



UPLAND HABITAT ASSESSMENT PROTOCOL FOR THE NEVADA BIRD COUNT PROGRAM

GREAT BASIN BIRD OBSERVATORY

1755 E. Plumb Lane, #256

Reno, NV 89502

WWW.GBBO.ORG

Draft of 4 May 2005

INTRODUCTION

The purpose of this project is to further our knowledge of the habitat-bird associations among the unique habitats of Nevada. Vegetation data collected on the ground will allow us to make habitat-bird associations using data collected for the Nevada Bird Count Program (NBC; 2002-present). The NBC is an ongoing monitoring project implemented by the Great Basin Bird Observatory. The focus of this protocol is the assessment of **sagebrush, salt desert scrub, Mojave desert (Joshua tree and Mojave shrub communities), and pinyon-juniper habitats** in bird survey plots of the Nevada Bird Count monitoring program. Several birds found in sagebrush and pinyon-juniper have become of recent management concern, and conservation plans have been developed to address future needs and monitoring of Nevada's Partners-in-Flight priority bird species (Neel 1999) and the habitats they use. In order to shed light on habitat needs of such species as Sage Thrasher, Brewer's Sparrow, Black-throated Gray Warbler, Black-throated Sparrow, Bendire's and Le Conte's Thrashers, we have developed this upland habitat assessment protocol. The results of the statewide assessments of upland habitats will be analyzed together with bird survey data to correlate habitat structure and flora with presence and abundance of conservation priority bird species.

HOW TO USE THIS PROTOCOL

This protocol details several commonly used and/or adapted methods for assessing the flora of the sagebrush, salt desert scrub, Mojave scrub, Joshua tree, and pinyon-juniper habitats. Detailed methods for the assessment are referenced by habitat type and each

habitat section is broken down into subsections: trees, shrubs/forbs/grasses (which will be treated as one component of the plant community for the purpose of this project), and Joshua trees/yuccas, where appropriate. Some of the methods are the same for different habitat types, but are summarized separately for clarity.

Of the 10 points used for each transect in the bird survey design, only 5 will be measured for vegetation characteristics, collecting data on every other point in the transect (please use points 2, 4, 6, 8, and 10, unless that is not possible; there should be no chance of overlap between the assessed survey points). The UTM coordinates for the point centers and a map with the nearest access road will be provided each surveyor. The habitat assessments can be done at any time of day, although if simultaneous with morning bird surveys, the vegetation surveyor should keep a buffer distance of at least 400 meters (the span of approximately 2 points) behind the bird surveyor so as not to influence bird behavior during the bird counts. The habitat assessment should take approximately one hour per point. The surveyor(s) also have the option of doing the assessment, or part of it, in the afternoon before the bird survey and finish the remaining points the day of the bird survey.

Equipment needed for the habitat assessments:

- GPS (Set to NAD27)
- Rangefinder
- 30-meter length or longer measuring tape (be sure it is metric)
- Meter stick or some object that can be measured to determine shrub height (i.e. a hiking pole, tent pole, etc.)
- Data sheets, protocol, and clipboard, in case it is windy
- Reference on western flora, if needed (only the dominant vegetation needs to be identified, though)

...and don't forget those necessities of the desert, **sunscreen, snacks/lunch** and plenty of **water!**

The following table lists some of the dominant species for each habitat type (but is by no means all-inclusive!). Recommended for assistance in field identification of plants is a specialty book called "North American Range Plants," by Stubbendieck, Hatch, and Butterfield (5th ed., 1997), which has been updated, expanded, and given a new name, "North American Wildland Plants" (6th ed, 2003).

Sagebrush (SG)

Big sagebrush*
Mountain sagebrush*
Black sagebrush*
Desert peach
Winterfat
Ephedra (Mormon tea)

Pinyon-juniper (PJ)

Pinyon pine
Utah juniper
Cheatgrass
Mountain Mahogany
Any flora of the sagebrush habitat

Horsebrush
Bud sage
Cheatgrass
Crested Wheatgrass
Sedge/rush spp. (near water sources)

*Usually only one or two types of SG dominate most areas

Mojave scrub (MJS)

Creosote bush
Mojave/Banana yucca
Blackbrush
Red brome
Any flora of the JT habitat

Joshua tree (JT)

Joshua tree
Mojave/Banana yucca
Blackbrush
Ephedra (Mormon tea)
Apache plume
Mojave sage
Turpentine broom
Cheatgrass
Red brome

Salt Desert scrub (SD)

Shadscale
Ephedra (Mormon tea)
Four-wing saltbush
Greasewood
Spiny hopsage
Cheatgrass
Halogeton
Sedge/rush spp. (near water sources)

FILLING OUT THE HABITAT ASSESSMENT DATA SHEETS

For all habitats, the header of the data sheet needs to be filled out the same way. Enter transect ID and point number, date, and names of surveyors in the first box. Then draw a simple sketch of the plot on page 1 (i.e., everything within a 100 m radius circle around the bird survey point; hereafter referred to as “100 m radius plot”). In this sketch, only include basic landscape features, such as patches of our basic habitat types if more than one is present (including only basic vegetation types, such as pinyon-juniper, sagebrush, salt desert, Mojave scrub, wet meadow, etc.; don’t use a finer-scale classification than this), as well as roads, recently used OHV tracks, fences/power lines, creeks or dry washes, springs, etc. You DO NOT need to plot groves of trees or patches of shrubs, unless they form a habitat type on its own. The vegetation of these habitat patches will be assessed in detail later in the protocol.

Answer the yes/no/unknown questions on the right side of the header on page 1. The first question (charcoaled stems within 100 m radius plot?) refers to evidence of recent burns. Only circle Y (=yes) if you find evidence of charcoaled shrub stems or trees within the plot. For the 2nd, 3rd, and 5th question (cliffs, water sources, trees within 1000 m?) please look around beyond the plot and answer the questions based on what you can see within 1000 m (~ 2/3 mile). If you can’t determine the answer because you cannot see far enough (e.g., in a canyon), please circle “Unkn.” (=unknown).

We refer to “natural/modified-natural water sources” as anything that may provide the surface water and insect communities associated with natural wetlands and ponds. DISREGARD cement troughs, concrete pools, or other completely artificial water

sources that do not support wetland vegetation typical for the area. The last question (trees within 1000 m of survey point?) refers to the vicinity of woodlands in areas that are generally tree-less. So, if you are assessing a pinyon-juniper transect point, the answer to this will generally be “yes”.

Finally, don't forget to fill out the small header boxes on pages 2 and 3, which repeat the transect ID, point number, and surveyor information and will allow us to re-file the data sheets, should they get mixed up with others.

MEASUREMENT METHODS (BY HABITAT)

I. SAGEBRUSH or SALT DESERT SCRUB

A. Shrubs/Forbs/Grasses

Dominant Species, Cover, Height & Vigor by Line-Intercept Method: Within the 100 m radius plot, set up **two** 30 meter line transects each with a metric tape measure. When figuring out where to lay down each tape, it is important to remember these two things: 1) the location of each transect should be placed so that some of each line falls within the 100 m radius circle around the bird survey point, and 2) the two lines should be independent of each other and at least 35 m apart.

A good way to **quickly and easily** set these up is to choose a random direction from the center of the plot and then take between 15 - 30 steps and begin your transect where you stop. Repeat this for the second transect in the opposite direction, counting your steps from the center point. This way, you make sure the two transects do not overlap nor sample the same section of the bird survey plot.

To start taking measurements along the line transect, begin at one end of the line. Record what occurs along the line, using distances in cm. Plants that fall within a 1-cm (approx. ½ inch) strip to either side of the line should be included, as well as those plants whose foliage overlies the transect, but whose stems may not fall exactly under the transect line. Categories to record include “bare ground/rock”, plants by their species names (except in cases where we lump them into categories, see below), and “litter” (dead plant matter). Dominant grasses (or sedge/rush layer) should be named by species to the extent possible, such as “cheatgrass,” “crested wheatgrass,” “red brome,” “sedge/rush spp.,” etc. If a plant forms a minor component in terms of cover, list it as either “grass” or “bunchgrass” (clump-forming grasses), “sedge/rush”, or “forb” (i.e., broad-leaved non-woody ground vegetation). Provide as much detail as you would like; however, it is not necessary to know all forb and grass species — we are primarily interested in the dominant species. It is also pretty impossible to identify sedges, rushes, and many forbs by species without spending a lot of time. However, these plants often indicate a transitional zone into moister habitats and may provide an important habitat component for birds. Therefore, please measure sedge and rush cover using the simple category “sedge/rush” without spending time on trying to identify

them more specifically. Treat forbs the same way, although species identification may be easier and should be done to the extent possible.

You may come across a grass, forb, or sedge/rush species that is completely covered by a shrub (i.e. cheatgrass commonly shelters beneath sagebrush). In this case, list the grass/forb/sedge/rush on your list of species encountered along the transect, but do not assign them a measurement. The area is already counted when you measure the shrub.

As you move along the line transect recording plant species, also record their average height, using a meter stick to measure them. For each shrub that you count, visually evaluate the vigor and health of the shrub based on a scale—0=Dead, 1=Mostly dead or dying but not completely, 2=A few parts dead or wilting, 3=Healthy-looking.

Don't remove the line transect yet; you'll still need it to measure shrub density!

Shrub Density on Belt Transects: Use the same 30 m line transect that you used for the line-intercept method, except count the number of each type of shrub species that occurs **within 1 meter to either side** of the line. Since you've been down the line once already, it may be easiest to first write down what species you know are there, then as you walk back and count individual shrubs, put down hatch marks for each species and add to the species list as you go. Total up your hatch marks for each species when you are done counting.

B. Trees (If Present)

The presence of a tree within a sagebrush or salt desert habitat can significantly influence the bird community. Therefore, a general method for measuring pinyon-juniper (or other woodlands) cover is included here.

Species & Number: Record what species of tree are present within the 100 m radius plot under the "Trees" heading on page 3 of the data sheet. Use your rangefinder to determine the 100 m radius circle around the bird survey point. If there is only a small number (40 or less), count all trees of each species that are present within the circle. If there are more than 40 trees, please **refer to the pinyon-juniper section** of this protocol (see below) and follow its instructions for setting up a subplot.

Height by Size Class: Under the "Trees" heading on the data sheet, record the size class for each tree by checking the appropriate box (a rangefinder or stick of measured length can be used to get a precise estimate of tree height).

Tree height classes are: 0-6 ft (0-2 m), 6-18 ft (2-6 m), >18 ft (>6 m).

Snags: Count number of snags (dead trees > 8 inches in diameter or trees with dead limbs > 8 inches in diameter) within the point count circle and estimate their size class, using the size classes described above, and checking the appropriate box on page 3 of

the data sheet. If there are a good number of them, randomly pick 10 and estimate size class just for those 10 (but still **count all snags within the circle**).

II. PINYON-JUNIPER

A. Shrubs/Forbs/Grasses

Shrub and ground cover is assessed along two 30 m line transects laid out within the 100 m radius plot. If there are distinctly different habitat patches within the 100 m radius circle (e.g., dense pinyon-juniper stand in one section, open sagebrush in the rest of the plot) and enough room is available, please set up up to two 30 m line transects **in each** of the patches (i.e. a total of four transects within that one point count circle if you have both pinyon-juniper and sagebrush patches).

Dominant Species, Cover, Height & Vigor by Line-Intercept Method: Within the 100 m radius plot, set up **two** (more if there are distinctly different habitat patches within the circle) 30 m line transects with a metric tape measure. When figuring out where to lay down each tape, it is important to remember these two things: 1) the location of each transect should be placed so that some of each line falls within the 100 m radius circle around the bird survey point, and 2) the two lines should be independent of each other and at least 35 m apart.

A good way to **quickly and easily** set these up is to choose a random direction from the center of the plot and then take between 15 - 30 steps and begin your transect where you stop. Repeat this for the second transect in the opposite direction, counting your steps from the center point. This way, you make sure the two transects do not overlap nor sample the same section of the bird survey plot.

To start taking measurements along the line transect, begin at one end of the line. Record what occurs along the line, using distances in cm. Plants that fall within a 1-cm (approx. ½ inch) strip to either side of the line should be included, as well as those plants whose foliage overlies the transect, but whose stems may not fall exactly under the transect line. Categories to record include “bare ground/rock”, plants by their species names (except in cases where we lump them into categories, see below), and “litter” (dead plant matter). Dominant grasses (or sedge/rush layer) should be named by species to the extent possible, such as “cheatgrass,” “crested wheatgrass,” “red brome,” “sedge/rush spp.,” etc. If a plant forms a minor component in terms of cover, list it as either “grass” or “bunchgrass” (clump-forming grasses), “sedge/rush”, or “forb” (i.e., broad-leaved non-woody ground vegetation). Provide as much detail as you would like; however, it is not necessary to know all forb and grass species — we are primarily interested in the dominant species. It is also pretty impossible to identify sedges, rushes, and many forbs by species without spending a lot of time. However, these plants often indicate a transitional zone into moister habitats and may provide an important habitat component for birds. Therefore, please measure sedge and rush cover using the simple category “sedge/rush” without trying to identify these more

specifically. Treat forbs the same way, although species identification may be easier and should be done to the extent possible.

You may come across a grass, forb, or sedge/rush species that is completely covered by a shrub (i.e. cheatgrass commonly shelters beneath sagebrush). In this case, list the grass/forb/sedge/rush on your list of species encountered along the transect, but do not assign them a measurement. The area is already counted when you measure the shrub.

As you move along the line transect recording plant species, also record their heights, using a meter stick to measure them. For each shrub that you count, visually estimate the vigor and health of the shrub based on a scale—0=Dead, 1=Mostly dead or dying but not completely, 2=A few parts dead or wilting, 3=Healthy-looking.

Don't remove the line transect yet; you'll still need it to measure shrub density!

Shrub Density on Belt Transects: Use the same 30 m line transect that you used for the line-intercept method, except count the number of each type of shrub species that occurs **within 1 meter to either side** of the line. Since you've been down the line once already, it may be easiest to first write down what species you know are there, then as you walk back and count individual shrubs, put down hatch marks for each species and add to the species list as you go. Total up your hatch marks for each species when you are done counting.

B. Trees

Species & Number: Use your rangefinder to determine the 100 m radius of the plot. If the total number of trees is 40 or less, record the species and number of all trees present within the 100 meter radius under the "Trees" heading on page 3 of the data sheet. A total count of trees in the 100 m radius plot is **always** preferable if it can be done, so if you have already done it and turned up more than 40 trees, please go ahead and record that total. If two people are doing the assessment together, it is easiest to place one person at the plot center, while the other walks the perimeter of the 100m radius circle, counting the trees and occasionally checking the distance with the rangefinder. In this case, please have both persons conduct a count of the trees simultaneously and compare their totals. If only one surveyor is available, he/she should place a yardstick in the center of the circle and walk the perimeter, occasionally checking the distance to the yardstick with the rangefinder.

If it isn't reasonable to count **all trees** within the circle because there are more than 40, please count trees within two 30 x 30 m square subplots that are set up using the two 30 m transect lines used for shrub assessment (above). This 30 m line can function as a center line of your plot or as one side of the square if you get too close to your other line transects using the other layout (Figure 1). Use your rangefinder to count trees within the correct distance from your measuring tape (15 or 30 m respectively, depending on your set-up).

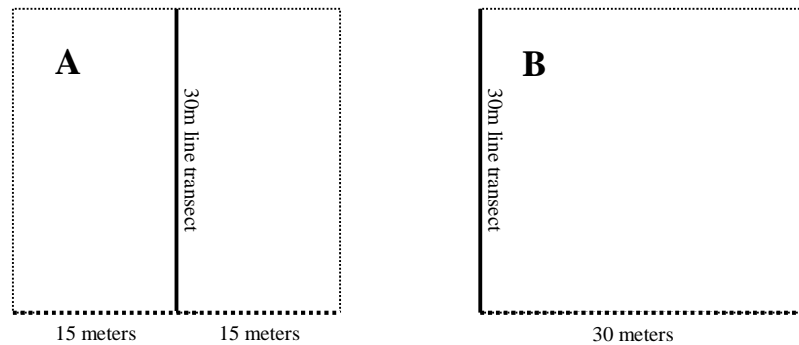


Figure 1. Two options of using your 30m line-intercept transect to setup 30 x 30 m tree density plots. **A** represents counting trees within 15 meters to either side of the line, and **B** represents counting trees within 30 meters of one side of the line.

Record species for each individual tree and its height class inside this 30 x 30 m plot. If you have Joshua trees (JT) or yuccas, record their exact height rather than height class (see data sheet, page 3). Use the back of the sheet for comments if necessary. Record trees along both of your 30 m line transects this way.

Height by Size Class: Under the “Trees” heading on the data sheet, record the size class for each tree by checking the appropriate box (a rangefinder or stick of measured length can be used to get a precise estimate of tree height).

Tree height classes are: 0-6 ft (0-2 m), 6-18 ft (2-6 m), >18 ft (>6 m).

Snags: Count number of snags (dead trees > 8 inches in diameter or trees with dead limbs > 8 inches in diameter) within the 100 m radius plot and estimate their size class, using the size classes described above, and checking the appropriate box on page 3 of the data sheet. If there are a good number of them, randomly pick 10 and estimate size class just for those 10 (but still **count all snags within the circle**).

III. MOJAVE DESERT (MOJAVE SCRUB or JOSHUA TREE)

A. Joshua trees/Yuccas

Density Estimate and “Tree” Species Composition: Use your rangefinder to measure the distance to the edge of the 100 m radius plot. Count all Joshua trees (JT) and Mojave/Banana yuccas within the 100 m radius plot **ignoring** those that are **less than one meter (3 ft) in height**. If two people are doing the assessment together, it is easiest to place one person at the plot center, while the other walks the perimeter of the 100m radius circle, counting the trees and occasionally checking the distance with the rangefinder. In this case, please have both persons conduct a count of the trees/yuccas simultaneously and compare their totals. If only one surveyor is available, he/she should place a yardstick in the center of the circle and walk the perimeter, occasionally checking the distance to the yardstick with the rangefinder.

If there are 40 or fewer Joshua trees and yuccas within the circle, identify the species of each individual and measure its height. If there are more than 40 trees/yuccas within the circle, follow the instructions in the Pinyon-juniper section for measuring tree density using the 30 x 30 m subplot method (see above). Only one of these subplots is necessary for Joshua tree/yucca density.

B. Shrubs/Forbs/Grasses

Dominant Species, Cover, Height & Vigor by Line-Intercept Method: Within each 100 meter radius point count circle, set up **two** 30 meter line transects each with a metric tape measure. When figuring out where to lay down each tape, it is important to remember these two things: 1) the location of each transect should be placed so that some of each line falls within the 100 m radius circle around the bird survey point, and 2) the two lines should be independent of each other and at least 35 m apart.

A good way to **quickly and easily** set these up is to choose a random direction from the center of the plot and then take between 15 - 30 steps and begin your transect where you stop. Repeat for the second transect in the opposite direction, counting your steps from the center point. This way, you make sure the two transects do not overlap nor sample the same section of the bird survey plot.

To start taking measurements along the line transect, begin at one end of the line. Record what occurs along the line, using distances in cm. Plants that fall within a 1-cm (approx. ½ inch) strip to either side of the line should be included, as well as those plants whose foliage overlies the transect, but whose stems may not fall exactly under the transect line. Categories to record include “bare ground/rock”, plants by their species names, **including Joshua trees and yuccas**, and “litter” (dead plant matter). Dominant grasses (or sedge/rush layer) should be named by species to the extent possible, such as “cheatgrass,” “crested wheatgrass,” “red brome,” “sedge/rush spp.,” etc. If a plant forms a minor component in terms of cover, list it as either “grass” or

“bunchgrass” (clump-forming grasses), “sedge/rush”, or “forb” (i.e., broad-leaved non-woody ground vegetation). Provide as much detail as you would like; however, it is not necessary to know all forb and grass species — we are primarily interested in the dominant species. It is also pretty impossible to identify sedges, rushes, and many forbs by species without spending a lot of time. However, these plants often indicate a transitional zone into moister habitats and may provide an important habitat component for birds. Therefore, please measure sedge and rush cover using the simple category “sedge/rush” without trying to identify these more specifically. Treat forbs the same way, although species identification may be easier and should be done to the extent possible.

You may come across a grass, forb, or sedge/rush species that is completely covered by a shrub (i.e. cheatgrass commonly shelters beneath sagebrush). In this case, list the grass/forb/sedge/rush on your list of species encountered along the transect, but do not assign them a measurement. The area is already counted when you measure the shrub.

As you move along the transect recording plant species, also record their heights using a meter stick to measure them. For each shrub that you count, visually estimate the vigor and health of the shrub based on a scale—0=Dead, 1=Mostly dead or dying but not completely, 2=A few parts dead or wilting, 3=Healthy-looking.

Don't remove the line transect yet; you'll still need it to measure shrub density!

Shrub Density on Belt Transects: Use the same 30 m line transect that you used for the line-intercept method, except count the number of each type of shrub species that occurs **within 1 meter to either side** of the line. Since you've been down the line once already, it may be easiest to first write down what species you know are there, then as you walk back and count individual shrubs, put down hatch marks for each species and add to the species list as you go. Total up your hatch marks for each species when you are done counting.

IV. CONTACT INFORMATION FOR QUESTIONS

If you have questions about this protocol or data sheets or your assignments, please contact us at **GBBO at 775-323-4226 (or email us at ammon@gbbo.org)**.

ACKNOWLEDGMENTS

We are grateful to Lara Hartley for researching habitat assessment protocols and preparing this document. This portion of the Nevada Bird Count program is funded by Nevada Bird Count partners, including the U.S. Forest Service, Nevada Department of Wildlife, the National Fish and Wildlife Foundation, Southern Nevada Water Authority, and the Clark County Multi-Species Habitat Conservation Program.

LITERATURE CITED

Neel, L. A. (ed.) 1999. Nevada Bird Conservation Plan. Nevada Partners-in-Flight Working Group, 335 pp.