NRCS Natural Resources Conservation Service

Helping People Help the Land

Reclaiming Disturbed Sites

USDA Natural Resources Conservation Service, Bismarck, North Dakota

Reclaiming disturbed sites successfully requires careful planning well in advance of the actual disturbance. (Photo credit: ND Dept of Trust Lands)

Soils

When revegetating disturbed sites, it is important to know what soils are impacted and ensure that plant species being planted are adapted to those soils. Contact your local NRCS/SCD Field Office for identification of the impacted soils or visit the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/) to find the location and soil mapping units. Soil surveys are available for all counties in North Dakota at a scale of 1:24,000. For project areas larger than 3 to 5 acres, the soil survey will provide adequate information for reclamation. Soil survey information is not site specific and does not eliminate the need for onsite investigation of soil properties for projects less than 3 to 5 acres. Soil surveys were designed for general conservation planning, not site specific interpretations.

Topsoil should be stripped from the site and kept separate during the construction. Upon completion of the project, and after replacement, grading, and shaping of the subsoil, the topsoil should be respread on the surface.

NRCS has developed Ecological Site Descriptions (ESD) that contain detailed information on the plant species naturally occurring on those soil mapping units. ESDs for the state are available at: https://esis.sc.egov.usda.gov/

Adjacent Land Use

The adjacent land use and vegetation should always be considered when determining proper species for revegetating disturbed sites. If construction is impacting native rangeland, it is important to revegetate with native species adapted to those soils and ecological sites. Planting these disturbed sites with introduced species can have negative impacts on the adjacent land resource. Species such as smooth bromegrass, Kentucky bluegrass and crested wheatgrass can invade adjacent native rangeland, usually reducing production and hindering management. If the construction impacts hayland or pastureland, it is important to replant desirable, compatible species. Pastureland and hayland are commonly planted to an introduced species such as alfalfa, intermediate wheatgrass, crested wheatgrass and smooth bromegrass. These species can make productive introduced pastures and hayland. It is critical to consider proper species selection. If cropland is impacted, it is still important to respread the topsoil on the soil surface to restore productivity of the disturbed site.

It is critical that disturbed sites are revegetated with plant species that match the adjacent land use. Do not use introduced species when revegetating disturbances in or adjacent to native sites.

Weed Control

Weeds need to be monitored on the site both during construction and after the site is reclaimed. Precautions should be taken to not introduce invasive weeds into these disturbed sites. Weeds may need to be controlled prior to seeding or after the site is seeded depending on weed species present and degree of infestation. If a weed problem is known to exist, then weed management needs to be considered when planning the species mix. Ensure the planted species and adjacent species are compatible with the selected herbicide.

Erosion Control

Erosion should be controlled at all times and is critical after planting and during plant establishment. Consider planting a cover crop during the part of the growing season that is not suited to planting permanent cover. On smaller areas a weed-free blanket mulch is an option. See NRCS Conservation practice Mulching in FOTG Section IV - Conservation Practice Standards http://efotg.sc.egov.usda.gov/references/public/ND/484_Standard.pdf.

Species Selection

Plant species should be selected that are adapted to the soils and will provide for the planned land use. Care must be taken to purchase northern adapted species that have been performance tested to survive and be productive in the area. Utilize the NRCS Herbaceous Vegetation Establishment Guide to determine proper species and seeding rates for the seed mix. *See NRCS Herbaceous Vegetation Establishment

Guide http://efotg.sc.egov.usda.gov/references/public/ND/Herbaceous_Veg_Est_Guide.pdf *See Conservation Practice Cover Crop in FOTG Section IV - Conservation Practice Standards http://efotg.sc.egov.usda.gov/references/public/ND/340_standard.pdf

'Lodorm' green needlegrass and 'Pierre' sideoats grama (left tray in each photo) established rapidly (25 days after seeding) compared to a native harvest seed source (right tray in each photo).

Proper Seeding of the Site

Once the species have been selected it is crucial to plant them when the best chance for establishment occurs. If the planting is dominated by cool-season species, a spring or late dormant planting date has proven to be the best. If the mix includes warm-season species, it is best to plant late spring after the last chance of frost. The seeding should be done into a firm, weed-free seedbed. Seed should be placed no more than ½ inch deep for most species. *See Five Keys for Successful Grass Seeding http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/ndpmcbr04959.pdf

Management During Establishment

Management during establishment is critical to achieving successful reclamation. A full growing season of deferment (no grazing or haying) is generally a minimum establishment period. Depending upon growing conditions, a second year of deferment may be required. If the reclaimed site involves rangeland or tame pasture which is currently being grazed, temporary fencing may be an option to exclude livestock from the seeded area. If the manager is currently using a prescribed grazing system of some type, adjustments could be made to the livestock rotation to provide the needed deferment period.

Annual weeds usually associated with grass seeding efforts will generally not be a long term problem. As the perennial seeded vegetation becomes established, annual weeds will decline. Noxious weeds will need to be controlled as per state law. This could involve spot spraying and/or clipping prior to seed formation.

Construction activities should leave little to no visible foot print on the land if properly planned and reclaimed (photo credit: USDA Forest Service).

Seeding Mixes

Example seeding mixtures based upon general soil types would include:

Native rangeland (loam, clayey and sandy soils)
Western wheatgrass (native cool-season rhizomatous grass)
Green needlegrass (native cool-season bunchgrass)
Canada wildrye (native cool-season bunchgrass)
Sideoats grama (native warm-season rhizomatous grass)
Blue grama (native warm-season bunchgrass)
Purple prairieclover (native leguminous forb)

Native rangeland (sands and shallow soils)
Western wheatgrass (native cool-season rhizomatous grass)
Prairie sandreed (native warm-season rhizomatous grass)
Little bluestem (native warm-season bunchgrass)
Canada wildrye (native cool-season bunchgrass)
Blue grama (native warm-season bunchgrass)
Narrow-leaf purple coneflower (native forb)

Native rangeland (saline and/or sodic affected soils)
Western wheatgrass (native cool-season rhizomatous grass)
Slender wheatgrass (native cool-season bunchgrass)
Canada wildrye (native cool-season bunchgrass)
Blue grama (native warm-season bunchgrass)
Western yarrow (native forb)
Wyoming big sagebrush (native shrub) – for reclaiming sites within sage grouse habitat

Introduced pasture or hayland (all soil types)
When reestablishing tame grass pastures or hayland, use introduced species which are adapted to the soil and match the existing vegetation. This may include intermediate/pubescent wheatgrass (introduced cool-season rhizomatous grass), meadow bromegrass (introduced cool-season bunchgrass), crested wheatgrass (introduced cool-season bunchgrass), and alfalfa (introduced leguminous forb). Be aware of the potential for livestock bloat when using alfalfa in pasture mixtures.

Herbaceous Establishment Guide (NRCS ND)
http://efotg.sc.egov.usda.gov/references/public/ND/Herbaceous_Veg_Est_Guide.pdf
Pasture or Hayland Specification (NRCS ND)
http://efotg.sc.egov.usda.gov/references/public/ND/512_specs.pdf
Range Specification (NRCS ND)
http://efotg.sc.egov.usda.gov/references/public/ND/550_specs.pdf

For more information or technical assistance, contact your local Natural Resources Conservation Service Field Office, County Soil Conservation District Office, or
USDA-NRCS Plant Materials Center
3308 University Drive
Bismarck, ND 58504
Phone: (701) 250-4330
http://Plant-Materials.nrcs.usda.gov

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