Galinsoga quadriradiata	shaggy soldier
GATE2	1	0	0	0	1	0	Galeopsis tetrahit	brittlestem hempnettle
GATR2	0	0	0	0	0	1	Galium trifidum	threepetal bedstraw
GAUR4	0	1	0	0	0	0	Galinsoga urticifolia	nettle-leaf soldier
GAYOP	0	0	1	0	0	0	Gayophytum	groundsmoke
GECA5	0	1	0	1	1	0	Geranium carolinianum	Carolina geranium
GEDI	0	1	0	0	0	0	Geranium dissectum	cutleaf geranium
GEMA4	0	1	0	0	0	0	Geum macrophyllum	largeleaf avens
GEPE3	1	0	0	0	0	0	Gentiana pennelliana	wiregrass gentian
GERAN	1	1	0	1	1	1	Geranium	geranium
GERI	0	0	1	0	0	0	Geranium richardsonii	Richardson's geranium
GERO	0	0	0	0	0	1	Geranium robertianum	Robert geranium
GETR3	0	0	0	1	0	0	Geranium traversii	cranesbill
GLAUX	0	1	0	0	0	0	Glaux	milkwort
GLBI2	0	0	0	1	0	0	Glandularia bipinnatifida	Dakota mock vervain
GLCA2	0	0	1	0	0	0	Glandularia canadensis	rose mock vervain
GLECH	0	1	0	0	0	0	Glechoma	glechoma
GLHE2	1	1	0	0	1	0	Glechoma hederacea	ground ivy
GNAPH	0	0	0	0	1	0	Gnaphalium	cudweed
GNPA	0	0	0	0	1	0	Gnaphalium palustre	western marsh cudweed
GRIND	0	0	1	1	0	1	Grindelia	gumweed
GRPA8	0	0	0	1	0	0	Grindelia papposa	Spanish gold
GRSQ	0	0	1	1	0	1	Grindelia squarrosa	curlycup gumweed
GUFL3	1	0	0	0	0	0	Guillenia flavescens	yellow mustard
GUKA2	1	0	0	0	0	0	Gunnera kauaiensis	'ape'ape
GYCE	1	0	1	0	1	0	Gypsophila cerastoides	chickweed baby's-breath

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
HACKE	0	0	0	0	0	1	Hackelia	stickseed
HAGL	0	0	0	0	0	1	Halogeton glomeratus	saltlover
HAVI2	0	0	0	0	1	0	Hackelia virginiana	beggarslice
HEAM	1	0	0	1	1	0	Helenium amarum	sneezeweed
HEAM6	1	0	0	0	0	0	Heuchera americana	American alumroot
HEAN2	0	0	0	0	1	0	Helianthus angustifolius	swamp sunflower
HEAN3	0	0	1	1	0	1	Helianthus annuus	common sunflower
HECA4	0	0	0	0	1	0	Helianthemum carolinianum	Carolina frostweed
HECI	0	0	0	1	0	0	Helianthus ciliaris	Texas blueweed
HEDYO2	0	0	0	1	0	0	Hedyotis	starviolet
HEGR4	1	0	0	0	0	0	Helianthus grosseserratus	sawtooth sunflower
HEHI	0	0	1	0	0	0	Hedeoma hispida	rough false pennyroyal
HELEN	0	0	0	1	0	0	Helenium	sneezeweed
HELIA3	1	0	1	1	1	1	Helianthus	sunflower
HEMA2	0	0	1	1	0	0	Helianthus maximiliani	Maximilian sunflower
HEMA80	0	0	0	0	0	1	Heracleum maximum	common cowparsnip
HEMER	1	0	0	0	0	0	Hemerocallis	daylily
HEMO2	0	0	0	1	0	0	Helianthus mollis	ashy sunflower
HENU	0	0	1	0	0	0	Helianthus nuttallii	Nuttall's sunflower
HEPA19	1	0	1	0	0	0	Helianthus pauciflorus	stiff sunflower
HESI	1	0	0	0	0	0	Helianthus silphioides	rosinweed sunflower
HESU3	1	0	0	1	0	0	Heterotheca subaxillaris	camphorweed
HETER18	1	0	0	0	0	0	Heteranthemis	oxeye
HETER8	0	0	1	0	0	0	Heterotheca	false goldenaster
HETU	0	1	0	0	0	0	Helianthus tuberosus	Jerusalem artichoke
HEXAS	0	0	0	1	0	0	Hexastylis	heartleaf
HIAU	1	1	0	0	0	1	Hieracium aurantiacum	orange hawkweed
HIERA	1	1	0	0	1	0	Hieracium	hawkweed
HILA6	0	0	0	1	0	0	Hibiscus lasiocarpos	rosemallow
HIPPU	1	0	1	0	1	0	Hippuris	mare's-tail
HIVE	0	0	0	0	1	0	Hieracium venosum	rattlesnakeweed
HIVU2	1	0	0	0	1	0	Hippuris vulgaris	common mare's-tail
HOPR	0	0	0	0	1	0	Houstonia procumbens	roundleaf bluet
HYDRO2	0	0	0	1	1	0	Hydrocotyle	hydrocotyle
HYDRO3	0	0	0	0	1	0	Hydrolea	false fiddleleaf
HYHI2	0	0	0	1	0	0	Hypoxis hirsuta	common goldstar
HYOD	0	0	0	1	1	0	Hymenoxys odorata	bitter rubberweed
HYOSC	0	1	0	0	0	0	Hyoscyamus	henbane

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
HYOV	0	0	0	1	0	0	Hydrolea ovata	ovate false fiddleleaf
HYPER	1	1	0	0	0	0	Hypericum	St. Johnswort
HYPOC	0	0	0	0	1	1	Hypochaeris	cat's ear
HYRA3	0	0	0	0	1	1	Hypochaeris radicata	hairy cat's ear
HYSI	0	0	0	0	1	0	Hydrocotyle sibthorpioides	lawn marshpennywort
HYUM	0	0	0	1	1	0	Hydrocotyle umbellata	manyflower marshpennywort
HYVE2	0	0	0	0	1	0	Hydrocotyle verticillata	whorled marshpennywort
IMCA	1	1	0	0	0	0	Impatiens capensis	jewelweed
IMPAT	0	1	0	0	0	0	Impatiens	touch-me-not
IOAC2	0	0	0	0	0	1	Ionopsidium acaule	false diamondflower
IPCA	0	1	0	0	0	0	Ipomoea cairica	mile a minute vine
IPCO2	0	0	0	0	0	1	Ipomoea costellata	crestrib morning-glory
IPER	0	0	0	0	1	0	Ipomoea eriocarpa	morningglory
IPHE	1	0	0	0	1	0	Ipomoea hederacea	ivyleaf morning-glory
IPOMO	1	1	1	1	1	0	Ipomoea	morning-glory
IRIS	0	1	1	0	0	0	Iris	iris
IRMI	0	0	1	0	0	0	Iris missouriensis	Rocky Mountain iris
ISATI	0	0	0	0	0	1	Isatis	woad
ISTI	0	0	0	0	0	1	Isatis tinctoria	Dyer's woad
IVA	0	0	1	1	0	0	Iva	marsh elder
IVAN	0	0	1	1	0	0	Iva angustifolia	narrowleaf marsh elder
IVAN2	0	0	1	1	1	0	Iva annua	annual marsh elder
KAMA	1	0	0	0	0	0	Kallstroemia maxima	big caltrop
KRCA	0	0	0	0	1	0	Krigia caespitosa	weedy dwarfdandelion
KRIGI	0	1	0	0	1	0	Krigia	dwarfdandelion
KRVI	0	0	0	0	1	0	Krigia virginica	Virginia dwarfdandelion
LAAM	1	1	1	0	1	0	Lamium amplexicaule	henbit deadnettle
LACA	1	0	0	0	1	0	Lactuca canadensis	Canada lettuce
LACA5	0	0	0	0	1	0	Lachnanthes caroliana	Carolina redroot
LACTU	1	0	0	1	1	0	Lactuca	lettuce
LAENN	0	0	0	0	1	0	Laennecia	horseweed
LAFL	0	0	0	1	1	0	Lactuca floridana	woodland lettuce
LAMIU	0	0	0	0	0	1	Lamium	deadnettle
LAPU2	1	0	0	0	0	0	Lamium purpureum	purple deadnettle
LASE	1	0	1	1	1	1	Lactuca serriola	prickly lettuce
LASQ	1	0	0	0	0	0	Lappula squarrosa	European stickseed
LATA	1	0	1	0	0	0	Lactuca tatarica	blue lettuce
LAVI8	0	0	0	0	1	0	Lactuca virosa	bitter lettuce
LEAU2	0	1	0	0	0	0	Leontodon autumnalis	fall dandelion
LECA2	1	0	0	0	0	0	Leonurus cardiaca	common motherwort

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
LECA5	1	1	0	0	1	0	Lepidium campestre	field pepperweed
LEDE	1	0	1	1	1	0	Lepidium densiflorum	common pepperweed
LELA2	0	0	0	0	1	1	Lepidium latifolium	broadleaved pepperweed
LELU	0	0	1	0	0	0	Lesquerella ludoviciana	foothill bladderpod
LEMA8	1	0	0	0	0	0	Leucanthemum maximum	max chrysanthemum
LEMU3	0	0	0	0	1	0	Lechea mucronata	hairy pinweed
LEPE2	0	0	1	0	0	1	Lepidium perfoliatum	clasping pepperweed
LEPID	1	0	1	1	1	1	Lepidium	pepperweed
LERA2	0	0	1	0	1	0	Lepidium ramosissimum	manybranched pepperweed
LESQU	0	0	0	1	0	0	Lesquerella	bladderpod
LETA	0	0	0	0	0	1	Leontodon taraxacoides	lesser hawkbit
LEUCA4	0	1	0	0	1	0	Leucanthemum	daisy
LEVI3	0	0	0	1	1	0	Lepidium virginicum	Virginia pepperweed
LEVU	1	1	0	0	1	1	Leucanthemum vulgare	oxeye daisy
LIAL2	0	0	0	1	0	0	Linum alatum	winged flax
LIATR	0	0	0	0	1	0	Liatris	blazing star
LIGUS	0	0	0	0	1	0	Ligusticum	licorice-root
LILIU	1	1	1	0	0	0	Lilium	lily
LINAR	1	1	0	0	0	0	Linaria	toadflax
LINUM	0	1	0	1	0	1	Linum	flax
LIOF	1	0	0	0	0	0	Lithospermum officinale	European stoneseed
LIPR	0	0	0	0	0	1	Linum pratense	meadow flax
LIPU	1	0	1	1	0	0	Liatris punctata	dotted blazing star
LIRI	0	0	1	0	0	0	Linum rigidum	stiffstem flax
LITTO	0	1	0	0	0	0	Littorella	littorella
LIVU2	1	0	0	0	0	0	Linaria vulgaris	butter and eggs
LOAM	0	0	0	0	0	1	Lomatium ambiguum	Wyeth biscuitroot
LOBEL	0	1	0	0	1	0	Lobelia	lobelia
LOBUL	0	1	0	0	0	0	Lobularia	lobularia
LOMAR	0	1	0	0	0	0	Lomariopsis	fringedfern
LOMI2	0	0	0	0	1	0	Lomatium minimum	little desertparsley
LUDWI	0	0	0	1	1	0	Ludwigia	primrose-willow
LUPA	0	0	0	1	0	1	Ludwigia palustris	marsh seedbox
LYCHN	1	1	0	0	0	0	Lychnis	campion
LYJA	0	0	0	0	1	0	Lygodium japonicum	Japanese climbing fern
LYJU	0	0	1	0	0	0	Lygodesmia juncea	rush skeletonplant
LYNU	1	1	0	0	1	0	Lysimachia nummularia	creeping jenny
MAAL	1	0	0	0	0	0	Malva alcea	vervain mallow

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MACHA	0	0	0	0	0	1	Machaeranthera	tansyaster
MADI6	1	0	0	0	1	0	Matricaria discoidea	disc mayweed
MADIA	0	0	0	0	0	1	Madia	tarweed
MAIAN	0	1	0	0	0	0	Maianthemum	mayflower
MALVA	0	1	0	1	0	1	Malva	mallow
MANE	0	0	0	1	0	0	Malva neglecta	common mallow
MAPU7	0	0	0	1	0	0	Mazus pumilus	Japanese mazus
MASA3	0	1	0	0	0	0	Malvella sagittifolia	arrowleaf mallow
MAST4	0	0	0	0	0	1	Maianthemum stellatum	starry false lily of the valley
MATEL	0	0	0	0	1	0	Matelea	milkvine
MATO3	0	0	0	0	0	1	Macrothelypteris torresiana	swordfern
MEAR4	1	0	1	0	0	0	Mentha arvensis	wild mint
MENTH	1	1	0	1	1	0	Mentha	mint
MEPU	1	0	0	1	0	1	Mentha pulegium	pennyroyal
MERE7	1	0	0	0	1	0	Mentha requienii	mint
MESU12	1	0	0	0	0	0	Melilotus suaveolens	sweetclover
MIGU	0	1	0	0	0	0	Mimulus guttatus	seep monkeyflower
MINY	0	0	1	0	0	0	Mirabilis nyctaginea	heartleaf four o'clock
MISC	0	0	0	0	1	0	Mikania scandens	climbing hempvine
MOLLU	0	1	0	0	1	0	Mollugo	carpetweed
MONAR	1	0	0	1	1	0	Monarda	beebalm
MOVE	0	0	0	0	1	0	Mollugo verticillata	green carpetweed
MYDI	0	0	0	0	0	1	Myosotis discolor	changing forget-me-not
MYLA	0	0	0	0	0	1	Myosotis laxa	bay forget-me-not
MYVE	0	0	0	0	1	0	Myosotis verna	spring forget-me-not
NAOF	0	1	0	0	0	0	Nasturtium officinale	watercress
NAVI	0	0	1	0	0	0	Navarretia viscidula	sticky pincushionplant
NECA2	1	0	0	0	0	0	Nepeta cataria	catnip
NEEX	0	0	0	0	1	0	Nephrolepis exaltata	Boston swordfern
NONE	0	1	0	0	0	0	Notholaena neglecta	Maxon's cloak fern
NOTHO5	0	0	0	1	1	1	Nothocalais	false dandelion
ODCL	1	0	0	0	0	0	Odontosoria clavata	clubbed creepingfern
OEBI	0	1	0	0	1	0	Oenothera biennis	common evening primrose
OELA	0	0	0	1	1	0	Oenothera laciniata	cutleaf evening primrose
OENOT	1	0	0	0	1	0	Oenothera	evening primrose
OLIGO3	1	0	0	0	1	0	Oligoneuron	goldenrod
OLRI	1	0	1	0	0	0	Oligoneuron rigidum	stiff goldenrod
OLRI2	1	0	0	0	0	0	Oligoneuron riddellii	Riddell's goldenrod
ONOCL	0	1	0	0	1	0	Onoclea	sensitive fern

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ONSE	0	1	0	0	0	0	Onoclea sensibilis	sensitive fern
ORAQ	0	1	0	0	0	0	Orontium aquaticum	goldenclub
OREOC	0	0	0	0	1	0	Oreochrysum	goldenrod
OSCA	1	0	0	0	0	0	Osteospermum calendulaceum	stinking roger
OSCI	0	1	0	1	0	0	Osmunda cinnamomea	cinnamon fern
OSCL2	0	1	0	0	0	0	Osmunda claytoniana	interrupted fern
OXALI	1	1	1	1	1	0	Oxalis	woodsorrel
OXAR5	0	0	0	0	1	0	Oxalis articulata	
OXCA3	1	1	0	0	1	0	Oxytheca caryophylloides	chickweed oxytheca
OXCO	0	0	0	1	0	0	Oxalis corniculata	creeping woodsorrel
OXDI	1	0	0	1	0	0	Oxalis dichondrifolia	peonyleaf woodsorrel
OXDI2	0	0	0	1	0	0	Oxalis dillenii	slender yellow woodsorrel
OXMA7	1	0	0	0	0	0	Oxalis macrocarpa	sorrel
OXPR	0	0	0	0	1	0	Oxalis priceae	tufted yellow woodsorrel
OXRO4	1	0	0	0	0	0	Oxalis rosea	sorrel
OXST	1	0	1	1	1	0	Oxalis stricta	common yellow oxalis
OXVI	1	0	1	1	0	0	Oxalis violacea	violet woodsorrel
PAAU3	0	1	0	0	0	0	Packera aurea	golden ragwort
PAHY	0	0	0	0	1	0	Parthenium hysterophorus	Santa Maria feverfew
PAIN6	0	0	0	0	1	0	Passiflora incarnata	purple passionflower
PANAX	1	1	0	0	0	0	Panax	ginseng
PAPAV	0	1	0	0	0	0	Papaver	poppy
PAPL12	1	0	0	0	0	0	Packera plattensis	prairie groundsel
PASA2	1	0	0	0	0	0	Pastinaca sativa	wild parsnip
PASSI	1	0	0	1	1	0	Passiflora	passionflower
PASTI	1	0	0	0	0	0	Pastinaca	parsnip
PAVI3	0	0	0	0	0	1	Parentucellia viscosa	yellow glandweed
PECR2	0	0	0	1	0	0	Petroselinum crispum	parsley
PEFR4	1	0	1	1	1	0	Perilla frutescens	beefsteakplant
PELAR2	0	1	0	0	0	0	Pelargonium	geranium
PENST	0	0	0	0	0	1	Penstemon	beardtongue
PERIL	0	0	0	0	1	0	Perilla	perilla
PETUN	1	0	0	0	0	0	Petunia	petunia
PHAM4	1	1	1	1	1	0	Phytolacca americana	American pokeweed
PHAN	0	0	0	1	0	0	Phacelia anelsonii	Aven Nelson's phacelia
PHHE5	0	0	0	1	0	0	Physalis heterophylla	clammy groundcherry
PHHO	0	0	1	0	0	0	Phlox hoodii	spiny phlox
PHLA3	0	0	0	1	0	0	Phyla lanceolata	lanceleaf fogfruit
PHNO2	0	0	0	1	1	0	Phyla nodiflora	turkey tangle fogfruit

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PHST8	0	0	0	0	1	0	Phyla stoechadifolia	southern fogfruit
PHUR	0	0	0	1	1	0	Phyllanthus urinaria	chamber bitter
PHVI17	1	0	0	0	0	0	Physalis viscosa	starhair groundcherry
PHVI5	1	0	1	0	0	0	Physalis virginiana	Virginia groundcherry
PHYLA	0	0	0	1	0	0	Phyla	fogfruit
PHYSA	0	0	1	1	0	0	Physalis	groundcherry
PHYTO	1	0	0	0	1	0	Phytolacca	pokeweed
PICA7	0	0	0	0	1	0	Pinguicula caerulea	blueflower butterwort
PIGR4	0	0	0	0	1	0	Pityopsis graminifolia	narrowleaf silkgrass
PILEA	1	0	0	0	0	0	Pilea	clearweed
PINGU	0	0	0	0	0	1	Pinguicula	butterwort
PINU	1	0	0	0	1	0	Pilea nummulariifolia	creeping charlie
PISP	0	0	0	0	1	0	Picris sprengeriana	bitterweed
PITYO2	0	0	0	0	1	0	Pityopsis	silkgrass
PLANT	1	1	1	1	1	1	Plantago	plantain
PLAR3	1	0	1	0	1	0	Plantago aristata	largebracted plantain
PLCO3	1	1	0	0	1	0	Plantago coronopus	buckhorn plantain
PLER	0	0	1	0	0	0	Plantago eriopoda	redwool plantain
PLLA	1	1	1	1	1	1	Plantago lanceolata	narrowleaf plantain
PLMA	0	1	0	0	0	0	Plantago macrocarpa	seashore plantain
PLMA2	1	1	0	1	1	1	Plantago major	common plantain
PLPA2	0	0	1	1	0	0	Plantago patagonica	woolly plantain
PLPU	0	0	0	0	1	0	Plantago pusilla	dwarf plantain
PLRU	1	0	0	1	0	0	Plantago rugelii	blackseed plantain
PLVI	0	0	0	1	0	0	Plantago virginica	Virginia plantain
POAC4	0	0	0	0	1	0	Polystichum acrostichoides	Christmas fern
POAM8	1	0	0	0	0	0	Polygonum amphibium	water knotweed
POAR11	0	0	1	0	0	0	Polygonum arenastrum	oval-leaf knotweed
POAR8	1	0	1	0	0	0	Potentilla argentea	silver cinquefoil
POAV	1	0	1	1	1	1	Polygonum aviculare	prostrate knotweed
POBI2	1	0	0	0	0	0	Polygonatum biflorum	smooth Solomon's seal
POBI6	0	0	0	0	0	1	Polygonum bistortoides	American bistort
POCA17	0	1	0	0	0	0	Potentilla canadensis	dwarf cinquefoil
POCE4	0	0	0	0	1	0	Polygonum cespitosum	
POCO10	0	0	1	0	0	0	Polygonum convolvulus	black bindweed
POCO14	0	0	0	0	1	0	Pontederia cordata	pickerelweed
POCR	0	0	0	1	0	0	Polygala cruciata	drumheads
PODO4	0	0	0	0	0	1	Polygonum douglasii	Douglas' knotweed
POER2	0	0	0	0	1	0	Polygonum erectum	erect knotweed

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
POFR7	0	0	0	0	1	0	Potentilla fragiformis	strawberry cinquefoil
POHY2	0	0	0	1	1	0	Polygonum hydropiperoides	swamp smartweed
POLA4	1	1	1	0	1	0	Polygonum lapathifolium	curlytop knotweed
POLYG	0	0	0	1	0	0	Polygala	polygala
POLYG2	1	1	0	0	0	0	Polygonatum	Solomon's seal
POLYG3	1	0	0	0	0	0	Polygonella	jointweed
POLYG4	1	1	1	1	1	0	Polygonum	knotweed
PONO3	0	0	1	0	0	0	Potentilla norvegica	Norwegian cinquefoil
POOL	1	0	1	1	1	0	Portulaca oleracea	little hogweed
POOV2	0	1	0	0	0	0	Potentilla ovina	sheep cinquefoil
POPE	1	0	0	0	0	0	Podophyllum peltatum	mayapple
POPE2	1	1	1	1	1	0	Polygonum pensylvanicum	Pennsylvania smartweed
POPE3	1	1	0	0	0	1	Polygonum persicaria	spotted ladysthumb
POPE8	1	0	0	0	0	0	Potentilla pensylvanica	Pennsylvania cinquefoil
POPR4	0	0	0	1	0	0	Polypremum procumbens	juniper leaf
PORA3	1	0	1	0	0	0	Polygonum ramosissimum	bushy knotweed
PORE5	1	0	1	0	1	0	Potentilla recta	sulphur cinquefoil
PORE6	0	1	0	0	0	0	Potentilla reptans	creeping cinquefoil
PORTU	1	0	0	1	1	0	Portulaca	purslane
POSA5	1	0	0	0	0	0	Polygonum sagittatum	arrowleaf tearthumb
POSI2	1	1	0	0	1	0	Potentilla simplex	common cinquefoil
POST3	0	0	0	0	1	0	Potentilla sterilis	strawberryleaf cinquefoil
POTAM	0	0	1	0	0	0	Potamogeton	pondweed
POTEN	1	1	1	0	1	1	Potentilla	cinquefoil
POVI2	1	0	0	0	0	0	Polygonum virginianum	jumpseed
PRIMU	0	0	0	1	1	0	Primula	primrose
PRUNE	0	1	0	0	1	1	Prunella	selfheal
PRVU	1	1	0	1	1	0	Prunella vulgaris	common selfheal
PSEUD43	0	0	0	1	1	0	Pseudognaphalium	cudweed
PSOB3	0	0	0	1	1	0	Pseudognaphalium obtusifolium	rabbit-tobacco
PTAQ	1	1	0	0	1	0	Pteridium aquilinum	western brackenfern
PTERI	0	1	0	0	1	0	Pteridium	brackenfern
PTILI	0	0	0	1	0	0	Ptilimnium	mock bishopweed
PUPA5	0	0	1	0	0	0	Pulsatilla patens	eastern pasqueflower

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
PYCA2	0	0	0	0	1	0	Pyrrhopappus carolinianus	Carolina desert-chicory
PYCNA	1	0	0	0	1	0	Pycnanthemum	mountainmint
PYGR2	0	0	0	1	0	0	Pyrrhopappus grandiflorus	tuberous desert-chicory
PYRA	0	0	0	0	0	1	Pyrrocoma racemosa	clustered goldenweed
PYTE	0	0	0	0	1	0	Pycnanthemum tenuifolium	narrowleaf mountainmint
PYVI	1	0	0	0	0	0	Pycnanthemum virginianum	Virginia mountainmint
QULO2	0	1	0	0	0	0	Quincula lobata	Chinese lantern
RAAB	1	0	0	1	0	0	Ranunculus abortivus	littleleaf buttercup
RAAC3	1	1	0	1	1	1	Ranunculus acris	tall buttercup
RAAE	0	0	0	1	0	0	Ranunculus aestivalis	fall buttercup
RAAL	0	0	0	0	0	1	Ranunculus alismifolius	plantainleaf buttercup
RACO3	0	0	1	1	0	0	Ratibida columnifera	upright prairie coneflower
RAGM	1	1	0	0	1	0	Ranunculus gmelinii	Gmelin's buttercup
RANUN	1	1	1	1	1	1	Ranunculus	buttercup
RAPI	1	0	0	0	0	0	Ratibida pinnata	pinnate prairie coneflower
RARA2	0	1	0	0	0	0	Raphanus raphanistrum	wild radish
RARE3	0	0	0	0	1	1	Ranunculus repens	creeping buttercup
RASA	0	0	0	1	1	0	Ranunculus sardous	hairy buttercup
RHEXI	0	0	0	0	1	0	Rhexia	meadowbeauty
RHMA	0	0	0	0	1	0	Rhexia mariana	Maryland meadowbeauty
RIBR2	0	0	0	0	1	0	Richardia brasiliensis	tropical Mexican clover
RICHA	0	0	0	0	1	0	Richardia	Mexican clover
RISC	0	0	0	0	1	0	Richardia scabra	rough Mexican clover
RUAC2	0	0	0	1	1	0	Rumex acetosa	garden sorrel
RUAC3	1	1	0	1	1	1	Rumex acetosella	common sheep sorrel
RUBUS	1	1	1	1	1	0	Rubus	blackberry
RUCA4	1	0	0	0	0	0	Ruellia caroliniensis	Carolina wild petunia
RUCR	1	1	1	1	1	1	Rumex crispus	curly dock
RUDBE	1	1	0	0	1	0	Rudbeckia	coneflower
RUELL	1	0	0	1	0	0	Ruellia	wild petunia
RUHA2	0	0	0	1	1	0	Rumex hastatulus	heartwing sorrel
RUHI2	1	1	1	1	1	0	Rudbeckia hirta	blackeyed Susan
RUHU	0	0	1	0	0	0	Ruellia humilis	fringeleaf wild petunia
RUMEX	1	1	0	1	1	1	Rumex	dock
RUOB	1	0	0	1	1	0	Rumex obtusifolius	bitter dock
RUPU3	0	0	0	1	0	0	Rumex pulcher	fiddle dock

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
RUST2	0	0	0	1	0	0	Ruellia strepens	limestone wild petunia
SAEL6	1	0	0	0	0	0	Salvia elegans	pineapple sage
SAGIN	1	0	0	0	0	0	Sagina	pearlwort
SAKA	1	0	1	1	0	1	Salsola kali	Russian thistle
SALA	0	0	0	1	0	0	Sagittaria lancifolia	bulltongue arrowhead
SALIC	0	0	0	0	0	1	Salicornia	pickleweed
SALSO	1	0	0	0	0	1	Salsola	Russian thistle
SALVI	0	0	0	0	1	0	Salvia	sage
SALY2	0	0	0	1	1	0	Salvia lyrata	lyreleaf sage
SAMA2	1	0	0	0	0	0	Sanicula marilandica	Maryland sanicle
SAMBU	1	1	0	0	0	0	Sambucus	elderberry
SATR12	0	0	1	0	0	1	Salsola tragus	prickly Russian thistle
SCAN2	0	0	0	0	1	0	Scleranthus annuus	German knotgrass
SCDU3	0	0	0	0	1	0	Scoparia dulcis	licorice weed
SCMU6	0	0	1	0	0	0	Schkuhria multiflora	manyflower false threadleaf
SCOPA	0	0	0	0	1	0	Scoparia	licorice weed
SCSA6	0	1	0	0	0	0	Scutellaria sapphirina	White Pine skullcap
SEAS3	1	0	0	0	0	0	Sericocarpus asteroides	
SEDE2	0	0	1	0	0	0	Selaginella densa	lesser spikemoss
SELE	0	0	0	1	0	0	Sedum leibergii	Leiberg stonecrop
SENEC	0	0	1	0	1	1	Senecio	ragwort
SEPA17	0	0	1	0	0	0	Securigera parviflora	
SETA	0	1	0	0	0	0	Senecio taraxacoides	dandelion ragwort
SHAR2	0	0	0	1	1	0	Sherardia arvensis	blue fieldmadder
SIAL2	1	0	1	0	0	1	Sisymbrium altissimum	tall tumblemustard
SIAL3	0	0	0	1	0	0	Sisyrinchium albidum	white blue-eyed grass
SIAN	0	0	1	1	0	0	Sicyos angulatus	oneseed bur cucumber
SIAN3	0	0	0	1	0	0	Sisyrinchium angustifolium	narrowleaf blue-eyed grass
SIAR4	1	0	0	0	0	0	Sinapis arvensis	charlock mustard
SIDA	0	0	0	1	1	0	Sida	fanpetals
SILA21	0	1	0	0	1	0	Silene latifolia	bladder campion
SILA3	1	0	0	1	0	0	Silphium laciniatum	compassplant
SILO3	0	0	1	0	0	0	Sisymbrium loeselii	small tumbleweed mustard
SILYB	0	0	0	0	1	0	Silybum	milkthistle
SIOF	0	0	0	0	1	1	Sisymbrium officinale	hedgemustard
SIPE2	1	0	1	0	0	0	Silphium perfoliatum	cup plant
SISYM	1	0	0	0	0	0	Sisymbrium	hedgemustard
SISYR	0	0	0	0	0	1	Sisyrinchium	blue-eyed grass

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
SIVU	1	0	0	0	0	0	Silene vulgaris	maidenstears
SMEC	0	0	0	0	1	0	Smilax ecirrhata	upright carrionflower
SMILA2	1	1	0	1	1	0	Smilax	greenbrier
SMLA3	1	0	0	0	1	0	Smilax lasioneura	Blue Ridge carrionflower
SOAL3	0	1	0	0	0	0	Solidago albopilosa	whitehair goldenrod
SOAL6	1	1	1	0	0	0	Solidago altissima	Canada goldenrod
SOAR2	1	0	1	0	0	0	Sonchus arvensis	field sowthistle
SOAS	0	0	0	0	1	0	Sonchus asper	spiny sowthistle
SOCA6	1	1	1	1	1	1	Solidago canadensis	Canada goldenrod
SODE8	1	0	0	1	1	0	Solanum demissum	nightshade
SODI	0	0	1	0	1	0	Solanum dimidiatum	western horsenettle
SOER	1	0	0	0	0	0	Solidago erecta	showy goldenrod
SOFL2	0	1	0	0	0	0	Solidago flexicaulis	zigzag goldenrod
SOGI	1	1	1	0	0	0	Solidago gigantea	giant goldenrod
SOHI	1	0	0	0	0	0	Solidago hispida	hairy goldenrod
SOJU	0	0	0	0	1	0	Solidago juncea	early goldenrod
SOLA4	0	0	0	0	1	0	Solidago latissimifolia	Elliott's goldenrod
SOLA6	1	0	0	0	0	0	Solidago lancifolia	lance-leaf goldenrod
SOLAN	1	1	0	1	1	0	Solanum	nightshade
SOLID	1	1	1	1	1	0	Solidago	goldenrod
SOMI2	1	0	1	0	0	0	Solidago missouriensis	Missouri goldenrod
SOMO	0	0	1	0	0	0	Solidago mollis	velvety goldenrod
SONCH	1	0	1	1	0	1	Sonchus	sowthistle
SONE	1	0	0	0	0	0	Solidago nemoralis	gray goldenrod
SOOL	0	0	0	0	1	0	Sonchus oleraceus	common sowthistle
SOPU9	0	0	0	0	1	0	Solanum pumilum	Carolina horsenettle
SORA	0	1	0	0	0	0	Solidago radula	western rough goldenrod
SORO	1	0	0	1	0	0	Solanum rostratum	buffalobur nightshade
SORU2	0	1	0	0	1	0	Solidago rugosa	wrinkleleaf goldenrod
SOSP2	1	0	0	0	0	0	Solidago speciosa	showy goldenrod
SOST	0	1	0	0	0	0	Solidago stricta	wand goldenrod
SOWR	0	1	0	0	0	0	Solidago wrightii	Wright's goldenrod
SPAR	1	0	0	0	0	0	Spergula arvensis	corn spurry
SPHAE	0	0	0	1	0	0	Sphaeralcea	globemallow
SPPR4	1	0	0	0	1	0	Spermacoce prostrata	prostrate false buttonweed
STELL	0	1	0	0	1	0	Stellaria	starwort
STGR	0	1	0	0	0	0	Stellaria graminea	grass-like starwort
STME	0	0	0	1	0	0	Stachys mexicana	Mexican hedgenettle
STME2	1	1	0	1	1	0	Stellaria media	common chickweed
STPU	0	0	0	0	1	0	Stellaria pubera	star chickweed
STSY	0	0	0	1	0	0	Stillingia sylvatica	queen's-delight

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
SUAED	0	0	1	0	0	0	Suaeda	seepweed
SYDR	0	0	1	0	0	0	Symphyotrichum drummondii	Drummond's aster
SYER	1	1	1	1	1	0	Symphyotrichum ericoides	white heath aster
SYFA	0	0	1	0	0	0	Symphyotrichum falcatum	white prairie aster
SYFL	0	0	0	0	1	0	Syngonanthus flavidulus	yellow hatpins
SYFO	1	0	0	0	0	0	Symplocarpus foetidus	skunk cabbage
SYLA3	1	0	0	0	0	0	Symphyotrichum laeve	smooth blue aster
SYLA6	1	0	1	0	0	0	Symphyotrichum lanceolatum	white panicle aster
SYMPH4	1	1	1	0	1	0	Symphyotrichum	aster
SYNO2	1	0	0	0	0	0	Symphyotrichum novae-angliae	New England aster
SYOB	0	0	1	0	0	0	Symphyotrichum oblongifolium	aromatic aster
SYPA11	0	0	1	0	0	0	Symphyotrichum patens	late purple aster
SYPO4	0	1	0	0	0	0	Symphyotrichum porteri	smooth white aster
SYRA5	1	0	0	0	0	0	Symphyotrichum racemosum	smooth white oldfield aster
SYSH	0	0	0	0	1	0	Symphyotrichum shortii	Short's aster
SYSP	0	0	1	0	0	0	Symphyotrichum spathulatum	western mountain aster
TAGET	0	0	0	0	1	0	Tagetes	marigold
TANAC	0	1	0	0	0	0	Tanacetum	tansy
TAOF	1	1	1	1	1	1	Taraxacum officinale	common dandelion
TARAX	1	1	1	1	1	1	Taraxacum	dandelion
TAVU	1	0	0	0	0	0	Tanacetum vulgare	common tansy
TECA3	1	0	1	0	1	0	Teucrium canadense	Canada germander
TEUCR	1	0	0	0	0	0	Teucrium	germander
THAL3	1	0	0	0	0	0	Thunbergia alata	blackeyed Susan vine
THAR5	1	0	1	0	0	1	Thlaspi arvense	field pennycress
THELE	0	0	0	1	0	0	Thelesperma	greenthread
THELY3	0	0	0	0	1	1	Thelypodiopsis	tumblemustard
THLAS	0	0	1	0	0	0	Thlaspi	pennycress
THNO	0	1	0	0	0	0	Thelypteris noveboracensis	New York fern

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
THYMU	0	1	0	0	0	0	Thymus	thyme
TIAN	0	0	0	1	0	0	Tinantia anomala	widowstears
TOXIC	1	1	0	0	1	1	Toxicodendron	poison oak
TRADE	0	0	1	0	0	0	Tradescantia	spiderwort
TRAGI	0	0	1	1	1	0	Tragia	noseburn
TRAGO	0	0	1	0	0	1	Tragopogon	goatsbeard
TRBE4	0	0	0	1	0	0	Tragia betonicifolia	betonyleaf noseburn
TRDU	1	0	1	0	0	1	Tragopogon dubius	yellow salsify
TREPO	0	0	0	0	1	0	Trepocarpus	trepocarpus
TRFL	1	0	0	1	1	0	Tradescantia fluminensis	small-leaf spiderwort
TRICA	0	0	0	0	1	0	Tricardia	tricardia
TRIOD	0	0	0	1	1	0	Triodanis	Venus' looking-glass
TRIPT	0	0	0	0	1	0	Tripterocalyx	sandpuffs
TROC	0	0	1	0	0	0	Tradescantia occidentalis	prairie spiderwort
TRPA20	0	1	0	0	0	0	Trifolium pallescens	
TRPE4	1	0	0	0	0	0	Triodanis perfoliata	clasping Venus' looking-glass
TRPO	0	0	1	0	0	1	Tragopogon porrifolius	salsify
TRRA5	0	0	1	1	0	0	Tragia ramosa	branched noseburn
TRRE	0	0	0	1	0	0	Tradescantia reverchonii	Reverchon's spiderwort
TUFA	0	0	0	0	1	0	Tussilago farfara	coltsfoot
TYAN	1	0	1	0	0	0	Typha angustifolia	narrowleaf cattail
TYLA	0	0	1	0	1	0	Typha latifolia	broadleaf cattail
TYPHA	1	1	0	0	0	1	Typha	cattail
URDI	1	0	1	0	1	1	Urtica dioica	stinging nettle
URTIC	1	1	0	0	1	0	Urtica	nettle
VACH	1	0	0	0	0	0	Valerianella chenopodiifolia	goosefoot cornsalad
VALER2	0	0	0	0	1	0	Valerianella	cornsalad
VEAL	1	1	0	0	1	0	Verbesina alternifolia	wingstem
VEAM2	0	0	1	0	0	0	Veronica americana	American speedwell
VEAN	1	0	0	0	1	0	Vernonia angustifolia	tall ironweed
VEAR	0	0	0	1	0	0	Veronica arvensis	corn speedwell
VEBA	1	0	1	1	0	0	Vernonia baldwinii	Baldwin's ironweed
VEBR	0	0	1	0	0	0	Verbena bracteata	bigbract verbena
VEGA	1	0	0	0	0	0	Vernonia galamensis	ironweed
VEGI	1	0	0	1	1	0	Vernonia gigantea	giant ironweed
VEHA2	1	0	1	1	1	0	Verbena hastata	swamp verbena
VELE	0	0	1	0	0	0	Vernonia lettermannii	narrowleaf ironweed

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
VEME	1	0	0	0	0	0	Verbena menthifolia	mint vervain
VEMI2	1	0	0	0	0	0	Vernonia missurica	Missouri ironweed
VENO	1	0	0	0	1	0	Vernonia noveboracensis	New York ironweed
VEOC	0	0	0	0	1	0	Verbesina occidentalis	yellow crownbeard
VEPO4	0	0	0	1	0	0	Verbena polystachya	verbena
VERBE	1	0	0	1	1	0	Verbena	vervain
VERI2	0	0	0	0	1	0	Verbena rigida	tuberous vervain
VERNO	1	1	0	1	1	0	Vernonia	ironweed
VERON	1	1	0	0	1	1	Veronica	speedwell
VESE	0	1	0	0	0	0	Veronica serpyllifolia	thymeleaf speedwell
VEST	0	0	1	1	0	0	Verbena stricta	hoary verbena
VETH	0	0	0	1	0	1	Verbascum thapsus	common mullein
VEUR	1	0	0	0	1	0	Verbena urticifolia	white vervain
VEVI3	0	0	0	0	1	0	Verbesina virginica	white crownbeard
VINE	0	0	1	0	0	0	Viola nephrophylla	northern bog violet
VIOLA	1	1	1	1	1	0	Viola	violet
VIPE2	1	0	0	0	0	0	Viola pedatifida	prairie violet
VISA2	0	1	0	0	0	0	Viola sagittata	arrowleaf violet
VISO	1	1	0	0	1	0	Viola sororia	common blue violet
WAMA	0	0	0	0	1	0	Wahlenbergia marginata	southern rockbell
WYAM	0	0	1	0	0	0	Wyethia amplexicaulis	mule-ears
XANTH2	1	1	1	1	1	0	Xanthium	cocklebur
XAST	1	0	1	1	1	0	Xanthium strumarium	rough cocklebur
XYRIS	0	0	0	0	1	0	Xyris	yelloweyed grass
ZIAU	1	0	0	0	0	0	Zizia aurea	golden zizia

Cool Season (C3) Grasses

Cool season grasses observed (1=observed, 0=not observed) on non-Federal pasturelands during 2013-2016 by region (MW=Midwest, NE=Northeast, NP=Northern Plains, SC=South Central, SE=Southeast, W=West).

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ACHY	0	0	1	0	0	1	Achnatherum hymenoides	Indian ricegrass
AECY	0	0	1	0	0	1	Aegilops cylindrica	jointed goatgrass
AGCA11	0	1	0	0	1	0	Agrostis castellana	bentgrass
AGCA5	0	0	0	0	0	1	Agrostis capillaris	colonial bentgrass
AGCR	0	0	1	0	0	1	Agropyron cristatum	crested wheatgrass
AGEL4	0	0	0	1	0	0	Agrostis elliottiana	Elliott's bentgrass
AGGI2	1	1	1	1	1	1	Agrostis gigantea	redtop
AGHY	0	0	1	1	0	0	Agrostis hyemalis	
AGPE	0	0	0	0	1	0	Agrostis perennans	upland bentgrass
AGROP2	1	0	1	0	1	1	Agropyron	wheatgrass
AGROS2	1	1	1	1	1	1	Agrostis	bentgrass
AGSC5	0	0	1	0	0	0	Agrostis scabra	rough bentgrass
AGST2	0	1	1	0	1	1	Agrostis stolonifera	creeping bentgrass
AICA	0	0	0	1	0	0	Aira caryophyllea	silver hairgrass
AIRA	0	0	0	1	0	0	Aira	hairgrass
ALAE	0	0	1	0	0	0	Alopecurus aequalis	shortawn foxtail
ALAR	0	0	1	0	0	1	Alopecurus arundinaceus	creeping meadow foxtail
ALBR12	1	1	0	0	1	0	Alopecurus brachystachus	foxtail
ALCA4	0	0	0	0	1	0	Alopecurus carolinianus	Carolina foxtail
ALMY	0	0	0	0	1	0	Alopecurus myosuroides	slender meadow foxtail
ALOPE	1	1	0	1	1	1	Alopecurus	foxtail
ALPR3	0	0	1	0	0	1	Alopecurus pratensis	meadow foxtail
ANOD	1	1	0	1	1	1	Anthoxanthum odoratum	sweet vernalgrass
ARAL28	0	1	0	0	0	0	Arrhenatherum album	tall oat grass
AREL3	0	0	0	0	0	1	Arrhenatherum elatius	tall oatgrass
ARLO16	0	0	0	1	0	0	Aristida longespica	slimspike threeawn
AVENA	0	0	0	0	0	1	Avena	oat
AVFA	0	0	1	1	1	0	Avena fatua	wild oat
AVSA	1	0	0	0	1	0	Avena sativa	common oat
BECKM	0	0	0	0	0	1	Beckmannia	sloughgrass
BESY	0	0	1	0	0	0	Beckmannia syzigachne	American sloughgrass
BRAN	1	0	0	0	0	1	Bromus anomalus	nodding brome
BRAR5	1	0	1	1	1	1	Bromus arvensis	field brome

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
BRBI2	0	1	0	0	0	1	Bromus biebersteinii	meadow brome
BRCA6	0	0	0	1	1	0	Bromus catharticus	rescuegrass
BRHO2	0	0	0	1	0	1	Bromus hordeaceus	soft brome
BRHU4	0	0	0	0	1	0	Briza humilis	quakinggrass
BRIN13	0	0	0	0	0	1	Bromus intermedius	
BRIN2	1	1	1	1	1	1	Bromus inermis	smooth brome
BRIZA	0	1	0	1	1	0	Briza	quakinggrass
BRLA6	0	1	0	0	0	0	Bromus lanatipes	woolly brome
BRMA4	0	0	1	0	0	1	Bromus marginatus	mountain brome
BRMI2	0	0	0	1	1	0	Briza minor	little quakinggrass
BROMU	1	1	1	1	1	1	Bromus	brome
BRRA2	0	0	0	0	1	1	Bromus racemosus	bald brome
BRRA3	0	0	0	1	0	0	Bromus ramosus	hairy brome
BRRI7	0	0	1	0	0	0	Bromus riparius	meadow brome
BRRU2	1	0	0	0	0	0	Bromus rubens	red brome
BRSE	0	0	0	1	1	0	Bromus secalinus	rye brome
BRST2	1	1	0	0	0	0	Bromus sterilis	poverty brome
BRTE	1	1	1	1	1	1	Bromus tectorum	cheatgrass
CACA4	1	0	0	0	0	0	Calamagrostis canadensis	bluejoint
CALAM	0	0	0	1	0	0	Calamagrostis	reedgrass
CAMO	0	0	1	0	0	0	Calamagrostis montanensis	plains reedgrass
CANU	0	0	0	1	0	0	Calamagrostis nutkaensis	Pacific reedgrass
CAPE10	1	0	0	0	0	0	Calamagrostis perplexa	wood reedgrass
CAST36	1	0	1	0	0	0	Calamagrostis stricta	slimstem reedgrass
CHASM	0	0	0	0	1	0	Chasmanthium	woodoats
CHLA5	0	0	0	1	1	0	Chasmanthium latifolium	Indian woodoats
CHSE2	0	0	0	0	1	0	Chasmanthium sessiliflorum	longleaf woodoats
CINNA	0	1	0	0	0	0	Cinna	woodreed
DACTY	1	1	0	0	1	0	Dactylis	orchardgrass
DAGL	1	1	1	1	1	1	Dactylis glomerata	orchardgrass
DAIN	0	0	1	0	0	0	Danthonia intermedia	timber oatgrass
DASP2	1	1	0	1	0	0	Danthonia spicata	poverty oatgrass
DECE	0	0	1	0	0	1	Deschampsia cespitosa	tufted hairgrass
DESCH	0	1	1	0	0	0	Deschampsia	hairgrass
DICHE	0	0	0	0	1	0	Dichelachne	plumegrass
DIMI9	0	0	0	0	1	0	Dichelachne micrantha	plumegrass
ELAL7	0	0	0	0	0	1	Elymus albicans	Montana wheatgrass
ELCA11	0	0	1	0	0	0	Elymus caninus	bearded wheatgrass
ELCA4	0	0	1	1	0	0	Elymus canadensis	Canada wildrye

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ELEL5	0	0	1	0	0	1	Elymus elymoides	squirreltail
ELLA3	0	0	1	0	0	1	Elymus lanceolatus	thickspike wheatgrass
ELRE4	1	1	1	0	1	1	Elymus repens	quackgrass
ELSU	1	0	0	0	0	0	Elymus submuticus	Virginia wildrye
ELTR7	1	0	1	0	0	0	Elymus trachycaulus	slender wheatgrass
ELVI3	1	0	1	1	1	0	Elymus virginicus	Virginia wildrye
ELYMU	0	1	1	1	1	0	Elymus	wildrye
FEID	0	0	0	0	0	1	Festuca idahoensis	Idaho fescue
FEOV	1	1	0	0	0	0	Festuca ovina	sheep fescue
FERU2	0	1	0	0	1	1	Festuca rubra	red fescue
FESTU	1	1	0	0	1	1	Festuca	fescue
GLST	1	0	1	0	0	0	Glyceria striata	fowl mannagrass
HECO26	0	0	1	0	0	0	Hesperostipa comata	needle and thread
HESP11	1	0	1	0	0	0	Hesperostipa spartea	porcupinegrass
HOBR2	0	0	0	0	0	1	Hordeum brachyantherum	meadow barley
HOJU	1	0	1	1	1	1	Hordeum jubatum	foxtail barley
HOLA	1	1	0	0	1	1	Holcus lanatus	common velvetgrass
HOLCU	1	1	0	0	1	1	Holcus	velvetgrass
HOPU	0	0	1	1	1	1	Hordeum pusillum	little barley
HORDE	0	0	0	0	1	0	Hordeum	barley
HOVU	0	0	0	0	1	0	Hordeum vulgare	common barley
HYAM2	0	0	0	0	1	0	Hymenachne amplexicaulis	West Indian marsh grass
KOMA	1	0	1	0	0	1	Koeleria macrantha	prairie Junegrass
LECI4	0	0	1	0	0	1	Leymus cinereus	basin wildrye
LEOR	1	0	0	0	0	0	Leersia oryzoides	rice cutgrass
LEPA12	0	1	0	0	0	0	Leymus pacificus	Pacific wildrye
LETR5	0	0	0	0	0	1	Leymus triticoides	beardless wildrye
LEVI2	0	1	0	0	0	0	Leersia virginica	whitegrass
LIAR	0	0	0	1	0	0	Limnodea arkansana	Ozark grass
LOLIO	0	0	0	0	1	0	Loliolum	
LOLIU	1	1	0	1	1	1	Lolium	ryegrass
LOPE	1	1	0	1	1	1	Lolium perenne	perennial ryegrass
LOPE2	0	0	0	1	0	0	Lolium persicum	Persian ryegrass
LORI	0	0	0	1	1	0	Lolium rigidum	Wimmera ryegrass
LUFL2	0	0	0	0	1	0	Luziola fluitans	southern watergrass
MILIU	1	0	0	0	0	0	Milium	milletgrass
NALE3	0	0	0	1	0	0	Nassella leucotricha	Texas wintergrass
NAVI4	0	0	1	0	0	0	Nassella viridula	green needlegrass
ORYZO	0	1	0	0	0	0	Oryzopsis	ricegrass

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
PAHE2	0	0	0	0	1	0	Panicum hemitomon	maidencane
PASM	1	0	1	1	0	1	Pascopyrum smithii	western wheatgrass
PHALA2	0	1	0	1	0	0	Phalaris	canarygrass
PHAN2	0	0	0	1	0	0	Phalaris angusta	timothy canarygrass
PHANO	1	0	0	0	0	0	Phanopyrum	savannah-panicgrass
PHAR3	1	1	1	1	1	1	Phalaris arundinacea	reed canarygrass
PHCA6	0	0	0	1	0	0	Phalaris caroliniana	Carolina canarygrass
PHLEU	1	1	1	0	1	1	Phleum	timothy
PHPR3	1	1	1	1	1	1	Phleum pratense	timothy
PHRAG	1	0	0	1	1	0	Phragmites	reed
POA	1	1	1	0	1	1	Poa	bluegrass
POAN	1	1	1	1	1	1	Poa annua	annual bluegrass
POAR	0	0	1	1	0	0	Poa arachnifera	Texas bluegrass
POAR2	0	1	0	0	0	0	Poa arctica	arctic bluegrass
POAU	0	0	0	1	0	0	Poa autumnalis	autumn bluegrass
POBU	0	0	0	0	0	1	Poa bulbosa	bulbous bluegrass
POCO	0	1	1	0	1	1	Poa compressa	Canada bluegrass
POCO2	0	1	0	0	0	0	Poa confinis	coastline bluegrass
POPA2	1	0	1	0	0	0	Poa palustris	fowl bluegrass
POPR	1	1	1	1	1	1	Poa pratensis	Kentucky bluegrass
POPR2	0	1	0	0	0	0	Poa pringlei	Pringle's bluegrass
POSE	0	0	1	0	0	1	Poa secunda	Sandberg bluegrass
POTR2	0	1	0	0	0	0	Poa trivialis	rough bluegrass
PSJU3	0	0	1	0	0	0	Psathyrostachys juncea	Russian wildrye
PUNU2	0	0	1	0	0	0	Puccinellia nuttalliana	Nuttall's alkaligrass
PUWR	0	0	0	0	0	1	Puccinellia wrightii	Wright's alkaligrass
SCAR7	1	1	1	1	1	1	Schedonorus arundinaceus	
SCBO	0	0	1	0	0	0	Scribneria bolanderi	Scribner's grass
SCPR4	1	1	0	0	1	0	Schedonorus pratensis	meadow fescue
SCRIB	0	0	1	0	0	0	Scribneria	Scribner's grass
SECAL	0	0	1	0	1	0	Secale	rye
SECE	1	0	0	1	1	1	Secale cereale	cereal rye
SPIN3	1	0	0	0	0	0	Sphenopholis intermedia	slender wedgescale
TACA8	0	0	0	0	0	1	Taeniatherum caput-medusae	medusahead
THIN6	0	0	1	0	0	1	Thinopyrum intermedium	intermediate wheatgrass
THPO7	0	0	1	0	0	1	Thinopyrum ponticum	tall wheatgrass
TRAE	0	0	1	0	0	0	Triticum aestivum	common wheat
TRIGL	0	0	0	0	0	1	Triglochin	arrowgrass
TRIN5	0	0	0	1	0	0	Trisetum interruptum	prairie false oat

TRIPS	0	1	0	0	1	0	Tripsacum	gamagrass
TRISE	0	0	0	1	0	0	Trisetum	oatgrass
TRITI	0	0	1	1	1	1	Triticum	wheat
VEDU	0	0	0	0	0	1	Ventenata dubia	North Africa grass
VENTE	0	0	0	0	0	1	Ventenata	North Africa grass
VUBR	1	0	0	0	0	1	Vulpia bromoides	brome fescue
VUMY	0	0	0	0	0	1	Vulpia myuros	annual fescue
VUOC	1	0	1	1	1	1	Vulpia octoflora	sixweeks fescue

Warm Season (C4) Grasses

Warm season grasses observed (1=observed, 0=not observed) on non-Federal pasturelands during 2013-2016 by region (MW=Midwest, NE=Northeast, NP=Northern Plains, SC=South Central, SE=Southeast, W=West).

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
ACRA6	1	1	0	0	1	0	Acrachne racemosa	goosegrass
ACRAC	0	1	0	0	1	0	Acrachne	goosegrass
ANBR2	0	0	0	0	1	0	Andropogon brachystachyus	shortspike bluestem
ANCA4	0	0	0	0	1	0	Andropogon capillipes	chalky bluestem
ANDRO2	1	0	0	0	1	0	Andropogon	bluestem
ANGE	1	1	1	1	1	0	Andropogon gerardii	big bluestem
ANGL10	0	0	0	0	1	0	Andropogon glaucopsis	purple bluestem
ANGL2	0	0	0	1	1	0	Andropogon glomeratus	
ANTE2	0	0	0	0	1	0	Andropogon ternarius	splitbeard bluestem
ANVI2	1	1	1	1	1	0	Andropogon virginicus	broomsedge bluestem
AROL	0	0	0	1	0	0	Aristida oligantha	prairie threeawn
ARPU8	0	1	0	0	1	0	Aristida purpurascens	arrowfeather threeawn
ARPU9	0	0	1	1	0	1	Aristida purpurea	purple threeawn
ARST5	0	0	0	0	1	0	Aristida stricta	pineland threeawn
AXFI	0	0	0	1	1	0	Axonopus fissifolius	common carpetgrass
AXONO	0	1	0	0	1	0	Axonopus	carpetgrass
AXSC	0	0	0	0	1	0	Axonopus scoparius	carpetgrass
AXSU2	0	1	0	0	0	0	Axonopus suffultus	carpet grass
BLEPH4	1	0	0	0	0	0	Blepharoneuron	dropseed
BOCU	1	1	1	1	0	1	Bouteloua curtipendula	sideoats grama
BODA2	0	0	1	1	1	0	Bouteloua dactyloides	buffalograss
BOGR2	0	0	1	1	0	1	Bouteloua gracilis	blue grama
BOHI2	0	0	1	0	0	0	Bouteloua hirsuta	hairy grama
BOIS	1	0	0	1	0	0	Bothriochloa ischaemum	yellow bluestem
BOLA2	0	0	1	1	0	0	Bothriochloa laguroides	silver beardgrass
BORI	0	0	0	1	0	0	Bouteloua rigidiseta	Texas grama
BOSA	0	0	1	1	0	0	Bothriochloa saccharoides	silver bluestem
BOUTE	0	0	1	0	0	0	Bouteloua	grama
BRACH	1	0	0	1	1	0	Brachiaria	signalgrass
CALO	0	0	1	0	0	0	Calamovilfa longifolia	prairie sandreed
CEGR3	0	0	0	0	1	0	Cenchrus gracillimus	slender sandbur
CELO3	0	0	0	1	0	0	Cenchrus longispinus	mat sandbur
CENCH	0	0	0	1	0	0	Cenchrus	sandbur
CESP4	0	0	0	0	1	0	Cenchrus spinifex	coastal sandbur
CHCI	0	0	0	1	0	0	Chloris ciliata	fringed windmill grass
CHCU2	0	0	0	1	0	0	Chloris cucullata	hooded windmill grass
CHLOR	1	0	1	1	1	0	Chloris	windmill grass

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
CHVE2	0	0	1	1	0	0	Chloris verticillata	tumble windmill grass
CTENI	0	0	0	0	1	0	Ctenium	toothache grass
CYDA	1	1	1	1	1	1	Cynodon dactylon	Bermudagrass
CYNOD	0	0	0	1	1	0	Cynodon	Bermudagrass
DACTY2	0	0	0	0	1	0	Dactyloctenium	crowfoot grass
DIAC	0	0	0	1	0	0	Dichanthelium aciculare	needleleaf rosette grass
DICHA2	1	0	0	1	1	0	Dichanthelium	rosette grass
DICHA3	1	0	0	0	0	0	Dichanthium	bluestem
DICI	0	0	0	1	1	0	Digitaria ciliaris	southern crabgrass
DICL	1	1	0	1	1	0	Dichanthelium clandestinum	deertongue
DICO2	0	0	0	0	1	0	Dichanthelium commutatum	variable panicgrass
DICO6	1	0	1	1	1	0	Digitaria cognata	fall witchgrass
DICR3	1	1	0	1	1	0	Digitaria cruciata	crabgrass
DIDE4	1	0	0	0	0	0	Dichanthelium depauperatum	starved panicgrass
DIDI16	1	0	1	0	1	0	Digitaria didactyla	crabgrass
DIDI6	1	0	0	1	1	0	Dichanthelium dichotomum	cypress panicgrass
DIGIT2	1	1	1	1	1	1	Digitaria	crabgrass
DIIS	1	1	0	1	1	0	Digitaria ischaemum	smooth crabgrass
DIMA5	0	0	0	1	0	0	Dichanthelium malacophyllum	softleaf rosette grass
DIOL	1	0	1	1	0	0	Dichanthelium oligosanthes	Heller's rosette grass
DIOLS	0	0	1	0	0	0	Dichanthelium oligosanthes var. scribnerianum	Scribner's rosette grass
DIOV	1	0	0	0	0	0	Dichanthelium ovale	eggleaf rosette grass
DISA	1	1	1	1	1	0	Digitaria sanguinalis	hairy crabgrass
DISC2	0	0	0	1	0	0	Dichanthelium scabriusculum	woolly rosette grass
DISC3	1	0	0	1	1	0	Dichanthelium scoparium	velvet panicum
DISE16	0	1	0	0	0	0	Digitaria seriata	crabgrass
DISP	0	0	1	0	0	1	Distichlis spicata	saltgrass
DISTI	0	1	0	0	0	0	Distichlis	saltgrass
DIVA5	0	0	0	0	1	0	Digitaria valida	
DIVE2	0	1	0	0	0	0	Digitaria velutina	velvet crabgrass
DIWI5	0	1	0	0	1	0	Dichanthelium wilcoxianum	fall rosette grass
ECCR	1	1	1	1	1	0	Echinochloa crus-galli	barnyardgrass
ECMU2	0	0	0	1	0	0	Echinochloa muricata	rough barnyardgrass
ELEUS	0	0	0	0	1	0	Eleusine	goosegrass
ELIN3	1	1	0	1	1	0	Eleusine indica	Indian goosegrass
ERAGR	0	0	0	1	1	0	Eragrostis	lovegrass
ERCA16	0	0	1	0	0	0	Eriochrysis cayennensis	moco de pavo
ERCI	0	0	1	1	0	0	Eragrostis cilianensis	stinkgrass
ERCU	0	0	0	1	0	0	Eragrostis curtipedicellata	gummy lovegrass
ERCU2	0	1	0	1	1	0	Eragrostis curvula	weeping lovegrass

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
EREMO2	0	0	0	0	1	0	Eremochloa	centipede grass
ERIN	0	0	0	1	0	0	Eragrostis intermedia	plains lovegrass
EROP	0	0	0	1	1	0	Eremochloa ophiuroides	centipede grass
ERPE	0	0	0	1	0	0	Eragrostis pectinacea	tufted lovegrass
ERSE	0	0	0	1	0	0	Eragrostis secundiflora	red lovegrass
ERSE2	0	0	0	1	0	0	Eragrostis sessilispica	tumble lovegrass
ERSE5	0	0	0	1	0	0	Eriochloa sericea	Texas cupgrass
ERSP	0	0	1	1	0	0	Eragrostis spectabilis	purple lovegrass
ERSU	0	0	0	1	0	0	Eragrostis superba	Wilman lovegrass
ERTR3	0	0	0	1	0	0	Eragrostis trichodes	sand lovegrass
ERVI3	1	0	0	0	0	0	Eriochloa villosa	hairy cupgrass
GYMNO3	1	0	0	0	0	0	Gymnopogon	skeletongrass
HEAL5	0	0	0	0	1	0	Hemarthria altissima	limpograss
HYHI	0	1	0	0	0	0	Hyparrhenia hirta	thatching grass
HYPAR	0	1	0	0	0	0	Hyparrhenia	thatching grass
IMCY	0	0	0	0	1	0	Imperata cylindrica	cogongrass
LEPTO	0	0	0	0	1	0	Leptochloa	sprangletop
MERE9	0	0	0	0	1	0	Melinis repens	rose Natal grass
MICRO7	0	0	0	0	1	0	Microstegium	browntop
MISI	0	0	0	0	1	0	Miscanthus sinensis	Chinese silvergrass
MIVI	0	1	0	0	1	0	Microstegium vimineum	Nepalese browntop
MUAS	0	0	0	1	0	0	Muhlenbergia asperifolia	scratchgrass
MUCA2	1	0	0	0	0	0	Muhlenbergia capillaris	hairawn muhly
MUHLE	1	0	1	0	1	0	Muhlenbergia	muhly
MURI	0	0	1	0	0	1	Muhlenbergia richardsonis	mat muhly
MUSC	1	1	1	1	1	0	Muhlenbergia schreberi	nimblewill
MUSQ3	0	0	0	1	0	0	Munroa squarrosa	false buffalograss
MUTO2	0	0	0	0	0	1	Muhlenbergia torreyi	ring muhly
PAAC4	0	0	0	1	0	0	Paspalum acuminatum	brook crowngrass
PAAL7	0	0	0	1	0	0	Paspalum almum	Comb's crowngrass
PAAN	1	0	0	1	1	0	Panicum anceps	beaked panicgrass
PACA6	1	1	1	1	1	1	Panicum capillare	witchgrass
PACO15	0	0	0	1	0	0	Paspalum convexum	Latin American crowngrass
PACO2	0	0	0	1	0	0	Panicum coloratum	kleingrass
PADI	1	1	0	1	1	0	Panicum dichotomiflorum	fall panicgrass
PADI3	1	1	0	1	1	0	Paspalum dilatatum	dallisgrass
PADI6	1	0	0	1	0	0	Paspalum distichum	knotgrass
PAFL4	0	0	1	1	1	0	Paspalum floridanum	Florida paspalum
PAHA	0	0	0	1	0	0	Panicum hallii	Hall's panicgrass
PAHI13	1	0	0	0	1	0	Paspalum hieronymi	paspalum
PAHY15	0	0	0	1	0	0	Paspalum hydrophilum	

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
PALA10	0	0	0	1	1	0	Paspalum laeve	field paspalum
PAMA17	1	0	0	1	1	0	Panicum makarikariense	panicum
PAMI4	0	0	0	1	0	0	Paspalum minus	matted paspalum
PANO2	0	0	0	1	1	0	Paspalum notatum	bahiagrass
PAOB	0	0	0	1	0	1	Panicum obtusum	vine mesquite
PAPA40	1	0	0	1	1	0	Panicum paniculatum	panicum
PAPL3	0	0	0	1	0	0	Paspalum plicatulum	brownseed paspalum
PARE3	0	0	0	1	1	0	Panicum repens	torpedo grass
PARI4	1	1	0	1	1	0	Panicum rigidulum	redtop panicgrass
PASE5	0	0	0	1	1	0	Paspalum setaceum	thin paspalum
PASPA	0	0	0	0	1	0	Paspalidium	watercrown grass
PASPA2	1	0	0	1	1	0	Paspalum	crowngrass
PAUR2	0	0	0	1	1	0	Paspalum urvillei	Vasey's grass
PAVI2	1	1	1	1	1	0	Panicum virgatum	switchgrass
PLJA	0	0	0	0	0	1	Pleuraphis jamesii	James' galleta
SAGI	0	0	0	0	1	0	Saccharum giganteum	sugarcane plumegrass
SCHIZ4	1	0	1	0	1	0	Schizachyrium	little bluestem
SCPA	0	0	1	1	0	0	Schedonnardus paniculatus	tumblegrass
SCSC	1	1	1	1	1	1	Schizachyrium scoparium	little bluestem
SCTE5	0	0	0	1	0	0	Schizachyrium tenerum	slender little bluestem
SEFA	1	1	0	0	1	0	Setaria faberi	Japanese bristlegrass
SEIT	1	0	0	0	0	0	Setaria italica	foxtail millet
SELE6	1	0	1	1	1	0	Setaria leucopila	streambed bristlegrass
SEMA6	0	0	0	1	0	0	Setaria magna	giant bristlegrass
SEPA10	0	0	0	1	1	0	Setaria parviflora	marsh bristlegrass
SEPU8	1	1	1	1	1	0	Setaria pumila	yellow foxtail
SERE3	0	0	0	1	0	0	Setaria reverchonii	Reverchon's bristlegrass
SETAR	1	0	1	1	1	1	Setaria	bristlegrass
SEVE5	1	0	0	0	0	0	Setaria verticilliformis	barbed bristlegrass
SEVI4	1	0	1	1	1	0	Setaria viridis	green bristlegrass
SOAL	0	0	0	0	1	0	Sorghum almum	Columbus grass
SOBI2	0	0	0	0	1	0	Sorghum bicolor	sorghum
SOHA	1	1	0	1	1	1	Sorghum halepense	Johnsongrass
SONU2	1	1	1	1	1	0	Sorghastrum nutans	Indiangrass
SORGH	0	1	0	0	1	0	Sorghastrum	Indiangrass
SORGH2	0	0	0	0	1	0	Sorghum	sorghum
SPAI	0	0	1	0	0	1	Sporobolus airoides	alkali sacaton
SPCL	1	0	0	1	0	0	Sporobolus clandestinus	rough dropseed
SPCO16	0	0	1	1	0	0	Sporobolus compositus	composite dropseed

Symbol	MW	NE	NP	SC	SE	W	Scientific Name	Common Name
SPCOC2	0	0	0	1	0	0	Sporobolus compositus var. compositus	composite dropseed
SPCR	1	0	1	1	0	1	Sporobolus cryptandrus	sand dropseed
SPHE	0	0	1	0	0	0	Sporobolus heterolepis	prairie dropseed
SPIN4	0	0	0	1	1	0	Sporobolus indicus	smut grass
SPORO	0	0	1	1	1	0	Sporobolus	dropseed
SPPE	1	0	1	0	0	0	Spartina pectinata	prairie cordgrass
STENO3	0	0	0	0	1	0	Stenotaphrum	St. Augustine grass
STSE	0	0	0	1	0	0	Stenotaphrum secundatum	St. Augustine grass
TRAL2	0	0	0	1	0	0	Tridens albescens	white tridens
TRDA3	0	0	1	1	1	0	Tripsacum dactyloides	eastern gamagrass
TRER	1	0	0	0	0	0	Tridens eragrostoides	lovegrass tridens
TRFL2	1	1	1	1	1	0	Tridens flavus	purpletop tridens
TRIDE	0	0	0	1	1	0	Tridens	tridens
TRMU	0	0	0	1	0	0	Tridens muticus	slim tridens
TRST2	0	0	0	1	0	0	Tridens strictus	longspike tridens
UNIOL	0	0	0	1	0	0	Uniola	seaoats
UROCH	0	0	0	0	1	0	Urochloa	signalgrass
URPL2	0	0	0	1	1	0	Urochloa platyphylla	broadleaf signalgrass
ZEA	0	1	0	0	0	0	Zea	corn

Appendix C. Resource concerns documented during on-site data collection

Resource	Abbreviation Used in Figures	Resource Concern
Soil	ESR	Erosion - Sheet and Rill
	EW	Erosion - Wind
	ECG	Erosion - Classic Gully
	EST	Erosion - Streambank
	ESH	Erosion - Shoreline
	EMM	Erosion - Mass Movement
	OMD	Condition - Organic Matter Depletion
	COM	Condition - Compaction
	DSD	Condition - Damage From Soil Deposition
	EXR	Quantity - Excessive Runoff Flooding Pond
	RSS	Quantity - Reduced Storage of Waterbodies by Sediment Accumulation
Water	INF	Quantity - Insufficient Flows in Water Courses
	EXN	Quality - Excessive Nutrients and Organics in Surface Water
	EXS	Quality – Excessive Suspended Sediment and Turbidity in Surface Water
Plant	PNA	Condition - Plant Not Adapted Or Suited
	PHV	Condition - Productivity Health And Vigor
	NIP	Condition - Noxious And Invasive Plants
	FQP	Condition - Forage Quality Palatability
	WFH	Condition - Wildfire Hazard
Animals	ISW	Domestic Animal - Inadequate Stock Water

Appendix D. Conservation practices documented during on-site data collection on pasturelands

Abbreviation Used in Figures	Conservation Practice
BM	Brush Management (Applied)
BMN	Brush Management (Needed)
PB	Prescribed Burning (Applied)
PBN	Prescribed Burning (Needed)
PD	Pond (Applied)
PDN	Pond (Needed)
WS	Windbreak/Shelterbelt Establishment (Applied)
WSN	Windbreak/Shelterbelt Establishment (Needed)
FN	Fence (Applied)
FNN	Fence (Needed)
RH	Riparian Herbaceous Cover (Applied)
RHN	Riparian Herbaceous Cover (Needed)
FS	Filter Strip (Applied)
FSN	Filter Strip (Needed)
IR	Irrigation Water Management (Applied)
IRN	Irrigation Water Management (Needed)
FB	Forage and Biomass Planting (Applied)
FBN	Forage and Biomass Planting Needed)
PL	Pipeline (Applied)
PLN	Pipeline (Needed)
PG	Prescribed Grazing (Applied)
PGN	Prescribed Grazing (Needed)
MT	Grazing Land Mechanical Treatment (Applied)
MTN	Grazing Land Mechanical Treatment (Needed)
SD	Spring Development (Applied)
SDN	Spring Development (Needed)
AT	Animal Trails and Walkways (Applied)
ATN	Animal Trails and Walkways (Needed)
WF	Watering Facility (Applied)
WFN	Watering Facility (Needed)
WW	Water Well (Applied)
WWN	Water Well (Needed)
FI	Forest Stand Improvement (Applied)
FIN	Forest Stand Improvement (Needed)