

# BIRD HABITAT GUIDE



## **SAGEBRUSH COMMUNITIES** in the **INTERMOUNTAIN WEST**



This Bird Habitat Guide provides information on breeding season habitat for several bird species commonly found in sagebrush communities of the Intermountain West. It is intended to be used as a field reference guide for land managers to quickly assess potential breeding bird species' use of sagebrush habitats relative to general habitat type, shrub canopy cover, and shrub height. In particular, we show how those individual species habitat relationships overlap with the habitat requirements of Greater Sage-grouse because their habitat requirements and conservation are the dominant management theme in sagebrush communities.

Most bird species use similar breeding habitat types and conditions across their range. However, there can be variability in habitat use within a species across the large geographic range of sagebrush habitats in western North America. We encourage use of this guide in conjunction with local knowledge and resources where available, along with a number of regional resources on birds and habitat management in sagebrush communities such as *Birds in a Sagebrush Sea* ([www.partnersinflight.org/wwg/sagebrush.pdf](http://www.partnersinflight.org/wwg/sagebrush.pdf)), *Guidelines to Manage Sage-grouse Populations and their Habitats* ([http://sagemap.wr.usgs.gov/Docs/Sage\\_Grouse\\_Guidelines.PDF](http://sagemap.wr.usgs.gov/Docs/Sage_Grouse_Guidelines.PDF)), *Pocket Guide to Sagebrush Birds* ([www.sagestep.org/pubs/birdguide.html](http://www.sagestep.org/pubs/birdguide.html)), and the *Western Juniper Field Guide* (<http://pubs.usgs.gov/circ/1321/>).

## Bird Habitat Selection in Sagebrush Communities

Birds that breed in sagebrush communities choose habitats at multiple spatial scales. They select the landscape in which they will breed, their territory within that landscape, a vegetation patch for nesting, and ultimately, the exact location to construct a nest. Some bird species, such as Sage Sparrow and Brewer's Sparrow, favor large landscapes dominated by continuous sagebrush cover, which further limits their habitat selection. Although this guide focuses on the territory or patch scale (e.g., approximate size of a football field), it is important to consider the landscape context of those patches. Large, unfragmented areas of sagebrush are desirable for all sagebrush associated species.

## Variation in Habitat Structure in Sagebrush Communities

Vegetation in sagebrush communities can be highly variable within and between sites based on factors such as soils, topography, climate, and disturbance history. Sites may differ from one another in varieties of sagebrush, the amount of shrub cover, the presence of one or more co-occurring shrub species, the height of the shrub canopy, and the shape of individual shrubs. Additional variation in habitat structure occurs in the composition and amount of understory vegetation such as grasses and forbs. All these variables interact with landscape-level influences to determine what habitat conditions occur, and ultimately what bird species will nest at a site.

## Major Types of Sagebrush and Associated Habitats

**Wyoming big sagebrush** (*Artemisia tridentata* ssp. *wyomingensis*) is widely distributed in shallower soils and under more xeric conditions than the other forms of big sagebrush. Shrubs typically mature at 45-100 cm (18-40 in). It is often the dominant shrub where it occurs, or it may co-occur with other shrubs, including rabbitbrushes (*Ericameria* spp.), and horsebrushes (*Tetradymia* spp.).

**Mountain big sagebrush** (*Artemisia tridentata* vaseyana) grows at higher elevations than Wyoming big sagebrush (typically over 1500 m). While it sometimes is the only shrub present, it can co-occur with a number of species, including antelope bitterbrush (*Purshia tridentata*), mountain snowberry (*Symphoricarpos oreophilus*), and several species of horsebrush (*Tetradymia*). Shrubs mature at 50-110 cm in height. There is typically a discrete transition from Wyoming to mountain big sagebrush, although the elevation where that occurs varies to some degree throughout the Intermountain West.

**Basin big sagebrush** (*Artemisia tridentata* ssp. *tridentata*) is the tallest of the big sagebrush subspecies, typically maturing at 120-180 cm (47-71 in), although individuals can reach up to 300 cm (120 in). It grows in areas of deep, loamy soils. Because of its tendency to occur on fertile soils, much of the area formerly dominated by basin big sagebrush has been converted to agriculture. Basin big sagebrush also occurs with the other types of big sagebrush, especially in drainages and bottomlands.

**Dwarf sagebrushes**, including low sagebrush (*Artemisia arbuscula*), and black sagebrush (*Artemisia nova*), are generally 10-35 cm (4-14 in) tall, with low sagebrush reaching 50 cm (20 in) at more productive sites. Low sagebrush can occur alone, in a mosaic with big sagebrush communities as dictated by soils, or mixed with big sagebrush as a co-dominant shrub.

**Salt desert scrub communities** are found in rain shadows and other very xeric portions of the sagebrush biome. Although a number of shrub species may be present they tend to have low total vegetative cover. For this guide we also include greasewood (*Sarcobates vermiculatus*) as part of salt desert scrub communities.

## Habitat Types

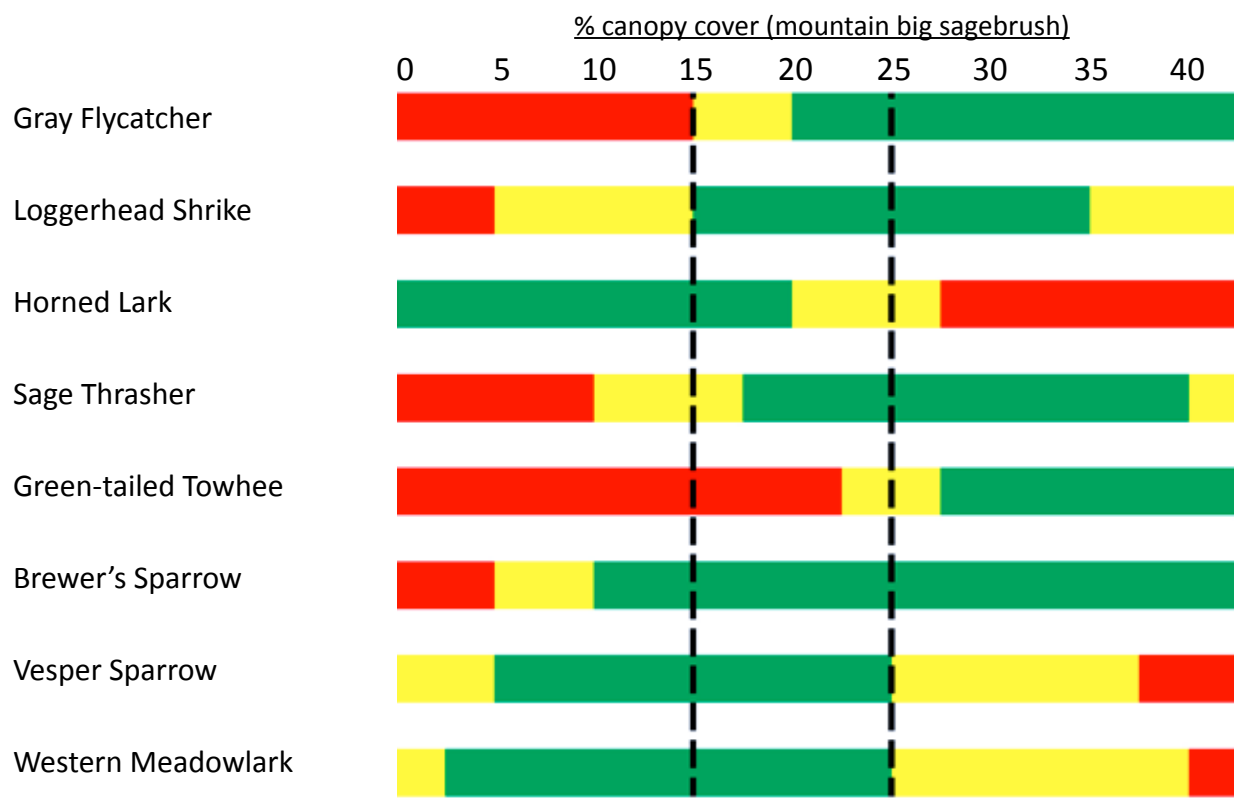
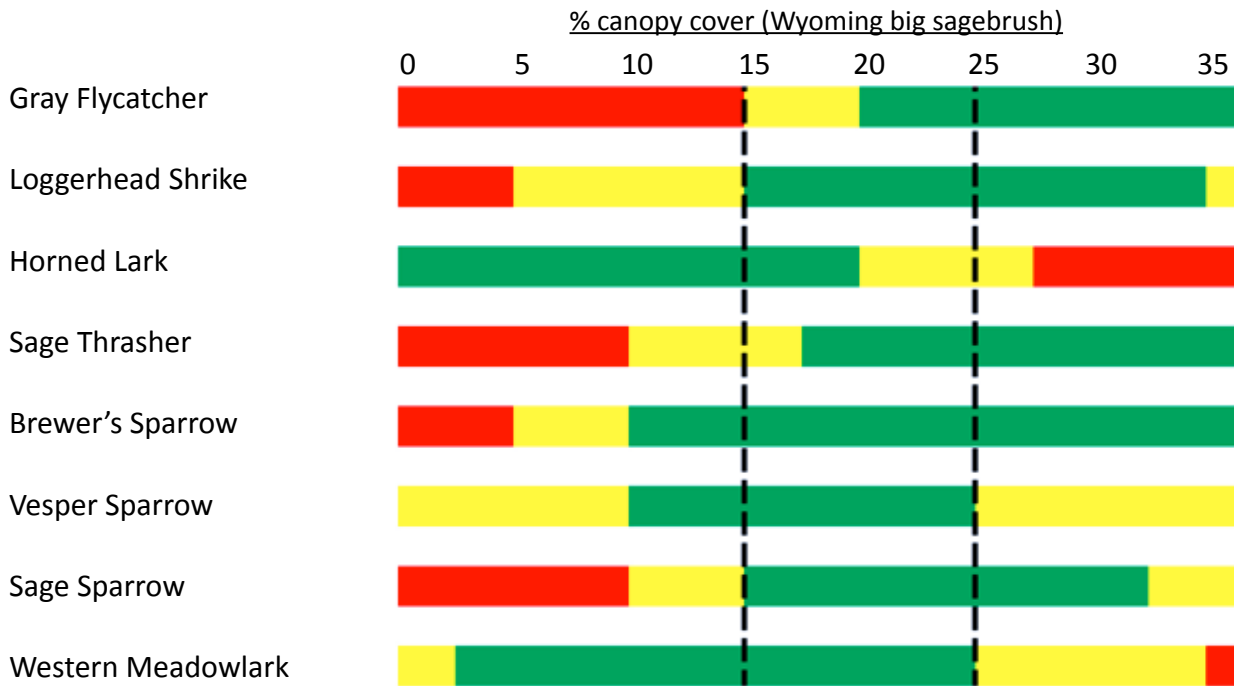
This matrix shows bird species and their likelihood of nesting in each of the major sagebrush habitat types including grassland and woodland habitat types in the sagebrush landscape. Grassland habitats exist in a variety of settings, sometimes for a relatively short period of time following removal of shrubs by fire, or as a mosaic of patches within landscapes dominated by shrublands. Woodlands occur most often in conjunction with mountain big sagebrush, but also occur in other sagebrush types. Green indicates a species commonly nests in that habitat type, yellow indicates a species may nest in that habitat type in some circumstances, and red indicates a species generally does not use that habitat type for nesting.

	Annual grass	Perennial grass	Dwarf sagebrush	Salt desert scrub	Wyoming big sagebrush	Mountain big sagebrush	Open woodland	Closed woodland
Long-billed Curlew <sup>1</sup>	Green	Yellow	Red	Yellow	Yellow	Red	Red	Red
Gray Flycatcher	Red	Red	Green	Red	Green	Green	Green	Red
Loggerhead Shrike	Red	Red	Red	Green	Green	Green	Green	Red
Horned Lark	Green	Green	Green	Green	Green	Green	Yellow	Red
Sage Thrasher	Red	Red	Red	Yellow	Green	Green	Green	Red
Green-tailed Towhee <sup>2</sup>	Red	Red	Red	Red	Yellow	Green	Green	Red
Brewer's Sparrow	Red	Red	Yellow	Green	Green	Green	Yellow	Red
Vesper Sparrow	Yellow	Green	Green	Red	Green	Green	Green	Red
Sage Sparrow <sup>3</sup>	Red	Red	Red	Green	Yellow	Yellow	Red	Red
Grasshopper Sparrow <sup>4</sup>	Yellow	Green	Red	Red	Yellow	Red	Red	Red
Western Meadowlark <sup>5</sup>	Green	Green	Green	Yellow	Green	Green	Green	Red

### Footnotes:

- 1 Long-billed Curlew may nest in Wyoming big sagebrush and desert scrub communities where there are open, grass-dominated patches of sufficient size.
- 2 Green-tailed Towhee is uncommon in Wyoming big sagebrush, but can occur on mesic sites, typically associated with shrub diversity.
- 3 Sage Sparrow is relatively uncommon in mountain big sagebrush, primarily using south facing slopes, or lower elevations.
- 4 Grasshopper Sparrow may use Wyoming big sagebrush with less than 10% shrub cover, as long as there is sufficient bunchgrass cover in the understory.
- 5 Western Meadowlark is associated with grass cover, but may nest at sites with varying amounts of shrub cover as long as there is sufficient grass in the understory.

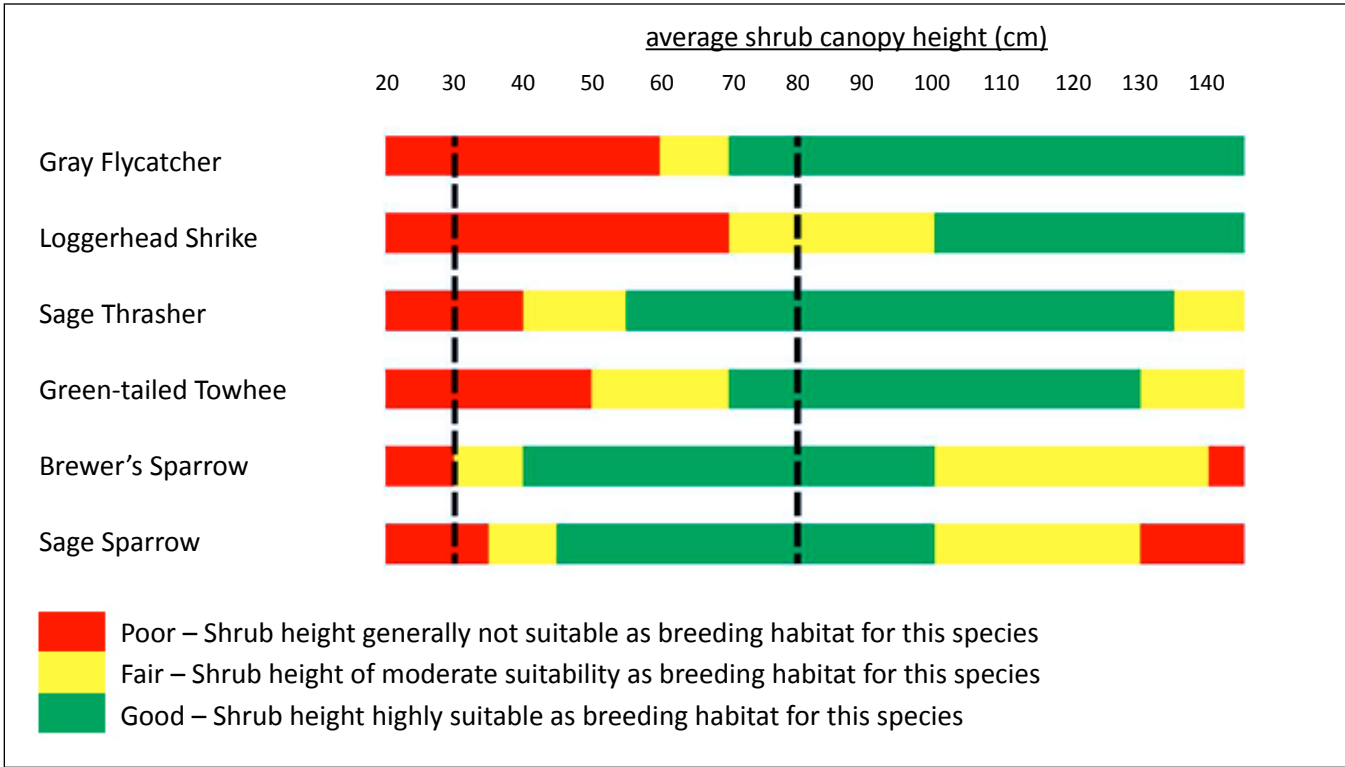
**Shrub canopy cover** can be a strong predictor of bird species occurrence and abundance. These figures illustrate the range used by some regularly occurring species in Wyoming and mountain big sagebrush communities. Vertical dashed lines indicate the suggested range of canopy cover for nesting Greater Sage-grouse.



- Poor – Canopy cover generally not suitable as breeding habitat for this species
- Fair – Canopy cover of moderate suitability as breeding habitat for this species
- Good – Canopy cover highly suitable as breeding habitat for this species



**Shrub height** can be a strong predictor for bird species occurrence and abundance. This figure shows the range of shrub heights used by some regularly occurring species in both mountain and Wyoming big sagebrush communities. Vertical dashed lines indicate the suggested range of heights for nesting Greater Sage grouse.



Nest locations in sagebrush vary depending on the bird species. Nests are typically placed on the ground or the lower half of the shrub for Green-tailed Towhee, Sage Thrasher, and Sage Sparrow (photo on left), in the middle of the shrub for Brewer's Sparrow and Gray Flycatcher, and in the top third of the shrub canopy for Loggerhead Shrike.



**Shrub cover variation in a productive mountain big sagebrush community  
(Washoe County, Nevada)**

10% shrub cover (6% sagebrush): Bird species nesting at this location in order of abundance were Brewer’s Sparrow, Vesper Sparrow, and Horned Lark.



20% shrub cover (10% sagebrush): Bird species nesting at this location in order of abundance were Brewer’s Sparrow, Green-tailed Towhee, Sage Thrasher, and Gray Flycatcher.





31% shrub cover (18% sagebrush): Bird species nesting at this location in order of abundance were Brewer's Sparrow, Green-tailed Towhee, Gray Flycatcher, and Sage Thrasher.



43% shrub cover (30% sagebrush): Bird species nesting at this location in order of abundance were Brewer's Sparrow, Green-tailed Towhee, Gray Flycatcher, and Sage Thrasher.





## Shrub cover variation in Wyoming big sagebrush communities

10% shrub cover (Sweetwater County, Wyoming): Bird species nesting at this site in order of abundance were Brewer's Sparrow, Sage Sparrow, and Sage Thrasher.



20% shrub cover (Harney County, Oregon): Bird species nesting at this site in order of abundance were Sage Sparrow, Sage Thrasher, and Brewer's Sparrow.

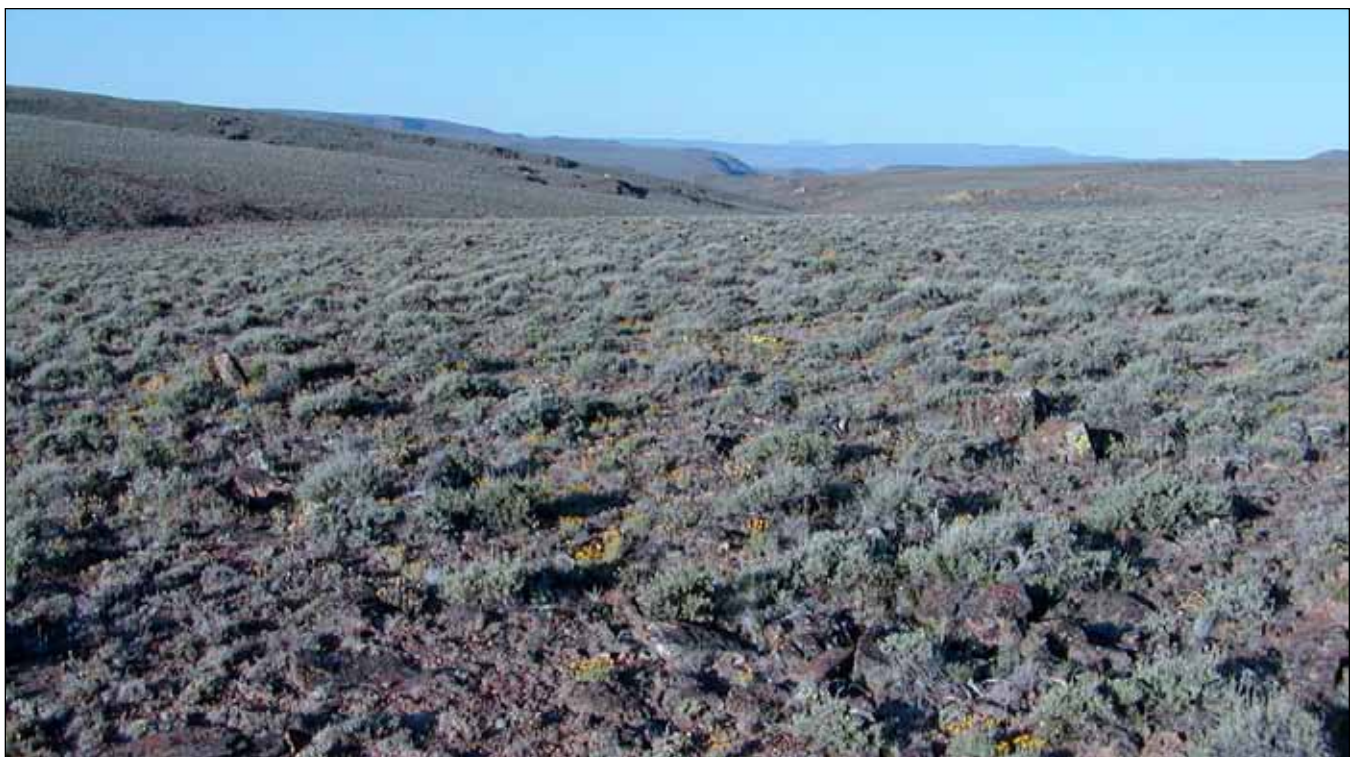




30% shrub cover (Lake County, Oregon): Bird species nesting at this site in order of abundance were Brewer's Sparrow, Sage Thrasher, Vesper Sparrow, and Western Meadowlark.



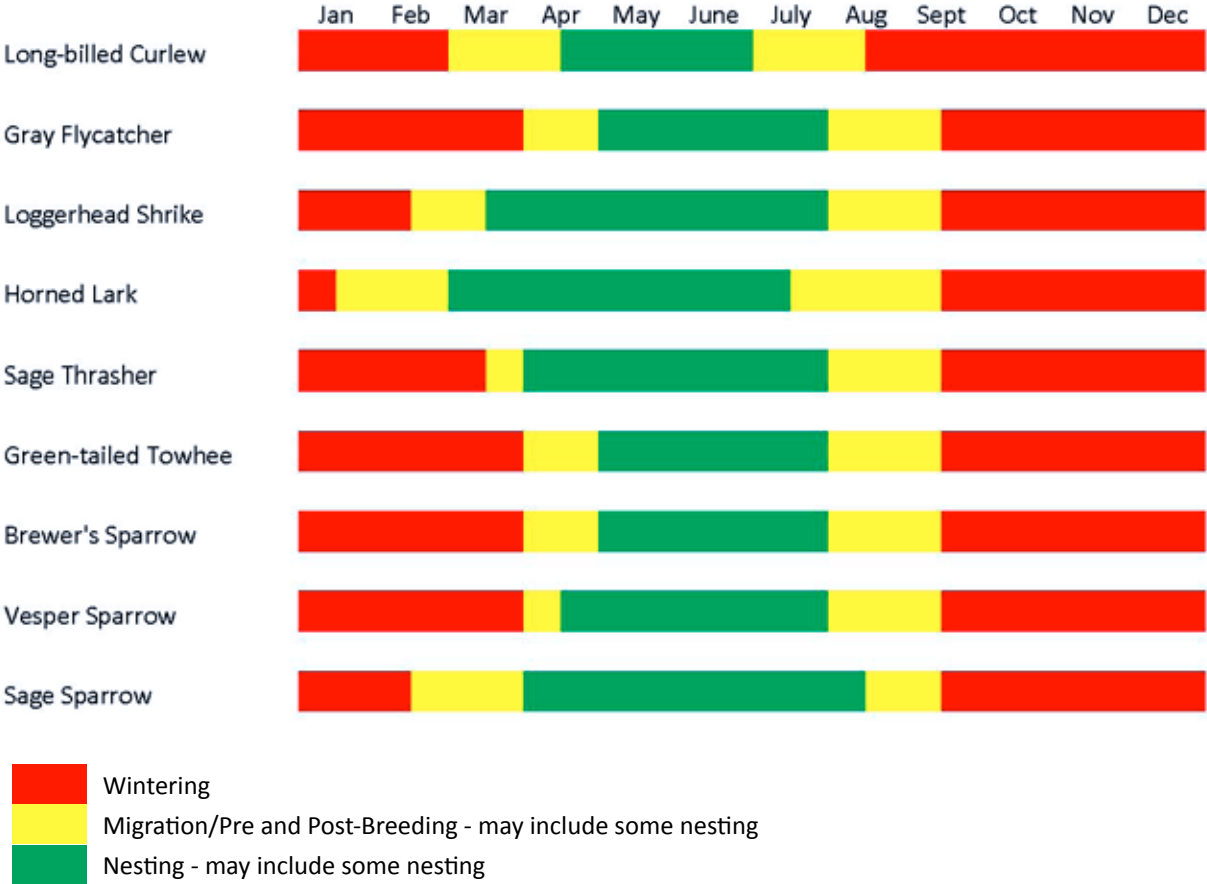
Low sagebrush communities, often rich in forbs, are important to sage-grouse. However, the simpler structure of the shrub canopy supports very few other bird species. Average shrub height at the location shown in this picture was only 20 cm (8 in), which is too short for shrub-nesting birds. The only nesting bird species at this location in northern Nevada was Horned Lark.



Perennial bunchgrasses are used for nesting by a number of species. Recommendations for Greater Sage-grouse call for bunchgrass cover of sufficient height to conceal nests. Bunchgrasses also are used for nesting by Grasshopper Sparrow, Western Meadowlark, Vesper Sparrow, and Horned Lark. This photo shows a Vesper Sparrow nest associated with blue-bunch wheatgrass in Lake County, Oregon.



**Timing of nesting for some common sagebrush birds**





Shrub form is an important habitat component for a number of species. Nesting sage-grouse benefit from a low-growing form with spreading branches for nest concealment (photo on right).



Tall, lollipop-shaped shrubs (photo on left) may be targets for treatments such as burning or brush-beating as a means of improving habitat quality for nesting sage-grouse. However, this may reduce habitat quality for several species that favor taller shrubs for nesting, including Loggerhead Shrike, Sage Thrasher, and Gray Flycatcher.

## Acknowledgments

This bird habitat guide was prepared by Aaron Holmes, PRBO Conservation Science, and Bob Altman, American Bird Conservancy under the auspices of the Western Working Group of Partners in Flight. Funding was provided by the Washington Office of the Bureau of Land Management through the efforts of Geoff Walsh. Reviewers of earlier drafts included J. Boone, B. Bresson, C. Burns, J. Carlisle, J. Carlson, J. Dillon, S. Franklin, W. Gilgert, S. Knick, K. Fullen, M. Green, T. Luszcz, J. Martin, R. Norvell, J. Peters, N. Peterson, T. Rich, J. Ruth, G. Shire, G. Walsh, C. Wightman, and group input from the Western Working Group of Partners in Flight. Photos were provided by A. Holmes except the cover photo, by D. Casey. Design provided by G. Radko. Illustration on back page by C. Vest.





## Gradient of habitat type & bird associations in the mountain big sagebrush ecosystem

- A** **Horned Larks** nest on the ground typically at the base of a bunchgrass in both natural and seeded grasslands as well as sagebrush shrublands with an open understory. In productive mountain big sagebrush communities where understory vegetation is dense Horned Larks may be limited to rocky areas.
- B** **Vesper Sparrows** nest on the ground in natural and seeded bunchgrass grasslands as well as mountain big sagebrush communities with a bunchgrass understory. They typically decline as tree cover increases, or where shrub cover is excessively dense.
- C** **Sage Thrashers** nest on the ground or in shrubs using a wide range of shrub cover and height. They favor sagebrush shrublands, use woodland edges, but avoid dense woodlands.
- D** **Loggerhead Shrikes** nest in taller shrubs and in juniper or pinyon trees. They are fairly common in mountain big sagebrush communities that contain taller bitterbrush shrubs as well as open juniper woodlands.
- E** **Brewer's Sparrows** nest in the canopies of sagebrush and occasionally other shrubs. They use a wide variety of shrub cover levels, but decline with increasing tree density.
- F** **Green-tailed Towhees** nest on the ground or low in shrubs. They favor dense shrubland and open woodland habitats, but decline with increasing tree density. Nests are often located in patches containing multiple shrub species, especially mountain snowberry.
- G** **Gray Flycatchers** nest in the canopy of sagebrush, or occasionally in juniper trees. They favor patches containing taller sagebrush, often using patches of basin big sagebrush associated with deeper soil profiles.