Southwest Regional Gap Analysis
Wildlife Habitat Relationship

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Background

We may want to (1) develop four models for each state and then aggregate into a regional model, (2) generate one model using vegetation types only, and (3) compare the two. Vegetation also differs in Nevada from remainder of study area.

ELEVATION differs for each state. However, the vegetation types identified will likely constrain habitat well. We may want to (1) develop four models for each state and then aggregate into a regional model, (2) generate one model using vegetation types only, and (3) compare the two.

VEGETATION: For Nevada, riparian and wet meadow were identified as important to this species. These vegetation types were not identified as important throughout the remainder of the project area. Thus, either this species selects for these systems in Nevada only, or these types were overlooked in other areas. It is likely these vegetation types are important to this species as stopover habitat throughout out the project area; however, we found no information to support this.

Vegetation Type:

Low elevation Chihuahuan Desert and riparian areas represent transient observations. In the Chiricahua Mountains, it is “occasional” in deserts from mid-July onward (Ligon and Balda 1968). In Nevada, Alcorn (1988) suggests this species is “transient” within riparian areas.
USEFUL INFORMATION:
Woodlands through Mixed Conifer: In the Chiricahua Mountains, it is “regular” from woodlands through coniferous forest from mid-July onward (Ligon and Balda 1968). These primary woodland types expected to occur in the Chiricahua Mountains. Because Ligon and Balda (1968) identified “woodlands” within the Chiricahuas, and it seems reasonable they were referring to the primarily woodland types, inclusion of these systems seems reasonable. This species is expected to “stop-over” on its migration southward back to Latin America within these ecological systems. While all of the conifer ecological systems are known to occur within Arizona; however, the last three systems are not specific as to whether they occur in southern Arizona. Because Ligon and Balda (1968) identified “mixed conifer forests” within the Chiricahuas, and these ecological systems may occur with southern Arizona, inclusion of this system is reasonable. This species is expected to “stop-over” on its migration southward back to Latin America within this ecological system.

MADREAN PINE-OAK FOREST AND WOODLAND - This system occurs on mountains and plateaus in the Sierra Madre Occidentale and Sierra Madre Orientale in Mexico, Trans-Pecos Texas, southern New Mexico and southern and central Arizona, from the Mogollon Rim southeastward to the Sky Islands. These forests and woodlands are composed of Madrean pines (Pinus arizonica, Pinus engelmannii, Pinus leiophylla or Pinus strobiformis) and evergreen oaks (Quercus arizonica, Quercus emoryi, or Quercus grisea) intermingled with patchy shrublands on most mid-elevation slopes (1500-2300 m elevation). Sierra Madre Occidentale and Sierra Madre Orientale in Mexico, Trans-Pecos Texas, southern New Mexico and Arizona, generally south of the Mogollon Rim.

MADREAN PINYON-JUNIPER WOODLAND - This system occurs on foothills, mountains and plateaus in the Sierra Madre Occidentale and Sierra Madre Orientale in Mexico, Trans-Pecos Texas, southern New Mexico and in southern and central Arizona, from the Mogollon Rim south to the Sky Islands. Substrates are variable, but soils are generally dry and rocky. The presence of Pinus cembroides, Pinus discolor, or other Madrean trees and shrubs is diagnostic of this woodland system. Juniperus coahuilensis, J. deppeana, J. monosperma, and Pinus edulis may be present to dominant. Madrean oaks such as Quercus arizonica, Q. emoryi, and Q. grisea may be codominant. Pinus ponderosa is absent or sparse. If present, understory layers may be variable and may be dominated by shrubs or graminoids.

MADREAN ENCINAL - Madrean Encinal occurs on foothills, canyons, bajadas and plateaus in the Sierra Madre Occidentale and Sierra Madre Orientale in Mexico, extending north into Trans-Pecos Texas, southern New Mexico and sub-Mogollon Arizona. These woodlands are dominated by Madrean evergreen oaks along a low-slope transition below Madrean Pine-Oak Forest and Woodland (CES305.796) and Madrean Pinyon-Juniper Woodland. Lower elevation stands are typically open woodlands or savannas where they transition into desert grasslands, chaparral or some case desertsclrub. Common evergreen oak species include Quercus arizonica, Q. emoryi, Q. intricata, Q. velutina.
grisea, Quercus oblongifolia, Quercus toumeyi and in Mexico, Quercus chihuahuensis and Quercus albocincta. Madrean pine, Arizona cypress, pinyon and juniper trees may be present, but do not codominate. Chaparral species such as Arctostaphylos pungens, Cercocarpus montanus, Purshia spp. Garrya wrightii, Quercus turbinella, Frangula betulifolia (=Syn Rhamnus betulifolia), or Rhus spp. May be present, but do not dominate. Sierra Madre Occidentale and Sierra Madre Orientale in Mexico, Trans-Pecos Texas, southern New Mexico and southeastern Arizona.

MADREAN UPPER MONTANE CONIFER-OAK FOREST AND WOODLAND - This system occurs at the upper elevations in the Sierra Madre Occidentale and Sierra Madre Orientale. In the U.S., it is restricted to north and east aspects at high elevations (1980-2440 m) in the Sky Islands (Chiricahua, Huachuca, Pinaleno, Santa Catalina, and Santa Rita mountains) and along the Nantanes Rim. It is more common in Mexico and does not occur in Arizona central highlands. The vegetation is characterized by large- and small-patch forests and woodlands dominated by Pseudotsuga menziesii, Abies coahuilensis, or Abies concolor and Madrean oaks such as Quercus hypoleucoides and Quercus rugosa. This is one of the primary mixed conifer forest types expected to occur in the Chiricahua Mountains.

ROCKY MOUNTAIN SUBALPINE MESIC SPRUCE-FIR FOREST AND WOODLAND - This is a high-elevation system of the Rocky Mountains, dominated by Picea engelmannii and Abies lasiocarpa. Occurrences are typically found in locations with cold-air drainage or ponding, or where snowpacks linger late into the summer, such as north-facing slopes and high-elevation ravines. They can extend down in elevation below the subalpine zone in places where cold-air ponding occurs; northerly and easterly aspects predominate. These forests are found on gentle to very steep mountain slopes, high-elevation ridgetops and upper slopes, plateau-like surfaces, basins, alluvial terraces, well-drained benches, and inactive stream terraces. Mesic understory shrubs include Rhododendron albiflorum, Amelanchier alnifolia, Rubus parviflorus, Ledum glandulosum, Phyllodoce empetriformis, and Salix spp. Herbaceous species include Actaea rubra, Maianthemum stellatum, Cornus canadensis, Erigeron eximius, Saxifraga bronchialis, Luzula glabratavar. Hitchcockii, or Calamagrostis canadensis. This ecological system is characterized as a spruce-fir forest/woodland type. However, there is no indication whether this system extends into the Madrean lifezone. Phillips et al. (1964) and Edison et al. (1995) identified this species as occurring within spruce-fir forest. Therefore, inclusion of this system seems reasonable. If this system occurs in the Madrean archipelago, this species is expected to occur summer and breed where suitable habitat is available.

ROCKY MOUNTAIN CLIFF AND CANYON - This ecological system is found from foothill to subalpine elevations and includes barren and sparsely vegetated landscapes (generally <10% plant cover) of steep cliff faces, narrow canyons, and smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock type. Also included are unstable scree and talus slopes that typically occur below cliff faces. There may be small patches of dense vegetation, but it typically includes scattered trees and/or shrubs. Characteristic trees include
Pseudotsuga menziesii, Pinus ponderosa, Pinus flexilis, Populus tremuloides, Abies concolor, Abies lasiocarpa, or Pinus edulis and Juniperus spp. At lower elevations. There may be scattered shrubs present such as species of Holodiscus, Ribes, Physocarpus, Rosa, Juniperus, and Jamesia americana, Mahonia repens, Rhus trilobata, or Amelanchier alnifolia.

ROCKY MOUNTAIN MONTANE MESIC MIXED CONIFER FOREST AND WOODLAND - These are mixed-conifer forests of the Rocky Mountains west into the ranges of the Great Basin, occurring predominantly in cool ravines and on north-facing slopes. Elevations range from 1200 to 3300 m. Occurrences of this system are found on cooler and more mesic sites than Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland. Such sites include lower and middle slopes of ravines, along stream terraces, moist, concave topographic positions and north- and east-facing slopes which burn somewhat infrequently. Pseudotsuga menziesii and Abies concolor are most common canopy dominants, but Picea engelmannii, Picea pungens, or Pinus ponderosa may be present. This system includes mixed conifer/Populus tremuloides stands. A number of cold-deciduous shrub species can occur, including Acer glabrum, Acer grandidentatum, Alnus incana, Betula occidentalis, Cornus sericea, Jamesia americana, Physocarpus malvaceus, Robinia neomexicana, Vaccinium membranaceum, and Vaccinium myrtillus. Herbaceous species include Bromus ciliatus, Carex geyeri, Carex rossii, Carex siccata, Muhlenbergia virescens, Pseudoroegneria spicata, Erigeron eximius, Fragaria virginiana, Luzula parviflora, Osmorhiza berteroi, Packera cardamine, Thalictrum occidentale, and Thalictrum fendleri.

GREAT BASIN PINYON-JUNIPER WOODLAND - This ecological system occurs on dry mountain ranges of the Great Basin region and eastern foothills of the Sierra Nevada. It is typically found at lower elevations ranging from 1600-2600 m. These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges. Severe climatic events occurring during the growing season, such as frosts and drought, are thought to limit the distribution of pinyon-juniper woodlands to relatively narrow altitudinal belts on mountainsides. Woodlands dominated by a mix of Pinus monophylla and Juniperus osteosperma, pure or nearly pure occurrences of Pinus monophylla, or woodlands dominated solely by Juniperus osteosperma comprise this system. Cerocarpus ledifolius is a common associate. Understory layers are variable. Associated species include shrubs such as Arctostaphylos patula, Artemisia arbuscula, Artemisia nova, Artemisia tridentata, Cerocarpus ledifolius, Cerocarpus intricatus, Coleogyne ramosissima, Quercus gambelii, Quercus turbinella, and bunch grasses Hesperostipa comata, Festuca idahoensis, Pseudoroegneria spicata, Leymus cinereus (= Elymus cinereus), and Poa fendleriana. This system occurs at lower elevations than Colorado Plateau Pinyon-Juniper Woodland (CES304.767) where sympatric.

SOUTHERN ROCKY MOUNTAIN PINYON-JUNIPER WOODLAND - This southern Rocky Mountain ecological system occurs on dry mountains and foothills in southern Colorado, in mountains and plateaus of northern New Mexico and Arizona, and extends out onto limestone breaks in the Great Plains. These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and
ridges. Severe climatic events occurring during the growing season, such as frosts and drought, are thought to limit the distribution of pinyon-juniper woodlands to relatively narrow altitudinal belts on mountainsides. Soils supporting this system vary in texture ranging from stony, cobbly, gravelly sandy loams to clay loam or clay. Pinus edulis and/or Juniperus monosperma dominate the tree canopy. Juniperus scopulorum may codominate or replace Juniperus monosperma at higher elevations. In transitional areas along the Mogollon Rim and in northern New Mexico, Juniperus deppeana becomes common. Understory layers are variable and may be dominated by shrubs, graminoids, or be absent. Associated species include Artemisia tridentata, Cercocarpus montanus, Quercus gambelii, Achnatherum scribneri, Bouteloua gracilis, Festuca arizonica, or Pleuraphis jamesii.

These pinyon-juniper woodland types occur within Nevada. Therefore, these systems fit the dominant descriptive information provided by Austin (1967).

Ponderosa Pine: In northern Arizona, this species occurs in ponderosa pine forests from mid-July through August (JJW). This is the only Ponderosa pine ecological system identified as occurring with the SWREGAP project area. This ecological system is identified as occurring within Arizona. Therefore, inclusion of this ecological system is reasonable. This species is expected to "stop-over" on its migration southward back to Latin America within these ecological systems. In the Spring Mountains of southern Nevada, this species is transient in pine-fir forest (Austin 1967).

ROCKY MOUNTAIN PONDEROSA PINE WOODLAND - This very widespread ecological system is most common throughout the cordillera of the Rocky Mountains. It is also found in the Colorado Plateau region, west into scattered locations in the Great Basin, and north into southern British Columbia. These woodlands occur at the lower treeline/ecotone between grassland or shrubland and more mesic coniferous forests typically in warm, dry, exposed sites. Elevations range from less than 500 m in British Columbia to 2800 m in the New Mexico mountains. Occurrences are found on all slopes and aspects, however, moderately steep to very steep slopes or ridgetops are most common. This ecological system generally occurs on igneous, metamorphic, and sedimentary material derived soils, with characteristic features of good aeration and drainage, coarse textures, circumneutral to slightly acid pH, an abundance of mineral material, rockiness, and periods of drought during the growing season. These woodlands in the eastern Cascades, Okanagan and northern Rockies regions receive winter and spring rains, and thus have a greater spring "green-up" than the drier woodlands in the central Rockies. Pinus ponderosa is the predominant conifer; Pseudotsuga menziesii, Pinus edulis, and Juniperus spp. May be present in the tree canopy. The understory is usually shrubby, with Artemisia nova, Artemisia tridentata, Arctostaphylos patula, Arctostaphylos uva-ursi, Cercocarpus montanus, Cercocarpus ledifolius, Purshia stansburiana, Purshia tridentata, Quercus gambelii, Symphoricarpos oreophilus, Prunus virginiana, Amelanchier alnifolia, and Rosa spp. Common species. Pseudoroegneria spicata and species of Hesperostipa, Achnatherum, Festuca, Muhlenbergia, and Bouteloua are some of the common grasses. Mixed fire regimes and ground fires of variable return interval maintain these woodlands,
depending on climate, degree of soil development, and understory density.

Vegetation Structure: Nest ecology - This species is not known to breed within the Southwestern Regional GAP project area.

Chaparral: In the Spring Mountains of southern Nevada, this species is transient in chaparral (Austin 1967).

SONORA-MOJAVE-BAJA SEMI-DESERT CHAPARRAL - This ecological system is composed of evergreen shrublands on sideslopes transitioning from low-elevation desert landscapes up into woodlands of the western Mojave and Sonoran deserts. It extends from northeast Kern County, California, into Baja Norte. Associated species include Quercus john-tuckeri, Quercus cornelius-mulleri, Quercus berberidifolia, Arctostaphylos patula, Arctostaphylos pungens, Arctostaphylos glauca, Rhus ovata, Cercocarpus montanus var. glaber (= Cercocarpus betuloides), Ceanothus greggii, Garrya flavesens, Juniperus californica, and Nolina parryi.

GREAT BASIN SEMI-DESERT CHAPARRAL - This system includes chaparral on sideslopes transitioning from low-elevation desert landscapes up into pinyon-juniper woodlands of the western and central Great Basin. There are limited occurrences extending as far west as the inner Coast Ranges in central California. These are typically fairly open-canopy shrublands with open spaces either bare or supporting patchy grasses and forbs. Characteristic species may include Arctostaphylos patula, Arctostaphylos pungens, Ceanothus greggii, Cercocarpus montanus var. glaber, Cercocarpus intricatus, Eriogonum fasciculatum, Garrya flavesens, Quercus turbinella, Purshia stansburiana, and Rhus trilobata. Cercocarpus ledifolius is generally absent. Typical fire regime in these systems varies with the amount of organic accumulation.

MOGOLLON CHAPARRAL - This ecological system occurs across central Arizona (Mogollon Rim), western New Mexico and southwestern Utah and southeast Nevada. It often dominates along the mid-elevation transition from the Mojave, Sonoran, and northern Chihuahuan deserts into mountains (1000-2200 m). It occurs on foothills, mountain slopes and canyons in dryer habitats below the encinal and Pinus ponderosa woodlands. Stands are often associated with more xeric and coarse-textured substrates such as limestone, basalt or alluvium, especially in transition areas with more mesic woodlands. The moderate to dense shrub canopy includes species such as Quercus turbinella, Quercus toumeyi, Cercocarpus montanus, Canotia holacantha, Ceanothus greggii, Forestiera pubescens (= Forestiera neomexicana), Garrya wrightii, Juniperus deppeana, Purshia stansburiana, Rhus ovata, Rhus trilobata, and Arctostaphylos pungens and Arctostaphylos pringlei at higher elevations. Most chaparral species are fire-adapted, resprouting vigorously after burning or producing fire-resistant seeds. Stands occurring within montane woodlands are seral and a result of recent fires.

Elevational Range: The available information does not satisfy EDR 5. However, habitat will likely be constrained by vegetation type. We may want to (1) develop four models for each state and then aggregate into a regional model, (2) generate one model using vegetation types only, and (3) compare the
two. Arizona elevation is from 1727 to 2727 meters (Swarth 1904; Bené 1947; Kodric-Brown and Brown 1978). Colorado elevation is from 2121 to 3030 meters (Cooke 1897). Elevational range in New Mexico is from 1515 to 3818 meters (Bailey 1928; Heinemann 1992).

While in the Huachuca Mountains, this species occurs between 8000 to 9000 feet (2424-2727 meters) elevation (Swarth 1904), while Bené (1947) identified this species at 5700 feet (1727 meters) elevation. In the White Mountains, Arizona, Kodric-Brown and Brown (1978) conducted investigations on territoriality within a meadow at 2300 meters elevation. For Arizona, we have information from three sources representing two different areas. These areas occur within two different latitudinal quadrants. Consequently, this information satisfies EDR 5. Therefore, the estimated elevational range for Arizona is from 1727 to 2727 meters. For Nevada, elevational range is from 1242 to 2197 meters (Linsdale 1936; Gullion et al. 1959; Ligon 1936). Only one record exists for Utah; therefore, there is no elevational range information available. The Utah model should be developed using vegetation information only.

Historically in southwestern Colorado, this species breeds from 7000 to 10000 feet (2121 – 3030 meters) and ranges in the summer several thousand feet higher (Cooke 1897). The elevational range provided for this species is based on “breeding records?” This information is over 100 years old and it conflicts with our current knowledge of this species breeding habits within Colorado. Also, there is no information to support this species was actually observed breeding or nesting within southwestern Colorado. However, this information may be used to suggest the elevational range for stopover habitat. This elevational range for the southwestern extent of the state is between 2121 an 3030 meters.

In New Mexico, this species is “common” from 5000 to 12600 feet (1515-3818) elevation (Bailey 1928). In the Sandia Mountains, New Mexico, it was observed in established feeding territories comprised of Scrophularia spp. flower between 2000 to 3000 meters (Heinemann 1992). For New Mexico, statewide and site-specific information was available. Because the information for the Sandia Mountains falls within the state elevational range, the state elevational range is used, which is between 1515 to 3818 meters.

For Nevada, elevation information is based on three individual observations; these range in elevation from 7000 to 7250 feet (2121-2197 meters; Linsdale 1936). Also, Gullion et al. (1959) provide an elevational range from 4100 to 5500 feet (1242 - 1667 meters) elevation; this was based on five observations within southern Nevada. The elevational information provided by Ligon (1936) and Gullion et al. (1959) was based on a paucity of observations - n = 3 and n = 5, respectively. However, this information agrees well with the information for Arizona and New Mexico. Therefore, this information will not be excluded due to a dearth of data. Elevational range is combined using EDR 3, which is from 1242 to 2197 meters.

In Utah, Behle and Ghiselin (1958) have elevation information from the collection site of one specimen; the elevation was 6000 feet (1818 meters) at
Lake Fork Creek near Mt. Emmons, Uinta Mountains, northeastern Utah. The elevational information for Utah is based on one observation. Therefore, it will not be used as an indicator for elevation for the entire state. However, this one observation does fall within the elevational range for AZ, NM and NV.

Territory Size: In the Sandia Mountains, New Mexico, feeding territories average 31 m²; this is smaller than other estimated territory sizes, which is probably due to the relatively rich and dense Scrophularia spp. flower (Heinemann 1992). Feeding/stop over territory size exists only for one mountain range in New Mexico. Because this species is known to stop over throughout the entire SWREGAP project area, this information cannot be considered representative. Therefore, this information will not be used.

Assessment: References used in developing this habitat description include BNA species’ account of the Rufous hummingbird (Calder 1993), five peer-reviewed journal articles (Behle and Ghiselin 1958; Gullion et al. 1959; Kodric-Brown and Brown 1978; Cook 1984; Heinemann 1992), two U.S. government document (Hayward et al. 1978; Stamp and Ohmart 1976), 15 natural history accounts (Cooke 1897; Bailey 1923, 1928; Swarth 1904, 1914; Linsdale 1936; Huey 1942; Bene 1947; Tanner and Hardy 1958; Ligon 1961; Ligon and Balda 1968; Phillips et al. 1978; Johnsgard 1983; Rea 1983; Rosenberg et al. 1991; Hahn 2003) and eight species checklists (Behle 1944; Hubbard 1978; Kaufmann et al. 1980; Monson and Phillips 1981; Alcorn 1988; Williams 1994; Edison et al. 1995). Vegetation information was derived from one peer-reviewed journal article (Heinemann 1992), and one natural history account (Ligon and Balda 1968) and two species checklists (Hubbard 1978; Alcorn 1988). Elevational range was identified from four peer-reviewed journal articles (Behle and Ghiselin 1958; Gullion et al. 1959; Kodric-Brown and Brown 1978; Heinemann 1992), and five natural history accounts (Cooke 1897; Bailey 1928; Swarth 1904; Linsdale 1936; Bene 1947). Ligon and Balda (1968) conducted individual bird studies in Cave Creek Canyon and the Southwestern Research Station from 17 May – 21 July 1964 (Ligon; Cave Creek Canyon), 03 June – 02 July 1964 (Balda; Southwest Research Station), 17 February – 18 August 1965 (Balda; Chiricahua Region), 04 May – 05 August 1965 (Ligon; Southwest Research Station) and Ligon spent three days in April and 18 days in July in Cave Creek Canyon. Kodric-Brown and Brown (1978) conducted investigations on RUHU territoriality within a meadow in the White Mountains, Arizona from 02 July to 10 August 1975 and 5-17 August 1976.

Narrative description of distribution: Only winter range in Arizona was based upon the BNA account (Calder 1993), the Great Basin Bird Observatory (GBBO) Nevada Bird Count Data (unpublished data), and GBBO Nevada Breeding Bird Atlas (unpublished data). Stopover habitat was delineated using available literature. This species is an early migrant southbound to Mexico; it is territorial in stopover habitats (these include areas in Arizona, Colorado and New Mexico), which has been confused with breeding territoriality (Calder 1993). Historically, there were no occurrences of this species breeding within Arizona, Colorado or New Mexico (Bailey 1928); Bailey (1928) indicates this species did not occur on these states’ breeding lists for the past 30 years. In Arizona, it is an “exceedingly common migrant” in the higher mountains of the state (Swarth
1914). Edison et al. (1995) suggest this species is a “common fall transient” and “uncommon spring transient” throughout southeastern Arizona, primarily west of Tucson. Phillips et al. (1978) considers this species a “common spring migrant” from the west slope of the Baboquivari Mountains westward (south to the Gila River) almost to the Colorado River. Also, it is “very rare” further east and “casual” in the northern extent of the state (Phillips et al. 1964; Monson and Phillips 1981). It has been observed in Madera Canyon, Santa Rita Mountains (n = 3 juveniles; Bailey 1923). This hummingbird is an “abundant fall migrant” in northern and eastern Arizona, and occurs in small numbers in central and southwestern Arizona (Phillips et al. 1978; Monson and Phillips 1981). It is an abundant hummer of Arizona mountains during its southward migration of late summer, and is less common in southwestern deserts during the spring (Phillips et al. 1978). In Mountainaire, south of Flagstaff, it has been observed in late summer through early fall since 1999 (Wynne, pers. obs.). Within the Middle Gila River, this species is considered “rare” during the spring and an “uncommon fall transient” (Rea 1983). This species occurs in the Huachuca Mountains from mid-July through August (Swarth 1904). In the Lower Colorado River Valley, it is considered an “uncommon spring migrant” from early-March through mid-April, and is a “fairly common” fall migrant in August and September (Rosenberg et al. 1991). Swarth (1914) suggests this species is “comparatively rare” during the spring. This species was documented within Alamo Canyon, Ajo Range, Organ Pipe Cactus National Monument (n = 3; Huey 1942). Historically in Colorado, this species was a “summer resident” and “not uncommon locally” (Cooke 1897). It was tolerably common in the western portion of the state, and much less common along the eastern slope of the mountains (Cooke 1897). However, it currently is identified as only stopping over in the state between from mid-July through mid- to late-September (Hahn 2003). In New Mexico, this species is considered common to abundant, but only as a migrant in the higher mountains (Ligon 1961). It is most abundant in early August and mostly gone by early September, although some may remain until the end of September (Johnsgard 1983). According to Bailey (1928), this species migrates through the region and is “common” in late-July. It has been observed in Apache, Silver City, Santa Fe (Bailey 1928), and Pecos (Bailey 1928; Hubbard 1978) and the Rio Grande Rivers as well as in the Little Florida, Animas (Bailey 1928) and Sandia Mountains (Hubbard 1978; Heinemann 1992), Las Cruces (n = 1; Williams 1994), Albuquerque, Clovis, in the Big Hatchet Mountains and occasionally east to Clayton (Hubbard 1978). Eastern-most records for this species includes northeast of Roswell and Artesia (Kaufman et al. 1980). This species was observed in the Big Hatchet Mountains, Hidalgo County (Hayward et al. 1978). In Nevada, this species is considered “transient” occurring during the late summer and fall (Linsdale 1936), and occurs over most of the state during the spring and fall (Alcorn 1988). It has been observed in the Truckee Reservation (n = 1 male), in the East Humboldt Mountains, Elko County (n = 1 male), at Lake Tahoe (n = 1), Soldiers Meadows, Humboldt County (n = 1 immature), at Martin Creek, Santa Rosa Mountains, Humboldt County (n = 1 female), at Willard Creek, Snake Mountains, White Pine County (n = 2; 1 male, 1 female), and in Pine Grove, Mineral County (n = 1 male; Linsdale 1936). It was also observed at Big Pine Spring, McCullough Range, 16 miles northwest of Searchlight (n = 3), at McCullough Spring, McCullough Range (n = 1) and at Mule Springs, four miles west of Mountain Springs, Clark County (n =
1; Gullion et al. 1959). Other records include Sheldon NWR, Reno, Lake Tahoe, Fallon, Eureka, in Faulkner Canyon, Monitor Range, and on Wheeler Peak, White Pine County (Alcorn 1988). In Utah, it is a “fairly common transient,” especially in late-July (Behle 1944). This species has been observed in the northeastern corner of the state, Uintah County, within the Colorado Plateau province (Cook 1984). In northeastern Utah, three specimens were collected in the mid to late 1950s; one was collected three miles northwest of Strawberry Reservoir, one at Lake Fork Creek near Mt. Emmons and one at Smith-Morehouse Creek (Behle and Ghiselin 1958).

Description Changes

Relationships

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**Ecological System**

- S006 Rocky Mountain Cliff and Canyon
- S030 Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
- S034 Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- S035 Madrean Pine-Oak Forest and Woodland
- S036 Rocky Mountain Ponderosa Pine Woodland
- S038 Southern Rocky Mountain Pinyon-Juniper Woodland
- S040 Great Basin Pinyon-Juniper Woodland
- S051 Madrean Encinal
- S053 Great Basin Semi-Desert Chaparral
- S057 Mogollon Chaparral
- S091 Rocky Mountain Subalpine-Montane Riparian Shrubland
- S092 Rocky Mountain Subalpine-Montane Riparian Woodland
- S093 Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- S094 North American Warm Desert Lower Montane Riparian Woodland and Shrubland
S095 Western Great Plains Riparian Woodland and Shrubland
S097 North American Warm Desert Riparian Woodland and Shrubland
S102 Rocky Mountain Alpine-Montane Wet Meadow
S111 Madrean Upper Montane Conifer-Oak Forest and Woodland
S112 Madrean Pinyon-Juniper Woodland
S114 Sonora-Mojave-Baja Semi-Desert Chaparral
S118 Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland

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