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:

04/29/2013

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

___ 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, Foster, 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, Calhoun, TX, Cameron, TX, Dimmit, TX, Hidalgo, TX, Jim Wells, TX, Kenedy, TX, Kleberg, TX, Maverick, TX, Nueces, TX, Refugio, TX, San Patricio, TX, Starr, TX, Victoria, TX, Willacy, TX

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

Land Ownership:

We identified public land within the breeding range of the Sprague's pipit as shown in Table 1. Depending on the regulations specific to the land ownership, the land may not be protected from activities that increase fragmentation or even conversion. For example, US Forest Service and Bureau of Land Management land can be developed for oil production, and Indian Reservations can be developed at the discretion of the tribes.

Furthermore, many of the public lands are not contiguous with a number of small patches in public ownership interspersed with private inholdings. Many of the public land patches by themselves may not be in patches large enough to support Sprague's pipit nesting.

Table 1: Public land ownership within the breeding range of the Sprague's pipit.

Sources: Montana: http://nris.mt.gov/gis/ownmaps.asp, Accessed March 18, 2011; North Dakota: From: USFWS data, Bismarck, ND; South Dakota: http://arcgis.sd.gov/server/sdGIS/Data.aspx, Accessed March 25, 2011, SD Indian Reservation BIA 2007, USFWS SD Refuges 2007; Wyoming: http://www.blm.gov/wy/st/en/resources/public_room/gis/datagis/state/state-own.html, Accessed March 24, 2011, Minnesota: Minnesota Department of Natural Resources 2011.

Lead Region Contact:

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Biological Information

Species Description:

The Sprague's pipit is about 10 to 15 centimeters (cm) (3.9 to 5.9 inches (in.)) in length, and weighs 22 to 26 grams (g) (0.8 to 0.9 of an ounce (oz)), 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, endemic 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) throughout their life cycle (Owens and Myres 1973, pp. 705, 708; Davis 2004, pp. 1138-1139; Dechant *et al*. 1998, pp. 1-2; Dieni *et al*. 2003, p. 31; McMaster *et al*. 2005, p. 219). 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 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 (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.) (Dieni and Jones 2003, p. 390; Madden *et al*. 2000, p. 382; Sutter 1997, pp. 464-466). The species prefers to breed in well-drained, open grasslands and avoids grasslands with excessive shrubs (Desmond *et al.* 2005, p. 442; Grant et al. 2004, p. 812; 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. 2). A minimum size requirement has been suggested to be approximately 145 hectares (ha) (358.3 acres (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). Recent analysis has refined the species habitat needs, suggesting that 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 depressed compared with 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). They may avoid roads, trails (Sutter *et al*. 2000, p. 114; Linnen 2008, p. 1; Dale *et al*. 2009, pp. 194, 200), and habitat edges (Koper *et al.* 2009, pp. 1293-1295).

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, entire). In Canada, Sprague's historical range included southeastern Alberta, the southern half of Saskatchewan, and in southwest Manitoba (Robbins and Dale 1999, p. 5, Sauer *et al*. 2012, p. 56).

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 2006-2010 shows a shrinking of the species range (Sauer *et al*. 2012, entire). Data from the most recently available five-year period shows that 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 habitat remains (Loesch, 2010 pers. comm.), so we believe the contraction is probably accurate.

The Sprague's pipit's wintering range includes south-central and southeast Arizona, Texas, southern Oklahoma, southern Arkansas, northwest Mississippi, southern Louisiana, and northern Mexico. The vast majority of the U.S. winter sightings have been in Texas (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).

Less is known about the species on the wintering range. Sprague's pipits appear to use a wider range of habitat types during the winter, but likely still rely largely on grassland habitat (Arizona Game and Fish Department, 2010, p. 4; Emlen 1972, p. 324; Freeman 1999, p. 51; McCaskie 1975, p. 29; Igl and Ballard 1999, p. 776). Conversion to agriculture and poor grassland management have led to a decline in grassland habitat (Igl and Ballard 1999, p. 771; Desmond et al. 2005; pp. 448-449; Maci-as-Duarte et al. 2009, p. 902; Manzano-Fischer *et al.* 2006, p. 3820).

Approximately 21 percent of the U.S. breeding range remains in a habitat type that is potentially suitable for Sprague's pipit nesting. When we overlaid current and estimated road locations, oil and gas wells, and wind development, the amount of suitable habitat in patches larger than 145 ha (358.3 ac), described as the minimum size requirement for breeding Sprague's pipits (Davis 2004, p. 1134), declined to 15 percent of the historic breeding range (Figure 1) (Loesch 2010, pers. comm.). If we include habitat patches 29 ha (71.6 ac) or larger, the smallest patch size where Sprague's pipits were observed (Davis 2004, p. 1134), the amount of potentially suitable habitat increases marginally to 18 percent of the historic breeding range in the United States (Loesch 2010, pers. comm.). If energy development continues as projected, the amount of suitable habitat will decline even further.

Population Estimates/Status:

Due to its cryptic coloring and secretive nature, the Sprague's pipit has been described as one of the least known birds in North America (Robbins and Dale 1999, p. 1), and range-wide surveys for the species have not been conducted. The population from 1990-1999 was estimated at approximately 870,000, based on extrapolation of BBS data (Blancher *et al*. 2007, p. 27; Rich *et al*. 2004, p. 18). The BBS data may underestimate the population since it surveys along roads. The likelihood of finding Sprague's pipit has been found to decrease with even small increases in human disturbance (Hamilton 2010, p. 35). A recent survey of randomly located survey points in Bird Conservation Region (BCR) 17 (encompassing southern Montana,

southeastern North Dakota, eastern South Dakota and northwestern Wyoming) estimated that the population in the BCR was approximately 274,273 (CV 0.67) (Drilling 2011, p. 3). However, this estimate is based on a relatively small sample size and only two years of data.

Regardless of absolute numbers, the BBS data has shown a steady decline over time (Sauer *et al*. 2008, p. 13), although the population seems to have stabilized in recent years (Sauer *et al*. 2011, entire). The species was described as abundant in the late 1800s in the upper Missouri River basin (Coues 1874, p. 42; Seton 1890, p. 626). More recent long-term estimates of Sprague's pipit abundance are derived from the BBS, a long-term, large-scale survey of North American birds that began in 1966. The population showed an estimated 80-percent decline from 1966 through 2007 (Peterjohn and Sauer 1999, p. 32) in the U.S. and Canadian breeding range (approximately 3.9 percent annually) (Sauer *et al*. 2008, p. 8). The annual population decline shows some slight variation, but the long-term trend is consistently negative (95-percent confidence interval -5.6 to -2.2) (Sauer *et al*. 2008, pp. 5-6, 8). Assuming that the population was approximately 870,000 in 1995 (the mid-point between 1990 and 1999 (Rich *et al*. 2004, p. 18)), and the population continues to decline at 3.9 percent annually, the population would have declined to approximately 479,000 by 2010. By 2060, the population could drop to 66,000, and in 100 years, by 2110, the population could decline to 8,970. However, this estimate involves a number of assumptions. The original population estimate comes from the BBS data and is characterized as beige, indicating that the 95-percent confidence limit around the average is within 20 percent of the average itself (Blancher et al. 2007, p. 22). Additionally, this assumes that the population will continue to decline in a linear fashion. In fact, threats may be accelerating, particularly the threats of habitat fragmentation due to energy development and conversion due to high crop prices.

In addition to BBS surveys, the Canadian Wildlife Service conducts a Grassland Bird Monitoring program (GBM) using the same methods as the BBS. GBM surveys are conducted along roads in areas within the mixed-grass prairie ecosystem where grassland is still common (Dale et al. 2005, entire; Environment Canada 2008, pp. 3-4). The GBM survey shows an even sharper decline of 10.5 percent annually from 1996-2004 in the core area of Sprague's pipits habitat in Canada (Environment Canada 2008, pp. iii, 3-4). The GBM program decline compares with a 1.8-percent decline for the same period from the BBS data (Environment Canada 2008, pp. iii, 3-4). Since the GBM survey is conducted in habitat that should be optimal for Sprague's pipits in Canada, it may indicate a serious decline in species abundance (Environment Canada 2008, p. 4).

The Christmas Bird Count (CBC) represents the only long-term data set that includes wintering information for the Sprague's pipit. The CBC is an annual count performed around the end of December in which volunteers observe birds in 15-mile-radius count circles. The Sprague's pipit CBC data from the winters of 1966/1967 through 2005/2006 (a 40-year span) were analyzed following the methods described in Link et al. (2006, entire) (Niven 2010, pers. comm.). The 40-year trend data for Sprague's pipit shows an annual decline for Texas (2.54 percent), Louisiana (6.21 percent), Mississippi (10.21 percent), and Arkansas (9.27 percent). The data from Oklahoma, New Mexico, Arizona, Florida, and California indicated an uncertain or stable trend (Niven 2010, pers. comm.). California and Florida are outside of the described range, and the number of sightings was quite low, presumably representing a few birds straying off of their normal migration routes or wintering areas. Oklahoma is part of the migration route, so sightings there in December may be somewhat varied, depending on annual weather conditions. Overall, the 40-year trend showed a median declining population of approximately 3.23 percent annually and a 73.1-percent decline for the entire time period (Niven 2010, pers. comm.). These estimates are fairly consistent with the decline observed on the breeding grounds, indicating that the observed decline is real, rather than an artifact of the sampling technique.

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:

Habitat Conversion

Land Conversion

Thirty percent of prairie habitat in the Great Plains and Canada remains from pre-colonial times (Samson *et al*. 2004, p. 7), but the amount of suitable habitat remaining in the Sprague's pipits range is lower. Land conversion is accelerating in native prairie, with a conversion rate faster than the estimated conversion rate of rainforests in the Amazon (Stephens *et al*. 2008, pp. 1326-1327). Much of the land conversion is from native prairie to agricultural uses. A Government Accountability Office report on agricultural conversion documented the continued conversion of native prairie to cropland, particularly in the Northern Plains of Montana, North Dakota, and South Dakota (Government Accountability Office 2007, pp. 4, 12, 15). A number of factors that encourage farmers to convert native prairie were identified, 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. The Northern Plains is identified as an area with continued conversion of native grassland (Government Accountability Office 2007, p. 4). From 2005 through 2007 (the most recent year data were available), approximately 94,400 ha (233,000 ac) of virgin prairie was broken for the first time, or approximately 32,000 ha (78,000 ac) annually (Stephens 2010).

To determine the amount of potentially suitable habitat remaining within the Sprague's pipit's range, we performed a Geographic Information System (GIS) analysis for the U.S. portion of the breeding range in 2010 (Loesch 2010, pers. comm.). We based the breeding range on data from the BBS in the U.S. range from 1966 through 2003, and included cover types that were classified as grassland, pastureland, prairie, or temporary wetland (Loesch 2010, pers. comm.). From these data, we determined that approximately 21 percent or 10 million ha (25 million ac) of the total area in the Sprague's pipit's U.S. breeding range remains in suitable habitat, with most of the historic range converted to other uses. Note that these numbers are different than those reported in the 12-month finding (74 FR 63337), where we reported that 10 million ha (25 million ac) was only 2.1 percent of the total area within the Sprague's pipit U.S. breeding range, due to an error in the original GIS analysis. Unsuitable land cover types within the Sprague's pipits range include urban areas, transportation infrastructure, barren areas, cropland, forest, tree rows, shrublands, water, and wetland areas. Researchers predict that native grassland will continue to be converted, and the rate of conversion may increase (Fargione *et al*. 2009, p. 769; Stephens *et al*. 2008 p. 1328). Prairie habitat loss in the Missouri River Coteau is estimated to be approximately 0.4 percent annually (Stephens *et al.* 2008, pp. 1320, 1327). Even in areas that remain in native prairie, historic and current land management, including increased stocking levels, fencing, augmentation of water sources (which concentrate animals, making overgrazing more likely), and fire suppression, have all changed the grassland ecology and species mix (Knopf 1994, pp. 248-250; Weltzin *et al*. 1997, pp. 758-760). The changes in the grassland ecosystem have led to a steep decline in many grassland bird species, including the Sprague's pipit (Knopf 1994, pp. 251-254; Grant *et al*. 2004, p. 812; Lueders *et al.* 2006, pp. 602-604).

As in the United States, most of the native grasslands in Canada have been converted to other uses, which are largely not suitable for nesting of the Sprague's pipit (Environment Canada 2008, p. 6). Approximately 94 percent of the species range has been lost in Canada (Dale 2010, pers. comm.). Of the approximately 20 million ha (49.4 million ac) remaining as grassland in the Sprague's pipit's 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 2010, pers. comm.).

Prairie conversion is continuing, and is expected to continue (Fargione *et al*. 2009, p. 775; Stephens *et al*. 2008, pp. 1320, 1325). Because of the decreased amount of suitable native prairie remaining throughout the United States and Canada, the continued conversion of native prairie to other land uses, and the altered management regime in the native prairie that remains, we conclude that ongoing habitat loss and land conversion is a significant threat (i.e., a threat that, alone or in combination with other factors, is causing the species to be in danger of extinction, now or in the foreseeable future) to Sprague's pipit throughout its range.

Grazing

Grazing is a major driver in 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). Much of the prairie is now grazed more uniformly than it was in pre-colonial times and is often overgrazed, 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). Additionally, cattle have replaced bison as the primary herbivore in Sprague's pipit habitat. Substituting cattle for bison does not necessarily lead to a change in grassland vegetation. While improperly timed or overly heavy or light grazing negatively impacts Sprague's pipits ability to use an area, we do not believe that grazing is a major threat to Sprague's pipits. While some areas are undoubtedly poorly managed, we believe this is a local rather than a rangewide problem. There is not enough information at this time to determine conclusively whether 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 do not believe that it is a significant threat to the species.

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 pipit's range has impacted the composition and structure of native prairie, favoring the incursion of trees and shrubs in areas that were previously grassland (Knopf 1994, p. 251). This change of structure negatively impacts Sprague's pipits, which avoid trees and are negatively associated with shrub cover on both their breeding and wintering grounds (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 that are not suitable for Sprague's pipits (Owens and Myres 1973, pp. 700-701). The lack of widespread fire in current prairie management has contributed to land conversion to landcover types not suitable for the pipit. Some form of disturbance is necessary to maintain the grassland ecosystem, and grazing and mowing are generally used today. While the lack of widespread fires as a management technique has led to changes in the grassland ecosystem, we believe that other methods of habitat maintenance are substituting for the role that fire historically played, but may result in a different suite of grassland species. Therefore, lack of fire in the landscape is a threat to the species in that without fire, trees and shrubs make the remaining prairie less suitable for Sprague's pipits.

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 (Owens and Myres 1973, p. 700).

There is not sufficient information available about the extent, timing, and frequency of mowing throughout the species range to make firm conclusions about how much of a threat mowing poses. 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. There is not enough information at this time to determine conclusively how mowing throughout much of the range impacts the Sprague's pipit, but from the available information, we do not believe that mowing is a significant 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. Sprague's 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 other habitat features that are structurally different than grassland (Davis 2004, p. 1134; Koper *et al*. 2009, pp. 1287, 1293-1296). 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, and a singing male not observed in a patch 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 Sprague's pipit use than patch size (Davis *et al*. 2013).

The shape of the patch also is important. Since Sprague's pipits have been shown to avoid edges (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 Sprague's pipit's 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.

Because of the Sprague's pipit's selection for relatively large grassland areas and avoidance of edges, habitat fragmentation is a threat throughout the populations breeding range. As more grassland is converted to native prairie, roads, oil and gas, wind farms, and other features are constructed in the Northern Great Plains, the fragmentation of the native prairie is expected to increase, further decreasing the amount of suitable habitat in the landscape suitable for breeding.

In order to determine the potential cumulative impact of human features on Sprague's pipits, we performed a GIS analysis. We used the BBS to map the breeding distribution of the species. The BBS uses inverse distancing to smooth the data by using route relative abundance to estimate presence beyond the end of a survey road (Sauer *et al*. 2008, pp. 17-19). We overlaid layers of suitable Sprague's pipit habitat, the road system, permitted oil and gas wells, and existing wind towers in the U.S. breeding range. Since GIS information regarding the location of the roads constructed by the energy companies to access their wells or towers was not available, we estimated new road construction by having the GIS program measure the shortest distance from the nearest road to the energy feature (Loesch 2010, pers. comm.). Topography may preclude building a road following the most direct route, so this is a conservative estimate of the miles of new

roads constructed. We buffered the roads, wind towers, and oil and gas well pads by 350 m (1,148 ft) based on an estimate of Sprague's pipits' avoidance of oil pads and associated roads (Linnen 2008, pp. 1, 9-11). A 350 m (1,148 ft) buffer may be a conservative (i.e. larger than the actual avoidance distance) estimate of Sprague's pipit avoidance distance since as discussed below, studies have found mixed results regarding Sprague's pipits' response to roads (Sutter *et al*. 2000, p. 110; Dale *et al*. 2009, p. 200; Koper *et al*. 2009, p. 1287; Jones and White 2013, pp. 311, 313-315).

FIGURE 1 : Grassland habitat patches for Sprague's pipits of 145 ha (358.3 ac) or larger in areas of the north-central United States where the species has been encountered by the BBS, 2009 (Loesch 2010, pers. comm.).

A similar GIS analysis of remaining suitable breeding habitat in Canada, including oil and gas wells, roads, and trails leading to each well, determined that about 5.6 percent of the historical Canadian range is suitable (having a greater than 50 percent probability of occupancy) for Sprague's pipits (Dale 2010, pers. comm.). A similar estimate (5 to 6 percent) was independently reached by another researcher also analyzing land cover data for the Canadian range (Davis 2010, pers. comm.).

Our analysis shows that the remaining suitable habitat continues to be converted and fragmented, a trend that we expect to increase. With only 15 to 18 percent of the U.S. historic breeding habitat and only approximately 15 to 20 percent of the Canadian breeding habitat still suitable for Sprague's pipit nesting, the areas where birds can relocate to as more habitat becomes fragmented and unsuitable for Sprague's pipit nesting is drastically diminished. As development continues, we expect the potential area for Sprague's pipits

to nest to decline further. The existing and ongoing fragmentation of suitable habitat makes the long-term observed decline of Sprague's pipit likely to continue into the future. Therefore, we believe that the present and future threat of habitat fragmentation is a threat to the species.

Energy Development

Oil and Gas

Energy development (oil, gas, and wind) and associated roads and facilities increase the fragmentation of grassland habitat. Much of the Sprague's pipit's breeding range overlaps with major areas of oil and gas development, which have been increasing rapidly in some portions of the Sprague's pipit's range. In North Dakota, the number of drilling rigs in the state has increased almost five-fold in five years, from 39 rigs in 2006 to 182 in 2011 (North Dakota Petroleum Council 2012a, p. 1). This trend is expected to increase. The North Dakota Petroleum Council estimates that from 2,000 to 3,000 wells could be drilled annually for the next 15 to 25 years (North Dakota Petroleum Council 2012b, p. 17). 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. Throughout the Sprague's pipit U.S. BBS range, there were 1,364 new wells drilled in 2011 (DNRC Montana Board of Oil and Gas 2011, p. 19; North Dakota Oil and Gas Industrial Commission 2012, entire; South Dakota Department of Environment and Natural Resources 2011, entire; Wyoming Oil and Gas Commission 2011, entire).

The Bakken formation lies entirely within the U.S. and Canadian breeding range (USGS 2008, p. 1; Robbins and Dale 1999, p. 5). 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. As discussed above, Sprague's pipits may avoid oil wells, staying up to 350 meters (m) (1148 ft) away, magnifying the effect of the well feature itself (Linnen 2008, pp. 1, 9-11). Oil and gas wells, especially at high densities, decrease the amount of habitat available for breeding territories. If we include the avoidance distance, each well and associated road can impact approximately 21 ha (51 ac) (Loesch 2010, pers. comm.). Thus, an additional 2,000 to 3,000 wells could directly impact 4,000 to 6,000 ha (10,000 to 15,000 acres) of habitat and result in avoidance of up to 42,000 to 60,000 ha (104,000 to 60,000 ac). As a worst case scenario, if 3,000 wells were constructed annually over the next 25 years in North Dakota, up to 1.6 million hectares (4 million acres) of habitat may have reduced use by Sprague's pipit because of oil and gas development alone. However, because many of the impact areas of these new wells will overlap with existing wells, and many will not be in suitable habitat, the actual area impacted by the wells will be less. Regardless, the potential impacts from future oil and gas development may be substantial.

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 to17,500 hectares (43,000 ac), including the area avoided. Assuming that the same percentage of roads was on potentially suitable habitat as the oil wells themselves, there would be an additional 271 km (168 miles) of new roads on potentially suitable habitat from the wells drilled in 2010. Applying an avoidance buffer of 352.4 m (1156.2 ft), the new roads could impact an additional 19,100 ha (47,200 ac). Therefore, the new wells and road constructed in 2010 may have impacted approximately 36,600 ha (90,200 ac) of suitable habitat. We are currently re-evaluating our analysis assumptions for the impacts of oil and gas wells and so did not replicate the analysis for wells drilled in subsequent years, but we assume that the loss of native prairie has continued at a similar rate for new wells drilled.

Oil and gas development has been shown to double 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). Researchers estimated that 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). With increased oil and gas development in much of the Sprague's pipit's range, this level of fragmentation is likely to be occurring over a large percentage of the range. As discussed above, habitat fragmentation is one of the major threats facing the species.

Wind

Major wind development is likely to occur in the remaining suitable Sprague's pipit habitat (U.S. Department of Energy 2010a, p. 1). The entire U.S. range of the Sprague's pipit is within an area with high potential for wind development (Pacific Northwest Laboratory 1991, p. 1; U.S. Department of Energy 2010a, p. 1). Wind energy development has been increasing rapidly in recent years, with increases of more than 45 percent in 2007 and more than 50 percent in 2008 (Manville 2009, p. 1). Like oil development, wind projects built in native grassland fragment the habitat with turbines, towers, roads, transmission infrastructure, and associated facilities. North Dakota and South Dakota each have the potential wind-energy capacity of at least 4 mega-watts (MW) of wind power per square km, while Montana has been projected to have the potential for 3 to 4 MW of wind power per square km (National Research Council 2007, p. 45).

We anticipate the number of wind farms to continue to increase dramatically throughout the species range. For example, in North Dakota alone, there are proposals to construct up to approximately 4,200 new turbines within the Sprague's pipit's range (Ellsworth 2010, pers. comm.). If constructed, this proposed development has the potential to make approximately 69,200 to 145,000 ha (170,000 to 358,000 ac) of land unsuitable for pipit nesting, depending on how the turbines are spaced. This likely represents a fraction of potential habitat loss from wind energy development, because we typically are not informed of wind projects until sites are selected.

We calculated how much of the Sprague's pipit's U.S. range this amount of development may impact, using the following assumptions:

(1) Each turbine would provide 2 MW of power. Onshore turbines are constructed between 700 kW to 2.5 MW (American Wind Energy Association 2010, p. 3), with most industrial projects that we are aware of in the 1.5 MW range. However, the wind industry is working toward developing larger turbines , so we believe that in the future turbine size is likely to be 2 MW or greater.

(2) Future wind projects would be constructed at approximately the same density as existing wind farms in these states, with the area of habitat that Sprague's pipits avoid from one turbine overlapping the avoidance area from another. We also assume that each turbine, road and associated area makes approximately 16.4 ha (40.5 ac) of habitat unsuitable for nesting.

(3) Turbines would be evenly distributed across the Sprague's pipit range in the U.S. This assumption is likely conservative in terms of effects to habitat because the areas with the highest wind potential in these states are largely within the remaining suitable prairie habitat.

We estimate that each turbine and associated road impacts approximately 34.5 ha (85.3 ac) of land, including an area around the road that Sprague's pipits avoid (Linnen 2008, p. 9-10; Loesch 2010, pers. comm.). However, because most turbines are placed close enough together for the avoidance areas to overlap, we calculated the impact of each individual turbine to be less, approximately 16.4 ha (40.5 ac) per turbine on average. Through 2009, we estimate that 12,400 ha (30,522 ac) have been impacted by 752 wind turbines and associated roads within the Sprague's pipit U.S. range (Federal Aviation Association [FAA] 2009). In 2011, 205 new turbines were reported to the FAA as constructed within the Sprague's pipit breeding range (FAA Obstruction Evaluation 2012, p. 1). We estimate that these towers impact a maximum of 3,400 ha (8,400 ac) although many of these turbines are on cropland, so the actual impacts are considerably less.

Using the above assumptions, we estimate that a minimum of 4.8 million hectares (12 million ac) could

become unsuitable for Sprague's pipit nesting within the range in North Dakota and a minimum of 2.1 million ha (5.1 million ac) could become unsuitable in South Dakota, while in Montana from 6.6 to 8.8 million hectares (16.4 to 21.8 million ac) could be impacted. While full development of the wind potential in Sprague's pipit habitat is not likely, these figures indicate that even a fraction of full development could result in significant losses of Sprague's pipit habitat. This estimate only includes the impacts from the turbines and associated roads. The potential impacts from other associated infrastructure (e.g. power lines) is not known, but may impact the species (e.g. from power-line strikes). The areas with the highest wind potential often overlap with the areas of remaining native prairie (Loesch, pers. comm. 2010), making it likely that wind development will focus on the remaining suitable Sprague's pipit habitat (U.S. Department of Energy 2010a, p. 1). There is some information suggesting that wind farms adversely impact grassland songbirds, a group that is already in decline (Casey 2005, p. 4; Manville 2009, p. 1). The entire U.S. range of the Sprague's pipit is within an area with high potential for wind development (Pacific Northwest Laboratory 1991, p. 1; U.S. Department of Energy 2010a, p. 1). Thousands of acres of Sprague's pipit habitat have already been fragmented by wind development (Loesch 2010, pers. comm.), a trend which is presumably consistent throughout the range as the number of wind farms increases (U.S. Department of Energy 2010b, entire). 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 Sprague's pipits are likely to fuel increases in wind development in the Sprague's pipits' range because wind power generated in these wind-rich areas are generally transmitted out-of-State (e.g. Great River Energy 2010, p. 1). We anticipate the number of turbines throughout the Sprague's pipit range to continue to dramatically increase. We anticipate that future wind development will likely have adverse impacts on Sprague's pipits since much of the highest wind resources overlays the remaining native prairie that is used by Sprague's pipits.

Oil and gas extraction is ongoing throughout much of the Sprague's pipit's range in Canada, and is expected to increase into the future (Standing 2006, entire). Similarly, wind development is increasing throughout the Canadian range of the Sprague's pipit (Canadian Wind Energy Association 2010, entire; Canadian Environmental Assessment Agency Canadian Environmental Assessment Registry 2010, entire). Because of wide-scale energy development across the Sprague's pipits' range, we believe that oil, gas, and wind development represents a significant threat to the continued existence of the Sprague's pipit. Sprague's pipits avoid features in the landscape that are structurally different than grassland, so the construction of energy-related structures negatively impacts the species use of a wide area. The amount and extent of energy development has been increasing rapidly and is expected to continue to increase, so energy development will be an ongoing and increasing threat into the future.

Roads

The literature is mixed regarding Sprague's pipit's 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 2013, 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 one study did not document avoidance of roads, although it did document avoidance of other changes in habitat structure (Koper *et al*. 2009, pp. 1287, 1293). Jones and White (2012, pp. 312-315) found no difference in daily survival rate of nests based on their distance from roads or other linear features (trails, agricultural field, railroad, shoreline). 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 2013, p. 314).

If Sprague's pipits are avoiding roads, they may be avoiding the changes in vegetation structure associated with the road rather than the road feature itself (Sutter *et al*. 2000, pp. 110, 112). Roads enable the spread of

exotic species because vegetative propagules (parts that can sprout independently) can be inadvertently transported along roads, while the ground disturbance associated with road construction provides sites where propagules can readily germinate (Trombulak and Frissell 2000, p. 24; Simmers 2006, p. 7). Furthermore, the dust and chemical runoff from roads allow only tolerant plant species to grow nearby, changing the plant composition even if the right-of-way were 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, indicating that long-term impacts of road construction extend 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). 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.

The increase in roads throughout the Sprague's pipit's 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 negatively affect the structure and make-up of the prairie, and also make grassland habitat more accessible to predators, which may decrease Sprague's pipits' reproductive success.

Migration and Wintering Habitat

Although there have been few studies of non-breeding Sprague's pipits, the birds appear to be strongly tied to native prairie habitat during the winter (Desmond *et al*. 2005, p. 442; Emlin 1972, p. 324). They are occasionally observed in other habitat types, especially during migration (Maher 1973, p. 20; Robbins and Dale 1999, pp. 13-14). 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). In the Chihuahuan Desert Region (United States and Mexico), an estimated 7 percent of grassland habitat remained in 2005 (Desmond et al. 2005, pp. 439, 448). Between 2005 and 2008, an estimated 30,000 ha (74,000 ac) of this grassland was converted (Macias-Duarte *et al*. 2009, p. 902). 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's pipit's presence on the wintering grounds in a particular area is related to rainfall the previous year (Dieni *et al.* 2003, p. 31; MacÃ-as-Duarte 2009, p. 901), pipits move to different parts of the wintering range annually, with densities dependent on local conditions. Therefore, it is likely necessary for sufficient suitable habitat to be available throughout the wintering range so that areas that are too dry one year may be used when conditions improve but are poor elsewhere. With conversion of grassland habitat on the wintering grounds, the amount of suitable habitat available to Sprague's pipits is shrinking (MacÃ-as-Duarte 2009, p. 896; Manzano-Fischer*et al*. 2006, p. 3820). Even grassland that is not actively converted is becoming unsuitable for Sprague's 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 Sprague's pipit's wintering habitat has undergone widespread conversion to farmland and degradation from management changes since pre-colonial times. These changes are likely negatively impacting the Sprague's pipit population as a whole. As conversion and degradation continue, we expect wintering habitat to be more limiting. However, there have not been specific studies examining Sprague's pipits' habitat use

during migration or on the wintering grounds, so it is not possible to determine if the changes to the migration and wintering grounds already constitute a threat to the species that may be placing the species at risk of extinction now or in the future. However, we think the magnitude of loss on the breeding grounds is sufficient to determine that the species is at risk of extinction now or in the future even in the absence of specific information on the wintering grounds.

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 2003, pp. 388 389; Jones *et al*. 2007; 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).

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 there have been no documented Sprague's pipit mortalities due to West Nile.

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 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 presumably is 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).

We do not believe that the natural level of predation presents a threat to the species. Rather, 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). The Sprague's pipit's preference for larger patches of unfragmented prairie may reduce their susceptibility to

predation. However, as fewer large patches of grassland are available, predation risk to Sprague's pipits may increase.

Cowbird Parasitism

Cowbird parasitism also leads to Sprague's pipit nest failures, because the cowbirds remove or damage host eggs and cowbird young out-compete the hosts for resources (Davis 2003, pp. 119, 127). Limited evidence suggests that Sprague's pipit nests that are parasitized do not produce any pipit young (Davis and Sealy 2000, p. 226). 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), so the Sprague's pipit's preference for larger tracts of grassland, when these are available, may make the species less susceptible to cowbird parasitism than some other grassland species. 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.

At this time, based on the available information we conclude that disease or predation is a not significant threat to the species now and is not likely to become so in the future.

D. The inadequacy of existing regulatory mechanisms:

The MBTA currently provides Federal protection from direct take of migratory birds native to the United States, their active nests, and their eggs, but it does not provide protection for habitat. A recent U.S. Court of Appeals for the Eighth Circuit court case (*United States* v. *Brigham Oil and Gas et al*. 2012, pp. 9-20) determined that the under the MBTA, take refers to conduct directed at birds, such as hunting and poaching, and not acts or omissions having merely the incidental or unintended effect of causing bird deaths. This ruling makes the prohibition against unintentional take of migratory birds in North Dakota less clear. If applied broadly, this ruling creates an even greater inadequacy in existing regulatory mechanisms as regards to the MBTA.

As discussed under Factor A, remaining habitat in both the breeding and wintering range is rapidly being converted and fragmented. While most of the States in the Sprague's pipit's range have identified the Sprague's pipit as a species of conservation concern, this designation does not provide protection of remaining habitat. Because the main threat to the species is habitat loss, we find that existing Federal and State regulatory mechanisms do not protect the species from the threat of habitat loss. In Canada, the Sprague's pipit is listed as a threatened species (Environment Canada 2008, p. 1). While this listing provides considerable protection to the species, the population would be unlikely to reverse its decline without additional protection on the U.S. breeding portion of the range as well as on its wintering grounds.

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 (Desmond *et al.* 2005, pp. 448-449; Macías-Duarte *et al.* 2009, p. 902; Manzano-Fischer *et al*. 2006, p. 3820). While the lack of regulatory mechanisms preventing habitat conversion on the wintering range in the United States and Mexico is likely contributing to the decline of the species, we have limited information at this time regarding whether the lack of regulatory mechanisms on the wintering grounds alone is a significant threat to the continued existence of the species.

Based on our review of the best scientific and commercial information available, we conclude that existing regulatory mechanisms are inadequate to protect the species and its habitat. The inadequacy of existing regulatory mechanisms therefore is a significant threat to the species, now and in the foreseeable future.

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

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.

Average global climate temperatures are likely to increase approximately 0.2 Celsius (ºC) (0.4 Fahrenheit (ºF) for each of the next two decades, with warming trends after that time dependent on emission scenarios (IPCC 2007, pp. 19-20). With these changes, resiliency of many ecosystems is likely to be exceeded. Given the large amount of land conversion that has already taken place throughout North America, it is not clear that the Sprague's pipit's range could shift into new areas in response to changes in climate. However, there is not sufficient information at this time to determine the likely effects of climate change on the Sprague's pipit.

Pesticide use and harassment aimed at blackbirds (*Xanthocephalus xanthocephalus*) in agricultural fields have been identified as having potential negative impacts on the Sprague's pipit (Igl *et al*. 2008, pp. 280-284; Hagy *et al*. 2007, p. 66; Wells 2007, p. 297). However, Sprague's pipits do not generally use agricultural fields, so the potential impacts from activities there should be minimal.

We conclude that the best scientific and commercial information available indicates that other natural or manmade factors are not a significant threat to the Sprague's pipit.

Conservation Measures Planned or Implemented :

The Natural Resources Conservation Service (NRCS) has opted to treat the Sprague's pipit as if it were proposed for listing and has worked with the Service to develop a policy document. The document provides guidance for NRCS offices throughout the state so that NRCS activities do not contribute to the species decline.

National Wildlife Refuges in North Dakota, South Dakota, and Montana developed a guidance document for refuge lands. 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.

Conservation efforts to benefit the federally endangered Attwaters greater prairie-chicken (*Tympanuchus cupido attwateri*) 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 managers make better decisions for the species. A study identified in the Conservation Plan to evaluate winter distribution and habitat classification for Sprague's pipit is ongoing.

Summary of Threats :

In this review of the status of the species, we identified a number of threats under the five-factor analysis including: habitat loss and conversion, habitat fragmentation on the breeding grounds, energy development, roads, and inadequacy of existing regulatory mechanisms.

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 accelerating. The remaining prairie is being converted to other land uses and is being increasingly fragmented, largely due to the development of wind, oil, and gas resources and associated roads and infrastructure. Land conversion is likely impacting the species throughout its range, but the effects of fragmentation most strongly impact the species on the breeding grounds. Because Sprague's pipits avoid unsuitable landscape features in breeding territories, the effect of a change in the landscape is magnified beyond the simple footprint of the disturbance. Only approximately 21 percent of the species historical U.S. range remains in potentially suitable habitat. When we included the effects of fragmentation and disturbance, the remaining suitable habitat declined even further to 15 to18 percent of the historical breeding habitat in the United States and between 5 and 6 percent of the historical breeding range in Canada remaining in large enough patches to support nesting territories. This loss of suitable habitat will likely continue and accelerate for the foreseeable future with the increase in energy development and prairie conversion throughout much of the species range. We estimate that habitat will likely continue to be converted from native prairie at a rate of approximately 32,000 ha (78,000 ac) annually, with a total potential conversion of 640,000 ha (1.6 million ac) in 20 years within the U.S. breeding range. In addition, wind power has the potential to impact a substantial amount of the suitable habitat remaining within the range. With limited exceptions, existing regulatory mechanisms do not protect the species' habitat from development.

The evidence we have 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. 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, but the nature and magnitude of these changes on the Sprague's pipit population is unknown at this time. While there are some broad estimates of how climate change will impact the central region of North America, many uncertainties remain. Land conversion, fragmentation of habitat, and inadequacy of regulatory mechanisms to halt habitat loss are causing a significant decline in the Sprague's pipit population, such that listing is warranted.

Both the BBS and the CBC data show long-term, sustained declines in the Sprague's pipit population of 3.23 to 3.9 percent annually and a 73 to 80 percent decline over the past 40 years. These surveys provide an indication of population trends. The evidence for decline is particularly strong because these two lines of independent evidence both point to the same conclusion. Even though the surveys take place in different parts of the species range (breeding and wintering) and use different methodologies, the resulting estimates for population trend are remarkably similar. The only available population-wide estimate comes from the BBS data, estimating the population at approximately 870,000 in 1995 (Blancher et al. 2007 p. 27). The decline since 2001 has been less steep, estimated at 2.4 percent decline from 2001-2011 (Sauer *et al*. 2012, pp. 4-5). Assuming a 3.9 percent decline from 1995 through 2001, and a 2.4 percent decline trend since that time, the population may have dropped to approximately 490,000 today.

Prairie habitat loss and fragmentation has resulted in only 15 to 18 percent of the historical breeding habitat in the United States and between 5 and 6 percent of the historical breeding range in Canada remaining in patches large enough to support nesting. We expect current habitat loss and fragmentation to continue into the future. Farm policy and practices continue to provide economic incentives for farmers to convert native prairie into cropland, while advances in farming (herbicide resistant crops and the advent of no-till planting) contribute to decisions to convert prairie to cropland. The historic primary impact to the Sprague's pipit population has been land conversion to cropland. While land conversion to cropland is ongoing and remains a chronic threat, the major threat in the future is further fragmentation and degradation of native prairie habitat from the rapid expansion of oil and gas production and wind farm development. While there are

approximately 10 million ha (25 million ac) of native prairie remaining in the U.S. range, only approximately 7.5 million ha (18.5 million ac) of this habitat remains in large enough patches to be used by breeding Sprague's pipits. Similarly, in the Canadian range, only approximately 3 to 4 million ha (7.4 to 9.9 million ac) remains in patches large enough to be used by breeding Sprague's pipits. Even this remaining habitat is becoming increasingly fragmented through continued conversion and fragmentation, especially due to energy development. As the amount of suitable habitat declines, the quality is also reduced, because the remaining habitat is increasingly fragmented, with more edge effects and greater impact from predators, cowbirds, and weed incursion. We anticipate the current rate of population decline (3.23 to 3.9 percent annually) to continue, and possibly increase, into the future due to the current and future loss of suitable breeding habitat and associated disturbance.

This status review identified threats to the Sprague's pipit attributable to Factors A and D. The primary threat to the species is from habitat conversion and fragmentation (Factor A), especially due to native prairie conversion to other uses and fragmentation from energy (oil, gas, and wind) development.

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 :

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:

Hold preliminary discussions with willing state and Federal agencies to conserve remaining prairie via their programs of land management, subsidies, and technical assistance.
In conjunction with land managers and GIS analysts, identify unbroken areas of native prairie of suitable size to prioritize habitat conservation efforts.
Adopt conservation and research measures identified in the Sprague's Pipit (*Anthus spragueii*) Conservation Plan (Jones 2010, pp. 24-33)

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**	Monotypic genus	7
		Species	**8**
		Subspecies/Population	9
	Non-Imminent	Monotype genus	10
		Species	11
		Subspecies/Population	12

Rationale for Change in Listing Priority Number:

Magnitude:

The major threats facing the species are habitat conversion and fragmentation, energy development, and inadequacy of regulatory mechanisms. These threats occur throughout the species range. In our 12-month finding (75 FR 56028), we reported that the magnitude was high because our GIS analysis showed that only approximately 2.1 percent of the breeding range remained in a grassland cover type that it was suitable for nesting, with only 1.55 percent remaining in large enough patch sizes to be used by the species (145 ha and 358.3 ac respectively). However, following the publication of our 12-month finding, we identified an error in the original GIS analysis. The new analysis showed that approximately 21 percent of the breeding range remains in suitable habitat cover, and approximately 15.1 percent remaining in patches 145 ha (358.3 ac) or larger (Loesch 2010, pers. comm.). Due to this change in amount of available suitable habitat remaining, we determined the magnitude of the threats to be moderate. For this review, we again determined that the threats are still moderate in magnitude because the amount of suitable habitat has decreased incrementally, but we do not believe that the amount of potentially suitable habitat remaining has declined sufficiently to be considered high.

Imminence :

The major threats facing the species include habitat conversion and fragmentation and inadequate regulatory mechanisms. In addition to their current existence, we expect these threats to continue and likely intensify in the foreseeable future. State agency representatives, energy industry spokesmen, and researchers anticipate that the amount of wind and oil and gas development will increase in the northern Great Plains for the foreseeable future. Since both oil and gas and wind development are occurring in areas that remain in native prairie, we believe that the impacts of increased development will further reduce the remaining suitable Sprague's pipit habitat. Therefore, we consider that the threats are imminent.

__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 shows a long-term sustained decline, there is sufficient habitat remaining to prevent the species' numbers from plummeting drastically in the short term. 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 winter of 2010/2011, with further targeted surveys planned for Sprague's pipits during the winter of 2012-2013. They also plan to do vegetation sampling in the areas where Sprague's pipits were flushed. Results are still being analyzed.

Sprague's pipit was reported to be a rare but regular visitor to Stuttgart Airport in Arkansas (Brian 2011, pers. comm).

Both the BBS and CBC are continuing, which should provide trend information into the future.

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

Arizona,Colorado,Louisiana,Montana,Nebraska,New Mexico,North Dakota,Oklahoma,South Dakota

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

Arkansas,Kansas,Minnesota,Mississippi

State Coordination:

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

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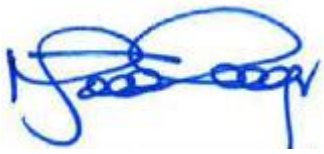
Approval/Concurrence:

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:  07/12/2013
Date

Concur:  10/28/2013
Date

Did not concur: _____ _____
Date

Director's Remarks: