

# Photo Guidebook for Ecological Integrity Monitoring



*Washington Department of Fish and Wildlife*

## Soil Crust



*A: Soil soil crust matches capacity where characteristics of site not limiting (i.e. steep or dense grass).*



*B: Soil crust is close to site capacity, but its continuity is broken.*



*C: Soil crust present in protected areas and a relatively minor component elsewhere.*



*D: Soil crust, if present, is only in protected areas. Crust is mostly absent*

## Soil Surface



*A: Bare soil areas limited to natural disturbances such as burrowing animals or game trails.*



*B: Bare soil due to human causes, but extent and impact minimal; disturbance depth ~5cm.*



*C: Bare soil due to human causes common; compaction to ~15cm; machinery may have left shallow ruts.*



*D: Bare soil substantial and long-lasting; deep ruts from machinery present or livestock trails widespread.*

## Total Plant Cover



*25 (10-25% cover): Shrub and herbaceous cover combined.  
Values less than this are rare.*



*50 (25-50% cover): Shrub and herbaceous cover combined  
(no shrubs are here).*



*75 (50-75% cover): Shrub and herbaceous cover combined.*



*100 (75-100% cover): Shrub and herbaceous cover combined.*

## Total Shrub Cover (also for Big and Rigid Sagebrush and Rabbitbrush)



*0 (Absent): This category is used when the target group is completely absent.*



*1 (Present, but <1% cover): This category is used when the target group is present, but uncommon.*



*5 (1-5% cover): Shrubs are infrequent. This category does not include dead shrubs.*



*10 (5-10% cover): Shrubs are common. This category does not include dead shrubs.*



*25 (10-25% cover): Shrubs are common. This category does not include dead shrubs.*



*50 (25-50% cover): Shrubs are abundant. Categories higher than this are unlikely.*

## Key shrubs

*These shrubs are included in the 'total shrub' category as well as specific categories.*



*Big sagebrush: Most common species of shrub in shrubsteppe; it is not fire tolerant.*



*Rigid sagebrush: Common shrub in shallow soil sites; decreases as a result of fire.*



*Gray rabbitbrush: Common native shrub that increases in abundance following disturbance (yellow flowers in late-summer/early-autumn).*



*Green rabbitbrush: Common native shrub that increases in abundance following disturbance (yellow flowers in late-summer/early-autumn).*

## Other shrubs

*These shrubs are included in the 'total shrub' category, but not the other shrub categories.*



*Threetip sagebrush: A common species in moister shrubsteppe; it is somewhat fire tolerant.*



*Antelope bitterbrush: Common in higher elevation shrubsteppe and transitional ecosystems.*



*Horsebrush: This species is relatively uncommon, but increases following disturbance (yellow flowers mid-summer).*



*Wax currant: Native shrub that frequently is present, but rarely is common.*

## Native Perennial Grass Cover and Common Native Grass Species

*Estimate the cover values using the same technique as for total plant and shrub cover.*



*Bluebunch wheatgrass: This is the most common large native species of bunchgrass in shrubsteppe.*



*Sandberg bluegrass: Common native bunchgrass that is often in shallow soil sites.*



*Basin wildrye: This is the tallest species of native bunchgrass.*



*Other species: There are numerous species of native grass including needle-and-thread and Junegrass.*

## Invasive Cover and Common Invasive Species

*Estimate the cover values using the same technique as for total plant and shrub cover.*



*Cheatgrass (downy brome); most common invasive species in Washington. Japanese brome is similar.*



*Cheatgrass: This invasive species can be very common as in this example of category 50 (25-50% cover).*



*Dalmatian toadflax: This is expanding in Washington as this category 25 (10-25% cover) illustrates.*



*Dalmatian toadflax: New growth and plants from previous year; category 100 (75-100% cover).*

## Invasive Cover and Common Invasive Species

*Estimate the cover values using the same technique as for total plant and shrub cover.*



*Diffuse knapweed: Species of knapweed are common and invasive.*



*Diffuse knapweed: View of a young knapweed plant.*



*Russian thistle: Growing plant (inset) and dry plants that have blown in the wind.*



*Canada thistle: There are different species of thistle in Washington; this is the most common.*

## Non-native Cover

*Estimate the cover values using the same technique as for total plant and shrub cover. This includes species like the grasses below that are not invasive, even though they are non-native.*



*Crested wheatgrass: Common non-native grass that is often planted.*



*Intermediate wheatgrass: Common non-native grass that is often planted.*

## Online Resources

Plant guide (USDA, Natural Resources Conservation Service): <http://plants.usda.gov/java/>  
Ecosystem guide (Department of Natural Resources): [http://www1.dnr.wa.gov/nhp/refdesk/pubs/wa\\_ecological\\_systems.pdf](http://www1.dnr.wa.gov/nhp/refdesk/pubs/wa_ecological_systems.pdf)  
Ecosystems of Washington (Washington Native Plant Society): [http://www.wnps.org/ecosystems/eco\\_system\\_home.htm](http://www.wnps.org/ecosystems/eco_system_home.htm)  
Noxious weeds of Washington (Washington State Noxious Weed Control Board): <http://www.nwcb.wa.gov/>  
Noxious weeds of Lincoln County (Noxious Weed Control Board): <http://www.co.lincoln.wa.us/WeedBoard/weedbooklet.pdf>