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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2018–0057; FF09E21000 FXES11110900000 201]

RIN 1018–BD21

Endangered and Threatened Wildlife and Plants; Threatened Species Status for Eastern Black Rail with a Section 4(d) Rule

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine threatened species status for the eastern black rail (*Laterallus jamaicensis jamaicensis*) under the Endangered Species Act of 1973 (Act), as amended. Accordingly, we list the eastern black rail, a bird subspecies known from as many as 35 States, the District of Columbia, Puerto Rico, Canada, Brazil, and several countries in the Caribbean and Central America, as a threatened species under the Act. The effect of this regulation will be to add this subspecies to the List of Endangered and Threatened Wildlife. We also finalize a rule under the authority of section 4(d) of the Act that provides measures that are necessary and advisable to provide for the conservation of the eastern black rail. We have determined that designation of critical habitat for the eastern black rail is not prudent.

DATES: This rule is effective [INSERT DATE 30 DAYS AFTER DATE OF

PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: This final rule is available on the internet at

<http://www.regulations.gov> in Docket No. FWS–R4–ES–2018–0057 and at the South Carolina Ecological Services Field Office. Comments and materials we received, as well as supporting documentation we used in preparing this rule, are available for public inspection in the docket on <http://www.regulations.gov>. Comments, materials, and documentation that we considered in this rulemaking will also be available by appointment, during normal business hours at: U.S. Fish and Wildlife Service South Carolina Ecological Services Field Office, 176 Croghan Spur Road, Suite 200, Charleston, SC 29407; telephone 843–727–4707.

FOR FURTHER INFORMATION CONTACT: Tom McCoy, Field Supervisor, South Carolina Ecological Services Field Office, 176 Croghan Spur Road, Suite 200, Charleston, SC 29407; telephone 843–727–4707. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species may warrant protection through listing if it is endangered or threatened throughout all or a significant portion of its range. Listing a species as an endangered or threatened species can only be completed by issuing a rule.

What this document does. This rule will list the eastern black rail (*Laterallus jamaicensis jamaicensis*) as a threatened species and provide measures under section 4(d) of the Act that are tailored to our current understanding of the conservation needs of the

eastern black rail.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that habitat loss and destruction, sea level rise and tidal flooding, incompatible land management, and increasing storm intensity and frequency are the primary threats to this subspecies.

Peer review and public comment. We prepared a species status assessment report (SSA report) for the eastern black rail (Service 2019). The SSA report represents a compilation and assessment of the best scientific and commercial information available concerning the status of the eastern black rail, including the past, present, and future factors influencing the subspecies (Service 2019, entire). We solicited independent peer review of the SSA report by 10 individuals with expertise in rail biology and ecology and in species modeling; we received comments from 5 of the 10 reviewers. The reviewers were generally supportive of our approach and made suggestions and comments that strengthened our analysis. We also considered all comments and information received during the comment period. The SSA report and other materials relating to this rule can be found at <http://www.regulations.gov> under Docket No. FWS–R4–ES–2018–0057.

Previous Federal Actions

Please refer to the proposed listing rule for the eastern black rail (83 FR 50610) for a detailed description of previous Federal actions concerning this species.

Background

A thorough review of the taxonomy, life history, and ecology of the eastern black rail is presented in the SSA report (Service 2019, entire). Please refer to the proposed listing rule for the eastern black rail (83 FR 50610, October 9, 2018) for a summary of species information.

Summary of Biological Status and Threats

We completed a comprehensive assessment of the biological status of the eastern black rail, and prepared a report of the assessment (SSA report; Service 2019, entire), which provides a thorough account of the subspecies' overall viability. Below, we summarize the key results and conclusions of the SSA report, which can be viewed under Docket No. FWS-R4-ES-2018-0057 at <http://www.regulations.gov>.

To assess eastern black rail viability, we used the three conservation biology principles of resiliency, representation, and redundancy (together, “the three Rs,” (3Rs)) (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency refers to the ability of a species to withstand environmental and demographic stochasticity (for example, wet or dry years); representation refers to the ability of the species to adapt over time to long-term changes in the environment (for example, climate change); and redundancy refers to the ability of the species to withstand catastrophic events (for example, hurricanes). In general, the more redundant and resilient a species is and the more representation it has, the more likely it is to sustain populations over time, even under changing environmental

conditions. Using these principles, we identified the eastern black rail's ecological requirements for survival and reproduction at the individual, population, and subspecies levels, and described the beneficial and risk factors influencing the subspecies' viability.

We delineated analysis units for the eastern black rail based on environmental variables (aquifer permeability, slope, mean precipitation, mean potential evapotranspiration, and percent sand in soil). We used 8,281 point localities from combined datasets (i.e., eBird, Center for Conservation Biology, University of Oklahoma, and additional research partners) from 1980 through 2017, to delineate the analysis units for the eastern black rail. We named the analysis units using standard topographic and ecological landmarks: New England, Mid-Atlantic Coastal Plain, Appalachians, Southeast Coastal Plain, Southwest Coastal Plain, Central Lowlands, and Great Plains. Based on available data, we have concluded that the New England, Appalachians, and Central Lowlands analysis units are effectively extirpated. While these three analysis units historically did not support abundances of the eastern black rail as high as the other four analysis units, an evaluation of the current status information, including the paucity of current records, negative survey results, and the demonstrated range contraction throughout these areas, supports our conclusion that the eastern black rail is effectively extirpated from these analysis units. The remaining four analysis units, the Mid-Atlantic Coastal Plain, Southeast Coastal Plain, Southwest Coastal Plain, and Great Plains, have records of current populations of eastern black rails.

To assess resiliency, we analyzed occupancy within the analysis units through the creation of a dynamic occupancy model. We used data from repeated presence/absence surveys across the range of the eastern black rail to estimate the probability of presence at

a site and related the occupancy probability to environmental covariates of interest (wettest month precipitation, temperature range, annual mean temperature, coldest month mean temperature, presence/absence of fire ants, and State identification). The lower the occupancy probability in an analysis unit, the less resiliency that analysis unit exhibits. We found the four extant analysis units (Southeast Coastal Plain, Mid-Atlantic Coastal Plain, Great Plains, and Southwest Coastal Plain) to have very low occupancy probabilities ranging from 0.099 to 0.25. The results also indicated fairly high site extinction probabilities with accompanying low site persistence.

To assess representation, we used two metrics to estimate and predict representative units that reflect the subspecies' adaptive capacity: habitat variability and latitudinal variability. The eastern black rail exhibits adaptive potential by using similar habitat elements within different wetland types (habitat variability) within analysis units, *i.e.*, higher elevation areas within wetlands with dense vegetation, moist soils, and shallow flood depths (Eddleman *et al.* 1988, p. 463; Nadeau and Conway 2015, p. 292). Therefore, the subspecies shows a level of adaptive capacity by using different wetland types that contain the required habitat elements. Additionally, we used the metric of latitudinal variability to reflect the eastern black rail's wide range across the contiguous United States. To maintain existing adaptive capacity, it is important to have resilient populations (analysis units) that exhibit habitat variability and latitudinal variability.

To assess redundancy, we evaluated the current distribution of eastern black rail analysis units through their present-day spatial locations. To have high redundancy, the eastern black rail would need to have multiple resilient analysis units spread throughout its range.

Current Condition of Eastern Black Rail

Historically, the eastern black rail ranged across the eastern, central, and southern United States; historical records also exist from the Caribbean, Central America, Brazil, and Ontario, Canada. It occupied multiple areas of wetlands (including salt marshes, coastal prairies, and hay fields) throughout the range; approximately 90 percent of documented breeding-season occurrence records occurred at coastal locations and less than 10 percent were inland records, with more than 60 percent of the inland records occurring before 1950 (Watts 2016, entire). The eastern black rail also occupied multiple areas of wetlands within each analysis unit.

Within the northeastern United States, historical (1836–2010) records document the eastern black rail as present during breeding months from Virginia to Massachusetts, with 70 percent of historical observations (773 records) in Maryland, Delaware, and New Jersey (Watts 2016, p. 22). Maryland, Delaware, and New Jersey are considered historical strongholds for eastern black rail in this region of the United States (the Northeast) as well as across the subspecies' entire breeding range (Watts 2016, p. 22), due to the total number and frequency of observations reported over time. Virginia, New York, and Connecticut account for an additional 21 percent of the historical records (235 records) from the Northeast (Watts 2016, p. 22). Recent (2011–2016) records from the Northeast are low in number (64 records), with almost all records restricted to outer coastal habitats (Watts 2016, pp. 22, 24). The distribution of the recent records points toward a substantial southward contraction in the subspecies' range of approximately 450 kilometers (280 miles), with vacated historical sites from 33 counties extending from the Newbury marshes in Massachusetts to Ocean County, New Jersey (Watts 2016, pp. 24,

119). Further, the distribution of the recent records has become patchy along the Atlantic coast, and an evaluation of the records within the 15 counties still currently occupied suggests an almost full collapse of the eastern black rail population in the Northeast (Watts 2016, p. 24).

While the Appalachians and Central Lowlands analysis units supported less habitat for eastern black rails compared to the more coastal analysis units, interior occurrences were more common historically. Current population estimates for states with a large area occurring within the boundaries of the Appalachians analysis unit are effectively zero (Watts 2016, p. 19). Within that unit, an estimated 0 to 5 breeding pairs currently occur in Pennsylvania, and no breeding pairs are thought to occur in New York or West Virginia (Watts 2016, p. 19). Birds previously detected in the Appalachians analysis unit were found in small depressional wetlands within active pastures; other freshwater wetlands dominated by cattails, rushes, or sedges; and drainage ditches (Watts 2016, pp. 48, 74). While these wetland types still exist within the analysis unit and may support single individuals or a very low-density, scattered population (Watts 2016, pp. 48, 74), a substantial amount of this kind of habitat has been lost primarily due to the draining of freshwater wetlands for agricultural purposes. These estimates likely hold true for the interior portions of the other States within the Appalachians analysis unit (e.g., Georgia, Virginia) based on few current detections. Similar losses of habitat have occurred in the Central Lowlands analysis unit, and there are currently few detections of eastern black rails across this unit. Moreover, the current detections are not consistent from year to year even when habitat remains suitable. For example, Indiana Department of Natural Resources surveys for eastern black rails at multiple sites during the period

2010–2016 yielded one detection at a single site previously known to support eastern black rails (Gillet 2017, unpublished data).

In the Chesapeake Bay region, the distribution of eastern black rail has contracted, and the counts of birds have declined. A series of systematic surveys for eastern black rails has been conducted around the Chesapeake Bay since the early 1990s (Watts 2016, pp. 59, 67). Surveys estimated 140 individuals in the 1990–1992 survey period, decreasing to 24 individuals in 2007, and only 8 individuals in 2014, a decline of over 90 percent in less than 25 years (taking into account the number of survey points; Watts 2016, p. 59; Brinker 2017, unpublished data). Of 328 points surveyed in Virginia in 2007, researchers detected 15 birds; a second round of surveys in 2014 yielded 2 detections at 134 survey points (including all survey points with positive occurrences in 2007), equating to a 67 percent decline over 7 years (corrected from Watts to take into account the number of survey points; Wilson *et al.* 2015, p. 3; Watts 2016, pp. 67, 71;).

Historically, the eastern black rail was also present during breeding months at inland and coastal locations throughout southeastern coastal States (the Southeast), a region that included North Carolina, South Carolina, Georgia, Florida, Tennessee, Mississippi, Alabama, Louisiana, and Texas (Watts 2016, pp. 75–76). Of these States, Texas, Florida, South Carolina, and North Carolina contained 89 percent of all historical observations (734 records) (Watts 2016, p. 77). The other States (Georgia, Tennessee, Mississippi, Alabama, and Louisiana) either do not have a history of supporting eastern black rails consistently or are considered to be on the peripheries of known breeding areas (Watts 2016, p. 77).

Recently, there have been 180 records of eastern black rails during the breeding season, and at a coarse view, the same 4 southeastern States that substantially supported the subspecies historically still support the subspecies (Watts 2016, pp. 77, 79). However, North Carolina shows a severe decline in the number of occupied sites, with only four properties occupied in 2014–2015, down from nine in 1992–1993 (Watts 2016, p. 80). Additional surveys in 2017 yielded no new occupied coastal sites, and no birds were detected at inland/freshwater sites from two surveys in 2018 (Watts *et al.* 2017, p. 3; Watts *et al.* 2018b, p. 3). South Carolina shows a limited distribution, with two known occupied areas (Wiest 2018, pers. comm.) and an estimated 50 to 100 breeding pairs (Watts 2016, p. 19), leaving Texas and Florida as the current strongholds for the Southeast. At the time of the 2016 coastal assessment, it was surmised that coastal Georgia may support a breeding population of unknown size (Watts 2016, pp. 93–95); however, a coastwide survey in 2017 at 409 survey points in Georgia yielded no detections of eastern black rails (Watts *et al.* 2018a, p. 3). Initial results from the 2018 field season in Georgia detected no black rails at inland or coastal locations; a total of 206 points had been visited (Watts *et al.* 2018a, p. 4). A small population in inland Georgia was tracked during the breeding season from 1991 to 2010 until the population disappeared in 2011 for unknown reasons; observed young from this population remains the only evidence of definitive breeding in the State (Watts 2016, pp. 93–94; Sykes 2018, pers. comm.). Overall, across the Atlantic and Gulf Coasts, recent observations show poor presence inland and a widespread reduction in the number of sites used across coastal habitats (Watts 2016, p. 79).

The history of the subspecies' distribution in the interior continental United States is poorly known. Historical literature indicates that a wide range of interior States were occupied by the eastern black rail, either regularly or as vagrants (Smith-Patten and Patten 2012, entire). Eastern black rails are currently vagrants (casual or accidental) in Arkansas, Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, New Mexico, Ohio, and Wisconsin (Smith-Patten and Patten 2012, entire). Presently, eastern black rails are reliably located within the Arkansas River Valley of Colorado (presumed breeder in the State) and in southcentral Kansas (confirmed breeder in the State) (Smith-Patten and Patten 2012, pp. 9, 17; Butler *et al.* 2014, p. 22). In Colorado, the subspecies is encountered in spring and summer at Fort Lyon Wildlife Area, Bent's Old Fort, Oxbow State Wildlife Area, Bristol, and John Martin Reservoir State Park (Smith-Patten and Patten 2012, p. 10). Surveys conducted between April 15 and June 15, 2018, in southeastern Colorado detected at least one black rail during repeat surveys at 39 of 115 points and 17 of 66 marshes surveyed (Rossi and Runge 2018, p. 6). In Kansas, available information on the occurrence of eastern black rail suggests eight counties have confirmed breeding records, but Quivira National Wildlife Refuge (NWR) is the only known site with consistent or regular breeding activities (Thompson *et al.* 2011, p. 123). In Oklahoma, occurrence mapping suggests that this subspecies had at a maximum a patchy historical distribution throughout the State. At present, it is possible that there is not sufficient suitable habitat or numbers of birds to constitute a true breeding population in Oklahoma (Smith-Patten and Patten 2018, p. 7).

Eastern black rail analysis units currently have low to no resiliency in the contiguous United States (Service 2019, pp. 79–82). The Great Plains, Southwest

Coastal Plain, and Southeast Coastal Plain analysis units have low resiliency based on the dynamic occupancy model results, which indicate very low occupancy probabilities in each modeled analysis unit: 0.25 in the Southwest Coastal Plain, 0.13 in the Great Plains, and 0.099 in the Southeast Coastal Plain. The Mid-Atlantic Coastal Plain analysis unit currently exhibits very low resiliency for the eastern black rail. It supports fewer birds and has fewer occupied habitat patches than the Southeast Coastal Plain analysis unit. The remaining three analysis units, New England, Appalachians, and Central Lowlands, currently demonstrate no resiliency. These three units historically did not support abundances of the eastern black rail as high as the other four analysis units. There are currently insufficient detections to model these units; recent detections (2011 to present) are fewer than 20 birds for each analysis unit. An evaluation of current status information yields that eastern black rails are effectively extirpated from portions of the New England, Appalachians, and Central Lowlands analysis units that were once occupied. Lastly, resiliency is unknown for the Central America and Caribbean portion of the eastern black rail's range. However, the sparsity of historical and current records, including nest records, indicates that resiliency outside of the contiguous United States is likely low. All recent sightings in Central America and the Caribbean have been of adult eastern black rails; there are no reports of nests, chicks, or juveniles.

To assess current representation, we evaluated both habitat variability and latitudinal variability. When considering habitat variability, we determined the eastern black rail has a level of adaptive potential by using similar habitats elements (*i.e.*, higher elevation areas within wetlands with dense vegetation, moist soils, and shallow flood depth) within different wetland types within analysis units. However, there may be

unknown factors that influence and affect the eastern black rail's use of wetland habitat, as not all apparently suitable wetland habitat is currently occupied. While the New England, Appalachians, and Central Lowlands analysis units have experienced wetland habitat loss and fragmentation, wetland habitats continue to be present on the landscape. However, the eastern black rail is not being found in these three analysis units with any consistency or by detections representing more than single individuals. Historically, the eastern black rail had a wide distribution and exhibited latitudinal variability. Currently, as discussed above, three of the analysis units (New England, Appalachians, and Central Lowlands) are effectively extirpated, and, therefore, this latitudinal variability (higher latitudes) has effectively been lost to the subspecies. Therefore, even though the eastern black rail still occurs at varying latitudes, we conclude that the subspecies currently has reduced representation across its range.

Despite having a wide distribution, the eastern black rail currently has low redundancy across its range. With the loss of three analysis units in upper latitudes of the range, the subspecies has reduced ability to withstand catastrophic events, such as hurricanes and tropical storms, which could impact the lower latitudinal analysis units. Given the lack of habitat connectivity, and patchy and localized distribution, it would be difficult for the subspecies to recover from a catastrophic event in one or more analysis units.

Risk Factors for Eastern Black Rail

The Act directs us to determine whether any species is an endangered species or a threatened species because of any factors affecting its continued existence. Under section 4(a)(1) of the Act, we may list a species based on (A) The present or threatened

destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term “threat” to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term “threat” may encompass—either together or separately—the source of the action or condition or the action or condition itself.

The mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an “endangered species” or a “threatened species.” In determining whether a species meets either definition, we must evaluate all identified threats by considering the expected response by the species, and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species—such as any existing

regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an “endangered species” or a “threatened species” only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future. We reviewed the potential risk factors (*i.e.*, threats or stressors) that are affecting the eastern black rail now and into the future. In this rule, we will discuss in detail only those threats that we conclude are driving the status and future viability of the species. The primary threats to eastern black rail are: (1) Habitat fragmentation and conversion, resulting in the loss of wetland habitats across the range (Factor A); (2) sea level rise and tidal flooding (Factors A and E); (3) land management practices (*i.e.*, incompatible fire management practices, grazing, and haying/mowing/other mechanical treatment activities) (Factors A and E); and (4) stochastic events (*e.g.*, extreme flooding, hurricanes) (Factor E). Human disturbance, such as birders using excessive playback calls of black rail vocalizations (Factor B), is also a concern for the species. Additional stressors to the species (including oil and chemical spills and environmental contaminants (Factor E); disease, specifically West Nile virus (Factor C); and predation and altered food webs resulting from invasive species (fire ants, feral pigs, nutria, mongoose, and exotic reptiles) introductions (Factor C)) are discussed in the SSA report (Service 2019, entire). However, although these additional stressors may be having localized impacts, they are not the primary drivers of the status of the subspecies, and so we do not discuss them in detail in this document. We also reviewed the conservation efforts being undertaken for the subspecies. The existing regulatory mechanisms do not address threats to the eastern black rail such that it does not warrant listing under the Act (Factor D).

Habitat Fragmentation and Conversion

The eastern black rail is a wetland-dependent bird requiring dense emergent cover (i.e., vegetation) and extremely shallow water depths (typically ≤ 3 cm) over a portion of the wetland-upland interface to support its resource needs. Grasslands and their associated palustrine (freshwater) and estuarine wetland habitats have experienced significant loss and conversion since European settlement (Hannah *et al.* 1995, pp. 137, 151; Noss *et al.* 1995, pp. 57–76, 80–84; Bryer *et al.* 2000, p. 232). Approximately 50 percent (greater than 100 million acres) of the wetlands in the conterminous United States have been lost over the past 200 years; the primary cause of this loss was conversion for agricultural purposes (Dahl 1990, p. 9). Wetland losses for the States within the eastern black rail's historical range have been from 9 percent to 90 percent, with a mean of 52 percent (Dahl 1990, p. 6). Similarly, most of the native grassland/prairie habitats associated with eastern black rail habitat have been lost since European settlement (Sampson and Knopf 1994, pp. 418–421).

The eastern black rail also uses the transition zone (ecotone) between emergent wetlands and upland grasslands. These transitional areas are critical to eastern black rails, as they provide refugia during high-water events caused by precipitation or tidal flooding. These habitat types have also experienced significant declines over time (Sampson and Knopf 1994, pp. 418–421), with many areas within the eastern black rail's historical range losing over 90 percent of their prairie habitat. Most of this loss can be attributed to agricultural conversion (Sampson and Knopf 1994, pp. 419–420). Many of the freshwater wetlands associated with these grasslands were emergent and ephemeral in nature, and would have supported eastern black rails. For example, in Texas, between the

1950s and 1990s, 235,000 acres, or 29 percent, of freshwater wetlands within Gulf coastal prairie were converted primarily to upland agriculture and other upland land uses (Moulton *et al.* 1997, p. 5). This value does not include the numbers of upland prairie acres that were also converted.

Despite regulatory efforts to minimize the loss of wetland habitats, losses and alterations continue to occur to habitats occupied by the eastern black rail. Marshes continue to face substantial impacts from dikes, impoundments, canals, altered freshwater inflows, erosion, relative sea level rise, tidal barriers, tropical storm events, and other natural and human-induced factors (Turner 1990, entire; Kennish 2001, entire; Adam 2002, entire; Tiner 2003, p. 513; Gedan *et al.* 2009, entire). Estuarine emergent wetland losses are mostly attributable to conversion to open water through erosion (Dahl and Stedman 2013, p. 37), while freshwater emergent wetland losses appear to be the result of development (Dahl and Stedman 2013, p. 35). Marine and estuarine wetlands along the northern Gulf of Mexico have been negatively impacted by development, including energy development and coastal storms (Dahl 2011, p. 47). Because the rail is a wetland-dependent subspecies, the loss and alteration of palustrine and estuarine wetlands and associated grassland habitats have a negative impact.

Within the range of the eastern black rail, land use in the United States has affected and continues to affect groundwater and surface water resources (Johnston 1997, entire; McGuire 2014, pp. 1–2, 7, 9; Barfield 2016, pp. 2–4; Juracek and Eng 2017, pp. 1, 11–16). The conversion of wetland habitat, largely for agricultural use, was mentioned above. However, habitat conversion and land use directly and indirectly affect water resources, largely tied to the interaction of groundwater and surface water resources

(Sophocleous 2002, entire; Tiner 2003, p. 495; Glazer and Likens 2012, entire; Konikow 2015, entire; U.S. Geological Survey (USGS) 2016, unpaginated).

Where groundwater resources are hydraulically connected to surface water resources, these connections can either be unconfined (water table) or confined (springs) aquifers. In unconfined aquifers, locations can support surface features such as wetlands or riparian habitats where groundwater is located near the land surface (Haag and Lee 2010, pp. 16–19, 21–24). Lowering of groundwater through withdrawals via wells or ditches can cause wetlands to shrink or become dry. Withdrawals of confined aquifers can lead to the drying of springs and associated wetland habitats (Weber and Perry 2006, p. 1255; Metz 2011, p. 2). In the central and southcentral United States, high groundwater use, largely attributed to cropland irrigation and other human activities, may affect the long-term sustainability of water resources, including causing wetland loss (McGuire 2014, entire; Juracek 2015, entire; Juracek and Eng 2017, entire; Juracek *et al.* 2017, entire; Perkin *et al.* 2017, entire).

Human modifications to the environment have led to significant changes in vegetation. Some of these modifications include water withdrawals and the construction of levees, drainage canals, and dams. Changes to native vegetation can result in changes to the structure of the habitat (*e.g.*, conversion from emergent to scrub-shrub wetlands, wetland into upland habitat, or vice-versa), as well as the introduction of invasive plant species (*e.g.*, *Phragmites australis*; Crain *et al.* 2009, p. 157). Given the narrow habitat preferences of the eastern black rail (*i.e.*, very shallow water and dense emergent vegetation), small changes in the plant community can easily result in habitat that is not suitable for the subspecies.

Subsidence (lowering of the earth's surface) is caused by the withdrawal of liquids from below the ground's surface, which relieves supporting hydraulic pressure of liquids by the long-term compression of unconsolidated, geologically deposited sediments, or by other geologic processes (White and Tremblay 1995, entire; Day *et al.* 2011, p. 645; Karegar *et al.* 2016, p. 3129). Localized subsidence can occur with groundwater withdrawals where withdrawal rates are greater than the aquifer recharge rates (White and Tremblay 1995, pp. 794–804; Morton *et al.* 2006, p. 271) or where liquids associated with hydrocarbon extraction have caused the lowering of ground elevations (Morton *et al.* 2006, p. 263). On the Atlantic coast, an area of rapid subsidence exists between Virginia and South Carolina, where the rate of subsidence has doubled due to increased groundwater withdrawals (Karegar *et al.* 2016, pp. 3131–3132). An extreme example of subsidence in the United States is along the Gulf of Mexico coast, where both subsurface liquid withdrawal and sediment consolidation have significant influence on coastal wetland habitats (Turner 1990, pp. 93–94, 96, 98; White and Tremblay 1995, pp. 795–804; Morton *et al.* 2006, entire). Subsidence combined with sea level rise is referred to as relative sea level rise, and the Gulf of Mexico has the highest relative sea level rise rates in the conterminous United States, leading to significant losses in wetland habitats (National Oceanic and Atmospheric Administration (NOAA) 2018, unpaginated).

Subsidence can affect the eastern black rail and its habitat in both fresh and tidal wetlands. Vegetated wetland habitats used by the eastern black rail can be converted to unvegetated open water or mudflats through drowning of vegetation or erosion from increased wave energy. Locations with higher subsidence rates can experience increased

tidal flooding sooner than areas with lower subsidence rates (Sweet *et al.* 2014, pp. 10–13). The effect of increased tidal flooding will change black rail habitat over time (*i.e.*, marsh migration) but can have direct impacts on black rail reproduction when flooding occurs during the breeding season (Erwin *et al.* 2006, entire; Pol *et al.* 2010, pp. 724–728).

Extensive drainage features have been created or modified in the United States, primarily to reduce flooding to protect agricultural land or infrastructure. These include excavation of drainage ditches, channelization of rivers and streams, construction of levees and berms, tidal restrictions, and diversions of waterways. Extensive areas of Florida were channelized in an effort to drain wetlands in the early 1900s (Renken *et al.* 2005, pp. 37–56). Most, if not all, of the coastal plain in Texas contains existing drainage features that were either created or modified to reduce flooding of agricultural lands and associated communities. These features can reduce or eliminate the hydroperiod to sustain associated wetlands by removing water rapidly off the landscape (Blann *et al.* 2009, pp. 919–924). In glaciated geographies such as the Midwest, drain tiles and other methods have been used to drain wetlands to improve conditions for agricultural production (Blann *et al.* 2009, pp. 911–915). Approximately 90 percent of the salt marshes on the northeast United States coast have been ditched to control mosquitoes (Bourn and Cottam 1950, p. 15; Crain *et al.* 2009, pp. 159–161). Ditching increases the area of the marsh that is inundated as well as drained (Daiber 1986, in Crain *et al.* 2009, p. 160; Crain *et al.* 2009, p. 160).

Levees have been constructed in flood-prone areas to minimize damage to crops and local communities. Levees can modify the duration, intensity, and frequencies of

hydroperiods associated with riparian and tidal wetlands and thus change the nature and quality of wetland habitat, including that used by marsh-dependent species (Walker *et al.* 1987, pp. 197–198; Bryant and Chabreck 1998, p. 421; Kuhn *et al.* 1999, p. 624; Kennish 2001, p. 734; Adam 2002, p. 46). They also facilitate the movement patterns of mesopredators and improve their access to wetland habitats (Frey and Conover 2006, pp. 1115–1118). Navigation channels and their management have had extensive impacts to tidal wetlands (*e.g.*, in Louisiana). These channels can modify the vegetation community of associated wetlands and can increase the frequency of extreme high tide or high flow events by providing a more direct connection to the influencing water body (Turner 1990, pp. 97–98; Bass and Turner 1997, pp. 901–902; Kennish 2001, pp. 734–737). Tidal restrictions, such as water control structures, bridges, and culverts built for the purposes of flood protection, restricting salt water intrusion, and modification of vegetation, have also affected coastal salt marshes.

All of these alterations to drainage affect the hydrology, sediment and nutrient transport, and salinities of wetland habitats used by the eastern black rail, which in turn affect the habitat's composition and structure. These changes can lead to instability in the duration and intensity of hydroperiods, affect associated vegetation communities, and impact the ability of marsh habitats to adapt to changing conditions. This situation affects the ability of the habitat to support populations of the eastern black rail, by exposing eastern black rails to unsuitable water regimes or converted habitats.

Sea Level Rise and Tidal Flooding

Representative concentration pathways (RCPs) are the current set of scenarios used for generating projections of climate change; for further discussion, please see the

SSA report (Service 2019, entire). Recent studies project global mean sea level rise to occur within the range of 0.35 to 0.95 meters (m) (1.14 to 3.11 feet (ft)) for RCP 4.5, and within the range of 0.5 to 1.3 m (1.64 to 4.27 ft) for RCP 8.5, by 2100 (Sweet *et al.* 2017b, p. 13). The Northeast Atlantic and western Gulf of Mexico coasts are projected to have amplified relative sea level rise greater than the global average under almost all future sea level rise scenarios through 2100 (Sweet *et al.* 2017b, p. 43).

Sea level rise will amplify coastal flooding associated with both high tide floods and storm surge (Buchanan *et al.* 2017, p. 6). High tide flooding currently has a negative impact on coastal ecosystems, and annual occurrences of high tide flooding have increased five- to ten-fold since the 1960s (Reidmiller *et al.* 2018, p. 728). In addition, extreme coastal flood events are projected to increase in frequency and duration, and the annual number of days impacted by nuisance flooding is increasing, along the Atlantic and Gulf Coasts (Sweet *et al.* 2017b, p. 23). Storm surges from tropical storms will travel farther inland.

Along the Texas Gulf Coast, relative sea level rise is twice as large as the global average (Reidmiller *et al.* 2018, p. 969). Over the past 100 years, local sea level rise has been between 12.7 and 43.2 cm (5 to 17 in), resulting in an average loss of 73 hectares (180 acres) of coastline per year, and future sea level rise is projected to be higher than the global average (Runkle *et al.* 2017b, p. 4; Reidmiller *et al.* 2018, p. 972). In South Carolina, sea level has risen by 3.3 cm (1.3 in) per decade, nearly double the global average, and the number of tidal flood days has increased (Runkle *et al.* 2017c, p. 4). Projected sea level rise for South Carolina is higher than the global average, with some projections indicating sea level rise of 1.2 m (3.9 ft) by 2100 (Runkle *et al.* 2017c, p. 4).

The number of tidal flood days are projected to increase and are large under both high and low emissions scenarios (Runkle *et al.* 2017c, p. 4). Similarly, in Florida, sea level rise has resulted in an increased number of tidal flooding days, which are projected to increase into the future (Runkle *et al.* 2017a, p. 4).

Even with sea level rise, some tidal wetlands may persist at slightly higher elevations (*i.e.*, “in place”) for a few decades, depending on whether plant primary productivity and soil accretion (which involves multiple factors such as plant growth and decomposition rates, buildup of organic matter, and deposition of sediment) can keep pace with the rate of sea level rise, thus avoiding “drowning” (Kirwan *et al.* 2016, entire). Under all future projections, however, the rate of sea level rise increases over time (Sweet *et al.* 2017a, pp. 342–345). A global analysis found that in many locations salt marsh elevation change did not keep pace with sea level rise in the last century and even less so in the past two decades, and concluded that the rate of sea level rise in most areas will overwhelm the capacity of salt marshes to persist (Crosby *et al.* 2016, entire). Under this analysis, based on RCP 4.5 and RCP 8.5 scenarios and assuming continuation of the average rate of current accretion, projected marsh drowning along the Atlantic coast at late century (2081–2100) ranges from about 75 to 90 percent (Crosby *et al.* 2016, p. 96, figure 2). The accretion balance (reported accretion rate minus local sea level rise) is negative for all analyzed sites in the Louisiana Gulf Coast and for all but one site in the mid-Atlantic area (figures 3c and 3d in Crosby *et al.* 2016, p. 97); both of these areas are part of the range of the eastern black rail.

Sea level rise will reduce the availability of suitable habitat for the eastern black rail and overwhelm habitat persistence. Sea level rise and its effects (*e.g.*, increased

flooding and inundation, salt water intrusion) may affect the persistence of coastal or wetland plant species that provide habitat for the eastern black rail (Warren and Niering 1993, p. 96; Morris *et al.* 2002, p. 2876). Increased high tide flooding from sea level rise, as well as the increase in the intensity and frequency of flooding events, will further impact habitat and directly impact eastern black rails through nest destruction and egg loss (Sweet *et al.* 2017b, pp. 35–44).

Land Management Practices (Fire Management, Haying, Mowing, and Other Mechanical Treatment Activities, and Grazing)

Fire Management

Fire suppression has been detrimental to habitats used by the eastern black rail by allowing encroachment of woody plants. Without fire or alternate methods of disturbing grassland and emergent wetland vegetation such as mowing or rotational grazing, the amount of preferred habitat for eastern black rails is expected to continue to decrease in some regions due to encroachment by woody vegetation, such as coastal Texas (Grace *et al.* 2005, p. 39). Therefore, prescribed (controlled) fire is one tool to maintain and restore habitat for this subspecies at the desired seral stage (intermediate stages of ecological succession).

While fire is needed for the maintenance of seral stages for multiple rail species, the timing and frequency of the burns, as well as the specific vegetation types targeted, can lead to undesirable effects on rail habitats in some cases (Eddleman *et al.* 1988, pp. 464–465). Burning salt marshes during drought or while the marshes are not flooded can result in root damage to valuable cover plants (Nyman and Chabreck 1995, p. 138). Controlled burning of peat, or accumulated organic litter, when marshes are dry has

resulted in marsh conversion to open water due to the loss of peat soils. Variations in soil type supporting the same plant species may lead to differing recovery times post-burn, and therefore potentially unanticipated delays in the recovery of black rail habitat (McAtee et al. 1979, p. 375). Simply shifting the season of burn may alter plant species dominance and the associated structure available to the eastern black rail, as is seen with spring fire conversion of chairmaker's bulrush (*Schoenoplectus americanus*) to salt meadow cordgrass (*Spartina patens*) (Nyman and Chabreck 1995, p. 135).

Prescribed fire at any time of the year may result in mortality to adult and juvenile birds, as well as eggs and chicks during the breeding season. Fall and winter burns are more likely to avoid reproductive season impacts (Nyman and Chabreck 1995, p. 138). When burning is needed during the nesting season (for example, brush control), loss of eggs and chicks can be reduced by limiting the proportion of eastern black rail habitat to be burned within a management boundary. Incorporating additional best management practices (BMPs) such as leaving unburned refugia within a controlled burn and planning burn rotations so that adjacent suitable habitat is present to accommodate these rails post-burn, are important at all times of the year to reduce mortality of birds.

Fire pattern can have profound effects on birds. Controlled burns can result in indirect rail mortality, as avian predators attracted to smoke are able to capture rails escaping these fires (Grace *et al.* 2005, p. 6). Because eastern black rails typically prefer concealment rather than flight to escape threats, the birds may attempt to escape to areas not affected by fire, such as wetter areas or adjacent areas not under immediate threat. Ring, expansive, or rapidly moving fires are therefore not conducive to rail survival (Grace *et al.* 2005, p. 9; Legare *et al.* 1998, p. 114). On the other hand, controlled burns

designed to include unburned patches of cover (refugia) may positively influence eastern black rail survival. For example, in Florida, a mosaic of unburned vegetation patches (refugia) 0.1 to 2.0 ac in size facilitated eastern black rail survival during a 1,600-ac controlled burn during the late summer, whereas a controlled burn of a 2,400-ac marsh during the winter resulted in direct mortality of 34 eastern black rails when refugia areas were not provided (Legare *et al.* 1998, p. 114; Legare 2018, pers. comm.). Prescribed fires that include patches of unburned habitat (refugia) scattered throughout provide escape cover for wildlife, including, but not limited to, eastern black rails (Legare *et al.* 1998, p. 114). Unburned strips of vegetation bordering the inside perimeters of burn units also are believed helpful as escape cover from both fire and avian predators (Grace *et al.* 2005, p. 35). Coastal marshes that are burned in staggered rotations to create a mosaic of different seral stages or are burned less frequently will continue to provide cover for marsh species, such as the eastern black rail (Block *et al.* 2016, p. 16).

Haying, Mowing, and Other Mechanical Treatment Activities

Haying, mowing, and other mechanical treatment activities are used throughout the range of the eastern black rail. Mechanical treatment activities maintain grasslands by reducing woody vegetation encroachment, which may provide suitable habitat for eastern black rails. However, these practices can have detrimental impacts to wildlife when used too frequently or at the wrong time of year (Beintema and Muskens 1987, p. 755; Bollinger *et al.* 1990, p. 148; Arbeiter *et al.* 2017, pp. 554–566). For example, at Quivira NWR in Kansas, haying at a frequency of once or twice per year resulted in no occupancy of hayed habitats by eastern black rails during the following year (Kane 2011, pp. 31–33). Further, haying or mowing timed to avoid sensitive stages of the life cycle

(nesting and molt period) would be less detrimental to eastern black rails (Kane 2011, p. 33). Eastern black rails reproduce from approximately mid-March through September across a latitudinal gradient, and mechanical treatment activities during this time period disturbs eastern black rail adults and can potentially crush eggs and chicks. As with fire, when mechanical treatment activities are alternated to allow mosaics of treated and untreated habitat at all times, the site can continue to support cover-dependent wildlife (Tyler *et al.* 1998, pp. 45–49; Kleijn *et al.* 2010, pp. 476, 484; Arbeiter *et al.* 2017, pp. 562–566).

Grazing

Grazing, predominately by cattle, occurs on public and private lands throughout the range of the eastern black rail. Because eastern black rails occupy drier areas in wetlands and require dense cover, these birds are believed to be more susceptible to grazing impacts than other rallids (Eddleman *et al.* 1988, p. 463). Based on current knowledge of grazing and eastern black rail occupancy, the specific timing, duration, and intensity of grazing will result in varying impacts to the eastern black rail and its habitat. Light-to-moderate grazing may be compatible with eastern black rail occupancy under certain conditions, while intensive or heavy grazing is likely to have negative effects on eastern black rails and the quality of their habitat, specifically if the dense overhead cover that the bird requires is removed. It may benefit black rail habitat (or at least not be detrimental) when herbaceous plant production is stimulated (Allen-Diaz *et al.* 2004, p. 147) and the necessary overhead cover is maintained. In Kansas, eastern black rails were documented in habitats receiving rotational grazing during the nesting season that preserved vegetation canopy cover (Kane 2011, pp. 33–34). Black rails occur in habitats

receiving light-to-moderate grazing (*i.e.*, Kane 2011; Richmond *et al.* 2012; Tolliver 2017). These results suggest that such grazing is an option for providing disturbance, which may promote black rail occupancy. However, cattle grazing at high intensities may not favor black rail occupancy, as heavy grazing or overgrazing reduces the wetland vegetation canopy cover (Richmond *et al.* 2010, p. 92).

In addition to the loss of vegetation cover and height (Chabreck 1968, p. 56; Whyte and Cain 1981, p. 66; Kirby *et al.* 1986, p. 496; Yeargan 2001, p. 87; Martin 2003, p. 22), grazing may also have direct negative effects on eastern black rails by livestock disturbing nesting birds or trampling birds and nests (Beintema and Muskens 1987, p. 755; Eddleman *et al.* 1988, p. 463; Jensen *et al.* 1990, pp. 73–74; Durham and Afton 2003, p. 438; Mandema *et al.* 2013, pp. 412–415). Heavy disturbance from grazing can also lead to a decline in eastern black rail habitat quality through soil erosion (Walker and Heitschmidt 1986, pp. 428, 430; Warren *et al.* 1986a, p. 486; Weltz and Wood 1986, p. 263), decreased sediment accumulation and increased soil compaction (Andresen *et al.* 1990, p. 146; Esselink *et al.* 2002, p. 27), diminished water infiltration (Warren *et al.* 1986b, p. 500), and increased salinities eventually leading to habitat conversion (Esselink *et al.* 2002, p. 28).

Stochastic Events (Extreme Weather Events)

Extreme weather effects, such as storms associated with frontal boundaries or tropical disturbances, can also directly affect eastern black rail survival and reproduction, and can result in direct mortality. Tropical storms and hurricanes are projected to increase in intensity and precipitation rates along the North Atlantic coast and Gulf Coast (Bender *et al.* 2010, p. 458; Kossin *et al.* 2017, pp. 259–260). The frequency of Category

4 and 5 tropical storms is predicted to increase despite an overall decrease in the number of disturbances (Bender *et al.* 2010, pp. 457–458). Storms of increased intensity, which will have stronger winds, higher storm surge, and increased flooding, cause significant damage to coastal habitats by destroying vegetation and food sources, as well as resulting in direct mortality of birds. For example, Hurricane Harvey flooded San Bernard NWR in Texas with storm surge, which was followed by runoff flooding from extreme rainfall. This saltmarsh, occupied by eastern black rails, was inundated for several weeks (Woodrow 2017, pers. comm.). Increases in storm frequency, coupled with sea level rise, may result in increased predation exposure of adults and juveniles if they emerge from their preferred habitat of dense vegetation (Takekawa *et al.* 2006, p. 184). Observations show predation upon California black rails during high tides when the birds had minimal vegetation cover in the flooded marsh (Evens and Page 1986, p. 108).

Weather extremes associated with climate change can have direct effects on the eastern black rail, leading to reduced survival of eggs, chicks, and adults. Indirect effects on the eastern black rail are likely to occur through a variety of means, including long-term degradation of both inland and coastal wetland habitats. Other indirect effects may include loss of forage base of wetland-dependent organisms. Warmer and drier conditions will most likely reduce overall habitat quality for the eastern black rail. Because eastern black rails tolerate a narrow range of water levels and variation within those water levels, drying as a result of extended droughts may result in habitat becoming unsuitable, either on a permanent or temporary basis (Watts 2016, p. 120). Extreme drought or flooding conditions may also decrease bird fitness or reproductive success by reducing the availability of the invertebrate prey base (Hands *et al.* 1989, p. 5; Davidson

1992, p. 129). Lower rates of successful reproduction and recruitment lead to further overall declines in population abundance and resiliency to withstand stochastic events such as extreme weather events. The vulnerability of the eastern black rail to the effects of climate change depends on the degree to which the subspecies is susceptible to, and unable to cope with, adverse environmental changes due to long-term weather trends and more extreme weather events.

Human Disturbance

Human disturbance can stress wildlife, resulting in changes in distribution, behavior, demography, and population size (Gill 2007, p. 10). Activities such as birding and hiking, have been shown to disturb breeding and nesting birds. Disturbance may result in nest abandonment, increased predation, and decreased reproductive success, and in behavioral changes in non-breeding birds. Singing activity of breeding male birds declined in sites that experienced human intrusion, although the response varied among species and level of intrusion (Gutzwiller *et al.* 1994, p. 35). At the Tishomingo NWR in Oklahoma, recreational disturbances of migratory waterbirds accounted for 87 percent of all disturbances (followed by natural disturbances (10 percent) and unknown disturbances (3 percent)) (Schummer and Eddleman 2003, p. 789).

Many birders strive to add rare birds to their “life list,” a list of every bird species identified within a birder’s lifetime. Locations of rare birds are often posted online on local birding forums or eBird, leading to an increased number of people visiting the location in an attempt to see or hear the bird. Due to its rarity, the eastern black rail is highly sought after by birders (Beans and Niles 2003, p. 96). Devoted birders may go out of their way to add an eastern black rail to their life list (McClain 2016, unpaginated).

The efforts of birders to locate and identify rare birds, such as the eastern black rail, can have both positive and negative impacts on the bird and its habitat. Birders play an especially important role in contributing to citizen science efforts, such as the eBird online database, and have helped further our understanding of species' distributions and avian migration ecology in crucial ways (Sullivan *et al.* 2014, entire). Birders have provided valuable location information for eastern black rails that might have otherwise gone undetected and have made these records publicly available (see eBird's black rail account; eBird 2017, unpaginated).

While amateur and professional birding have made important contributions to our understanding of rare species like the eastern black rail, some birders may be more likely to pursue a sighting of a rare bird, as they may perceive the benefits of observing the bird to outweigh the impacts to the bird (Bireline 2005, pp. 55–57). As a result, methods may be employed to increase the likelihood of observing a rare bird, including the use of vocalized calls or audio recordings, as is the case for eastern black rails, or approaching birds in order to get a sighting (Beans and Niles 2003, p. 96; Bireline 2005, p. 55). These methods have the potential to disturb nesting birds or trample nests or eggs, and may lead to increased predation (Beans and Niles 2003, p. 96).

With the prevalence of smartphones, the use of playback calls has increased as recordings of birds are readily available on the Internet, and birding websites and geographic site managers (State, Federal, or nongovernmental organizations) often provide guidance on the use of playback calls (Sibley 2001, unpaginated). The American Birding Association's Code of Birding Ethics encourages limited use of recordings and other methods of attracting birds, and recommends that birders never use such methods in

heavily birded areas or for attracting any species that is endangered, threatened, of special concern, or rare in the local area (American Birding Association 2018, unpaginated).

While most birders likely follow these ethical guidelines, using playback calls of eastern black rail vocalizations in attempts to elicit responses from the birds and potentially lure them into view is commonly done outside of formal eastern black rail surveys (eBird 2017, unpaginated). Due to the rarity of the eastern black rail, a few cases of trespassing are known from people looking for the bird (*e.g.*, Kerlinger and Wiedner 1990, p. 62).

Trespassing has been documented on private lands and in areas on public lands specifically closed to the public to protect nesting eastern black rails (Hand 2017, pers. comm.; Roth 2018, pers. comm.). Trespassing may not only disturb the bird, but can also result in trampling of the bird's habitat, as well as of eggs and nests. Some State resource managers and researchers have expressed concern that releasing locations of eastern black rail detections may increase human disturbance and harassment of the subspecies. The potential for human disturbance varies by site and is likely less of an issue for areas that are remote and difficult to access.

Synergistic Effects

It is likely that several stressors are acting synergistically or additively on the subspecies. The combination of multiple stressors may be more harmful than a single stressor acting alone. For the eastern black rail, a combination of stressors result in habitat loss, reduced survival, reduced productivity, and other negative impacts on the subspecies. Sea level rise, coupled with increased tidal flooding, results in the loss of the high marsh habitat required by the subspecies. Land management activities, such as prescribed burning, that are conducted without maintaining dense overhead cover or

providing refugia in eastern black rail habitat will further exacerbate impacts. If these combined stressors occur too often within and across generations, they will limit the ability of the subspecies to maintain occupancy at habitat sites, which may become lost or unsuitable for the subspecies and limit its ability to colonize other previously occupied sites or new sites. For example, tidal marshes in Dorchester County, Maryland, in the Chesapeake Bay (specifically the areas of Blackwater NWR and Elliott Island) served as one of the most well-known former strongholds for the eastern black rail (Watts 2016, p. 22). These marshes have and continue to experience marsh erosion from sea level rise, prolonged flooding, a lack of a sufficient sediment supply, and land subsidence, as well as habitat destruction from nutria (*Myocastor coypus*; now eradicated) and establishment of the invasive common reed (*Phragmites australis*). On Elliott Island, high decadal counts of eastern black rails have declined from the hundreds in the 1950s to no birds detected in recent years (from 2012–2015 the peak count was a single bird, and no birds were detected in 2016) (Watts 2016, pp. 61–62).

Regulations and Conservation Efforts

Federal Protections

The Migratory Bird Treaty Act of 1918 (MBTA; 16 U.S.C. 703 *et seq.*) provides specific protection for the eastern black rail, which is a migratory bird under the statute. The MBTA makes it illegal, unless permitted by Federal regulation, “by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive

for shipment, transportation, carriage, or export, any migratory bird, [or] any part, nest, or egg of any such bird . . . ” (16 U.S.C. 703(a)). Through issuance of permits for scientific collecting of migratory birds, the Service ensures that best practices are implemented for the careful capture and handling of eastern black rails during banding operations and other research activities. However, the December 22, 2017, Solicitor’s Opinion, Opinion M-37050, concludes that consistent with the text, history, and purpose of the MBTA, the statute’s prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to direct and affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs. Therefore, take of an eastern black rail, its chicks, or its eggs that is incidental to another lawful activity does not violate the MBTA. Furthermore, the MBTA does not address the major stressors affecting the eastern black rail, which include habitat alteration and sea level rise. Given that only intentional take is prohibited under the MBTA and the habitat-based stressors to the black rail are not regulated, this law does not provide sufficient substantive protections to the eastern black rail.

Section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) and section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. 403) are intended to protect jurisdictional wetlands from excavation and filling activities. The U.S. Army Corps of Engineers (USACE), in conjunction with the U.S. Environmental Protection Agency, administers permits that require avoidance, minimization, and compensation for projects affecting wetlands. Projects that cannot avoid impacts to wetlands must compensate for their impacts through a restoration enhancement or preservation action for the equivalent functional loss. Mitigation banks are often used, in which actions at a specific location

compensate for impacts in a considerably wider service area. However, the wetland types affected are not always the same types that are restored or enhanced, and there is considerable uncertainty that current mitigation practices would support the presence of black rails.

State Protections

The black rail is listed as endangered under State law by seven States within the subspecies' range: Delaware, Illinois, Indiana, Maryland, New Jersey, New York, and Virginia. The species was formerly listed as endangered in Connecticut, but was considered extirpated during the last listing review based on extant data and was subsequently delisted. Protections are afforded to wildlife listed as either endangered or threatened by a State, but those protections vary by State. Although we have no information as to the effectiveness of these State regulations as they pertain to the conservation of the eastern black rail, one benefit of being State-listed is to bring heightened public awareness of the bird's existence.

In Delaware, the importation, transportation, possession, or sale of any endangered species or parts of endangered species is prohibited, except under license or permit (title 7 of the Delaware Code, sections 601–605). Illinois also prohibits the possession, take, transport, selling, and purchasing, or giving, of a listed species, and allows incidental taking only upon approval of a conservation plan (Illinois Compiled Statutes, chapter 520, sections 10/1–10/11). Indiana prohibits any form of possession of listed species, including taking, transporting, purchasing, or selling, except by permit (title 14 of the Indiana Code, article 22, chapter 34, sections 1–16 (I.C. 14–22–34–1

through 16)). Listed species may be removed, captured, or destroyed only if the species is causing property damage or is a danger to human health (I.C. 14–22–34–16).

Similar prohibitions on the possession of a listed species in any form, except by permit or license, are in effect in Maryland (Code of Maryland, Natural Resources, section 10-2A-01–09), New Jersey (title 23 of the New Jersey Statutes, sections 2A-1 to 2A-15), New York (New York’s Environmental Conservation Law, article 11, title 5, section 11-0535; title 6 of the New York Codes, Rules and Regulations, chapter I, part 182, sections 182.1–182.16), and Virginia (Code of Virginia, title 29.1, section 29.1, sections 563–570 (29.1-563–570)). Violations of these statutes typically are considered misdemeanors, generally resulting in fines or forfeiture of the species or parts of the species and the equipment used to take the species. Some States also have provisions for nongame wildlife and habitat preservation programs (*e.g.*, title 7 of the Delaware Code, sections 201–204; Code of Maryland, Natural Resources, section 1-705). For example, in Maryland, the State Chesapeake Bay and Endangered Species Fund (Code of Maryland, Natural Resources, section 1-705) provides funds to promote the conservation, propagation, and habitat protection of nongame, threatened, or endangered species.

Black rail is listed as a “species in need of conservation” in Kansas, which requires conservation measures to attempt to keep the species from becoming a State-listed endangered or threatened species (Kansas Department of Wildlife, Parks and Tourism 2018, unpaginated). Black rail also is listed as a species of “special concern” in North Carolina and requires monitoring (North Carolina Wildlife Resources Commission 2014, p. 6). The species is identified as a “species of greatest conservation need” in 19 State wildlife action plans as of 2015 (USGS 2017, unpaginated). However, no specific

conservation measures for black rail are associated with these listings, and most are unlikely to address habitat alteration or sea level rise.

Other Conservation Efforts

The Atlantic Coast Joint Venture (ACJV) recently decided to focus efforts on coastal marsh habitat and adopted three flagship species, one being the eastern black rail, to direct conservation attention in this habitat. As part of this initiative, the ACJV-led Black Rail Working Group (BLRA WG) has drafted population goals for the eastern black rail and is drafting a Black Rail Conservation Plan (ACJV BLRA WG 2018, 2019, entire). An initial workshop to start development of the Conservation Plan took place in October 2018. Workshop participants identified five highest priority strategies to conserve the species in the Atlantic Flyway: (1) create new habitat, (2) promote improved impoundment management, (3) develop and promote black rail-friendly fire best management practices, (4) develop and promote black rail-friendly agricultural practices, and (5) develop a landowner assurances program (ACJV BLRA WG 2019, entire). The Conservation Plan is expected to be completed in 2020. ACJV staff are also in the early stages of coordinating several other black rail-specific projects, namely, a species distribution map and an adaptive management tool. In addition, staff are working with partners on a Salt Marsh Bird Conservation Plan, which identifies stressors to Atlantic Coast tidal marshes and the efforts needed to conserve these habitats to maintain bird populations (ACJV 2019, entire). A draft of the plan has been developed, and a final plan is expected late 2019.

The Gulf Coast Joint Venture (GCJV) has had the eastern black rail listed as a priority species since 2007 (GCJV 2005, unpaginated). As a priority species, the black

rail is provided consideration during the review of North American Wetland Conservation grant applications (Vermillion 2018, pers. comm.). Although detailed planning for the eastern black rail is not yet complete, the subspecies is considered in coastal marsh habitat delivery efforts discussed by GCJV Initiative Teams. Eastern black rails are believed to benefit from a plethora of coastal marsh habitat delivery efforts of GCJV partners, including projects authorized under the North American Wetland Conservation Act (16 U.S.C. 4401 *et seq.*), the Coastal Wetlands Planning, Protection and Restoration Act (16 U.S.C. 3951 *et seq.*), and the Service's Coastal Program, as well as management actions on State and Federal refuges and wildlife management areas. Eastern black rails will benefit when projects conserve, enhance, or restore suitable wetland habitat and BMPs, such as the use of prescribed burns and brush-clearing activities, are employed to account for the subspecies.

In November 2016, the Texas Parks and Wildlife Department (TPWD), in partnership with the Texas Comptroller's Office, initiated the Texas Black Rail Working Group (Shackelford 2018, pers. comm.). The main purpose of the group is to provide a forum for collaboration between researchers and stakeholders to share information about what is known about the species, identify information needs, and support conservation actions. The group has held two in-person meetings thus far: January 10, 2017, and August 9–10, 2018, and produced two newsletters and a conservation planning report (Horndeski and Shackelford 2017, entire; Horndeski 2018a, 2018b, entire).

Future Scenarios

As discussed above, we define viability as the ability of a species to sustain populations in the wild over time. To help address uncertainty associated with the degree

and extent of potential future stressors and their impacts on the eastern black rail's needs, we applied the 3Rs using five plausible future scenarios. We devised these five scenarios by identifying information on the primary stressors anticipated to affect the subspecies into the future: habitat loss, sea level rise, groundwater loss, and incompatible land management practices. These scenarios represent a realistic range of plausible future scenarios for the eastern black rail.

We used the results of our occupancy model to create a dynamic site-occupancy, projection model that allowed us to explore future conditions under these scenarios for the Mid-Atlantic, Great Plains, Southeast Coastal Plain, and Southwest Coastal Plain analysis units. We did not project future scenarios for the New England, Appalachian, or Central Lowlands analysis units because, as discussed earlier in this document, we consider these analysis units to be currently effectively extirpated and do not anticipate that this situation will change in the future. Our projection model incorporated functions to account for changes in habitat condition (positive and negative) and habitat loss over time. The habitat loss function was a simple reduction in the total number of possible eastern black rail sites at each time step in the simulation by a randomly drawn percentage that was specified under different scenarios to represent habitat loss due to development or sea level rise. We used the change in "developed" land cover from the National Land Cover Database (Homer *et al.* 2015, entire) to derive an annual rate of change in each region, and we used NOAA climate change and sea level rise projections to estimate probable coastal marsh habitat loss rates; storm surge was not modeled directly (Parris *et al.* 2012, entire; Sweet *et al.* 2017b, entire). In the Great Plains analysis unit, we used ground water loss rates, instead of sea level rise data, to represent

permanent habitat loss in the region. The overall groundwater depletion rate was based on the average over 108 years (1900–2008) (Konikow 2013, entire).

Our five scenarios reflected differing levels of sea level rise and land management, and the combined effects of both. These future scenarios forecast site occupancy for the eastern black rail out to 2100, with time steps at 2043 and 2068 (25 and 50 years from present, respectively). Each scenario evaluates the response of the eastern black rail to changes in three primary risks we identified for the subspecies: habitat loss, sea level rise, and land management (grazing, fire, and haying). The trends of urban development and agricultural development remain the same, i.e., follow the current trend, for all five scenarios. We ran 5,000 replicates of the model for each scenario. For a detailed discussion of the projection model methodology and the five scenarios, please refer to the SSA report (Service 2019, entire).

The model predicted declines in all analysis units across all five plausible future scenarios. Specifically, they predicted a high probability of complete extinction for all four analysis units under all five scenarios by 2068. The model predicted that, depending on the scenario, the Southeast Coastal Plain and Mid-Atlantic Coastal Plain analysis units would reach complete extinction between 35 and 50 years from the present; the Great Plains analysis unit would reach complete extinction between 15 to 25 years from the present; and the Southwest Coastal Plain analysis unit would reach complete extinction between 45 to 50 years from the present. Most predicted occupancy declines were driven by habitat loss rates that were input into each scenario. The model results exhibited little sensitivity to changes in the habitat quality components in the simulations for the range of

values that we explored. For a detailed discussion of the model results for the five scenarios, please refer to the SSA report (Service 2019, entire).

Under our future scenarios, the Mid-Atlantic Coastal Plain, Great Plains, Southwest Coastal Plain, and Southeast Coastal Plain analysis units generally exhibited a consistent downward trend in the proportion of sites remaining occupied after the first approximately 25 years for all scenarios. Given that most of the predicted declines in eastern black rail occupancy were driven by habitat loss rates, and future projections of habitat loss are expected to continue and be exacerbated by sea level rise or groundwater loss, resiliency of the four remaining analysis units is expected to decline further. We expect all eastern black rail analysis units to have no resiliency by 2068, as all are likely to be extirpated by that time. We have no reason to expect the resiliency of eastern black rail outside the contiguous United States to improve in such a manner that will substantially contribute to its viability within the contiguous U.S. portion of the subspecies' range. Limited historical and current data, including nest records, indicate that resiliency outside of the contiguous United States will continue to be low into the future, or decline if habitat loss or other threats continue to impact these areas.

We evaluated representation by analyzing the latitudinal variability and habitat variability of the eastern black rail. Under our future scenarios, the Great Plains analysis unit is projected to be extinct within the next 15 to 25 years, which will result in the loss of that higher latitudinal representative unit for the subspecies. In addition, the three remaining analysis units (Mid-Atlantic Coastal Plain, Southwest Coastal Plain, and Southeast Coastal Plain) are predicted to decline and reach extinction within the next 50 years. Thus, the subspecies' representation will continue to decline.

The eastern black rail will have very limited redundancy in the future. The Great Plains analysis unit will likely be extirpated in 15 to 25 years, leading to further reduction in redundancy and resulting in only coastal populations of the eastern black rail remaining. Having only coastal analysis units remaining (and with even lower resiliency than at present) will further limit the ability of the eastern black rail to withstand catastrophic events, such as flooding from hurricanes and tropical storms.

Please refer to the SSA report (Service 2019, entire) for a more detailed discussion of our evaluation of the biological status of the eastern black rail, the influences that may affect its continued existence, and the modeling efforts undertaken to further inform our analysis.

Summary of Changes from the Proposed Rule

This final rule incorporates changes to our proposed rule based on the comments we received, as discussed below in the **Summary of Comments and Recommendations**. Based on these comments, we also incorporated as appropriate new information into our SSA report, including updated survey information from Colorado, North Carolina, and Georgia. Small, nonsubstantive changes and corrections were made throughout the document in response to comments. However, the information we received during the public comment period on the proposed rule did not change our determination that the eastern black rail is a threatened species. The information also did not cause us to revise our determination that designation of critical habitat for the eastern black rail is not prudent.

We received substantive comments on the proposed 4(d) rule and have made changes to this rule as a result of the public comments received. Below is a summary of substantive changes made to the final listing rule and 4(d) rule:

- Based on information received on South Dakota, we removed it from the list of States where eastern black rail is considered a vagrant.
- In the preamble to the 4(d) rule, we provided a description of “dense overhead cover” for the eastern black rail and identified three methods of assessing this cover.
- In the preamble to the 4(d) rule, we defined a “management boundary” to include individual landholdings, such as a National Wildlife Refuge boundary, or as being formed through landscape-level agreements across landholdings of different or contiguous ownerships.
- In the 4(d) rule and its preamble, we removed the seasonal restrictions and provided clarification on the BMPs identified under the fire management activities. Based on the comments received, we removed the prohibition of prescribed burn activities when these activities take place during the nesting, brooding, and post-breeding flightless molt period. We recognize the importance of using prescribed fire as a management tool for restoring and maintaining habitats on public and private lands and realize that, in order to meet specific management goals, flexibility is needed with regard to the timing of prescribed fire application. For example, a prescribed burn during the growing season may be necessary to target invasive vegetation. We also acknowledge that prescribed burns conducted at any time of the year that do not provide for escape routes and refugia may result in negative impacts to eastern black rails. Under the final 4(d) rule, incidental take of eastern black rails resulting from prescribed fires is

prohibited unless BMPs that minimize negative effects of the prescribed burn on the eastern black rail are employed and a portion of occupied dense cover for the rail is maintained within management boundaries.

We received comments requesting that we provide more information or clarification on the BMPs to use when conducting prescribed burns in eastern black rail habitat. We received feedback on the BMPs from fire practitioners within the Service who have experience managing for prescribed fire within eastern black rail habitat. We determined that at least 50 percent of the eastern black rail habitat within the management boundary should provide dense overhead cover required by the species within one calendar year, and we revised the 4(d) preamble and rule accordingly.

In order to accommodate smaller landholdings, we are excepting landholdings smaller than 640 acres from maintaining 50 percent of eastern black rail habitat in any given calendar year, as we realize it could be challenging to manage for this percentage on small parcels of land. We clarified examples of tactics that can be used to provide unburned refugia and escape routes for the eastern black rail and identified that unburned refugia patches should be no smaller than 100 square feet.

- In the 4(d) preamble and rule, we clarified the exception for the haying, mowing, and other mechanical treatment activities as to existing infrastructure that may be included in the exception. We clarified that existing infrastructure includes existing firebreaks, roads, rights-of-way, levees, dikes, fence lines, airfields, and surface water irrigation infrastructure (e.g., head gates, ditches, canals, water control structures and culverts).

- In the 4(d) preamble and rule, we added an exception for incidental take that results from mechanical treatment activities that are done during the nesting or brooding periods with the purpose of controlling woody encroachment or other invasive plant species to restore degraded habitat.

- In the 4(d) rule and preamble, we removed the reference to “intensive or heavy grazing” in the prohibition. Based on a review of public comments, the terms “light,” “moderate,” and “heavy” grazing caused confusion. Eastern black rails may be found in grazed areas as long as dense overhead cover remains to provide them with suitable habitat. Therefore, grazing densities should maintain the dense overhead cover required by the eastern black rail and allow for the long-term maintenance of habitat conditions required by the subspecies. Because eastern black rails require this dense overhead cover year-round, and not just during the nesting, brood-rearing, or flightless molt period, we removed the seasonal restriction on grazing activities. The final 4(d) rule prohibits incidental take resulting from only those grazing activities on public lands, either individually or cumulatively with other land management activities, that do not maintain the dense overhead cover required by the subspecies in at least 50 percent of eastern black rail habitat.

- We added a prohibition to the 4(d) rule that prohibits incidental take of the eastern black rail that results from long-term or permanent conversion, fragmentation, and damage of persistent emergent wetland habitat and the contiguous wetland-upland transition zone to other habitat types or land uses. We received public comments requesting that we consider prohibiting activities, such as road construction, residential, commercial, and industrial development, commercial development, and oil and natural

gas exploration and extraction, including seismic lines, as these may have negative impacts on the eastern black rail and its habitat. In our SSA report and proposed and final rule for the eastern black rail, we identified habitat loss and fragmentation as an ongoing and future threat to the subspecies. We agree that protecting the persistent emergent wetland habitat and contiguous wetland-upland transition zone is necessary and advisable for the conservation of the eastern black rail.

- We added an exception to the 4(d) rule for incidental take of eastern black rails that may result from prescribed burns, grazing activities, and mechanical treatment activities that take place in existing moist soil management units or prior converted croplands, such as impoundments for rice or other cereal grains. We received public comments requesting that we consider an exception for these types of units. Some individual managed wetland units have an established history of intensive vegetation and soil management, which may include burning during the growing season on an annual or nearly annual basis (e.g., moist soil management). In contrast to emergent wetlands, these wetland units have established objectives to maintain unvegetated (e.g., mudflat), sparsely vegetated, and/or primarily annual plant communities that may not provide vegetative cover during a substantial portion of the growing season.

- We added an exception to the 4(d) rule for incidental take that may result from efforts to control wildfires and an exception for incidental take resulting from the establishment of new firebreaks (for example, to protect wildlands or manmade infrastructure) and new fence lines. Both of these activities allow for management that will benefit the conservation of the eastern black rail and its habitat, as well as provide for public safety.

Summary of Comments and Recommendations

In the proposed rule published on October 9, 2018 (83 FR 50610), we requested that all interested parties submit written comments on the proposal by December 10, 2018. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. A newspaper notice inviting general public comments was published in the USA Today on October 15, 2018. We did not receive any requests for a public hearing. All substantive information provided during the comment period has either been incorporated directly into the SSA report or this final determination or addressed below.

Peer Reviewer Comments

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinion from knowledgeable individuals with scientific expertise that included familiarity with the eastern black rail and its habitat, biological needs, and threats. During development of the SSA report, we reached out to 10 peer reviewers and received responses from 5. We reviewed all comments received from the peer reviewers for substantive issues and new information regarding the eastern black rail. All comments were incorporated into the SSA report prior to the proposed rule. The reviewers were generally supportive of our approach and made suggestions and comments that strengthened our analysis. Peer reviewer comments are addressed in the following summary and incorporated into the SSA report and this final rule as appropriate.

1. Comment: One peer reviewer suggested we include additional discussion on the functional aspects of slope and hydrology in our Habitat Description provided in the

SSA report. The commenter stated that this section focused almost entirely on floristics and the section would benefit from more discussion of habitat structure.

Response: The Habitat Description section describes the floristic communities associated with the presence of eastern black rails. These floristic communities have associated relationships with slope and hydrology, which may vary across the range of the species. We have updated the SSA to include more information on habitat structure, including slope and hydrology in eastern black rail habitat.

2. Comment: One peer reviewer requested that we add a summary of the information on the rapid declines of eastern black rail populations.

Response: We have added this information to chapter 2 of the SSA report.

3. Comment: One peer reviewer requested that we add a figure to show the analysis units where the eastern black rail is considered extirpated.

Response: We include a map in the SSA report that identifies the five analysis units. In the report's text, we identify the three analysis units that we consider to be effectively extirpated: New England, Appalachians, and Central Lowlands due to recent low numbers of detections and documented extirpations from previously occupied areas.

4. Comment: One peer reviewer requested that we provide a 'minimum number' of eastern black rails in the analysis units. This reviewer stated that it would highlight how dire the situation is for this subspecies across all of its range. The reviewer noted that the subspecies has been extirpated from a large percentage of its range and has declined by over 90 percent in areas that were former strongholds.

Response: We added a table to the SSA report that provides population estimates (reported as the number of breeding pairs) for eastern black rail in the northeast and

southeast United States. We also provided additional discussion in chapter 2 of the SSA report on population declines.

5. Comment: One peer reviewer requested that we provide a more detailed description of the projection model and the data that drive the model.

Response: We expanded the discussion in the SSA report and the Appendices.

6. Comment: One peer reviewer commented that the current condition analysis underestimated the range of habitat the eastern black rail has used and will accept. According to the reviewer, eastern black rails have historically nested in a range of situations along the coast and inland that are connected by some physical characteristics. The peer reviewer stated that most of the recent survey data came from coastal marshes, which represents a subset of what the species has used, and so may underestimate resiliency.

Response: We respectfully disagree with this comment. The eastern black rail has a very small home range. There is currently substantial habitat available that is not being used at locations where we know the bird is present. The fact that habitats are not being fully used indicates that there is a lack of "resiliency" for the population under current conditions. The limiting factor does not appear to be habitat. Further, our current condition analysis was informed by our analysis units, which were developed using data from South Carolina, Florida, Texas, and Kansas.

7. Comment: One peer reviewer commented that the eastern black rail has historically shown a pattern of colonization that puts it in the pioneer category, that is, it can take advantage of habitat patches that are ephemeral. While the eastern black rail

may require a narrow niche in terms of vegetation structure and hydrology, it does appear capable of finding locations that have these preferred habitat characteristics.

Response: We added a discussion of this adaptive potential into the SSA report in chapter 4.

8. Comment: One peer reviewer noted that some eastern black rails are migratory, but acknowledged that this cannot really be incorporated into a dynamic occupancy model. However, the reviewer suggested we note this in our discussion of the model.

Response: We agree that some eastern black rails are migratory. However, we note that we are trying to understand how populations might change and it is likely that individual birds would breed in the same place. Eastern black rails that reside in northern latitudes migrate and overwinter at locations further south (Butler 2017). Since little is known about migration behavior and site fidelity of migrants, migration is not considered a factor in these analyses.

9. Comment: One peer reviewer asked why we used slope as a covariate in the development of our analysis units and whether we considered using elevation.

Response: The variation in elevation was very small, and we did not have enough information on elevation to find a relationship. In essence, the variables were colinear and elevation varied by little if at all. Slope, however, while colinear with elevation, had a wide range of values. In the end, elevation was not a useful variable for the analysis.

10. Comment: One peer reviewer identified a dataset from North Carolina that provides data on eastern black rails from the historical 'high use' part of the State, as well as two datasets from Maryland and New Jersey, and suggested we consider incorporating

these data into our dynamic occupancy model to inform the analysis of the Mid-Atlantic analysis unit. A second peer reviewer also identified the Maryland dataset and asked why these data were not incorporated into the dynamic occupancy model.

Response: Our occupancy analyses used to evaluate current condition required at least two consecutive years of survey data; therefore, the Maryland survey data were not used in our model, as these data were not collected in successive years. However, we used the Maryland dataset to calculate psi (detection) and occupancy for a single season and incorporated this information into our SSA report. These data were from the same sites surveyed three times over ~25 years (Brinker 2014, unpublished data). The Maryland sites saw a decline in estimated occupancy from ~0.25 to 0.03, giving credence to the inference that occupancy has declined for eastern black rails in the Mid-Atlantic Coastal Plain analysis unit. Similarly, the New Jersey and North Carolina datasets referred to by the commenter did not have successive years of surveys; however, the contemporary State data were used in the development of our analysis units (the data were insufficient for the dynamic occupancy analysis).

11. Comment: One peer reviewer noted that when developing the covariate analysis we do not have the high-resolution data, such as water depth data that has a resolution of 1 centimeter or vegetation data associated with the hydrology, that would provide the resolution really needed for this species and produce meaningful insights.

Response: We did not get these types of data (e.g., water depth or vegetation) from available reports. In fact, we often had to use remotely-sensed information to help inform the model. The covariates might be considered coarse given that these variables had to be remotely sensed; however, these data were not collected during the studies

across all sites, so this was the best available information. It should be noted that water depth is weather dependent and can change at any time, so we do not believe that a more resolute data set of +/- 1 centimeter would be meaningful. It is reasonable to desire higher resolution, i.e., vegetation, in order to enhance our understanding; however, we conclude that the results are meaningful. We do note in our current condition occupancy analysis that the occupancy data indicated only the null model (i.e., a model with no covariates) or a simple, year-specific model was the best model or equally as good. However, the occupancy and extinction risk analyses were useful, even if we cannot predict at a local scale why any individual site might disappear.

12. Comment: One peer reviewer asked how the occupancy modeling results were influenced by the selection of the survey data inputted into the model. For example, how would the results differ if survey points were used from areas that lacked black rails as opposed to locations where black rails are known to occur?

Response: Our assessment of current condition and future condition is based on the occupancy, colonization, and extirpation estimates from the repeated survey data, which rely on adequate site selection for black rail surveys in order for the results to be useful in making inferences about current and future population status. Improper site selection could introduce negative bias on model estimates (i.e., decrease occupancy, decrease colonization) and thus lead to pessimistic assessment of current and future status. However, these survey points were specifically selected to target black rail habitat and sites where black rails had been previously observed. Surveyors used the best available information on black rail habitat preferences and set their survey points accordingly.

13. Comment: One peer reviewer noted that the datasets used in the dynamic occupancy model were based on point-count networks. As noted in the SSA report, the availability of such surveys is limited for the eastern black rail. The peer reviewer suggests an occupancy analysis based on marsh patches, rather than point counts, as it would allow for longer time series and a greater geographic area for analysis.

Response: In order to undertake an occupancy analysis based on marsh patches, we would need to come up with a definition of what constituted a patch, and these would likely not be equal in size across the range of the bird. Points have a distinct spatial definition that is repeatable. Additionally, we followed the National Marshbird Monitoring Plan, which uses a point-count approach. While developing an analysis based on marsh patches may allow for the use of longer time series and larger geographic areas, there would be an associated incorporation of error through defining marsh patches and extrapolation. The approach used directly relies on survey results, and, given the limited number of observations, using patches would have resulted in more temporal samples but fewer point samples.

14. Comment: One peer reviewer commented that land cover, vegetation type, land-use/modification, extent of hydrologic disruption, or percentage change in wetland area may be more suitable variables to use in the projection model to predict extinction and colonization probability of eastern black rails.

Response: Other analysis already available showed that temperature was an important covariate. We included temperature to reflect those existing analyses. Precipitation was used because it was colinear with wetland water depth and wetland spatial extent for this species. Some of these variables were used in the projection

modeling, as well. Assumptions of both models were clearly articulated in the SSA report.

15. Comment: One peer reviewer stated that the definition of a site is missing. This peer reviewer commented that the site-occupancy projection model does not consider site isolation, which limits eastern black rail colonization, and site size, which is a factor related to extinction.

Response: The definition of “site” was added to both the data analysis portion of the Appendix and to the simulation modeling portion (in the SSA report). The projection model was not spatially explicit; adding site isolation could potentially increase extinction risk at a local site and reduce colonization.

16. Comment: One peer reviewer requested clarification on how occupancy and resilience were related and if we were equating occupancy with resiliency.

Response: Given data availability, eastern black rail resiliency was estimated using the probability of occupancy at the analysis unit-level. Resiliency describes the ability of a population to withstand stochastic disturbance. Stochastic events are those arising from random factors such as weather, flooding, or fire. Resiliency is positively related to population size and growth rate and may be influenced by connectivity among populations. Generally speaking, populations need enough individuals, within habitat patches of adequate area and quality, to maintain survival and reproduction in spite of disturbance. Resiliency is measured using metrics that describe analysis unit condition and habitat; in the case of the eastern black rail, we used occupancy within the analysis units to assess resiliency.

17. Comment: One peer reviewer asked what would happen to our assessment of viability if our assessment had included types of habitat that eastern black rails can use that have not been sampled, such as the types of sites where black rails are found in California or the Front Range of Colorado.

Response: The projection models are entirely dependent on the data used to estimate occupancy and extinction dynamics. Our assessment included habitat types such as those found in California or Colorado (i.e., inland palustrine marshes). The values we used to project future conditions used regional rates of wetland loss where available for emergent wetlands and did not distinguish between emergent wetland types.

Federal Agency Comments

18. Comment: A Federal agency recommended including the following on the list of mowing and mechanical treatment activity exemptions in the 4(d) rule as they are unlikely to occur in suitable eastern black rail habitat: permanently flooded areas/open water exceeding [e.g., less than 6 cm]; paved areas; cropland (i.e., areas planted to annual row crops, such as corn and soybeans including hay in rotation); forest; and pasture or areas mowed, hayed, or grazed too frequently or intensively to allow development of dense emergent wetland vegetation.

Response: Incidental take associated with activities in habitats not suitable for the eastern black rail is not prohibited. While there is a chance that an individual eastern black rail may be present in such non-suitable habitats, it is the intent of this rule to focus the prohibitions in areas where eastern black rail occupancy is likely and where eastern black rails are present. Therefore, we are not adding a list of unsuitable habitats to the

list of exceptions for haying, mowing, and other mechanical treatment activities because it is not necessary.

19. Comment: A Federal agency requested that we provide, in the exemptions section of the 4(d) rule, a list of land uses or habitat types where the eastern black rail is likely to be present.

Response: Section 2.4.2 of the SSA report describes the vegetation associations used by the eastern black rail. For more specific information, we encourage interested parties to contact the local Service field office.

20. Comment: One Federal agency commented that BMPs should aim to discourage eastern black rail occupancy, as opposed to limiting exemptions when infrastructure and human health or safety is the sole concern.

Response: We did not include measures to discourage eastern black rail occupancy, as these types of activities would not promote conservation of the species.

21. Comment: A Federal agency asked that the Service provide seasonal windows corresponding to the critical time periods during which activities are prohibited under the 4(d) rule.

Response: We revised the 4(d) rule to allow the use of prescribed fire and grazing during any time of year. Incidental take resulting from haying, mowing and other mechanical treatment activities is prohibited, with exceptions, in persistent emergent wetlands during the nesting and brood-rearing periods. We have provided additional information on critical time periods for the eastern black rail in the SSA report (Service 2019, entire).

22. Comment: One Federal agency commented that a blanket restriction on burning during the natural fire season in South Florida may reduce habitat suitability for other threatened and endangered species. One commenter recommended that the 4(d) rule exempt take of birds in South Florida that results from all prescribed fire being undertaken for all natural resource management, in recognition of the fact that fire is a natural and integral component of managing the ecosystems upon which black rails and countless other species occupy.

Response: Under the final 4(d) rule, incidental take of eastern black rails due to prescribed fire is prohibited unless BMPs that minimize negative effects of the prescribed burn on the eastern black rail are employed. If these practices are followed, prescribed burning is permissible year-round under the 4(d) rule. This is similar to recovery efforts for fire-adapted threatened and endangered species such as the Florida grasshopper sparrow, which involve precautions designed to limit mortality of eggs and chicks due to prescribed fire activities. The identified practices are necessary and advisable for the conservation of the eastern black rail and, if followed, should minimize take of the eastern black rail and allow for population growth and maintenance. The 4(d) rule provides land managers the flexibility to address habitat management goals while maintaining suitable habitat for eastern black rails.

23. Comment: One Federal agency commented that we should focus on the vegetative conditions desired when using prescribed fire for the eastern black rail rather than the methods and techniques used.

Response: Most grassland and marshland habitats are maintained through a disturbance regime with natural and anthropogenic fires being a primary disturbance

agent. Survey results and field observations indicate that habitat is currently available that would support the eastern black rail but is unoccupied. Therefore, measures that minimize mortality and improve survival are important if populations are expected to grow and spread to available habitats. For these reasons, we determined that the 4(d) rule must address methods and techniques used, as we find that this is necessary and advisable to provide for the conservation of the eastern black rail. The preamble of the 4(d) rule does discuss the dense overhead cover required by the eastern black rail and provides three examples of how to measure this cover.

24. Comment: One Federal agency and one State requested that activities to control nuisance and/or invasive wildlife, e.g., hazing or pyrotechnics at airports, aerial shooting of feral swine, beaver and nutria trapping, and removal of beaver dams, be added to the exceptions from prohibitions.

Response: Incidental take of eastern black rails that results from activities to control nuisance and/or invasive wildlife is not prohibited by the 4(d) rule and, therefore, does not need to be listed under the exceptions from prohibitions. These activities include pyrotechnics at airports, aerial shooting of feral swine, beaver and nutria trapping, and removal of beaver dams.

State Comments

Listing

25. Comment: Three States and two public commenters expressed concerns regarding the limited information surrounding the species' and management needs overall, as well as in the SSA analysis and the listing and 4(d) rules. Commenters either

requested that listing of the eastern black rail be delayed, or stated that a listing determination could not be made until more data were collected on the species.

Response: We are required to make our determination based on the best scientific and commercial data available at the time of our rulemaking, except in cases where the Secretary finds that there is substantial disagreement regarding the sufficiency or accuracy of the available data relevant to the determination. In such a case, under section 4(b)(6)(B)(i) of the Act, the Secretary may extend the 1-year period to make a final determination by up to 6 months for the purposes of soliciting additional data. In this case, we did not extend our final determination on the listing status of the eastern black rail because we determined that there was no substantial disagreement regarding the sufficiency or accuracy of the available threats information. We considered the best scientific and commercial data available regarding the eastern black rail to evaluate its potential status under the Act. We solicited peer review of our evaluation of the available data, and our peer reviewers supported our analysis.

That said, science is a cumulative process, and the body of knowledge is ever-growing. In light of this, the Service will always take new research into consideration. If such research supports amendment or revision of this rule in the future, the Service will modify the rule consistent with the Act.

26. Comment: One State stated that there is little evidence to suggest eastern black rails can be reliably found at any location in Kansas other than Quivira National Wildlife Refuge. Another commenter stated that there is little evidence to suggest eastern black rails can be reliably found at Cheyenne Bottoms. Both commenters requested that the final rule reflect this information.

Response: We reviewed the best available information on the occurrences of eastern black rail in Kansas. This information indicates that eight counties have confirmed breeding records in Kansas, but Quivira National Wildlife Refuge is the only known site with consistent or regular breeding activities (Thompson *et al.* 2011, p. 123). We have revised the SSA report accordingly.

27. Comment: One State commenter stated that the single accepted record for South Dakota was rejected by the South Dakota Rare Bird Records Committee; therefore, no verified occurrence records of the subspecies occur in South Dakota.

Response: The reference to South Dakota has been removed from the final listing rule and from the corresponding sentence in the SSA.

28. Comment: One State and one other commenter stated that eastern black rail estimates for Texas are underestimates and public and private lands have ample area for eastern black rail. One commenter stated that the listing of the eastern black rail should be limited to the portions of the range where decline has been documented. This commenter stated that the species is declining in other parts of the range but is not imperiled on the Texas Gulf Coast. One commenter stated that the SSA used only Watts' data on subspecies abundance in Texas and excluded that provided by Tolliver (2017). This commenter also stated that eastern black rail estimates for Texas are underestimates, commenting that because the Texas coast is largely privately owned with sites managed similarly as described in Tolliver (2017), it is safe to assume that the Texas population of eastern black rails is higher than suggested in the SSA report.

Response: We analyzed occurrence records from Watts (2016), Smith-Patten and Patten (2012), and eBird, as well as from formal black rail surveys (e.g., Tolliver 2017) in

the SSA. The best available science as detailed in the SSA report documents 300–5,830 black rails known to exist along the Texas Gulf Coast (Tolliver *et al.* 2017). These estimates were made prior to Hurricane Harvey, which flooded vast areas of Texas coastal marshes for several weeks. Accordingly, we recognize that the estimates in Tolliver *et al.* (2017) may overestimate the current numbers of eastern black rails on the Texas coast in the protected areas that were surveyed. However, the occupancy rates provided by Tolliver *et al.* (2019) were obtained from sites known to be dependable for the species and data were collected by trained observers. The low occupancy rates indicate that not all available habitat is being used because so few individuals remain; these populations are not at density-dependent levels, i.e., the habitat is not full or at carrying capacity. Note that the Tolliver *et al.* (2017) report stated that, while the researchers did extrapolate abundance of birds at survey points to perceived habitat available within the study sites, they cautioned against viewing this information as hard estimates of population size due to inherent flaws in making broad-scale extrapolations of this type. Site occupancy modeling detailed in the SSA projects that this species will disappear without human intervention. While this species may exist at undocumented locations on the Texas Gulf Coast, we have received no records of large numbers of previously undocumented eastern black rails for this portion of the range and have no scientific basis for assuming that they are present. Further, while there may be habitat on private lands outside of conservation lands that do support black rails, we have no data to indicate that the amount of suitable habitat on private lands is significant, nor was data that supports this claim provided during the public comment period.

It would not be appropriate to assume that the public lands evaluated by Tolliver 2017 and private lands are managed the same and that the population estimates for Texas are actually higher than what is suggested in the SSA report. While habitat can be assessed through remote sensing methods, its quality is extremely difficult to assess using this method. The quality of the habitat (dense overhead herbaceous cover) is necessary to support eastern black rail occupancy. No data support the assumption that areas outside of those studied by Tolliver 2017 (and Tolliver *et al.* 2017 and 2019) support similar numbers of rails.

Decisions under the Act cannot be made on a State-by-State basis, but at the species, subspecies, or distinct population segment (DPS) level. For the eastern black rail, we have determined that the subspecies warrants listing as a threatened species throughout its range based on current threats and how those threats are likely to impact the subspecies into the future.

29. Comment: Several States and other commenters stated that the eastern black rail geographic range should include only areas where the species occurs regularly (annually or near annually), and should avoid identifying jurisdictions (e.g., States) where eastern black rail is considered to be a vagrant. One State noted that the Service does not explain or provide justification as to why it accepted several additional reports as "credible" in Nebraska even though previous authors (Bray *et al.* 1986, Sharpe *et al.* 2001, Smith-Patten and Patten 2012, Silcock and Jorgensen 2018) and the Nebraska Ornithological Union Records Committee rejected most of these records and deemed them unacceptable, and that only records accepted by the State rare bird committee should be used. The State commenters specifically requested removal of entire States or

large portions of their States, and requested that listing of the eastern black rail not confer any requirements for any Federal or State agency or private landowners in those areas. Commenters also recommended that the final rule rely only on accepted and verified records of eastern black rail when determining the species' range, in particular for migratory birds that breed in the interior United States.

Response: In both the proposed and final rules, we have defined the eastern black rail's range based on the best available data; however, we recognize that scientific understanding of this species' range will likely continue to improve over time. We recognize that Nebraska has limited detections of eastern black rails and the small likelihood that Nebraska holds any breeding populations. The Service may define a species' range using State boundaries or other geographically appropriate scale. How range is defined depends on characteristics of the species' biology and how it is listed (i.e., as species/subspecies or a DPS). A species' or subspecies' range is typically described at the State or country scale.

We defined the eastern black rail's range based on the data from reliable published scientific literature, submitted manuscripts, species' experts, and occurrence data. Range descriptions do not imply any limitations on the application of the prohibitions in the Act or implementing rules. Such prohibitions apply to all individuals of the species, **wherever found** [emphasis added]. Therefore, whether a specific State or geographic area is included or excluded from the textual description or maps of the eastern black rail's range, the subspecies would be protected under the Act wherever it may be found, for as long as it remains listed. Further, the Act protects individuals of the species wherever they occur, regardless if they are considered vagrant in their occurrence.

Conversely, if the species is not present in areas within the range states, no protections or restrictions would apply to those areas.

30. Comment: One State commented that invasive species such as nonnative *Phragmites* and nutria should be identified as threats to the eastern black rail.

Response: Our SSA report for the eastern black rail discusses the impacts of invasive species, including nonnative plants and nutria, on the eastern black rail. See Service 2019 (chapter 3).

31. Comment: One State commented that human disturbance is not a significant threat in North Carolina due to the remote nature of the habitat and the bird's nocturnal habits.

Response: The comment is noted; however, the evaluation of threats for this subspecies were done both at the analysis unit and the range-wide scale and reflect evidence that human disturbance can and does impact eastern black rail.

32. Comment: One State commented that the Service should consider the use of DPSs given the broad range of the eastern black rail and differences in potential threats, habitat types, and life cycles (migratory versus non-migratory) to those populations.

Response: The petition to list the eastern black rail requested that we consider whether listing is warranted for the species. In conducting status reviews, we generally follow a step-wise process where we begin with a range-wide evaluation, and only consider the status of other listable entities if the species does not warrant listing range-wide. Furthermore, the Service is to exercise its authority with regard to DPSs “sparingly and only when the biological evidence indicates that such action is warranted” (Senate Report 151, 96th Congress, 1st Session). For the eastern black rail, we have determined

that the subspecies warrants listing as a threatened species throughout its range, so there was no need to identify or list a DPS.

Species Status Assessment (SSA)

33. Comment: Two States and several public commenters provided additional information concerning the historical and current status, range, distribution, and population size of the eastern black rail within the contiguous United States.

Response: In our SSA report, we have updated the Historical and Current Range and Distribution section to reflect additional information for Colorado, Delaware, Georgia, Maryland, and North Carolina.

34. Comment: Two States and one public commenter stated that there is a scarcity of data used for the Great Plains Analysis Unit in the SSA. One commenter stated that using general marshbird survey data from Kansas is not appropriate.

Response: The best available scientific and commercial information for this species was used to inform extinction probabilities. Data from black rail-specific surveys were not available for the Great Plains Analysis Unit; therefore, the general marshbird survey data from Kansas, which include eastern black rail detections, represent the best available scientific information. The general marshbird dataset was sufficient for occupancy modeling to be completed for this analysis unit. Further, the occupancy probabilities appeared to be well estimated since the standard error estimates for most parameters were less than the estimated mean (i.e., the coefficient of variations are less than 1.0).

35. Comment: Two States encouraged the Service to apply more critical scrutiny to historical observations of eastern black rail that are used in the SSA, especially those

from the interior portion of the range, and only include verified and substantial observations.

Response: The SSA report summarizes several past assessments, including Watts (2016) and Smith-Patten and Patten (2012), and identifies how those reports classified the eastern black rail. In collecting data points from different sources to assess the eastern black rail across its entire contiguous United States range, we went through a rigorous process to ensure validity of these data. We assessed datasets using different criteria for the analysis unit and occupancy modeling (occupancy modeling is described in section 4.2 of the SSA report). Latitude and longitude data provided by each research group and State wildlife agency was cross-checked with site identification codes. We visually assessed the proximity of points with identical site identification codes by entering the points' latitude and longitude in the open-source geographic information systems program QGIS (QGIS Development Team 2009, unpaginated). We considered eastern black rail occurrences that occurred within a 200–250-meter radius within a season as a single occurrence (presence point) at a single site in a single year. The radius was applied to the data points to remove spatial autocorrelation to provide a robust dataset for the occupancy modeling. Each point was identified by a unique identification number rather than specific locality for all analyses to ensure privacy of the data.

36. Comment: One State suggested that the Service consider how survey effort or methodology might have influenced the figures on page 25 of the SSA.

Response: The figures used to describe the county-level occurrences were slightly modified from Watts (2016) based on more recent survey results. The county-level maps illustrate occurrence and are not intended to illustrate abundance. These maps

did not need to be adjusted for survey effort or differing methodologies, as occurrence is not a measure of abundance. Survey effort for eastern black rails has actually increased over the last decade based on protocols developed by Conway (2011) and others for secretive marsh birds as well as an increased interest in secretive marsh bird conservation. Despite the increase in surveys, documented occurrences of eastern black rail continue to decrease in most States.

Critical Habitat

37. Comment: One State commented that if critical habitat is designated, it would be beneficial if it provides protection for extensive high marsh area but does not preclude beneficial management activities. Another State commented that any critical habitat designation must be based on the best available science and consider sea level rise, marsh habitat types, and tidal regimes. Several other States, and one organization, recommended that we not designate critical habitat for the eastern black rail.

Response: As discussed below (see Comment 39 and **Critical Habitat**), we have determined that designation of critical habitat would not be prudent for the eastern black rail.

38. Comment: We received comments from three States, one organization, and one other commenter recommending that we work with eBird to add eastern black rail to the sensitive species list.

Response: On May 3, 2019, the Service sent a letter to the Project Leader for eBird requesting that the eastern black rail be designated as a Sensitive Species in eBird. On May 23, 2019, we received a response from eBird indicating that eBird designated the eastern black rail as a Sensitive Species.

39. Comment: One State and several public commenters disagreed with the Service's determination that critical habitat is not prudent, or otherwise suggested that we reconsider this determination. Four commenters supported our not prudent determination. Comments in opposition to our not prudent determination were largely based on the potential benefits of designating critical habitat and skepticism that increased risk and harm to the eastern black rail would occur with designation, as birders already know the types of habitat occupied by eastern black rails and can locate remaining populations. One commenter stated that a critical habitat designation would provide added assurances to private and public land managers. One commenter requested designating all known occupied habitat as critical habitat as well as considering designating additional areas for habitat restoration and inland migration.

Response: We recognize that designation of critical habitat can provide benefits to listed species; however, for the eastern black rail, increased threats caused by designation outweigh the benefits (see 83 FR 50627–50628, October 9, 2018, for further discussion). We do not dispute the arguments of the commenters who suggested that birders may have enough information to be able to locate eastern black rail populations, particularly given the use of social media. We acknowledge that general location information is provided within the rule, and more specific location information can be found through other sources. However, we maintain that designation of critical habitat would more widely publicize known occupied locations of the eastern black rail and its essential habitat, thereby exacerbating the threat of disturbance, habitat destruction, or other harm from humans.

4(d) Rule

40. Comment: One State and another commenter requested that the 4(d) rule include a definition of "present" as well as specifics regarding timing, frequency, and methodology of surveys. The State also requested that the rule describe the details of survey methods. One State and another commenter questioned whether there is an accepted survey protocol for the eastern black rail. One State requested including in the 4(d) rule a monitoring requirement that at a minimum establishes presence/absence of the subspecies within the affected area prior to burning during the nesting or molt period.

Response: Eastern black rails are considered present when they are detected using visual, aural, or other means of detection. The Service will be providing guidance on survey methodology acceptable and appropriate for determining presence. However, these will not be included in the final 4(d) rule because methods may change as technology advances and methods to detect presence are significantly different than those used to determine other biological variables such as estimates of abundance or population size. Researchers are in the early stages of assessing the current survey protocols used for black rails and will be investigating the feasibility of developing a single standardized or semi-standardized survey protocol. Until the survey protocol assessment is completed, we recommend that surveyors use the survey methods currently employed by their State wildlife agency for black rails (e.g., Watts *et al.* 2017). Many States use a protocol specific for black rails that has been modified from the Standardized North American Marsh Bird Monitoring Protocol (Conway 2011). The Service and partners are reviewing existing protocols and will be providing in the future additional recommended methods to assess absence/presence.

41. Comment: One State commented that it was unclear if properties located outside of eastern black rail habitat are exempt from the habitat management restrictions. Four States and several other commenters requested that the 4(d) rule apply only in areas where eastern black rails are known to occur and breed regularly. One State suggested the 4(d) rule should be applied only to wetlands that support or are reasonably likely to support breeding or wintering eastern black rails. One State asked the Service to reconsider the requirement in the 4(d) rule that interior States comply with BMPs outside of the reproductive period when black rails are not present. Another State commented that the prohibitions should not apply to northern interior States when the eastern black rail is not seasonally present. One commenter suggested that the 4(d) rule apply only to areas where eastern black rails have been documented within the past 5 years. One commenter requested the Service consider regional application of the 4(d) rule, as opposed to a range-wide application of the prohibitions. One commenter responded that land management practices should receive prohibitions only on public lands where eastern black rails have been seen or heard within the previous 10 days and fire should receive prohibitions only when relative humidity is <20% and wind speed is >20 mph. This commenter stated that prohibitions should not apply across the entire range.

Response: The prohibitions and exceptions to the prohibitions identified in the 4(d) rule are considered necessary and advisable for the conservation of the eastern black rail. The activities identified in the 4(d) rule may result in incidental take of the bird if they are conducted in areas where the bird is present. These activities may take place across the range of the bird and are not limited to one specific geographic area or specific areas where eastern black rails regularly occur and breed. Therefore, the prohibitions and

exceptions to the prohibitions that may result in incidental take of the eastern black rail apply across the range of the bird. If eastern black rails do not occur in an area that an activity, such as prescribed fire or mechanical treatment, is taking place, then no eastern black rails would be in a position to be taken; thus, the take prohibitions do not apply. If suitable habitat is present and eastern black rails may occur in the area, we recommend that surveys be conducted to inform the presence of eastern black rails, and we will provide future guidance on survey methodology. If habitat is unsuitable for the eastern black rail, such as forested areas or row crops, it is unlikely they will occur there. We are not limiting the 4(d) rule to locations where the eastern black rail has been seen or heard only within the previous 10 days; because the eastern black rail is a secretive bird, this measure may not provide enough protection to ensure that the species is not taken. We do not find that the prohibitions should apply only when relative humidity is less than 20 percent and wind speed is greater than 20 mph, as these conditions will vary across the range of the species and such a restriction will not support conservation of the species.

42. Comment: One State commented that restrictions under the 4(d) rule for the eastern black rail would reduce the State's ability to manage for the mottled duck. One commenter disagreed that mowing, disking, or other brush-clearing activities would have a measurable impact on eastern black rail recruitment and survival. The commenter also stated that these tools are essential wetland management tools for the mottled duck.

Response: There is considerable overlap between nesting habitat for eastern black rail and mottled ducks along the Gulf Coast. Mottled ducks, like the eastern black rail, use tall grass and require cover (Stutzenbaker 1988, pp. 72–81). Peak nesting for the mottled duck occurs in March, April, and May on the upper Texas Gulf Coast, but birds

may nest January through August (Stutzenbaker 1988, p. 70). As this species requires approximately a month between initiation of egg-laying and hatching (Bielefeld *et al.* 2010, unpaginated), disruptions to nesting activity early in the season have the potential to greatly delay brood production following re-nesting attempts.

Mottled ducks and other species of migratory birds may benefit from less burning activity during their peak nesting months. Either absence of grazing or the presence of light-intensity grazing is beneficial to mottled duck nesting habitat, while heavy grazing is not beneficial (Stutzenbaker 1988, pp. 72–81; Durham and Afton 2003, p.440). As the 4(d) rule for eastern black rail does not restrict grazing at any period during the year as long as the grazing activity supports the maintenance of appropriate dense overhead cover, we anticipate no conflicts between grazing activities designed to manage mottled duck nesting habitat and eastern black rail habitat. Mechanical treatment activities are prohibited during the nesting and brooding season for the eastern black rail, and this prohibition will avoid incidental take of eastern black rails (via nest destruction and chick mortality) and will likely benefit nesting mottled ducks, as well. The 4(d) rule does not prohibit prescribed burns within (or outside) the sensitive period. The 4(d) rule enables the use of land management tools, such as prescribed burns and mechanical treatment activities, for waterfowl management and may also have positive impacts on the mottled duck.

43. Comment: We were advised by one State, the Central Flyway Council, and three other commenters that prescribed fire, grazing, and haying, mowing, and mechanical treatment activities are needed to conserve eastern black rails and their

habitat and are not incompatible with eastern black rails. One commenter said that land management practices are not detrimental to the species.

Response: Prescribed fire, grazing, haying, mowing, and mechanical treatment activities are positive techniques that can enhance and maintain eastern black rail habitat. However, any of these techniques may be used in a manner that will result in loss of eastern black rail individuals and reproductive potential. Throughout the SSA report (Service 2018 and Service 2019) and the proposed listing rule (83 FR 50610, October 9, 2018), the Service does not treat prescribed fire, grazing, haying, mowing, or mechanical treatment activities as incompatible land management practices. Please see sections 3.4.1–3.4.3 of the SSA report, where we review these management actions in a thorough fashion and pages 50618–50619 of the proposed rule, where we identify both the benefits and potential concerns to consider when using these practices: For example, if a prescribed fire does not ensure refugia are maintained for the subspecies or if grazing activities remove the dense overhead cover required by the eastern black rail. While active management is needed to maintain habitat for the eastern black rail and other species, incidental take associated with these activities should not prevent local population growth and recruitment in order to have an overall beneficial effect for the species. The final 4(d) rule allows for flexibility in applying prescribed burns, grazing, and haying, mowing and other mechanical treatment activities while also providing measures that are necessary and advisable to conserve the eastern black rail.

44. Comment: One State requested that the Service include current and relevant BMPs for each 4(d) rule prohibition, such as the Saltmarsh Conservation Business Plan, the Black Rail Conservation Plan, and State Wildlife Action Plans. The State requested

that if no BMPs exist, we include a provision that supports the future development of BMPs.

Response: The 4(d) rule includes guidelines for land management actions, such as prescribed burns and grazing activities. It does not refer to the specific conservation plans identified by the commenter, as some of these may be in draft form at the time of this rule and may be revised in the future, and others may not have specific BMPs that are tied to the activities identified in the 4(d) rule. However, we encourage the continued development of these plans, as they will also provide for the conservation of the eastern black rail.

45. Comment: One State commented that seasonal prohibitions may affect their ability to manage conservation lands and suggested the restrictions be reduced by 4 to 6 weeks in the spring and 2 weeks in the fall.

Response: The Service agrees with the comment and has revised the prohibitions in the 4(d) rule to remove the seasonal restrictions for prescribed burns and grazing. As modified, these prohibitions still promote habitat management activities while also conserving the eastern black rail.

46. Comment: One State commented that a more reasonable timeframe of the beginning of the nesting season in Oklahoma and Kansas would be mid to late May. The State also commented that several of the records currently classified as evidence of probable nesting are more likely to be of migrants. One State requested guidance as to when eastern black rails initiate the breeding, nesting, and molting period across North Carolina, as this will help facilitate fire planning.

Response: The Service appreciates the comments and recognizes that there is latitudinal variability with the nesting, brooding, and flightless molt periods across the range of the eastern black rail. We have expanded our discussion of the timing of the breeding, nesting, and molting period in the SSA report (Service 2019).

47. Comment: One State commented that the 4(d) rule proposed to apply broad management prohibitions on various forms of wetland management, and expressed concern that it would not be able to adequately manage its wetlands under the proposed 4(d) rule.

Response: The Service has modified the 4(d) rule to provide flexibility to land managers while also ensuring the rule is necessary and advisable for the conservation of the eastern black rail. Seasonal constraints are minimized as long as a portion of dense cover habitat is maintained. Exceptions are also included for specific types of wetland management operations, such as mechanical treatment of woody vegetation in degraded habitat and moist soil unit management activities.

48. Comment: Three States and one commenter requested more flexibility in prescribed fire timing and scale than contained in the proposed rule. One commenter requested greater specificity as to the time of year that prescribed fire may take place in the various regions where the eastern black rail is distributed. One commenter interpreted the 4(d) rule as prohibiting the use of all fire. Another commenter commented that the fire prohibitions in the proposed rule would take away or limit use of prescribed burning. Three States and eight other commenters stated that the 4(d) rule should allow growing season fire, citing concerns for brush control and their ability to meet habitat management goals. They also commented that prohibitions during the

growing season would limit their ability to provide and maintain habitat for eastern black rail and other species due to timing restrictions, impacted burn return intervals, and ignition restrictions. One of these commenters also suggested that fire should be allowed year round. One State commented that the time period of the prohibitions in the 4(d) rule conflicts with management for other species of conservation concern, such as the Florida grasshopper sparrow and the bald eagle. For example, growing season fires are important to reduce woody encroachment and maintain habitat for the Florida grasshopper sparrow. Also, reducing woody encroachment in dry prairie and its embedded marshes also maintains the open conditions needed by the Federally-listed crested caracara and State-designated threatened Florida sandhill crane.

Response: Under the final 4(d) rule, fire is allowed year-round within a framework designed to promote eastern black rail population growth and maintenance at the site level. We agree that brush encroachment is a concern for eastern black rail habitat management. We revised the 4(d) rule to allow incidental take of eastern black rails resulting from prescribed fires throughout the year, as long as identified practices are followed. Employing these practices will minimize incidental take of eastern black rails and provide for long-term habitat needs for the eastern black rail and other cover-dependent species. Under the practices identified in the 4(d) rule, practitioners should ensure that habitat always remains to provide for eastern black rail population growth and maintenance at the site level. Under the 4(d) rule, burning within one calendar year within a management boundary of any ownership should leave in place at least 50 percent of the dense overhead cover habitat available for eastern black rails. This practice will reduce mortality while still allowing for fire application throughout the year.

The conditions described in the rule allow site managers to maintain a mosaic of seral stages on their managed landscape that support many different species that may have slightly different needs including the eastern black rail. The 4(d) rule does not assign burn return intervals; rather, this is left to the discretion of the site manager. Ignition tactics, rates of spread, and flame lengths should allow for wildlife escape routes and avoid trapping birds in a fire. The 4(d) rule provides guidelines for burning using techniques that do not trap and kill eastern black rails. The 4(d) rule also includes guidelines for providing refugia during prescribed fires for this subspecies.

49. Comment: One State commented that the SSA identified a possible risk of increased frequent wildfires as a result of increased drought or lightning strikes. The State commented that the 4(d) rule should be revised to encourage prescribed fire at times that would reduce the potential for catastrophic, unplanned fires.

Response: We have revised the 4(d) rule to remove the seasonal restrictions on prescribed burns. The 4(d) rule allows incidental take resulting from prescribed fires throughout the year, as long as identified practices are followed. Reducing the potential for catastrophic unplanned fires can still be achieved by employing controlled fires where eastern black rails are present. This strategy also allows maintenance of needed habitat that promotes population maintenance and growth for eastern black rail.

50. Comment: One State and one public commenter commented that burn return intervals were not identified for their region or would be affected by the 4(d) rule.

Response: The Service has modified the 4(d) rule to allow prescribed fire to take place any time during the year when using practices that minimize the take of eastern black rails. Fire return frequencies in areas known to support eastern black rails should

be infrequent to a degree that suitable habitat is available for several years to breeding individuals and yet frequent enough to maintain suitable eastern black rail habitat. These fire return frequencies may vary across the species' range and, therefore, should be determined by site managers.

51. Comment: The Central Flyway Council and one commenter requested more information as to how fire prohibitions apply during the nonbreeding season for States with migratory populations such as Colorado, Kansas, and Oklahoma. One State commented that the fire prohibitions should not apply to northern interior States during the nonbreeding season when eastern black rails are not there. One State commenter commented that restricting prescribed fire to the winter season may increase risk, including predation risk, to eastern black rails in Florida.

Response: The Service has modified the 4(d) rule to allow prescribed fire to take place any time during the year when practices that minimize the take of eastern black rails are used. This provision includes retaining habitat in untreated areas that supports the dense overhead cover required by the eastern black rail. This approach allows managers to continue habitat management efforts important to the eastern black rail while supporting its life-cycle needs. The fire prohibition in the 4(d) rule does not apply during the nonbreeding season to areas that only support eastern black rails during the breeding season, as there would not be incidental take of the bird. However, we encourage land managers to maintain suitable habitat for the eastern black rail in known breeding areas if the area does undergo fire treatment during the nonbreeding season.

52. Comment: One State commented that the BMPs outlined in the proposed 4(d) rule may conflict with wildfire risk mitigation and may not work in coastal marsh

settings. The commenter requested technical assistance from the Service to continue to meet obligations to mitigate wildfire risk for coastal communities in a way that aligns with the spirit and intent of the ESA protections for the eastern black rail.

Response: The 4(d) prohibition and identified BMPs on prescribed fire were constructed with input from prescribed fire professionals throughout the range of the subspecies, including four regions of the Service. These personnel found the prohibitions realistic and clearly constructed from a fire professional's perspective. The Service will gladly provide technical assistance in implementing the 4(d) rule upon request.

53. Comment: One State commenter advised that eastern black rails use fire dependent habitats and these habitats require an appropriate amount of fire to maintain. One State commenter advised that fire planning should provide critical cover for the breeding season and consider fire impacts to the invertebrate prey base. More information is needed on overwintering and stopover use of mid-Atlantic marshes where fire is used outside the breeding seasons in order to assess impacts during these time periods.

Response: We agree that habitats occupied by the eastern black rail are fire dependent and may require fire to maintain them (for further discussion, please see the SSA report, section 3.4 (Service 2019)). The 4(d) rule has been modified to ensure that birds are provided sufficient habitat that provides suitable overhead cover during the year for the breeding and non-breeding season. The Service agrees that more research and study will improve our knowledge and understanding of the eastern black rail.

54. Comment: One State requested clarity on prescribed fire refugia size.

Response: In the final 4(d) rule, we have clarified the minimal refugia size and the amount of area within a prescribed fire unit for unburned refugia. As outlined below, unburned patches should be no smaller than 100 square feet.

55. Comment: One State commented that the eastern black rail is documented to re-nest after the loss of an early nest and that the loss of an early nest may reduce, but not preclude, successful annual recruitment. The State commented that, therefore, a failure to apply fire with the appropriate seasonal considerations will result in the eventual loss of the habitat necessary for breeding.

Response: Eastern black rails can re-nest after nest failure. However, for many species of birds including some rallids, re-nesting attempts are less productive than the initial nesting effort. Additionally, displaced adults would have to relocate to untreated sites and establish new territories after a fire. The 4(d) rule allows prescribed fire during the breeding season of the eastern black rail, while ensuring at least half of nesting habitat is untreated and available for established nesting adults and for birds displaced by prescribed fire events, i.e., areas supporting dense overhead cover are maintained. The 4(d) rule allows site managers to maintain a mosaic of seral stages on their managed landscape that support many different species that may have slightly different needs, including the eastern black rail. This approach allows managers to continue habitat management efforts important to the eastern black rail while supporting its life-cycle needs.

56. Comment: One State commented that, if heavy grazing results in the degradation of known black rail habitat on public lands, the 4(d) rule should include a provision that includes a no-net-loss habitat restoration/mitigation requirement.

Response: We have revised the 4(d) rule to remove the terms “light to moderate grazing” and “heavy grazing.” The rule prohibits incidental take that results from grazing activities on public lands that occur on eastern black rail habitat and, that individually or cumulatively with other land management practices, do not maintain at least 50 percent of eastern black rail habitat, i.e., dense overhead cover, in any given calendar year within a management boundary.

57. Comment: One State requested that all grazing activities, regardless of intensity, conducted on public lands should include a monitoring requirement prior to the initiation of grazing and after grazing has occurred. The purpose of the before and after monitoring is to confirm the presence/absence of the subspecies within the affected area and to help establish the costs and benefits of grazing on local eastern black rail populations.

Response: Public land site managers may use any of a wide range of methods to assess and evaluate site conditions. These can include pre- and post-treatment assessments of relevant information such as black rail presence/absence or occupancy, or plant species composition and structure. This is a key aspect of Strategic Habitat Conservation Planning (<https://www.fws.gov/science/doc/SHCFactSheet1008pdf.pdf>), which provides continual feedback on the effectiveness of any conservation action. We are not including a monitoring requirement in the 4(d) rule because the methods and techniques may change over time based on improved knowledge.

58. Comment: One State commented that grazing can be a very effective means of removing invasive plant species. The State commented that if survey efforts for eastern black rails increase beyond the traditional salt marsh habitats in the region,

eastern black rails may be discovered in areas like bog turtle wetlands where grazing is the most efficient and effective tool to control invasive plant species and maintain freshwater habitats.

Response: We recognize that grazing can be used as a management tool. The rule allows for the use of grazing as a tool as long as at least 50 percent of eastern black rail habitat, i.e., dense overhead cover, is maintained within management boundaries in any given calendar year.

59. Comment: One State commenter advised that there is no evidence that properly managed cattle would result in take or deleterious impacts to the eastern black rail. They further stated that excessive grazing would be detrimental but rarely occurs on the Texas coast due to its highly productive conditions. They added that herbivory of muskrat, snow goose, and cattle benefits the system that includes eastern black rail habitat, citing Miller *et al.* 1996 and Bhattacharjee *et al.* 2007.

Response: We agree that take of or deleterious impacts to the eastern black rail would not be expected from properly maintained grazing activities that maintain dense overhead cover for the bird. However, we disagree that detrimental effects of excessive grazing are offset by highly productive conditions in Texas. While herbivory may promote diversity, it does not always lead to benefits for all species of wildlife, including the eastern black rail. At a Texas refuge, Miller *et al.* (1996) found that herbivory by geese and cattle can lead to mudflat and open water habitats and loss of emergent marsh and recommended the removal of cattle from sensitive areas (p. 474). In a separate salt marsh in Galveston County, Texas, two studies found that total vegetative cover was significantly reduced by grazing (Yeorgan 2001, entire; Martin 2003, entire). In addition,

both found that the greatest grazing impacts occurred at higher elevations in upper marshes. In Louisiana marshes, the destruction of chairmaker's bulrush (*Scirpus olneyi*) due to heavy grazing has been documented (Chabreck 1968, entire). Diversity of plants increased to pre-disturbance conditions after a multiple-year period of deferred disturbance (Bhattacharjee *et al.* 2007, p. 23). They recommended that grazing and or fire may be used as a disturbance mechanism if the resulting condition is a desired management goal (p. 23). They do not describe disturbance as being beneficial but rather a method to exert a change in the vegetation community.

60. Comment: One State suggested that the grazing prohibition from mid-March through September 30 contained in the 4(d) rule may not fit all cases. This State suggested that the Service consider a shorter prohibition on grazing, coupled with BMPs. For example, cattle stocking densities that closely match historical, natural grazing densities as determined by the Natural Resources Conservation Service likely could be used throughout the year without significant detrimental impacts to the eastern black rail and would likely provide a net benefit. Another State asked that the Service consider eliminating the restriction of "intensive or heavy grazing should be avoided between mid-March and September 30th" or at least provide further details as to how regionally specific grazing recommendations will be defined throughout the eastern black rail's range.

Response: We have revised the 4(d) rule to allow for grazing year-round as long as at least 50 percent of eastern black rail habitat, i.e., dense overhead cover, is maintained in any given calendar year. Generally, favorable grazing intensity leaves overhead cover intact within eastern black rail habitat. Because of differences in plant

communities and climate within and between regions of the species' range, it is not possible to assign specific stocking densities in terms of grazing animal density for a specific site within the 4(d) rule. Cover targets and assessment methods will be provided in guidance documents, and site managers will be responsible for managing grazing densities.

61. Comment: One State asked that the 4(d) rule define "public lands" and clarify which public lands will be subject to the grazing prohibition in the 4(d) rule.

Response: Public lands covered by this prohibition are those lands under governmental management whose intended purpose is to conserve wildlife and/or natural habitats for the general public. This definition includes Federal, State, and locally managed lands. Public lands whose intended purpose may be recreational sports, (e.g., soccer, baseball, etc.), operational management, or other civic purposes are not subject to the rule.

62. Comment: One State and one commenter indicated that although grazers may trample nests, eggs, young chicks, or incubating adults, it seems unlikely that adult or older juveniles would be easily trampled under light to moderate grazing.

Response: We agree that trampling of adult birds may happen less frequently at lighter stocking densities. The primary concern with grazing is the removal of dense overhead cover that this subspecies requires for nesting and to avoid predation.

63. Comment: Two States and a Federal agency requested that we define intense, heavy, moderate, and light grazing. One commenter requested that we define 'intensive or heavy grazing' in terms of Animal Unit Months.

Response: The prohibition of incidental take associated with grazing activities in the 4(d) rule has been revised and applies only to grazing activities on public lands that do not support the maintenance of at least 50 percent of appropriate dense overhead cover habitat for the eastern black rail in any given calendar year. Favorable grazing intensity leaves overhead cover intact within eastern black rail habitat. Because of differences in plant communities and climate within and between regions, it is not possible to assign specific stocking densities in terms of grazing animal density for a specific site within the 4(d) rule. Cover targets and assessment methods will be provided in guidance documents, and site managers will be responsible for managing grazing densities.

64. Comment: One State commented that if grazing, mowing, and haying are used in moderation and under BMPs, these practices could also be used to create better eastern black rail habitat.

Response: We agree that some land management practices can be used to enhance habitat required by the species. The species prefers wet grasslands and emergent marshes that are dominated by herbaceous vegetation. These habitats often require some level of disturbance to reset their successional stage, and this disturbance may be achieved from grazing, mowing, or haying activities.

65. Comment: One State requested more flexibility in mechanical treatment timing and scale than contained in the proposed 4(d) rule. Multiple commenters requested that we clarify or expand the exception for incidental take of eastern black rails that results from mowing, haying, or other mechanical treatment activities that are conducted during the brooding or nesting period and are maintenance activities to ensure safety or operational needs of existing infrastructure. One commenter requested clarity

regarding exceptions to the rule associated with maintenance of existing rights-of-way for electric and other transmission corridors such as pipelines as well as their respective structures such as pump stations or transfer stations. One commenter requested that maintenance of irrigation infrastructure be excepted from the 4(d) rule. One commenter requested that we except maintenance, safety, and operational needs associated with existing electric infrastructure from prohibitions.

Response: We recognize haying, mowing or other mechanical treatment activities may need to be used for maintenance requirements to ensure safety and operational needs for existing infrastructure, and these activities may need to take place during the nesting or brooding periods. We added exceptions to the final 4(d) rule for incidental take resulting from mechanical treatment activities that occur during the nesting and brooding periods, and that are maintenance requirements to ensure safety and operational needs of existing infrastructure. These include maintenance of existing firebreaks, roads, rights-of-way, levees, dikes, fence lines, airfields, and surface water irrigation infrastructure (e.g., head gates, ditches, canals, water control structures, and culverts). Also excepted is incidental take resulting from mechanical treatment activities done during the nesting or brooding periods with the purpose of controlling woody encroachment or other invasive plant species to restore degraded habitat for eastern black rails. Mechanical treatment activities outside of the nesting and brooding period are not prohibited. We find that this approach addresses infrastructure and habitat maintenance needs while promoting eastern black rail population growth and maintenance at the site level.

66. Comment: One State requested management flexibility to manage wetlands for a variety of species as well as to conserve important late-successional cattail and

bulrush habitats for black rails. Cattail management is critical to open up monotypic cattail marshes, and a variety of techniques are needed in different seasons. This State uses mowing, mechanical treatment, and herbicide treatment in early summer through winter.

Response: The incidental take prohibition for mowing and mechanical treatment activities has been modified to apply only during the nesting and brood-rearing period. This provision should provide ample opportunity in late summer to early fall to treat cattail and bulrush marshes and reset their seral stage. The use of herbicides is not prohibited under the 4(d) rule.

67. Comment: Two States and two commenters opposed the timing restrictions for haying, mowing, and other mechanical treatment activities. One State requested more flexibility in the timing. One commenter did not feel that this activity will have measurable impacts on eastern black rail recruitment and survival.

Response: Several exceptions to the rule apply to the haying, mowing, and other mechanical treatment activities that may occur during the brooding or nesting season, including maintenance of existing infrastructure and control of woody encroachment. The impact of these activities on grassland and marshland nesting birds has been well documented (see discussion in the SSA report (Service 2019)). Incidental take of eastern black rails from mowing, haying, and other mechanical treatment activities that take place outside of the brooding or nesting season is not prohibited. However, where prohibitions apply, it is important to recognize that the loss of eggs or chicks affects recruitment into and growth of the population. Population recruitment and growth are crucial to the recovery of the subspecies.

68. Comment: One State suggested that we add a requirement for monitoring prior to the initiation of mechanical treatment activities to determine if the eastern black rail is present.

Response: The determination of whether eastern black rails are present is the responsibility of those undertaking the activity. A variety of methods may be used to assess whether the eastern black rail is present. The Service will be providing guidance and recommendations on different methods to determine the presence of eastern black rails.

69. Comment: One State and two commenters indicated that prohibitions in the proposed rule may prevent control of nonnative plant species, such as *Phragmites*, and thus may impact eastern black rail habitat and its recovery.

Response: We added an exception to the rule to allow incidental take of eastern black rails that result from mowing, haying, and other mechanical treatment activities during the brooding or nesting season, that occurs during the control of woody encroachment and other invasive plant species to restore degraded habitat. Incidental take of eastern black rails from mowing, haying, and other mechanical treatment activities that take place outside of the brooding or nesting season is not prohibited.

70. Comment: One State and three commenters suggested that we did not fully consider the impacts of development (such as urbanization, construction, or oil and gas activities) and other activities that result in the loss of suitable habitat for the eastern black rail. These comments requested that we consider additional provisions in our 4(d) rule to address activities that result in the loss or degradation of eastern black rail habitat.

Response: We appreciate these comments and have included a prohibition in the 4(d) rule that prohibits incidental take resulting from long-term or permanent damage, fragmentation, or conversion of persistent emergent wetlands and the contiguous wetland-upland transition zone to other habitat types (such as open water) or land uses that do not support eastern black rail.

71. Comment: One State and one commenter questioned why the Service did not propose prohibitions under the 4(d) rule that addressed sea level rise and tidal flooding.

Response: Although sea level rise and tidal flooding are threats to the eastern black rail's habitat, we cannot tie these activities to one specific regulated entity. Prohibiting take incidental to an otherwise lawful activity, such as prescribed fire, allows the Service to identify an entity that is conducting the activity (e.g., a Refuge conducting a prescribed burn) and regulate this entity through the prohibitions and exceptions in the 4(d) rule. Prohibiting take of eastern black rails incidental to tidal flooding or sea level rise would not allow us to regulate an identified entity. Therefore, addressing the threats of sea level rise and tidal flooding are outside the scope of this 4(d) rule.

72. Comment: One State commenter requested that several habitat management activities be excepted from incidental take. These included prescribed fire between October 1 through April 15, water level management within impoundments, control of invasive plants using herbicides and/or mechanical means, removal of sediments from existing structures, and restoration activities under USACE Nationwide Permit (NWP) 27.

Response: The Service has revised the 4(d) rule to allow prescribed fire anytime during the year as long as best practices as outlined in the rule are used. The Service has

also excepted from the prohibitions of the rule existing moist soil unit management sites, invasive species control activities, and maintenance of existing water infrastructure. However, activities and projects that are eligible for NWP 27 may or may not have adverse impacts on the eastern black rail. Therefore, activities under NWP 27 are not categorically excepted under the 4(d) rule. Each individual activity must be evaluated to determine whether the prohibitions and exceptions under the rule apply.

73. Comment: One State requested that the Service consider how the 4(d) rule would impact the ability to employ known management methods that benefit eastern black rail habitat and support functional ecosystems. Restrictions should not unduly impact the ability to test habitat creation/restoration methods in an adaptive management framework, especially given our large knowledge gaps for this secretive species.

Response: The Service has modified the 4(d) rule to accommodate habitat management activities that limit incidental take of the bird and maintain wetland habitat for the eastern black rail and other wildlife species. Land managers will maintain flexibility under the 4(d) rule to conduct activities that support functional ecosystems, while also minimizing take of the eastern black rail. Land managers may pilot habitat creation and restoration methods in the future. If these activities have a Federal nexus, the land manager will be required to consult with the Service on the activity, as is required by section 7 of the Act.

74. Comment: One State was concerned that the creation of wetlines as an alternative to firebreaks will not be allowed under the 4(d) rule.

Response: Maintenance of existing firebreaks and the establishment of new firebreaks are excepted under the 4(d) rule. This exception includes temporary breaks in the form of wetlines or compaction lines.

75. Comment: One State commented that moist soil management is important on public and private lands for recovery and that impoundments may help with marsh migration management.

Response: In the 4(d) rule, incidental take resulting from mechanical treatment activities in existing moist soil management units is excepted.

76. Comment: One State requested that airfields be added to the list of existing infrastructure under the exceptions from prohibitions for incidental take resulting from haying, mowing, or other mechanical treatment activities.

Response: We agree and have added airfields to the list of existing infrastructure excepted from the prohibitions of the 4(d) rule.

77. Comment: One State commenter requested that mosquito surveillance and larvicide and adulticide applications be excepted. Another commenter requested that public health mosquito control applications be excepted from the 4(d) rule.

Response: Incidental take of eastern black rails resulting from these activities is not prohibited under the 4(d) rule, so an exception is not needed.

78. Comment: One State requested reassurance that prohibitions in the 4(d) rule will not hinder coastal restoration work, particularly with the current inability to fully delineate locations of high marsh in the bird's range.

Response: The Service recognizes the importance of coastal restoration efforts and that these activities may prove beneficial to the eastern black rail. Coastal restoration

projects may have both temporary and permanent effects on eastern black rails. While not all coastal restoration projects benefit the eastern black rail, some do and can support recovery of the species. The Service recognizes the challenges facing this species and will not arbitrarily hinder restoration activities that may benefit the eastern black rail and its habitat. See Comment 79 for section 7 requirements.

79. Comment: One State and one public commenter requested clarification regarding their section 7 responsibilities under the Act. One commenter asked which public lands will be required to complete section 7 consultation.

Response: Section 7(a)(2) of the Act requires all Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service. This requirement does not change when a 4(d) rule is implemented. In accordance with our regulations found at 50 CFR 402.14 and the Services' Consultation Handbook, it is the action agency's responsibility to determine whether any action "may affect" listed species or critical habitat, and if it may, additional consultation is required. Therefore, when an action agency determines its proposed action will not affect a listed species, no further consultation with the Service is required. If the species will not be exposed directly or indirectly to the proposed action or any resulting environmental changes, an agency should conclude "no effect" and document the finding; this completes the section 7 process. For example, if suitable habitat is not present in the action area and the project does not otherwise present

a risk to the species, an action agency can conclude “no effect” and document their finding.

When an action agency determines its proposed action “may affect” a listed species, all standard consultation procedures apply unless a programmatic consultation approach is developed. For example, if an action is anticipated to result in adverse effects (regardless of whether the effects will result in prohibited or excepted take) to the species, formal consultation is required. While the basic consultation procedures apply, any resulting biological opinions are different in that there are no incidental take statements or associated reasonable and prudent measures and terms and conditions for forms of take that are not prohibited by the 4(d) rule.

80. Comment: One State commented that the 4(d) rule would negatively affect eastern black rail conservation by being a disincentive for more research.

Response: When this final rule is effective, there are several mechanisms to allow for research for the eastern black rail. In accordance with our regulations found at 50 CFR 17.32(a), we may issue a permit for any activity otherwise prohibited with regard to threatened wildlife; permits issued under this section must be for one of the following purposes: scientific purposes, or the enhancement of propagation or survival, or economic hardship, or zoological exhibition, or educational purposes, or special purposes consistent with the Act. Further, any employee or agent of the Service, of the National Marine Fisheries Service, or of a State conservation agency that is operating a conservation program for the eastern black rail pursuant to the terms of a cooperative agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties,

take eastern black rails. We anticipate that the listing of the eastern black rail will necessitate further research that generates knowledge needed to conserve the species, and we encourage States and other partners to continue with research efforts that contribute to conservation.

81. Comment: The Central Flyway Council and one public commenter stated that the Service should fund additional research and explore options to avoid limiting future research as a result of the 4(d) rule.

Response: Research that is conducted for the purpose of recovery of a species is an activity that can be authorized under section 10 of the Act, normally referred to as a recovery permit, or can be conducted by certain State conservation agencies by virtue of their authority under section 6 of the Act. Additional research will be important for recovery of the eastern black rail, and thus the Service will continue to support such actions.

Public Comments

Listing

82. Comment: A commenter stated that the literature has knowledge gaps regarding how black rails and their habitat are affected by management practices and how agencies should proceed with management in different geographic regions.

Response: Current literature, graduate research projects, and project reports have consistently concluded that eastern black rail occupancy increases with increasing overhead cover (see Kane 2011, Butler *et al.* 2015, Tolliver *et al.* 2019). Land management actions that do not leave overhead cover in place for eastern black rail and ensure that such cover is always present within a land management boundary, may

impact the bird. During the breeding season, actions that remove overhead cover or destroy nests will impact egg and chick survival. As more research on eastern black rails and management impacts is completed, our understanding of this issue will continue to expand; however, our rule is based on the best available science.

83. Comment: A commenter asked how relevant scientific data from the Texas Gulf Coast were used in making the listing recommendation.

Response: The Service employed an active outreach effort soliciting any information regarding the eastern black rail. This effort took place at the initiation (July 2017) of and during the development of the SSA. This effort included letter requests for information as well as verbal requests at various times throughout the process; requests were made to Federal agencies, State conservation and land management agencies, national Convention on International Trade in Endangered Species of Wild Fauna and Flora authorities, universities, non-governmental conservation organizations, and species experts. The data we obtained relative to Texas included books, scientific publications, dissertations and theses, governmental documents, personal interviews, survey datasheets and websites that house information. These sources of information were reviewed and used to inform the SSA analysis and report. See **ADDRESSES**, above, for information regarding how to access the materials used in preparing the rule or to review the Literature Cited of the SSA report (Service 2019).

84. Comment: One commenter stated that listing will cause excessive management problems to private landowners in Louisiana. One commenter stated that the listing of the eastern black rail will affect agriculture and that these effects should be taken into consideration.

Response: For listing actions, the Act requires that we make determinations “solely on the basis of the best available scientific and commercial data available” (16 U.S.C. 1533(b)(1)(A)). The Act does not allow us to consider the impacts of listing on economics or human activities, whether over the short term, long term, or cumulatively. Therefore, we may not consider information concerning economic or management impacts when making listing determinations. It should be noted that Louisiana has few documented occurrences of eastern black rail and these occurrences are concentrated in and around southwest Louisiana (Johnson and Lehman 2019b, entire). With such limited occurrences, we do not anticipate the listing rule will have a widespread impact on agriculture or private landowners. Further, our 4(d) rule excepts incidental take of eastern black rails from activities in existing moist soil management units or prior converted croplands (e.g., impoundments for rice or other cereal grain production).

85. Comment: Two commenters questioned the quality of information used in decision-making, and whether adequate surveys exist to inform the listing decision.

Response: In accordance with section 4 of the Act, we are required to determine whether a species warrants listing on the basis of the best scientific and commercial data available at the time we make our determination. Further, our Policy on Information Standards under the Act (published in the *Federal Register* on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106-554; H.R. 5658)), and our associated Information Quality Guidelines (www.fws.gov/informationquality/), provide criteria and guidance, and establish procedures to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent

consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for determining whether a species warrants listing as an endangered or threatened species.

Primary or original information sources are those that are closest to the subject being studied, as opposed to those that cite, comment on, or build upon primary sources. However, the Act and our regulations do not require us to use only peer-reviewed literature, but instead they require us to use the “best scientific and commercial data available” in a listing determination. We use information from many different sources, including articles in peer-reviewed journals, scientific status surveys and studies completed by qualified individuals, Master's thesis research that has been reviewed but not published in a journal, other unpublished governmental and nongovernmental reports, reports prepared by industry, personal communication about management or other relevant topics, conservation plans developed by States and counties, biological assessments, other unpublished materials, experts’ opinions or personal knowledge, and other sources. We have relied on published articles, unpublished research, digital data publicly available on the Internet, and the expert opinion of subject biologists to make a final listing determination for the eastern black rail.

We collected and used data from eBird (these records included historical records, observations from birders, and survey-collected data through 2017). The Center for Conservation Biology dataset provided an integrated dataset for U.S. coastal states, including surveys, literature, and museum records; these data are through 2016. The University of Oklahoma – Oklahoma Biological Survey dataset provided a similar integrated dataset of the interior United States through 2012. Sixteen research groups and

States provide monitoring and inventory datasets with records through 2017. We also received updated survey information from some sources, including several States between the proposed and final rules.

Also, in accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited peer review from knowledgeable individuals with scientific expertise that included familiarity with the species, the geographic region in which the species occurs, and conservation biology principles. Additionally, we requested comments or information from other concerned governmental agencies, Native American Tribes, the scientific community, industry, and any other interested parties concerning the proposed rule. Comments and information we received helped inform this final rule.

86. Comment: One commenter suggested it would help to support a listing recommendation if we were able to differentiate our analysis units based on genetic information and genetic differences among eastern black rail populations.

Response: We agree that genetic information on the eastern black rail would help inform our understanding of this subspecies. However, at the time of the listing, genetic information on the eastern black rail was not available. We are required to make our listing determinations on the best available scientific and commercial data at the time the determination is made (see response to Comment 93, above).

87. Comment: Two commenters stated their views that the species should be listed as endangered.

Response: We do not find that the eastern black rail is currently in danger of extinction throughout its range. Although the eastern black rail has experienced reductions in its numbers and seen a range contraction, this subspecies is still relatively

widespread in terms of its geographic extent. The current condition of the subspecies still provides for resiliency, redundancy, and representation such that it is not currently at risk of extinction throughout its range (see **Determination** section). The commenters did not provide any new information regarding threats to the eastern black rail or its current status that was not already considered in the SSA report or proposed rule. One commenter cited the proposed rule and SSA report to support their argument of listing the eastern black rail as an endangered species. With no new information to consider, our conclusion regarding the status of the eastern black rail remains the same.

SSA Report

88. Comment: Two commenters stated that we did not consult Tolliver (2017) or Tolliver *et al.* (2019) (referred to as Tolliver 2018 and Tolliver *et al.* 2018 in comment letters) in the *Federal Register* document and/or in the Species Status Assessment. Three commenters stated eastern black rail colonization is not affected by fire and recruitment increases in recently burned areas. Commenters cited Tolliver (2018) as a supporting document.

Response: We referenced Tolliver (2017) in the *Federal Register* document for the proposed listing and in the Species Status Assessment Version 1.2. Tolliver *et al.* (2019) was first published online October 15, 2018, and in print on January 13, 2019, both occurring after the publication of the proposed listing rule (9 October 2018) and completion of SSA Version 1.2 (June 2018). Tolliver *et al.* (2019) is the peer-reviewed journal article based on Tolliver's 2017 master's thesis. In addition, there is Tolliver *et al.* (2017), which is a final performance report for a grant submitted to TPWD. We consulted the two existing documents generated by Tolliver during our preparation of the

SSA Version 1.2 (Tolliver 2017 and Tolliver *et al.* 2017) and have updated SSA Version 1.3 to reflect the new Tolliver publication (Tolliver *et al.* 2019).

The effects of fire frequency or intensity were not considered by Tolliver *et al.* (2019, p. 322). Further, they state that some of the survey points used in their study were found on boundaries between burned and unburned management units. This finding leads to uncertainty regarding the accuracy of treatment (fire or grazing) assignments to vocalizing eastern black rails for the data analysis in their paper. They recommend that future studies include fire intensity, frequency, and an assessment of the influence of point placement (within units or between them) when assessing occupancy and abundance. When summarizing their conclusions or formulating their abstract, they do not relay any information about fire effects on the population states examined; instead they emphasize their findings of cover dependence for this species. While the authors speculated on colonization and recruitment following fire, their data treatment did not allow them to draw firm conclusions from their analyses. Therefore, we do not agree with the commenters' statements that recently burned areas are found to support recruitment increases and that colonization is not affected by fire, as these statements are contrary to the Tolliver *et al.* (2019) findings that this species is most abundant in densely vegetated grasslands.

89. Comment: One commenter stated that the Service did not quantify occupancy in New England and presumed low resiliency and low representation. The commenter states that Watts contradicts this presumption.

Response: Information presented by Watts (2016, p. 19) shows recent estimates of zero breeding pairs for Maine, New Hampshire, Vermont, Massachusetts, Rhode

Island, Connecticut, and New York. He also shows range contractions in the Northeast in figures 5 and 6, which present maps of Northeast counties with all (1836–2016) and current (2011–2016) credible records of eastern black rails during the breeding period (pp. 21 and 23). In 2015, the State of Connecticut concluded that the black rail was extirpated from the State and removed the species from the State’s endangered species list. This information supports our conclusions of low resiliency and low representation for the New England Analysis Unit.

90. Comment: A commenter claims Watts’ estimates of eastern black rail are guesses rather than estimates, and guesses are not good science.

Response: Watts used the best information available to estimate eastern black rail population size on a state-by-state basis. The estimates are the result of a critical assessment of the most recent information available on the subspecies in each state, including the results of targeted black rail surveys and of general marshbird surveys, knowledge of available habitat, and consultation with state ornithologists and other marshbird experts (Watts 2016, p. 4-10). While the estimates were not quantitatively derived, the approach is appropriate and thorough for compiling and summarizing all diverse sources of information available on the status and distribution of the eastern black rail for the geographical areas covered by the report.

91. Comment: One commenter remarked on the occurrence of eastern black rail outside of the contiguous United States, stating that there is no known record of black rail for Barbados. The bird has ventured on rare occasions as far south as Antigua and Guadeloupe, but not Barbados.

Response: In our SSA report, we have updated the Historical and Current Range and Distribution section to state that there are no known records of eastern black rail for Barbados and rare records for Antigua and Guadeloupe.

92. Comment: One commenter stated that differences in two time points can be due to simple stochastic processes rather than true trends. The commenter stated that one needs at least three data points to infer trends.

Response: This concern was addressed by the dynamic occupancy modeling techniques that we used. While, in general, the commenter is correct that the changes over two observation periods can be stochastic; dynamic occupancy modeling approach accounts for this and uses multiple sites and detection probability to estimate colonization and extinction. Three or more data points will result in more precise estimates, but the modeling framework allows us to use data from just two.

93. Comment: One commenter stated that claiming a change from 15 detections on 328 survey points in 2007 to 2 detections on 135 survey points in 2014 is an 85 percent decline is incorrect, because the claim does not account for survey effort.

Response: The correct value should be a decline of 68 percent since the number of survey points had changed between 2007 and 2014. This value has been updated in the rule and the SSA report.

94. Comment: One commenter stated that the Service did not examine trends in true abundance when examining the status of the eastern black rail. The commenter stated that the Service only used changes in raw numbers of counted rails to estimate trends.

Response: There are no statistically valid abundance estimates for assessing trend over time over the full range of the species. Some data might be useful for assessing localized trends, but we could not use those local trends to infer population trend across the entire range of the species. The standard required by the ESA is the best available scientific and commercial information available, and that standard is what was used for the analysis.

95. Comment: One commenter stated that the Service did not account for variations in call rate or for detection probabilities in the data used.

Response: Our models estimated detectability and accounted for variability over space and time. In addition, we tried to relate those probabilities to covariates; however, no covariates were useful predictors of detection probability.

96. Comment: A commenter questioned how occupancy is used to predict long-term persistence.

Response: The specific procedure for determining extinction risk to analysis units is laid out in the SSA, specifically chapters 4 and 5 and appendices A and B. We took locations of known occupancy and assessed how environmental variables at those locations would influence that known occupancy location's ability to support eastern black rails over time (persistence). We used probabilistic distributions based on different rates of change (wetland loss rates, relative sea level rise projections, land management practices, etc.) and projected these rates for each environmental variable. These rates of change included a range of scenarios that evaluated habitat availability and quality with regard to the eastern black rail.

97. Comment: One commenter requested clarification on the terms “resiliency, redundancy, and representation (3Rs)” and how these were applied in our SSA analysis. This commenter indicated there was apparently overlap between the three terms. The commenter also asked for clarity on how low, very low, and no resiliency are defined in the SSA report. This same commenter stated that the Service had only evaluated occupancy to inform our 3Rs analysis.

Response: In general, resiliency reflects the ability of populations to withstand stochastic variation, such as random fluctuations in demographic rates. Redundancy reflects the species’ ability to withstand catastrophic events, such as a hurricane or oil spill, and representation reflects a species’ adaptive capacity. In a practical sense there is often overlap in resiliency, redundancy, and representation in the Species Status Assessment process. For eastern black rail, resiliency was measured at the analysis unit scale for this subspecies, in part, because of the difficulty in establishing true population boundaries. The Service used two metrics to estimate and predict representative units that reflect the subspecies’ adaptive capacity: (1) habitat variability and (2) latitudinal variability. There was no information related to genetic diversity to inform adaptive capacity for the subspecies. As the commenter noted, we did suggest overlap in resiliency and representation because, as noted in the SSA, to maintain existing adaptive capacity, it is important to have resilient populations (analysis units) that exhibit habitat variability and latitudinal variability. While typically we think of redundancy as the number and distribution of populations within representation units, because of the difficulty in delineating populations, analysis units are the only scale at which we can reflect the subspecies’ ability to withstand stochastic events. In general, species (and

subspecies) that are well-distributed across their historical range are considered less susceptible to extinction and more likely to be viable than species confined to a small portion of their range (Carroll et al. 2010, entire; Redford et al. 2011, entire). Occupancy analysis informed both the 3Rs and extinction probability for the subspecies. We have added further discussion in the SSA report to provide clarification on how we applied the 3Rs.

98. Comment: One commenter stated that our future projections of habitat loss for eastern black rail are flawed because the model assumed a 10 percent loss rate of habitat per year, and there would not be any habitat left in 10 years.

Response: This comment reflects a misunderstanding about the loss function used in the model. The loss rate was not an absolute loss rate of 10 percent per year. It was a 10 percent loss of remaining habitat available each year, so the rate actually decreases over time. It is a decay curve not a linear decay. In our future scenario modeling, we incorporated functions to account for habitat quality and possible habitat loss over time. The habitat loss function was a simple reduction in the total number of possible black rail sites at each time step in the simulation by a randomly drawn percentage (a beta distributed random variable) that was specified under different simulation scenarios to represent habitat loss due to development (urbanization) or sea level rise. We used the change in “developed” land cover from NLCD data to derive an annual rate of change in each region and we used NOAA climate change and sea level rise predictions to estimate probable coastal marsh habitat loss rates. In the Great Plain AU, groundwater loss rates were used, instead of sea level rise data, to represent permanent non-urbanization habitat loss in the region.

99. Comment: One commenter stated that our future projections of habitat loss for eastern black rail are flawed because we assumed that the rate of marsh loss due to sea level rise will be greater than the rate of marsh creation. This commenter also stated we assumed sea level rise will only destroy marsh and provided citations for relevant literature supporting net increases in tidal marsh over time.

Response: We recognize that there are scientific differences of opinion on many aspects of climate change, including the role of natural variability in climate and the uncertainties involved with climate change projections and how local ecosystems may respond, such as tidal marsh responses to sea level rise. We relied on synthesis documents (e.g., Parris *et al.* 2012; Sweet *et al.* 2017; Runkle *et al.* 2017a, 2017b, 2017c; Reidmiller *et al.* 2018) that present the consensus view of a very large number of experts on climate change, including sea level rise, from around the world. Additionally, we relied on downscaled sea level rise projections (Sweet *et al.* 2017).

We recognize the salt marsh elevation in some locations may be able to keep pace with sea level rise (e.g., Kirwan *et al.* 2016, Raabe and Stumpf 2016, Schieder *et al.* 2018); however, the rate of sea level rise in many areas will overwhelm the capacity of salt marshes to persist (Crosby *et al.* 2016), and marsh migration will not be possible where hardened shorelines exist (Torio and Chmura 2013). We have found that these latter reports, as well as the scientific papers used in those reports or resulting from those reports, represent the best available scientific information we can use to inform our decision and have relied upon them and provided citations within our analysis. Overall, sea level rise is projected to lead to substantial losses of salt marsh habitat, and new salt marsh creation is not expected to keep pace.

100. Comment: One commenter stated that a study done by the Texas Comptroller's Office suggests that the black rail has a stronghold along the Upper Coast of Texas, especially in Chambers and Jefferson Counties. The commenter stated that with nearly 160,000 acres of Federal and State-owned property in Chambers and Jefferson Counties that is prime black rail habitat, it stands to reason that the population in that area could change the listing determination.

Response: The study, supported by the Texas Comptroller of Public Accounts and the TPWD, estimated that during 2015 there were between 183 and 2,414 eastern black rails present at Anahuac NWR (Tolliver *et al.* 2017, p. 18). The refuge is approximately 34,000 acres (13,759 hectares) in size; however, the refuge area estimated to support eastern black rails was between 11,345 to 15,716 acres (4,591 to 6,360 hectares) (Tolliver *et al.* 2017, p. 18). This area is roughly 33 to 46 percent of the refuge, demonstrating that not all 160,000 acres of conservation lands in Chambers and Jefferson Counties would necessarily support eastern black rails. It is not appropriate to presume that eastern black rails are present and supported by all 160,000 acres. Surveys to estimate habitat occupancy indicate very low occupancy rates for this species. This finding means that the available habitat is not fully occupied by the species due to their low numbers. See Comments 28 and 96 for additional discussion.

101. Comment: One commenter asked how altering land management practices during the nesting and molting period will increase population numbers.

Response: When numbers within a population are very low, changes in management that affect survival of both young and adults can have significant effects on population numbers because each adult's reproductive potential and nest survival matter

more to overall population dynamics. This scenario is often best thought of in the extinction vortex paradigm (Gilpin and Soule 1986, entire; Fagan and Holmes 2006, entire) where the loss of every individual can have a substantial impact on the population.

102. Comment: A commenter stated that potential threats resulting from mosquito control activities are speculative and should be considered alongside the threats mosquitos pose to humans and wildlife.

Response: For listing actions, section 4(a)(1) of the Act requires that we determine whether any species is an endangered species or threatened species because of any of the following factors that affect the species, including: the present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence. It does not allow us to consider such information as the threats mosquitoes pose to humans and wildlife. At this time, there is no information regarding the impacts of pesticides used for mosquito control on the eastern black rail.

103. Comment: One commenter stated that there is a difference in agricultural pesticide application and mosquito control methodologies and that product application parameters and conclusions drawn in the SSA report regarding pesticides do not apply to mosquito control products. The comment states that permethrin, a product commonly used in aerial adult mosquito control applications is considered low toxicity to birds and cites a 2009 fact sheet from the National Pesticide Information Center.

Response: The SSA report discusses pesticide use to control mosquitoes and its potential impacts to the prey base of eastern black rail. The SSA report does not assert

that permethrin is causing a direct effect on the eastern black rail; however, it does identify as a concern the widespread use of pesticides to control mosquitoes in marshes that are used by eastern black rails and the potential impacts of these chemicals to the prey base of the subspecies.

104. Comment: One commenter stated that there is no evidence to support mosquitocide impacts to the eastern black rail or to their trophic structure effects.

Response: The SSA concluded that "while there are hotspots for environmental contaminants, there is no evidence of specific threats that might affect the subspecies and demonstrate a population level response. Indirect effects to eastern black rails such as impacts to forage base from certain pesticides require further study." The conclusion drawn relates to all contaminants, not just mosquitocide, which was only referenced with regard to the fact that it might affect prey (see previous comment); however, the conclusion drawn was that there was no evidence of a specific threat that might affect the subspecies.

105. Comment: One commenter questioned why the Service did not consider oil and gas exploration and extraction, including seismic exploration, as a threat to eastern black rails.

Response: Section 3.1 (Habitat Fragmentation and Conversion) of the SSA report discusses the status and trend information for wetlands. While not explicit, these trends of wetland conversion include impacts of oil and gas activities. Additional information was added to Section 3.3 (Altered Hydrology) regarding specific types of activities associated with oil and gas development that modify hydrology and exacerbate wetland conversion or loss. Further, we revised the 4(d) rule to prohibit incidental take resulting

from long-term or permanent habitat conversion that captures permanent damage to habitat where eastern black rails are present, which would include oil and gas activities. In addition, all jurisdictional wetlands affected by such activities are already covered under existing regulations. Public land site managers may negotiate the terms of access (including timing, the use of monitors, and equipment to be operated as well as other specifics) and damage concerns ahead of seismic activity or any other related access. They may also arrange compensatory actions for damages of any kind agreed to in advance of project initiation. The managers of public lands often do not own the mineral rights beneath their boundaries and in those cases may not deny access to the owners of those rights.

106. Comment: One commenter stated that our statements about the possible negative effects on eastern black rail from flooding caused by Hurricane Harvey are speculation and not fact, and asked that we acknowledge this sentiment.

Response: The SSA report and the proposed rule referenced Hurricane Harvey's aftermath to illustrate that flooding during hurricane events may be prolonged and extensive and impact the subspecies. Extensive flooding from Hurricane Harvey was documented at occupied sites of eastern black rail across the Texas coast, and thus we do not consider the hurricane's effects as speculative.

107. Comment: A commenter recommended that the Service provide additional guidelines for determining what human activities and behaviors in suitable habitat are threats to this subspecies. Two commenters provided suggestions for restoration or recovery efforts for the eastern black rail. For example, one commenter asked that we consider the impact of invasive species, such as feral swine and nutria, to eastern black

rail recovery. One commenter requested additional guidelines be developed on appropriate human activity and behaviors within eastern black rail habitat.

Response: We will consider additional guidelines in developing a recovery plan or any potential future consultation guidelines for the subspecies.

Critical Habitat

108. Comment: One commenter from the American Mosquito Control Association provided information on how the designation of critical habitat would compromise mosquito control measures and negatively impact public health.

Response: We are not designating critical habitat for the eastern black rail (see Comments 37–39 above and **Critical Habitat** discussion below).

109. Comment: Several commenters suggested that the Service designate critical habitat for the eastern black rail and focus on cooperative educational efforts for the eastern black rail among birders, States, and non-governmental partners, such as State ornithological societies. One commenter stated that these efforts could help maximize citizen science value while minimizing disturbance. Commenters indicated that birders contribute significantly to understanding the distribution of the eastern black rail.

Response: The Service recognizes the important contributions birders have made to our understanding of bird species, including the eastern black rail. Even though we are not designating critical habitat, we intend to incorporate education efforts and outreach information to a variety of stakeholders as a component of the recovery plan for this species.

4(d) Rule

110. Comment: One commenter responded that departures from traditional ranch burning and grazing in place for hundreds of years (along the Gulf Coast) could adversely affect plants, animals, elevations and so on. The commenter also said that the 4(d) rule risks damages to healthy grasslands used by other species.

Response: The evolution of the plants, animals, and the ecology of the habitats within the eastern black rail's range took place over a much more extended period of time than the timeframe being referenced by the commenter and without the presence of fenced domestic cattle or modern fire management. Stambaugh's (2014) literature review compiles the results of historical fire regime research and suggests that most coastal habitat in Texas used by the eastern black rail may have burned naturally as infrequently as once every 11 to 15 years. The authors summarize that burn intervals for most of Texas spanned 1 to 12 years. The 4(d) rule allows for up to 50 percent of available eastern black rail habitat to be burned in any given calendar year such that the other 50 percent of habitat within the management boundary remains present on the landscape and suitable for eastern black rails. This provision allows for maintenance of eastern black rail habitat, as well as population growth and maintenance. The 4(d) rule does not prohibit grazing, which is an important habitat management tool that stimulates herbaceous plant production and may help maintain the necessary overhead vegetation cover for eastern black rails and other native species, as long as dense overhead cover is maintained for the eastern black rail in at least 50 percent of the habitat. Grazing activities that maintain dense overhead cover are allowed during all times of year on suitable occupied eastern black rail habitat on public lands, and grazing activities on private lands are unaffected. We do not expect the 4(d) grazing prohibition to result in

adverse impacts to plants, animals, and elevations, since grazing is not restricted at any time.

111. Comment: One commenter expressed concerns that fire prohibitions threaten communities.

Response: The construction of new firebreaks, and the maintenance of existing ones, are excepted in the 4(d) rule, as are responses to wildfire.

112. Comment: One commenter advised that prescribed fire plans should be specific to location and supported by the best possible science.

Response: We agree that fire plans should be specific to location and have endeavored to keep the practices outlined in the 4(d) rule general enough to allow site managers to determine the appropriate techniques that will enable them to conserve eastern black rails and their habitats. We have used information from fire experts and land managers as well as experts in the behavior of eastern black rails in revising the 4(d) rule to provide what is necessary and advisable for the conservation of the eastern black rail while also providing flexibility for land managers.

113. Comment: One commenter recommended encouraging prescribed fire application in the fall rather than the spring and that the Service should provide financial incentives to do so.

Response: The Service has modified the 4(d) rule to allow prescribed fire to take place any time during the year when using practices that minimize the take of eastern black rails. Further, the Service, as well as the U.S. Department of Agriculture's Natural Resources Conservation Service, already have in place several programs that provide financial and technical support to private landowners interested in actions that support

fish and wildlife resources. In addition, some State Fish and Wildlife agencies also provide wildlife-related technical assistance to private landowners.

114. Comment: Two commenters said that the Service ignored positive burn and grazing effects in its assessment of these activities, which promote eastern black rails in Texas. A second commenter stated that the Service ignored positive burn and grazing effects (as reported in Kane 2011 and other studies) in its assessment of these activities.

Response: The Service presented the best available science on the effects of various land management practices on eastern black rail occurrence, highlighting the known favorable and unfavorable approaches for each one. Please see section 3.4.1 of the SSA for the discussion on fire effects, which includes Kane's findings. For a discussion of grazing effects (including Kane's findings), please see section 3.4.3 of the SSA. Although the Texas population estimates suggest that more eastern black rails are present there than in other portions of the range, all predictive modeling indicates that eastern black rails will be extirpated from Texas and the rest of its U.S. range before 2100 without human intervention. Therefore, we cannot conclude that land management practices that result in the removal or destruction of eastern black rail habitat have not taken a toll on a formerly much larger population in Texas, or in other parts of the range. We have revised the 4(d) rule to provide greater flexibility to land managers with the use of BMPs that are designed to promote population growth and maintenance of eastern black rails at the site level.

115. Comment: Two commenters stated there is no proof in peer-reviewed literature or otherwise that fire causes direct or indirect mortality to eastern black rails. One commenter stated that Legare 1998 was just a conference abstract with no way to

validate its validity. Others stated that Grace *et al.* 2005 provided no evidence of direct mortality to rails from prescribed fire. One commenter asked to clarify why fast fires produce rail mortality and why this is significant.

Response: The Service has sufficient evidence documenting the threat of fire mortality due to ignition and burn patterns that do not provide refugia or that trap eastern black rails between fire fronts. Photographic proof of the eastern black rail mortality detailed in Legare's abstract was made available by the author to the Service during preparation of the SSA. This photograph accompanied by follow-up conversations with the author was accepted as evidence of direct mortality of eastern black rail from a prescribed fire event. We have incorporated this photograph into the SSA report. The fact that the Legare *et al.* (1998) abstract appears in conference proceedings and not peer-reviewed literature has no bearing on the existence of this mortality event. Entrapment issues during this fire event led to bird mortality and the National Wildlife Refuge where this event occurred has since modified their burning practices to avoid and minimize wildlife entrapment. The Refuge identified in this abstract now employs slow-moving fires and takes the maximum amount of time to burn, employs flanking fires, and divided their burn units into smaller units after the large mortality event (now burning half or a third of what they used to) (Legare 2019, pers. comm.). The recommendation is also provided by Grace *et al.* (2005, entire), is based on fundamental evidence, and is reasonable. A fast fire can lead to rail mortality when the fire spreads quickly enough to overcome individual birds attempting to escape it, or through asphyxiation. With regard to significance, when numbers within a population are very low, changes in management that affect survival of both young and adults can have significant effects on population

numbers because each adult's reproductive potential and nest survival matter more to overall population dynamics. This is often best thought of in the extinction vortex paradigm (Gilpin and Soule 1986, entire; Fagan and Holmes 2006, entire) where the loss of every individual can have substantial impact on the population.

116. Comment: One commenter supported the use of prescribed fire as a management tool and relayed that natural fires would have included fast-moving perimeter fires. The commenter also cited several references (Van't Hul *et al.* 1997 and Rogers *et al.* 2013) to support limited detrimental impacts of prescribed burns to certain bird species.

Response: The Service has modified the rule to allow prescribed fire to take place any time during the year while retaining habitat in untreated areas that supports dense overhead cover required by the eastern black rail. This approach allows managers to continue habitat management efforts important to the eastern black rail while supporting its life cycle needs. While historical fires may have been perimeter fires, historical conditions (abundant habitat and multiple population sources) no longer exist across the range of the eastern black rail and, therefore, the effects of these types of fires may have greater negative impacts today than they would have historically. It is important for fire managers to minimize the negative impacts to wildlife through the use of ignition tactics and timing. The papers referenced by the commenter did not evaluate the direct or indirect mortality associated with prescribed fire but instead studied habitat use. For example, Van't Hul *et al.* 1997 found that the bird species studied returned to pre-burn levels after 2 years, with the exception of the sedge wren. The sedge wren is similar to

the eastern black rail in that it requires dense herbaceous cover. The revised rule supports activities that provide for dense overhead cover required by the eastern black rail.

117. Comment: One commenter, citing McKee and Grace (2012), stated that fire prohibitions will lessen fire opportunities which in turn will lead to subsidence and diminished marsh health and greater impacts from sea level rise. The commenter advised against blanket restrictions for a wide-ranging species.

Response: We do not find that an increased rate of subsidence will result from the prohibitions on prescribed fire outlined in the 4(d) rule. Subsidence is a sinking of the landscape that occurs due to changes in or collapse of the subsurface layers of the earth; shifting of underground mines; or the extraction of underground fluids like water or oil (Geology.com 2019; USGS 2000). However, it is possible that various human acts can cause a net loss in elevation over time or offset losses due to subsidence or other factors. McKee and Grace (2012) state that prescribed burning of *Spartina patens* may decrease elevation losses by roughly 1 mm/year at McFaddin National Wildlife Refuge; however, their work at McFaddin and Blackwater NWRs involved sites that were subsiding and in poor sediment supply. This research has not been extended to other marshes, and the authors state that their results are not applicable to other marshes outside the Texas Chenier Plains Complex NWR or Blackwater NWR, as other marshes will vary in sediment supply, geologic setting, and disturbances from other factors. The study also calls for further research, as the net loss of elevation relative to fire regime is still not well understood (McKee and Grace 2012, p. 42). Where eastern black rails are present, burning may be done year round within guidelines designed to ensure habitat is always available and that the population growth and maintenance of this species is

supported. In addition, incidental take of eastern black rails from otherwise prohibited activities can be exempted through either section 7 or section 10 of the Act.

118. Comment: One commenter stated that the proposed 4(d) rule would end all summer grazing on public lands.

Response: The 4(d) rule does not end grazing on public lands. It has been further modified since the proposed version was released for comment, so that grazing will be allowed on public lands as long as the dense overhead cover required by the subspecies is maintained in at least 50 percent of the eastern black rail habitat within a management boundary.

119. Comment: One commenter stated grazing is a useful tool and should be allowed on both private and public lands. Two commenters suggested that public lands with an approved grazing plan be allowed to continue grazing, as prescribed grazing can be an important habitat management tool. One commenter stated that "properly managed cattle" are not detrimental to eastern black rails.

Response: We agree that grazing can be a useful management tool for resetting the seral stage to maintain suitable habitat for eastern black rail. These types of grazing activities can be used as part of an ownership boundary's overall plan to promote eastern black rail population growth and maintenance. The final 4(d) rule allows grazing on public lands as long as 50 percent of eastern black rail habitat, i.e., the dense overhead cover required by the eastern black rail, is maintained. We encourage land managers who use grazing in areas with eastern black rails to consider implementing a grazing plan that will ensure that dense overhead cover is maintained for the species.

120. Comment: One person reported that grazing (buffalo) and fire are part of Salt Bayou Plan, which restores habitat on the upper Texas Coast in Chambers County.

Response: The Salt Bayou Watershed Restoration Plan (2013) does not identify the use of grazing or prescribed fire as actions to restore the watershed.

121. Comment: One commenter stated that grazing programs funded or permitted through the U.S. Department of Agriculture would be affected outside of public lands and would result in harmful changes to private land use practices.

Response: The grazing prohibition in the 4(d) rule does not apply to private lands. As discussed in Comment 79, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service. This requirement does not change when a 4(d) rule is implemented.

122. Comment: One commenter stated that Kane (2011) shows the negative impacts of mowing or haying during sensitive seasons but is not sufficiently comprehensive to demonstrate the effects of not mowing or haying within seasons, across seasons, or across habitat types. The commenter recommended that the study be replicated throughout the species' range so that it is certain these results are not localized or correlated to the Kane study site.

Response: We agree that more research and study of the eastern black rail will improve our knowledge and understanding of the subspecies.

123. Comment: One commenter stated that he owned mineral rights under a Refuge and that the 4(d) rule would have devastating effects on oil and gas exploration and cause harm to families relying on this income.

Response: The 4(d) rule does not prohibit oil and gas activities or mineral extraction within the range of the eastern black rail. Incidental take resulting from activities that result in long-term or permanent conversion, fragmentation, or damage to persistent emergent wetland habitat and the contiguous wetland-upland transition zone to other habitat types or land uses is prohibited under the 4(d) rule. However, entities have other means to have take excepted, such as section 10 permits or section 7 incidental take authorization. The rule extends exemptions for maintenance of existing infrastructure. Entities engaging in oil and gas activities within jurisdictional wetlands, or in settings that are addressed by existing regulations, will be required to complete the same permitting process already in place prior to initiating work. Further, any activity that has a Federal nexus, that is an action that is authorized, funded, or carried out by a Federal agency, and may affect the eastern black rail, will require consultation with the Service. However, section 7 consultation requirements are triggered by the listing of a species and not a 4(d) rule.

124. Comment: One commenter requested that we include a prohibition to reduce the risk of predation by cats.

Response: The impacts of feral and/or free-ranging domestic cats on wildlife has been well documented. These exotic felines can become problematic at the localized level and depress local wildlife populations. Our review of threats faced by the subspecies considered practices that could possibly affect substantial numbers of birds

and influence population maintenance and growth. We did not find that the risk of predation by cats is a threat such that we should regulate incidental take of this activity under our 4(d) rule.

125. Comment: One commenter requested that new rights-of-way projects be excepted.

Response: New rights-of-way projects will be required to consider their effects on the species; they are not excepted under the 4(d) rule. New rights-of-way may be planned in areas of currently occupied habitat and their construction may result in the take of eastern black rails. Therefore, we are not excepting new rights-of-way projects under the 4(d) rule.

Recovery

126. Comment: Three commenters stated that an approved Recovery Plan should precede efforts to list the species.

Response: According to the requirements in the Act, species are listed prior to the initiation of recovery planning. Recovery actions will be decided upon during recovery planning. We are working on a recovery outline that will be made publically available within 30 days of the publication of this final rule. Additionally, a recovery plan and strategy will be developed with input from our conservation partners including States, Federal agencies, private and public landowners, and non-governmental organizations. The Service has already begun working on the development of a Black Rail Conservation Plan with the Atlantic Flyway branch of the Black Rail Working Group, coordinated by the Atlantic Coast Joint Venture. The Plan outlines five priority strategies for black rail recovery and conservation on the Atlantic Coast of the United States and the Gulf Coast

of peninsular Florida. The Service has also participated in preliminary conservation planning with the Texas Black Rail Working Group, led by the Texas Parks and Wildlife Department in partnership with the Texas Comptroller's Office. Planning documents from these efforts will be foundational to the recovery strategy that is developed over the next two to three years.

Determination of Eastern Black Rail Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of "endangered species" or "threatened species." The Act defines an "endangered species" as a species that is "in danger of extinction throughout all or a significant portion of its range," and a "threatened species" as a species that is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The Act requires that we determine whether a species meets the definition of "endangered species" or "threatened species" because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence.

Status Throughout All of Its Range

After evaluating threats to the subspecies and assessing the cumulative effect of the threats under the section 4(a)(1) factors, we summarize our findings below. We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the eastern black rail. When viewing historical

occurrences on the State level compared to what is known of present distribution, the range contraction (from Massachusetts to New Jersey) and site abandonment (patchy coastal distribution) noted by Watts (2016, entire) appear to be occurring throughout the eastern United States. Over the past 10 to 20 years, reports indicate that populations have declined by 75 percent or greater. North of South Carolina, occupancy has declined by 64 percent and the number of birds detected has declined by 89 percent, equating to a 9.2 percent annual rate of decline (Watts 2016, p. 1).

In relative terms, regional strongholds still exist for this subspecies; however, the best available scientific data suggest that the remaining strongholds support a relatively small total population size, i.e., an estimated 1,299 individuals on the upper Texas coast within specific protected areas prior to Hurricane Harvey, and an estimated 355 to 815 breeding pairs on the Atlantic Coast from New Jersey to Florida (including the Gulf Coast of Florida) prior to multiple major hurricanes. There are no current population estimates from the interior States (Colorado, Kansas, or Oklahoma), although there are consistent populations of eastern black rails at Quivira NWR in Kansas and at least four sites in Colorado where the subspecies is encountered in the spring and summer. We have no information to indicate that the eastern black rail is present in large numbers in the Caribbean, Central America, or Brazil.

Based on our review of the available science, we identified the current threats to eastern black rail. Habitat loss and degradation (Factor A) as a result of sea level rise along the coast and ground and surface water withdrawals are having a negative impact on the eastern black rail now and will continue to impact this subspecies into the future. Incompatible land management techniques (Factor E), such as the application of

prescribed fire, haying, mowing, and grazing, have negative impacts on the bird and its habitat, especially when conducted at sensitive times, such as the breeding season or the flightless molt period. Stochastic events (Factor E), such as flood events and hurricanes, can have significant impacts on populations and the subspecies' habitat. For example, the impacts of Hurricane Harvey on the Texas coastal populations of eastern black rail likely caused direct mortality as well as short-term habitat loss, as the hurricane occurred during the flightless molt period and resulted in the habitat being flooded for an extended period of time. Human disturbance (Factor B) to the eastern black rail occurs throughout the bird's range and is driven by the bird's rarity and interest by the birding community to add this bird to individual life lists.

As we consider the future risk factors to the eastern black rail, we recognize that a complex interaction of factors have synergistic effects on the subspecies as a whole. In coastal areas, sea level rise, as well as increasing storm frequency and intensity and increased flood events (which are both associated with high tides and storms), will have both direct and indirect effects on the subspecies. Extensive patches of high marsh required for breeding are projected to be lost or converted to low marsh or open water as a result of sea level rise. Demand for groundwater is increasing, which will reduce soil moisture and surface water, and thus negatively impact wetland habitat. We expect to see localized subsidence, which can occur when groundwater withdrawal rates are greater than the aquifer recharge rates. Also, warmer and drier conditions (associated with projected drought increases) will reduce overall habitat quality for the eastern black rail. Further, incompatible land management (such as fire application and grazing) will

continue to negatively impact the subspecies throughout its range, especially if done during the breeding season or flightless molt period.

These stressors contribute to the subspecies' occupancy at sites and thus its population numbers. Some stressors have already resulted in permanent or long-term habitat loss, such as the historical conversion of habitat to agriculture, while other factors may only affect sites temporarily, such as a fire or annually reduced precipitation. Even local but too frequent intermittent stressors, such as unusual high tides or prescribed fire, can cause reproductive failure or adult mortality, respectively, and thus reduce eastern black rail occupancy at a site and the ability of a site to allow for successful reproduction of individuals to recolonize available sites elsewhere. While these intermittent stressors allow for recolonization at sites, recolonization is based on productivity at other sites within a generational timescale for the subspecies. If these stressors, combined, occur too often within and across generations, they limit the ability of the subspecies to maintain occupancy at habitat sites and also limit its ability to colonize other previously occupied sites or new sites.

It is likely that several of these stressors are acting synergistically on the subspecies. Sea level changes, together with increasing peak tide events and higher peak flood events, wetland subsidence, past wetland filling and wetland draining, and incompatible land management (e.g., prescribed fire and grazing), all limit the ability of the eastern black rail to persist in place or to shift to newly lightly flooded, "just-right" areas as existing habitats are impacted. These interacting threats all conspire to limit the ability of this subspecies to maintain and expand populations now and in the foreseeable future.

Although the eastern black rail has experienced reductions in its numbers and seen a range contraction, this subspecies is still relatively widespread in terms of its geographic extent. It continues to maintain a level of representation in four analysis units, which demonstrates continued latitudinal variability across its range. These four analysis units are spread throughout most of the subspecies' range, providing for some level of redundancy. Though the resiliency in the four currently occupied analysis units is low, Florida and Texas remain strongholds for the subspecies in the Southeast and Southwest. The current condition of the subspecies still provides for resiliency, redundancy, and representation such that it is not at risk of extinction now throughout its range.

However, our estimates of future resiliency, redundancy, and representation for the eastern black rail are further reduced from the current condition, consistent with this analysis of future threats. Currently, three analysis units are effectively extirpated, and four analysis units that continue to support populations of the eastern black rail all have low levels of resiliency. Given the projected future decreases in resiliency for these four analysis units, the eastern black rail will become more vulnerable to extirpation from ongoing threats, consequently resulting in concurrent losses in representation and redundancy. The range of plausible future scenarios of the eastern black rail all predict extirpation for all four analysis units by mid-century (2068) with the Great Plains analysis units potentially becoming extirpated within 15 to 25 years (depending on the scenario). In short, our analysis of the subspecies' current and future conditions show that the population and habitat factors used to determine the resiliency, representation,

and redundancy for the subspecies will continue to decline so that it is likely to become in danger of extinction throughout its range within the foreseeable future.

Our implementing regulations at 50 CFR 424.11(d) set forth a framework within which we evaluate the foreseeable future on a case-by-case basis. The term foreseeable future extends only so far into the future as the Services can reasonably determine that both the future threats and the species' responses to those threats are likely. The foreseeable future extends only so far as the predictions about the future are reliable. "Reliable" does not mean "certain"; it means sufficient to provide a reasonable degree of confidence in the prediction. In the same way, a "reliable prediction" is also meant in a non-technical, ordinary sense and not necessarily in a statistical sense. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species' likely responses to those threats in view of its life-history characteristics.

In cases where the available data allow for quantitative modeling or projections, the time horizon for such analyses does not necessarily dictate what constitutes the "foreseeable future" or set the specific threshold for determining when a species may be in danger of extinction. Rather, the foreseeable future can extend only as far as the Service can reasonably explain reliance on the available data to formulate a reliable prediction and avoid reliance on assumption, speculation, or preconception. Regardless of the type of data available underlying the Service's analysis, the key to any analysis is a clear articulation of the facts, the rationale, and conclusions regarding foreseeability. We identify the foreseeable future for the eastern black rail to be 25 to 50 years from the present. We consider 25 to 50 years "foreseeable" in this case because this timeframe

includes projections from our modeling efforts and takes into account the threats acting upon the eastern black rail and its habitat and how we consider the eastern black rail will respond to these threats in the future. For all five plausible scenarios, all analysis units exhibited a consistent downward trend in the proportion of sites remaining occupied after the first 25 years (by 2043), with extirpation for all analysis units by 2068. The Great Plains analysis unit is predicted to be extirpated by 2043. Given that future projections of habitat loss are expected to continue and be exacerbated by sea level rise and tidal flooding, resiliency of the four remaining analysis units is expected to decline further over the next 25 to 50 years.

We find that the eastern black rail is likely to become endangered throughout all of its range within the foreseeable future. It is facing threats across its range that have led to reduced resiliency, redundancy, and representation, and we expect the subspecies to continue to decline into the future. Thus, after assessing the best available information, we conclude that the eastern black rail is not currently in danger of extinction, but is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. The court in *Center for Biological Diversity v. Everson*, 2020 WL 437289 (D.D.C. Jan. 28, 2020) (*Everson*), vacated the aspect of the 2014 Significant Portion of its Range Policy (SPR Policy) (79 FR 37578) that provided that the Services do not undertake an analysis of significant portions of a species' range if the species warrants listing as threatened

throughout all of its range. Therefore, we proceed to evaluating whether the species is endangered in a significant portion of its range—that is, whether there is any portion of the species’ range for which both (1) the portion is significant; and, (2) the species is in danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the “significance” question or the “status” question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species’ range.

Following the court’s holding in *Everson*, we now consider whether there are any significant portions of the species’ range where the species is in danger of extinction now (i.e., endangered). As discussed above and in our SSA report, there are little to no data to evaluate resiliency for the Central America and Caribbean portion of the eastern black rail’s range. For the purposes of considering portions of the eastern black rail’s range, we reviewed the analysis units we identified in the SSA report. Three of the analysis units we evaluated – Appalachians, Central Lowlands, and New England – are effectively extirpated. These three units historically did not support abundances of eastern black rail as high as the other four analysis units and an evaluation of current status information yielded that the species is effectively extirpated from the portions of these units that were once occupied. We did not consider these three analysis units in our future scenario modeling, as we do not anticipate that these units will contribute to the future viability of the eastern black rail. Accordingly, when conducting our analysis to determine whether the species may be in danger of extinction in a significant portion of its range, we consider these portions to be lost historical range. Consistent with our SPR Policy, we

do not base a determination to list a species on the status (extirpated) of the species in lost historical range. We already take into account the effects that the loss of these three units have on the current and future viability of the eastern black rail in our determination. As articulated in our SPR Policy, we conclude that this consideration is sufficient to account for the effects of loss of historical range, i.e., the Appalachians, Central Lowlands, and New England analysis units, when evaluating the current status of the eastern black rail, and a specific consideration of whether lost historical range constitutes a significant portion of the range is not necessary.

We then considered the current status of the remaining analysis units – the Great Plains, Mid-Atlantic Coastal Plain, Southeast Coastal Plain, and Southwest Coastal Plain – to determine if any portion may be in danger of extinction now. We evaluated the Mid-Atlantic Coastal Plain and Southeast Coastal Plain as one portion, because we used the results from the Southeast Coastal Plain to help infer the current resiliency of the Mid-Atlantic Coastal Plain, these analysis units are adjacent to one another along the Atlantic coast, and we suspect that the birds within the Mid-Atlantic Coastal Plain overwinter in the Southeast Coastal Plain.

As discussed in our SSA report and above, the eastern black rail's current distribution is patchy across the range of the species. Our occupancy model results indicated that eastern black rail analysis units currently have low to very low resiliency across these portions based on the occupancy model results (Service 2019, pp. 94-95). The Mid-Atlantic Coastal Plain currently exhibits very low resiliency for eastern black rail as it supports fewer birds and occupied habitat patches than the Southeast Coastal Plain. Current estimates for the Mid-Atlantic and Southeast Coastal Plain (i.e., New Jersey to Florida) are 355-815 breeding pairs (Watts 2016, p.19). The uncertainty surrounding these estimates varies from

low to moderate; there is moderate uncertainty for states with more extensive marshes that preclude full survey coverage (e.g., New Jersey, Maryland; Watts 2016, pp. 19, 54, 64). South Carolina shows a limited distribution with two known occupied areas and an estimated 50-100 breeding pairs (Watts, 2016, p. 19). In Florida, birds are found in inland and coastal habitats on both the Atlantic and Gulf Coasts and the state is estimated to support between 200-500 breeding pairs (Watts, 2016, p. 19). Florida is considered the stronghold of this portion, although the eastern black rail remains distributed along the Atlantic Coast (in the Mid-Atlantic and Southeast Coastal Plain).

The Southwest Coastal Plain also has a stronghold of birds, with an estimated 1,299 individuals on the upper Texas coast within specific protected areas prior to Hurricane Harvey (Tolliver et al. 2017, p. 18). The remaining Gulf Coast states support few to no birds during the breeding season. Alabama and Mississippi had a population estimate of zero breeding pairs and Louisiana supported an estimated zero to ten breeding pairs in 2016 (Watts, 2016, p. 19). However, recent first-time surveys conducted in Louisiana during the breeding and non-breeding seasons in 2017 and 2018 detected eastern black rails at 21 of 152 survey points (Johnson and Lehman, 2019b, p. 6), confirming a small year-round population in the state.

In the Great Plains analysis unit there are no current population estimates from the interior States still known to support the species (i.e., Colorado and Kansas), but there are consistently detected populations of eastern black rails at a site in Kansas and along the Arkansas River Basin in southeastern Colorado. In 2018, the first formal repeat surveys were completed for the species in southeastern Colorado during the breeding season (Rossi and Runge 2018, entire). Surveys detected at least one black rail at 39 of 115 points and 17 of 66 marshes surveyed (Rossi and Runge 2018, p. 6). Detection

probability estimates for dusk and night surveys were 0.413 (95% CI = 0.176 - 0.698) and 0.552 (95% CI = 0.329 - 0.756), respectively, and the mean probability of eastern black rail occupancy (the probability that a site was occupied) in core habitat was 0.792 (95% CI = 0.562 – 0.919) (Rossi and Runge 2018, p. 6-7). The 2018 detection and occupancy estimates for eastern black rails in Colorado are higher than those recently estimated for the upper Texas coast (Tolliver et al. 2019, entire), the species' stronghold in the Southwest Coastal Plain analysis unit.

When determining whether a species is endangered in any portion, there is often a temporal aspect of the analysis. We consider whether the species is presently on the brink of extinction, as opposed to likely to become so in the foreseeable future. This species faces significant habitat loss and conversion from different drivers, including development pressure, groundwater extraction, incompatible land management practices, and impacts from climate change (i.e., changes in temperature and precipitation events, sea level rise, and increases in tidal flooding). Most of the predicted declines in eastern black rail occupancy modeled in the SSA report were driven by habitat loss rates. Future projections of habitat loss are expected to continue and be exacerbated by sea level rise and other drivers. While the extent and severity of the major threats vary across the four remaining analysis units – the Great Plains, Mid-Atlantic Coastal Plain, Southeast Coastal Plain, and Southwest Coastal Plain – the species is likely to become an endangered species within the foreseeable future, 25 to 50 years from the present, and is not in danger of extinction now. The Southwest Coastal Plain analysis unit had the longest predicted time to potential extirpation, between 45 to 50 years from the present, while the Southeast Coastal Plain and the Mid-Atlantic Coastal Plain analysis units'

predicted time to probable extirpation is between 35 and 50 years from present depending on the scenario.

The Great Plains analysis unit had the shortest time to potential extirpation, forecasting between 15 to 25 years from the present depending on the scenario. However, we determined the one scenario resulting in extirpation within 15 years is a worst-case scenario and is unlikely to be an accurate representation of the species viability in that portion. As noted above, there are no current population estimates from Great Plains analysis unit, but there are consistently detected populations of eastern black rails at a site in Kansas and along the Arkansas River Basin in southeastern Colorado. At the time of the SSA projection analysis, replicated survey data for Colorado were unavailable and data from Kansas (Hands 2009, entire) were used to represent the Great Plains analysis unit. While the Kansas dataset was from a survey for all secretive marshbirds and not a black rail-specific survey, the dataset included eastern black rail detections and represented the best available scientific information at the time of the SSA analysis. However, more recent surveys indicate a higher occupancy rate for portions of the Great Plains (Rossi and Runge 2018, entire).

Given our review of the current condition of the eastern black rail, the additional information from the 2018 surveys in the Great Plains, and our future projection models, we conclude that, while the species is likely to become in danger of extinction within each of these portions within the foreseeable future, we do not find that these portions are in danger of extinction now. Thus, there are no portions of the species' range where the species has a different status from its range-wide status. Therefore, no portion of the species' range provides a basis for determining that the species is in danger of extinction

in a significant portion of its range, and we determine that the species is likely to become in danger of extinction within the foreseeable future throughout all of its range. This is consistent with the courts' holdings in *Desert Survivors v. Department of the Interior*, No. 16-cv-01165-JCS, 2018 WL 4053447 (N.D. Cal. Aug. 24, 2018), and *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d , 946, 959 (D. Ariz. 2017).

Determination of Status

Our review of the best available scientific and commercial information indicates that the eastern black rail meets the definition of a threatened species. Therefore, we are listing the eastern black rail as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies; private organizations; and individuals. The Act encourages cooperation with the States and other countries and calls for recovery actions to be carried out for listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act calls for the Service to

develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan also identifies recovery criteria for review of when a species may be ready for reclassification from endangered to threatened (“downlisting”) or removal from the Lists of Endangered and Threatened Wildlife and Plants (“delisting”), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our website (<http://www.fws.gov/endangered>), or from our South Carolina Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental

organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

Following publication of this final listing rule, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the U.S. States and territories of Alabama, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, Tennessee, Texas, Virginia, U.S. Virgin Islands, and West Virginia would be eligible for Federal funds to implement management actions that promote the protection or recovery of the eastern black rail. Information on our grant programs that are available to aid species recovery can be found at: <http://www.fws.gov/grants>.

Please let us know if you are interested in participating in recovery efforts for this subspecies. Additionally, we invite you to submit any new information on this subspecies whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402.

Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the eastern black rail's habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered by the U.S. Fish and Wildlife Service and National Park Service; issuance of section 404 Clean Water Act (33 U.S.C. 1251 *et seq.*) permits by the U.S. Army Corps of Engineers; and construction and maintenance of roads or highways by the Federal Highway Administration.

Final 4(d) Rule

Background

Section 4(d) of the Act states that the "Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation" of species listed as

threatened. The U.S. Supreme Court has noted that very similar statutory language demonstrates a large degree of deference' to the agency (see *Webster v. Doe*, 486 U.S. 592 (1988)). Conservation is defined in the Act to mean “the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the Act] are no longer necessary.” Additionally, section 4(d) of the Act states that the Secretary “may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants.” Thus, regulations promulgated under section 4(d) of the Act provide the Secretary with wide latitude of discretion to select appropriate provisions tailored to the specific conservation needs of the threatened species. The statute grants particularly broad discretion to the Service when adopting the prohibitions under section 9.

The courts have recognized the extent of the Secretary's discretion under this standard to develop rules that are appropriate for the conservation of a species. For example, courts have approved rules developed under section 4(d) that include a taking prohibition for threatened wildlife, or include a limited taking prohibition (see *Alsea Valley Alliance v. Lautenbacher*, 2007 U.S. Dist. Lexis 60203 (D. Or. 2007); *Washington Environmental Council v. National Marine Fisheries Service*, 2002 U.S. Dist. Lexis 5432 (W.D. Wash. 2002)). Courts have also approved 4(d) rules that do not address all of the threats a species faces (see *State of Louisiana v. Verity*, 853 F.2d 322 (5th Cir. 1988)). As noted in the legislative history when the Act was initially enacted, “once an animal is on the threatened list, the Secretary has an almost infinite number of options available to him with regard to the permitted activities for those species. He may, for example,

permit taking, but not importation of such species, or he may choose to forbid both taking and importation but allow the transportation of such species,” (H.R. Rep. No. 412, 93rd Cong., 1st Sess. 1973).

The Service has developed a species-specific 4(d) rule that is designed to address the eastern black rail’s specific threats and conservation needs. Although the statute does not require the Service to make a “necessary and advisable” finding with respect to the adoption of specific prohibitions under section 9, we find that this rule as a whole satisfies the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of the eastern black rail. As discussed under the **Determination** section, the Service has concluded that the eastern black rail is at risk of extinction within the foreseeable future due to continued wetland habitat loss, sea level changes, increasing storm frequency and intensity and increased flood events (which are both associated with high tides and storms), wetland subsidence, and land management practices (e.g., incompatible prescribed fire, grazing, and mechanical treatment activities). The provisions of this 4(d) rule would promote conservation of the eastern black rail by encouraging management of the landscape in ways that meet both land management considerations and the conservation needs of the eastern black rail. The provisions of this rule are one of many tools that the Service would use to promote the conservation of the eastern black rail.

Provisions of the 4(d) Rule

Under the Act, “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Some of these provisions have been further defined in regulation at 50 CFR 17.3. Take can result

knowingly or otherwise, by direct and indirect impacts, intentionally or incidentally. As discussed under the **Summary of Biological Status and Threats** (above), multiple factors are affecting the status of the eastern black rail. A range of activities have the potential to impact the eastern black rail, including fire management, grazing, mechanical treatment activities, and long-term or permanent conversion, fragmentation, and damage of persistent emergent wetland habitat and the contiguous wetland-upland transition zone to other habitat types or land uses. Regulating incidental take from these activities would help preserve the species' remaining populations and decrease synergistic, negative effects from other stressors.

A major goal of the 4(d) rule is to minimize incidental take and to maintain the dense overhead cover that the subspecies needs. For the purposes of this rule, we define dense overhead cover as cover that exists in excess of the height of an eastern black rail, and is assessed from above in terms of herbaceous persistent emergent wetland plant cover (as defined by Cowardin et al. 1979, p. 20) versus non-vegetative cover of the ground, including bare ground itself. Eastern black rails typically occupy areas with overhead cover that permits little or no view of bare ground. This type of cover has been assessed by three different means for eastern black rails: (1) the visual estimate of overhead cover in a 50-m radius centered upon the point of interest (e.g, Roach and Barrett 2015, Tolliver et al. 2019); (2) a 10-cm graduated pole accompanied by percent cover estimates (Wiens pole; e.g., Kane 2011, Butler et al. 2015); and (3) a Robel pole and percent cover or plant density estimates (e.g., Butler et al. 2015, Rossi and Runge 2018, Haverland 2019). The latter two protocols included both vertical and horizontal assessments of cover. Roach and Barrett, Tolliver, Haverland, and Butler worked in

Spartina-dominated estuarine wetlands, whereas Kane and Rossi and Runge worked in inland palustrine marshes. Plant height is generally ≤ 1 m in coastal habitats, but can be taller in occupied cattail and bulrush marshes (e.g., Legare and Eddleman 2001, p. 170; Culver and Lemly 2013, pp. 316-318).

Under this 4(d) rule, incidental take resulting from fire management activities, grazing activities, and haying, mowing, and other mechanical treatment activities would be prohibited unless otherwise noted. Regardless of management tool, be it mowing, haying, other mechanical treatment activities, fire, or grazing, within a management boundary, a minimum of 50 percent of habitat (i.e., dense overhead cover) required by the eastern black rail should be maintained in any given calendar year. For example, if a single management boundary conducts burning and mechanical treatment activities, the cumulative treatment should not exceed 50 percent of total eastern black rail habitat within the boundary. We discourage disproportionately applying land management treatments to habitats during the breeding season because this will limit population growth and recruitment. Management boundaries can include individual landholdings, e.g., a National Wildlife Refuge boundary, or be formed through landscape-level agreements across landholdings of different but contiguous ownerships.

Fire Management Activities

Prescribed fire is an essential management tool for re-initialization of vegetative succession and seral sequencing for restoring and maintaining habitats on public and private lands, which is important to ensure suitable habitat for maintaining populations of the eastern black rail. Wildland fire occurrence from both natural and human ignition sources can occur any time of the year across much of the eastern black rail's

distribution. Eastern black rails can survive fires that slowly progress in a way where individuals can move ahead of the flames and when areas of unburned refugia are available. Refugia can include wetter areas with emergent vegetation, areas with natural or created firebreaks, or areas not conducive to burning (e.g., wet or green areas in a burn unit). These refugia provide escape from the prescribed fire and predators. Prescribed fires that are conducted with large, fast-moving flame fronts and lines of fire merging into each other may result in trapping eastern black rails that may be killed directly by fire or indirectly through asphyxiation.

While the application of prescribed fire may temporarily affect breeding success of individual eastern black rails, periodic burning supports appropriate seral stages and other beneficial features of the habitat conditions necessary for this species. Fire return frequencies in areas known to support eastern black rails should be infrequent to a degree that suitable habitat is available for several years to breeding individuals and yet frequent enough to maintain suitable eastern black rail habitat. These fire return frequencies may vary across the species' range and, therefore, should be determined by site managers. Fire regimes should provide a broad range of habitat conditions, such as adequate breeding habitat and overhead cover, to support completion of the life cycle of individuals and that, overall, provide for population maintenance and growth. Strategies to accomplish this objective should minimize incidental take of eggs and chicks, where possible. If the prescribed fire occurs during the breeding and nesting season, adults that lose eggs and chicks would have the opportunity to re-nest in unaffected areas. Certain prescribed fire practices can result in unnecessary mortality of eastern black rail during both the breeding and non-breeding season.

The 4(d) rule prohibits incidental take of eastern black rails resulting from prescribed fires throughout the year, unless the practices described below, which would minimize incidental take of eastern black rails and provide for long-term habitat needs for the eastern black rail and other cover-dependent species, are followed. Practices include:

- Regardless of the size of the area under management with prescribed fire, a broad range of habitat conditions should be maintained by burning on a rotational basis, which supports black rail population maintenance and growth. In any given calendar year, at least 50 percent of eastern black rail habitat within a management boundary should be maintained in order to provide the dense overhead cover required by the subspecies. This percentage does not apply to landholdings smaller than 640 acres.
- Where eastern black rail are present, the application of prescribed fire uses tactics that provide unburned refugia allowing birds to survive a fire (e.g., using short flanking, backing fires, or similar approaches). Prescribed fire is applied under fuel and weather conditions (e.g., soil moisture and/or relative humidity) that are most likely to result in patchy persistence of unburned habitat to serve as refugia as well as provide dense overhead cover for protection from aerial predators. For each burn unit, as an objective approximately 10 percent of the burn unit should be distributed as small dispersed patches of unburned area. Unburned patches should be no smaller than 100 square feet. In addition to refugia dispersed in the interior of a burn unit, leaving unburned habitat along unit edges (such as those available on the outward side of roadside borrow ditches) may provide additional refugia for birds to shelter in prior to dispersing to adjacent suitable habitat.

- Ignition tactics, rates of spread, and flame lengths should allow for wildlife escape routes and avoid trapping birds in a fire. The application of prescribed fire should avoid fires, such as ring and strip head fires, that have long, unbroken boundaries and/or that come together in a short period of time and which consume essentially all vegetation and prevent black rails from escaping a fire. If aerial ignition is the chosen tool, ignitions should be conducted in such a way that large, fast-moving fires are avoided. Special precautions should be taken when using aerial ignition, and using short flanking fires into prevailing wind to slow the rate of spread is recommended.

For landholdings smaller than 640 acres, we are excepting these areas from the practice to provide dense overhead cover in 50 percent of the eastern black rail habitat within the management boundary. The selection of 640 acres as a lower limit is based on the feasibility of meeting the percentage requirement on smaller land holdings. In many States where eastern black rails may occur, roads are often used as firebreaks and often form the perimeter of a “section” or square mile, i.e. 640 acres. Smaller land holdings may find achieving the percentage requirement difficult or infeasible and possibly unsafe. It is unlikely that all small land holdings within a geographic area that supports eastern black rails would be treated with prescribed fire at the same time. Further, other nearby land holdings may support eastern black rails where habitat is present.

This provision of the 4(d) rule for fire management activities would promote conservation of the eastern black rail by encouraging continued management of the landscape in ways that meet management needs while simultaneously ensuring the continued survival and propagation of the eastern black rail and by providing suitable habitat.

Haying, Mowing, and Other Mechanical Treatment Activities

Haying and mowing can maintain eastern black rail habitat by reducing woody vegetation encroachment. Mechanical treatment activities include disking (using a disk, harrow, or other tractor-drawn implement) and brush clearing (using a variety of tools that may be attached to a tractor or a stand-alone device). While these practices can be used to enhance eastern black rail habitat, the timing and manner of implementation can impact recruitment and survival.

Haying, mowing, and mechanical treatment activities in persistent emergent wetlands should be avoided during the nesting and brood-rearing periods where eastern black rails are present. We define persistent, emergent wetlands as areas where persistent emergent plants (i.e., erect, rooted, herbaceous hydrophytes, excluding mosses and lichens, that normally remain standing at least until the beginning of the next growing season) are the tallest life form with at least 30 percent areal coverage (Cowardin *et al.* 1979, pp. 11, 19-20). Persistent, emergent vegetation are typically perennial hydrophytic plants (e.g., *Spartina* sp., *Juncus* sp., *Scirpus* sp., *Typha* sp., *Phragmites* sp., *Zizaniopsis* sp., etc.; Federal Geographic Data Committee 2013, p. 33) that form dense stands and provide overhead cover and primary nesting substrate for black rail and other secretive marsh birds. For more information on emergent wetlands, please visit the Service's National Wetlands Inventory website: <https://www.fws.gov/wetlands/>.

Haying, mowing, and mechanical treatment activities in persistent emergent wetlands that take place during critical time periods for eastern black rail (i.e., nest construction, egg-laying, incubation, and parental care) can potentially lead to disturbance of nesting birds; destruction of nests; and mortality of eggs, chicks, juveniles,

and adults. We recognize that there is latitudinal variability of these life-history events across the range of the eastern black rail. For example, in Texas, eastern black rails begin to nest in March, whereas in Kansas and Colorado nesting begins in May. Therefore, the timing of prohibitions would coincide with when the eastern black rail is using the habitat for nesting and brood-rearing.

We recognize haying, mowing, or other mechanical treatment activities may need to be used for maintenance requirements to ensure safety and operational needs for existing infrastructure, and we understand that these maintenance activities may need to take place during the nesting or brooding periods. These include maintenance of existing firebreaks, roads, rights-of-way, levees, dikes, fence lines, airfields, and surface water irrigation infrastructure (e.g., head gates, ditches, canals, water control structures and culverts). Incidental take resulting from these activities are an exception to this prohibition.

We also except incidental take that results from mechanical treatment activities that are done during the nesting or brooding periods with the purpose of controlling woody encroachment or other invasive plant species to restore degraded habitat. It is unlikely that eastern black rails will be occupying areas of unsuitable habitat, and mechanical treatment activities to remove woody vegetation or other invasive plant species may help restore habitat and allow for eastern black rail use in the future. Invasive species (both native [e.g., *Baccharis halimifolia*] and nonnative [e.g., *Phragmites australis*, *Triadica sebifera*]) have played a role by converting emergent systems into shrub- or tree-dominated landscapes or monocultures. Given the narrow habitat preferences of the eastern black rail, i.e., very shallow water and dense emergent

vegetation, small changes in plant community structure from woody encroachment or other invasive plant species can quickly result in unsuitable habitat for the eastern black rail.

We do not prohibit incidental take from mowing, haying, or other mechanical treatment activities outside of the nesting or brood-rearing periods. However, we encourage land managers to employ voluntary BMPs outside of these time periods in emergent wetlands with eastern black rails present. BMPs for haying, mowing, and mechanical treatment activities include avoiding treatment of more than 50 percent of a contiguous block of habitat resources in emergent wetlands where eastern black rails are present; providing untreated (*i.e.*, unmown or avoided) areas that provide refugia for species dependent on dense overhead vegetative cover, such as the eastern black rail, during years when treatments are conducted; and using temporary markers to identify where birds occur so that these areas may be avoided.

This provision of the 4(d) rule for haying, mowing, and other mechanical treatment activities in persistent emergent wetlands would promote conservation of the eastern black rail by prohibiting incidental take of eastern black rail during the nesting and brood-rearing period.

Grazing Activities

Based on current knowledge of grazing and eastern black rail occupancy, the specific timing, duration, and intensity of grazing will result in varying impacts to the eastern black rail and its habitat. Either no grazing or light-to-moderate grazing may be compatible with eastern black rail occupancy under certain conditions, while intensive or heavy grazing is likely to have negative effects on eastern black rails and the quality of

their habitat. Intensive or heavy grazing may lead to the removal of required dense overhead cover, as well as disturbance of nesting birds and possible destruction of nests and mortality of eggs and chicks due to trampling. Grazing densities should maintain the dense overhead cover required by the eastern black rail and allow for the long-term maintenance of habitat conditions required by the eastern black rail.

Grazing practices support other land use purposes and management goals, including resetting of grassland and marsh seral stages necessary to support habitat needs of various species. Grazing (such as short duration grazing) is sometimes used to delay seral stage succession as a surrogate for prescribed fire.

We are limiting this prohibition to public lands whose intended purpose is wildlife and/or habitat conservation, given our knowledge of where grazing activities and the presence of eastern black rails overlap. The rationale for this approach is based on several factors. First, applying the prohibition to these public ownerships that have been established for wildlife or habitat conservation provides clarity to land managers who presently employ grazing as a management tool and to land managers who may consider using grazing as a management tool at a future date. Further, the Service and its Federal and State partners have significant efforts working with private landowners who conduct grazing activities on their lands to support conservation of other listed and at-risk wildlife species. For example, the Partners for Fish and Wildlife Program is working with private landowners on Attwater's prairie chicken recovery in Texas. Preliminary results suggest that land management activities at this site, which include grazing prescriptions, may also support eastern black rails. These efforts provide public and private land managers with strategies and approaches that will support conservation and recovery of the eastern black

rail. Although we are not proposing to prohibit incidental take resulting from grazing that maintains dense overhead cover, we recommend that land managers follow voluntary practices to support conservation of the eastern black rail and associated habitat.

Voluntary practices to avoid negative impacts to the eastern black rail from grazing activities include the use of fences to exclude grazing from habitat where eastern black rails are present, and rotational grazing practices so that a mosaic pattern of cover density is present across fenced tracts of land.

The rule prohibits incidental take resulting from grazing activities on public lands that, individually or cumulatively with other land management practices, do not maintain at least 50 percent of eastern black rail habitat, i.e., dense overhead cover, in any given calendar year within a management boundary. This provision of the 4(d) rule for grazing activities would promote conservation of the eastern black rail by encouraging land managers to continue managing the landscape in ways that meet their needs while simultaneously providing suitable habitat for the eastern black rail. We encourage the use of rotational and deferred grazing practices in an effort to reduce the duration of disturbance/impacts to eastern black rails and their habitat.

Long-Term or Permanent Conversion, Fragmentation, and Damage of Persistent Emergent Wetland Habitat and Contiguous Wetland-Upland Transition Zone to Other Habitat Types or Land Uses

The eastern black rail is a wetland-dependent bird requiring dense overhead cover and soils that are moist to saturated (occasionally dry) and interspersed with or adjacent to very shallow water (typically ≤ 3 cm) to support its resource needs. Eastern black rails occur across an elevational gradient that lies between low marsh and uplands. Their

location across this gradient may vary depending on hydrologic conditions. The wetland-upland transition zone is a narrow band of habitat where wetlands and uplands intersect and contains vegetation types from both ecotones and are important to provide refugia during flooding events and minimize the risk of predation (Evens and Page 1986). For activities planned within the wetland-upland transition zone, we encourage you to contact the local Ecological Services Field Office (<http://www.fws.gov/offices>) to help evaluate the potential for take of eastern black rail.

Although conservation measures to protect wetlands have resulted in meaningful decreases in the rate of wetland habitat loss, loss of emergent wetlands continues (Service 2019, entire). The most recent wetlands status and trends report indicates that estuarine emergent wetland losses are mostly attributable to conversion to open water through erosion (Dahl and Stedman 2013, p. 37), while freshwater emergent wetland losses appear to be the result of development (Dahl and Stedman 2013, p. 35). While we cannot prohibit incidental take that may result from the effects of climate change, such as sea level rise or erosion, we can ensure that incidental take of eastern black rails that results from conversion or fragmentation of wetlands and the contiguous wetland-upland transition zone outside of natural community shifts (e.g., due to wet and dry cycles), to other habitat types or land uses is prohibited. Conversion of this type may result from development and construction activities or from vehicular access when such access results in a permanent or long-term conversion or damage of the habitat. For example, track equipment or equipment with amphibious tires may leave behind ruts or depressions that exist permanently or for the long term.

This prohibition addresses public comments received requesting that the Service include measures to address impacts from infrastructure development and construction activities in eastern black rail habitat.

Other Forms of Take

This 4(d) rule provides for the conservation of the eastern black rail by prohibiting the following activities, except as otherwise authorized or permitted: importing or exporting; purposeful take; possession and other acts with unlawfully taken specimens; delivering, receiving, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce. We extend the Act's section 9(a)(1)(A) and 9(a)(1)(D) – (F) prohibitions to the eastern black rail throughout its range.

We may issue permits to carry out otherwise prohibited activities involving threatened wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.32. With regard to threatened wildlife, a permit may be issued for the following purposes: for scientific purposes, to enhance propagation or survival, for economic hardship, for zoological exhibition, for educational purposes, for incidental taking, or for special purposes consistent with the purposes of the Act. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

The Service recognizes the special and unique relationship with our state natural resource agency partners in contributing to conservation of listed species. State agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened, and candidate species of wildlife and plants. State agencies,

because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist the Services in implementing all aspects of the Act. In this regard, section 6 of the Act provides that the Services shall cooperate to the maximum extent practicable with the States in carrying out programs authorized by the Act. Therefore, any qualified employee or agent of a State conservation agency that is a party to a cooperative agreement with the Service in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, would be able to conduct activities designed to conserve the eastern black rail that may result in otherwise prohibited take without additional authorization.

Other Exceptions to Prohibitions

We recognize that some individual managed wetland units have an established history of intensive vegetation and soil management, which may include burning, during the growing season on an annual or nearly annual basis (e.g., moist soil management). In contrast to the definition of persistent emergent wetlands provided above, these wetland units have established objectives to maintain unvegetated (e.g., mudflat), sparsely vegetated, and/or primarily annual plant communities that may not provide vegetative cover during a substantial portion of the growing season. For example, prior converted croplands that support active production of rice and other cereal grains do not provide suitable habitat for eastern black rail and are, therefore, excepted. These and other wetland units with established management practices to provide habitat conditions other than those described in our definition of persistent emergent wetlands are an exception to this prohibition.

We are excepting incidental take resulting from actions taken to control wildfires. There are also incidental take exceptions for construction of new firebreaks (for example, to protect wildlands or manmade infrastructure) and fence lines, as these are needed when management units are subdivided or new property is acquired. Both of these activities allow for improved targeted management that benefits the habitat needs of eastern black rails and provide for public safety.

Nothing in this 4(d) rule changes in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or the ability of the Service to enter into partnerships for the management and protection of the eastern black rail. However, interagency cooperation may be further streamlined through planned programmatic consultations for the species between Federal agencies and the Service. We ask the public, particularly State agencies and other interested stakeholders that may be affected by the 4(d) rule, to contact us regarding additional guidance and methods that the Service could provide or use, respectively, to streamline the implementation of this 4(d) rule (see **ADDRESSES**, above).

Critical Habitat

Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features:

- (a) Essential to the conservation of the species, and
- (b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation, as defined at section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but even in the event of a destruction or adverse modification finding, the obligation of the Federal action agency and the landowner is not to restore or recover the species, but to implement

reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the *Federal Register* on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines, provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

Prudency Determination

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12), require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. Our regulations (50 CFR 424.12(a)(1)) state that the Secretary may, but is not required to, determine that a designation would not be prudent in the following circumstances:

- (i) The species is threatened by taking or other human activity and identification of critical habitat can be expected to increase the degree of such threat to the species;
- (ii) The present or threatened destruction, modification, or curtailment of a species' habitat or range is not a threat to the species, or threats to the species' habitat

stem solely from causes that cannot be addressed through management actions resulting from consultations under section 7(a)(2) of the Act;

(iii) Areas within the jurisdiction of the United States provide no more than negligible conservation value, if any, for a species occurring primarily outside the jurisdiction of the United States;

(iv) No areas meet the definition of critical habitat; or

(v) The Secretary otherwise determines that designation of critical habitat would not be prudent based on the best scientific data available.

In the proposed listing rule (83 FR 50610, October 9, 2018), we determined that designation of critical habitat for the eastern black rail would not be prudent. However, we invited public comment and requested information on the threats of taking or other human activity, particularly by birders, on the eastern black rail and its habitat, and the extent to which designation might increase those threats, as well as the possible benefits of critical habitat designation to the eastern black rail.

During the comment period, we did not receive any substantive comments, or any comments that would require us to change the not prudent determination or our rationale for it (see 83 FR 50627–50628). Therefore, we restate our conclusion that the designation of critical habitat is not prudent, in accordance with 50 CFR 424.12(a)(1), because the eastern black rail and its habitat face a threat by overzealous birders, and designation can reasonably be expected to increase the degree of these threats to the subspecies and its habitat by making location information more readily available.

Required Determinations

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act, need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244).

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes. Although we have no records of the eastern black rail occurring on tribal lands, the range of the eastern black rail overlaps with tribal lands. At the time of the proposed rule, we contacted Tribal leaders and Natural Resource Coordinators for those Tribes residing within the

subspecies' range. We did not receive any comments on the proposed rule from these Tribes.

References Cited

A complete list of references cited in this rule is available on the Internet at <http://www.regulations.gov> in Docket No. FWS–R4–ES–2018–0057 and upon request from the South Carolina Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Species Assessment Team, U.S. Fish and Wildlife Service.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

AUTHORITY: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

2. Amend § 17.11(h) by adding an entry for “Rail, eastern black” to the List of Endangered and Threatened Wildlife in alphabetical order under BIRDS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* * * * *	* *	BIRDS		
* * * * *	* *			
Rail, eastern black	<i>Laterallus jamaicensis jamaicensis</i>	Wherever found	T	85 FR[INSERT <u>FEDERAL REGISTER</u> PAGE WHERE THE DOCUMENT BEGINS], [INSERT DATE OF PUBLICATION IN THE <u>FEDERAL REGISTER</u>]; 50 CFR 17.41(f). ^{4d}
* * * * *	* *			

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3. Amend § 17.41 by adding paragraph (f) to read as follows:

§ 17.41 Special rules—birds.

* * * * *

(f) Eastern black rail (*Laterallus jamaicensis jamaicensis*).

(1) *Prohibitions.* The following activities with the eastern black rail are prohibited:

(i) Purposeful take, including capture, handling, or other activities.

(ii) Incidental take resulting from the following activities:

(A) Prescribed burn activities, unless best management practices that minimize negative effects of the prescribed burn on the eastern black rail are employed. Best management practices include:

(1) Regardless of the size of the area under management with prescribed fire, a broad range of habitat conditions should be maintained by burning on a rotational basis, which supports black rail population maintenance and growth. In any given calendar year, at least 50 percent of the eastern black rail habitat within the management boundary should be maintained in order to provide the dense overhead cover required by the subspecies. Management boundaries can include individual landholdings, e.g., a National Wildlife Refuge boundary, or be formed through landscape-level agreements across landholdings of different but contiguous ownerships. This percentage does not apply to landholdings smaller than 640 acres.

(2) Where eastern black rail are present, the application of prescribed fire uses tactics that provide unburned refugia allowing birds to survive a fire (e.g., using short flanking, backing fires, or similar approaches). Prescribed fire is applied under fuel and weather conditions (e.g., soil moisture and/or relative humidity) that are most likely to result in patchy persistence of unburned habitat to serve as refugia from fire and predators.

(3) Ignition tactics, rates of spread, and flame lengths should allow for wildlife escape routes to avoid trapping birds in a fire. The application of prescribed fire should avoid fires, such as ring and strip head fires, that have long, unbroken boundaries and/or that come together in a short period of time and that consume essentially all vegetation and prevent black rails from escaping a fire. If aerial ignition is the chosen tool, ignitions should be conducted in such a way that large, fast-moving fires are avoided.

(B) Mowing, haying, and other mechanical treatment activities in persistent emergent wetlands when the activity occurs during the nesting or brooding periods, except in accordance with paragraph (f)(2)(iii) of this section.

(C) Grazing activities on public lands that occur on eastern black rail habitat and, that individually or cumulatively with other land management practices, do not maintain at least 50 percent of eastern black rail habitat, i.e., dense overhead cover, in any given calendar year within a management boundary.

(D) Long-term or permanent damage, fragmentation, or conversion of persistent emergent wetlands and the contiguous wetland-upland transition zone to other habitat types (such as open water) or land uses that do not support eastern black rail.

(iii) Possession and other acts with unlawfully taken eastern black rails. It is unlawful to possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any eastern black rail that was taken in violation of section 9(a)(1)(B) and (C) of the Act or State laws.

(iv) Import or export, as set forth at § 17.21(b) for endangered wildlife.

(v) Possess and conduct other acts with unlawfully taken specimens, as set forth at § 17.21(d)(1) for endangered wildlife.

(vi) Engage in interstate or foreign commerce in the course of commercial activity, as set forth at § 17.21(e) for endangered wildlife.

(vii) Sell or offer for sale, as set forth at § 17.21(f) for endangered wildlife.

(2) *Exceptions from prohibitions.*

(i) All of the provisions of §17.32 apply to the eastern black rail.

(ii) Any employee or agent of the Service, of the National Marine Fisheries Service, or of a State conservation agency that is operating a conservation program for the eastern black rail pursuant to the terms of a cooperative agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take eastern black rails.

(iii) Incidental take resulting from haying, mowing, or other mechanical treatment activities in persistent emergent wetlands that occur during the nesting and brooding periods is allowed if those activities:

(A) Are maintenance requirements to ensure safety and operational needs, including maintaining existing infrastructure such as firebreaks, roads, rights-of-way, levees, dikes, fence lines, airfields, and surface water irrigation infrastructure (e.g., head gates, ditches, canals, water control structures, and culverts); or

(B) Occur during the control of woody encroachment and other invasive plant species to restore degraded habitat.

(iv) Incidental take resulting from actions taken to control wildfires is allowed.

(v) Incidental take resulting from the establishment of new firebreaks (for example, to protect wildlands or manmade infrastructure) and new fence lines is allowed.

(vi) Incidental take resulting from prescribed burns, grazing, and mowing or other mechanical treatment activities in existing moist soil management units or prior converted croplands (e.g., impoundments for rice or other cereal grain production) is allowed.

Signed:

Aurelia Skipwith

Director, U.S. Fish and Wildlife Service.

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