

## GREEN-TAILED TOWHEE

### *Pipilo chlorurus*

#### **Description**

No subspecies are recognized.

Occasionally hybridizes with the spotted towhee (Rising 1996).

The green-tailed towhee is a relatively large sparrow, with a rust or rufous crest; dull olive back, rump, wings and tail; blackish forehead, lores, and malar stripe; white chin, throat, and supraloral and submustachial stripes; and gray breast. The wings have a yellowish lining and yellow carpal edge. The legs are brownish and the bill is black with a gray to bluish-white lower mandible. The iris is cinnamon colored after the second year (Rising 1996).

The sexes are similar in coloration, but the female's back may be grayish and her crown duller than the male's. The crest is often held erect (Rising 1996).

#### **Life history & behavior**

An obligate shrubland nester and ground-foraging opportunistic omnivore.

The call notes of green-tailed towhees have been described as a cat-like *mee a-yew*. The male's song is characteristically buzzy (Ryser 1985).

Little data is available regarding fidelity of breeding birds to breeding territories.

Green-tailed towhees arrive on their breeding grounds during April and depart by the last week of September. The earliest nest building recorded by Colorado BBA was May 3<sup>rd</sup> and the last fledgling was August 22<sup>nd</sup> (Richter 1998). Nests are placed on or close to the ground in shrubby habitat in locations well-concealed by foliage. Clutch size is typically 3 to 5 eggs, with hatching about 12 days after incubation by the female. The young are cared for by both parents, and fledge 11 to 14 days after hatching. Green-tailed towhees potentially double brood (Gibbons et al. Unpublished), but data is limited in this regard. Breeding pairs may attempt to re-nest up to 4 times after nest failure. Most reproductive data comes from studies on Arizona's Mogollon Rim (Dobbs et al. 1998).

The green-tailed towhee forages on the ground and gleans from low foliage, primarily under dense shrub canopies and around the edges of thickets. It forages less often on bare, open ground among scattered brush and herbaceous vegetation. It eats an omnivorous diet of seeds, invertebrates, and fruits, including serviceberries and elderberries (Dobbs et al. 1998).

When disturbed, green-tailed towhees drop to the ground without opening their wings and scurry for cover with their tails held up in a way that resembles a small rodent. They hop from branch to branch through vegetation with closed wings, and often make low, short flights along breeding territory boundaries or between perches or foraging areas. Males chase and quarrel with conspecific males after breeding territories are established (Dobbs et al. 1998).

Migration is nocturnal. During winter, green-tailed towhees often associate with other species in flocks and frequent bird feeders (Dobbs et al. 1998). Fidelity to wintering sites is unknown.

#### **Population trends**

Potentially in decline rangewide.

Standard BBS estimates (Sauer et al. 2004) show a pattern of long-term decline in eastern and western portions of the range and through the Rocky Mountain and Cascade/Sierra Nevada corridors, and positive trends in the Great Basin, the geographical core of green-tailed towhee range. The following are selected annual average BBS trend estimates for the period of 1966 through 2003:

BBS trend estimates are mixed.

- 0.4% survey-wide ( $P=0.43$ ,  $n=312$ ,  $RA=3.19$ )
- 0.3% in western region ( $P=0.47$ ,  $n=304$ ,  $RA=3.58$ )
- 1.0% in Colorado ( $P=0.33$ ,  $n=80$ ,  $RA=9.71$ )

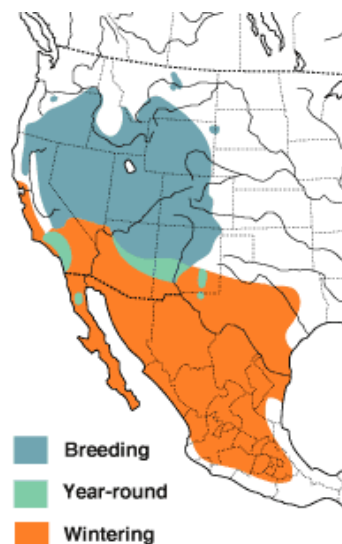
Colorado trends tracked by MCB are as yet uncertain (T. Leukering, pers. comm.).

BBS data should be interpreted with caution; the species may be poorly sampled by BBS methods (Knick et al. 2003).

A recent spatial analysis by Dobkin and Sauder (2004) comparing BBS data between two periods (1963 through 1983 and 1984 through 2001) suggests that green-tailed towhees may have increased in abundance in the western U.S.; areas predicted to have >1 bird per route expanded by 6 percent in the western U.S. and by 16 percent in the shrubsteppe provinces overall. However, comparison of detection frequencies on BBS routes during the same periods suggests mixed trends; for example, green-tailed towhee detection frequencies declined in south-central Colorado and increased in western and northwestern Colorado.

## Range

The green-tailed towhee remains extant in all states where it historically occurred.



The green-tailed towhee breeds on the Columbia Plateau, in the Great Basin, the Wyoming Basins, central and southern California, and the Colorado Plateau. Across its breeding range, centers of abundance are northeastern Utah, the central Sierra Nevada, montane southern California, and northwestern Colorado (Sauer et al. 2004).

In winter, green-tailed towhees typically retreat to the southern U.S., coastal California, Mexico, and Baja California (Dobbs et al. 1998).

Overall range map reproduced from Dobbs et al. (1998) with permission.

## Colorado distribution patterns & abundance

In Colorado, green-tailed towhees nest in suitable habitat most commonly between 5,500 and 9,000 feet (Righter et al. 2004).

Colorado BBA ranked the green-tailed towhee as the twelfth most numerous species in Colorado (Kingery 1998), with over half the state's population in the shrublands of the state's northwest corner (Righter 1998). BBS data suggest green-tailed towhees reach their highest breeding abundance in North America in northwestern Colorado (Dobbs et al. 1998).

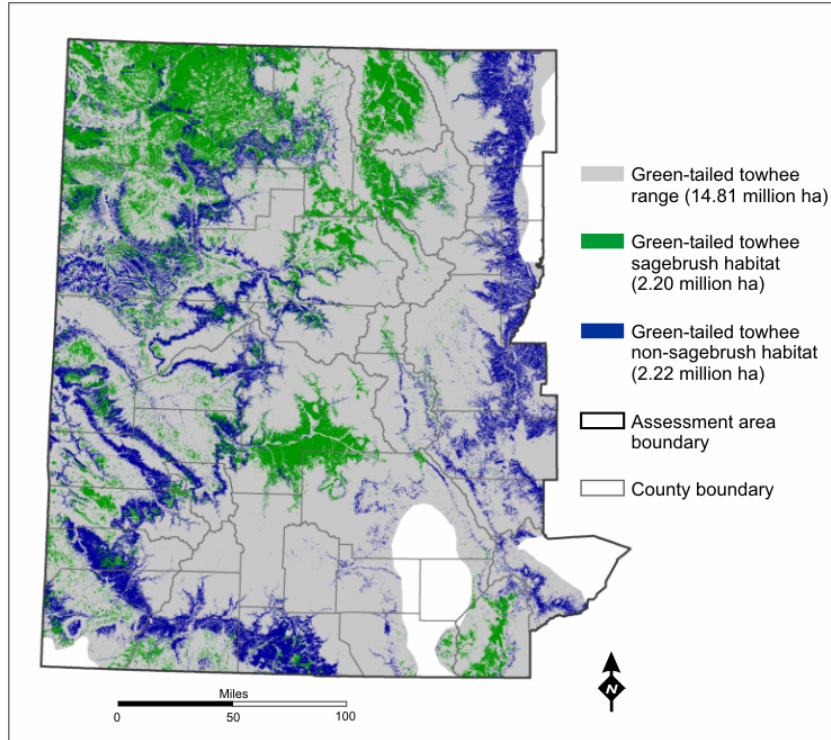
Breeding green-tailed towhees are generally absent from the eastern plains of Colorado, from the low western desert valleys, and from the forested peaks of mountains or mesa tops (Righter 1998; Righter et al. 2004). Andrews and Righter (1992) and the Colorado BBA (Righter 1998) showed similar summer distribution of this species; however, Andrews and Righter indicated absence from the Williams Fork Mountains in eastern Rio Blanco and Garfield Counties, and the Colorado BBA indicated absence in the interior of the San Luis Valley.

The range of the green-tailed towhee in the assessment area encompasses approximately 14.81 million ha, with about 4.41 million ha of suitable habitat.

Green-tailed towhee distribution was positively correlated with vesper sparrow distribution in one regional-scale northwestern Great Basin study (Wiens and Rotenberry 1981).

Breeding densities in occupied habitat are highly variable.

In Colorado between 1999 and 2003, estimates varied from 0.10 to 0.40 birds per ha in sagebrush, 0.65 to 2.6 birds per ha in mountain shrublands (T. Leukering, pers. comm.). In the shrubsteppe of the northwestern Great Basin, Wiens and Rotenberry (1981) calculated green-tailed towhee abundance (where the birds were present) ranging from 0.02 to 0.17 individuals per ha.

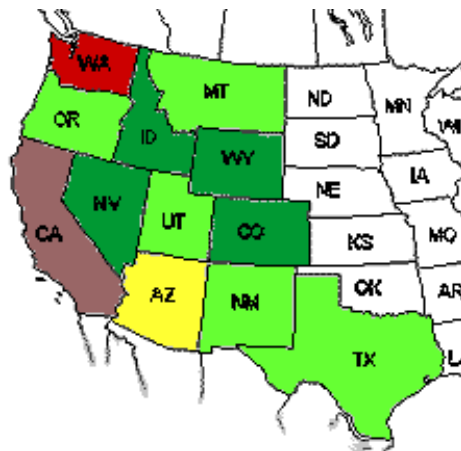


Prior to migration, juveniles may disperse upslope to subalpine meadows, presumably to fatten up for migration (Morton 1991). Green-tailed towhees are widely distributed at lower elevations throughout the state during migrations. Occasionally, individuals winter in Colorado’s low foothills, desert lowlands or eastern plains (Andrews and Righter 1992).

**Conservation status**

Ranked G5/S5, “demonstrably secure” rangewide and in Colorado.

U.S. Forest Service species of concern (Pacific Region); no legal status in any state.



- S1: Critically imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently secure
- S5: Secure
- Not ranked / Under review

Map courtesy of NatureServe (2004).

## Habitat

Some experts consider the green-tailed towhee a near-obligate of sagebrush (Braun et al. 1976).

In the Colorado sagebrush assessment area, about 4.41 million ha of suitable habitat exists, 2.2 million ha of which is sagebrush shrublands (see figure in Colorado Distribution and Abundance Patterns).

Breeding territories possibly vary in size with vegetation characteristics. Breeding territory size has been estimated (but not measured) in west-central Colorado sagebrush as less than 1 ha (Gibbons et al. unpublished). Mean territory size in a Utah shrubsteppe population was estimated as 0.9 ha ( $n = 7$ ; Dobbs et al. 1998 citing Dotson 1971).

Minimum patch size and habitat connectivity requirements for green-tailed towhees are unknown.

Across their breeding range, green-tailed towhees are shrubland specialists, nesting on dry, brushy hillsides and mesas. Early successional or post-disturbance shrubby second growth make suitable habitat (Andrews and Righter 1992; Sedgwick 1987), as do shrubby montane forest openings. Green-tailed towhees tolerate shrublands interspersed with sparse trees or saplings, but they typically avoid forests. Common vegetation associations are mountain shrub communities; sagebrush shrubsteppe; Gambel oak; pinyon-juniper with big sagebrush-dominated openings; shrubby openings in montane conifer, deciduous, or mixed conifer-deciduous forests; and riparian willow scrub (Andrews and Righter 1992; Dobbs et al. 1998; Righter et al. 2004; Sedgwick 1987).

The Colorado BBA project recorded green-tailed towhees in 13 vegetation classes (Righter 1998). Almost 28 percent of breeding green-tailed towhees were found in mid- to high-elevation mountain shrub habitat. About 23 percent of occurrences were in lowland and mountain sagebrush, combined. The breakdowns of Colorado BBA occurrences are as follows (note that some non-shrubland occurrences recorded by the Colorado BBA project were potentially artifacts of BBA vegetation classes, which were not designed to capture landscape context information such as shrubby ecotones or shrubby openings associated with a forest type):

- 28% - mountain shrublands
- 18% - mountain big sagebrush shrublands
- 16% - oak brush
- 12% - deciduous or evergreen forests, combined
- 7% - ponderosa pine & other montane woodlands, combined
- 7% - montane carr & montane grasslands, combined
- 6% - pinyon-juniper woodlands
- 5% - lowland big sagebrush shrublands
- 2% - tall semi-desert shrublands

Between 1999 and 2003, MCB found the highest densities of green-tailed towhees in mountain shrublands, and the second or third-highest densities consistently in sagebrush (T. Leukering, pers. comm.). Mountain shrub species used by green-tailed towhees may include, but are not limited to, mahogany species, snowberry, serviceberry, bitterbrush, common chokecherry, and wild rose. Big sagebrush species used by green-tailed towhees include mountain big sagebrush, basin big sagebrush, Wyoming big sagebrush, and black sagebrush (Medin et al. 2000).

At a limited number of study sites in Nevada, Utah, and Colorado, Knopf et al. (1990) noted that green-tailed towhees were "only found in appreciable numbers in sagebrush shrubsteppe habitats that included a component of mountain mahogany," suggesting green-tailed towhees prefer inclusions of other shrubs in their habitat. Green-tailed towhee abundances in northwestern Great Basin big sagebrush-dominated shrubsteppe were positively correlated with presence of green rabbitbrush and bitterbrush (Wiens and Rotenberry 1981). In northwestern Colorado, green-tailed towhee abundance was positively correlated with shrub species richness in areas where pinyon-juniper woodlands were chained (Sedgwick 1987). In Grand County, Colorado, three study areas with nesting green-tailed towhees were dominated by big sagebrush, but also included bitterbrush, serviceberry, snowberry, and

During spring and fall migrations, green-tailed towhees use shrubland habitats similar to their breeding habitats throughout Colorado's western valleys, foothills, and mountain parks, and riparian shrub corridors on the eastern plains near foothills (Andrews and Righter 1992).

On their winter range, green-tailed towhees occur in dry, shrubby, lowland habitats dominated by acacia, honey mesquite, spiny hackberry, and creosote bush (Dobbs et al. 1998).

rabbitbrush (Gibbons et al. Unpublished). In 15 years of collecting data on the Douglas Pass BBS transect in Garfield County, Lambeth noted that green-tailed towhees were typically associated with sagebrush-dominated shrublands with a mountain shrub component and spotted towhees were typically associated with mountain shrublands with a component of sagebrush (R. Lambeth, pers. comm.).

Breeding green-tailed towhees occur in shrublands with a range of structural characteristics. In a northwestern Colorado study comparing green-tailed towhee abundances in mature pinyon-juniper woodland with chained and natural pinyon-juniper openings, green-tailed towhees were more strongly associated with open areas than with mature woodlands. Their abundance was positively correlated with percent shrub canopy cover, and negatively correlated with increasing shrub canopy height and ground slope (Sedgwick 1987). In a discriminant analysis of habitat variables in central Wyoming sagebrush steppe, green-tailed towhees were strongly associated with shrub height (greater than 30 cm) and canopy cover (greater than 35 percent) and moderately associated with cover of understory grasses (Kerley and Anderson 1995). In a locust shrub community in central Arizona, green-tailed towhees preferred nest sites with more ground cover and significantly more woody stems within a 5-meter radius than randomly-sampled sites (Martin 1998). In the northwestern Great Basin area, green-tailed towhee abundance was positively correlated with vertical structural density and "shrubbiness" in sagebrush shrublands (Wiens and Rotenberry 1981).

Green-tailed towhees typically nest in brushy areas with openings, and shrub heights ranging from 50 to 150 cm (Dobbs et al. 1998). In a Grand County, Colorado study, 62 percent of 79 green-tailed towhee nests were in or under big sagebrush, 29 percent were in bitterbrush, 6 percent were in snowberry, and less than 3 percent were in rabbitbrush or serviceberry (Gibbons et al. Unpublished). Nest heights averaged 18 cm (ranging from 0 to 50 cm) in shrubs averaging 61 cm (ranging from 25 to 100 cm) in height, with relatively high vigor (average of 4 on a scale of 1 to 5). Knopf et al. (1990) found that shrub patch vigor (percentage of live shrub branches, standing herbaceous biomass) was the best vegetative descriptor of green-tailed towhee nesting habitat. Nest sites must offer heavy concealment (Oberholser 1974), and nests are seldom visible from any angle outside of the plant itself (Dobbs et al. 1998).

### Threats & Sensitivities

In Colorado, where sagebrush makes up about 50 percent of green-tailed towhee suitable habitat, threats to sagebrush are a major concern.

For green-tailed towhees in the shrublands of the Intermountain West, loss and degradation of sagebrush habitat are primary concerns (Knick et al. 2003; Paige et al. 2001; Paige and Ritter 1999). Broad-scale fire suppression in montane forests is also thought to be a major factor in the decline of the green-tailed towhee in some parts of its overall range, where succession by forests is eliminating suitable shrubland habitat (Bock et al. 1978; Paige et al. 2001).

In Colorado, where sagebrush makes up about 50 percent of green-tailed towhee suitable habitat, loss and degradation of sagebrush are major concerns. Green-tailed towhee sagebrush habitat in Colorado is at risk of four widespread threats modeled in the Colorado sagebrush conservation assessment and strategy: pinyon-juniper encroachment, understory

See [Chapter 6](#) for more detail about green-tailed towhee habitat estimates and predictive threat modeling for its sagebrush habitat in the Colorado assessment area. [Chapter 4](#) presents rule sets for threats modeling in sagebrush habitat.

The green-tailed towhee's response to sagebrush range treatments is likely negative overall.

encroachment by non-native herbaceous vegetation, residential development, and energy development.

Residential development probably poses the lowest threat of the four, with an estimated 2 percent of green-tailed towhee sagebrush habitat at high risk, 2 percent at moderate risk, and 14 percent at low risk. About 82 percent of green-tailed towhee sagebrush habitat is at no risk of residential development based on our predictive model. Residential development threats to sagebrush are fairly scattered, with hot spots around Craig, Steamboat Springs, Granby, the Eagle River Valley, Aspen Valley and the Roaring Fork Valley, Hotchkiss and Cedaredge in Delta County, and Cortez, Mancos, and Durango.

Pinyon-juniper encroachment risk is also relatively low. Our predictive model estimated 18 percent of green-tailed towhee sagebrush habitat is at high risk of pinyon-juniper encroachment, while 27 percent is at moderate or low risk, and 56 percent is at no risk. Pinyon-juniper encroachment is not anticipated to be a serious threat to the green-tailed towhee in the short-term because the species tolerates scattered trees in its habitat. However, complete conversion of sagebrush habitats to mature pinyon-juniper woodlands would result in a loss of green-tailed towhee habitat. Removal or thinning of pinyon-juniper canopy where an understory of sagebrush or mixed shrub communities exists may benefit green-tailed towhee (Sedgwick 1987).

Risk of energy development is broadly moderate. About 58 percent of green-tailed towhee sagebrush habitat is at moderate risk of energy development in the Colorado sagebrush assessment area, 35 percent is at low or no risk, and 8 percent is at high risk. Energy development can result in destruction, degradation, and fragmentation of habitat via mechanisms described in [Chapter 2](#). Sagebrush habitat at highest risk of energy development is scattered throughout the western-most counties in the assessment area, with larger hot spots clustered in Rio Blanco, Garfield, and southern La Plata Counties. The effects of habitat fragmentation on the green-tailed towhee are unknown.

Over 99 percent of green-tailed towhee sagebrush habitat is at some degree of risk of understory encroachment by non-native herbaceous vegetation. Our model predicts 23 percent at high risk, 18 percent at moderate risk, and 58 percent at low risk. The effects of non-native herbaceous understory encroachment on green-tailed towhee sagebrush habitat quality have not been studied. High percent ground cover and nearly monotypic stands that often characterize non-native herbaceous understories could physically interfere with foraging habits or impact plant or invertebrate food sources of this ground-foraging omnivore. Sagebrush habitat at moderate or high risk of understory encroachment in green-tailed towhee range is mostly broadly scattered across the western-most counties at lower elevations. Moffat and Rio Blanco Counties contain the largest contiguous patches of sagebrush habitat at high risk of understory encroachment.

The green-tailed towhee probably responds negatively in the short- and long-term to sagebrush range treatments. Destruction of large areas of sagebrush range followed by reseeding with grasses has probably had a substantial negative impact on green-tailed towhees (Braun et al. 1976). In a Wyoming study, green-tailed towhees were present on untreated control sites, but not



The effects of livestock grazing on green-tailed towhees are unknown.

present on big sagebrush sites burned 9 years previously or herbicide-treated 22 years previously (Kerley and Anderson 1995). Sagebrush canopy cover was 15 percent in the herbicide-treated areas, less than 8 percent in the burned areas, and about 36 percent in untreated areas. Mean shrub height and density was significantly higher on untreated sites than treated sites, while mean percent cover of grasses was lower on untreated sites than on treated sites. Grazing intensity was also lower on untreated sites. Forb cover and height of herbaceous vegetation did not vary significantly between treated and untreated sites. The toxicity of herbicides applied to sagebrush and its effects on nestling growth or nest success are unknown.

The effects of avian diseases and cowbird parasitism on green-tailed towhee nesting success have not been studied.

No long-term, comprehensive studies comparing avifaunas of ungrazed and grazed sagebrush shrubsteppe habitats exist for Colorado or elsewhere, and two recent literature reviews (Bock et al. 1993; Saab et al. 1995) found no studies documenting the effects of grazing on green-tailed towhees. The effects of grazing on green-tailed towhees probably vary depending on habitat and grazing practices. Green-tailed towhees are not likely affected where livestock grazing regime maintains native vegetation composition and densities. Green-tailed towhees may benefit where grazing has influenced increases in shrub height and canopy cover, but there are no data supporting this hypothesis. Livestock grazing is potentially associated with the introduction of exotic plants (effects on green-tailed towhees are unknown) and higher densities of parasitic cowbirds in shrubland habitats.

Green-tailed towhees appear to tolerate brief activity of researchers at their nests, although nest visitation may cue predators to nest locations (Dobbs et al. 1998).

Green-tailed towhees apparently do not readily reject cowbirds eggs and are known to raise brown-headed cowbird young. Colorado BBA observers reported green-tailed towhee nests with cowbird eggs in Larimer County, and with dependent cowbird young in Routt, Montrose, and Chaffee counties (Chace and Cruz 1996; Righter 1998). Others observed cowbird parasitism of green-tailed towhee nests in Mesa County (Chace and Cruz 1996). During a two-year study of 79 green-tailed towhee nests in Grand County, Colorado, brown-headed cowbirds were present but no nest parasitism occurred (Gibbons et al. Unpublished).

Potential predators of green-tailed towhee eggs or young are black-billed magpie, common raven, Steller's jay, scrub jay, snakes, and small mammals, including red fox, badgers, skunks, weasels, and ground squirrels. Raptors, such as sharp-shinned hawk, Cooper's hawk, northern goshawk, peregrine falcon, red-tailed hawk, American kestrel, and long-eared owl have taken adults. During a study on the Mogollon Rim in Arizona, 75 percent of nests failed due to depredation (Dobbs et al. 1998; Martin 1998). In northwestern Colorado, Gibbons et al. (unpublished) observed a western terrestrial garter snake preying on a green-tailed towhee nestling. The authors estimated the probability of green-tailed towhee nest success as 46.5 percent over a two-year study period, and attributed most nest failures to depredation.

### Data gaps

The green-tailed towhee is one of the least-known shrubland sparrows

Because green-tailed towhee densities do not necessarily imply preference for habitat conditions or correlation with nest success (Martin 1998), green-tailed towhee population trend monitoring should be coupled with investigation of nest success (including brood parasitism and predation) under alternate rangeland management and grazing regimes, over a spectrum of habitat conditions and geographic areas in Colorado.

in Colorado.

Information is needed regarding landscape-scale patterns of habitat use, effects of habitat fragmentation, and patch size and habitat connectivity requirements of the green-tailed towhee.

The degree of breeding territory fidelity of green-tailed towhees is not well documented, and must be understood in terms of how it potentially masks the species' response to habitat changes. Study is also needed to gain better understanding of wintering ecology and the effects of winter habitat degradation on Colorado's breeding populations.

## Management issues

Preservation, restoration, and beneficial management of sagebrush habitat and species-rich shrubland mosaics may increase breeding habitat for green-tailed towhees (Braun et al. 1976, Knopf et al. 1990). However, about 44 percent of green-tailed towhee sagebrush habitat in the Colorado sagebrush assessment area is controlled by private landowners, posing a challenge for effective, integrated habitat management for the species. About 73 percent of the sagebrush habitat managed by public entities is managed by the BLM, making it the public entity best-positioned to have a positive impact on the green-tailed towhee in this regard.

Our threats analysis did not consider non-sagebrush vegetation types, which provide a significant amount (about 50 percent) of the green-tailed towhee's habitat. Ideally, conservation planning and management of species of concern should consider all primary habitat types. Such an approach is beyond the scope of this assessment.

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