U.S. FISH AND WILDLIFE SERVICE SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

Scientific Name:

Anthus spragueii

Common Name:

Sprague's Pipit

Lead region:

Region 6 (Mountain-Prairie Region)

Information current as of:

08/29/2014

Status/Action

___ Funding provided for a proposed rule. Assessment not updated.

___ Species Assessment - determined species did not meet the definition of the endangered or threatened under the Act and, therefore, was not elevated to the Candidate status.

___ New Candidate

_X_ Continuing Candidate

Listing Priority Number (LPN) Change
Former LPN: 8
New LPN: 11

___ Candidate Removal

___ Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status

___ Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species

___ Range is no longer a U.S. territory

___ Insufficient information exists on biological vulnerability and threats to support listing

___ Taxon mistakenly included in past notice of review

___ Taxon does not meet the definition of "species"

___ Taxon believed to be extinct

___ Conservation efforts have removed or reduced threats

___ More abundant than believed, diminished threats, or threats eliminated.

Petition Information

___ Non-Petitioned

_X_ Petitioned - Date petition received: 10/10/2008

90-Day Positive:12/03/2009

12 Month Positive:09/15/2010

Did the Petition request a reclassification? **No**

For Petitioned Candidate species:

Is the listing warranted(if yes, see summary threats below) **Yes**

To Date, has publication of the proposal to list been precluded by other higher priority listing? **Yes**

Explanation of why precluded:

Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for this species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The Progress on Revising the Lists section of the current CNOR (http://endangered.fws.gov/) provides information on listing actions taken during the last 12 months.

Historical States/Territories/Countries of Occurrence:

- **States/US Territories**: Arizona, Arkansas, Colorado, Kansas, Louisiana, Minnesota, Mississippi, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Wyoming
- **US Counties**: Campbell, WY, Crook, WY, Park, WY
- **Countries**: Canada, Mexico, United States

Current States/Counties/Territories/Countries of Occurrence:

- **States/US Territories**: Arizona, Arkansas, Colorado, Kansas, Louisiana, Minnesota, Mississippi, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas
- **US Counties**: Franklin, AR, Lafayette, AR, Little River, AR, Miller, AR, Cochise, AZ, La Paz, AZ, Maricopa, AZ, Santa Cruz, AZ, Yuma, AZ, Acadia, LA, Allen, LA, Avoyelles, LA, Bienville, LA, Bossier, LA, Caddo, LA, Calcasieu, LA, Cameron, LA, Catahoula, LA, DeSoto, LA, East Baton Rouge, LA, East Carroll, LA, Iberia, LA, Iberville, LA, Jackson, LA, Jefferson Davis, LA, Lafayette, LA, La Salle, LA, Natchitoches, LA, Orleans, LA, Plaquemines, LA, Rapides, LA, Red River, LA, Richland, LA, St. Bernard, LA, St. Charles, LA, St. John the Baptist, LA, St. Martin, LA, St.

Tammany, LA, Tensas, LA, Terrebonne, LA, Vermilion, LA, West Baton Rouge, LA, West Feliciana, LA, Clay, MN, Polk, MN, Roseau, MN, Big Horn, MT, Blaine, MT, Broadwater, MT, Carbon, MT, Carter, MT, Cascade, MT, Chouteau, MT, Custer, MT, Daniels, MT, Dawson, MT, Fallon, MT, Fergus, MT, Gallatin, MT, Garfield, MT, Glacier, MT, Golden Valley, MT, Hill, MT, Jefferson, MT, Judith Basin, MT, Lewis and Clark, MT, Liberty, MT, Madison, MT, McCone, MT, Meagher, MT, Musselshell, MT, Park, MT, Petroleum, MT, Phillips, MT, Pondera, MT, Powder River, MT, Powell, MT, Prairie, MT, Richland, MT, Roosevelt, MT, Rosebud, MT, Sheridan, MT, Stillwater, MT, Sweet Grass, MT, Teton, MT, Toole, MT, Treasure, MT, Valley, MT, Wheatland, MT, Wibaux, MT, Yellowstone, MT, Adams, ND, Barnes, ND, Benson, ND, Billings, ND, Bottineau, ND, Bowman, ND, Burke, ND, Burleigh, ND, Cavalier, ND, Dickey, ND, Divide, ND, Dunn, ND, Eddy, ND, Emmons, ND, Golden Valley, ND, Grand Forks, ND, Grant, ND, Hettinger, ND, Kidder, ND, LaMoure, ND, Logan, ND, McHenry, ND, McIntosh, ND, McKenzie, ND, McLean, ND, Mercer, ND, Morton, ND, Mountrail, ND, Oliver, ND, Pembina, ND, Pierce, ND, Ramsey, ND, Ransom, ND, Renville, ND, Rolette, ND, Sargent, ND, Sheridan, ND, Sioux, ND, Slope, ND, Stark, ND, Stutsman, ND, Towner, ND, Walsh, ND, Ward, ND, Wells, ND, Williams, ND, Bernalillo, NM, Chaves, NM, Curry, NM, DeBaca, NM, Dona Ana, NM, Eddy, NM, Grant, NM, Guadalupe, NM, Hidalgo, NM, Lea, NM, Luna, NM, Otero, NM, Roosevelt, NM, San Juan, NM, San Miguel, NM, Sierra, NM, Socorro, NM, Union, NM, Canadian, OK, Cleveland, OK, Grady, OK, Jefferson, OK, Kiowa, OK, Latimer, OK, Mayes, OK, McClain, OK, Murray, OK, Payne, OK, Pittsburg, OK, Butte, SD, Campbell, SD, Corson, SD, Custer, SD, Dewey, SD, Fall River, SD, Haakon, SD, Hand, SD, Harding, SD, Hyde, SD, Jackson, SD, Jones, SD, Lawrence, SD, Lyman, SD, McPherson, SD, Meade, SD, Pennington, SD, Perkins, SD, Shannon, SD, Stanley, SD, Ziebach, SD, Aransas, TX, Atascosa, TX, Bee, TX, Brazoria, TX, Brazos, TX, Calhoun, TX, Cameron, TX, Chambers, TX, Galveston, TX, Grimes, TX, Harris, TX, Hidalgo, TX, Jim Wells, TX, Kenedy, TX, Kleberg, TX, Matagorda, TX, Maverick, TX, Nueces, TX, Refugio, TX, San Patricio, TX, Starr, TX, Victoria, TX, Willacy, TX, Wilson, TX, Zavala, TX

- **Countries**: Canada, Mexico, United States

Land Ownership:

Table 1 shows the land ownership for the Sprague's pipit range for the U.S. and Canada. As the table shows, most of the range in both the U.S. and Canada is in private ownership.

Table 1: Percent land ownership in the breeding range of the Sprague's pipit (Lipsey *in litt*. 2014a, pp. 16-17).

	United States	**Canada**
Private	66.9%	72.9%
Tribal/First Nations	13.6%	1.4%
Federal	12.8%	6.0%
State/Provincial	6.4%	19.3%
Private Conservation	0.3%	0.4%

Lead Region Contact:

OFC OF THE RGNL DIR, Justin Shoemaker, 303 236-4214, Justin_Shoemaker@fws.gov

Lead Field Office Contact:

ND ESFO, Carol Aron, 605-773-2745, carol_aron@fws.gov

Biological Information

Species Description:

The Sprague's pipit is a small prairie bird 10 to 15 cm (3.9 to 5.9 in) in length, and 22 to 26 g (0.8 to 0.9 oz) in weight, with buff and blackish streaking on the crown, nape, and underparts. Males and females are similar in appearance. The Sprague's pipit has a plain buffy face with a large eye-ring. The bill is relatively short, slender, and straight, with a blackish upper mandible. The lower mandible is pale with a blackish tip. The wings and tail have two indistinct wing-bars, and the outer retrices (tail feathers) are mostly white (Robbins and Dale 1999, p. 3-4). Juveniles are slightly smaller, but similar to adults, with black spotting rather than streaking (Robbins and Dale 1999, p. 3). Male Sprague's pipits have a territorial flight display that takes place high in the air and that can last up to 3 hours (Robbins 1998, pp. 435-436).

Taxonomy:

The Sprague's pipit is a small passerine of the family Motacillidae, genus Anthus, native to the Northern Great Plains (Robbins and Dale 1999, p. 1). It was first described by Audubon (1844, pp. 334-336). It is one of the few bird species endemic to the North American prairie. The closest living relative is believed to be the yellowish pipit (A. *lutescens*) of South America (Robbins and Dale 1999, p. 9).

Habitat/Life History:

Sprague's pipits are strongly tied to native prairie (land which has never been plowed) on both the breeding and wintering grounds (Davis 2004, pp. 1138-1139; Dechant *et al*. 1998, pp. 1-2; McMaster *et al*. 2005, p. 219; Levandoski *in litt*. 2014, pp. 1-2; Owens and Myres 1973, pp. 705, 708; Ruvalcaba-Ortega *et al*. 2012; p. 15). In migration and on the wintering grounds, there are also reports of pipits occurring in a variety of non-native grass habitat (Arizona Game and Fish Department 2010, p. 4; Desmond 2006, p. 1; Dieni *et al*. 2003a, p. 31; Igl and Ballard 1999, p. 776; Imhof 1958, p. 355; James 1960, pp. 11-12; James and Neal 1986, p. 278; McCaskie 1975, pp. 29-30; Arizona Game and Fish Department 2010, p. 4; Stephens 2011, pp. 13, 25). They are rarely observed in cropland (Koper *et al*. 2009, p. 1987; Owens and Myres 1973, pp. 697, 707; Igl *et al*. 2008, pp. 280, 284) or land in the Conservation Reserve Program (a federal program whereby marginal farmland is planted primarily with grasses), presumably because the vegetation is too dense (Higgins *et al*. 2002, pp. 46-47). Sprague's pipits will use nonnative planted grassland when the vegetative structure is appropriate (Higgins *et al*. 2002, pp. 46-47; Dechant *et al*. 1998, p. 3; Dohms 2009, pp. 77-78, 88). Vegetation structure may be a better predictor of Sprague's pipit occurrence than plant species composition throughout the range (Davis 2004, pp. 1135, 1137). Preferred grass height has varied between studies, but is estimated to be between 10 and 30 cm (4 and 12 in.) on both the breeding and wintering ground (Dieni and Jones 2003b, p. 390; Madden *et al*. 2000, p. 382; Pool *et al*. 2012, pp. 55-56; Sutter 1997, pp. 464-466). The species prefers to breed in well-drained, open grasslands and avoids grasslands with excessive shrubs throughout the range (Desmond *et al*. 2005, p. 442; Grant *et al*. 2004, p. 812; Pool *et al*. 2012, pp. 55-56; Sutter 1997, p. 464).

During the breeding season, Sprague's pipits prefer to nest in native grassland, defined as areas with at least 75 percent cover in native species and without a history of cultivation in most of the plot (Davis *et al*. 2013, p. 909). A minimum size requirement has been suggested to be approximately 145 hectares (ha) (358.3 ac) (range 69 to 314 ha (170 to 776 ac)) of native grassland (Davis 2004, p. 1134), with individuals not observed in areas smaller than 29 ha (71.6 ac) (Davis 2004, p. 1134). The best predictor of Sprague's pipit presence is the amount of native grassland within 400 m (1,312 ft) of the breeding parcel (Davis *et al*. 2013). Sprague's pipits will nest in planted grassland (Dechant *et al*. 1998, pp. 1, 4; Dohms 2009, pp. 41-81), although

fledgling success in non-native prairie is lower than nests in native prairie (Fisher and Davis 2011, pp. 263, 269). Sprague's pipits are up to five times more likely to occur in native compared with planted parcels (Davis *et al*. 2013, p. 7).

Sprague's pipits can be found in lightly to moderately grazed areas (Dechant *et al*. 1998, p. 4), but in North Dakota, a greater abundance of Sprague's pipits have been reported from moderately to heavily grazed areas (Kantrud 1981, p. 414). However, these descriptions are relative; vegetation described as lightly grazed in one study may be called heavily grazed in another (Madden *et al*. 2000, p. 388).

Sprague's pipits winter use of an area on an annual basis is highly dependent on current habitat conditions, which in turn are closely related to the previous summer's rainfall (Dieni *et al*. 2003a, p. 31; MacÃ-as-Duarte *et al*. 2009, p. 901; MacÃ-as-Duarte*et al*. 2011, p. 38). Sprague's pipits preferred grassland habitat in the Chihuahuan Desert consists of 80 percent grass cover, with average grass height of 28 cm (11 in) and less than 5 percent shrub cover (Pool et al. 2012a, pp. 55-56). It is not clear whether converted habitat can be restored (Pool and Panjabi 2011, p. 4), but removing shrubs would likely increase Sprague's pipit use (Pool and Panjabi 2011, p. 4; Pool *et al*. 2012a, p. 56).

While most sightings of Sprague's pipits on the wintering grounds are on native prairie (Pool *et al*. 2012, p. 55), they may not be so tightly tied to native prairie in winter or migration as they are on the breeding grounds (Igl and Ballard 1999, p. 776; Stephens 2011, pp. 13, 25).

Historical Range/Distribution:

The historical breeding range is described as throughout North Dakota, except for the southeastern-most counties; northern and central Montana east of the Rocky Mountains; northern portions of South Dakota, northwestern Minnesota, and possibly some small patches in extreme northcentral and northwest Wyoming (Sauer *et al*. 2012, p.6). In Canada, Sprague's historical breeding range included southeastern Alberta, the southern half of Saskatchewan, and in southwest Manitoba (Robbins and Dale 1999, p. 5, Sauer *et al*. 2012, p. 6).

There is no detailed information regarding the historical winter range (Jones 2010, p. viii).

Current Range Distribution:

The most recent Breeding Bird Survey (BBS) analysis of the Sprague's pipits range, which includes an estimate of the species distribution based on surveys conducted from 2006-2012, shows a reduction of the species range compared with the previous range from 1994-2003 (Sauer *et al*. 2012, p. 6). The edges of the range have been reduced to exclude Minnesota and Wyoming, most of eastern North Dakota, much of South Dakota, and parts of southern and western Montana. In Canada, the updated species distribution excludes eastern and northern Manitoba, and portions of Saskatchewan and Alberta. Especially in the eastern portion of the range, very little grassland breeding habitat remains (Lipsey *et al*. 2014, p. 10).

Recent analysis of survey data on breeding range collected from a number of sources from 2007-2012 revealed that the species has a highly clumped distribution (Lipsey *et al*. 2014, p. 7). Seventy-five percent of the population uses approximately 29 percent of the breeding range (hereafter referred to as the Core area) (Lipsey *in litt*. 2014b, p. 3) (Figure 1).

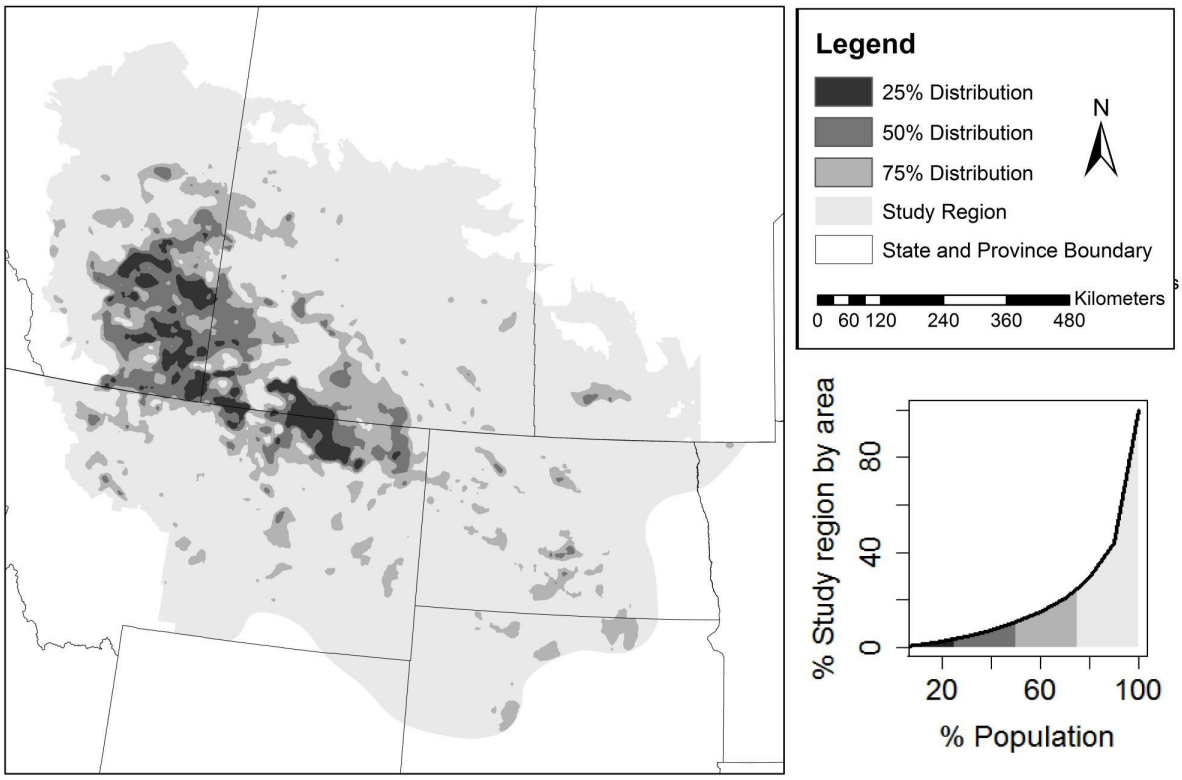


Figure 1: The range of the Sprague's pipit (light gray) from the BBS data with areas of higher occupancy shaded darker. As the graph on the lower right shows, 75 percent of the population is concentrated in approximately 29 percent of the range.
Source: Lipsey *et al*. 2014, p. 7.

The Sprague's pipits current wintering range includes south-central and southeast Arizona, Texas, southern Oklahoma, southern Arkansas, northwest Mississippi, southern Louisiana, and northeastern Mexico, to Michoacan, Puebla, and Veracruz (Robbins and Dale 1999, p. 6). Most of the winter range, and we assume most of the population, winters in Mexico (Robbins and Dale 1999, pp. 5-6). The vast majority of the winter sightings in the U.S. have been in Texas (Figure 2) (From National Audubon Society 2012, p. 1). There have been migration sightings in Michigan, western Ontario, Ohio, Massachusetts, and Gulf and Atlantic States from Mississippi east and north to South Carolina. Sprague's pipits also have been sighted in California during fall migration (Robbins and Dale 1999, p. 6; From National Audubon Society 2012, p. 1).

In the U.S., most of the Sprague's pipit winter range sightings are in the coastal prairie of Texas and Louisiana (Figure 2). However, the majority of the population likely resides in Mexico during the winter, which is not shown on the figure below.

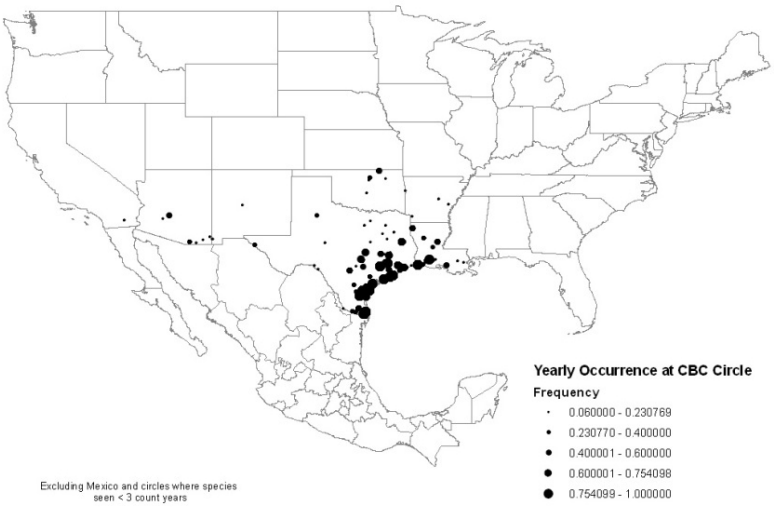


Figure 2: The relative frequency of Sprague's pipits reported at Christmas Bird Count Circles in the U.S. from 1951 through 2011 when the species was observed in more than three count years during the period of the count. Note that most of the observations are along the coastal prairie of Texas and Louisiana. Source: Audubon's Annual Christmas Bird Count 2012 (pages not available)

A study in seven Chihuahuan Desert Grassland Priority Conservation Areas (GPCA) in Northern Mexico, southeastern Arizona, southern New Mexico and west Texas provided information about Sprague's pipit presence and density in those areas of the winter range (Macias-Duarte *et al.* 2011, entire; Pool *et al*. 2012a, p. 52). Sprague's pipits were broadly distributed across the region (Figure 3, Table 2), with Cuchillas de la Zarca, El Tokio, Valle Colombia in the southeastern part of the Chihuahuan Desert having the highest density for the survey period between 2007-2011 (Macias-Durarte *et al*. 2011, pp. 151-152; Pool *et al*. 2012a, p. 52). Presence and density varied dramatically between years and areas. For example, in Cuchillas de la Zarca, no Sprague's pipits were observed in 2007, while a mean of 7.05 (CI 4.96 to 9.77) individuals were observed along survey transects in 2010 (Macias-Durarte *et al*. 2011, p. 151). This suggests that having large areas of extant grassland spread throughout the winter range is important for species viability so that birds can winter in areas where the grassland conditions are good in that year (Macias-Duarte *et al*. 2011, p. 38).

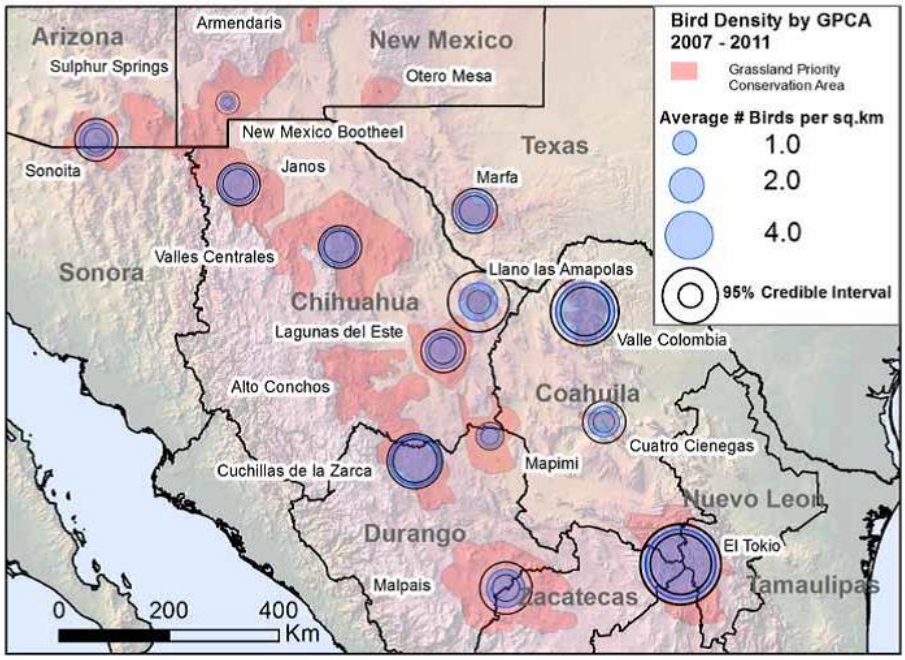


Figure 3: The estimated mean density (in Sprague's pipits per km^2) across years in the surveyed Grassland Priority Conservation Areas. The size of the circle is proportional to the density in the area. The blue circle shows the mean density, while the concentric black circles show the 95% credible intervals. Source: Macias-Durarte *et al*. 2011, p. 153

Table 2: The mean density of Sprague's pipits observed in each Grassland Priority Conservation Areas and the number of years that the survey occurred in that area. The Sprague's pipit is fairly well distributed across the Grassland Priority Conservation Areas. Source: Macias-Durarte *et al*. 2011, pp. 151-152

Grassland Priority Area	**Mean Birds Observed expressed as individuals/km^2 (CI)**	**Years Area Surveyed**
Armendaris	0	2011
Cuatro Ciénegas	1.67 (0.81-3.16)	2007-2010
Cuchillas de la Zarca	4.27 (0.49-5.28)	2007-2011
El Tokio	8.65 (1.29-11.29)	2007-2011
Janos	2.37 (0.38-3.18)	2007-2011
Lagunas del Este	2.13 (0.52-3.26)	2009-2011
Llano Las Amapolas	2.61 (1.34-6.33)	2009-2011
Malpaís	2.57 (0.85-4.73)	2010-2011
Mapimí	0.84 (0.21-1.31)	2007-2011
Marfa	2.34 (0.52-3.54)	2009-2011
NM Bootheel	0.45 (0.21-0.99)	2011
Otero Mesa	0	2011
Sonoita	1.90 (0.56-3.21)	2008-2011
Sulphur Springs	0	2011
Valles Centrales	2.43 (0.34-3.15)	2007-2011
Valle Colombia	6.04 (0.98-8.12)	2007-2011

Population Estimates/Status:

The best available information we currently have regarding the estimated size of the Sprague's pipit population is approximately 900,000 individuals rangewide, based on an analysis of BBS data (Partners in Flight 2013, p. 6). The BBS is a standardized survey performed annually across the continental U.S. and Canada since 1966. Surveyors travel along the same routes at the same time of year annually and count bird seen or heard during three-minute stops every half-mile (Sauer *et al.* 1997, entire). However, the 900,000 population estimate is considered conservative because the BBS routes in the U.S. used to generate this number were largely from a portion of the range where the species occurs in low breeding densities (Sauer *in litt.* 2013, p. 9; Lipsey *et al*. 2014, p. 7). In the U.S., only five routes of 54 total routes run in the U.S. portion of the range were surveyed in the species Core area (Sauer *in litt*. 2014b, p. 3). While the routes to be included in the BBS were randomly selected, we found in our evaluation that many routes, especially in the Core area of Montana and the Dakotas, are not run, presumably due to their locations in sparsely populated areas that are time consuming to access. For routes within the U.S. Core area, the annual index of route abundance was 15.18 individuals (CI 7.6 to 31.7), while outside of the U.S. Core area, the annual index of route abundance was 0.57 individuals (CI 0.36 to 0.91) (Sauer *in litt*. 2014b, p. 3). Thus, the population estimate from the U.S. portion of the breeding range is likely an underestimate, because the part of the range where the species is concentrated is under-represented in the survey routes. Note that this is not an issue in Canada, where habitat is well represented across the Sprague's pipit range (Sauer *in litt*. 2014, p. 5).

Nevertheless, we conservatively use the published population estimate of 900,000 individuals as the starting point to forecast the extinction risk for the future population. The Endangered Species Act (16 U.S.C. 1531 *et seq*.) defines a Threatened species as one that is likely to become endangered within the foreseeable future. We use 40 years as a reasonably foreseeable future for this analysis. This time period represents modeling that was the least speculative and encompasses a minimum of 10 to 20 generations, assuming a generation time of 2 to 4 years (COSEWIC 2010, p. V).

Because the Sprague's pipit population is highly clumped, with most of the remaining population concentrated in areas with relatively large, intact, grassland (Lipsey *et al*. 2014, p. 7) (see further discussion in the *Current Range Distribution* section), the Service elected to evaluate population trends both inside and outside of the Core area. The annual population trend in the Core area (both U.S. and Canada) from 2003-2012 was -1.61 (CI -5.7 to 3.6) (Figure 4) (Sauer *in litt*. 2014a, excel spreadsheet). While the mean estimate is negative, note that the credible intervals encompass zero. When the credible intervals include zero, this indicates that there is no strong trend in any direction and suggests a stable population that cannot reliably be predicted to either increase or decrease in the foreseeable future. Therefore, we cannot determine with any certainty whether the trend in the Core area is increasing, decreasing, or stable. By contrast, outside of the Core area, the trend shows a downward trend for the same period in both the overall estimate and in the credible intervals; -9.84 (-14.11 to -5.67) (Sauer *in litt*. 2014a, excel spreadsheet). As stated above, 75 percent of the population is concentrated in approximately 29 percent of the range.

To determine how these trends might affect the species distribution and abundance into the foreseeable future, we evaluated the change in abundance both inside and outside of the Core area using the most recent trend reported above. The Service estimates that 675,000 individuals currently breed in the Core area (75 percent of 900,000). Therefore, if the most recent ten-year trend continues in the Core area (-1.61 [CI -5.7 to 3.6]), there would be an estimated 356,000 (CI 65,000 to 2,800,000) individuals remaining in 2054 within the Core area. Outside of the Core area, where an estimated 225,000 individuals currently reside (25 percent of 900,000), the projected estimate for 2054 is 3,600 (CI 500 to 22,000) with the steeper decline outside of the Core area -9.84 (-14.11 to -5.67) (Sauer in litt. 2014a, excel spreadsheet). Assuming the vital rates and the species response to existing threats remains unchanged from current conditions, the reasonable worse-case response of the species indicates the area of occupancy associated with the current distribution of the species would be expected to exhibit a strong decrease, largely due to the expected decline in abundance of the species in non-core breeding habitat. In total, the species would have a population size of 356,000 individuals (CI 65,000 to 2,800,000) in the year 2054.

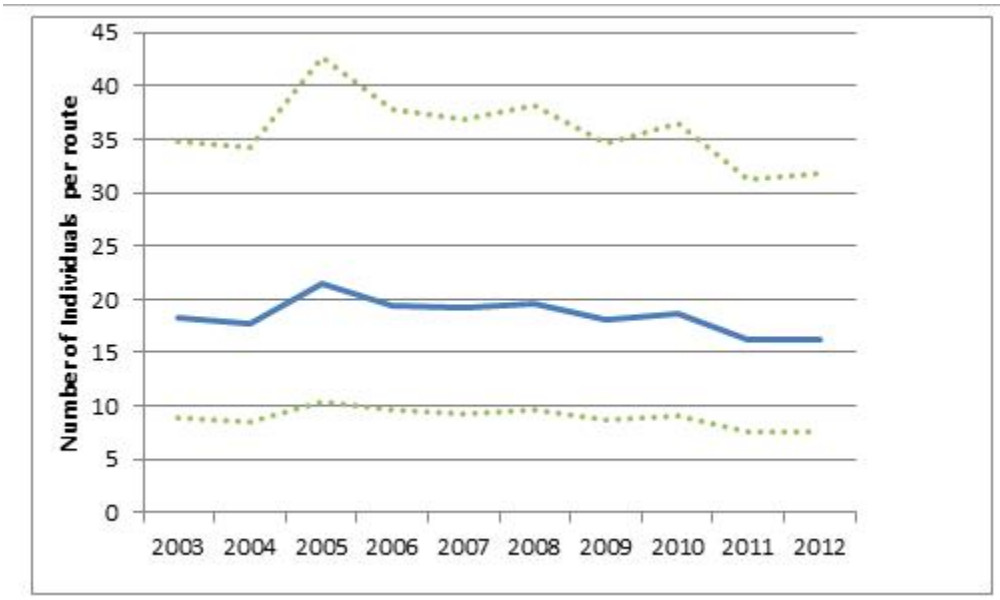


Figure 4: The Sprague's pipit population trend from 2003 through 2012 in the Core area (U.S. and Canada

breeding range) from the BBS analysis. Note that while the mean trend estimate is -1.61 (solid line), the credible intervals encompass zero (-5.7 to 3.6) (dotted lines).

The Christmas Bird Count (CBC) is a long-term survey effort performed in the few weeks around Christmas in which observers attempt to count all birds observed in 15 mile count circles (Dunn *et al*. 2005, p. 338). For this analysis, count circles from 1966 through 2013 were used. The CBC data is long-term and widespread, making it a valuable source of data (Dunn *et al*. 2005, p. 1). However, the CBC has some limitations in design, reducing the ability to perform rigorous statistics (Dunn *et al*. 2005, entire). Locations are non-random, and they are generally surveyed by volunteers with variable birding experience (Dunn *et al*. 2005, pp. 1-2). This can be problematic for observing relatively nondescript, secretive species like the Sprague's pipit, which are difficult to observe and are easily misidentified. Data from the CBC in the U.S. show an uncertain to stable trend for the Sprague's pipit from both the period of the survey from 1966-2013 (-0.49; CI -2.16 to 0.9) and for the past ten years from 2003-2012 (0.59; CI -2.88 to 4.04) (Soykan *in litt*. 2014, excel spreadsheet). Note that the previous analysis for the period from 1966 through 2010 showed a declining trend (-4.2; CI -2.6 to -6.0) (Niven *in litt*. 2012, entire), so the population trend may have stabilized in recent years.

While we acknowledge that both the BBS and the CBC have limitations in their design and implementation (the large number of unsurveyed BBS routes in the Core area of the U.S. portion of the breeding range and the non-random location selection and potential observer inexperience with the CBC), we conclude that these efforts provide reliable information about population trends because of their wide-spread nature and long-term datasets. Even though the surveys take place in different parts of the species range (breeding and wintering) and use different methodologies, both the BBS and CBC analyses independently come to a similar conclusion that the long-term population decline has ceased and the population shows no clear trend either increasing or decreasing.

Distinct Population Segment(DPS):

We have determined that the entire species is warranted for listing under the ESA as threatened or endangered, but that listing has been precluded by higher priorities, so no DPS analysis is necessary.

Threats

A. The present or threatened destruction, modification, or curtailment of its habitat or range:

Grassland Conversion on the Breeding Grounds

Approximately 25 to 30 percent of prairie habitat in the Great Plains and Canada remains from pre-colonial times (Gauthier and Wiken 2005, p. 343; Samson *et al*. 2004, p. 7). Land conversion is ongoing as native prairie is converted to agricultural uses (Hoekstra *et al*. 2005, p. 25; Stephens *et al*. 2008, pp. 1326-1327). Conversion of native prairie to cropland continues, particularly in the Northern Plains of Montana, North Dakota, and South Dakota (Government Accountability Office 2007, pp. 4, 12, 15). A number of factors encourage farmers to convert native prairie, including; higher crop prices, especially for corn; farm payment programs that increase expected cropland profitability without increasing risk; the advent of herbicide-ready crops; and no-till farming methods, which allow farmers to plant directly into native prairie (Government Accountability Office 2007, pp. 4). One study estimated that there was an approximately 3.2 percent loss of native grassland in the Missouri River coteau (a large plateau along the eastern and northern side of the Missouri River) in North Dakota and South Dakota during an 11-year period from 1992 to 2002 (Stephens *et al*. 2008, pp. 1322, 1325). However, this number cannot be reliably extrapolated across the range because a number of factors including climate, soil suitability, precipitation, land ownership, and growing season, among others, make conversion less likely in north-central Montana and much of the Canadian portion of the Sprague's pipit range (Lipsey *in litt*. 2014b, p. 1; Lipsey *et al*. 2014, p. 5). While conversion is ongoing, the

best available information indicates that most conversion will occur outside of the Core area for Sprague's pipit (Lipsey *et al*. 2014, pp. 12-14). The highest risk of cropland conversion is near areas that are already extensively cropped and where there are already few Sprague's pipits: along the Missouri River coteau and in the wheat producing regions of southwest North Dakota and northern Montana (Rashford *et al*. 2013, pp. 14-16; Lipsey *et al*. 2014, pp. 10-13).

Lipsey *et al*. 2014 (entire) developed a model to evaluate the risk of habitat conversion to cropland in the U.S. portion of the Sprague's pipit breeding range (a similar evaluation is underway for the Canadian portion of the range, but results are not yet available). The model evaluated a number of factors to determine likelihood of conversion on the remaining grassland areas. Factors included in the analysis were: risk of drought, annual precipitation (both snowfall and rain), summer precipitation, frost-free days, annual temperature, land ownership, and federal, state, and conservation easements held by non-profit entities (Lipsey *in litt.* 2014b, p. 1; Lipsey *et al*. 2014, p. 5). Three scenarios were evaluated that spanned the reasonable future potential risk of conversion within the Sprague's pipit range. Under the Background Growth scenario, the best 2 percent of habitat would be converted. Under the Constrained Growth scenario, the best 30 percent of habitat would be converted, and for unconstrained growth scenario, the best 70 percent of habitat would be converted. The map of which areas were predicted to be converted under the various conversion scenarios were then overlaid with the model results of where the Sprague's pipit population is concentrated to predict how the various conversion scenarios would impact the Sprague's pipit population. Table 3 shows the three conversion scenarios considered and the resulting effects that the model predicts would occur on the amount of cropland and on the Sprague's pipit population.

In February of 2014, the Service invited a number of Sprague's pipit experts to an expert elicitation meeting to facilitate information exchange and elicit individual expert opinion on issues regarding the species biological status. We did not seek consensus among experts. Instead, we focused on fully probing and understanding the basis for, and extent of, differences of opinion or interpretation. Discussions focused on scientific and technical information; experts were not asked to provide, nor did they voluntarily discuss or recommend, management decisions related to the ESA. The information gathered and analyses conducted during the expert elicitation meeting was considered along with the published literature and other information in our records to inform our decision. At the meeting, results of the model predicting habitat loss on the U.S. breeding grounds were presented under various conversion scenarios (Table 3, Figure 5) (USFWS 2014, Appendix E, pp. 11-13).

Table 3: Three conversion risk models of the Sprague's pipit U.S. Breeding range. These models predict the population effects of these levels of conversion on the Sprague's pipit.

Scenario	**Tillage Risk Cutoff**	**Tillage Risk Cutoff**	**Predicted Population Loss**
Background Growth	0.98	1.2 million	~1-2%
Constrained Growth	0.7	1.2 million	~10-15%
Unconstrained Growth	0.3	30.9 million	~30%

Source: Lipsey *et al*. 2014, p. 14

The Service concludes that the Constrained Growth scenario (Figure 5) is the best approximation of the future for the following reasons. With the availability of crop insurance, increased crop prices, market demand, and tile drainage, areas that have been unsuitable for cropping will become more likely to be converted to row-crop agriculture (Government Accountability Office 2007, pp. 4-5; Classen *et al*. 2011, pp.

i, 1). Even so, factors such as soil quality, dry conditions, cooler temperatures, and relatively short growing season are likely to limit row-crop agriculture in north-central Montana. Therefore, the Constrained Growth scenario, which predicts a mid-level amount of conversion, most likely represents a reasonable future scenario. As shown in Table 3, the model predicts a 10-15 percent population loss under the Constrained Growth scenario. The current Sprague's pipit population is conservatively estimated to be 900,000 individuals (see discussion in the Population Estimates/Trend section), with approximately 170,000 individuals in the U.S. (Partners in Flight 2013, p. 11). Therefore, a loss of 10-15 percent of the population would result in approximately 145,000 to 153,000 individuals remaining in the U.S. portion of the range after the most vulnerable 30 percent of prairie in the U.S. range has been converted.

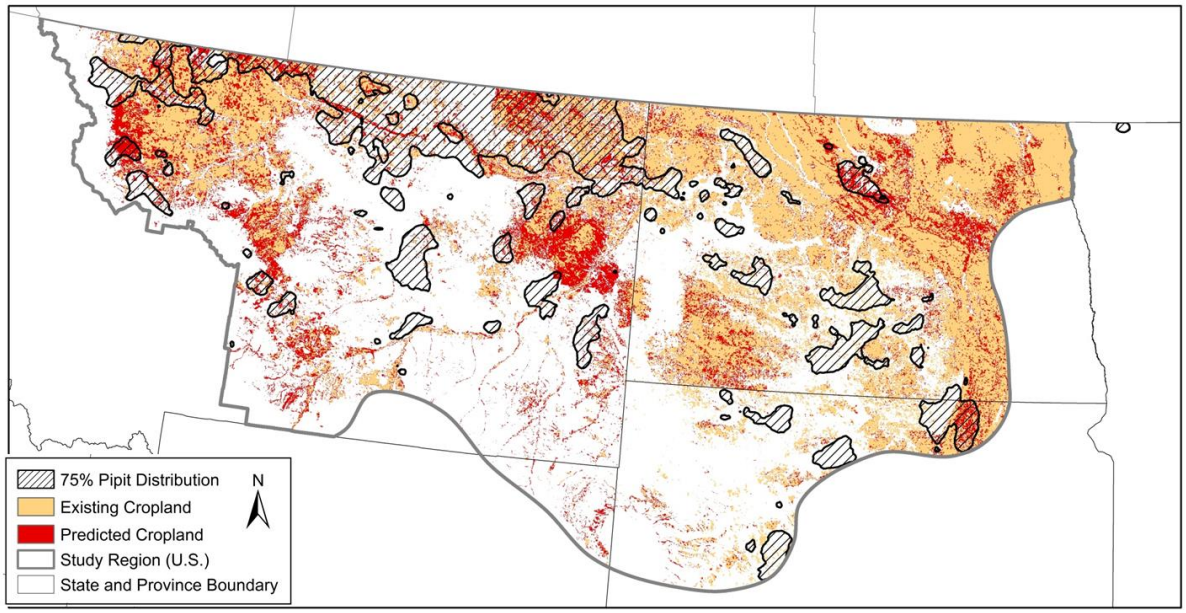


Figure 5: The Sprague's pipit range showing the Core area (hatched) and the predicted conversion to cropland (red) under the Constrained Growth scenario, which we consider the most likely to occur. Under this scenario, the model predicts a 10 to 15 percent decline in the U.S. population.

The model does not include a time element. It predicts how much grassland would likely be converted and in what areas, but not when. Stephens *et al*. (2008, p. 1325) estimated that there was a 3.2 percent conversion of prairie to cropland along the Missouri River coteau in North and South Dakota during the 11-year period from 1992 through 2002, or approximately a 0.3 percent annualized rate. Assuming that this conversion rate is similar to the future conversion rate throughout the Sprague's pipit Core area, it would take approximately 97 years for the conversion predicted in the Constrained Growth model to occur. However, for the reasons discussed above, the conversion rate in the Missouri Coteau region is probably higher than the conversion risk in north-central Montana that has much more Sprague's pipit Core area habitat. Therefore, even though we anticipate continued grassland conversion in parts of the Sprague's pipit breeding range, it is likely to be at a much lower rate than modeled here (i.e. the ending population would be higher) and is unlikely to be at a scale that would threaten the species.

In Canada, an estimated 25 to 30 percent of native grassland remains, although much of that is fragmented or otherwise unsuitable for Sprague's pipit nesting (Gauthier and Wiken 2005, pp. 343, 348; Dale *in litt*. 2010, entire; Roch and Jaeger 2014, pp. 1, 11-14). Approximately 94 percent of the species range has been lost in Canada (Dale *in litt*. 2010, entire). Of the approximately 20 million ha (49.4 million ac) remaining as grassland in the Sprague's pipits range in Canada, 15 to 20 percent (3 to 4 million ha (7.4 to 9.9 million ac)) remains in patches large enough to support breeding territories (Dale *in litt*. 2010).

While prairie conversion is still occurring, modelling of the conversion risk in the U.S. suggests it will only impact an estimated 10-15 percent of the U.S. population, leaving 145,000 to 153,000 individuals in the U.S.

after the most at-risk 30 percent of the remaining grassland is converted. Because the habitat in the Canadian portion of the range is drier and cooler, conversion risk may be lower, and thus impact less of the approximately 80 percent of the population that breeds in Canada. Evaluating a reasonable worst-case-scenario, if future conversion impacts 10-15 percent of the Canadian population as well, the remaining total population would be 765,500 to 810,000 individuals.

Grazing on the Breeding Grounds

Grazing is a major influence in maintaining the prairie ecosystem. An appropriate level of grazing can help to maintain the prairie habitat, while too much or too little may make the habitat unsuitable for Sprague's pipits (Dechant *et al*. 1998, pp. 2-5). However, Sprague's pipits avoid idle areas with deep litter (Prescott 1997, p. 1). Much of the prairie is now grazed more uniformly than it was in pre-colonial times and in some areas may be overgrazed (Sliwinski 2011, p. 21; Walker *et al*. 1981, p. 473), leading to a decline in species diversity and an increase in woody structure (since cattle do not eat woody vegetation, it has a competitive advantage over grass if some other mechanism is not used to remove trees and shrubs) (Walker *et al*. 1981, pp. 478-481; Towne *et al*. 2005, pp. 1550-1558). While improperly timed or overly heavy or light grazing negatively impacts Sprague's pipits ability to use an area, prairie is a disturbance-dependent habitat, and grazing is an effective management method. Some areas are undoubtedly grazed at an intensity incompatible with Sprague's pipit (USFWS 2014, pp. 4-5), but this appears to be a local rather than a rangewide problem, and overgrazed areas recover quickly with sufficient moisture (USFWS 2014, pp. 4-5). There is insufficient information to conclude the change in the grazing regime since European settlement throughout much of the range impacts the Sprague's pipit, but from the available information, we conclude that grazing on the breeding grounds is not a threat to the species. More impactful to Sprague's pipit are those circumstances where ranching/grazing lands are converted to cropland.

Fire Suppression

Like grazing, fire is a major driver on the prairie ecosystem. While there are still some controlled and wild prairie burns, fire is no longer a widespread regular phenomenon as it was in pre-colonial times. Fire suppression has allowed suites of plants, especially woody species and non-natives, to flourish (Knopf 1994, p. 251; Samson *et al*. 1998, p. 438). Fire suppression since European settlement throughout the Sprague's pipits range has impacted the composition and structure of native prairie, favoring the incursion of trees and shrubs in areas that were previously grassland on both the breeding and wintering grounds (Knopf 1994, p. 251; Pool *et al*. 2012a, p. 52). This change in structure negatively impacts Sprague's pipits, which avoid trees and are negatively associated with shrub cover throughout the range (Desmond *et al*. 2005, p. 442; Grant *et al* . 2004; p. 812; Sutter 1997, p. 464).

Eliminating fire from the landscape has likely changed the overall composition of the prairie (Towne *et al*. 2005, pp. 1557-1558). Trees and shrubs can be controlled to some extent through grazing or eliminated by regular mowing, although these management practices may result in selection for yet another suite of grassland plant species (Owens and Myres 1973, pp. 700-701). Some form of disturbance is necessary to maintain the grassland ecosystem, and grazing and mowing are generally used today instead of fire. While the lack of widespread fires as a management technique has led to changes in the grassland ecosystem, other methods of habitat maintenance are substituting for the role that fire historically played, albeit other management techniques may result in a different suite of grassland species (Sampson *et al*. 1998, p. 444; Valone and Kelt 1999, pp. 15, 18-26). While returning the pre-colonial fire frequency and intensity would likely benefit the Sprague's pipit, especially by removing trees and shrubs, grazing and mowing also maintain native prairie habitat, so fire suppression does not represent a threat to the species.

Mowing

Like grazing and fire, mowing is a management technique that can be used as a source of disturbance to prevent woody species from invading into grassland habitat. However, mowing (i.e., haying) in the breeding range could negatively impact Sprague's pipits by directly destroying nests, eggs, nestlings, and young fledglings, and by reducing the amount of nesting habitat available in the short term. Nest success of ground-nesting birds is already low, with an estimated 70 percent of nests destroyed by predators (Davis

2003, p. 119). While Sprague's pipits occasionally will renest if the first nest fails or if nestlings from the first clutch fledge early enough in the season, long intervals between nesting attempts suggest that renesting is relatively uncommon (Sutter *et al*. 1996, p. 694). Thus, early mowing can negatively impact reproductive success for the year. Even mowing done later in the season after chicks have fledged may impact the availability of breeding habitat the following year because Sprague's pipits will not use areas with short grass until later in the season when the grass has grown, possibly due to dense revegetation and the lack of litter (Dechant *et al*. 1998, p. 3; Owens and Myres 1973, p. 708; Kantrud 1981, p. 414). On the other hand, as noted above, mowing can improve Sprague's pipit habitat in the long term by removing trees and shrubs and maintaining prairie habitat (Owens and Myres 1973, p. 700).

The information available about the extent, timing, and frequency of mowing throughout the species range is insufficient to conclude that mowing poses a threat to the species. Since mowing can play both a positive and negative role in the maintenance of Sprague's pipit habitat, the impacts of mowing are mixed. In some parts of the range where large portions of the remaining grasslands are mowed annually or grass growth is slow or both, mowing may be negatively impacting the population, but this management technique is likely local rather than regional in scale. From the available information, we conclude that mowing is not a threat to the species.

Energy Development

Oil and Gas

At the time of the 12-month finding in 2010, the available information suggested that oil and gas development was impacting a large percentage of the breeding birds and that Sprague's pipits showed a large and consistent avoidance of oil and gas development, including associated roads (see Roads section for a discussion of species response to roads). Since that time, we received new information on the distribution of the Sprague's pipit, allowing us to focus our analysis on the portion of the range that supports the majority of the population, as well as new information regarding the potential effects of oil and gas development on the Sprague's pipit as discussed below.

Much of the oil and gas development in the U.S. breeding range has occurred in northwestern North Dakota and northeastern Montana, while the U.S. portion of the population is centered in north-central Montana as shown in Figure 1. Therefore, the impacts from the Bakken oil field development are somewhat limited in scope. Energy development is occurring in Canada, but research has suggested that the birds may show less avoidance than previous studies suggested as described below.

New information collected since our 12-month finding in 2010 indicates that the response of Sprague's pipits to oil and gas development and associated infrastructure varies based upon the type of feature and location across the range (Hamilton 2010, pp. 4, 35; Sliwinski and Koper 2010, p. 7; Hamilton *et al*. 2011, p. 1; Kalyn Bogard 2011, pp, 24, 26; Jones *in litt*. 2013, entire; Jones and White 2012, pp. 310-311; Thompson *et al*. 2013, p. 1; USFWS 2014, Appendix J, pp. 16-20). In Alberta, Sprague's pipit abundance decreased as well density increased from 4 to 8 or 16 wells per square mile (1 mi^2 equals 2.59 km^2) (Dale *et al*. 2009, pp. 194, 200; Hamilton 2010, p. 35; Hamilton *et al*. 2011, p. 9). Other studies have shown decreased use within 75-300 m (246-984 ft) of a traditional oil well (USFWS 2014, Appendix J, p. 18; Linnen 2008, pp. 1, 10; Thompson *et al*. 2013, pp. 1, 6-7). However, Sprague's pipits were not affected by natural gas wells in Saskatchewan (Kalyn Bogard and Davis 2014, p. 479). Natural gas wells have a much smaller footprint than oil wells, and because gas is typically transported via pipeline, the nearby roads have less traffic, so overall disturbance is much lower (ND Pipeline Authority 2014, pp 1-3). Where avoidance is observed, it may be a response to other factors associated with the oil and gas development such as a change in vegetation near the well site, roads, development configuration, industrial noise, vehicular traffic, context within the landscape, presence of drilling infrastructure, or regional variation in population (Kalyn Bogard and Davis 2014, p. 479).

The variation in species response observed between studies may represent the disturbance associated with the different types of facilities common in different parts of the range, rather than avoidance of the oil and/or gas

feature itself. For example, new oil wells have a much larger pad, often accommodating multiple wells and higher traffic associated with them than older oil pads or shallow-gas extraction wells. While each well may create more disturbance, siting multiple wells onto a single pad can result in larger spacing between wells, lowering fragmentation and overall impacts (BIA 2014, p.3).

In North Dakota, the number of drilling rigs has increased dramatically in recent years, from 39 rigs in 2006 to an average of 185 in 2012 (North Dakota Petroleum Council 2013, p. 1). The number of rigs is a good indicator of the number of wells drilled (North Dakota Petroleum Council 2013, p. 1). This upward trend is expected to continue. The North Dakota Department of Mineral Resources estimates that an average of 2,000 wells will be constructed annually in North Dakota for the next 20 years, with up to 70,000 wells constructed total (Department of Mineral Resources 2014, p. 18). In Montana, the amount of oil and gas produced has remained fairly stable with only minor fluctuations since 1986 (DrillingEdge 2014, p. 2). Much of the oil activity is occurring in areas of native prairie (Loesch 2010, pers. comm), a trend that we expect to continue given the amount of native prairie overlaying the Bakken formation, an area of high oil and gas potential in western North Dakota, eastern Montana, and southern Alberta and Saskatchewan (Chelsey-Preston 2013b, entire).

Drilling a well requires an estimated 1,360 truck trips over 80 days (50 trucks per day) (BIA 2014, p. 15). Once the well is in production, the amount of truck traffic drops considerably, with only 0.5 to 3 trucks per day if the oil is transported by truck, and less than that if the oil is piped (North Dakota Department of Mineral Resources 2014, p. 7). Thus, traffic decreases somewhat once the wells in an area are complete, especially if pipelines are constructed. If Sprague's pipits do show avoidance of busy roads, then their avoidance of areas with oil and gas development should decrease as the field matures.

However, when oil production drops at a particular well, companies perform a workover, during which they re-frack the well to increase production. Wells are worked over every one-to-two years, in a process that takes from three to ten days (BIA 2014, p. B14). We assume that the amount of traffic associated with a workover is similar to initial construction, so during a workover, each well has approximately 50 truck trips a day. With many wells on each pad or in each lease (oil companies typically lease an area in which they have the right to drill), the workovers may be more-or-less continuous in an area. If traffic causes avoidance behavior in Sprague's pipits, the effect of oil and gas extraction is likely to continue for the life of the field, estimated at least 40 years; 20 years to complete drilling, and at least 20 years of production (North Dakota Department of Mineral Resources 2014, p. 11).

The Bakken formation lies entirely within the U.S. and Canadian breeding range in northeastern Montana, much of western North Dakota, southeastern Alberta, southern Saskatchewan, and the southwest corner of Manitoba. The Williston formation overlies much of the range in eastern Montana, western North Dakota, northeastern South Dakota, much of southern Saskatchewan, and the southwest corner of Manitoba (Chelsey-Preston 2013a, p. 3; Chelsey-Preston 2013b, p. 4; Sauer *et al*. 2008, pp. 17-19; Robbins and Dale 1999, p. 5; USGS 2008, p. 1). We estimate that each well pad directly impacts approximately 1.1 ha (2.75 acres), and requires approximately 472 m (1,549 ft) of new road, which is approximately 20 m (66 ft) wide (Loesch 2010, pers. comm). Therefore, approximately 2 ha (5 ac) of habitat is directly impacted by each well and associated road (Loesch 2010, pers. comm.). As discussed above, Sprague's pipits may avoid oil wells, staying from 75 to 350 meters (m) (246 to 1148 ft) away, magnifying the effect of the well feature itself (Linnen 2008, pp. 1, 9-11; Thompson et al. 2013, pp. 1, 6-7; USFWS 2014, Appendix J, p. 18). If we include the avoidance distance, each well and associated road can impact from 9 to 71 ha (22 to 175 ac). In 2010, there were 1,421 wells drilled within the Sprague's pipit U.S. breeding range. Of these we estimated that approximately 570 were on potentially suitable habitat, potentially impacting up to approximately 4,900 to 40,000 ha (12,500 to 100,000 ac), including the area avoided if each well had its own well pad rather than being clumped (Loesch 2010, pers. comm.). Additionally, as discussed in the Current Range Distribution section, the Sprague's pipit population is concentrated in north-central Montana, southern Alberta, and southern Saskatchewan, so the ongoing oil development in western North Dakota does not impact most of the breeding population.

Depending on the degree of avoidance Spragues pipits show to these features, oil and gas development could result in a reduction of use across the south-eastern portion of the range. However, Spragues pipits show variable avoidance of different features across the range and to date, most of the oil and gas development in the U.S. has been outside of the Core area where the population is concentrated. While oil and gas development is expected to impact the population, the impacts are not anticipated to impact most of the population; therefore, we do not foresee oil and gas development resulting in future declines larger than those factored into our existing model predicting decline as a result of habitat conversion.

From the available information, we conclude that oil and gas development is not a threat to the species. Spragues pipits show a more variable response to oil and gas development than the available information indicated at the time we completed the 12-month finding, making the overall impact less than previously believed. Where avoidance does occur, the species may be avoiding the disturbance associated with construction rather than the feature itself, so avoidance can be expected to decline to some degree as the construction phase of oil and gas development is complete. Additionally, new information shows that the Spragues pipit has a clumped distribution, with the majority of the population centered west of the Bakken oil field in North Dakota and north eastern Montana, and thus not exposed to that development activity.

Wind

There is very little information specific to Spragues pipit regarding their response to wind turbines. One study in Texas found no avoidance of wind turbines by Spragues pipits on wintering grounds (Stephens 2011, p. 27). On the breeding grounds, we could not find any studies that included the Spragues pipit, but there is information that wind farms adversely affect some grassland bird species, while others show no avoidance (Casey 2005, p. 4; Manville 2009, p. 1; Shaffer and Johnson 2008, p. 51). Spragues pipits avoid trees at the territory scale, although they will nest with some trees at the landscape scale (defined as a 500 m radius or approximately 160 ac) (Winter undated, pp. 6, 8; Grant *et al*. 2004, pp. 810, 812), so it is not clear whether or not they would avoid tall, structures like wind turbines. With their high flight display (Robbins 1998, pp. 435-436), Spragues pipits that form territories near wind turbines may be at risk of collision. However, Spragues pipits avoid trees at the territory scale (Grant *et al*. 2004, p. 812), so they may avoid nesting or displaying near turbines, reducing their risk of a direct turbine strike.

Major wind development could occur in the remaining suitable Spragues pipit habitat because the entire U.S. range of the Spragues pipit is within an area with high potential for wind development (Pacific Northwest Laboratory 1991, p. 1; U.S. Department of Energy 2010, p. 1). Wind energy development has increased rapidly since the early 2000s, from an estimated 4,147 MegaWatts (MW) in 2001 to 61,327 MW at the end of the first quarter of 2014 (AWEA 2014, pp. 1-2). Wind development is also increasing throughout the Canadian range of the Spragues pipit (Canadian Wind Energy Association 2010, entire; Canadian Environmental Assessment Agency Canadian Environmental Assessment Registry 2010, entire). Like oil development, wind projects built in native grassland fragment the habitat with turbines, towers, roads, transmission infrastructure, and associated facilities. Approximately 88 percent of Core area is in the fair or higher class of potential wind development (Juliusson *in litt*. 2014, excel spreadsheet).

Thirty-three States and the District of Columbia have requirements or voluntary goals for renewable energy to make up a percentage of their energy needs, including North Dakota, South Dakota, Minnesota, and Montana (U.S. Department of Energy 2009, entire). Mandates for green energy in States without Spragues pipits are likely to fuel increases in wind development in the Spragues pipits range (e.g. Great River Energy 2010, p. 1). We anticipate the number of turbines throughout the Spragues pipit range to continue to increase. The location of future wind farms will determine whether wind development ultimately impacts the Spragues pipit population. Impacts to habitat and nesting birds could be high if wind development occurs in the Core part of the range in northcentral Montana, Alberta, and Saskatchewan. Therefore, we anticipate that most of the development will occur in the eastern part of the range, which is nearer the large Minnesota market in an area with existing transmission lines. If most of the development occurs in the eastern part of the range, the impacts on the Spragues pipit population should be minimal, especially since much of the eastern part of the range has already been converted from native prairie.

While the potential for wind development throughout the Sprague's pipit range is high, to date, actual construction has been limited. Through 2011, only 957 wind turbines were documented within the Sprague's pipit range, many of them in crop fields where impacts to the species would not be expected (Federal Aviation Association [FAA] 2009; FAA Obstruction Evaluation 2012, p. 1; Loesch, pers. comm. 2010).

In conclusion, wind energy development has the potential to impact Sprague's pipit habitat, especially on the breeding grounds, but how Sprague's pipits respond to wind development is not known. Even if we assume that the Sprague's pipit would be negatively impacted by wind development, to date, the amount of wind development within the range has been relatively low. We do not have information regarding where and how likely wind development would occur throughout the range. If development occurs outside of the areas where the population is concentrated, or if it occurs primarily in cropland, the impacts on the species would be limited. If wind development occurs in native prairie that Sprague's pipits use, it may impact the local population, if they avoid the area surrounding the turbines or by strike risk. However, at this time we do not have sufficient information to determine that wind energy is a threat to the species.

Roads

The literature is mixed regarding Sprague's pipits response to roads on the breeding grounds, with some studies suggesting that they avoid roads, and others finding no avoidance (Linnen 2008, pp. 1, 9-11; Dale *et al*. 2009, p. 200, Koper et al. 2009, p. 1287; Jones and White 2012, pp. 311, 313-315). One study found that of 46 mapped Sprague's pipit territories, only 5 (11 percent) crossed a trail or pipeline (*in* Dale *et al*. 2009, p. 200). However, other studies found that Sprague's pipits avoid roads but not trails, presumably because of the difference in structure in the road right-of-way (Sutter *et al*. 2000, p. 110), and some studies did not document avoidance of roads at all (Koper *et al*. 2009, p 1287; Jones and White 2012, pp. 310-311; Sliwinski and Koper 2012, p. 7). Jones and White (2012, pp. 312-315) found no avoidance of roads and no difference in daily survival rate of nests based on their distance from roads or other linear features (trails, agricultural field, railroad, shoreline) (Jones *in litt*. 2013, p. 1). The differences in behavior observed between studies may reflect different responses across the range, or a response to aspects of the roads themselves, such as the amount of traffic, or the amount of non-native vegetation along the roadway (Dale *et al*. 2009, p. 200; Jones and White 2012, p. 314).

Roadside edges are often planted with non-native species, which Sprague's pipits avoid (Dale *et al*. 2009, pp. 195, 200; Davis *et al*. 1999, p. 393). Exotics have a tendency to spread into nearby prairie, and vehicles also transport invasive species, increasing the footprint of the disturbance (Gelbard and Belnap 2003, p. 420; Dale *et al*. 2009, p. 195; Simmers 2006, p. 7; Trombulak and Frissell 2000, p. 24). Furthermore, the dust and chemical runoff from roads allows only tolerant plant species to grow nearby, changing the plant composition even if the right-of-way is not actually disturbed and reseeded (Trombulak and Frissell 2000, p. 23). Even 20 years after reclamation, the nonnative seeds used on reclaimed roadbeds can still dominate the area (Simmers 2006, p. 24). These nonnative species spread into the nearby prairie, expanding the long-term impacts of road construction beyond the original footprint of the roadway (Simmers 2006, p. 24). Even if vehicles are cleaned before entering an area, they pick up nonnative seeds when visiting infested sites, and carry them to newly disturbed areas, transporting nonnative species throughout the landscape (Dale *et al*. 2009, p. 195). When road avoidance is observed, it may be due to lack of suitable habitat near road edges rather than the physical road. In addition, as discussed under Factor C, roads serve as pathways for predators (Pitman *et al*. 2005, p. 1267). Thus, a secondary impact of habitat fragmentation may be an increase in predation. Predation rates on grassland birds are generally high, but the rates of predation on the Sprague's pipit are generally in line with other grassland birds (Jones and Dieni 2007, p. 122). We do not think that the predation rates on Sprague's pipits are sufficiently high to be impacting the population above background levels.

Sprague's pipits do not appear to avoid road edges in migration or on the wintering grounds (Freeman 1999, p. 51).

Oil and gas development doubles the density of roads on range lands (Naugle *et al*. 2009, pp. 11, 46). In areas with ranching, tillage agriculture, and oil and gas development, 70 percent of the land was within 100 m (109

yards (yd)), and 85 percent of the land was within 200 m (218 yd), of a human feature (Naugle *et al*. 2009, p. 11). In those areas, every square km (0.39 square miles) of land may be both bounded by a road and bisected by a powerline (Naugle *et al*. 2009, p. 11). Assuming that the same percentage of roads was on potentially suitable habitat as the oil wells themselves (see Oil and Gas section above), there would be an additional 271 km (168 miles) of new roads on potentially suitable habitat from the wells drilled in 2010. As discussed above, studies show varied findings about how much Sprague pipits avoid roads, but where road avoidance has been documented in Sprague pipits and other grassland birds, there is a decrease in density at least out to 100 m (328 ft) (Ingelfinger and Anderson 2004, pp. 385-386; Linnen 2008, p. 10; Thompson *et al*. 2013, p. 1). Therefore, in 2010, approximately 5,400 ha (13,000ac) of habitat would have reduced use due to roads and potential avoidance in the U.S., a very small percentage of the range.

The increase in roads throughout the Sprague pipits range represents a potential, albeit not well understood, threat to the species. Because every new energy feature requires at least some new road construction, the impacts of energy development on the species are closely tied to the impacts of road development. Roads can negatively affect the structure and species composition of prairies, and also make grassland habitat more accessible to predators, which may decrease Sprague pipits reproductive success. However, studies have found a mixed response to roads, so rangewide, the effects of roads on the Sprague pipit are not clear.

Where avoidance has been observed, Sprague pipits show some (not complete) avoidance (Linnen 2008, p. 9; Thompson *et al*. 2013, p. 8) up to 250 to 350 m (820 to 1148 ft). Individuals may show more avoidance of roads that are busier, or with a more pronounced habitat difference between the road ditch and the surrounding prairie. While roads may have some localized impacts on the individuals in an area, we do not anticipate that they will have a significant effect on the population because of the limited and incomplete avoidance of road features and similar nesting success in areas adjacent to and away from roadways. From the best available information, we conclude that roads are not a threat to the species.

Impacts to Migration and Wintering Habitat

As on the breeding grounds, Sprague pipits primarily use prairie habitat during the winter (Desmond *et al*. 2005, p. 442; Emlin 1972, p. 324; Levandoski *in litt*. 2014, p. 1; Ruvalcaba-Ortega *et al*. 2012, p. 40). However, they are sighted in other habitat types, especially during migration (Maher 1973, p. 20; Robbins and Dale 1999, pp. 13-14). On the wintering grounds, Sprague pipits are widely and relatively evenly distributed (Audubons Christmas Bird Count 2012, pages not available; Macias-Durarte *et al.* 2011, p. 153). Surveys have found widely varying numbers from year-to-year, suggesting that the birds move annually in response to local habitat conditions (Macias-Duarte *et al*. 2011, p. 901).

Several researchers have noted the rapid conversion rate to cropland and extremely limited area protected in the Chihuahuan desert region along the border between the United States and Mexico (Desmond *et al*. 2005; pp. 448-449; MacÃ-as-Duarte*et al*. 2009, p. 902; Manzano-Fischer *et al*. 2006, p. 3820). An estimated 7 percent of land in the Chihuahuan Desert Region (United States and Mexico), an area of approximately 45,000 ha (175 square miles), is grassland (Desmond *et al*. 2005, pp. 439, 448; New Mexico State University 2013, p. 1). We do not have information about habitat conditions east of the Chihuahuan Desert in Mexico, where a large percentage of the population may winter (Pool *et al*. 2012b, p. 64; Robbins and Dale 1999, p. 6).

There is ongoing, presumably widespread conversion to agriculture in the Chihuahuan Desert on the wintering range (Macias-Duarte *et al*. 2009, p. 902; Pool *et al*. 2014, entire). In many places where native grassland remains, a variety of factors have led to shrub encroachment, including overgrazing, elimination of prairie dogs, changes in stream flow and the water table due to irrigation, and changes in climate patterns (Desmond *et al*. 2005, p. 448; Manzano-Fischer *et al*. 2006, p. 3820; Walker *et al*. 1981, p. 493). Reversing the pattern of woody species invasion is very difficult because once established, woody species tend to be stable in the landscape (Whitford *et al*. 2001, p. 9).

Because Sprague pipits annual presence on the wintering grounds in a particular area is related to rainfall the

previous year (Dieni *et al*. 2003a, p. 31; MacÃ-as-Duarte 2009, p. 901), pipits use different parts of the range annually, with densities dependent on local conditions. Therefore, it is likely valuable for sufficient suitable habitat to be available across the wintering range so that the birds can use different regions annually depending on conditions that year. With conversion of grassland habitat on the wintering grounds, the amount of suitable habitat available to Spragues pipits is shrinking (MacÃ-as-Duarte 2009, p. 896; Manzano-Fischer *et al*. 2006, p. 3820). Even grassland that is not actively converted may become unsuitable for Spragues pipits due to widespread changes in grassland management and resulting changes in grassland structure. These changes are caused by overgrazing, shrub encroachment, and an increase in the biomass of annual grasses, among other causes (Drilling 2010, pp. 9-10; Manzano-Fischer *et al*. 2006, pp. 3819-3821; Walker *et al*. 1981, pp. 473-474).

The Spragues pipits wintering habitat has undergone widespread conversion to farmland and degradation from management changes since pre-colonial times, with conversion and degradation continuing. These changes in habitat are not reflected in the population trend, which, as discussed in the Population Estimates/Status section, no longer shows a clear decline in recent years. We recommend continued monitoring both of native prairie loss on the wintering grounds and of the Spragues pipit population as a whole to ensure that there is not a time lag between habitat loss on the wintering grounds and population response. At this time, there is a large population (900,000) remaining, which has been relatively stable (or at least has shown no clear increasing or decreasing trend) over the past ten years on both breeding and wintering ground surveys. However, in recognition of the acceleration of habitat loss on the wintering grounds, we will be assessing whether these losses represent a present and future threat to the species.

Habitat Fragmentation on the Breeding Grounds

The effect of a non-grassland feature (e.g., shrubs, trees, cropland, human-made structures) in the landscape can be much larger than its actual footprint. Spragues pipits are sensitive to patch size (i.e., the amount of contiguous native grassland available) (Davis 2004, pp. 1134, 1135-1137; Davis *et al*. 2006, pp. 812-814; Greer 2009, p. 65), and they avoid edges between grassland and a number of habitat features that are structurally different than grassland (Davis 2004, p. 1134; Koper *et al*. 2009, pp. 1287, 1293-1296). Spragues pipits have been shown to avoid wetlands, cropland, trees and shrubs, and burned or mowed areas (until the grass has grown back) (Askins *et al*. 2007, p. 21; Koper *et al*. 2009, p. 1287; Sliwinski and Koper 2012, pp. 1, 6-7, 11).

Size of the grassland patch is important, with a patch size of 145 ha (358.3 ac) (range 69 to 314 ha (170 to 776 ac)) suggested to be the minimum patch required for breeding. Singing males have not been observed in patches smaller than 29 ha (71.7 ac) (Davis 2004, p. 1134), with even larger patches preferred (Davis 2004, pp. 1134-1135, 1138; Greer 2009, p. 65). While large, intact grasslands are important, the amount of grassland within a 400 m (1,312 ft) radius may be a better predictor of Spragues pipit use than patch size (Davis *et al*. 2013).

Because Spragues pipits have been shown to avoid edges, the shape of the patch also is important (Linnen 2008, pp. 1, 9-11, 15). Grassland areas with a low edge-to-area ratio provide optimal habitat (Davis 2004, pp. 1139-1140). Thus, a linear patch may not be suitable for a Spragues pipits territory, even if it is sufficiently large. Koper *et al*. (2009, p. 1295) noted that conversion of one quarter section (64 ha (158 ac)) in the middle of a grassland patch reduced the utility of an additional 612 ha (1,512 ac) of grassland.

Spragues pipits strong preference for large, intact, grasslands on the breeding grounds and avoidance of non-prairie structures make them vulnerable to changes on the landscape that may reduce the usability of nearby prairie. However, as discussed in the previous sections, while some human-caused changes will occur within the range of the species, most of these will occur outside of the areas where most of the Spragues pipit population is concentrated. Therefore, we do not consider that habitat fragmentation on the breeding grounds is a threat to the species.

Summary of Factor A

At this time, based on the best available information, grassland conversion on the breeding grounds, and grazing, energy development, roads, and habitat fragmentation throughout the range, do not appear to threaten the Sprague's pipit. While habitat changes on the breeding grounds have resulted in a reduction in range from pre-colonial levels, there is a large remaining population at an estimated 900,000 individuals. The population trend in the Core areas where the species is concentrated is relatively stable, and even in our reasonable worst-case analysis of continued entire population decline at the rates seen from 2003-2012, after 40-years, the population would remain relatively high at approximately 356,000 individuals (CI 65,500 to 2,800,000). The species is widely distributed and mobile during winter, but grassland conversion is ongoing and apparently widespread on the wintering grounds. Despite the fact that our analysis seems to indicate that the population is no longer declining, especially in the Core areas on the breeding grounds, we will be gathering additional information to determine whether the acceleration of habitat losses on the wintering grounds is a threat to the species.

B. Overutilization for commercial, recreational, scientific, or educational purposes:

We are not aware of any commercial, recreational, or educational uses of the species. Sprague's pipit has not been extensively studied for scientific purposes (e.g., Robbins and Dale 1999, p. 1; Davis 2009, p. 265). A limited number of studies have involved close observation or handling of Sprague's pipit adults, nests, or young (e.g., Sutter *et al*. 1996, pp. 694-696; Davis 2003, pp. 119-128; Dieni and Jones 2003b, pp. 388 389; Jones *et al.* 2007, pp. 90-91; Dohms and Davis 2009, pp. 826-830). Work involving radio-transmitter attachment on Sprague's pipit nestlings found no evidence that the devices impacted survival, although the transmitter may temporarily impact the birds balance and mobility (Davis and Fischer 2009, p. 199; Fischer *et al.* 2010, pp. 1, 3-5). In any event, all studies are on a very small scale compared to the overall population size and range of the species.

Most research on Sprague's pipit relies on passive sampling (e.g., point counts) rather than active handling. The studies that involve active handling of adults, nestlings, or nests may impact the individuals involved, but are small enough in scale that they are unlikely to affect the population as a whole. Passive sampling techniques are unlikely to have negative impacts on Sprague's pipits. We do not have any evidence of risks to Sprague's pipits from overutilization for commercial, recreational, scientific, or educational purposes, and we have no reason to believe this factor will become a threat to the species in the future.

C. Disease or predation:

Disease

We are not aware of any information to indicate that disease poses a significant threat to Sprague's pipits at this time. The Intergovernmental Panel on Climate Change (IPCC) (2007, p. 51) suggests that the distribution of some disease vectors may change as a result of climate change. However, the Service currently has no information to suggest that any specific disease may become problematic to Sprague's pipit. More than 300 species of birds have been documented to be killed by West Nile virus (CDC 2009, entire), but to date there have been no documented Sprague's pipit mortalities due to West Nile.

Predation

Grassland birds have evolved with high levels of predation: predation is thought to destroy up to 70 percent of grassland bird nests (Davis 2003, p. 119). The predation rate on Sprague's pipits may be lower than other grassland bird species due to their well-concealed nests and secretive behavior (Davis 2003, pp. 124; Davis and Sealy 2000, p. 223; Jones and Dieni 2007, pp. 117-122). The species tendency to choose taller vegetation and to build covered nests with a runway is presumably at least in part an attempt to avoid being seen by predators (Sutter 1997, p. 467), although a covered nest may not reduce predation (Jones and Dieni 2007, p. 123). Predation has been documented to be the main cause of mortality of nestling and fledgling Sprague's pipits (Davis and Fisher 2009, entire), with a wide variety of predators implicated (Davis *et al*. 2012, entire).

The available evidence does not suggest that predation presents a threat to the species. It is possible that the predation risk for the Sprague's pipit may be unnaturally increased by the fragmentation of habitat discussed above under Factor A. Songbird predators tend to travel along habitat edges, avoiding prairie areas where escape is more difficult (Johnson and Temple 1990, p. 110). Birds that may nest near a habitat edge, such as a road, could experience lower nest success because they may be more likely to be parasitized by cowbirds (*Molothrus ater*) (Davis 1994, p. i) and because roads may serve as travel routes for predators (Pitman *et al*. 2005, p. 1267). Despite these theoretical possibilities, Sprague's pipits have evolved with a number of grassland predators, and we have no indication that predation rates have increased due to anthropomorphic or other factors. The Sprague's pipits preference for larger patches of unfragmented prairie may reduce their susceptibility to predation.

Cowbird Parasitism

Cowbird parasitism leads to Sprague's pipit nest failures, because the cowbirds may remove or damage host eggs and cowbird young out-compete the hosts for resources (Davis 2003, pp. 119, 127). Both nest predation and cowbird parasitism generally are higher in small remnant grassland plots near habitat edges (Johnson and Temple 1990, pp. 106, 108; Davis 1994, p. i; Davis and Sealy 2000, p. 226). A study in Manitoba, Canada found no cowbird parasitism on Sprague's pipit nests on two 64 ha (158 ac) sites, while five nests were parasitized in a 22 ha (54 ac) site (Davis and Sealy 2000, p. 221), reinforcing the theory that nests in small grassland patches are more likely to be parasitized than those in larger patches. As with predation, the continued loss and fragmentation of native grassland (see discussion under Factor A) means that the remaining habitat is more fragmented, likely leading to increased levels of cowbird parasitism and predation. However, the Sprague's pipits preference for larger tracts of grassland, when these are available, likely reduces their susceptibility to cowbird predation (Jones *et al*. 2010, p. 462).

Summary of Factor C
We have no information regarding disease impacts on the Sprague's pipit. There have been no documented large die-offs, so at this time we conclude that disease is not a threat to the species now and is not likely to become so in the future. Predation is generally high for grassland birds, and we assume that the Sprague's pipit also experiences high levels of predation, especially at the nest and juvenile stage. However, the Sprague's pipits secretive behavior at the nest and preference for large patches of prairie may decrease their likelihood of predation to some extent. Similarly, while cowbirds have been documented to parasitize Sprague's pipit nests (Davis and Sealy 2000, p. 226; Jones *et al*. 2010, p. 462), their preference for large habitat patches away from trees and shrubs may limit their susceptibility to parasitism. At this time, based on the available information we conclude that disease or predation is a not threat to the species now and is not likely to become so in the future.

D. The inadequacy of existing regulatory mechanisms:

In Canada, Sprague's pipits are listed as threatened under the Species at Risk Act (COSEWIC 2010, p. V). This designation provides some protection on Crown, or federal lands, although only approximately six percent of the range is on federal land (Table 1). As in the U.S., the Sprague's pipit is protected as a migratory bird under the Migratory Bird Treaty Act (16 U.S.C. 703 *et seq*.) in both Canada and Mexico. The Migratory Bird Treaty Act protects the Sprague's pipit from direct take, but it does not protect habitat from conversion.

As discussed under Factor A, habitat in both the breeding and wintering range is being converted and fragmented to some extent. While most of the States in the Sprague's pipits range have identified the Sprague's pipit as a species of conservation concern, this designation only protects the bird, it does not result in protection of remaining habitat. However, as discussed in the *Habitat Conversion* section of Factor A, most conversion on the breeding grounds is likely to occur outside of the Core part of the range where most of the species breeds. Therefore, we have determined that the lack of regulatory mechanisms protecting native grassland on the breeding grounds is not a threat to the species at this time.

Sprague's pipits nest on federal public land administered by the Bureau of Land Management (BLM), which is subject to the Federal Land Policy and Management Act (FLPMA) (Pub.L. 94579), a law that requires the BLM to manage land for multiple use, including protecting and preserving land for fish and wildlife resources (Bureau of Land Management 2011, p. 1). Under FLPMA, the BLM is required to develop resource management plans (RMPs) to ensure compliance with FLPMA (Bureau of Land Management 2011, p. 1). BLM lands in the Sprague's pipit range are generally managed for grazing, which is compatible with nesting activities.

National Wildlife Refuges in North Dakota, South Dakota, and Montana developed a guidance document for refuge lands (USFWS 2011, entire). This document identifies the key areas that support the Sprague's pipit and describes the management approach that the Service will take to actively manage prairie habitat to benefit Sprague's pipit in the long term. There are approximately 304,000 ha (751,000 ac) of grassland in perpetual easement within the Sprague's pipit range (Loesch *in litt*. 2014, p. 1). These acres are in private ownership, but are protected from conversion, and activities such as mowing, haying, and grass seed harvesting must be delayed until after July 15 of each year (USFWS 2010, p.1). These protections would benefit the Sprague's pipit by keeping the land in grass, and ensuring that most nests are protected from impacts associated with cutting the grass.

Other than some limited protected areas, we are not aware of any regulatory mechanisms protecting Sprague's pipits habitat in Mexico. A large portion of the wintering range is in Mexico, and the literature suggests that habitat is rapidly being converted without regulatory oversight (Desmond et al. 2005, pp. 448-449; MacÃ-as-Duarte*et al*. 2009, p. 902; Manzano-Fischer *et al*. 2006, p. 3820; Pool 2014, entire). While the population has been relatively stable for the past ten years, there may be a lag period between conversion and population response. In recognition of the accelerated losses of habitat in the wintering grounds, we will be assessing whether these losses constitute a threat to the species now or in the future.

E. Other natural or manmade factors affecting its continued existence:

Climate change

Our analyses under the Endangered Species Act include consideration of ongoing and projected changes in climate. The terms climate and climate change are defined by the Intergovernmental Panel on Climate Change (IPCC). Climate refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term climate change thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 814, 1819). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

The temperature throughout the Great Plains (an area extending from North Dakota and Montana south to Texas) and Prairie Pothole region has increased significantly over the 20th century (Millett *et al*. 2006 p. 243; Kunkel *et al*. 2013, p. 22). Climate models predict that the Great Plains temperatures will continue to increase relatively uniformly across the region, except in Coastal Texas, where the temperature increase is projected to be smaller (Kunkel *et al*. 2013, p. 36). The models predict a slight increase in precipitation in the northern part of the region, and a slight decrease in the southern portion, but at least through 2035, the changes will be less than current annual variation (Kunkel *et al*. 2013, pp. 53-54). However, by 2085, the models predict that the changes in precipitation will be larger than normal annual variation (Kunkel *et al*. 2013, pp. 53-54). The

western portion of the regions are predicted to become drier, while the eastern portion will become wetter (Millett *et al*. 2006 p. 243; Shaffer *et al*., 2014, p. 443) and the southern areas will generally be drier than the northern portions (Kunkel *et al*. 2013, p. 53).

Grassland bird nesting success has been shown to be related to local weather conditions during the breeding season (George *et al*. 1992, entire). While some grassland bird populations can probably withstand a few bad years, long-term climate change may have much larger implications on the populations ability to rebound, and some species may be much more resilient to several years of poor reproductive success than others (George *et al*. 1992, pp. 275, 281).

On the wintering range, rainfall is highly correlated with mean grass height, and as discussed in the *Winter habitat condition* section above, Sprague's pipits are highly sensitive to factors relating to precipitation the previous season (Dieni *et al*. 2003a, p. 31; MacÃ-as-Duarte*et al*. 2009, p. 901; Macias-Duarte *et al*. 2011, p. 38). A decline in mean annual rainfall, as predicted by the climate models, would result in a decrease in grassland passerines in the Chihuahuan Desert grasslands (Kunkel *et al*. 2013, p. 53; MacÃ-as-Duarte*et al*. 2009, p. 896). Thus, climate change, especially due to precipitation declines on the wintering grounds, may negatively impact the Sprague's pipit.

With their wide distribution on both the breeding and wintering grounds, the Sprague's pipit population may shift in response to climate change if sufficient grassland habitat remains in those parts of the range where climate conditions promote suitable conditions. The population is highly mobile, so as long as there is suitable habitat available, the population should be able to shift in response to climate change. However, as discussed in the *Impacts to Migration and Wintering Habitat* section, there is widespread conversion occurring in the remaining grasslands in the Chihuahuan Desert.

While climate change may affect the habitat where the Sprague's pipit breeds and winters, these changes are predicted to be similar to year-to-year variation for precipitation, at least until sometime after 2035, when the effects may be larger. The species mobility and wide range may reduce the effect of climate change somewhat since birds select breeding and wintering conditions annually based on habitat conditions in that area. Because of the predicted reduction in rainfall on the wintering grounds, leading to unsuitable grassland conditions, climate change may be a threat to the Sprague's pipit.

Conservation Measures Planned or Implemented :

The Natural Resources Conservation Services (NRCS) national policy directs agents to recommend only actions that will avoid adverse effects, and to the extent practicable, provide long-term benefits to the species (NRCS 2014, p. 25). The NRCS estimates that approximately 10 percent, or 73,000 ha (180,000 ac) of land that came out of the Conservation Reserve Program (CRP) remains in grass in North Dakota (Schwagler, *in litt*. 2014, p. 2). We do not have information for the other states in the range. Because CRP land is comprised of only a few species of grass and forbs, it probably does not provide optimal habitat for the Sprague's pipit, but if it is grazed, it may provide the appropriate structure in some areas to support nesting or feeding.

Conservation efforts to benefit the federally endangered Attwater's greater prairie-chicken (*Tympanuchus cupido attwateri*) such as restoring coastal prairie in Texas should also benefit the Sprague's pipit. The Coastal Prairie Conservation Initiative associated with Texas Parks & Wildlife Department, the Service, The Nature Conservancy, NRCS, Grazing Land Conservation Initiative, and many private landowners have spent hundreds of thousands of dollars on brush control on at least 24,281 ha (60,000 ac) of grasslands in Victoria, Goliad, and Refugio counties since 2000. The high-quality prairie habitat conserved should also benefit the Sprague's pipit in Texas (Ortego 2011, pers. comm.).

The Service developed a Conservation Plan for the Sprague's pipit (Jones 2010, entire). This plan identifies a number of actions to benefit Sprague's pipit as well as research questions that would help land managers throughout the range make better decisions for the species. The Service is currently working with partners to

develop a grassland conservation plan on the breeding grounds that will likely include tasks identified in the Jones (2010) Conservation Plan. Since this plan is still in development, we have not considered the benefits that may be accrued from its implementation in evaluating whether the species is meets the criteria of federally threatened or endangered.

The Service is currently working with a number of partners to develop a conservation plan to protect native prairie on the U.S. breeding grounds. This plan is still in development, but it will focus on efforts to conserve grassland in the area identified as having a high percentage of the breeding population.

Summary of Threats :

Native prairie is one of the most imperiled habitats worldwide, with loss rates approximating 70 percent in the United States and Canada, and prairie loss is continuing. While conversion to agriculture is still occurring, our analysis suggests conversion risk in the Core parts of the breeding range where 75 percent of the population occurs is relatively low, with future conversion potentially impacting approximately 10 to 15 percent of the population. The population has experienced a sharp decline since historic levels, but independent surveys (BBS and CBC) suggest that in recent years, the population trend can be described as uncertain to stable on the winter range and in the Core part of the breeding range rather than showing a clear declining trend as analysis of the previous period did. The remaining population is conservatively estimated at 900,000 individuals. If the 2003-2012 BBS trend estimate continues, there would be an estimated 356,000 individuals (CI 65,000 to 2,800,000) remaining in 40 years.

In the 12-month finding, we identified energy development (oil, gas, and wind) and associated infrastructure as a threat to the species. New information since that time has found that the species shows a variable response to these stressors, suggesting that the impacts on the species from energy development are not as strong as previously believed.

Prairie habitat on the wintering grounds is also being degraded and converted. Surveys suggest that Sprague's pipits are widely distributed throughout the wintering grounds, so that habitat conversion in one region may affect only a portion of the population. Further surveys and analysis of habitat conditions on the wintering grounds should help to determine how winter habitat is affecting the species.

The best available information at this time suggests that while grazing, mowing, overutilization, predation, cowbird parasitism, harassment, and chemical use may have some impacts on Sprague's pipits, these effects are unlikely to be influencing the population as a whole. On the breeding grounds, the risk of continued conversion of native prairie in the part of the range where the species is concentrated is relatively low, but on the wintering grounds, habitat conversion is ongoing and has likely accelerated in recent years. The effects of climate change may lead to large-scale population-level impacts if it causes changes in the remaining suitable habitat. The available information strongly suggests that changes in the global climate system are likely to impact rainfall and temperature throughout the Sprague's pipits range. In particular, the models predict decreased precipitation in the wintering part of the range, especially after 2035. Annual local use on the winter range is dependent on habitat conditions, which in turn depends on precipitation in the previous growing season. Therefore, reduced precipitation may impact the amount of available habitat on the wintering grounds, where widespread habitat loss is already occurring.

This status review identified potential threats to the Sprague's pipit attributable to Factors A and possibly E. The primary factor affecting the species is habitat conversion (Factor A), especially due to native prairie conversion on the wintering grounds. Climate change (Factor E) is predicted to increase drought, especially on the wintering grounds, increasing the potential that the remaining grassland conditions are unsuitable.

For species that are being removed from candidate status:

_____ Is the removal based in whole or in part on one or more individual conservation efforts that you

determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions(PECE)?

Recommended Conservation Measures :

Continued monitoring and actions on both the breeding and wintering grounds to conserve native grasslands.

The Service has had preliminary discussions with partner agencies on potential actions to conserve Sprague's pipit; however, these are as yet preliminary, and demonstrable conservation has not yet occurred:

- Work with public and private landowners to conserve and improve existing Sprague's pipit habitat on the breeding grounds, especially in the Core area.
- Adopt conservation and research measures identified in the Sprague's Pipit (Anthus spragueii) Conservation Plan (Jones 2010, pp. 24-33)
- Continue to monitor the population and habitat on the wintering grounds so that changes affecting the population can be identified early and conservation measures implemented.
- Work throughout the wintering range to prevent the continued loss of native prairie. Once converted, this habitat would be difficult to reclaim. Protecting grasslands on the wintering grounds would also benefit a number of other grassland birds and wildlife.

Priority Table

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/Population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/Population	6
Moderate to Low	Imminent	Monotype genus	7
		Species	8
		Subspecies/Population	9
	Non-imminent	Monotypic genus	10
		Species	**11**
		Subspecies/Population	12

Rationale for Change in Listing Priority Number:

We are changing the Priority Number from 8 to 11, indicating a moderate and nonimminent threat risk, based on new information gathered since the 2013 CNOR as summarized below.

Magnitude:

The major potential threat facing the species is habitat conversion on both the breeding and wintering grounds. On the breeding grounds, modeling has suggested that most of the population (75 percent) is concentrated in approximately 29 percent of the range, primarily centered on Montana, Alberta, and Saskatchewan. Information about the risk of conversion in Canada is not available, but in the U.S., modeling

projected that the risk of large-scale conversion is limited (Lipsey *et al.* 2014, p. 10). The most likely future scenario predicts that conversion may affect 10 to 15 percent of the U.S. population. A similar analysis is still ongoing in Canada, but many of the same factors that limit the likelihood of conversion in the U.S., such as moisture, soil quality, frost-free days, and growing season probably also limit conversion risk in Canada.

Additionally, in the 12-month finding and previous CNORs, we identified oil and gas development and associated infrastructure, specifically roads, as a major threat to the species on the breeding grounds, especially from the Bakken oil field in North Dakota. However, as discussed above, the population is concentrated in central Montana, Alberta, and Saskatchewan, reducing the potential population impacts from oil and gas development and associated infrastructure from the Bakken oil field development. New information suggests that Spragues pipits response to oil and gas development, including roads, is more nuanced than previous literature suggested, with varying avoidance behavior across the range.

There has been recent, widespread conversion of native prairie in the Chihuahuan Desert of Mexico, which may affect populations of grassland birds, including the Spragues pipit (Pool *et al*. 2014, entire). Ongoing population monitoring should help determine what effect this habitat conversion is having on the population as a whole.

Given the above, we consider the magnitude of threats affecting Spragues pipit to be moderate to low.

Imminence :

While the Spragues pipit population has experienced a large decline from historical times, when it was described as one of the most common birds in the Northern Great Plains (Coues 1874, p. 42), the population estimated at 900,000, is still relatively large (Partners in Flight 2013, p. 6). Due to poor BBS coverage in the U.S. range, this estimate is likely low (Sauer *in litt*. 2013, p. 9; Lipsey *et al*. 2014, p. 7). Life history parameters (e.g. annual survival) are not well described, but surveys on both the breeding Core area and on the wintering range suggest that the population trend is stable to increasing in the past ten years (Sauer *in litt*. 2014a, excel spreadsheet; Soykan *in litt*. 2014, excel spreadsheet). Because of the relatively large population remaining and the stable-to-uncertain (i.e. not showing a clear decline) trends by independent surveys on both the breeding and wintering grounds, the immediacy of the threats and potential decline is nonimminent.

__Yes__ Have you promptly reviewed all of the information received regarding the species for the purpose of determination whether emergency listing is needed?

Emergency Listing Review

__No__ Is Emergency Listing Warranted?

We determined that issuing an emergency regulation temporarily listing the species is not warranted for this species at this time, because while the population has shown a decline since the BBS monitoring began approximately 40-years ago, this decline has stabilized in the past ten years. On the breeding grounds, the portion of the range where the population is concentrated has a relatively low risk of large-scale conversion. On the wintering grounds, prairie conversion is ongoing, but the species may be more flexible in habitat use during winter.

Additionally, while we believe that both the U.S. and Canadian portions of the breeding range are necessary for the long-term survival of the species, the protections afforded in Canada under SARA should somewhat buffer the species' decline. However, if at any time we determine that issuing an emergency regulation temporarily listing the Sprague's pipit is warranted, we will initiate the action at that time.

Description of Monitoring:

Refuges in North Dakota, South Dakota, and Montana are currently developing guidelines to ensure that their actions benefit the Sprague's pipit. Because the species may not use an area for several years, depending on local conditions, and because the survey window for the species is limited to the few weeks when the male is displaying, they plan to primarily monitor the species using habitat evaluation as a proxy for species use.

The Nature Conservancy in Texas conducted Sprague's pipit surveys at Fort Hood, Texas during the winters of 2010/2011 and 2012/2013, including vegetation sampling in the areas where Sprague's pipits were flushed. Results are still being analyzed.

The Rocky Mountain Bird Observatory has done a survey of grassland birds, including the Sprague's pipit, in the Chihuahuan Desert of Texas and Mexico from 2009-2011 (Poole *et al*. 2012, entire).

Sprague's pipit was reported to be a rare but regular visitor to Stuttgart Airport in Arkansas (Brian *in litt*. 2011, p. 4).

Both the BBS and CBC are continuing, which should provide trend information into the future. BBS routes will be added in the U.S. Core area starting in 2015, to better track the population in those areas where the species is concentrated.

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment:

Texas

Indicate which State(s) did not provide any information or comment:

Arkansas,Kansas,Minnesota,Mississippi,South Dakota

State Coordination:

Information was provided from the states mentioned above as well as the Tonkawa Tribe of Oklahoma. No information was provided from Mexico.

Literature Cited:

Askins, R.A., F.Chavez-Ramirez, B.C. Dale, C.A. Haas, J.R. Herkert, F.L. Knopf, and P.D. Vickery. 2007. Conservation of grassland birds in North America: understanding ecological processes in different regions. Ornithological Monographs 42: 1-46.

Arizona Game and Fish Department. 2010. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 7 pp. (http://www.azgfd.gov/w_c/edits/documents/Anthspra.d_003.pdf)

Audubon, J.J. 1844. Sprague's Missouri lark. The Birds of America. 7: 334-336. (Reprinted 1967, Dover Publ., New York).

Audubons Annual Christmas Bird Count. 2012. Available at http://netapp.audubon.org/cbcobservation/Historical/SpeciesData.aspx (Accessed January 17, 2013.

AWEA. 2014. Wind energy facts at a glance. Available on-line at http://www.awea.org/Resources/Content.aspx?ItemNumber=5059&navItemNumber=742 (Accessed June 27, 2014).

BIA. 2014. Programmatic biological assessment and biological evaluation for Fort Berthold Indian Reservation oil and gas development. May 2014. 283 pp.
Blancher, P.J., K.V. Rosenberg, A.O. Panjabi, B. Altman, A.R. Couturier, W.E. Thogmartin and the Partners in Flight Science Committee. 2013. Handbook to the Partners in Flight Population Estimates Database, Version 2.0. PIF Technical Series No 6. Available at http://www.partnersinflight.org/pubs/ts/ (Accessed May 9, 2014).

Bureau of Land Management. 2011. RMP Process. Available at http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/kfo-gsfo/rmp_process.html (Accessed July 9, 2014).

Canadian Wind Energy Association. 2010. Wind Farms, Map of Installations. Available at http://www.canwea.ca/farms/wind-farms_e.php. (Accessed 11 March, 2010).

Canadian Environmental Assessment Agency Canadian Environmental Assessment Registry. 2010. Available at http://www.ceaa.gc.ca/050/index_e.cfm. (Accessed 11 March, 2010).

Casey, D. 2005. Prairie Pothole Joint Venture: 2005 Implementation Plan, Section V Landbird Plan. Available at http://www.ppjv.org/PPJV_presntations/2005_PPJV/12_Landbird_Plan.pdf (Accessed 25 February 2009).

Center for Disease Control (CDC). 2009. Division of vector-borne infectious diseases, West Nile virus. Available at http://www.cdc.gov/ncidod/dvbid/westnile/birdspecies.htm (Accessed 19 May, 2011).

Chelsey-Preston, T. 2013a. Williston Basin. Publication Date 2013-11-27. Available at https://www.sciencebase.gov/catalog/item/529fbb60e4b01942f4ab9f19?community=Energy+and+the+Environ (Accessed June 6, 2014).

Chelsey-Preston, T. 2013b. Bakken Formation. Publication Date 2013-12-3. Available at https://www.sciencebase.gov/catalog/item/529fbb60e4b01942f4ab9f19?community=Energy+and+the+Environ (Accessed June 6, 2014).

Classen, R., F. Carriazo, J.C. Cooper, D. Hellerstein, and K. Udea. 2011. Grassland to Cropland Conversion in the Northern Plains: The Role of Crop Insurance, Commodity, and Disaster Programs. Washington, DC: US Department of Agriculture. Economic Research Service, ERR120. U.S. Dept. of Agri., Econ. Res. Serv. 85 pp.

COSEWIC. 2010. COSEWIC assessment and status report on the Sprague's pipit Anthus spragueii in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 34 pp. Available online at http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=2064 (Accessed June 18, 2014).

Coues, E. 1874. Birds of the Northwest. U.S. Geol. Surv. Terr. Misc. Publ. no. 3.

Dale, B.C., T.S. Wiens, and L.E. Hamilton. 2009. Abundance of three grassland songbirds in an area of natural gas infill drilling in Alberta, Canada. Pp. 194-204 in Rich, T.D., C. Arizmendi, D. Demarest and C. Thompson [eds.]. 2009. Tundra to Tropics: Connecting Birds, Habitats and People. Proceedings of the 4th International Partners in Flight Conference, 13-16 February 2008. McAllen, TX. Partners in Flight.

Davis, S.K. 1994. Cowbird parasitism, predation, and host selection in fragmented grassland of southwestern Manitoba. Masters Thesis. University of Manitoba, Winnipeg. 77 pp.

Davis, S.K. 2003. Nesting ecology of mixed-grass prairie songbirds in southern Saskatchewan. Wilson Bulletin. 115(2):119-130.

Davis, S.K. 2004. Area sensitivity in grassland passerines: effects of patch size, patch shape, and vegetation structure on bird abundance and occurrence in southern Saskatchewan. The Auk 121(4):1130-1145.

Davis, S.K. 2009. Renesting intervals and duration of the incubation and nestling periods of Sprague's pipit. Journal of Field Ornithology 80(3): 265-269.

Davis, S.K., R.M. Brigham, T.L. Shaffer, and P.C. James. 2006. Mixed-grass prairie passerines exhibit weak and variable responses to patch size. The Auk. 123(3): 807-821.

Davis, S.K., D.C. Duncan, and M. Skeel. 1999. Distribution and habitat associations of three endemic grassland songbirds in southern Saskatchewan. Wilson Bulletin 113(3): 389-396.

Davis, S.K. and R.J. Fisher. 2009. Post-fledging movements of Sprague's pipit. The Wilson Journal of Ornithology 121(1): 198-202.

Davis, S.K., R.J. Fisher, S.L. Skinner, T.L. Shaffer, and R.M. Brigham. 2013. Songbird Abundance in Native and Planted Grassland Varies with Type and Amount of Grassland in the Surrounding Landscape. Journal of Wildlife Management Early online version. Available at DOI: 10.1002/jwmg.537, Accessed March 27, 2013.

Davis, S. K., S. L. Jones, K. M. Dohms, and T. G. Holmes. 2012. Identification of Sprague's Pipit nest predators. Pp. 173 182 in C. A. Ribic, F. R. Thompson III, and P. J. Pietz (editors). Video surveillance of nesting birds. Studies in Avian Biology (no. 43), University of California Press, Berkeley, CA.

Davis, S.K., and S.G. Sealy. 2000. Cowbird parasitism and nest predation in fragmented grasslands of southwestern Manitoba. Pages 220-228 in J.N.M. Smith, T.L. Cook, S.K. Robinson, S.I. Rothstein, S.G. Sealy, editors. Ecology and management of cowbirds and their hosts: studies in the conservation of North American passerine birds. University of Texas Press, Austin, Texas.

Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, M.P. Nenneman, and B.R. Euliss. 1998 (revised 2001). Effects of management practices on grassland birds: Sprague's Pipit. Northern Prairie Wildlife Research Center, Jamestown, ND. Northern Prairie Wildlife Research Center Online. Available at http://www.npwrc.usgs.gov/resource/literatr/grasbird/sppi/sppi.htm (Version 28 MAY2004) (Accessed 25 February 2009).

Department of Mineral Resources. 2014. ND Wildlife Society 2-2-14. Available at https://www.dmr.nd.gov/oilgas/presentations/presentations.asp (Accessed June 6, 2014).

Desmond, M. 2006. Influence of landscape and within-patch characteristics on avian community dynamics in Chihuahuan desert grasslands. New Mexico Department of Game and Fish Share-with-Wildlife Final Report June 2006. 19 pp.

Desmond, M. J., K. E. Young, B. C. Thompson, R. Valdez, and A. Lafon-Terrazas. 2005. Habitat associations and conservation of grassland birds in the Chihuahuan desert region: two case studies in Chihuahua. Pages 439-451 in J.E. Cartron, G. Ceballos, and R. S. Felger, editors. Biodiversity, ecosystems and conservation in Northern Mexico. Oxford University Press, New York, New York.

Dieni, J. S., W. H. Howe, S. L. Jones, P. Manzano-Fischer, and C. P. Melcher. 2003a. New information on wintering birds of Northwestern Chihuahua. American Birds 103:26-31.

Dieni, J.S. and S.L. Jones. 2003b. Grassland songbird nest site selection patterns in northcentral Montana. Wilson Bulletin 115(4): 388-396.

Dohms, K.M. 2009. Sprague's pipit (Anthus spragueii) nestling provisioning and growth rates in native and

planted grasslands. Master's Thesis. University of Regina, Saskatchewan. 94 pp.

Dohms, K.M. and S.K. Davis. 2009. Polygyny and male parental care by Sprague's pipit. The Wilson Journal of Ornithology 121(4): 826-830.

Drilling, N.E. (compiler). 2010. Spragues Pipit (Anthus spragueii) data from Rocky Mountain Bird Observatorys Science Programs. Tech. Rep. S-USFWS-SPPI10. Rocky Mountain Bird Observatory, Brighton, CO. 21 pp.

DrillingEdge. 2014. Montana oil & gas wells and production in Montana. Available online at http://www.drillingedge.com/montana (Accessed July 8, 2014).

Dunn, E.H., C.M Francis, P.J. Blancher, S.R Drennan, M.A. Howe, D. LePage, C.S. Robbins, K.V. Rosenberg, K.R. Sauer, and K.G. Smith. 2005. Enhancing the scientific value of the Christmas Bird Count. The Auk 122(1): 338-346.

Emlen, J. T. 1972. Size and structure of a wintering avian community in southern Texas. Ecology 53(2): 317-329. Environment Canada. 2008. Recovery Strategy for the Spragues Pipit (Anthus spragueii) in Canada. Species at Risk Act Recovery Strategy Series.

Federal Aviation Administration. 2009. Available online at http://naco.faa.gov/index.asp?xml=naco/catalog/charts/digital/dof. Accessed 2010 (date not noted).

FAA. 2012. Federal Obstruction Evaluation. Available online at https://oeaaa.faa.gov/oeaaa/external/portal.jsp. Accessed March 2012.

Fisher, R.J. and S.K. Davis. 2011. Post-fledging dispersal, habitat use, and survival of Spragues pipits: are planted grasslands a good substitute for native? Biological Conservation 144: 263-271

Fisher, R.J., K. M. Dohms, and S.K. Davis. 2010. Removal of nestling radio-transmitters by adult Spragues pipit (Anthus spragueii). Journal of Ornithology Advance online publication. DOI 10.1007/s10336-010-0503-2. 5 pp.

Freeman, B. 1999. Finding Spragues Pipits in Texas. Texas Ornithological Society 1:50-51.

Gauthier, D.A. and E.B. Wiken. 2005. Monitoring the conservation of grassland habitats, prairie ecozone, Canada. Environmental Monitoring and Assessment 88: 343364.

Gelbard, J. L. and J. Belnap. 2003. Roads as conduits for exotic plant invasions in a semiarid landscape. Conservation Biology 2:420-432.

George, T.L., A.C. Fowler, R.L. Knight and L.C. McEwen. 1992. Impacts of a severe drought on grassland birds in western North Dakota. Ecological Applications 2: 275284.

Government Accountability Office. 2007. Agricultural conservation: Farm program payments are an important factor in landowners decisions to convert grassland to cropland. GAO-07-1054. Available at http://www.gao.gov/new.items/d071054.pdf (Accessed 12 August, 2010).

Grant, T.S., E. Madden, and G.B. Berkey. 2004. Tree and shrub invasion in northern mixed-grass prairie: implications for breeding grassland birds. Wildlife Society Bulleting 32(3):807-818.

Great River Energy. 2010. Great River Energy purchases output of North Dakota wind farm. Available at http://www.greatriverenergy.com/aboutus/pressroom/lead_050310_ashtabula_ii.html (Accessed 24, May

2010).

Greer, M.J. 2009. An evaluation of habitat use and requirements for grassland bird species of greatest conservation need in central and western South Dakota. M.S. Thesis, South Dakota State University. 158 pp.

Hamilton, L.E. 2010. Effects of natural gas development on thee grassland bird species in the CFB Suffield, Alberta, Canada. Masters Thesis. University of Alberta, Canada. 137 pp.

Hamilton, L.E., B.C. Dale and C.A. Paszkowski. 2011. Effects of disturbance associated with natural gas extraction on the occurrence of three grassland songbirds. Avian Conservation and Ecology 6(1): Article 7. 17pp. Available at http://dx.doi.org/10.5751/ACE-00458-060107 (Accessed August 3, 2011).

Higgins, K.F., D.E. Naugle, and K.J. Forman. 2002. A case study of changing land use practices in the northern Great Plains, USA: An uncertain future for waterbird conservation. Waterbirds. pp. 42-50.

Hoekstra, J, M., T.M. Boucher, T.H. Ricketts, and C. Roberts. 2005. Confronting a biome crisis: global disparities of habitat loss and protection. Ecology Letters 8: 23-29.

Igl, L.D. and B.M. Ballard. 1999. Habitat associations of migrating and overwintering grassland birds in southern Texas. The Condor 101(4): 771-782.

Igl, L. D., D. H. Johnson, and H. A. Kantrud. 2008. A historical perspective: changes in grassland breeding bird densities within major habitats in North Dakota between 1967 and 1992-1993. Pages 275295 in J. T. Springer and E. C. Springer (editors), Prairie invaders: proceedings of the 20th North American Prairie Conference. University of Nebraska at Kearney, Kearney, Nebraska.

Imhof, T.A. 1958. Recent Additions to the Avifauna of Alabama. Auk 75:354-357.

Ingelfinger, F. and S. Anderson. 2004. Passerine response to roads associated with natural gas extraction in a sagebrush steppe habitat. Western North American Naturalist 64(3): 385-395.

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate change 2007: synthesis report, summary for policymakers. IPCC Plenary XXVII. Valencia, Spain, 12-17 November 2007. Available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf (Accessed 18 September, 2009).

James, D. 1960. Some Recent Findings Concerning the Avifauna of Arkansas. Arkansas Adac. Sci., 14:8-13.

James, D.A., and J.C. Neal. 1986. Arkansas birds: their distribution and abundance. University of Arkansas Press. 402pp.

Johnson, R.G. and S.A. Temple. 1990. Nest predation and brood parasitism of tallgrass prairie birds. Journal of Wildlife Management 54(1): 106-111.

Jones, S. L. 2010. Sprague's Pipit (Anthus spragueii) conservation plan. U.S. Department of Interior, Fish and Wildlife Service, Washington, D.C. 56 pp. Available at http://www.fws.gov/mountain-prairie/species/birds/spraguespipit/SpraguesJS2010r4.pdf (Accessed 17 May, 2011)

Jones, S. L., and J. S. Dieni. 2007. The relationship between predation and nest concealment in mixed-grass prairie passerines: an analysis using program MARK. Studies in Avian Biology 34: 117-123.

Jones, S.L., J.S. Dieni, M.T. Green and P.J. Gouse. 2007. Annual return rates of breeding grassland songbirds. The Wilson Journal of Ornithology 119(1): 89-94.

Jones, S.L. and G.C. White. 2012. The effect of edges on nest survivorship in Sprague's pipits (Anthus spragueii). The Wilson Journal of Ornithology 124(2) 310-315.

Kalyn Bogard, H.J. 2011. Natural gas development and grassland songbird abundance in southwestern Saskatchewan: the impact of gas wells and cumulative disturbance. M.S. Thesis, University of Regina. 154 pp.

Kalyn Bogard, H.J. and S.K. Davis. 2014. Grassland songbirds exhibit variable responses to the proximity and density of natural gas wells. Journal of Wildlife Management 78(3): 471-482.

Kantrud, H.A. 1981. Grazing intensity effects on the breeding avifauna of North Dakota native grasslands. The Canadian Field Naturalist 95(4):404-417.

Knopf, F.L. 1994. Avian assemblages on altered grasslands. Studies in Avian Biology. 15: 247-257.

Koper, N., D.J. Walker, and J. Champagne. 2009. Nonlinear effects of distance to habitat edge on Sprague's pipits in southern Alberta, Canada. Landscape Ecology 24(10): 1287-1297.

Kunkel, K.E., L.E. Stevens, S.E. Stevens, L.Sun, E. Janssen, D. Wuebbles, M.C. Kruk, D.P. Thomas, M.D. Shulski, N.A. Umphlett, K.G. Hubbard, K. Robbins, L. Romolo, A. Akyuz, T.B. Pathak, T.R. Bergantino, and J.G. Dobson. 2013. Regional climate trends and scenarios for the U.S. national climate assessment; Part 4. Climate of the U.S. Great Plains. NOAA Technical Report NESDIS 142-4. 91 pp. Available at http://www.hprcc.unl.edu/publications/files/NOAA_NESDIS_Tech_Report_142-4-Climate_of_the_U.S.%20G (Accessed May 13, 2014).

Linnen, C.G. 2008. Effects of oil and gas development on grassland birds. Prepared for Petroleum Technology Alliance Canada. Prepared by Northern EnviroSearch Ltd. Saskatchewan. Unpublished Document. 24 pp.

Lipsey, M., K. Doherty, S. Fields, J. Evans, and D. Naugle. 2014. Sprague's pipit: range-wide modeling and tillage risk analysis. PowerPoint presentation. February 11th, 2014, Bozeman, MT. 17 pp.

MacÃ-as-Duarte, A., A.B. Montoya, C.E. MÃ©ndez-GonzÃ¡lez, J.R. RodrÃ-guez-Salazar, W.G. Hunt, and P.G. Krannitz. 2009. Factors influencing habitat use by migratory grassland birds in the state of Chihuahua, Mexico. The American Ornithologists Union. 126(4): 896-905.

Macias-Duarte, A., A. O. Panjabi, D. Pool, Erin Youngberg and Greg Levandoski. 2011. Wintering Grassland Bird Density in Chihuahuan Desert Grassland Priority Conservation Areas, 2007-2011. Rocky Mountain Bird Observatory, Brighton, CO, RMBO Technical Report IMXPLAT-10-01. 164 pp. Available at http://rmbo.org/v3/Portals/0/Documents/International/2011_Chihuahuan_Desert_Grassland_Bird_report_with_ (Accessed April 9, 2012).

Madden, E.M., R.K. Murphy, A.J. Hansen, and L. Murray. 2000. Models for guiding management of prairie bird habitat in northwestern North Dakota. American Midland Naturalist 144:377-392.

Maher, W. J. 1973. Birds: I. Population dynamics. Canadian Committee for the International Biological Programmme (Matador Project) Technical Report no. 34. Univ. of Saskatchewan, Saskatoon. 56 pp.

Manville, A.M. 2009. Current avian issues and land-based wind turbine developments. Briefing statement.

Manzano-Fischer, P., R. List, G. Ceballos, and J.E. Cartron. 2006. Avian diversity in a priority area for conservation in North America: the Janos-Casas Grandes prairie dog complex and adjacent habitats in northwestern Mexico. Biodiversity and Conservation 15: 3801-3825.

Mason, R. H. Tennekes, F.SÃ¡nchez-Bayo, and P.U. Jepson. 2013. Immune suppression by neonicotinoid insecticides at the root of global wildlife declines. Journal of environmental immunology and toxicology 1: 3-12.

McCaskie, G. 1975. The Sprague's Pipit Reaches California. Western Birds 6:29-30.

McMaster, D.G., J.H. Devries, and S.K. Davis. 2005. Grassland birds nesting in haylands of southern Saskatchewan: landscape influences and conservation priorities. Journal of Wildlife Management 69(1): 211-221.

Millett, B., W.C. Johnson, and G. Guntenspergen. 2006. Climate trends of the North American prairie pothole region 1906-2000. Climatic Change 93: 243-267.

National Audubon Society. 2012. The Christmas Bird Count Historical Results [Online]. Available online at http://www.christmasbirdcount.org (Accessed April 25, 2012).

Naugle, D.E., K.E. Doherty, B.L. Walker, M.J. Holloran, and H.E. Copeland. 2009. Energy development and greater sage-grouse. Chapter 21, Studies in Avian Biology, Cooper Ornithological Society. Available http://sagemap.wr.usgs.gov/monograph.aspx. (Accessed January 4, 2009). 49 pp.

ND Pipeline Authority. 2014. Natural gas facts. Available on-line at http://northdakotapipelines.com/natgasfacts/ (Accessed June 16, 2014).

New Mexico State University. 2013. The Chihuahuan Desert. Available online at http://ddl.nmsu.edu/chihuahua.html (Accessed June 16, 2014).

North Dakota Department of Mineral Resources. 2014. BSC Energy Conference 1/29/14. Available on-line at https://www.dmr.nd.gov/oilgas/presentations/BSCEnergyGen012914_100.pdf (Accessed June 14, 2014.

North Dakota Petroleum Council. 2013. North Dakota oil and gas industry: Facts and Figures. Available at http://www.ndoil.org/resources/documents/ (Accessed June 6, 2014).

NRCS. 2014. Handbooks: Title 190 Ecological Services, Part 610 National Environmental Compliance Handbook. 101 pp.

Owens, R.A., and M.T. Myres. 1973. Effects of agriculture upon populations of native passerine birds of an Alberta fescue grassland. Canadian Journal of Zoology 51:697-713.

Pacific Northwest Laboratory. 1991. Top 20 states with wind energy resource potential. Available at http://www.casperlogisticshub.com/downloads/Top_20_States.pdf (Accessed June 19, 2013)

Partners in Flight. 2013. Population estimates database, version 2013. Available at http://rmbo.org/pifpopestimates (Accessed on May 9, 2014).

Pitman, J.C., C.A. Hagen, R.J. Robel, T.M. Loughin, and R.D. Applegate. 2005. Location and success of lesser prairie-chicken nests in relation to vegetation and human disturbance. Journal of Wildlife Management 69(3):1259-1269.

Pool, D. B., A. Macias-Duarte, A. O. Panjabi, G. Levandoski, and E. Youngberg. 2012a. Chihuahuan Desert Grassland Bird Conservation Plan, version 1.0. Rocky Mountain Bird Observatory, Brighton, CO, RMBO Technical Report I-RGJV-11-01. 74 pp.

Pool, D.B., Macias-Duarte, A., A. O. Panjabi, G. Levandoski, and E. Youngberg. 2012b. Rio Grande Joint

Venture Wintering Grassland Bird Conservation Plan, Using Surveys from Chihuahuan Desert Grassland Priority Conservation Areas from 2007-2011. Rocky Mountain Bird Observatory, Brighton, CO, RMBO Technical Report I-RGJV-11-01. 77 pp.

Pool, D.B., A.O. Panjabi, A. Macias-Duarte, and D.M. Solhjem. 2014. Rapid expansion of croplands in Chihuahua, Mexico threatens declining North American grassland bird species. Biological Conservation 170: 274-281.

Pool, D. and A. Panjabi. 2011. Assessment and revisions of North American Grassland Priority Conservation Areas. Background Paper, Commission for Environmental Cooperation. 66 pp.

Prescott, D. R. C. 1997. Status of Sprague's Pipit (Anthus spragueii) in Alberta. Alberta Environmental Protection, Wildlife Management Division, Wildlife Status Report No. 10, Edmonton, Alberta, Canada.

Rashford, B.S., A.M. Schrag and J. Walker. 2013. Targeting grassland conservation: an estimate of land-use conservation risk in the Northern Great Plains. Report prepared for USFWS, Plains and Prairie Pothole Landscape Conservation Cooperative, September 2013, 69 pp.

Robbins, M.B. 1998. Display behavior of male Sprague's pipits. Wilson Bulletin 110(3): 435-438.

Robbins, M.B., and B.C. Dale. 1999. Sprague's Pipit (Anthus spragueii), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Available at http://bna.birds.cornell.edu/bna/. (Accessed June 19, 2009).

Roch, L. and J.A.G. Jaeger. 2014. Monitoring an ecosystem at risk: what is the degree of grassland fragmentation in the Canadian prairies? Environmental Monitoring and Assessment. doi:10.1007/s10661-013-3557-9. 30 pp.

Ruvalcaba-Ortega, I., J. Allen-Bobadilla, and J.I. GonzÃ¡lez-Rojas. 2012. Aves de pastizal invernando en Ã¡reas agrÃ-colas de la RegiÃ³n el Tokio. Rocky Mountain Bird Observatory. 59 pp.

Samson, F. B., F. L. Knopf, and W. R. Ostlie. 1998. Grasslands. Pp. 437-472. In Mac, M.J., P.A. Opler, C.E. Puckett Haecker, and P.D. Doran [eds.]. 1998. Status and trends of the nations biological resources, Vol. 2. U.S. Geological Survey, Reston, VA.

Samson, F.B., F.L. Knopf, and W.R. Ostlie. 2004. Great Plains ecosystems: past, present, and future. Wildlife Society Bulletin 32:6-15.

Sauer, J. R., J. E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007. Version 5.15.2008. USGS Patuxent Wildlife Research Center, Laurel, MD. Available at http://www.mbr-pwrc.usgs.gov/bbs/bbs.html. (Accessed June 7, 2010).

Sauer, J. R., J. E. Hines, J. E. Fallon, K. L. Pardieck, D. J. Ziolkowski, Jr., and W. A. Link. 2012. The North American Breeding Bird Survey, Results and Analysis 1966 - 2011. Version 12.13.2011 USGS Patuxent Wildlife Research Center, Laurel, MD. Available at http://www.mbr-pwrc.usgs.gov/bbs/ (Accessed June 17, 2014).

Shaffer, J.A. and D.H. Johnson. 2008. Displacement effects of wind developments on grassland birds in the Northern Great Plains. PowerPoint Presentation. 64 pp. Available at http://www.nationalwind.org/wp-content/uploads/assets/research_meetings/Research_Meeting_VII_Shaffer.pd (Accessed May 23, 2013)

Shafer, M., D. Ojima, J. M. Antle, D. Kluck, R. A. McPherson, S. Petersen, B. Scanlon, and K. Sherman, 2014. Ch. 19: Great Plains. Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program. PP. 441-461. doi:10.7930/J0D798BC Available at http://nca2014.globalchange.gov/report/regions/great-plains (Accessed May 13, 2014)

Simmers, S.M. 2006. Recovery of semi-arid grassland on recontoured and revegetated oil access roads. Thesis. University of Minnesota Graduate School.

Sliwinski, M. S. and N. Koper. 2012. Grassland bird responses to three edge types in a fragmented mixed grass prairie. Avian Conservation and Ecology 7(2): Article 6. 15 pp. Available at http://dx.doi.org/10.5751/ACE-00534-070206 (Accessed May 23, 2014).

Stephens, T.K. 2011. The effects of wind energy on overwintering grassland birds. Master's Thesis. Texas Christian University, Fort Worth, Texas. 36 pp.

Stephens, S.E., J.A. Walker, D.R. Blunck, A. Jayaraman, D.E. Naugle, J.K. Ringelman, and A.J. Smith. 2008. Predicting risk of habitat conversion in native temperate grasslands. Conservation Biology 22(5): 1320-1330.

Sutter, G.C. 1997. Nest-site selection and nest-entrance orientation in Sprague's Pipit. Wilson Bulletin 109:462469.

Sutter, G.C., S.K. Davis, and D.C. Duncan. 2000. Grassland songbird abundance along roads and trails in southern Saskatchewan. Journal of Field Ornithology 71(1):110-116.

Sutter, G.C., D.J. Sawatzky, D. M. Cooper and R. M. Brigham. 1996. Renesting intervals in Sprague's Pipit, Anthus spragueii . Can. Field-Nat. 110: 694-697.

Thompson, S.J., D.H. Johnson, N.D. Niemuth, and C.A. Ribic. 2013. The impact of oil and natural gas development on grassland birds: 2013 progress report. Unpublished document. 19 pp.

Towne, E.G., D.C. Hartnett, and R.C. Cochran. 2005. Vegetation trends in tallgrass prairie from bison and cattle grazing. Ecological Applications 15(5):1550-1559.

Trombulak, S.C., and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14(1):18-30. U.S. Department of Energy. 2009. States with renewable portfolio standards. Available at http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm#chart (accessed 25 March, 2010). 2 pp.

U.S. Department of Energy. 2009. States with renewable portfolio standards. Available at http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm#chart (accessed 25 March, 2010). 2 pp.

U.S. Department of Energy. 2010. Wind powering America: Wind maps and wind resource potential estimates. Available at http://www.windpoweringamerica.gov/wind_maps.asp (Accessed 9 March, 2010). 2 pp.

USFWS. 2010. Grassland Easements. Division of Realty, Mountain-Prairie Region. Available at http://www.fws.gov/mountain-prairie/realty/grassesmt.htm (Accessed July 9, 2014).

Wildlife Service lands in Region 6. U.S. Fish and Wildlife Service, 134 Union Blvd, Lakewood, Colorado,

80228. 31 pp.

USFWS. 2014. Sprague's Pipit Species Status Assessment (SSA) Expert Elicitation Meeting, February 11-13, 2014, Bozeman, MT. Unpublished Document. 19 pp. plus 11 Appendices.

USGS. 2008. Assessment of undiscovered oil reserves in the Devonian-Mississippian Bakken shale formation, Williston Basin province, Montana and North Dakota, 2008. Accessed on May 31, 2009. Available online at: http://geology.com/usgs/bakken-formation-oil.shtml.

Valone, T.J. and D.A. Kelt. 1999. Fire and grazing in a shrub-invaded arid grassland community: independent or interactive ecological effects? Journal of Arid Environments. 42: 15-28.

Walker, B.H., D. Ludwig, C.S. Holling, and R.M. Peterman. 1981. Stability of semi-arid Savanna grazing systems. Journal of Ecology 69:473-498.

Whitford, W.G., R. Nielson, and A. de Soyza. 2001. Establishment and effects of establishment of creosotebush, Larrea tridentata, on a Chihuahuan Desert watershed. Journal of Arid Environments. 47: 1-10.

Winter, M. Undated. Distribution and habitat associations of Bairds sparrows and Sprague's pipits on the Grand River National Grassland, South Dakota. Final Report 2005-2007. Cornell lab of Ornithology. Ithaca, NY.

Correspondence, Electronic Communications and Telephone Conversations

Brian, N. 2011. Electronic communication dated March 21, 2011, from Nancy Brian, National Park Service, to Carol Aron, USFWS North Dakota Field Office, regarding information bullets from 6 part units concerning Sprague's pipit.

Dale, B. 2010. Electronic mail dated March 17, 2010 between Brenda Dale, Canadian Wildlife Service, and Carol Aron, USFWS North Dakota Field Office, regarding Sprague's pipit habitat fragmentation.

Jones, S.L. 2013. Electronic communication between Stephanie Jones, U.S. Fish and Wildlife Service, Brenda Dale, Canadian Wildlife Service, and Carol Aron, U.S. Fish and Wildlife Service regarding A question about pipits. October 30, 2013. 3pp.

Juliusson, L. 2014. Electronic communication exchange between Lara Juliusson, U.S. Fish and Wildlife Service, Lakewood, CO and Carol Aron, U.S. Fish and Wildlife Service, Bismarck, ND April 29-June 11, 2014. Re: SPPI/Wind Updated dataset with additional metrics. 5 pp.

Levandoski, G. 2014. Electronic communication between Greg Levandoski, Rocky Mountain Bird Observatory and Carol Aron, U.S. Fish and Wildlife Service, SPPI Observations? June 13-16, 2014.

Lipsey, M. 2014a. Electronic communication from Marissa Lipsey, University of Montana to Carol Aron, U.S. Fish and Wildlife Service, Sprague's pipit Update. June 20, 2014. 23 pp.

Lipsey, M. 2014b. Electronic communication between Marissa Lipsey, University of Montana to Carol Aron, U.S. Fish and Wildlife Service, Some more questions. April 28-29, 2014. 3 pp.

Loesch, C.R. 2010. Electronic communication dated March 5, 2010, March 9, 2010, March 15, 2010, March 26, August 18, 2010, and October 12, 2010 from Charles R. Loesch, USFWS Habitat and Population Evaluation Team, to Carol Aron, USFWS North Dakota Field Office, regarding GIS analysis of Sprague's pipit habitat.

Loesch, C.R. 2014. Electronic communication dated June 19, 2014 from Charles R. Loesch, USFWS Habitat and Population Evaluation Team, to Carol Aron, USFWS North Dakota Field Office, regarding Grass Easement Acres in SPPI.

Niven, D. 2012. Electronic communication exchange between Dan Niven, National Audubon Society and Kelly Hogan, USFWS, Sprague's Pipit CBC Circles. May 17-30, 2012. 2 pp. plus attachment.

Ortego, B. 2011. Electronic communication dated March 10, 2011 from Brent Ortego, Texas Parks and Wildlife Department, to Carol Aron, USFWS North Dakota Field Office, regarding actions that may benefit Sprague's pipit.

Sauer, J.R. 2014a. Electronic communication between John Sauer, USGS Patuxent Wildlife Research Center, Kevin Doherty, Bridget Fahey, and Carol Aron, U.S. Fish and Wildlife Service, regarding US BBS trend information & SPPI. February 20-February 21, 2014. 5 pp.

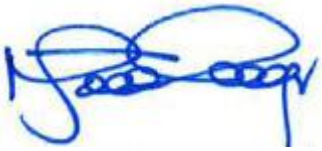
Sauer, J.R. 2014b. Electronic communication between John Sauer, USGS Patuxent Wildlife Research Center, Kevin Doherty, Sean Fields, and Carol Aron, U.S. Fish and Wildlife Service, regarding Sprague's pipit BBS analysis. September 13, 2013-January 31, 2014. 9 pp.

Schwagler, T. 2014. Electronic communication communication between Todd Schwagler, NRCS, and Carol Aron, U.S. Fish and Wildlife Service, regarding sodsaver. June 18-19, 2014. 3 pp.

Soykan, C. 2014. Electronic communication exchange between Candan Soykan, National Audubon Society, and Carol Aron, USFWS regarding Updated Sprague's pipit analysis? April 24 to May 6, 2014. 52 pp.

Approval/Concurrence:

Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:  09/10/2014
Date

Concur:  11/18/2014
Date

Did not concur: _____ _____
Date

Director's Remarks: