

DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 17**[Docket No. FWS-R9-IA-2009-0059;
4500030115]

RIN 1018-AV77

Endangered and Threatened Wildlife and Plants; Listing Foreign Bird Species in Peru and Bolivia as Endangered Throughout Their Range**AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (We or Service), determine endangered status for the following six South American bird species (collectively referred to as species for purposes of this final rule) under the Endangered Species Act of 1973, as amended (Act): Ash-breasted tit-tyrant (*Anairetes alpinus*), Junín grebe (*Podiceps taczanowskii*), Junín rail (*Laterallus tuerosi*), Peruvian plantcutter (*Phytotoma raimondii*), royal cinclodes (*Cinclodes aricomae*), and white-browed tit-spinetail (*Leptasthenura xenothorax*). These species are in danger of extinction throughout all of their ranges. All six species are native to Peru. The ash-breasted tit-tyrant and royal cinclodes are also native to Bolivia.

DATES: This rule becomes effective August 23, 2012.

ADDRESSES: This final rule is available on the Internet at <http://www.regulations.gov>. Comments and materials received, as well as supporting documentation used in the preparation of this rule, are available for public inspection at <http://www.regulations.gov> or by appointment, during normal business hours at: U.S. Fish and Wildlife Service, Endangered Species Program, 4401 N. Fairfax Drive, Suite 400, Arlington, VA 22203.

FOR FURTHER INFORMATION CONTACT: Janine Van Norman, Chief, Branch of Foreign Species, Endangered Species Program, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 420, Arlington, VA 22203. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339.

SUPPLEMENTARY INFORMATION:**Executive Summary**

On January 5, 2010, we published a proposed rule (75 FR 606) to list these six foreign bird species as endangered: Ash-breasted tit-tyrant, Junín grebe,

Junín rail, Peruvian plantcutter, royal cinclodes, and white-browed tit-spinetail. These species are all native to Peru. The ash-breasted tit-tyrant and royal cinclodes are also native to Bolivia. Each of these six species is affected by the loss and degradation of habitat. In addition to severely contracted ranges and distributions of these species, their small, declining populations are an additional threat to their survival.

This action is authorized by the Endangered Species Act of 1973 (Act) (16 U.S.C. 1531 *et seq.*), as amended. It affects part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations.

These six foreign bird species will be listed as endangered under the Act.

Background

On January 5, 2010, we published a proposed rule (75 FR 606) to list these six species as endangered: Ash-breasted tit-tyrant (*Anairetes alpinus*), Junín grebe (*Podiceps taczanowskii*), Junín rail (*Laterallus tuerosi*), Peruvian plantcutter (*Phytotoma raimondii*), royal cinclodes (*Cinclodes aricomae*), and white-browed tit-spinetail (*Leptasthenura xenothorax*). These species are all native to Peru. The ash-breasted tit-tyrant and royal cinclodes are also native to Bolivia.

We opened the public comment period on the proposed rule for 60 days, which ended March 8, 2010, to allow all interested parties an opportunity to comment on the proposed rule.

We are addressing these six species under a single rule for efficiency. Each of these species is affected by similar threats. The major threat to these species is the loss and degradation of habitat. In addition to severely contracted ranges and distributions of these species, their small, declining populations are an additional threat. In this rule, we combined the evaluation of species that face similar threats within the same general habitat type and geographic area into one section to maximize our limited staff resources.

Previous Federal Actions

On May 6, 1991, we received a petition (the 1991 petition) from the International Council for Bird Preservation (ICBP) to add 53 foreign bird species to the List of Endangered and Threatened Wildlife, including the six Peruvian bird species that are the subject of this proposed rule. In response to the 1991 petition, we published a substantial 90-day finding on December 16, 1991 (56 FR 65207), for all 53 species and initiated a status review. On March 28, 1994 (59 FR

14496), we published a 12-month finding on the 1991 petition, along with a proposed rule to list 30 African birds under the Act (which included 15 species from the 1991 petition). In that document, we announced our finding that listing the remaining 38 species from the 1991 petition, including the six Peruvian bird species that are the subject of this proposed rule, was warranted but precluded by higher priority listing actions. We made a subsequent warranted-but-precluded finding for all outstanding foreign species from the 1991 petition, including the six Peruvian bird species that are the subject of this proposed rule, as published in our annual notice of review (ANOR) of foreign species on May 21, 2004 (69 FR 29354).

Per the Service's listing priority guidelines (September 21, 1983; 48 FR 43098), our 2007 ANOR (77 FR 20184, April 23, 2007) identified the listing priority numbers (LPNs) (ranging from 1 to 12) for all outstanding foreign species. The six Peruvian bird species that are the subject of this proposed rule were designated with an LPN of 2, and we determined that their listing continued to be warranted but precluded because of other listing actions. A listing priority of 2 indicates that the species faces imminent threats of high magnitude. With the exception of the listing priority ranking of 1, which addresses monotypic genera that face imminent threats of high magnitude, LPN categories 2 and 3 are among the Service's highest priorities for listing.

On July 29, 2008 (73 FR 44062), we published in the **Federal Register** a notice announcing our annual petition findings for foreign species. In that notice, we announced listing to be warranted for 30 foreign bird species, including the six Peruvian bird species that are the subject of this proposed rule, and stated that we would promptly publish proposals to list these 30 taxa. In selecting these six species from the list of warranted-but-precluded species, we took into consideration the magnitude and immediacy of the threats to the species, consistent with the Service's listing priority guidelines.

On September 8, 2008, the Service received a 60-day notice of intent to sue from the Center for Biological Diversity (CBD) and Peter Galvin over violations of section 4 of the Act for the Service's failure to promptly publish listing proposals for the 30 warranted species identified in our 2008 ANOR. Under a settlement agreement approved by the U.S. District Court for the Northern District of California on June 15, 2009, (*CBD et al. v. Salazar*, 09-CV-02578-

CRB), we were required to submit to the **Federal Register** proposed listing rules for the ash-breasted tit-tyrant, Junín grebe, Junín rail, Peruvian plantcutter, royal cinclodes, and white-browed tit-spinetail by December 29, 2009. That proposed rule published on January 5, 2010 (75 FR 606).

Summary of Changes From the Proposed Rule

This final rule incorporates changes to our proposed listing based on new information located on these species since the proposed rule was published, including comments and information received from peer reviewers. In order to be concise and efficient, we are incorporating by reference background information that was published on these six species in the proposed rule, 75 FR 606, published January 5, 2010. Species descriptions, taxonomy, and habitat and life history may be found in the proposed rule, unless we are making technical corrections or incorporating new information. In this final rule, we included new information on recent location data for the royal cinclodes. We also updated the population estimates, range, and conservation status on the other species.

We also changed the format of this final rule to make it more readable, particularly in light of the Plain Writing Act of 2010 (Executive Order 13563). We organized it first by species descriptions for all six species, and then by the evaluation of factors affecting the species. We organized the threats evaluation for these six species (also known as the five-factor analysis, see Section 4(a)(1) of the Act), primarily by three habitat types and locations for efficiency. Three species occur in *Polylepis* forest, two species occur at Lake Junín, and the Peruvian plantcutter is evaluated on its own due to its unique habitat requirements and distribution. Because each habitat experiences similar threats, for each threat factor, we identified and evaluated those factors that affect these species within the particular habitat and that are common to all of the species within that habitat. For example, the degradation of habitat and habitat loss are threats to all six species. We also identified and evaluated threats that may be unique to certain species, but that may not apply to all of the species addressed in this final rule. For example, the Peruvian plantcutter is the only species addressed in this rule that is found in the northwestern coast of Peru, and we have addressed threats that are unique to that species specifically. Lastly, we included range maps for each species to better identify their ranges to the public.

Summary of Comments and Recommendations

In the proposed rule that published on January 5, 2010 (75 FR 606), we requested that all interested parties submit information that might contribute to the development of a final rule. We also contacted appropriate scientific experts and organizations and invited them to comment on the proposed listings.

We received three comments on the proposed rule from the public. One comment from the public expressed support for the proposed listings but provided no substantive information. One commenter requested that we take climate change into account when evaluating threats to these species. Although the science of climate change is still uncertain with respect to how it will affect the long-term viability of species and the ecosystems upon which they depend, the Service did consider effects of climate change to these species in this final rule.

The other comment received from the public was also non-substantive—the commenter asked why these species should be listed under the Act if they are not native to the United States. The Act provides for the listing of any species that qualifies as an endangered or threatened species, regardless of its native range. Protections under the Act apply to species not native to the United States and include restrictions on importation into the United States; sale or offer for sale in foreign commerce; and delivery, receipt, carrying, transport, or shipment in foreign commerce and in the course of a commercial activity. Listing also serves to heighten awareness of the importance of conserving these species among foreign governments, conservation organizations, and the public.

Peer Review

In accordance with our policy published on July 1, 1994 (59 FR 34270), we solicited expert opinions from six knowledgeable individuals with scientific expertise that included familiarity with one or more of these six species, the geographic region in which the species occur, and conservation biology principles. We received responses from four peer reviewers. The peer reviewers generally agreed that the description of the biology and habitat for each species was accurate and was based on the best available information. New location data were provided for the royal cinclodes, and we incorporated the information into the rule. Supporting data and information such as the species' biology, ecology, life

history, population estimates, threat factors, and current conservation efforts were provided and also incorporated into this rule. In response to a comment from a peer reviewer who thought that the proposed rule was difficult to read, we have tried to reorganize our evaluation and finding in a clearer manner in this final rule.

Species Information

Below is a description of each species. The species are described in alphabetical order, beginning with the ash-breasted tit-tyrant, followed by the Junín grebe, Junín rail, Peruvian plantcutter, royal cinclodes, and the white-browed tit-spinetail.

*I. Ash-breasted tit-tyrant (*Anairetes alpinus*)*

Species Description

The ash-breasted tit-tyrant, locally known as “torito pechicencizo,” is a small New World tyrant flycatcher in the Tyrannidae family that is native to high-altitude woodlands of the Bolivian and Peruvian Andes (BirdLife International (BLI) 2000, p. 392; Collar *et al.* 1992, p. 753; del Hoyo *et al.* 2004, pp. 170, 281; Fjeldså and Krabbe 1990, pp. 468–469; InfoNatura 2007, p. 1; Supreme Decree No. 034–2004–AG 2004, p. 276854). The sexes are similar, with adults approximately 13 centimeters (cm) (5 inches (in)) in length, with dark gray, inconspicuously black-streaked upperparts (BLI 2009o, p. 1; del Hoyo *et al.* 2004, p. 281). The two subspecies (see Taxonomy) are distinguished by their underbelly color, which is yellowish-white in the nominate subspecies and white in the other (BLI 2009o, p. 1). Juvenile plumage is duller in appearance, but is otherwise similar to the adult coloration (del Hoyo *et al.* 2004, p. 281).

Taxonomy

When the species was first taxonomically described by Carraker (1933, pp. 27–29), it was placed in its own genus, *Yanacea*. It was not until the 1960s that *Yanacea* was merged into *Anairetes* (a genus long-known as *Spizitornis*) by Meyer de Schauensee (1966, p. 376). Some contemporary researchers have suggested retaining the species within *Yanacea* (Fjeldså and Krabbe 1990, p. 468). Smith (1971, pp. 269, 275) and Roy *et al.* (1999, p. 74) confirmed that the ash-breasted tit tyrant is a valid species based on its phylogenetic placement and degree of genetic divergence from other species of *Anairetes*, and recent texts continue to place it in *Anairetes* (e.g., del Hoyo *et al.* 2004, p. 281). Therefore, we accept

the species as *Anairetes alpinus*, which follows the Integrated Taxonomic Information System (ITIS 2009, p. 1). Two subspecies are recognized, including, *A. alpinus alpinus* (the nominate subspecies) and *A. alpinus bolivianus*. These subspecies occur in two widely separated areas (see Current Range) (ITIS 2009, p. 1; del Hoyo *et al.* 2004, p. 281) and are distinguished by the color of their underbellies (see Taxonomy) (BLI 2009o, p. 1).

Habitat and Life History

Density of foliage rather than size of tree seems to be an important factor for this species (Fjeldsá 2010 pers. comm.). This species forages in the terminal branches and outer foliage, usually in the treetops but also at ground level at the edges of dense forest patches. In areas where all trees have been cut, it forages in the dense regrowth near ground level. In general, these patches are found in a zone of persistent cloudiness, in places with difficult accessibility and few people (Fjeldsá 2010 pers. comm.).

In west-central Peru, the species occurs in the Cordilleras (mountains in Spanish) Central and Occidental (in the Peruvian Administrative Regions of Ancash, Huánuco, La Libertad, and Lima) (BLI 2009, p. 1; del Hoyo *et al.* 2004, p. 281). Until 1992, the taxon in this locality was highly localized and known only in Ancash Region (Collar *et al.* 1992, p. 753). The species was subsequently reported in other regions between 2003 and 2007, such as Lima, Huánuco, and Libertad (BLI 2009i, p. 1; BLI 2007, pp. 1, 5; del Hoyo *et al.* 2004, p. 281). There is little remaining *Polylepis* habitat in its elevational zone in the humid east Andean slope of Puno, so there may be a large distribution gap there today (Purcell and Brelsford 2004, p. 155).

The ash-breasted tit-tyrant is restricted to remnant patches of semihumid *Polylepis* or *Polylepis*-*Gynoxys* woodlands of Peru and Bolivia (See <http://www.birdlife.org/datazone/speciesfactsheet.php?id=4173> for a range map of the species), where the species is found at elevations between 3,700 and 4,600 meters (m) (12,139 and 15,092 feet (ft)) above sea level. It is found in severely fragmented and local populations in remote valleys in the Andes (Benham *et al.* 2011, p. 145; Association Armonia 2011, p. 1; InfoNatura 2007, p. 1; del Hoyo *et al.* 2004, pp. 170, 281; Collar *et al.* 1992, p. 753; Fjeldsá and Krabbe 1990, pp. 468–469). The genus *Polylepis* (locally referred to as “queuña”) (Aucca and Ramsay 2005, p. 1), in the Rosaceae family, comprises approximately 20

species of evergreen bushes and trees (Kessler and Schmidt-Lebuhn 2006, pp. 1–2; De la Via 2004, p. 10; Kessler 1998, p. 1), 19 of which occur in Peru (Chutas *et al.* 2008, p. 3). In Bolivia, the ash-breasted tit-tyrant is associated only with *P. pepei* forests, but the bird is found among a greater variety of *Polylepis* species in Peru (Chutas *et al.* 2008, p. 16; I. Gómez, in litt. 2007, p. 1). The average *Polylepis* species are 3–10 m (10–33 ft) tall, but may grow to a height of 36 m (118 ft) (Purcell *et al.* 2004, p. 455). *P. pepei* is considered vulnerable by IUCN and is described as rare. The genus *Gynoxys* includes several species of flowering shrubs. The ash-breasted tit-tyrant is known to exist in disjunct areas: West-central Peru and in suitable habitat stretching from southern Peru into northern Bolivia (Benham *et al.* 2011, pp. 145–157; del Hoyo *et al.* 2004, p. 281).

Polylepis woodlands occur as dense forests, as open-canopied stands with more arid understories, or as shrubland with scattered trees (De la Via 2004, pp. 10–11; Fjeldsá and Kessler 1996, as cited in Fjeldsá 2002a, p. 113; Lloyd and Marsden in press, as cited in Lloyd 2008, p. 532). Ash-breasted tit-tyrants prefer dense *Polylepis* forests (Fjeldsá 2002a, p. 114; Smith 1971, p. 269), which often include a mixture of *Gynoxys* trees (no common name), in the Asteraceae family (International Plant Names Index (IPNI) 2009, p. 1; De la Via 2004, pp. 10). Dense *Polylepis* woodlands are characterized by moss- or vine-laden vegetation, with a shaded understory and a rich diversity of insects, making good feeding grounds for insectivorous birds (De la Via 2004, p. 10), such as the ash-breasted tit-tyrant (BLI 2009o, p. 1; Lloyd 2008, p. 535).

There is little information about the ecology and breeding behavior of the ash-breasted tit-tyrant. The species' territory ranges from 1–2 hectares (ha) (2.5–5 acres (ac)) (BLI 2009o, p. 1). The breeding season appears to occur during late dry season (Collar *et al.* 1992, p. 754)—November and December (BLI 2009o, p. 1). Juveniles have been observed in March and July (del Hoyo *et al.* 2004, p. 281; Collar *et al.* 1992, p. 754). Although species-specific information is not available, tit-tyrant nests are generally finely woven, open cups, built in a bush (Fjeldsá and Krabbe 1990, p. 468).

The ash-breasted tit-tyrant forages alone, in family groups, and sometimes in mixed-species flocks. The bird takes short flights, either hovering or perching to consume invertebrates near the tops and outer edges of *Polylepis* shrubs and trees (BLI 2009o, p. 1; Lloyd 2008, p. 535; del Hoyo *et al.* 2004, p. 281;

Engblom *et al.* 2002, p. 58; Fjeldsá and Krabbe 1990, p. 468). In winter, when invertebrate populations diminish, tit-tyrants may also forage on seeds (Fjeldsá and Krabbe 1990, p. 468).

Historical Range and Distribution

The ash-breasted tit-tyrant may once have been well-distributed throughout previously dense and contiguous *Polylepis* high-Andes woodlands of Peru and Bolivia. Researchers believe that these woodlands were historically contiguous with lower-elevation cloud forests and widespread above 3,000 m (9,843 ft) (Fjeldsá 2002a, pp. 111–112, 115; Herzog *et al.* 2002, p. 94; Kessler 2002, pp. 97–101; Collar *et al.* 1992, p. 753). Researchers consider the reduction in *Polylepis* forest habitat to be the result of historical human activities, including burning and grazing, which have prevented regeneration of the woodlands and resulted in the fragmented habitat distribution seen today (Herzog *et al.* 2002, p. 94; Kessler 2002, pp. 97–101; Fjeldsá and Kessler 1996, Kessler 1995a, Kessler 1995b, and Lægaard 1992, as cited in Fjeldsá 2002a, p. 112; Kessler and Herzog 1998, pp. 50–51). Modeling studies by Fjeldsá (2002a, p. 116) indicate that this habitat reduction was accompanied by a loss in species richness. It is estimated that only 2–3 and 10 percent of the original forest cover still remain in Peru and Bolivia, respectively (Fjeldsá and Kessler 1996, as cited in Fjeldsá 2002a, p. 113). Of this amount, only 1 percent of the remaining *Polylepis* woodlands are found in humid areas, where denser stands occur (Fjeldsá and Kessler 1996, as cited in Fjeldsá 2002a, p. 113) and which are preferred by the ash-breasted tit-tyrant (BLI 2009o, p. 1; Lloyd 2008, p. 535; Fjeldsá 2002a, p. 114; Smith 1971, p. 269) (see Factor A).

Current Range and Distribution

The current range of the ash-breasted tit-tyrant is estimated to be 11,900 square kilometers (km²) (4,595 square miles (mi²)) (BirdLife International [BLI] 2011a, p. 1; see <http://www.birdlife.org/datazone/speciesfactsheet.php?id=4173> for a range map). However, BLI (2000, pp. 22, 27) defines a species' range as the extent of occurrence or the area contained within the shortest continuous imaginary boundary that can be drawn to encompass all the known, inferred, or projected sites of present occurrence of a species, excluding cases of vagrancy. Given that the species is known to occur in disjunct locations, this range estimate includes a large area of habitat in which the species is not known to occur, and its actual occupied

habitat is much smaller than its range (Jetz *et al.* 2008, p. 2).

Population Estimates

The species has experienced a population decline of between 10 and 19 percent in the past 10 years, and this rate of decline is predicted to continue (BLI 2009o, pp. 1, 4). The population is considered to be declining in close association with continued habitat loss and degradation (see Factor A) (BLI 2009o, p. 5; BLI 2007, pp. 1, 4). Population information is presented first on a global population estimate, and then at the range country level. The range country estimates will begin with Peru, where the majority of the population resides.

Global population estimate. BLI, a global organization that consults with and assimilates information from bird species experts, categorizes the ash-breasted tit-tyrant as having a population size between 250 and 999 individuals, with an estimated actual population size to be in the mid- to upper-hundreds (BLI 2009o, p. 1; BLI 2007, p. 1). Combining the estimated number of ash-breasted tit-tyrants in Peru and Bolivia, the total population consists of possibly 780 individuals (Benham *et al.* 2011, p. 155; Auccha-Chutas 2007, pp. 4, 8; Gómez *in litt.* 2007, p. 1), consistent with the BLI category of between 250–999 individuals.

Peru. Peruvian population estimates are incomplete, with no estimates for the ash-breasted tit-tyrants in Arequipa, Huánuco, La Libertad, or Lima (BLI 2009g, p. 1; del Hoyo *et al.* 2004, p. 281). Auccha-Chutas (2007, p. 8) surveyed five disjunct *Polylepis* forest patches in Peru and estimated that a total of 461 ash-breasted tit-tyrants were located in these areas. This included 30 birds in Corredor Conchucos (Ancash Region); 181 and 33 birds in Cordilleras Vilcanota and Vilcabamba, respectively (Cusco Region); 22 birds in Cordillera de Carabaya (Puno Region); and 195 birds in a study site called Cordillera del Apurímac (Apurímac Region) (Auccha-Chutas 2007, pp. 4, 8), referring to an area within the Runtacocha highlands. Other research in the Runtacocha highlands has indicated that the ash-breasted tit-tyrant is relatively common there (BLI 2009o, p. 1), with an estimated 100 pairs of birds found in approximately 40 forest patches (Fjeldsá *in litt.* 1990, as cited in Collar *et al.* 1992, p. 753). Small numbers of birds are reported in La Libertad Region (del Hoyo *et al.* 2004, p. 281).

Bolivia. Although BLI reports an estimated population size of 150–300 ash-breasted tit-tyrants in Bolivia

(Gómez *in litt.*, 2003 and 2007, as cited in BLI 2009o, p. 1), recent surveys indicate that the population is smaller. Over a 6-year period, Gómez (*in litt.* 2007, p. 1) conducted intensive searches throughout 80 percent of the suitable habitat in Bolivia in the Cordillera Real and the Cordillera Apolobamba (La Paz Department), to detect the presence of the ash-breasted tit-tyrant. From this work, researchers inferred or observed the presence of 2–10 individuals in each of four forest patches, and estimated that approximately 180 ash-breasted tit-tyrants occur in Bolivia.

Within La Paz, there may be two separate populations separated by the Mapiro canyon (see <http://www.birdlife.org/datazone/speciesfactsheet.php?id=4173>). The population in the Runtacocha highland in Apurímac, Peru, is morphologically distinct from that in Cusco, although a formal subspecies description has not been published (Fjeldsá 2010 pers. comm.). Research on Bolivian localities indicates that gene flow has occurred between some subpopulations, but not all (Gómez 2005, p. 86). In Bolivia, the birds are distributed in 2 metapopulations, with at least 5 subpopulations in one location and 14 subpopulations in the other (Gómez 2005, p. 86). Research in 2011 documented this species traveling distances greater than 30 m (98 ft) between patches (Benham *et al.* 2011, p. 153). A “patch” is considered to be any contiguous area of forest separated from other fragments by 30 m (98 ft) or more (Lloyd 2008, p. 166); and patch sizes are categorized generally as follows: small is less than 4 hectares (ha) (9.9 acres [ac]), medium is between 4 and 12 ha (29.6 ac), and large is greater than 12 ha (Benham *et al.* 2011, p. 148; Lloyd 2008, p. 166). Ash-breasted tit-tyrants occupy territories of 1–2 ha (2.5–5 ac) (BLI 2009o, p. 1).

Because the ash-breasted tit-tyrant may exist as two subspecies (BLI 2009o, p. 5; ITIS 2009, p. 1), it is reasonable to conclude that there may be little or no gene flow between the population that is in Bolivia and the population that is in Peru. However, there is insufficient information at this time to determine the extent of gene flow. All populations of this species essentially face the same threats, are all generally in the same region and habitat type, and all have quite small populations. Absent peer-reviewed information to the contrary and based on the best available information, we recognize all populations of ash-breasted tit-tyrants as a single species. For the purpose of this rule, the ash-breasted tit-tyrant includes

all subspecies, if they are later identified as such.

Conservation Status

The ash-breasted tit-tyrant is considered endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276,855). This Decree prohibits hunting, take, transport, and trade of protected species, except as permitted by regulation. Peru follows the IUCN RedList classification for its species. The IUCN considers the ash-breasted tit-tyrant to be endangered because it has a very small population that is undergoing continued decline in the number of mature individuals, is confined to a habitat that is severely fragmented, and is also undergoing a continuing decline in extent, area, and quality of habitat (BLI 2009o, p. 4; IUCN 2001, pp. 8–12). The ash-breasted tit-tyrant occurs within the following Peruvian protected areas: Parque Nacional Huascarán, in Ancash, and Santuario Histórico Machu Picchu, in Cusco, and Zona Reservada de la Cordillera Huayhuash, spanning Ancash, Huánuco, and Lima (BLI 2009i, p. 1; BLI 2009l, p. 1; BLI 2009n, p. 1; Auccha-Chutas *et al.* 2008, p. 16). In La Paz Department, Bolivia, the species is found in Parque Nacional y Área Natural de Manejo Integrado Madidi, Parque Nacional y Área Natural de Manejo Integrado Cotapata, and the collocated protected areas of Reserva Nacional de Fauna de Apolobamba, Área Natural de Manejo Integrado de Apolobamba, and Reserva de la Biosfera de Apolobamba (BLI 2009i, p. 1; Auccha-Chutas *et al.* 2008, p. 16; Auza and Hennessey 2005, p. 81).

II. Junín Grebe (*Podiceps taczanowskii*)

Species Description

The Junín grebe is a highly social, flight-impaired water bird in the *Podicipedidae* family that is endemic to a single location (Lake Junín) in Peru. It was observed being in the air 5–10 meters (16–33 ft) during the crossing of a mud bank (Fjeldsá 2010, pers. comm.). Its underparts are white with a strong silky gloss rather than mottled (Fjeldsá 2010, pers. comm.). Common names for the species in English are: Junín flightless grebe, puna grebe, and Taczanowski's grebe. This species is also known by two Spanish names: “zampullín del Junín” or “zambullidor de Junín” (del Hoyo *et al.* 1992, p. 195; Fjeldsá 2004, p. 199; Instituto Nacional de Recursos Naturales (INRENA) 1996, p. 3; Ramsen *et al.* 2007, p. 18; Supreme Decree 034–2004–AG 2004, p. 276854).

A slim, long-necked bird, the Junín grebe is about 35 cm (13.78 in) in length, and its weight ranges from 0.30 to 0.47 kilograms (0.66 to 1.04 pounds) (BLI 2009b, p. 1; UNEP–WCMC 2009, p. 1). The Junín grebe has a pointed head, with dark feathers on its back, a white throat, and mottled, dusky-colored underparts. This grebe is distinguished by its slender gray bill, red iris, and dull yellow-orange colored feet. Immature birds are darker gray on the flanks than mature birds (BLI 2009b, p. 1).

Taxonomy

The Junín grebe was taxonomically described by Berlepsch and Stolzmann in 1894 (ITIS 2009, p. 1). It is one of nine species of grebes in the genus *Podiceps* worldwide (Dickinson 2003, p. 80). The species' taxonomic status as *Podiceps taczanowskii* is valid (ITIS 2009, p. 1).

Habitat and Life History

The typical feeding habitat of this species consists of shallow water in Lake Junín with calcareous sediments and extensive carpets of chalk-encrusted algae known as *Chara* (brittlewort or stonewort), which is its principal feeding substrate (O'Donnell and Fjeldsá 1997, p. 30). Lake Junín *Chara*, is an aquatic plant genus (Denike and Geiger undated, p. 18). Over the last 20 years, the extent of *Chara* vegetation has decreased in Lake Junín (Tueros *in litt*; in Fjeldsá pers. comm. 2010, pp. 2–3.) As a result, the feeding habitat for the grebe has also changed dramatically. The disappearance of *Chara* (specifically *Chara fragilis*; ParksWatch 2006, p. 8) may be linked with zinc pollution. Higher zinc concentration levels are detrimental to green algae (Fjeldsá pers. comm. 2010, pp. 2–3). The concentrations of heavy metals are reported to be within legal limits for humans; however, copper and zinc concentrations may be limiting factors for the *Chara* vegetation. Local reports indicate that vegetation, particularly sedges within the *Schoenoplectus* genus family (this species' nesting habitat), has disappeared completely in recent years, likely due to low water levels and grazing cattle in the marshes and wetlands (Fjeldsá pers. comm. 2010).

The Junín grebe is endemic to the open waters and marshlands of Lake Junín, located at 4,080 m (13,390 ft) above sea level in the Peruvian Administrative Region of Junín (BLI 2009b, p. 1). The 147-km² (57-mi²) lake, also known as “Chinchaycocha” or “Lago de Junín,” is large but fairly shallow (ParksWatch 2009, p. 1; Tello 2007, p. 1). Situated within “puna”

habitat, the climate is seasonal and can be “bitterly cold” in the dry season (Fjeldsá 1981, p. 240). Local vegetation is characterized by tall dense grasslands and scrubland with open, rocky areas, all interspersed with wetlands and woodlands (BLI 2003, p. 1; ParksWatch 2009, pp. 1, 4). The dominant terrestrial plant species surrounding the lake includes 43 species of grass (*Poaceae* family), 15 species of asters (*Asteraceae* family), and 10 species of legumes (*Fabaceae* family) (ParksWatch 2009, p. 1). Aquatic vegetation includes Andean water milfoil (*Myriophyllum quitense*), several species of pondweed (including *Elodea potamogeton*, *Potamogeton ferrugineus*, and *P. filliformis*), and bladderwort (*Utricularia* spp.). Floating plants, such as duckweed (*Lemna* species (spp.)), large duckweed (*Spirodela* spp.), and water fern (*Azolla filiculoides*), also occur on the lake (ParksWatch 2009, p. 2). The Lake is surrounded by extensive marshland along the lake shore (BLI 2009a, p. 1; BLI 2009b, p. 1) that extends into the lake up to 1–3 mi (2–5 km) from shore (O'Donnell and Fjeldsá 1997, p. 29). The marshes are dominated by two robust species of cattails, giant bulrush (*Schoenoplectus californicus* var. *Totara*) and totorilla (*Juncus articus* var. *Andicola*) (Fjeldsá 1981, pp. 244, 246). Both cattail species can reach nearly 2 m (6.6 ft) in height. These plant communities, or “tortoras,” grow so densely that stands are often impenetrable (ParksWatch 2009, p. 1). In shallow water, during low lake levels, tortora communities can become partially or completely dry (ParksWatch 2009, p. 2).

Lake Junín supports one of the richest and most diverse arrays of bird species of all Peruvian high Andean wetlands (ParksWatch 2009, p. 3). These bird species include migratory birds, birds that nest at high altitudes, aquatic birds, and local endemic species such as the Junín grebe, the Junín rail (*Laterallus tuerosi*; also the subject of this final rule), the giant coot (*Fulica ardesiaca*), and the Chilean flamingo (*Phoenicopterus chilensis*) (BLI 2009a, pp. 2–3; ParksWatch 2009, p. 3; Tello 2007, p. 2). Mammals are relatively scarce in the area, although there are some predators (ParksWatch 2009, p. 4) (see Factor C).

Breeding season for this species occurs annually from November to March (O'Donnell and Fjeldsá 1997, p. 29; Fjeldsá 1981, pp. 44, 246). The Junín grebe nests in the protective cover of the marshlands during the breeding season (Tello 2007, p. 3; Fjeldsá 1981, p. 247), particularly in stands of giant bulrush (ParksWatch 2009, p. 4). Under

natural conditions, winter rains increase the lake water level during the breeding season, allowing the grebes to venture into local bays and canals, although they are never found nesting on the lake's shore (Tello 2007, p. 3). The species nests in the giant bulrush marshlands (ParksWatch 2009, p. 4). Well-hidden floating nests can contain up to three eggs, with an average of two eggs, laid during November and December (Fjeldsá 1981, p. 245). The species is believed to have a deferred sexual maturation (Fjeldsá 2004, p. 201) and exhibits low breeding potential, perhaps as a reflection to adaptation to a “highly predictable, stable environment” (del Hoyo *et al.* 1992, p. 195), laying one clutch during the breeding season (ParksWatch 2009, p. 4). Junín grebes occasionally produce a replacement clutch if their original nest is disturbed (Fjeldsá 2004, pp. 199, 201). After the eggs hatch, the male grebe cares for the chicks, and does not leave the nest to feed. The female grebe is responsible for feeding the male and chicks until the chicks can leave the nest (Tello 2007, p. 3). The Junín grebe is likely a long-lived species (Fjeldsá 2004, p. 201), and its breeding success and population size are highly influenced by the climate (BLI 2009b, p. 2; BLI 2008, pp. 1, 3–4; Fjeldsá 2004, p. 200; Hirshfeld 2007, p. 107; Elton 2000, p. 3) (see Factor A).

The Junín grebe feeds in the open waters of the lake and around the marsh edges, moving into the open waters of the lake to feed where it is easier to dive for food during the winter (Tello 2007, p. 3; Fjeldsá 1981, pp. 247–248). Fish (primarily pupfish (*Orestias* spp.)) account for over 90 percent of the grebe's diet (Fjeldsá 1981, pp. 251–252). Pupfish become scarce when the marshlands dry during periods of reduced water levels, and the Junín grebe is then known to vary its diet with midges (Order *Diptera*), corixid bugs (*Trichocorixa reticulata*), amphipods (*Hyalella simplex*), and shore fly maggots and pupa (*Ephydriid* spp.).

Historical Range and Distribution

The Junín grebe was historically known to be endemic to Lake Junín, in the Peruvian Administrative Region of Junín (Fjeldsá 2004, p. 200; Fjeldsá and Krabbe 1990, p. 70; INRENA 1996, p. 1; Fjeldsá 1981, p. 238). Experts believe that the species was previously distributed throughout the entire 57-mi² (147-km²) lake (BLI 2009a, p. 1; BLI 2003, p. 1; Fjeldsá 1981, p. 254; Gill and Storer in Fjeldsá 2004, p. 200). In 1938, the Junín grebe was encountered throughout the entire lake (Morrison 1939, p. 645). The Junín grebe is now

absent from the northwestern portion of Lake Junín due to mine waste contamination (Gill and Storer, pers. comm. As cited in Fjeldsá 2004, p. 200; Fjeldsá 1981, p. 254).

Current Range and Distribution

The Junín grebe is endemic to Lake Junín, located at 4,080 m (13,390 ft) above sea level in the Peruvian high Andes (see <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3644> for a range map of the species; BLI 2009a, p. 1; BLI 2009b, p. 1). Although BLI (2009b, p. 1) reports the current estimated range of the species as 143 km² (55 mi²), BLI's definition of a species' range is the total area within its extent of occurrence, noting that Lake Junín is only a 147-km² (57-mi²) lake (BLI 2009a, p. 1) and that the Junín grebe is restricted to the southern portion of the lake (Gill and Storer, pers. comm. As cited in Fjeldsá 2004, p. 200; Fjeldsá 1981a, p. 254), its current range is actually smaller than the figure reported by BLI. The entire population of this species is located only within a protected area, the Junín National Reserve (BLI 2009a, p. 1; BLI 2009b, p. 1; ParksWatch 2009, p. 4).

Population Estimate

The current population of the Junín grebe is estimated to be 100–300 individuals (BLI 2009b, p. 3), having undergone a severe population decline in the latter half of the 20th century, with extreme population fluctuations during this time (Fjeldsá 1981, p. 254). Field studies in 1938 indicated that the Junín grebe was extremely abundant throughout Lake Junín (Morrison 1939, p. 645). Between 1961 and 1979, the population fell from more than 1,000 individuals to an estimated 250–300 birds (BLI 2009b, p. 2; Collar *et al.* 1992, p. 43; Harris 1981, as cited in O'Donnell and Fjeldsá 1997, p. 30; Fjeldsá 1981, p. 254). Surveys during the mid-1980s estimated a total of 250 individuals inhabiting the southern portion of Lake Junín (BLI 2009b, p. 2; Collar *et al.* 1992, p. 43). In 1992, only 100 birds were observed, and by 1993, the population had declined to 50 birds, of which fewer than half were breeding adults (BLI 2008, p. 3; BLI 2009b, p. 2). In 1995, an estimated 205 Junín grebes were present on Lake Junín (O'Donnell and Fjeldsá 1997, p. 30). Breeding and fledging were apparently unsuccessful from 1995 to 1997. However, there were two successful broods fledged during the 1997 and 1998 breeding seasons (BLI 2008, p. 3; Valqui *in litt.*, as cited in BLI 2009b, p. 2). In 1998, more than 250 Junín grebes were counted in a 4-km²

(1.5-mi²) area in the southern portion of Lake Junín, suggesting a total population of 350 to 400 birds (Valqui *in litt.*, as cited in BLI 2009b, p. 2). In 2001, field surveys indicated that there may have been a total population of 300 birds, but that estimate has been considered optimistic (Fjeldsá *in litt.* 2003, as cited in BLI 2009b, p. 2). Fjeldsá (*in litt.* 2003, as cited in BLI 2009b, p. 2) postulated that perhaps only half that number would have been mature individuals.

The species has experienced a population decline of 14 percent in the past 10 years, and the population is expected to continue to decline (BLI 2009b, pp. 1, 6–7). The species' decline is associated with continued habitat loss and degradation (Gill and Storer, pers. comm. as cited in Fjeldsá 2004, p. 200; Fjeldsá 1981, p. 254). These population fluctuations are strongly linked to precipitation (see Factor A).

Conservation Status

The Junín grebe is considered critically endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, pp. 276, 853). The IUCN categorizes the Junín grebe as critically endangered because it is endemic to one location and has undergone significant population declines, such that an extremely small number of adults remain (BLI 2009b, pp. 1, 3). The single known population of the Junín grebe occurs wholly within one protected area in Peru, the Junín National Reserve (BLI 2009b, pp. 1–2).

III. Junín rail (*Laterallus tuerosi*)

Species Description

The Junín rail is a secretive bird of the *Rallidae* family that is endemic to a single lake (Lake Junín) in Peru. The species is also referred to as the Junín black rail (Fjeldsá 1983, p. 281) and is locally known as “gallinetita de Junín” (Supreme Decree 034–2004–AG 2004, p. 27684). This rail measures 12–13 cm (4.7–5.1 in) in length, and has a dark slate-colored head, throat, and underparts. Its belly and vent (anal aperture) are black. The characteristic feature of this rail is the heavily barred (black and white) entire upperparts of the body, including its wings and flanks (Fjeldsá 2010 pers. comm.). The undertail coverts (feathers on the underside of the base of the tail) are buff in color, with a dull rufous-brown back. The remaining underparts are dark brown and boldly barred in white, and the legs are greenish-yellow (BLI 2009b, p. 1).

Taxonomy

This species was discovered by Fjeldsá in 1977 and described in 1983 (BLI 2011; Fjeldsá 2010 pers. comm.). BirdLife International considers this rail a full species based on morphological features (BLI 2009b; p. 1). The closely related black rail, *Laterallus jamaicensis* occurs at much lower elevations (i.e., 0 to 1,350 m (0 to 4,429 ft) above sea level) (BLI 2007, p. 1; BLI 2000, p. 170; Collar *et al.* 1992, p. 190). Based on the morphological differences and the species' distinct and disjunct ranges, we consider the Junín rail to be a discrete species and recognize it as *L. tuerosi*.

It should be noted that it appears that only 2 specimens of the Junín rail have ever been collected (near Ondores) (Fjeldsá 1983, pp. 278–279) and that all expert accounts of this species rely solely on that collection and a subsequent observation of the species in Pari (Fjeldsá *in litt.*, 1992, as cited in Collar *et al.* 1992, p. 190).

Habitat and Life History

The Junín rail occurs in the dense, interior marshlands of Lake Junín where rushes (*Juncus* spp.) predominate or in more open mosaics of rushes, mosses (division Bryophyta), and low herbs (Fjeldsá 1983, p. 281). Lake Junín is located in the seasonally climatic “puna” habitat, with a variety of species of grasses, asters, and trees of the bean family forming tall, dense grasslands and open scrubland, interspersed with wetlands and woodlands (ParksWatch 2009, pp. 1, 4; ParksWatch 2006, p. 2). Giant bulrushes and totorilla dominate the extensive marshlands surrounding the lake (BLI 2009b, p. 1; ParksWatch 2009, p. 1; Fjeldsá 1983, p. 281). In shallow water, during low lake levels, “tortora” communities can become partially or completely dry (ParksWatch 2009, p. 2). The lake supports a wide variety of bird species and aquatic vegetation (BLI 2009a, pp. 2–3; ParksWatch 2009, p. 3; Tello 2007, p. 2; BLI 2003, p. 1).

There is little information regarding the ecology of the Junín rail. The species appears to be completely dependent on the wide marshlands located around the southeastern shoreline of the lake for nesting, foraging, and year-round residence (BLI 2009b, p. 2; Collar *et al.* 1992, p. 190; Fjeldsá 1983, p. 281) (see also Current Range and Distribution). Information received during the comment period on the proposed rule indicates that the species inhabits mosaic vegetation with dense *Juncus* (rush) beds (often areas where the vegetation is broken down) and open waterlogged areas with short but

densely matted vegetation of mosses and *Lilaeopsis* (grassworts) rather than the drier bunchgrass hills (puna habitat). The habitat provides a complex mosaic of niches that leads to the patchy distribution of many bird species throughout the region, indicating that this species has specialized habitat requirements that are only satisfied locally (Fjelds  and Krabbe 1990, p. 32). The species' distribution is highly localized around the lake. The Jun n rail apparently prefers the dense, interior marshlands comprised primarily of rushes and mosaics of rushes, mosses (division Bryophyta), and low herbs in more open marsh areas (Fjelds  1983, p. 281). High habitat specificity is consistent with related rail species. The water depth, emergent vegetation used for cover, and access to upland vegetation are all important factors in the rail's habitat use (Flores and Eddleman 1995, p. 362). Similar to all rails, the Jun n rail is furtive and remains well-hidden in the marshes surrounding the lake (BLI 2009b, p. 2). The Jun n rail reportedly nests at the end of the dry season, in September and October. Nests are built on the ground within dense vegetative cover, and the species' clutch size is two eggs (BLI 2009b, p. 2; Collar *et al.* 1992, p. 190). The diet of the Jun n rail has not been studied specifically, but other black rail species feed primarily on small aquatic and terrestrial invertebrates and seeds (Eddleman *et al.* 1994, p. 1).

Historical Range and Distribution

The Jun n rail is endemic to Lake Jun n (BLI 2009b, p. 2; Fjelds  1983, p. 278). The species may have been historically common in the rush-dominated marshlands surrounding the entire lake (Fjelds  1983, p. 281). In addition to the species' specific habitat preferences (see Current Range and Distribution), it is believed that the Jun n rail is now restricted to the marshes at the southwestern corner of the lake due to the high level of water contamination that flows into the northwestern margins of the lake via the San Juan River (Martin and McNee 1999, p. 662).

Current Range and Distribution

The Jun n rail is restricted to the southwestern shore of Lake Jun n (Lago de Jun n), in the Andean highlands of central Peru (see <http://www.birdlife.org/datazone/speciesfactsheet.php?id=2842> for a range map of the species). It is currently known from only two localities (near the towns of Ondores and Pari) (Fjelds  2010 pers. comm.; BLI 2009b, p. 2; Collar *et al.* 1992, p. 190; Fjelds  1983,

p. 281). However, based on habitat needs, it may occur in other portions of the approximately 150 km² (57.9 mi²) of marshland surrounding the lake, discussed in more detail below.

The range of the species is estimated to be 160 km² (62 mi²) (BLI 2011b, p. 1). However, this is likely an overestimate of the species' actual range for several reasons. First, BLI's definition of a species' range results in an overestimate of the actual range. Second, the species' range was calculated based on the availability of presumed suitable habitat for the Jun n rail. It has long been assumed that the rail potentially occupies the entire marshland area surrounding Lake Jun n (Fjelds  1983, p. 281). The two localities mentioned, Ondores and Pari, are villages at the lake shore. Information received during the comment period on the proposed rule indicates that there is continuous rail habitat in the outer part of the marshes outside these villages, 1–2 km (0.6–1.2 mi) outside the firm ground (Fjelds  2010 pers. comm.). The rail has been documented along this 6–7 km (3.7–4.3 mi) section; the area of suitable habitat here is about 10 km² (3.9 mi²). East and north of the lake, there is similar habitat, approximately 25 km² (9.6 mi²) combined (Fjelds  2010 pers. comm.). However, the Jun n rail's actual range is very likely smaller than the approximated range reported by BLI since 2000 (BLI 2009b, p. 1; BLI 2008, p. 3; BLI 2007, p. 1; BLI 2000, p. 170).

Population Estimates

The species has experienced a population decline of between 10 and 19 percent in the past 10 years (BLI 2009b, p. 2). However, rigorous population estimates have not been conducted (Fjelds  1983, p. 281), and the species' elusiveness makes it difficult to locate (BLI 2009b, p. 2). The population is considered to be declining in close association with continued habitat loss and degradation (see Factor A) (BLI 2008, p. 1). Local fishermen have reported serious declines in some years, and several individual birds have been found dead (Fjelds  2010 pers. comm.). In 1983, the Jun n rail was characterized as possibly common, based on local fishermen's sightings of groups of up to a dozen birds at a time (Fjelds  1983, p. 281). The species continues to be reported as fairly common (BLI 2009b, p. 1; BLI 2007, p. 1). BLI estimates that this species' population size falls within the population range category of 1,000–2,499 (BLI 2009b, p. 1; BLI 2007, p. 1; BLI 2000, p. 170). This estimate is an extrapolation that continues to be based

on the assumption that the species may be fairly common in the entire circa 150 km² (58 mi²) of available marshland around Lake Jun n (BLI 2009b, p. 1; BLI 2007, p. 1). The species has never been confirmed outside its two known localities and, therefore, it is possible that the species is locally common, but not widely distributed. If the Jun n rail is not common throughout Lake Jun n's marshland, the actual population size may be much lower.

Conservation Status

The Jun n rail is considered endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276855). The IUCN categorizes the Jun n rail as endangered because it is known only from a small area of marshland around a single lake, where the habitat quality is declining (BLI 2008, p. 3). The single known population of the Jun n rail occurs wholly within one protected area in Peru, the Jun n National Reserve (BLI 2009b, pp. 1–2; BLI 2008, p. 1).

IV. Peruvian Plantcutter (*Phytotoma raimondii*)

Species Description

The Peruvian plantcutter, locally known as “cortarrama Peruana,” is a small finch-like bird endemic to the dry forests of coastal northwest Peru (Schulenberg *et al.* 2007, p. 488; Walther 2004, p. 73; Ridgely and Tudor 1994, p. 733; Collar *et al.* 1992, p. 805; Goodall 1965, p. 636; Sibley and Monroe 1990, p. 371). The Peruvian plantcutter is an herbivore with a predominantly leaf-eating diet (Schulenberg *et al.* 2007, p. 488; Walther 2004, p. 73; Bucher *et al.* 2003, p. 211).

Plantcutters have bright yellow eyes, short wings and rather long tails, and their crown feathers form a slight crest (Ridgely and Tudor 1994, p. 732; Goodall 1965, p. 635). Adult birds are 18.5 to 9 cm (7.28 to 7.48 in) in length and weigh approximately 36 to 44 grams (g) (1.26 to 1.55 ounces (oz)) (Schulenberg *et al.* 2007, p. 488; Walther 2004, p. 73). Males are pale ashy gray, except a broad cinnamon-rufous color band on the belly and above the bill, and white colored bands on their wings (BLI 2009a, p. 1; Goodall 1965, p. 636; Ridgely and Tudor 1994, p. 733). Females are buff-brown with broad, dark brown stripes above, and white with heavy black-striped underparts (BLI 2009a, p. 1; Collar *et al.* 1992, p. 805). Juvenile birds have not been described (Walther 2004, p. 73). The Peruvian plantcutter's bill is stout, short, conical, and finely serrated with

sharp tooth-like projections that run the length of the beak on both sides, and which are well suited for plucking buds, leaves, shoots, and fruits (Schulenberg *et al.* 2007, p. 488; Ridgely and Tudor 1994, p. 732; Goodall 1965, p. 635) (see Habitat and Life History).

Taxonomy

The Peruvian plantcutter was first taxonomically described as *Phytotoma raimondii* by Taczanowski in 1883 (ITIS 2009, p. 1; Sibley and Monroe 1990, p. 371). The type-specimen of the Peruvian plantcutter (the specimen that was described by Taczanowski) was collected by the ornithologist Konstanty Jelski, who recorded the specimen as being collected in the Tumbes Department of Peru (Flanagan *et al.* in litt. 2009, p. 2). However, the reported collection location may have been inaccurate (see Historical range and Distribution, below).

The genus *Phytotoma* contains three species of plantcutters, all endemic to South America (Walther 2004, p. 73; Dickinson 2003, p. 346; Sibley and Monroe 1990, p. 371; Goodall 1965, p. 635). Ornithologists have long debated to which family this genus belongs. Some ornithologists have recommended that the genus be placed in its own family, Phytotomidae (Lanyon and Lanyon 1989, p. 422), while others placed the genus within the Tyrannidae family (Sibley and Monroe 1990, p. 371). Molecular research using DNA sequencing supports the inclusion of *Phytotoma* in the Cotingidae family (Ohlson *et al.* 2006, p. 10; *et al.* 2002, p. 993; Irestedt *et al.* 2001, p. 23; Johansson). Therefore, based on the information currently available to us, we accept that the Peruvian plantcutter belongs to the Cotingidae family, which follows the Integrated Taxonomic Information System (ITIS 2009, p. 1).

Habitat and Life History

The Peruvian plantcutter is reportedly selective in its habitat preference and requires a variety of arid tree and shrub species with dense low-hanging branches close to the ground (Flanagan *et al.* in litt. 2009, p. 7; Williams 2005, p. 2; Flanagan and More 2003, p. 5; Collar *et al.* 1992, p. 805). The primary habitat for the Peruvian plantcutter is seasonally dry tropical forest, which is also referred to as equatorial dry tropical forest, and occurs in the semiarid lowlands of northwestern Peru (Schulenberg *et al.* 2007, p. 21; Linares-Palomino 2006, pp. 260, 263–266; Walther 2004, p. 73). The Peruvian plantcutter also uses arid lowland scrub (dense and open) and dense riparian

shrub communities (BLI 2009a, p. 2; Schulenberg *et al.* 2007, pp. 21, 488; Walther 2004, p. 73; Stotz *et al.* 1996, p. 19; Collar *et al.* 1992, p. 805). The Peruvian plantcutter is a key indicator species for Equatorial Pacific Coast arid lowland scrub (Stotz *et al.* (1996, pp. 19, 428). The lowland dry tropical forest and scrub are characterized as small and heavily fragmented patches of plant species adapted to the arid conditions of the prolonged dry season of northwestern Peru (Bridgewater *et al.* 2003, pp. 132, 140; Best and Kessler 1995, p. 40; Ridgely and Tudor 1994, p. 734).

The lowland dry forest in northwestern Peru is open-canopied, with trees occurring in scattered clumps or individually (Flanagan and More 2003, p. 4). The dominant tree species of the lowland dry forest is *Prosopis pallida* (common name “kiawe;” also locally referred to as “algarrobo”) in the Fabaceae family (legume family) (Lopez *et al.* 2005, p. 542; More 2002, p. 39). *Prosopis pallida* is a wide-spreading tree or large shrub, 8–20 m (26–65 ft) tall, with dense branches; spines can be present or absent (Pasicznik *et al.* 2001, p. 36). This deep-rooted drought-tolerant species, related to mesquite species of the southwestern United States and Mexico, provides an important ecological function by improving and stabilizing soil conditions (Pasicznik *et al.* 2001, pp. 101–102; Brewbaker 1987, p. 1). Typical of legumes, *P. pallida* is able to “fix” atmospheric nitrogen for plant utilization and growth (Pasicznik *et al.* 2001, p. 3; Brewbaker 1987, p. 1).

Three of the most common tree species associated with *P. pallida* dry forest habitat used by the Peruvian plantcutter are *Capparis scabrifolia* (locally known as “sapote”), in the Capparaceae (caper) family, and *Acacia macracantha* (long-spine acacia, locally known as “faique”) and *Parkinsonia aculeata* (Jerusalem thorn, locally known as “palo verde”), both in the Fabaceae family (More 2002, pp. 17–23). Associated flowering shrubs in dry forest habitat include *Capparis avicennifolia* (locally known as “bichayo”) and *C. crotonoides* (locally known as “guayabito de gentil”), both in the Capparaceae (caper) family; *Cordia lutea* (locally known as “overall”) in the Boraginaceae (borage) family; and *Maytenus octogona* (locally known as “realengo”) in the Celastraceae (bittersweet) family. Other commonly occurring dry forest vegetation includes vines (e.g., Convolvulaceae (morning-glory) and Cucurbitaceae (gourd) families), *Psittacanthus chanduyensis* (tropical mistletoe; locally known as

“suelda con suelda”) in the Loranthaceae (mistletoe) family, scattered herbaceous species (e.g., Asteraceae (sunflower), Scrophulariaceae (figwort), and Solanaceae (nightshade) families), and grasses (e.g., Poaceae (grass) family) (Elton 2004, p. 2; Walther 2004, p. 73; More 2002, pp. 14–17; Ferreyera 1983, pp. 248–250). Riparian vegetation includes dense shrub and small trees of *P. pallida*, *A. macracantha*, *Capparis* spp., and *Salix* spp. (willow spp.) (Lanyon 1975, p. 443).

The arid climate of northwestern Peru is due to the influence of the cold Humboldt Current that flows north, parallel to the Peruvian Coast (UNEP 2006, p. 16; Linares-Palomino 2006, p. 260; Rodriguez *et al.* 2005, p. 2). The Humboldt Current has a cooling influence on the climate of coastal Peru, as the marine air is cooled by the cold current and, thus, is not conducive to generating rain. To the east, the Andean Mountains prevent humid air from the Amazon from reaching the western lowlands (Linares-Palomino 2006, p. 260; Lanyon 1975, p. 443).

Coastal northwestern Peru experiences a short rainy season during the summer months (January–April) (Linares-Palomino 2006, p. 260), which can also include precipitation in the form of mist or fine drizzle along the coast (Lanyon 1975, p. 443). The mean annual precipitation across the range of the Peruvian plantcutter is 5.0 to 99 mm (0.196 to 3.80 in) (hyper-arid to arid) (Galan de Mera *et al.* 1997, p. 351). The climate is warm and dry with the annual temperature range of 23 to 25 °C (74 to 77 °F) at elevations below 600 m (1,968 ft) (Linares-Palomino 2006, p. 260). Northwestern Peru is strongly influenced by the El Niño Southern Oscillation (ENSO) cycle (Rodriguez *et al.* 2005, p. 1), which can have particularly profound and long-lasting effects on arid terrestrial ecosystems (Mooers *et al.* 2007, p. 2; Holmgren *et al.* 2006a, p. 87) (see Factor A).

Knowledge of the breeding of most species within the Cotingidae family, including the Peruvian plantcutter, is not well known (Walther 2004, p. 73). The Peruvian plantcutter is considered a resident species in Peru, which indicates that it breeds there (Snow 2004, p. 61; Walther 2004, p. 73). Nesting activity of plantcutters appears to occur from March to April (Walther 2004, p. 73; Collar *et al.* 1992, p. 805). Plantcutters build shallow, cup-shaped nests that are made of thin dry twigs and lined with root fibers and other softer material (Snow 2004, p. 55). Nests can be built 1 to 3 m (3.3 to 9.8 ft) above the ground inside a thick thorny shrub

or higher in the fork of a tree (Elton 2004, p. 2; Snow 2004, p. 55; Flanagan and More 2003, p. 3). Females lay two to four eggs, and the incubation period lasts about 2 weeks (Snow 2004, p. 56; Walther 2004, p. 73; Goodall 1965, p. 636). Males assist in rearing the chicks, which fledge after 17 days or so (Snow 2004, p. 56).

Plantcutters are herbivores with a predominantly leaf-eating diet (Snow 2004, p. 46; Bucher *et al.* 2003, p. 211). As an herbivore, the Peruvian plantcutter is dependent on year-round availability of high-quality food, particularly during the dry season when plant growth is very limited (Bucher *et al.* 2003, p. 216). Peruvian plantcutters eat buds, leaves, and shoots of *P. pallida* and various other trees and shrubs, as well as some fruits (e.g., mistletoe) (Schulenberg *et al.* 2007, p. 488; Walther 2004, p. 73; Goodall 1965, p. 635). The seeds, green seed pods, leaves, and flowers of *P. pallida* provide a protein-rich food source for animals (Lewis *et al.* 2006, p. 282). The Peruvian plantcutter appears to prefer to feed while perched in shrubs and trees, although individuals also have been observed foraging on the ground (Snow 2004, p. 50). Birds have been observed in pairs and small groups (Schulenberg *et al.* 2007, p. 488; Walther 2004, p. 73; Flanagan and More 2003, p. 3; Collar *et al.* 1992, p. 804).

Historical Range and Distribution

The Peruvian plantcutter is a restricted-range species that is confined to the mostly flat, narrow desert zone, which is less than 50 km (31 mi) in width (Lanyon 1975, p. 443) and runs along the coast of northwestern Peru (Ridgely and Tudor 1994, p. 734; Stattersfield *et al.* 1998, p. 213; Walther 2004, p. 73). The historical range of the Peruvian plantcutter reportedly extended from the town of Tumbes, located in the extreme northwestern corner of Peru and approximately south to north of Lima within the Regions of Tumbes, Piura, Lambayeque, La Libertad, Ancash, and Lima (Collar *et al.* 1992, pp. 804–805).

The historical distribution of the Peruvian plantcutter was most likely throughout the contiguous lowland *P. pallida* dry forest and riparian vegetation, below 550 m (1,804 ft) (Williams 2005, p. 1; Collar *et al.* 1992). According to Collar *et al.* (1992, pp. 804–805), the Peruvian plantcutter is known from 14 historical sites.

The type-specimen of the Peruvian plantcutter was most likely collected south of the town of Tumbes (Flanagan *et al.* in litt. 2009, pp. 2, 15). It is unknown whether the type specimen

was lost or destroyed, or if it was ever returned to Peru (Flanagan *et al.* in litt. 2009, p. 2). Today, there is good indication that the type-specimen was mislabeled as being collected in Tumbes (Flanagan *et al.* in litt. 2009, p. 2). Although the Tumbes Region has been extensively surveyed for the Peruvian plantcutter, including the North-West Biosphere Reserve, there have never been other collections in or near the vicinity of Tumbes or other evidence to suggest that the Peruvian plantcutter ever occurred in the area (Flanagan *et al.* in litt. 2009, p. 2). Thus, it appears that the Peruvian plantcutter never occurred in the Tumbes Region.

Researchers consider the reduction in dry forest habitat to be the result of historical human activities, including extensive land clearing for agriculture, timber and firewood extraction, charcoal production, and overgrazing. These activities have led to the reduction and severe fragmentation of dry forest habitat today (Flanagan *et al.* in litt. 2009, pp. 1–9; Schulenberg *et al.* 2007, p. 488; Lopez *et al.* 2006, p. 898; Bridgewater *et al.* 2003, p. 132; Pasiecznik *et al.* 2001, pp. 10, 75, 78, 95; Stotz *et al.* 1998, p. 52; Lanyon 1975, p. 443; Ridgely and Tudor 1994, p. 734) (see Factor A).

Current Range and Distribution

The current range of the Peruvian plantcutter is approximately 4,900 km² (1,892 mi²) (BLI 2009a, p. 1), at an elevation of between 10 and 550 m (33 and 1,804 ft) above sea level. It occurs within the Peruvian regions of Piura, Lambayeque, Cajamarca, La Libertad, and Ancash (from north to south) (Flanagan *et al.* in litt. 2009, pp. 14–15). This species occurs within two protected areas in Peru (see <http://www.birdlife.org/datazone/speciesfactsheet.php?id=4474> for a range map of the species). It has been documented in the *Prosopis pallida* (a legume known as huarango, bayahonda, or carob) dry forest within the protected archeological sites of the Pómac Forest Historical Sanctuary (BLI 2009e, p. 1) and Murales Forest (Walther 2004, p. 73). The species' reported range is likely an overestimate (Jetz *et al.* 2008, p. 2). BLI defines a species' range as the total area within its extent of occurrence; however, the Peruvian plantcutter's current distribution is severely fragmented and distributed among small, widely separated remnant patches of *P. pallida* dominated dry forest (Flanagan *et al.* 2009, pp. 1–9; BLI 2009a, pp. 2–3; Ridgely and Tudor 1994, p. 18), which are usually heavily disturbed fragments of forest (Bridgewater *et al.* 2003, p. 132).

Therefore, the species' actual range is likely smaller than this figure.

The Peruvian plantcutter is extirpated from 11 of its 14 historical sites due to loss of habitat or degradation of habitat (Elton 2004, p. 1; Hinze 2004, p. 1; Flanagan and More 2003, p. 5). Depending on habitat quality, it is estimated that the Peruvian plantcutter requires approximately 1 ha (2.5 ac) of habitat for suitable food and nesting sites (Flanagan *et al.* in litt. 2009, p. 7; Flanagan and More 2003, p. 3). Although the Peruvian plantcutter has been found in patches of *P. pallida* dry forest habitat that are near agricultural lands, tracks or roads, and human settlement (Flanagan *et al.* in litt. 2009, pp. 2–7), much of the available *P. pallida* dry forest habitat is not occupied by the Peruvian plantcutter (Schulenberg *et al.* 2007, p. 488; Snow 2004, p. 69; Walther 2004, p. 73; BLI 2000, p. 401).

Flanagan *et al.* (in litt. 2009, pp. 1–15) recently completed a comprehensive review of 53 locations where there have been documented sightings of the Peruvian plantcutter. Of these, the species was determined to be extant (still living) in 29 sites. In the Piura Region, 17 of the 22 documented sites of the Peruvian plantcutter were extant as of a 2009 report (Flanagan *et al.* in litt. 2009, pp. 2–4, 14). In this particular region, the Talara Province contained the largest concentration of intact *P. pallida* dry forest habitat in northwestern Peru and the largest subpopulation of the Peruvian plantcutter (Flanagan *et al.* in litt. 2009, p. 3; BLI 2009a, p. 2; Walther 2004, p. 73; Flanagan and More 2003, p. 5). Additionally, there are several other documented sites of the Peruvian plantcutter in the Piura Region (e.g., Manglares de San Pedro, Illescas Peninsula, and Cerro Illescas) (Flanagan *et al.* in litt. 2009, pp. 4, 14; BLI 2009c, p. 1).

In the Lambayeque Region, Flanagan *et al.* (in litt. 2009, pp. 4–5, 14) reported a total of 13 locations of the Peruvian plantcutter, of which 5 are considered extant. Within the Region, there are four important areas for the Peruvian plantcutter:

(1) The Pómac Forest Historical Sanctuary (Santuario Histórico de Bosque de Pómac), designated as a protected archeological site in 2001, comprises 5,887 ha (14,547 ac) of *P. pallida* dry forest (Flanagan *et al.* in litt. 2009, p. 4; BLI 2009e, p. 1). The Sanctuary includes the archeological site Batán Grande, an area comprised of 500 ha (1,235 ac) of *P. pallida* dry forest (Flanagan *et al.* in litt. 2009, p. 4; BLI 2009e, p. 1).

(2) Near the small town of Rafan are remnant patches of *P. pallida* dry forest,

encompassing approximately 1,500 ha (3,706 ac) (BLI 2009f, p. 1). The Rafan area has become a popular birding site for the Peruvian plantcutter (BLI 2009f, p. 1; Engblom 1998, p. 1).

(3) Murales Forest (Bosque de Murales), comprised of *P. pallida* dry forest, is a designated archeological reserved zone (BLI 2009a, p. 3; Stattersfield *et al.* 2000, p. 402).

(4) Chaparri Ecological Reserve, comprised of 34,412 ha (85,033 ac) with *P. pallida* dry forest, is a community-owned and managed protected area (Walther 2004, p. 73).

The remaining sites in the Lambayeque Region are small remnant patches of *P. pallida* dry forest and comprise a few acres (Flanagan *et al. in litt.* 2009, pp. 4–5; Walther 2004, p. 73). The protected areas are further discussed under Factors A and D.

In the Cajamarca Region, Flanagan *et al. in litt.* 2009, pp. 5, 14) reported one occupied site of the Peruvian plantcutter, consisting of approximately 6 ha (14.8 ac) of remnant *P. pallida* dry forest in the Río Chicama Valley. Six of the 12 known sites of the Peruvian plantcutter in the La Libertad Region are considered extant (Flanagan *et al. in litt.* 2009, pp. 5–6, 14). Each of these sites consists of small patches of remnant *P. pallida* dry forest habitat (Flanagan *et al. in litt.* 2009, pp. 5–6; Walther 2004, p. 73). Of the three known sites of the Peruvian plantcutter in the Ancash Region, only one was reported to be extant as of 2009 (Flanagan *et al. in litt.* 2009, pp. 6, 14). Additionally, in the Lima Region, the authors reported that the two historical sites were also unoccupied in the most recent survey (Flanagan *et al. in litt.* 2009, pp. 7, 15).

This species was found recently in central coastal Peru, in the area of Huarmey, Ancash (Rosina y Mónica 2010, p. 257). Additional surveys are needed to determine if other available *P. pallida* dry forest habitat is occupied by the Peruvian plantcutter (Flanagan *et al. in litt.* 2009, p. 7).

Population Estimates

There have been no rigorous quantitative assessments of the Peruvian plantcutter's population size (Williams 2005, p. 1). The estimated extant population size is between 500 and 1,000 individuals and comprises 2 disjunct subpopulations (BLI 2009g, pp. 1–2; Walther 2004, p. 73) and several smaller sites (Flanagan *et al. in litt.* 2009, pp. 2–7; Williams 2005, p. 1; Walther 2004, p. 73; Flanagan and More 2003, pp. 5–9).

The northern subpopulation, located in the Talara Province in Piura Region, reportedly has between 400 and 600 individuals, or approximately 60 to 80 percent of the total population of the Peruvian plantcutter (BLI 2009a, p. 2;

Williams 2005, p. 1; Snow 2004, p. 69; Walther 2004, p. 73). The second subpopulation, located at Pómac Forest Historical Sanctuary (Lambayeque Region), reportedly has 20 to 60 individuals (BLI 2009a, p. 2; BLI 2009e, p. 1; Walther 2004, p. 73). The smaller sites are estimated to consist of a few individuals up to 40 individuals (Flanagan *et al. in litt.* 2009, pp. 2–7; Walther 2004, p. 73; Williams 2005, p. 1; Flanagan and More 2003, pp. 5–9).

The population estimate for the Peruvian plantcutter—that is, the total number of mature individuals—is not the same as the effective population size (i.e., the number of individuals that actually contribute to the next generation). The subpopulation structure and the extent of interbreeding among the occurrences of the Peruvian plantcutter are unknown. Although the two large subpopulations and many of the smaller occurrences of the Peruvian plantcutter are widely separated (BLI 2009a, pp. 2–3; Flanagan *et al. in litt.* 2009, pp. 1–9; Ridgely and Tudor 1994, p. 18), there is insufficient information to determine whether these occurrences function as genetically isolated subpopulations.

The Peruvian plantcutter has experienced a population decline of between 1 and 9 percent in the past 10 years, and this rate of decline is predicted to continue (BLI 2009g, p. 1). The population is considered to be declining in close association with continued habitat loss and degradation of habitat (see Factor A) (BLI 2009a, pp. 1–3; BLI 2009g, pp. 1–3; Snow 2004, p. 69; Ridgely and Tudor 1994, p. 18).

Conservation Status

The Peruvian plantcutter is considered endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276855). The IUCN considers the Peruvian plantcutter to be endangered because of ongoing habitat destruction and degradation of its small and severely fragmented range (BLI 2009a, pp. 2–3; BLI 2009g, pp. 1–2). From 1996 to 2000, the IUCN considered the Peruvian plantcutter to be critically endangered (BLI 2009g, p. 1), following changes to the IUCN listing criteria in 2001. Experts have suggested returning the species to its previous classification of critically endangered, due to the numerous and immediate threats to the species (Flanagan, *in litt.* 2009 p. 1; Snow 2004, p. 69; Walther 2004, p. 74).

V. Royal cinclodes (*Cinclodes aricomae*) Species Description

The royal cinclodes, also known as “churrete real” and “remolinera real,” is a large-billed ovenbird in the Furnariidae family that is native to high-altitude woodlands of the Bolivian and Peruvian Andes (BLI 2009i, pp. 1–2; InfoNatura 2007, p. 1; del Hoyo *et al.* 2003, p. 253; Supreme Decree No. 034–2004–AG 2004, p. 27685; Valqui 2000, p. 104). The adult is nearly 20 cm (8 in) in length, with a darker crown and a buff-colored area above the eyes. Its underparts are mostly gray-brown; it has only limited whitish mottling (this and the more distinctive rufous-brown wingbar are the main differences from the closely related species, the stout-billed *Cinclodes* (*C. excelsior*); Fjeldså 2010 pers. comm.). The throat is buff-colored, and the remaining underparts are gray-brown to buff-white. The wings are dark with prominent edging that forms a distinctive wing-bar in flight. The large, dark bill is slightly curved at the tip (BLI 2009i, p. 1).

Taxonomy

When the species was first taxonomically described, the royal cinclodes was placed in the genus *Upucerthia* (Carraker 1932, pp. 1–2) and was then transferred to *Geositta* as a subspecies (*Geositta excelsior aricomae*) (Vaurie 1980, p. 14). Later, it was transferred to the genus *Cinclodes*, where it was considered a race or subspecies of the stout-billed *Cinclodes* (*Cinclodes excelsior*) until recently (BLI 2009i, p. 1; Fjeldså and Krabbe 1990, pp. 337–338; Vaurie 1980, p. 15). The royal cinclodes is now considered a distinct species (*C. aricomae*) based on differences in its habitat, morphology, and genetic distance (Chesser 2004, p. 763; del Hoyo *et al.* 2003, p. 253). Therefore, we accept the species as *Cinclodes aricomae*, which also follows ITIS (2009, p. 1).

Habitat and Life History

In the Cordillera Vilcanota, southern Peru, the royal cinclodes shows distinctive preferences for areas with primary (lesser disturbed) woodland habitat quality in larger remnant woodland patches: Specifically tall, dense *Polylepis* vegetation cover, high density of large *Polylepis* trees, and areas with dense and extensive moss ground cover (Lloyd 2008b, pp. 735–745). Near Lampa, Junín Department, the royal cinclodes has recently been observed in *Gynoxys* dominated woodlands where no *Polylepis* species occur (Lloyd 2010, pers. comm.). These findings suggest that in some areas, the

royal cinclodes may not be dependent on *Polylepis* species, but can occur in other high-elevation woodland habitats with similar habitat structure and habitat quality to *Polylepis* (Lloyd 2010, pers. comm.; Witt and Lane 2009, pp. 90–94).

In the Cordillera Vilcanota, the royal cinclodes has a very narrow estimated niche breadth, and it is largely intolerant of the surrounding disturbed non-woodland puna matrix habitat (Lloyd and Marsden 2008, pp. 2645–2660). Individuals here have been observed foraging on the ground or on boulders, concentrating foraging efforts on moss or bark litter substrates (Lloyd 2008). The royal cinclodes is restricted to elevations between 3,500 and 4,600 m (11,483 and 12,092 ft) (BLI 2009i, p. 2; del Hoyo *et al.* 2003, p. 253; BLI 2000, p. 345; Collar *et al.* 1992, p. 588). The characteristics of *Polylepis* habitat were described above as part of the Habitat and Life History of the ash-breasted tityrant. The royal cinclodes prefers dense woodlands (BLI 2009i, p. 2; del Hoyo *et al.* 2003, p. 253; BLI 2000, p. 345; Collar *et al.* 1992, p. 588), with more closed canopies that provide habitat for more lush moss growth (Engblom *et al.* 2002, p. 57). The moss-laden vegetation and shaded understory harbor a rich diversity of insects, making good feeding grounds for insectivorous birds (De la Via 2004, p. 10) such as the royal cinclodes (del Hoyo *et al.* 2003, p. 253; Engblom *et al.* 2002, p. 57). In Bolivia, the royal cinclodes has been observed only in *P. pepei* forests, but it is found amongst a greater variety of *Polylepis* species in Peru (Chutas *et al.* 2008, p. 16; I. Gómez, in litt. 2007, p. 1).

Information on the ecology and breeding behavior of royal cinclodes is limited. The species' feeding territory ranges from 3 to 4 ha (7 to 10 ac) (del Hoyo *et al.* 2003, p. 253; Engblom *et al.* 2002, p. 57). Breeding pairs may occupy smaller, 2-ha (2.5-ac) territories (Chutas 2007, p. 7). The royal cinclodes is described as "nervous" and is easily disturbed by humans (Engblom *et al.* 2002, p. 57). The breeding season probably begins in December, but territorialism among pairs can be seen in austral winter (June–August) (del Hoyo *et al.* 2003, p. 253; BLI 2000, p. 345). *Cinclodes* species construct burrows or use natural cavities, crevices, or rodent burrows for nesting (Fjeldsá and Krabbe 1990, p. 337; Vaurie 1980, pp. 30, 34). The royal cinclodes' clutch size may be similar to that of the closely related stout-billed *Cinclodes* (*C. excelsior*), which is two eggs per clutch (Graves and Arango (1988, p. 252).

The royal cinclodes appears to mainly feed on beetle larvae, grubs, and earthworms, which they find by turning and tossing away moss and debris on the forest floor with their powerful bills (Fjeldsá 2010 pers. comm.). It has also been observed to consume invertebrates, seeds, and occasionally small vertebrates (frogs) (del Hoyo *et al.* 2003, p. 253). The royal cinclodes forages, solitary or in pairs, by probing through moss and debris on the forest floor (del Hoyo *et al.* 2003, p. 253; Fjeldsá 2002b, p. 9; BLI 2000, p. 345; Collar *et al.* 1992, p. 589). Their feeding is done so violently that the forest floor looks as if pigs have been feeding there. Due to its feeding behavior, the moss cover rapidly dries up and dies unless the humidity is very high. This characteristic limits the species to areas where the landscape is persistently covered by clouds and mists, or where the canopy is dense enough to provide permanent shade (Fjeldsá 2010 pers. comm.). Because this species can heavily disturb its habitat, it requires large feeding territories (thus, only large forest patches can sustain more than one pair). This ground-feeding strategy may facilitate interbreeding amongst groups located on adjoining mountain peaks when the species likely descends the mountains during periods of snow cover (Engblom *et al.* 2002, p. 57).

Historical Range and Distribution

The royal cinclodes may once have been locally common and distributed across most of central to southern Peru and into the Bolivian highlands, in once-contiguous expanses of *Polylepis* forests above 3,000 m (9,843 ft) (BLI 2009i, p. 1; Fjeldsá 2002a, pp. 111–112, 115; Herzog *et al.* 2002, p. 94; Kessler 2002, pp. 97–101; BLI 2000, p. 345). *Polylepis* woodlands are now restricted to elevations of 3,500 to 5,000 m (11,483 to 16,404 ft) (Fjeldsá 1992, p. 10). As discussed above for the Historical Range and Distribution of the ash-breasted tityrant, researchers consider human activity to be the primary cause for historical habitat decline and resultant decrease in species richness (Fjeldsá 2002a, p. 116; Herzog *et al.* 2002, p. 94; Kessler 2002, pp. 97–101; Fjeldsá and Kessler 1996, Kessler 1995a, b, and Lægaard 1992, as cited in Fjeldsá 2002a, p. 112; Kessler and Herzog 1998, pp. 50–51). The royal cinclodes may have been extirpated from its type locality (Aricoma Pass, Puno), and possibly throughout the entire Puno Region, where *Polylepis* forest no longer exists (Collar *et al.* 1992, p. 589; Engblom *et al.* 2002, p. 57) (see Population Estimates). It is estimated that between 2–3 and 10 percent of the original forest

cover still remains in Peru and Bolivia, respectively (BLI 2009i, p. 1; Fjeldsá and Kessler 1996, as cited in Fjeldsá 2002a, p. 113) (see Factor A). Of this amount, less than 1 percent of the remaining woodlands occur in humid areas, where *Polylepis* denser stands occur (Fjeldsá and Kessler 1996, as cited in Fjeldsá 2002a, p. 113) and which are preferred by the royal cinclodes (del Hoyo *et al.* 2003, p. 253; Engblom *et al.* 2002, p. 57). The royal cinclodes was initially discovered in Bolivia in 1876, but was not observed there again until recently (BLI 2009i, p. 2; Hirshfeld 2007, p. 198) (see Current Range and Distribution).

Current Range and Distribution

The royal cinclodes is generally restricted to moist and mossy habitat on steep rocky slopes of semihumid *Polylepis* or *Polylepis-Gynoxys* woodlands, where the species is found at elevations between 3,500 and 4,600 m (11,483 and 12,092 ft) (Benham *et al.* 2011, p. 151; BLI 2009i, p. 2; del Hoyo *et al.* 2003, p. 253; Collar *et al.* 1992, p. 588). The current potential range of the species is approximately 2,700 km² (1,042 mi²) (BLI 2009i, p. 1), which is an overestimate of the actual range, given the fragmented nature of the species' remaining habitat (BLI 2009i, p. 1; Fjeldsá and Kessler 1996, as cited in Fjeldsá 2002a, p. 113). The royal cinclodes was rediscovered in Bolivia within the last decade, after more than 100 years of not being observed there (Moble 2010 *in litt.*; Hirshfeld 2007, p. 198). It occurs in the Andes of southeastern Peru (Cusco, Apurímac, Puno and Junín) and adjacent Bolivia (La Paz) (Gomez 2010, p. 1; see <http://www.birdlife.org/datazone/speciesfactsheet.php?id=7773> for a range map of the species).

Within the last 15 years, royal cinclodes has been observed in Peru's Runtacocha highlands and in the Laguna Anantay Valley (both in Apurímac), Pariahuanca Valley (Junín), and Cordillera Vilcanota (Cusco), and in Bolivia, Department of La Paz: Cordillera Apolobamba and the Cordillera Real (including Ilampu Valley, Sanja Pampa, and Cordillera de La Paz) (Benham *et al.* 2011, p. 151; Hirshfeld 2007, p. 198; del Hoyo *et al.* 2003, p. 253; Engblom *et al.* 2002, p. 57; Valqui 2000, p. 104). It was also recently discovered in central Peru, approximately 5 km (3.1 mi) from Lampa, Junín Department, at 3700 m (12,139 ft). This represents a 300 km (186 mi) northward range extension for the species (Witt and Lane 2009, pp. 90–94).

Population Estimate

Population information is presented first by range country and then in terms of a global population estimate. The range country estimates begin with Peru, where the majority of the population resides. The royal cinclodes is believed to be a naturally low-density species (Lloyd 2008, pp. 164–180).

Peru. In the Puno Region of Peru, it is unclear whether a viable population of royal cinclodes remains. The royal cinclodes was first observed in Puno in 1930 (Fjelds  and Krabbe 1990, p. 338) and has continued to be reported there (BLI 2009i, pp. 1–2; BLI 2007, pp. 1–2; del Hoyo 2003, p. 253; Collar *et al.* 1992, p. 588). However, based on habitat availability, InfoNatura (2007, p. 1) predicted that the royal cinclodes does not occur in Puno because suitable habitat no longer exists there. Only two royal cinclodes individuals have been reported in the Puno Region (Cordillera de Carabaya) in recent decades (Aucca-Chutas 2007, pp. 4, 8).

Bolivia. The species' current range is more widespread in Bolivia than previously understood. The royal cinclodes had not been observed in Bolivia for more than a century, when it was rediscovered there in 1997 (BLI 2009i, p. 2; Hirshfeld 2007, p. 198). Recent surveys in La Paz Department found it in at least 13 localities (8 in Cordillera Apolobamba and 5 in Cordillera La Paz) (BLI 2009i, p. 1).

BLI reports an estimated population size of 50–70 royal cinclodes in Bolivia (G mez *in litt.* 2003, 2008, as cited in BLI 2009i, p. 2). Studies in Bolivia reported in 2007 found a density of 1–8 royal cinclodes in each of 30 forest patches (G mez *in litt.* 2007, p. 1). Thus, they estimated that the royal cinclodes population in Bolivia is approximately 30 birds. Researchers added that, because the royal cinclodes does not always respond to tape-playbacks, these numbers may underestimate the actual population size (G mez *in litt.* 2007, p. 1).

Global Population Estimate

In 1990, the global population of the royal cinclodes was estimated to be 100–150 individuals (Fjelds  and Krabbe 1990, p. 338). This number represented only the estimated Peruvian population because the royal cinclodes was thought to exist only in Peru at the time of this estimate (BLI 2009i, p. 2; Hirshfeld 2007, p. 198). In 2007, Auca-Chutas (2007, p. 8) reported an estimated 189 birds located within four separate *Polylepis* forest patches in Peru, with a combined area of 629 ha (1,554 ac). This estimate included 116

birds and 30 birds in Cordilleras Vilcanota and Vilcabamba, respectively (Cusco); 2 birds in Cordillera de Carabaya (Puno); and 41 birds in Cordillera del Apur mac (Runtacocha highlands in Apur mac) (Aucca-Chutas 2007, pp. 4, 8). Subpopulations at the four locations in the Cordillera Vilcanota may contain as few as 1–4 individuals (BLI 2008, p. 2).

In 2002, Engblom *et al.* (p. 57) estimated a total population size of up to 250 pairs of birds. In 2003, the global population was once again reported to include only a few hundred individuals (del Hoyo *et al.* 2003, p. 253). Based on recent observations in both countries, there are likely approximately 270 birds in Peru and 50–70 in Bolivia, totaling 239–340 individuals (this includes the 2011 observations in Laguna Anantay, Apur mac Department (Benham *et al.* 2011). While the BLI estimate of the population is between 50 and 249 individuals (BLI 2011d), recent research has found new habitat and birds in newly identified locations (Benham *et al.* 2011, pp. 145–157).

Population estimates are incomplete, and the population structure and the extent of interbreeding among the various localities are unknown. The species' territory ranges from 3 to 4 ha (7 to 10 ac), and its habitat is fragmented, dispersed, and sparse (del Hoyo *et al.* 2003, p. 253; Engblom *et al.* 2002, p. 57). Fjelds  (2010, pers. comm.) indicated that because of the range disjunction, the species may not be breeding as a single population. In the proposed rule, we indicated that there was no information to indicate the distance that this species is capable of or likely to travel between localities. However, research in 2011 found that this species was making flights greater than 100 m (328 ft) between *Polylepis* patches in Apur mac, and was also observed at forest edges (Benham *et al.* 2011, pp. 152).

Engblom *et al.* (2002, p. 57) noted that gene flow between localities likely occurs when the species descends the mountains to forage in the valleys during periods of snow cover at the higher altitudes such that interbreeding may occur at least among localities with shared valleys. Although the information available suggests that the species does not breed as a single population, we have insufficient information to determine if they are genetically isolated. The species has experienced a population decline of approximately 30 and 49 percent in the past 10 years, and this rate of decline is predicted to continue (BLI 2009i, pp. 1, 5). The population is considered to be declining in close association with

continued habitat loss and degradation (BLI 2009i, p. 6).

Conservation Status

The royal cinclodes is considered critically endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276854). The IUCN considers the royal cinclodes to be critically endangered due to its extremely small population, which consists of small subpopulations that are severely fragmented and dependent upon a rapidly deteriorating habitat (BLI 2009i, p. 1; BLI 2007, p. 1). The royal cinclodes occurs within the Peruvian protected area of Santuario Hist rico Machu Picchu, in Cusco (BLI 2009h, p. 1; BLI 2009i, p. 6; Auca-Chutas *et al.* 2008, p. 16). In La Paz Department, Bolivia, the species is found in Parque Nacional y  rea Natural de Manejo Integrado Madidi, Parque Nacional y  rea Natural de Manejo Integrado Cotapata, and the colocated protected areas of Reserva Nacional de Fauna de Apolobamba,  rea Natural de Manejo Integrado de Apolobamba, and Reserva de la Biosfera de Apolobamba (BLI 2009a, p. 1; BLI 2009b, p. 1; Auca-Chutas *et al.* 2008, p. 16). At Abra M laga Thastayoc, Cordillera Vilcanota, Peru, a new visitor's center was completed in the Royal Cinclodes Private Conservation Area in February 2011 (ECOAN 2012).

VI. White-browed tit-spinetail (*Leptasthenura xenothorax*)

Species Description

The white-browed tit-spinetail, or "tijeral cejiblanco," is a small dark ovenbird in the Furnaridaii family that is native to high-altitude woodlands of the Peruvian Andes (del Hoyo *et al.* 2003, pp. 266–267; BLI 2000, p. 347; Fjelds  and Krabbe 1990, p. 348; Parker and O'Neill 1980, p. 169; Chapman 1921, pp. 8–9). The sexes are similar in size (approximately 18 cm (7 in) in length). The most distinct feature of this species is its checkered (black-and-white) throat and dark grey body underparts, which distinguishes it from the rusty-crowned tit-spinetail (*Leptasthenura pileata*) (Fjelds  2010 pers. comm., p. 4). The species is characterized by its bright rufous crown and prominent white supercilium (eyebrow) (Lloyd 2009, p. 2; del Hoyo *et al.* 2003, p. 267), which gives the species its name. The species is highly vocal, "often singing while acrobatically foraging from the outermost branches of *Polylepis* trees" (Lloyd 2009, p. 2).

Taxonomy

The white-browed tit-spinetail was first described by Chapman in 1921 (del Hoyo *et al.* 2003, p. 267). The species was synonymized with the nominate subspecies of the rusty-crowned tit-spinetail (*Leptasthenura pileata pileata*) by Vaurie (1980, p. 66), but examination of additional specimens in combination with field observations strongly suggests that *L. xenothorax* is a valid species (Collar *et al.* 1992, p. 596; Fjelds  and Krabbe 1990, p. 348; Parker and O'Neill 1980, p. 169). Therefore, we accept the species as *Leptasthenura xenothorax*, which follows the Integrated Taxonomic Information System (ITIS 2009, p. 1).

Habitat and Life History

The white-browed tit-spinetail is restricted to high-elevation, semihumid *Polylepis* and *Polylepis-Gynoxys* woodlands, where the species is found between 3,700 and 4,550 m (12,139 and 14,928 ft) above sea level (Lloyd 2009, pp. 5–6; del Hoyo *et al.* 2003, p. 267; BLI 2000, p. 347; Collar *et al.* 1992, p. 595; Fjelds  and Krabbe 1990, p. 348). Dense stands of *Polylepis* woodlands are characterized by moss-laden vegetation and a shaded understory, and provide for a rich diversity of insects, making these areas good feeding grounds for insectivorous birds (De la Via 2004, p. 10), such as the white-browed tit-spinetail (BLI 2009d, p. 2). The characteristics of *Polylepis* habitat are described above in more detail as part of the Habitat and Life History of the ash-breasted tit-tyrant.

This species appears to prefer primary (lesser disturbed) woodland habitat in larger remnant patches at the lower to mid-elevation range of its known elevational range distribution (Lloyd 2008b, pp. 735–745). It prefers areas of high density of tall, large *Polylepis* trees. These usually correspond with areas containing dense and extensive moss ground cover (Lloyd 2008b, pp. 735–745). This species generally forages on vertical trunks and on thicker, epiphyte-clad branches of *Polylepis* trees covered with moss and lichens, unlike other *Leptasthenura* species, which generally forage on the thin terminal branches of the outer canopy (Fjelds  2010 pers. comm., p. 4). The species is different from other *Polylepis*-dependent insectivorous bird species, in particular *L. yanacensis*, in that it uses different foraging perch types, substrates, and a different niche position (Lloyd 2010 pers. comm.). The white-browed tit-spinetail has been observed to regularly use woodland patches smaller than 0.1 ha (0.25 ac) for foraging in Cordillera

Vilcabamba (Lloyd 2008, p. 531; Engblom *et al.* (2002, pp. 57–58).

It is classified as an “infrequent flyer” across gaps between woodland patches. At one site in the Cordillera Vilcanota, the species was observed avoiding flying across gaps to the most distant small woodland patches if these patches were separated by more than 73 m (239 ft) from larger woodland patches (Benham *et al.* 2011, p. 153; Lloyd and Marsden 2010, *in press*). Based on these observations, Engblom *et al.* (2002, p. 58) suggest that the species is able to persist in very small forest fragments, especially if a number of these patches are in close proximity. The lower elevation of this species’ range changes to a mixed *Polylepis-Escallonia* (no common name) woodland, and the white-browed tit-spinetail has been observed there on occasion, such as during a snowstorm (del Hoyo *et al.* 2003, p. 267; Collar *et al.* 1992, p. 595; Fjelds  and Krabbe 1990, p. 348). It may not be entirely as dependent on *Polylepis* forests; rather this species may be more dependent on the density of the forest which creates the moss-lichen-insect environment (Fjelds  2010 pers. comm.)

There is limited information on the ecology and breeding behavior of the white-browed tit-spinetail. Lloyd (2006, as cited in Lloyd 2009, p. 8) reports that the species breeds in October in Cordillera Vilcanota in southern Peru. In the same area, one adult was seen attending a nesting hole in a *Polylepis* tree in November 1997 (del Hoyo *et al.* 2003, p. 267; Bushell in litt. (1999), as cited in BLI 2009d, p. 2). Only one nest of the white-browed tit-spinetail has ever been described. According to Lloyd (2006, as cited in Lloyd 2009, p. 8), the nest was located within a natural cavity of a *Polylepis racemosa* tree’s main trunk, approximately 2 m (7 ft) above the ground. To construct their nest, the white-browed tit-spinetail pair uses moss, lichen, and bark fibers they stripped from *Polylepis* tree trunks, large branches, and large boulders while foraging. The nest was cup-shaped and contained two pale-colored eggs (Lloyd 2006, as cited in Lloyd 2009, p. 8).

The white-browed tit-spinetail is insectivorous, with a diet consisting primarily of arthropods (Lloyd 2009, p. 7; del Hoyo *et al.* 2003, p. 267). The species forages in pairs or small family groups of three to five, and often in mixed-species flocks, gleaning insects from bark crevices, moss, and lichens on twigs, branches, and trunks (BLI 2009d, pp. 2–3; Engblom *et al.* 2002, pp. 57–58; Parker and O'Neill 1980, p. 169). The white-browed tit-spinetail is highly arboreal, typically foraging acrobatically

from the outer branches of *Polylepis* trees while hanging upside-down (Lloyd 2008b, as cited in Lloyd 2009, p. 7; del Hoyo *et al.* 2003, p. 267).

Historical Range and Distribution

In our 2008 Annual Notice of Findings on Resubmitted Petitions for Foreign Species (73 FR 44062; July 29, 2008), we stated that, historically, the white-browed tit-spinetail may have occupied the *Polylepis* forests of the high-Andes of Peru and Bolivia. We included both countries in the historical range of the species because the species’ primary habitat, the *Polylepis* forest, was historically large and contiguous throughout the high-Andes of both Peru and Bolivia (Fjelds  2002a, p. 115). However, based on further research, we have determined that historically, the species was known from only two Regions in south-central Peru, Cusco and Apur mac (del Hoyo *et al.* 2003, p. 267; Collar *et al.* 1992, p. 594), and not in Bolivia.

The white-browed tit-spinetail may once have been distributed throughout south-central Peru, in previously contiguous *Polylepis* forests above 3,000 m (9,843 ft) (BLI 2009d, pp. 1–2; Fjelds  2002a, pp. 111–112, 115; Herzog *et al.* 2002, p. 94; Kessler 2002, pp. 97–101; BLI 2000, p. 347). However, *Polylepis* woodlands are now restricted to elevations of 3,500 to 5,000 m (11,483 to 16,404 ft) (Fjelds  1992, p. 10). As discussed above for the Historical Range and Distribution of the ash-breasted tit-tyrant, researchers consider human activity to be the primary cause for historical habitat decline and resultant decrease in species richness (Fjelds  2002a, p. 116; Herzog *et al.* 2002, p. 94; Kessler 2002, pp. 97–101; Fjelds  and Kessler 1996, Kessler 1995a, b, and L egaard 1992, as cited in Fjelds  2002a, p. 112; Kessler and Herzog 1998, pp. 50–51). It is estimated that only 2–3 percent of the original forest cover still remains in Peru (Fjelds  2002a, pp. 111, 113). Less than 1 percent of the remaining woodlands occur in humid areas, where denser stands are found (Fjelds  and Kessler 1996, as cited in Fjelds  2002a, p. 113), and which are preferred by the white-browed tit-spinetail (BLI 2009d, p. 2; Lloyd 2008a, as cited in Lloyd 2009, p. 6).

Current Range and Distribution

The white-browed tit-spinetail occurs in high-elevation, semihumid patches of *Polylepis* and *Polylepis-Gynoxys* woodlands in the Andes Mountains of south-central Peru (see <http://www.birdlife.org/datazone/speciesfactsheet.php?id=4824> for a range map of the species). The species

has a highly restricted and severely fragmented range, and is currently known from only a small number of sites in the Apurímac Department in these areas: The Runtacocha highlands; Nevado Sacsarayoc massif (mountain range); Cordillera Vilcanota and in the Laguna Anantay Valley in Apurímac. It is also known to occur in Vilcabamba in Cusco Department (within the Peruvian protected area of Santuario Histórico Machu Picchu) (Benham *et al.* 2011, p. 153; Fjeldsá 2010 pers. comm., p. 4; Lloyd 2010; BLI 2009c, pp. 1, 3; BLI 2009d, p. 6; del Hoyo *et al.* 2003, p. 267). The species occurs at an altitude of 3,700–4,550 m (12,139–14,928 ft) (Lloyd 2009, pp. 1, 5–6; del Hoyo *et al.* 2003, p. 267; Fjeldsá and Krabbe 1990, p. 348). It is more commonly encountered in the lower elevations within this range. Subpopulations of white-browed tit-spinetail in the Cordillera Vilcanota have a very narrow estimated niche (Benham *et al.* 2011, p. 153; Fjeldsá 2010 pers. comm.; Lloyd 2009, p. 5; Lloyd and Marsden 2008, pp. 2645–2660). The estimated potential range of the species is approximately 2,500 km² (965 mi²) (BLI 2011f, p. 1).

Population Estimates

Peru. An estimated 305 birds were located within 3 disjunct *Polylepis* forest patches in Peru (Aucca-Chutas 2007, p. 8). This included 205 birds and 36 birds in Cordilleras Vilcanota and Vilcabamba, respectively (Cusco), and 64 birds in Cordillera del Apurímac (Runtacocha highlands of Apurímac) (Aucca-Chutas 2007, p. 8). The species may occur at higher densities in other areas of *Polylepis* forests (Lloyd 2008c, as cited in Lloyd 2009, p. 9). Despite the low population estimates of this species, the quantitative data from Cordillera Vilcanota indicates that the white-browed tit-spinetail is one of the most abundant *Polylepis* specialists in southern Peru (Lloyd 2009, p. 9). This species was documented in Laguna Anantay, Apurímac in 2010, and its estimated population size in this location was 229 individuals (Benham *et al.* 2011, p. 153).

Global population estimate: BLI categorizes the white-browed tit-spinetail as having a population size between 500 and 1,500 mature individuals (BLI 2011f, p. 1). However, the estimate is based on Engblom *et al.* 2002 (p. 58). In 2002, Fjeldsá (2002b, p. 9) also estimated a total population size of between 250 and 1,000 pairs of birds. More recently it was described as having one of the highest densities of all the threatened *Polylepis* bird species in this area (Benham *et al.* 2011, p. 153; Lloyd 2010, pers. comm.). It is described

as being common in a rare and patchy (fragmented) habitat (Lloyd 2008). Some species have always been rare (Donald *et al.* 2010, p. 10); particularly those associated with habitat such as *Polylepis*-dominated forest. However, as of 2009, the species was described as experiencing a population decline between 10 and 19 percent in the past 10 years, and this rate of decline was predicted to continue (BLI 2009d, p. 5). The species' population decline is correlated with the rate of habitat loss and degradation (see Factor A) (BLI 2009d, p. 6). Based on the best available information, we consider the population estimate to be between 500 and 1,500 mature individuals.

Conservation Status

The white-browed tit-spinetail is considered endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276854). The IUCN considers the white-browed tit-spinetail to be endangered due to its very small and severely fragmented range and population, which continue to decline with ongoing habitat loss and a lack of habitat regeneration (BLI 2009d, p. 1). Additional protections that are likely to benefit this species include three new recently approved community-owned, private conservation areas (3,415 ha or 8,438 ac) to protect *Polylepis* forest in the Vilcanota Mountains of southeastern Peru, near Cusco, which will subsequently provide protection for bird species such as the white-browed tit-spinetail (American Bird Conservancy 2011, unpaginated; Salem News 2010, p. 1).

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act. The five factors are: (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; and (E) other natural or manmade factors affecting its continued existence. Listing actions may be warranted based on any of the above threat factors, singly or in combination. In considering what factors might constitute threats, we look beyond the

exposure of the species to determine whether the species responds to the factor in a way that causes actual impacts to the species, and we look at the magnitude of the effect. If there is exposure to a factor, but no response, or only a beneficial response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant the factor is. If the factor is significant and, therefore, a threat, it may drive or contribute to the risk of extinction of the species such that the species warrants listing as threatened or endangered as those terms are defined by the Act. In making this final listing determination, we evaluated threats to each of these six species. Our evaluation of this information is discussed below.

There are three habitat types in which these six species exist. All six species occur in Peru; two of them occur in Bolivia. The Peruvian plantcutter occurs in coastal northern Peru, the Junín grebe and Junín rail occur in and around Lake Junín, and three (the white-browed tit-spinetail, royal cinclodes, and ash breasted tit-tyrant) occur in forest habitat dominated by *Polylepis* species. Within each of these three habitats, these three species depend on similar physical and biological features and on the successful functioning of their ecosystems to survive. They also face the same or very similar threats within each habitat type. One peer reviewer thought that the proposed rule was difficult to follow, so we hope that the way we have organized our evaluation and finding in this final rule is more clear.

Although the listing determination for each species is analyzed separately, to avoid redundancy we have organized the specific analysis for each species within the context of the broader scale and threat factor in which it occurs. Since within each habitat, these species face a suite of common or mostly overlapping threats, similar management actions would reduce or eliminate those threats. Effective management of these threat factors often requires implementation of conservation actions at a broader scale to enhance or restore critical ecological processes and provide for long-term viability of those species in their native environment. Thus, by taking this broader approach, we hope this final rule is effectively organized.

Summary of Factors

A. The Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

Ash-breasted tit-tyrant, royal cinclodes, and white-browed tit-spinetail (Polylepis habitat)

1. *Ash-breasted tit-tyrant*. The ash-breasted tit-tyrant is dependent upon high-elevation semihumid *Polylepis* or *Polylepis-Gynoxys* woodlands (del Hoyo *et al.* 2004, pp. 281; Collar *et al.* 1992, p. 753; Fjelds  and Krabbe 1990, pp. 468–469). Researchers believe that this habitat was historically contiguous with lower-elevation cloud forests and widespread above 3,000 m (9,843 ft) (Fjelds  2002a, pp. 111, 115; Collar *et al.* 1992, p. 753), but *Polylepis* woodlands occur today only between 3,500 and 5,000 m (11,483–16,404 ft) (Fjelds  1992, p. 10). The species prefers dense woodlands (Fjelds  2002a, p. 114; Smith 1971, p. 269), where the best foraging habitat exists (De la Via 2004, p. 10).

Within La Paz, there may be two separate populations that are separated by the Mapiri canyon (see www.birdlife.org/datazone/speciesfactsheet.php?id=4173 for a range map of the species). The population in the Runtacocha highland in Apur mac, Peru, is morphologically distinct from that in Cusco, although a formal subspecies description has not been published (Fjelds  2010 pers. comm.). Several other areas with similar dense *Polylepis* stands exist further south in Apur mac, east of the Chalhuana valley (a zone with fairly high precipitation) and could hold other populations. These could act as links or corridors to other suitable habitat such as a small *Polylepis* patch that exists near Nevado Solimana in western Arequipa. However, this patch is isolated and could only accommodate a few pairs of ash-breasted tit-tyrants (Fjelds  2010 pers. comm.).

Although there is currently no evidence to suggest that populations in Cusco and in La Paz are connected, they may have been connected in the past. In 2007, the ash-breasted tit-tyrant was observed in the Ancash Region, Corredor Conchucos (Aucca-Chutas 2007, pp. 4, 8). Here, a *Polylepis* reforestation project is under way to connect two protected areas where ash-breasted tit-tyrants were known to occur: In Parque Nacional Huascar n and Zona Reservada de la Cordillera Huayhuash (MacLennan 2009, p. 1; Antamina Mine 2006, p. 5).

The second location spans the Peruvian-Bolivian border—in the Peruvian Administrative Regions of Apur mac, Cusco, Puno, and Arequipa (from north to south) and in the Bolivian Department of La Paz. Here it occurs in Cordillera Oriental (Apur mac

and Cusco), Cordilleras Vilcanota and Vilcabamba (Cusco), and Cordillera de Carabaya (Puno)—in Peru—and ranges into Bolivia, where it is found in the Cordillera Real and the Cordillera Apolobamba (La Paz) (BLI 2009e, p. 1; Auca-Chutas 2007, p. 8; del Hoyo *et al.* 2004, p. 281; Collar *et al.* 1992, p. 753; Fjelds  and Krabbe 1990, pp. 468–469). The ash-breasted tit-tyrant was only recently (in 2008) reported in Arequipa Region, Peru (BLI 2009j, p. 1).

The ash-breasted tit-tyrant is highly localized (Collar *et al.* 1992, p. 753) and has been described as very rare, with usually only 1–2 pairs per occupied woodland (Fjelds  and Krabbe 1990, p. 469). It exists at such low densities in some places that it may go undetected (Collar *et al.* 1992, p. 753). The species appears to be unable to persist in forest remnants smaller than 1 ha (2.5 ac) (BLI 2009o, p. 1).

2. *Royal cinclodes*. The royal cinclodes is restricted to high-elevation (3,500–4,600 m or 11,483–12,092 ft), moist, moss-laden areas of semihumid *Polylepis* or *Polylepis-Gynoxys* woodlands (BLI 2009i, p. 2; del Hoyo *et al.* 2003, p. 253; BLI 2000, p. 345; Collar *et al.* 1992, p. 588). *Polylepis* woodlands are dispersed and sparse, with an estimated remaining area of 1,000 km² (386 mi²) in Peru and 5,000 km² (1,931 mi²) in Bolivia (Fjelds  and Kessler 1996, as cited in Fjelds  2002a, p. 113). Within the remaining *Polylepis* woodlands, the royal cinclodes' range is approximately 2,700 km² (1,042 mi²) (BLI 2011e, p. 1) (See <http://www.birdlife.org/datazone/speciesfactsheet.php?id=9773> for a range map of the species). Less than 1 percent of the remaining woodlands occur in humid areas, where denser stands occur (Fjelds  and Kessler 1996, as cited in Fjelds  2002a, p. 113). The optimal habitat for the royal cinclodes is large areas of dense woodlands in the high Andes, with a closed canopy that supports its preferred foraging habitat of shady, moss-laden vegetation (Lloyd 2008, p. 735; De la Via 2004, p. 10; del Hoyo *et al.* 2003, p. 253; Engblom *et al.* 2002, p. 57).

3. *White-browed tit-spinetail*. The species is known from only a small number of sites at four locations: The Runtacocha highlands (in Apur mac Region), and the Nevado Sacsarayoc massif, Cordillera Vilcabamba, and Cordillera Vilcanota (in Cusco Region); however, new *Polylepis* habitat has been located (Benham *et al.* 2011, p. 145). In the Cordillera de Vilcanota (Cusco, Peru), where a large portion of the known white-browed tit-spinetail population occurs (205 birds were recently observed there, of 305 total

birds observed in 3 study sites in Peru) (Aucca-Chutas 2007, p. 8), *Polylepis* woodland habitat is highly fragmented and degraded. According to Engblom *et al.* (2002, pp. 57–58), the species has been recorded in patches of woodland as small as 0.25 ha (0.6 ac) in Cordillera Vilcabamba, but the species' persistence in small patches appears to be dependent on the patches being in close proximity to each other.

Polylepis habitat

High-Andean *Polylepis* woodlands are considered by experts to be the most threatened habitat in Peru and Bolivia (Purcell *et al.* 2004, p. 457), throughout the Andean region (BLI 2009a, p. 2), and are one of the most threatened woodland ecosystem types in the world (Renison *et al.* 2005, as cited in Lloyd 2009, p. 10). The IUCN has listed several *Polylepis* species as vulnerable, including two species, *Polylepis incana* and *P. pepei* that occur within the range of these three species (Ramsay and Auca 2003, pp. 3–4; WCMC 1998a, p. 1; WCMC 1998b, p. 1). Peruvian and Bolivian *Polylepis* woodlands today are highly fragmented. In the late 1990s, Fjelds  and Kessler (1996, as cited in Fjelds  2002a, p. 113) conducted comprehensive ground surveys and analyzed maps and satellite images of the area. They estimated that the current range of *Polylepis* woodlands had been reduced from historical levels by 97–98 percent in Peru and 90 percent in Bolivia. Contemporary *Polylepis* woodlands are dispersed and sparse, covering an estimated area of 1,000 km² (386 mi²) and 5,000 km² (1,931 mi²) in Peru and Bolivia, respectively (Fjelds  and Kessler 1996, as cited in Fjelds  2002a, p. 113). Of the remaining *Polylepis* woodlands, only 1 percent is found in humid areas, where the denser *Polylepis* forests preferred by the ash-breasted tit-tyrant tend to occur (Fjelds  and Kessler 1996, as cited in Fjelds  2002a, p. 113).

Habitat loss, conversion, and degradation throughout these three species' range have been and continue to occur as a result of ongoing human activity, including:

- (1) Clear cutting and burning;
- (2) Extractive activities;
- (3) Human encroachment; and
- (4) Climate fluctuations that may exacerbate the effects of habitat fragmentation.

Clearcutting and burning. Clear cutting and burning are among the most destructive activities and are a leading cause for *Polylepis* habitat loss (WCMC 1998a, p. 1; WCMC 1998b, p. 1). Forested areas are cleared for agriculture and to create pasture for cattle, sheep,

and camels (BLI 2009a, p. 2; BLI 2009c, pp. 1–2; BLI 2009d, pp. 1–2; BLI 2009e, pp. 1, 5; BLI 2009h, p. 1; BLI 2009m, p. 1; BLI 2009n, p. 4). Grazing lands situated among remaining forest patches are regularly burned in order to maintain the grassland vegetation (locally known as *chaqueo*). Regular burning prevents regeneration of native forests and is considered the key factor limiting the distribution of *Polylepis* forests (BLI 2009f, p. 1; BLI 2009n, p. 4; Fjeldsá 2002b, p. 8; WCMC 1998a, p. 1). In some areas, the burns escape control, causing further habitat destruction (BLI 2009a, p. 2; BLI 2009e, pp. 1, 5). Burning and clear cutting occur throughout the ash-breasted tit-tyrant's range, including Ancash, Apurímac, and Cusco in Peru; and in La Paz, Bolivia (BLI 2009a, p. 2). These activities are also ongoing within protected areas, including Parque Nacional Huascarán, Santuario Histórico Machu Picchu, and Zona Reservada de la Cordillera Huayhuash (BLI 2009l, p. 4; BLI 2009n, p. 2; Barrio 2005, p. 564).

With years of extremely high rainfall followed by years of extremely dry weather, the risk of fire is increased from the accumulated biomass during the wet period that dries and adds to the fuel load in the dry season (Block and Richter 2007, p. 1; Power *et al.* 2007, p. 898). Evidence suggests that the fire cycle in Peru has shortened, particularly in coastal Peru and west of the Andes (Power *et al.* 2007, pp. 897–898). Changes in the fire-regime can have broad ecological consequences (Block and Richter 2007, p. 1; Power *et al.* 2007, p. 898). Research in Ecuadorian *Polylepis-Gynoxys* mixed woodlands indicated a strong reduction in *P. incana* adult and seedling survival following a single fire. This indicates that *Polylepis* species do not recover well from even a single fire event (Cierjacks *et al.* 2007, p. 176). Because burning has been considered to be a key factor preventing *Polylepis* regeneration (Fjeldsá 2002a, p. 112, 120; Fjeldsá 2002b, p. 8), an accelerated fire cycle would exacerbate this situation.

As a result of the intensity of burning and grazing, *Polylepis* species are generally restricted to areas where fires cannot spread and where cattle and sheep do not normally roam—in stream ravines and on boulders, rock ledges, and sandy ridges (Fjeldsá 2002a, p. 112; Fjeldsá 2002b, p. 8). Grazing and trampling by domesticated animals further limit forest regeneration (Fjeldsá 2002a, p. 120) and contribute to the degradation of remaining forest patches. Sheep and cattle have solid, sharp hooves that churn up the earth, damaging vegetation and triggering

erosion (Purcell *et al.* 2004, p. 458; Engblom *et al.* 2002, p. 56). The loss of nutrient-rich soils leads to habitat degradation, which reduces the ability of the habitat to support dense stands of *Polylepis* woodlands (Jameson and Ramsay 2007, p. 42; Purcell *et al.* 2004, p. 458; Fjeldsá 2002b, p. 8).

Polylepis habitat is also subject to conversion, degradation, or destruction caused by extractive activities such as firewood collection, timber harvest, and mining. Cutting wood for fuel has a consistent and ongoing impact throughout these three species' ranges (BLI 2009a, p. 2; BLI 2009b, pp. 1–2; BLI 2009c, pp. 1–2; BLI 2009d, pp. 1–2; BLI 2009f, p. 1; BLI 2009l, p. 1; WCMC 1998a, p. 1). The high-altitude zones where *Polylepis* occurs have long been inhabited by subsistence farmers who rely on *Polylepis* wood for firewood and charcoal production (Aucca-Chutas and Ramsay 2005, p. 287). Habitat degradation is occurring in the Santuario Histórico Machu Picchu in Peru (BLI 2009h, p. 4), and Parque Nacional y Área Natural de Manejo Integrado Madidi, Parque Nacional y Área Natural de Manejo Integrado Cotapata, and the collocated protected areas of Reserva Nacional de Fauna de Apolobamba, Área Natural de Manejo Integrado de Apolobamba, and Reserva de la Biosfera de Apolobamba in Bolivia (BLI 2009a, p. 2; BLI 2009b, p. 2; BLI 2009c, p. 2; BLI 2009d, p. 5).

Community-based *Polylepis* conservation programs fostered by the Peruvian nongovernmental organization Asociación Ecosistemas Andinos (ECOAN) have been under way in Peru and Bolivia since 2004, encompassing Cordilleras Vilcanota and Vilcabamba (Cusco Region), highlands of the Apurímac Region (Lloyd 2009, p. 10; Auca-Chutas and Ramsey 2005, p. 287; ECOAN no date (n.d.), p. 1) and in the Ancash Region (MacLennan 2009, p. 2). These are known as the Vilcanota Project or ECOAN Projects (Aucca-Chutas and Ramsey 2005, p. 287; ECOAN n.d., p. 1). Local communities enter into and enforce management agreements aimed at mitigating the primary causes for *Polylepis* deforestation: burning, grazing, and wood-cutting. These projects foster local, sustainable use of resources (Aucca-Chutas and Ramsey 2005, p. 287; ECOAN n.d., p. 1; Engblom *et al.* 2002, p. 56), such as the use of more fuel-efficient wood-burning stoves that require half the amount of wood fuel (MacLennan 2009, p. 2).

Polylepis wood is also harvested for local commercial use, including within protected areas (BLI 2009a, p. 2; WCMC 1998a, p. 1). At one site, near Abra

Málaga (Cusco Region), wood has been harvested for sale to local hotels in the towns of Urubamba and Ollantaytambo to support tourism activity (Engblom 2000, p. 1). Engblom (2000, p. 1) documented felling for firewood at this site in Cusco over a 2-day period that significantly reduced the size and quality of the forest patch. Purcell *et al.* (2004, p. 458) noted a positive correlation between habitat destruction and increased demand for (and the concomitant rise in the price of) fuel. *Polylepis* is also harvested for construction, fencing, and tool-making (Aucca-Chutas and Ramsey 2005, p. 287; BLI 2009a, p. 2). Commercial-scale activities such as clear cutting, logging, tourism, and infrastructure development are ongoing throughout these species' ranges, and alter otherwise sustainable resource use practices (MacLennan 2009, p. 2; Auca-Chutas and Ramsay 2005, p. 287; Purcell and Brelsford 2004, pp. 156–157; Purcell *et al.* 2004, pp. 458–459; Engblom *et al.* 2002, p. 56; Engblom 2000, p. 2; WCMC 1998a, p. 1).

Human encroachment. Human encroachment and concomitant increasing human population pressures exacerbate the destructive effects of ongoing human activities throughout *Polylepis* habitat. Habitat destruction is often caused by a combination of human activities that contribute to habitat degradation. In the Cordillera de Vilcanota (Cusco, Peru), where an estimated 181 ash-breasted tit-tyrants were reported in 2007 (Aucca-Chutas 2007, pp. 4, 8), the rate of habitat loss was studied by comparing forest cover between 1956 and 2005. This study revealed a rate of habitat loss averaging only 1 percent. However, remaining patches of *Polylepis* woodland were small, with a mean patch size of 3 ha (7.4 ac). Four forest patches had disappeared completely; and no new patches were located within the study area (Jameson and Ramsay 2007, p. 42). Lloyd (2008, p. 532) studied bird foraging habits at three *Polylepis* woodland sites in the Cordillera Vilcanota during 2003–2005. The sites were described as highly fragmented, consisting of many small remnant patches (less than 1 ha (2.5 ac)) and scattered trees separated from larger woodland tracts (greater than 10 ha (25 ac)) by distances of 30–1,500 m (98–4,921 ft) (Lloyd and Marsden in press, as cited in Lloyd 2008, p. 532). ECOAN is working with local communities in this area to address habitat degradation and is working on *Polylepis* reforestation projects, which are discussed below in this document (ABC undated, pp. 1–3).

Extractive activities. Mining in *Polylepis* habitat occurs in the Peruvian regions of Ancash and Huánaco and in the Bolivian Department of La Paz (BLI 2009b, p. 1; BLI 2009d, p. 1; BLI 2009g, p. 1). As of 2006, Ancash was home to the largest zinc and copper mine in the world, with a monthly average production rate of 105,000 metric tons (231,485 pounds) of minerals per day and a 300-kilometer (km) (186-mile (mi)) underground pipeline that stretches from the mine to the port of Punta Lobitos along the coast (Antamina Mine 2006, pp. 4, 9;

www.antamina.com/02_operacion/En_puerto.html). A mixture of water and minerals are transported by the pipeline (Biodiversity Neutral Initiative [BNI] 2006, p. 2). The actual mining footprint was estimated to be 2,221 hectares (5,488 acres) (BNI 2006, p. 2). As a result of mining activities, the habitat is affected by effluent containing metals such as copper, zinc, iron, and molybdenum) (BNI 2006, p. 7). Mining also occurs in ash-breasted tit-tyrant habitat in La Paz, Bolivia, where there are active gold, tin, silver, and tungsten mines, in addition to gravel excavation for cement production (USGS Minerals Yearbook 2005, pp. 4–7).

Recently, an accelerated rate of *Polylepis* forest destruction has been attributed to clear cutting for road building and industrialization projects, such as mining and construction of hydroelectric power stations (Purcell and Brelsford 2004, pp. 156–157). Between 1991 and 2003, approximately 200 ha (494 ac) of *Polylepis* habitat was destroyed. Thus, nearly two-thirds of the forest cover that existed in the 1990s no longer existed in 2003 (Purcell and Brelsford 2004, p. 155). Only 520 ha (1,285 ac) of *Polylepis* forest was estimated to remain in the Bolivian Department of La Paz, representing approximately a 40 percent rate of habitat loss in just over one decade. The researchers inferred that this rate of destruction could result in extirpation of the remaining *Polylepis* forest in La Paz within the next 30 years if no mitigation is implemented (Purcell and Brelsford 2004, pp. 157).

Since 2003, Antamina Mine has undertaken *Polylepis* habitat conservation programs within the areas affected by mineral extraction in partnership with ECOAN and other NGOs. Antamina Mine has committed to investing a million dollars in programs ranging from education and tourism, to organic agriculture and sustainable development, and reforestation of areas using *Polylepis* species. The Antamina Mining Company conservation program

supports the planned reforestation within a 50,000-ha (123,552-ac) area. Planting of *Polylepis* species will assist in connecting habitat between two protected areas, Parque Nacional Huascarán and Zona Reservada de la Cordillera Huayhuash (Antamina Mine 2006, p. 5). As of 2009, the project had succeeded in restoring 150 ha (371 ac) of forest, with a 95 percent survival rate (MacLennan 2009, p. 1). Known as Corredor Conchucos, at least 30 ash-breasted tit-tyrants have recently been observed there (Aucca-Chutas 2007, p. 8).

Mining and hydroelectric projects open previously undisturbed areas to exploitation and attract people seeking employment (Purcell *et al.* 2004, p. 458). Increased urbanization and mining have led to increased infrastructure development. Road building and mining projects further facilitate human access to remaining *Polylepis* forest fragments, throughout these three species' ranges (Purcell *et al.* 2004, pp. 458–459; Purcell and Brelsford 2004, pp. 156–157), including protected areas. In the Bolivian Department of La Paz, one of the most transited highways in the country is located a short distance from the Parque Nacional y Área Natural de Manejo Integrado Cotapata (BLI 2009b, p. 2). Road building, mining, and other large-scale resource exploitations have major impacts on the habitat (Purcell and Brelsford 2004, p. 157).

Tourism. Ecotourism is considered a growing problem within protected areas where these three species occur such as in the Zona Reservada de la Cordillera Huayhuash in Peru, and in the Apolobamba protected areas in Bolivia (BLI 2009e, p. 5; Barrio 2005, p. 564). For example, in Huascarán National Park, irresponsible tourism is affecting habitat (TNC 2011, p. 6). Visitors form base camps at the foot of mountains and make expeditions to the summits. Tourists camp and hike for several days (TNC 2011, p. 6). Tourism along the climbing routes and circuits is causing progressive loss of vegetative coverage and is disturbing wildlife in the surrounding areas (TNC 2011, pp. 6–8). Poorly managed tourism results in contamination by unmanaged garbage and waste, unauthorized trail and road openings, soil erosion, and vegetation loss (TNC 2011, p. 6). Burying garbage can damage soil because it causes erosion as well as contamination. Garbage and waste left behind contaminates water (originating from glaciers), lakes, rivers, and streams.

Lack of *Polylepis* forest regeneration during nearly 50 years underscores the ramifications of continued burning and clearing to maintain pastures and

farmland, which are prevalent activities throughout the ranges of these three species (BLI 2009a, p. 2; BLI 2009b, p. 2; Engblom *et al.* 2002, p. 56; Fjeldsá 2002a, pp. 112, 120; Fjeldsá 2002b, p. 8; Purcell *et al.* 2004, p. 458; WCMC 1998a, p. 1). These habitat-altering activities are considered to be key factors preventing regeneration of *Polylepis* woodlands (Fjeldsá 2002a, p. 112, 120) and are factors in the historical decline of *Polylepis*-dependent bird species, including these three species (BLI 2009i, p. 6; Fjeldsá 2002a, p. 116; Herzog *et al.* 2002, p. 94; Kessler 2002, pp. 97–101; Fjeldsá and Kessler 1996).

The royal cinclodes' population size is considered to be declining in close association with continued habitat loss and degradation (BLI 2009i, p. 6). The royal cinclodes may once have been locally common and distributed across most of central to southern Peru and into the Bolivian highlands, in once-contiguous expanses of *Polylepis* forests (BLI 2009i, p. 1; Fjeldsá 2002a, pp. 111–112, 115; BLI 2000, p. 345). In the Cordillera de Vilcanota (Cusco, Peru), where a large portion of the known royal cinclodes population occurs (116 birds were observed there, out of 189 total birds observed in 4 study sites in Peru) (Aucca-Chutas 2007, pp. 4, 8), *Polylepis* woodland habitat is highly fragmented and degraded. The species may have been extirpated from its type locality (Aricoma Pass, Puno), where *Polylepis* forest no longer occurs. A search for the species in 1987 resulted in no observations of the royal cinclodes (Engblom 2002, p. 57; Collar *et al.* 1992, p. 589). The royal cinclodes is not predicted to occur in Puno because habitat no longer exists there (InfoNatura 2007, p. 1), and only two birds have been observed at that location in recent years (Aucca-Chutas 2007, pp. 4, 8). Therefore, further habitat loss will continue to impact the species' already small population size (see Factor E).

Polylepis habitat throughout the range of the white-browed tit-spinetail has been and continues to be altered and destroyed as a result of human activities, including clear cutting and burning for agriculture and grazing lands and extractive activities including harvest for timber, firewood, and charcoal. It is estimated that only 2–3 percent of the dense *Polylepis* woodlands preferred by the species remain. Observations suggest that the white-browed tit-spinetail is able to persist in very small forest fragments (e.g., areas as small as 0.25 ha (0.6 ac) in Cordillera Vilcabamba); however, this depends on whether or not adequate

patches are near one another. Continued loss, degradation, and fragmentation of remaining *Polylepis* woodlands increase the degree of isolation (distance) between populations and subpopulations (and neighboring woodland fragments within the same site). Since individuals tend not to cross the larger gaps between neighboring woodland patches, increasing isolation (at whatever scale) is likely to affect the dispersal and other movement patterns between populations, and, therefore, impact the species' population persistence within the landscape.

The white-browed tit-spinetail prefers areas of high density of tall, large *Polylepis* trees, which usually correspond with areas containing dense and extensive moss ground cover. When habitat is degraded, there is often a lag time before the species losses are evident (Brooks *et al.* 1999, p. 1140), so the white-browed tit-spinetail may still be present, despite the low quality of its habitat. This species is not likely able to persist in forest remnants smaller than 1 ha (2.5 ac) (Gomez *in litt.* 2003, 2007 in BLI 2009o, p. 1), and the remaining *Polylepis* forest patch sizes have met or are approaching the lower threshold of this species' ecological requirements.

Larger concentrations of people put greater demand on the natural resources in the area (Donald *et al.* 2010, p. 26). Increasing demand for firewood upsets informal and otherwise sustainable community-based forest management traditions (Purcell and Brelsford, 2004, p. 157). Increasing human populations in the high-Andes of Bolivia and Peru have also resulted in a scarcity of arable land. This has led many farmers to burn additional patches of *Polylepis* forests to plant crops, even on steep hillsides that are not suitable for cultivation (BLI 2009b, p. 2; BLI 2009h, p. 1; Hensen 2002, p. 199). These ongoing farming practices result in the rapid loss of *Polylepis* forests stretching from Bolivia to Peru.

Thus, habitat degradation has serious impacts in *Polylepis* woodlands (Jameson and Ramsay 2007, p. 42), especially given these species' preference for dense woodlands (Fjelds  2002a, p. 114; Smith 1971, p. 269). The fact that no new *Polylepis* forest patches had become established between 1956 and 2005 underscores the long-term ramifications of ongoing burning, clearing, grazing, and other habitat-altering human activities that are pervasive throughout these three species' ranges (BLI 2009f, p. 1; BLI 2009n, p. 4; Fjelds  2002b, p. 8; WCMC 1998a, p. 1; WCMC 1998b, p. 1). These activities are considered to be key factors both in preventing regeneration

of *Polylepis* woodlands and in the historical decline of *Polylepis*-dependent bird species, including these three species (Fjelds  2002a, p. 116). Therefore, further habitat loss will continue to impact these species' already small population sizes (see Factor E).

Climate Fluctuations

Peru is subject to climate fluctuations that may exacerbate the effects of habitat fragmentation, such as those that are related to the El Ni o Southern Oscillation (ENSO). The term ENSO refers to a range of variability associated with the southern trade winds in the eastern and central equatorial Pacific Ocean. El Ni o events are characterized by unusual warming of the ocean, while La Ni a events bring cooler ocean temperatures (Tropical Atmosphere Ocean (TAO) Project no date (n.d.), p. 1). Generally speaking, extreme ENSO events alter weather patterns, so that precipitation increases in normally dry areas, and decreases in normally wet areas. During an El Ni o event, rainfall dramatically increases, whereas a La Ni a event brings near-drought conditions (Holmgren *et al.* 2001, p. 89).

Climate change is characterized by variations in the earth's temperature and precipitation, causing changes in atmospheric, oceanic, and terrestrial conditions (Parmesan and Mathews 2005, p. 334). In addition to substrates (vegetation, soil, water), habitat is also defined by atmospheric conditions; changes in air temperature and moisture can effectively change a species' habitat. Periodic climatic patterns such as El Ni o and La Ni a can cause or exacerbate such negative impacts on a broad range of terrestrial ecosystems and Neotropical bird populations (Gosling *et al.* 2009, pp. 1–9; Plumart 2007, pp. 1–2; Holmgren *et al.* 2001, p. 89; England 2000, p. 86; Timmermann 1999, p. 694).

Over the past decade, there have been four El Ni o events (1997–1998, 2002–2003, 2004–2005, and 2006–2007) and three La Ni a events (1998–2000, 2000–2001, and 2007–2008) (National Weather Service (NWS) 2009, p. 2). Some research suggests the Andean highlands, and *Polylepis* species in particular, are strongly influenced by ENSO events (Christie *et al.* 2008, p. 1; Richter 2005, pp. 24–25). Christie *et al.* (2008, p. 1) found that tree growth in *P. tarapacana* is highly influenced by ENSO events because ENSO cycles during the Peruvian Coast are strongest during the growing season (December–February). ENSO-related droughts can increase tree mortality and dramatically alter age structure within tree

populations, especially in cases where woodlands have undergone disturbance such as fire and grazing (Villalba and Veblen 1998, pp. 2624, 2637; Villalba and Veblen 1997, pp. 121–123).

Some changes in the physical environment include changes in precipitation and temperature and the frequency and severity of events (Huber and Gullede 2011, p. 3; Solman 2011, p. 20; Laurance and Useche 2009, p. 1432; Margeno 2008, p. 1; Nu ez *et al.* 2008, p. 1). Climate change has also resulted in a variety of alterations in ecosystem processes, species distributions, and the timing of seasonal events such as bird migrations and the onset of flowering (GCCIOUS 2009, pp. 79–88). Forecasts of the rate and consequences of future climate change are based on the results of extensive modeling efforts conducted by scientists around the world (Solman 2011, p. 20; Laurance and Useche 2009, p. 1432; Nu ez *et al.* 2008, p. 1; Margeno 2008, p. 1; Meehl *et al.* 2007, p. 753). While projections from global climate model simulations are informative and various methods exist to downscale global and national projections to the regional or local area in which the species lives, in many cases, downscaled projections are still being developed (Solman 2011, p. 20; Insel *et al.* 2009; Nu ez *et al.* 2008, p. 1; Marengo 2008, p. 1), and the local effect of climate change on *Polylepis* is unclear.

Jetz *et al.* (2007, p. 1,211) investigated the effects of climate change on 8,750 land bird species that are exposed to ongoing manmade land cover changes (i.e., habitat loss). They determined that narrow endemics such as these three species are likely to suffer greater impacts from climate change combined with habitat loss (Jetz *et al.* 2007, p. 1213). This is due to the species' already small population size, specialized habitat requirements, and heightened risk of extinction from stochastic demographic processes (see also Factor E). According to this study, by 2050, up to 18 percent of the ash-breasted tit-tyrant's current remaining range is likely to be unsuitable for this species due to climate change. By 2100, one estimate predicted that about 18 to 42 percent of the species' range is likely to be lost as a result of climate change (Jetz *et al.* 2007, Supplementary Table 2, p. 73). With respect to the royal cinclodes, researchers predicted that, by 2050, approximately 3 to 15 percent of its current remaining range is likely to be unsuitable for this species due to climate change and, by 2100, it is predicted that about 8 to 18 percent of the species' range is likely to be lost as a direct result of global climate change

(p. 89). With respect to the white-browed tit-spinetail, the researchers predicted that, by 2050, another one percent of its current remaining range is likely to be unsuitable for this species due to changes in the local climate. By 2100, it is predicted that about 43 percent of the species' range is likely to be lost as a direct result of global climate change (p. 89).

There is conflicting information about how changes in climate might affect these species' habitat, which is associated with cloud mist-zones. Fossil records indicate that these species' habitat, *Polylepis* forest in the central Andes, was at a maximum during warm, wet conditions approximately 1,000 years ago, but might be at a minimum during the warmer and drier-than-modern conditions predicted for later this century (Gosling *et al.* 2009, pp. 2, 10). The maximum abundance of *Polylepis* is coincident with times of warmer, wetter conditions, while warmer, drier conditions minimize optimum habitat (Gosling 2009, p. 18). This suggests that *Polylepis* forests may become scarcer. If these three bird species are unable to adapt to other habitat, the lack of mature *Polylepis* forests may affect these species.

However, this same paper and other research indicate that *Polylepis* habitat may experience more moisture (Gosling *et al.* 2009, p. 11; Insel *et al.* 2009, unpaginated; Marengo 2008, p. 4). The effects of climate change are still uncertain, in part due to the localized effects of the Andes (Insel *et al.* 2009, pp. 1–2). Other recent regional models project both an increase in wet-season precipitation and a decrease in dry-season precipitation over most of South America (Kitoh *et al.* 2011, p. 1; Nuñez *et al.* 2008, p. 1081). In the future, for almost the entire South American continent, precipitation intensity is expected to increase (Kitoh *et al.* 2011, p. 2; Avalos-Roldán 2007, p. 76).

Other new information suggests that climate change may not be a significant factor affecting species in *Polylepis* forests (Fjeldsá 2010 pers. comm.). Although stronger ENSO impacts may cause drier conditions in Peru's western cordillera, the effect further east would likely be opposite. The areas where the ash-breasted tit-tyrant occurs, for example, correspond with peaks of endemism in the humid Peruvian Andes. These areas have been found to correlate with stable local environments, likely due to interactions between atmospheric flows and local topography (Fjeldsá 2010 pers. comm.). The *Polylepis* forests generally occur at the transition between deep Andean valleys and cold highlands, where the

mist-zone is determined more by topography rather than by regional or global climate (Fjeldsá 2010 pers. Comm; Fjeldsá *et al.* 1999). This characteristic is demonstrated by the persistence of relict endemic species in these places. Therefore, preferred *Polylepis* habitat may be less susceptible to larger scales of climate change.

Unpredictable climate fluctuations may exacerbate the effects of habitat fragmentation (Jetz *et al.* 2007, pp. 1,211, 1,213; Mora *et al.* 2007, p. 1,027). In the face of an unpredictable climate, the risk of population decline due to habitat fragmentation is heightened. Researchers have found that the combined effects of habitat fragmentation and climate change (in this case, warming) had a synergistic effect, rather than additive (Laurance and Useche 2009, p. 1427; Mora *et al.* 2007, p. 1,027). In other words, the interactive effects of both climate fluctuation and habitat fragmentation led to a greater population decline than if either climate change or habitat fragmentation were acting alone on populations. However, the effect of a changing climate on these species' habitat is still unclear.

Summary of Factor A—Ash-breasted tit-tyrant, royal cinclodes, and white-browed tit-spinetail (Polylepis habitat)

These three species are dependent on *Polylepis* habitat, with a preference for dense, shady woodlands. Although the white-browed tit-spinetail has been recorded in patches of woodland as small as 0.25 ha (0.6 ac), the ash-breasted tit-tyrant and the royal cinclodes both require larger ranges than the white-browed tit-spinetail: 1–2 ha (2.5–5 ac) and 3–4 ha (7–10 ac) respectively. In the Department of La Paz, Bolivia, which encompasses Bolivia's largest urban area, most of the *Polylepis* forest had been eliminated prior to the late 1990s (Purcell and Brelsford 2004, p. 157). In Cordillera Vilcanota (Cusco, Peru), where a large concentration of the royal cinclodes individuals was observed in 2007, the average size of forest fragments just meets the lower threshold of the species' ecological requirements.

Polylepis habitat throughout their range has been and continues to be altered and destroyed as a result of human activities, including clear cutting and burning for agriculture and grazing lands; tourism; extractive activities including firewood, timber, and minerals; human encroachment, and concomitant increased pressure on natural resources. Forest fragments in some portions of these three species' ranges are approaching the lower

threshold of the species' ecological requirements. The historical decline of habitat suitable for these species is attributed to the same human activities that are causing habitat loss today. Ongoing and accelerated habitat destruction of the remaining *Polylepis* forest fragments in both Peru and Bolivia continues to reduce the quantity, quality, distribution, and regeneration of remaining patches. Some NGOs and local communities are conducting reforestation efforts in areas such as the Cordillera Vilcanota, Peru (ECOAN 2012). However, the growth of *Polylepis* species will take some time, and the results of these efforts are not yet clear. Human activities that degrade, alter, and destroy habitat are ongoing throughout the species' range, including within protected areas.

Although some climate models predict that fluctuations in precipitation and temperature, particularly ENSO events, could affect this species' habitat, other research suggests that its very local climate will not be significantly affected (Fjeldsá 2010 pers. comm.; Gosling *et al.* 2009). Climate change models, like all scientific models, produce projections that have some uncertainty because of the assumptions used, the data available, and the specific model features (Fernanda and Solman 2010, p. 533). The science supporting climate model projections as well as models assessing their impacts on species and habitats will continue to be refined as more information becomes available, but there are still uncertainties. Nevertheless, the species' population declines are commensurate with the declining habitat. Therefore, we find that destruction and modification of habitat threaten the continued existence of these three species throughout their range (primarily *Polylepis*-dominant habitat).

Junín grebe and Junín rail (Lake Junín)

1. *Junín grebe*. The Junín grebe is endemic to Lake Junín, where it resides year-round. The species is completely dependent on the open waters and marshland margins of the lake for feeding and on the protective cover of the marshlands during the breeding season (BLI 2009a, p. 1; BLI 2008, p. 1; Tello 2007, p. 3; Fjeldsá 1981, p. 247). The current estimated range of the species is 143 km² (55 mi²) (BLI 2009b, p. 1). However, its actual range is smaller (see <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3644> for a range map of the species), because the species is restricted to the southern portion of the lake (BLI 2009b, p. 1; Gill and Storer in Fjeldsá 2004, p. 200; Fjeldsá 1981, p. 254). Breeding season

begins in November (O'Donnel and Fjeldsá 1997, p. 29; Fjeldsá 1981, pp. 44, 246). Junín grebes build their nests and obtain their primary prey, pupfish, in the expansive offshore flooded marshlands that may extend into the lake up to 2–5 km (1–3 mi) from shore (BLI 2008, p. 1; Tello 2007, p. 3; Fjeldsá 2004, p. 200; O'Donnel and Fjeldsá 1997, pp. 29–30; Fjeldsá 1981, p. 247).

2. *Junín rail*. The Junín rail is also endemic to Lake Junín, where it also resides year-round and is restricted to two localities within the shallow marshlands encircling Lake Junín (BLI 2009b, p. 2; Fjeldsá 1983, p. 278). The current estimated range of the species (160 km², 62 mi²) (BLI 2009b, p. 1) is likely an overestimate of this species' range (see www.birdlife.org/datazone/speciesfactsheet.php?id=2842 for a range map of the species). The species is known only from two discrete locations, which are near Ondores and Pari, on the southwest shore of the lake.

The quality of both Junín grebe and Junín rail habitat and their reproductive success is highly influenced by water levels and the water quality of the lake. Water levels in the lake are affected by hydropower generation which is exacerbated by unpredictable climate fluctuations (such as drought or excessive rain). Water quality in Lake Junín has been compromised by contamination, in part due to waste from mining activities that drain into the lake (ParksWatch 2012, pp. 2–3). Environmental Mitigation Programs (PAMA) have been implemented to combat pollution from mining wastes, and impacts have been reduced significantly because miners have begun to use drainage fields and residual water is being recycled (ParksWatch 2012). However, the PAMAs do not adequately address responsibilities for the mining wastes discharged into the San Juan River course and delta; sediments containing heavy metals in the San Juan River delta leach into Lake Junín (also see Factor D). Additionally, the Upamayo Dam, located at the northwestern end of the lake, has been in operation since 1936, and the lake water is used to power the 54-megawatt Malpaso hydroelectric plant (ParksWatch 2006, p. 5; Martin *et al.* 2001, p. 178). Dam operations have caused seasonal water level fluctuations up to 2 m (6 ft) in Lake Junín (Martin and McNee 1999, p. 659). Under normal conditions, water levels are lower in the dry season (June to November), and the marshlands can become partially or completely dry (ParksWatch 2009, p. 2). The floodgates of the dam are often opened during the dry season (ParksWatch 2009, p. 2), and water

offtake for hydropower generation further drains the lake, such that, by the end of the dry season, in November, the marshlands encircling the lake are more apt to become completely desiccated (Fjeldsá 2004, p. 123).

Reduced water levels directly impact the Junín grebe's breeding success by reducing the amount of available nesting habitat (BLI 2008, p. 1; Fjeldsá 2004, p. 200). The giant bulrush marshlands, upon which the Junín grebe relies for nesting and foraging habitat, have virtually disappeared from some sections of the lake (O'Donnel and Fjeldsá 1997, p. 29). When the marshlands are completely desiccated, the Junín grebe is reported to not breed at all (Fjeldsá 2004, p. 123).

Reduced water levels impact the species by reducing the Junín grebe's primary prey, pupfish (*Orestias* species) (Fjeldsá 2004, p. 200). The perimeter of the flooded marshlands provides the primary recruitment habitat for fish in the lake particularly during extremely dry years (Fjeldsá 2004, p. 200; O'Donnel and Fjeldsá 1997, p. 29). Submerged aquatic vegetation, habitat for pupfish, has become very patchy, further triggering declines in the prey population. Few marshlands are permanently inundated now due to the power generation of the Upamayo Dam, and the giant bulrushes that previously provided extensive cover for this species for breeding and feeding have virtually disappeared, reducing both nesting and foraging habitat for the Junín grebe. The reduction in nesting and foraging habitat is believed to contribute to mass mortality of Junín grebes during extreme drought years such as those that occurred during 1983–1987, 1991, and 1994–1997 (O'Donnel and Fjeldsá 1997, p. 30).

Manipulation of the Lake Junín's water levels also results in competition between the white-tufted grebe (*Rollandia rolland*) and the Junín grebe for food resources during the Junín grebe's breeding season (Fjeldsá 2004, p. 200). During the breeding season, in years when water levels remain high, the Junín grebe and white-tufted grebe are spatially separated. White-tufted grebes use the interior of the reed marsh, and Junín grebes use the remaining at the edges of the marshlands, closer to the center of the lake (Fjeldsá 1981, pp. 245, 255). Near the end of the dry season, as early as October, when water levels are lower in the lake and the marshlands can partially or completely dry out (BLI 2009b, p. 1; ParksWatch 2009, p. 2), thousands of white-tufted grebes move from the interior of the marshlands to the edges, where they compete with the

Junín grebe for food (Fjeldsá 1984, pp. 413–414). Competition becomes more critical the longer the water level remains low at the end of the dry season, and activities that further reduce low water levels only exacerbate this competition (Fjeldsá 1981, pp. 252–253).

Water quality affects the availability of habitat for both the endemic Junín grebe and Junín rail. The water in Lake Junín has been contaminated from mining, agricultural activities and organic matter and wastewater runoff from local communities around the lake (Shoobridge 2006, p. 3; ParksWatch 2006, pp. 5, 19; Martin and McNee 1999, pp. 660–661). Heavy metal contamination throughout the lake has exceeded established thresholds for aquatic life throughout at least one-third of the lake, and has rendered the northern portion of the lake lifeless (BLI 2008, p. 4; Shoobridge 2006, p. 3; Fjeldsá 2004, p. 124; Martin and McNee 1999, pp. 660–662; ParksWatch 2006, pp. 20–21). At the lake's center, lake bottom sediments are lifeless and anoxic (having low levels of dissolved oxygen) due to contaminants (Fjeldsá 2004, p. 124; Martin *et al.* 2001, p. 180), and the lakeshore has become polluted with toxic acidic gray sediment (O'Donnel and Fjeldsá 1997, p. 30). Martin *et al.* (2001, p. 180) determined that sediments at the lake's center are contaminated with copper, zinc, and lead and are anoxic. High concentrations of dissolved copper, lead, and zinc have damaged an estimated one-third of the lake (ParksWatch 2006, pp. 2, 20; Shoobridge 2006, p. 3; Martin and McNee 1999, pp. 660–661).

There is no vegetation at the northern end of the lake (ParksWatch 2006, pp. 20–21; Fjeldsá 2004, p. 124), and ongoing contamination has the potential to reduce vegetative cover in other areas of the lake, including the marshlands where these two species occur. These pollutants have severely affected animal and plant populations in the area, contributing to mortality of species around the lake including the Junín rail and the Junín grebe (ParksWatch 2006, pp. 3, 20), and are likely to reduce the health and fitness of these two species (see Factor C).

Lake Junín is a sink for several streams that transport mining wastes and other pollution downstream and into the lake (ParksWatch 2006, p. 19). The San Juan River is the primary source of water for Lake Junín, and feeds into the lake from the northern end (Shoobridge 2006, p. 3; Martin and McNee 1999, pp. 660–661; Fjeldsá 1981, p. 255). Tests indicate that the San Juan

River contains trace metals including copper, lead, mercury, and zinc in excess of currently accepted aquatic life thresholds (Martin and McNee 1999, pp. 660–661). Non-point-source pollutants from agricultural fertilizers such as ammonium and nitrate concentrations are also suspended in the water column (Martin and McNee 1999, pp. 660–661). Iron oxide contamination is prominently visible near the outflow of the San Juan River (iron oxide produces a reddish tinge, which colors the water and reed borders). Vegetation near the river's outflow is completely absent (ParksWatch 2006, pp. 20–21; Fjelds  2004, p. 124), and this portion of the lake has been rendered lifeless by the precipitation of iron oxide from mining wastewaters (BLI 2008, p. 4). The giant bulrush marshlands, which once existed in great expanses around the entire perimeter of the lake, have virtually disappeared, and at least one species of catfish (*Pygidium oroyae*) may have been extirpated from the lake (O'Donnel and Fjelds  1997, p. 29).

Heavy metal contamination is not limited to the northern end of the lake (ParksWatch 2006, p. 20), but extends throughout the southern end (Martin and McNee 1999, p. 662), where the Jun n grebe and Jun n rail are now restricted (BLI 2009b, p. 1; Fjelds  1981, p. 254; Gill and Storer in Fjelds  2004, p. 200). In 2009, conservation organizations and civil society groups demanded action to reverse the deterioration of Lake Jun n and requested an independent environmental audit and continuous monitoring of the lake (BLI 2009b p. 4). The conservation groups BLI, American Bird Conservancy (ABC), Asociaci n Ecosistemas Andinos (ECOAN), and INRENA adopted the Jun n grebe as the symbol of wetland conservation for the high Andes (BLI 2009c, p. 1). A translocation has been a consideration for the conservation of the Jun n grebe since the mid-1990s; however, no suitable habitat for the species has been located (BLI 2009b, p. 2; O'Donnel and Fjelds  1997, pp. 30, 35). To date, none of these conservation organization's activities have been able to adequately curb the ongoing habitat degradation.

The effects of habitat alteration and destruction (such as those caused by artificially reduced water levels and water contamination) are exacerbated by unpredictable climate fluctuations (such as drought or excessive rains) (Jetz *et al.* 2007, pp. 1,211, 1,213; Mora *et al.* 2007, p. 1027). Peru is subject to unpredictable climate fluctuations, such as those that are related to the ENSO. Changes in weather patterns, such as ENSO cycles (El Ni o and La Ni a

events), tend to increase precipitation in normally dry areas, and decrease precipitation in normally wet areas (Holmgren *et al.* 2001, p. 89; TAO Project n.d., p. 1); exacerbating the effects of habitat reduction and alteration on the decline of a species (Jetz *et al.* 2007, pp. 1211, 1213; Mora *et al.* 2007, p. 1027; Plumart 2007, pp. 1–2; Holmgren *et al.* 2001, p. 89; England 2000, p. 86; Timmermann 1999, p. 694), especially for narrow endemics such as the Jun n grebe and Jun n rail. Moreover, the Jun n grebe's low breeding potential is considered to be a reflection of its adaptation to being in a highly predictable, stable environment (del Hoyo *et al.* 1992, p. 195).

The Jun n grebe's breeding success and population size are highly influenced by the climate, with population declines occurring during dry years, population increases during rainy years, and mortality during extreme cold weather events. Several times during the last two decades (e.g., 1983–1987, 1991–1992, 1994–1997), the Jun n grebe's population declined to 100 birds or less following particularly dry years (BLI 2009b, p. 2; BLI 2008, pp. 1, 3–4; Fjelds  2004, p. 200; Elton 2000, p. 3). There have been short-term population increases of 200 to 300 birds in years with higher rainfall amounts following El Ni o events (such as the 1997–1998 and 2001–2002 breeding seasons) (Valqui pers. comm. in BLI 2009b, p. 2; PROFONANPE 2002, in Fjelds  2004, p. 133). However, excessive rains also can increase contamination in Lake Jun n, which decreases the amount of suitable habitat for the species and has adverse effects on the species' health (see Factor C). Many Jun n grebes died during extremely cold conditions in 1982 (BLI 2008, p. 4). In 2007, the population declined again following another cold weather event (Hirshfeld 2007, p. 107). These ENSO cycles are ongoing, having occurred several times within the last decade (NWS 2009, p. 2), and evidence suggests that ENSO cycles have already increased in periodicity and severity (Richter 2005, pp. 24–25; Timmermann 1999, p. 694), which can exacerbate the negative impacts of habitat destruction on a species.

Habitat degradation and alteration caused by fluctuating water levels and environmental contamination are considered key factors in the Jun n grebe's historical decline (Gill and Storer, pers. comm. in Fjelds  2004, p. 200; Fjelds  1981, p. 254). The Jun n grebe has experienced a population decline of 14 percent in the past 10 years, and this decline is expected to

continue as a result of deteriorating habitat and water quality (BLI 2009b, pp. 1, 6–7). Therefore, further habitat degradation is expected to continue impacting this species' already small population (see Factor E).

The habitat in and around Lake Jun n is subjected to manmade activities that have altered, destroyed, and degraded the quantity and quality of habitat available to the Jun n rail. These activities include: (1) Artificial manipulation of water levels; (2) water contamination; and (3) plant harvesting in the species' breeding grounds. The negative impacts of these activities are accentuated by unpredictable climate fluctuations such as droughts or excessive rains (Jetz *et al.* 2007, pp. 1211, 1213; Mora *et al.* 2007, p. 1027).

Lake drawdown has been known to cause water levels to fluctuate seasonally up to 2 m (6 ft) (Martin and McNee 1999, p. 659) and has at times caused complete desiccation of the marshlands by the end of the dry season (Fjelds  2004, p. 123). The ground-nesting Jun n rail breeds near the end of the dry season, in September and October, and the species relies on the dense vegetative cover of the rushes on the lake perimeter in which to build their nests (BLI 2009b, p. 2). Eddleman *et al.* (1988, p. 463) noted that water drawdown before nesting season disrupts nest-building initiation by rails. Therefore, water drawdown near the end of the dry season that results in complete desiccation of the shallow marshlands (BLI 2009b, p. 1; ParksWatch 2009, p. 2) is likely to disrupt Jun n rail nest initiation.

Experts believe that the Jun n rail is restricted to the marshes at the southwestern corner of the lake because of the high level of contamination at the northwestern margins of the lake (Martin and McNee 1999, p. 662). Experts also believe that pollution and artificial water level fluctuations will continue to have adverse consequences for the vegetation surrounding the lake and, therefore, the Jun n rail (BLI 2007, p. 1; J. BLI 2000, p. 170; Fjelds  *in litt.*, 1987, as cited in Collar *et al.* 1992, p. 190). In some places, the tall marshlands, which rely on inundated soils to thrive, have virtually disappeared because the reed-beds are no longer permanently inundated (O'Donnel and Fjelds  1997, p. 30). Moreover, as the marshes dry, livestock (primarily sheep (*Ovis aries*), but also cattle (*Bos taurus*), and some llamas (*Llama glama*) and alpacas (*Llama pacos*)) move into the desiccated wetlands surrounding the lake to graze. Overgrazing is a year-round problem around Lake Jun n because the entire

lakeshore is zoned for grazing a large number of livestock (approximately 60,000–70,000 head) (ParksWatch 2006, pp. 12, 19). During the dry season, the livestock moves into the marshlands to graze, compacting the soil and trampling the vegetation (ParksWatch 2006, p. 31). Increased access to the wetlands during the end of the dry season, which coincides with the inception of the Junín rail's nesting season, likely disrupts the rail's nesting activities or leads to nest trampling. Therefore, activities that increase lakeshore access, such as water drawdown, decrease the amount of available habitat for the Junín rail (for nesting and feeding) and are likely to negatively impact the Junín rail's reproduction (through trampling) and mating habits (through disturbance) (BLI 2009b, p. 1).

Local residents also harvest and burn cattails from the marshland habitat, which the Junín rail depends upon. Cattails are harvested to assemble rafts, baskets, and mats and as forage for livestock (ParksWatch 2006, p. 23). Cattails are also burned to encourage shoot renewal (ParksWatch 2006, p. 23) and to facilitate hunting the montane guinea pig (*Cavia tschudii*), which seeks cover in the cattail marshes and is part of the local human diet. Burning cattail communities has a negative and long-lasting impact on species that use the cattails as permanent habitat (INRENA 2000, as cited in ParksWatch 2006, p. 22; Eddleman *et al.* 1988, p. 464), including the Junín rail, which relies on the dense vegetative cover of the marshlands for year-round residence and nesting (BLI 2009b, p. 2; BLI 2007, p. 1; BLI 2000, p. 170).

Summary of Factor A—Junín grebe and Junín rail

The habitat in and around Lake Junín, where these two species are endemic, has been and continues to be altered and degraded as a result of human activities, including human-induced water level fluctuations to generate hydropower and water contamination caused by mining waste, agricultural and organic runoff from surrounding lands, and wastewater from local communities. Water levels in Lake Junín are manipulated to generate electricity, which leads to dramatic fluctuations in water levels of up to 1.8 m (6 ft). The Junín grebe is dependent on the quantity and quality of lake water for breeding and feeding. It is dependent on the marshland habitat surrounding the lake for breeding and feeding and relies on the protective cover of flooded marshlands for nesting. The Junín rail nests on the ground, within the

protective cover of the marshlands. As water drawdown occurs near the end of the dry season and the inception of these two species' mating seasons, portions of the marshlands may dry out completely. Reductions in water levels decrease the availability of suitable breeding and foraging habitat, and decrease the availability of the Junín grebe's primary prey, the pupfish, forcing competition with the white-tufted grebe for food. Drought years have a negative impact on these two species, resulting in severe population fluctuations due to poor breeding success and limited recruitment of juveniles into the adult population. The severe dry conditions can cause total breeding failure.

Although these two species may rebound during wetter years (i.e., following El Niño events), excessive rain also decreases the suitable habitat for these two species, as pollution washes into the water from around the lake and the upstream rivers that feed the lake, increasing contamination levels in Lake Junín. This increased contamination affects these two species' health and has resulted in mortality of both species. Severe water contamination has rendered the northwestern portion of the lake lifeless, devoid of aquatic and terrestrial species. Experts believe that these two species once inhabited the entire lake, but they are now confined to the southern portion of the lake due to water contamination. Elevated levels of heavy metals may reduce their fitness and overall viability. Nest disturbance also occurs due to livestock grazing in the area. Therefore, we find that destruction and modification of habitat are threats to the continued existence of the Junín grebe and Junín rail throughout their ranges.

Peruvian plantcutter

The Peruvian plantcutter is dependent upon undisturbed *Prosopis pallida* dry forest with floristic diversity (Flanagan and More 2003, p. 4; Engblom 1998, p. 1; Collar *et al.* 1992, p. 805). In northwestern Peru, *P. pallida* dry forest was historically contiguous, covering approximately 7,000 km² (2,703 mi²) of the coastal lowland of northwestern Peru (Ferrejera 1983, p. 248). There were also extensive wooded stands of small to medium trees of *P. pallida*, *Acacia* spp., *Capparis* spp., and *Salix* spp., along permanent lowland rivers, which have since been cleared for agricultural purposes (Lanyon 1975, p. 443).

Today, with the exception of three relatively large intact dry forests (i.e., Talara Province, Murales Forest, and

Pómac Forest Historical Sanctuary), the vast majority of *P. pallida* dry forest, arid lowland scrub, and riparian vegetation has been reduced due to human activities. Seasonally dry tropical forests are considered the most threatened of all major tropical forest types (Stotz *et al.* 1996, p. 51; Janzen 1988, p. 13). The Peruvian plantcutter has been extirpated from most of its historical sites due to loss or degradation of habitat (Flanagan *et al. in litt.* 2009, pp. 1–15; Elton 2004, p. 1; Snow 2004, p. 69; Flanagan and More 2003, pp. 5–9). Current information indicates that the vast majority of occupied sites of the Peruvian plantcutter are small, remnant, disjunct patches of *P. pallida* dry forest, each a few acres in size (Flanagan *et al. in litt.* 2009, pp. 2–7; Snow 2004, p. 69; Walther 2004, p. 73).

Habitat loss, conversion, and degradation throughout the Peruvian plantcutter's range have been and continue to occur as a result of human activities, including:

- (1) Clearcutting and burning of dry forest for agriculture and other purposes (BLI 2009a, p. 2; Flanagan *et al.* 2005, p. 244; Williams 2005, p. 2; Snow 2004, p. 69; Walther 2004, p. 73; Bridgewater *et al.* 2003, p. 132; Engblom 1998, p. 1; Ridgely and Tudor 1994, p. 734; Collar *et al.* 1992, p. 806);
- (2) Extraction activities, including cutting for timber, firewood, and charcoal production (BLI 2009d, pp. 1–2; Rodriguez *et al.* 2007, p. 269; Williams 2005, p. 1; Snow 2004, p. 69; Best and Kessler 1995, p. 196; Ridgely and Tudor 1994, p. 734);
- (3) Grazing by goats of *P. pallida* dry forests, and arid scrub and riparian vegetation (*Capra* species) (BLI 2009a, p. 2; More 2002, p. 37; Snow 2004, p. 69; Best and Kessler 1995, p. 196);
- (4) Human encroachment (Fernandez-Baca *et al.* 2007, p. 45); and
- (5) Unpredictable climate fluctuations that exacerbate human activities and encourage further habitat destruction (Block and Richter 2007, p. 1; Jetz *et al.* 2007, p. 1211; Richter 2005, p. 26).

The vast majority of *P. pallida* dry forest habitat has been converted to commercial agricultural production, which is the primary factor in the historical decline of the Peruvian plantcutter (BLI 2009a, p. 2; Williams 2005, p. 2; Snow 2004, p. 69; Walther 2004, p. 73; Engblom 1998, p. 1; Ridgely and Tudor 1994, p. 734; Collar *et al.* 1992, p. 806). Agriculture in the coastal lowlands of northwestern Peru consists of modern large, privately owned farms and large cooperatives that primarily produce crops (e.g., sugarcane, cotton, rice) for export (Roethke 2003, pp. 58–59; Lanyon 1975, p. 443).

Continual habitat destruction and degradation of the dry forest is also due

to firewood cutting and charcoal production. *P. pallida* is the dominant tree of the dry forest habitat, and is highly sought after because the wood provides an important source of high-quality cooking fuel (Pasiiecznik *et al.* 2001, p. 75; Brewbaker 1987, p. 1). Throughout the Peruvian plantcutter's range, whole trees, branches, and roots of *P. pallida* are cut for firewood and production of charcoal, which is used for cooking fuel in homes, restaurants, and businesses that use brick kilns, both locally and in urban centers (Flanagan *et al. in litt.* 2009, p. 7). Wood of *P. pallida* is also used for construction and fence posts (Pasiiecznik *et al.* 2001, p. 78). Additionally, roots of older *P. pallida* trees are used in wooden art crafts (BLI 2009a, p. 2).

Talara Province (in the Piura Region) contains the largest remaining intact *P. pallida* dry forest in northwestern Peru, encompassing approximately 50,000 ha (123,553 ac) (Flanagan *et al. in litt.* 2009, pp. 2–3; Walther 2004, p. 73; Flanagan and More 2003, p. 5). The Province also has the largest subpopulation of the Peruvian plantcutter, reportedly between 400 and 600 individuals or approximately 60 to 80 percent of the total population (BLI 2009a, p. 2; Williams 2005, p. 1; Elton 2004, pp. 3–4; Snow 2004, p. 69; Walther 2004, p. 73). Until recently, a large portion of the Province, including *P. pallida* dry forest habitat, was owned by the State-owned petroleum company PetroPeru, which prohibited access to approximately 36,422 ha (90,000 ac). Under the management of PetroPeru, the *P. pallida* dry forest was not subject to the same habitat destruction and degradation activities (e.g., clearing of trees, firewood cutting, and charcoal production) as other dry forest habitat areas (Elton 2004, pp. 3–4; Hinze 2004, p. 1). Recently, the land was reverted to the Peruvian Government, and it is unclear whether the government plans to issue private concessions as in other areas of the Province (Elton 2004, p. 4). Consequently, there have been efforts, including a formal petition to the Peruvian Government, to create a 4,856 to 10,000-ha (12,000 to 24,710-ac) protected reserve for the northern subpopulation of the Peruvian plantcutter (Elton 2004, p. 4; Walther 2004, p. 73). However, the government has not designated such a reserve for the species (NCI 2011, Williams 2005, p. 3; Elton 2004, p. 4).

Habitat destruction and degradation of *P. pallida* dry forest, including firewood cutting and charcoal production, is ongoing in the Talara Province, including on the land previously owned by PetroPeru and an

area identified as the Talara Important Birding Area (IBA) by BLI (Flanagan *in litt.* 2009, p. 1). Since 2005, there has been extensive cutting and clearing of *P. pallida* trees for fuel to cook and dry Humboldt giant squid (*Dosidicus gigas*) carcasses (Flanagan *et al. in litt.* 2009, p. 8). The most important commercial fishery of the Humboldt giant squid occurs along the coast of Peru (Zeidberg and Robison 2007, p. 12,948; UNEP 2006, p. 33). Harvested carcasses are transported by truck from the Talara port to recently cleared areas in the dry forest, where they are boiled and dried (Flanagan *et al. in litt.* 2009, p. 8). This fishery not only adds to the collection pressure on *Prosopis* species for use as fuel, but also adds to forest clearing in the area. Another relatively new demand for *P. pallida* firewood is associated with the illegal extraction of crude oil from above-ground pipes in the Talara Province. The stolen oil is distilled by heating it with firewood (Flanagan *et al. in litt.* 2009, p. 8). *Capparis scabrada* (locally known as sapote) is a tree that occurs with *P. pallida* and is also a food source for the Peruvian plantcutter. Although the tree is listed as critically endangered by the Peruvian Government, the highly sought-after wood is cut to produce handicrafts for the local, national, and international markets and is used for firewood and charcoal production (Rodriguez *et al.* 2007, p. 269).

Habitat alteration is also caused by grazing goats, which remove or heavily degrade the shrubs and trees (BLI 2009a, p. 2; Williams 2005, p. 2; Elton 2004, pp. 3–4; Snow 2004, p. 69; BLI 2000, p. 402). The seed pods and leaves of *P. pallida* provide highly nutritious fodder for goats (Pasiiecznik *et al.* 2001, p. 95; Brewbaker 1987, pp. 1–2). Goats roam freely and graze on trees and shrubs, particularly lower branches close to ground which are preferred by the Peruvian plantcutter for foraging and nesting (Williams 2005, p. 2; Elton 2004, pp. 3–4; Snow 2004, p. 50).

Human encroachment and concomitant increasing human population pressures exacerbate the destructive effects of ongoing human activities (e.g., clearing of *P. pallida* dry forest, firewood cutting, and charcoal production) throughout the Peruvian plantcutter's range. Although the coastal lowlands represent only about 10 percent of the country's total territory, many urban centers are located on the coast, which represent approximately 52 percent of the total population of Peru (Fernandez-Baca *et al.* 2007, p. 45). Large concentrations of people put greater demand on the natural resources in the area, which spurs additional

habitat destruction and increases infrastructure development that further facilitates encroachment.

Peruvian plantcutters are also impacted by unpredictable climate fluctuations that exacerbate the effects of habitat fragmentation. Changes in weather patterns, such as ENSO cycles (El Niño and La Niña events), tend to increase precipitation in normally dry areas, and decrease precipitation in normally wet areas (Holmgren *et al.* 2001, p. 89; TAO Project n.d., p. 1), while intensifying the effects of habitat fragmentation on the decline of a species (Jetz *et al.* 2007, pp. 1211, 1213; Mora *et al.* 2007, p. 1027; Plumart 2007, pp. 1–2; Holmgren *et al.* 2001, p. 89; England 2000, p. 86; Timmermann 1999, p. 694), especially for narrow endemics (Jetz *et al.* 2007, p. 1213) such as the Peruvian plantcutter.

The arid terrestrial ecosystem of northwestern Peru, where the Peruvian plantcutter occurs, is strongly influenced by the ENSO cycle (Rodriguez *et al.* 2005, p. 1), which can have severe and long-lasting effects (Mooers *et al.* 2007, p. 2; Holmgren *et al.* 2006a, p. 87). The amount of rainfall during an El Niño year can be more than 25 times greater than during normal years in northern Peru (Holmgren *et al.* 2006a, p. 90; Rodriguez *et al.* 2005, p. 2). El Niño events are important triggers for regeneration of plants in semiarid ecosystems, particularly the dry forest of northwestern Peru (Holmgren *et al.* 2006a, p. 88; Lopez *et al.* 2006, p. 903; Rodríguez *et al.* 2005, pp. 2–3). During El Niño events, plant communities and barren lands are transformed into lush vegetation, as seeds germinate and grow more quickly in response to increased rainfall (Holmgren *et al.* 2006a, p. 88; Holmgren *et al.* 2006b, pp. 2–8; Rodriguez *et al.* 2005, pp. 1–6). Over the last 20 years, recruitment of *P. pallida* in northwestern Peru doubled during El Niño years, when compared to non-El Niño years (Holmgren *et al.* 2006b, p. 7). However, the abundant supply of vegetation encourages locals to expand goat breeding operations, which results in overgrazing by goats and further land degradation (Richter 2005, p. 26).

ENSO cycles increase the risk of fire because El Niño events are often followed by years of extremely dry weather (Block and Richter 2007, p. 1). Accumulated biomass dries and adds to the fuel load in the dry season (Block and Richter 2007, p. 1; Power *et al.* 2007, p. 898). Evidence suggests that the fire cycle in Peru has shortened, particularly coastal Peru and west of the Andes (Power *et al.* 2007, pp. 897–898), which can have broad ecological consequences (Block and Richter 2007,

p. 1; Power *et al.* 2007, p. 898). According to Block and Richter (2007, p. 1), *P. pallida* dry forest and *Capparis* spp. scrublands in northwestern Peru would likely experience a long-term change in plant species composition that favors aggressive, annual, nonnative weedy plant species (Richter 2005, p. 26). An accelerated fire cycle would further exacerbate changes in species composition that hinder long-lived perennial, native plant species, such as *Prosopis* species, upon which the Peruvian plantcutter relies.

ENSO cycles are ongoing, having occurred several times within the last decade (NWS 2009, p. 2). Evidence suggests that ENSO cycles have increased in periodicity and severity (Richter 2005, pp. 24–25; Timmermann 1999, p. 694), which will exacerbate the negative impacts of habitat destruction on a species. It is predicted that, by 2050, approximately 11 to 16 percent of existing land is likely to be unsuitable for this species due to climate change; and, by 2100, it is predicted that about 24 to 35 percent of the species' range is likely to be lost as a direct result of climate change (Jetz *et al.* 2007, p. 81).

Habitat destruction is often caused by a combination of human activities. In Lambayeque Region, a 1,500-ha (3,706-ac) section of remnant *P. pallida* dry forest is under continual threat from human activities, including conversion to agriculture, cutting for firewood and charcoal production, and grazing by goats. This area may support between 20 and 40 Peruvian plantcutters (BLI 2009f, p. 1; Walther 2004, p. 73). In the 1990s, a significant portion of this dry forest was converted to sugarcane fields (Engblom *in litt.* 1998, p. 1; Snow 2004, p. 69; Walther 2004, p. 73; Williams 2005, p. 2). Within Piura and Lambayeque Regions, threats to the dry forest habitat include conversion to agriculture, firewood and timber cutting, and grazing by goats (BLI 2009d, pp. 1–2). Habitat destruction and alteration also occurs within two protected areas where the Peruvian plantcutter occurs (in Lambayeque Region), Pómac Forest Historical Sanctuary (Flanagan *et al. in litt.* 2009, pp. 7–8; Andean Air Mail and Peruvian Times 2009, p. 1; Williams 2005, p. 1), and the Murales Forest (BLI 2000, p. 402; BLI 2009a, p. 3; Walther 2004, p. 73; Stattersfield *et al.* 2000, p. 402).

Experts consider the population of this range-restricted endemic species to be declining in close association with the continued habitat loss and degradation (BLI 2009a, pp. 1–2; BLI 2009g, pp. 1–3; BLI 2000, p. 401), and suggest that the effects are greater in dry forest habitat than in any other

Neotropical habitat (Stotz *et al.* 1998, p. 51).

Summary of Factor A—Peruvian plantcutter

The Peruvian plantcutter is dependent upon intact *P. pallida* dry forest with low-hanging branches and high floristic diversity, and associated arid lowland scrub and riparian vegetation. *P. pallida* dry forest habitat, as well as arid lowland scrub and riparian shrub habitats, throughout the Peruvian plantcutter's range have been and continue to be altered and destroyed as a result of human activities, including conversion to agriculture; timber and firewood cutting and charcoal production; grazing of goats; and human encroachment. Extant *P. pallida* dry forest today consists of remnant, disjunct patches of woodlands, which are heavily disturbed and under continued threat of degradation by human activities. Observations suggest that this dry-forest-dependent species is able to occupy very small remnant patches of dry forest with low-hanging branches and floristic diversity, and is able to persist to some degree near developed lands. However, many of these sites are so small that they are below or approaching the lower threshold of the species' ecological requirements. This species has been extirpated from most of its historical sites due to loss or degradation of habitat. Additionally, many of the extant occupied sites are separated by great distances, which may lead to genetic isolation of the species.

The same activities that caused the historical decline in this species are ongoing today. These habitat-altering activities are compounded by unexpected climate fluctuations, especially for narrow endemics such as the Peruvian plantcutter. Excessive rains accompanied by El Niño events induce further habitat destruction, as people take advantage of better grazing and growing conditions. Destruction of the remaining *P. pallida* dry forest fragments in Peru continues to reduce the quantity, quality, distribution, and regeneration of remaining patches of dry forest. Human activities that degrade, alter, and destroy habitat are ongoing throughout the species' range, including within protected areas. Therefore, we find that destruction and modification of habitat threaten the continued existence of Peruvian plantcutter throughout its range.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The best available information does not indicate that overutilization for commercial, recreational, scientific, or educational purposes is a threat to any of the six bird species (the ash-breasted tit-tyrant, Junín grebe, Junín rail, Peruvian plantcutter, royal cinclodes, and the white-browed tit-spinetail) addressed in this final rule. With respect to the ash-breasted tit-tyrant and royal cinclodes, most areas where they occur are in very steep areas that are difficult to access. With respect to the Junín grebe, Fjeldså (1981, pp. 254–255) noted that local hunters were not interested in grebes as food because they have too little meat. No other information was located or provided during the proposed rule comment period regarding the overutilization of these six species. Therefore, we find that overutilization for commercial, recreational, scientific, or educational purposes is not a threat to any of these six species.

C. Disease or Predation

Ash-breasted tit-tyrant, Peruvian plantcutter, royal cinclodes, and the white-browed tit-spinetail

We are not aware of any scientific or commercial information that indicates disease or predation pose a threat to the following four species: Ash-breasted tit-tyrant, royal cinclodes, white-browed tit-spinetail, or Peruvian plantcutter. Disease and predation remain a concern for the management of each of these four species; however, the best available information does not indicate that the occurrence of disease or predation affecting these species rises to the level of threats that place any of these species at risk of extinction. Therefore, we do not find that disease or predation threaten the continued existence of any of these four species.

Junín grebe and Junín rail (Lake Junín)

Disease: Although no specific diseases have been identified for the Junín grebe and Junín rail, contamination of Lake Junín exposes these two species to mortality and a reduction in the overall fitness and health of these species. Water contamination affects the health of species inhabiting Lake Junín where mining activities occur (Shoobridge 2006, p. 3; Martin and McNeef 1999, pp. 660–661). Agricultural runoff, organic matter, and wastewater have contaminated the entire lake with high concentrations of dissolved chemicals (ParksWatch 2011, pp. 2–3; ParksWatch

2006, pp. 5, 19, 20–21; Shoobridge 2006, p. 3; Fjelds  2004, p. 124; Martin and McNee 1999, pp. 660–662).

Environmental contaminants exceed current established thresholds for aquatic life (ParksWatch 2006, p. 20; Martin and McNee 1999, pp. 660–661) and have rendered the northern portion of the lake lifeless due to eutrophication (BLI 2008, p. 4; Shoobridge 2006, p. 3). Due to severe contamination, the sediments in the center of the lake are anoxic (containing no dissolved oxygen), and the lake's turbidity has increased (ParksWatch 2006, p. 20; Martin *et al.* 2001, p. 180). Chemical waste has damaged at least one third of the lake, severely affecting animal and plant populations in the area and completely eliminating vegetation from the northern portion of the lake (Shoobridge 2006, p. 3; ParksWatch 2006, pp. 20–21; Fjelds  2004, p. 124; O'Donnell and Fjelds  1997, p. 29).

As discussed under Factor A, lead, copper, and zinc mining residues, agricultural runoff, organic matter, and wastewater are discharged directly into Lake Jun n (Shoobridge 2006, p. 3; ParksWatch 2006, pp. 5, 19; Martin and McNee 1999, pp. 660–661; Fjelds  1981, p. 255). High concentrations of environmental contaminants (including ammonium, copper, iron oxide, lead, mercury, nitrate, and zinc) have been detected throughout the lake (ParksWatch 2006, pp. 20–21; Fjelds  2004, p. 124; Martin and McNee 1999, pp. 660–662; Fjelds  1981, pp. 255–256) and exceed established thresholds for aquatic life (ParksWatch 2006, p. 20; Martin and McNee 1999, pp. 660–661).

High concentrations of suspended particulate matter increase the turbidity of the water, making it less penetrable to sunlight and results in die-off of aquatic plants and algae (ParksWatch 2006, p. 20). The northern portion of the lake is completely devoid of vegetation (ParksWatch 2006, pp. 20–21; Fjelds  2004, p. 124), and the giant bulrush marshlands, which once existed in great expanses around the entire perimeter of the lake and upon which the Jun n grebe relies for nesting and foraging habitat, have virtually disappeared.

During years of heavy rainfall, the lake is filled; however, the lakeshore becomes polluted with toxic acidic gray sediment that has caused large-scale mortality of cattle (approximately 2,000 died in 1994) and birds, apparently due to lead poisoning (O'Donnell and Fjelds  1997, p. 30). Lead poisoning from the presence of mining waste is a common cause of mortality in water birds, and is medically described as an intoxication resulting from absorption of hazardous

levels of lead into body tissues (Friend and Franson 1999, p. 317).

Water contamination has directly affected the health of the Jun n grebe population. As predators of aquatic organisms, the Jun n grebe occupies a mid-tertiary level position in the food chain and is prone to bioaccumulation of pesticides, heavy metals, and other contaminants that are absorbed or ingested by its prey (Fjelds  2004, p. 123; Fjelds  1981, pp. 255–256). Species such as the Jun n grebe, which inhabit high trophic levels, are strictly dependent upon the functioning of a multitude of ecosystem processes. The loss or absence of species at lower trophic levels can result in cascading ecosystem effects, causing imbalances in the food web at all higher trophic levels (The University of the Western Cape 2009, p. 1). Analysis of feathers and bone tissue of Jun n grebes and of pupfish, the species' primary prey, indicate that both the grebe and its prey contain elevated lead levels (Fjelds  1981, pp. 255–256).

Drought conditions exacerbate the effects of water contamination and bioaccumulation of contaminants in aquatic species and species at higher trophic levels (Fjelds  2004, p. 123; Demayo *et al.* 1982, as cited in Eisler 1988, p. 5). From 1989 to 1992, an extensive drought occurred in the Lake Jun n area. During that time, many dead Jun n grebes and other water birds were found along the edges of the lakeshore (Valqui and Barrio *in litt.* 1992, as cited in Collar *et al.* 1992, p. 45, 190). In 1992, one of the driest years in decades, up to 10 dead grebes per month were reported around the lake (Valqui and Barrio *in litt.* 1992, as cited in Collar *et al.* 1992, p. 45). Experts consider the cause of death to have been either heavy metal contamination, which increased in concentration as water levels decreased (Valqui and Barrio *in litt.* 1992, as cited in Collar *et al.* 1992, p. 45), or reduced prey availability (Fjelds  2004, p. 124). Reduced prey availability is exacerbated by manmade activities that are reducing the water levels of the lake, increasing competition among sympatric grebe species (different grebe species that occupy the same range) and decreasing the marshlands that provide primary spawning habitat for the pupfish.

Persistent exposure to contaminants can contribute to a decline in fitness for long-lived, mid-trophic level species. Contaminants may be inherited by offspring and can impact embryonic development, juvenile health, or viability (Rose 2008, p. 624). The excessive contaminant load in Lake Jun n could also allow opportunistic bacterial and viral infections to

overcome individuals. According to Fjelds  (1981, p. 254), the Jun n grebe bears a heavy infestation of stomach nematodes (parasitic roundworms), especially as compared to other grebe species. Stomach contents of Jun n grebes that have been examined had an average of 16.7 nematodes, compared with no nematodes in silver grebes (*P. occipitalis*) and 1.6 nematodes in white-tufted grebes (*Rollandia rolland*). Fjelds  (1981, p. 254) postulated that the higher nematode infestation in Jun n grebes may be an indicator of poor health.

Predation—Jun n grebe. Predators around Lake Jun n include the Andean fox (*Pseudalopex culpaeus*), the long-tailed weasel (*Mustela frenata*), Pampas cat (*Onicifelis colocolo*), and hog-nosed skunk (*Conepatus chinga*) (ParksWatch 2009, p. 4). However, nest sites of the Jun n grebe are generally inaccessible to mammalian predators (Fjelds  1981, p. 254). The only raptor likely to take a grebe on Lake Jun n is the Cinereus harrier (*Circus cinereus*), which primarily feeds in white-tufted grebe habitats. Moorhens (*Gallinula chloropus*), which also inhabit the lake (ParksWatch 2009, p. 3; Tello 2007, p. 2), may steal Jun n grebe eggs for food (Fjelds  1981, p. 254). However, there is no direct evidence of predation upon the Jun n grebe or indication that predation is a concern.

Predation—Jun n rail. Jun n rails are preyed upon by pampas cats (BLI 2009b, p. 2). Under normal conditions, water levels are lower in the dry season, and the marshlands can become partially or completely dry (BLI 2009b, p. 1; ParksWatch 2009, p. 2), reducing protective cover and allowing predators to more easily locate the rail. When the floodgates of the Upumayo Dam are opened during the dry season (June to November) (BLI 2009b, p. 1; ParksWatch 2009, p. 2), drawdown has led to complete desiccation of the marshlands by the end of the dry season (Fjelds  2004, p. 123). The ground-nesting Jun n rail breeds near the end of the dry season, in September and October, and builds its nests in the dense vegetative cover of the rushes on the lake perimeter (BLI 2009b, p. 2). Water drawdown and periods of drought increases the bird's vulnerability to predation because nesting grounds become exposed and larger areas of the marsh are accessible to predators (ParksWatch 2006, p. 23). Predation increases the risk of extirpation due to the species' already small population size. In addition, species that inhabit a small geographic range, occur at low density, occupy a high trophic level, and exhibit low reproductive rates tend

to have a higher risk of extinction than species that are not limited by the same risk factors (Purvis *et al.* 2000, p. 1949) (Factor E).

Summary of Factor C—Junín grebe and Junín rail

Disease. The best available information indicates that environmental contaminants (Factor A) in Lake Junín likely have negative consequences on the health of both the Junín grebe and Junín rail. The species' trophic level also exposes them to accumulation of toxins in the tissue of prey species. Therefore, we find that disease due to contamination is a threat to the continued existence of both the Junín grebe and Junín rail.

Predation. There is no available evidence to indicate that predation is causing declines in Junín grebe populations or otherwise contributing to the species' risk of extinction. Therefore, we do not find that predation is a threat to the Junín grebe.

Predation by the pampas cat results in the direct removal of Junín rails from the population and can remove potentially reproductive adults from the breeding pool. The species' habitat becomes more accessible to predators during droughts and water drawdowns due to ongoing habitat destruction (through reduced water levels and contamination), which continues to degrade the quality of habitat available to the Junín rail. Predation renders the species particularly vulnerable to local extirpation due to its small population size. Therefore, we find that predation, exacerbated by ongoing habitat destruction, is a threat to the continued existence of the Junín rail throughout its range.

D. Inadequacy of Existing Regulatory Mechanisms

Regulatory mechanisms affecting each of these six species could potentially fall under categories such as wildlife management, parks management, or forestry management. We are primarily

evaluating these regulatory mechanisms in terms of nationally protected parks because this is where these species generally occur. The FAO conducted a review of forest policies and laws in 2010, and a summary for Peru and Bolivia is in table 1. The study found that, although Peru does not have a national forest policy, it does have both a national forest program and law in place. Bolivia has a national forest policy, national forest program, and law program in place. No forest laws at the subnational level (such as jurisdictions equivalent to states in the United States) exist in these countries. FAO reported that Peru and Bolivia reported a significant loss of primary forests; this loss peaked in the period 2000–2005 in Peru and increased in Bolivia in the last decade compared with the 1990s (p. 56). FAO also reported that, at a regional level, South America suffered the largest net loss of forests between 2000 and 2010; at a rate of approximately 4.0 million ha (9.9 million ac) per year (p. xvi).

TABLE 1—SUMMARY OF FOREST POLICIES AND LAWS IN BOLIVIA AND PERU
[Adapted From FAO Global Forest Resource Assessment 2010, p. 303.]

Country	National		National forest program			Forest law national		
	Exists	Year	Exists	Year	Status	National—type	Year	Sub-national exists
Bolivia	Yes	2008	Yes	2008	In implementation	Specific forest law	1996	No
Peru	No	Yes	2004	In implementation	Specific forest law	2000	No

Ash-breasted tit-tyrant, royal cinclodes, and the white-browed tit-spinetail (Polylepis habitat)

The following analysis of regulatory mechanisms is discussed on a country-by-country basis, beginning with Peru.

Peru: The ash-breasted tit-tyrant and the white-browed tit-spinetail are considered endangered, and the royal cinclodes is considered critically endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276854, 276855). This Decree prohibits hunting, take, transport, and trade of protected species, except as permitted by regulation.

The Peruvian national protected area system includes several categories of habitat protection. Habitat may be designated as any of the following:

- (1) Parque Nacional (National Park, an area managed mainly for ecosystem conservation and recreation);
- (2) Santuario (Sanctuary, for the preservation of sites of notable natural or historical importance);

- (3) Reserva Nacional (National Reserve, for sustainable extraction of certain biological resources);
 - (4) Bosque de Protección (Protection Forest, to safeguard soils and forests, especially for watershed conservation);
 - (5) Zona Reservada (Reserved Zone, for temporary protection while further study is under way to determine their importance);
 - (6) Bosque Nacional (National Forest, to be managed for utilization);
 - (7) Reserva Comunal (Communal Reserve, for local area use and management, with national oversight); and
 - (8) Cotos de Caza (Hunting Reserve, for local use and management, with national oversight) (BLI 2008, p. 1; Rodríguez and Young 2000, p. 330).
- National reserves, national forests, communal reserves, and hunting reserves are managed for the sustainable use of resources (IUCN 1994, p. 2). The designations of National Parks, Sanctuaries, and Protection Forests are established by supreme decree that supersedes all other legal claim to the

land and, thus, these areas tend to provide more habitat protection than other designations. All other protected areas are established by supreme resolution, which is viewed as a less powerful form of protection (Rodríguez and Young 2000, p. 330).

Protected areas have been established through regulation in at least three sites occupied by the ash-breasted tit-tyrant and the white-browed tit-spinetail in Peru: Parque Nacional Huascarán (Ancash), and Santuario Histórico Machu Picchu (Cusco); and Zona Reservada de la Cordillera Huayhuash (spanning Ancash, Huánuco, and Lima) (BLI 2009i, p. 1; BLI 2009l, p. 1; BLI 2009n, p. 1; Barrio 2005, p. 563). The royal cinclodes is known to occur in the Santuario Histórico Machu Picchu (Cusco, Peru) (BLI 2009h, p. 4). Resources within Santuario Histórico Machu Picchu are managed for conservation (Rodríguez and Young 2000, p. 330). However, activities such as habitat destruction and alteration, including burning, cutting, and grazing occur within the sanctuary and prevent

regeneration of the woodlands (BLI 2009c, p. 3; Engblom *et al.* 2002, p. 58). Abra Malaga and Mantabay are now established as community reserves (Lloyd 2010, pers. comm.). These community reserves may be a more effective way of protecting area than other categories (e.g., national park, reserved zone), because local community-based projects greatly assist in resolving land tenure problems between local communities.

Habitat destruction and alteration, including burning, cutting, and grazing, are ongoing within Parque Nacional Huascarán and Santuario Histórico Machu Picchu (BLI 2009l, p. 4; BLI 2009n, p. 2; Engblom *et al.* 2002, p. 58). Reserved zones are intended to be protected pending further study (Rodríguez and Young 2000, p. 330). Burning for habitat conversion and maintenance of pastures for grazing and increasing ecotourism are ongoing within Zona Reservada de la Cordillera Huayhuash (Barrio 2005, p. 564). Although these three species occur within protected areas in Peru, these protected areas do not adequately protect the species. Therefore, the occurrence of these three species within protected areas in Peru does not protect these species, nor does it mitigate the threats to the species from ongoing habitat loss and concomitant population decline.

Bolivia: In Bolivia, several activities are occurring that affect the royal cinclodes and ash-breasted tit-tyrant. They occur within several protected areas in the Department of La Paz, Bolivia: Parque Nacional y Área Natural de Manejo Integrado Madidi, Parque Nacional y Área Natural de Manejo Integrado Cotapata, and the collocated protected areas of Reserva Nacional de Fauna de Apolobamba, Área Natural de Manejo Integrado de Apolobamba, and Reserva de la Biosfera de Apolobamba (BLI 2009a, p. 1; BLI 2009b, p. 1; Auza and Hennessey 2005, p. 81). Although national parks are intended to be strictly protected, the two parks in which these species occur are also designated as areas of integrated management, which are managed for biological conservation balanced with the sustainable development of the local human population (Supreme Decree No. 24,781 1997, p. 3). Within the Parque Nacional y Área Natural de Manejo Integrado Madidi, habitat destruction is caused by timber harvest used for construction, wood collection for firewood, and burning (that often goes out of control) to maintain pastures (BLI 2009a, p. 2; WCMC 1998a, p. 1). In addition, one of the most transited highways in the country is located a short distance from

the Parque Nacional y Área Natural de Manejo Integrado Cotapata, which may add to the habitat degradation in this area. Grazing also occurs within the protected area (BLI 2009b, p. 2; BLI 2009c, p. 2). Within the Apolobamba protected areas, uncontrolled clearing, extensive agriculture, grazing, and tourism are ongoing (BLI 2009d, p. 5; Auza and Hennessey 2005, p. 81).

Commercial logging has occurred within Parque Nacional y Área Natural de Manejo Integrado Madidi (BLI 2009a, p. 2; WCMC 1998a, p. 1). Grazing and firewood extraction are also ongoing within Parque Nacional y Área Natural de Manejo Integrado Cotapata (BLI 2009b, p. 2; BLI 2009c, p. 2). Uncontrolled clearing, extensive agriculture, and grazing are ongoing within the Apolobamba protected areas (BLI 2009e, p. 5; Auza and Hennessey 2005, p. 81). Habitat degradation and destruction from grazing, forest fires, and timber extraction are ongoing in other protected areas such as Tunari National Park (Department of Cochabamba, Bolivia), where suitable habitat exists for these two species (De la Vie 2004, p. 7).

In Bolivia, habitat is protected either on the national or departmental level. Recently, Bolivia passed the "Law of Rights of Mother Earth" to add strength to its existing environmental protection laws. This law has the objective of recognizing the rights of the planet (Government of Bolivia, 2010). Protected habitat in Bolivia has the following designations:

- (1) Parque (Park, for strict and permanent protection of representative ecosystems and provincial habitats, as well as plant and animal resources, along with the geographical, scenic and natural landscapes that contain them);
- (2) Santuario (Sanctuary, for the strict and permanent protection of sites that house endemic plants and animals that are threatened or in danger of extinction);
- (3) Monumento Natural (Natural Monument, to preserve areas such as those with distinctive natural landscapes or geologic formations, and to conserve the biological diversity contained therein);
- (4) Reserva de Vida Silvestre (Wildlife Reserve, for protection, management, sustainable use and monitoring of wildlife);
- (5) Área Natural de Manejo Integrado (Natural Area of Integrated Management, where conservation of biological diversity is balanced with sustainable development of the local population); and
- (6) Reserva Natural de Inmovilización (Immobilized Natural Reserve, a

temporary (5-year) designation for an area that requires further research before any official designations can be made and during which time no natural resource concessions can be made within the area) (Supreme Decree No. 24,781 1997, p. 3).

Within parks, sanctuaries and natural monuments, extraction or consumption of all resources are prohibited, except for scientific research, ecotourism, environmental education, and authorized subsistence activities of original towns. National protected areas are under the management of the national government, while departmental protected areas are managed at the department level (eLAW 2003, p. 3; Supreme Decree No. 24,781 1997, p. 3). Despite these protections, habitat degradation continues to occur even in areas that are designated as protected.

Bolivia's 1975 Law on Wildlife, National Parks, Hunting and Fishing (Decree Law No. 12,301 1975, pp. 1–34) has the fundamental objective of protecting the country's natural resources (ELAW 2003, p. 2). This law governs the protection, management, use, transportation, and selling of wildlife and their products; protection of endangered species; habitat conservation of fauna and flora; and the declaration of national parks, biological reserves, refuges, and wildlife sanctuaries, tending to the preservation, promotion, and rational use of these resources (ELAW 2003, p. 2; Decree Law No. 12,301 1975, pp. 1–34). Although this law designates national protection for all wildlife, there is little information as to the actual protections this confers to these two species or their habitat. Law No. 12,301 also placed into public trust all national parks, reserves, refuges, and wildlife sanctuaries. Bolivia passed an overarching environmental law in 1992 (Law No. 1,333 1992), with the intent of protecting and conserving the environment and natural resources. However, there is no specific legislation to implement these laws (eLAW 2003, p. 1).

A national strategy for conservation of *Polylepis* forest has been developed, and will be used in combination with current research to elaborate a specific plan for the conservation of these two species and their habitat (Gomez 2010, p. 1). In an effort to reverse the loss of *Polylepis* forest, the Peruvian Government has endorsed the creation of several new conservation areas that should have significant ramifications in the ongoing efforts to protect habitat for endangered bird species in the country (American Bird Conservancy (ABC)

2010, unpaginated). Three new community-owned, conservation areas encompassing 3,415 ha (8,438 ac) to protect *Polylepis* forest in the Vilcanota Mountains of southeastern Peru, near Cusco have been established. ECOAN and ABC are collaboratively working with the local communities to protect and restore these conservation areas: Choquechaca, Mantamay, and Sele Tecse Ayllu Lares in the Vilcanota Mountains (ABC 2010). A goal of planting 8,000 *Polylepis* trees (5,000 at Abra Malaga and 3,000 at Cancha) was reached (ABC undated, p. 1). These efforts should have a positive impact on the three *Polylepis*-dependent species in this rule: The ash-breasted tit-tyrant, royal cinclodes, and white-browed tit-spinetail (MacGregor-Fors et al. 2010, p. 1,492; Lloyd and Marsden 2009, pp. 7–8). Despite these efforts, they do not adequately protect these species, nor do they sufficiently mitigate the threats to these species from ongoing habitat loss and concomitant population decline. Given the ongoing habitat destruction throughout these two species' ranges in Bolivia, the laws and protections in place do not protect these species, nor do they mitigate the threats to the species from ongoing habitat loss (Factor A) and concomitant population decline (Factor E).

Summary of Factor D—*Polylepis* habitat

Peru and Bolivia have enacted various laws and regulatory mechanisms to protect and manage wildlife and their habitats. As discussed under Factor A, these three species require dense *Polylepis* habitat, which has been reduced by an estimated 98 percent in Peru and Bolivia. The remaining habitat is fragmented and degraded. Habitat throughout the species' range has been and continues to be altered as a result of human activities, including clearcutting and burning for agriculture, grazing lands, and industrialization; extractive activities, including firewood, timber, and minerals; and human encroachment and concomitant increased pressure on natural resources. A strategy for conservation of *Polylepis* forest has been developed, and will be used in combination with current research to develop a plan for the conservation of these species and their habitat (BLI 2012; Gomez 2010, p. 1). NGOs are conducting reforestation efforts of *Polylepis* in some areas of Peru, but it will take some time for these saplings to grow and create suitable habitat. Despite the laws in place in Peru and Bolivia, destructive activities are ongoing within protected areas and in these species' habitat, indicating that the laws governing wildlife and habitat

protection in both countries are either inadequate or inadequately enforced to protect the species or to mitigate ongoing habitat loss (Factor A) and population declines (Factor E). Therefore, we find that the existing regulatory mechanisms are inadequate to mitigate the current threats to the continued existence of these three species throughout their range.

Junín grebe and Junín rail—Lake Junín

The Junín grebe is listed as critically endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276853). The Junín rail is listed as endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276855).

These two species occur wholly within one protected area: The Junín National Reserve (Junín, Peru) (BLI 2009b, pp. 1–2). The Junín National Reserve has an area of 53,000 ha (133,437 ac), bordering Lake Junín and its adjacent territories (Wege and Long 1995, p. 264). In Peru, national reserves are created in part for the sustainable extraction of certain biological resources (BLI 2008, p. 1; Rodríguez and Young 2000, p. 330). Established in 1974, through Supreme Decree No. 0750–74–AG, the stated objectives of the Junín National Reserve include: Integrated conservation of the local ecosystem, its associated flora and wildlife; preservation of the scenic beauty of the lake; and support of socioeconomic development in the area through the sustainable use of its renewable natural resources (BLI 2009a, p. 2; Hirshfeld 2007, p. 107). Most of the lake shore is designated a *direct use zone*, which allows fishing, grazing, and other educational, research, and recreational activities (ParksWatch 2006, p. 12). Although designation of this reserve has heightened awareness of the ecological problems at Lake Junín (BLI 2009c, p. 1), it has not reduced or eliminated the primary threats to these two species: Water fluctuations and contamination (Factor A), contamination resulting in poor health (Factor C), and small population size (Factor E). Therefore, the existence of this species within a protected area has not reduced or mitigated the threats to the species.

Ramsar. The Junín National Reserve was designated a Ramsar site under the Convention on Wetlands of International Importance (Ramsar Convention) in 1997 (BLI 2009a, p. 2; Hirshfeld 2007, p. 107; INRENA 1996, pp. 1–14). The Ramsar Convention, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty that provides the framework for national action and

international cooperation for the conservation and wise use of wetlands and their resources. There are presently 159 Contracting Parties to the Convention, with 1,874 wetland sites, totaling more than 185 million ha (457 million ac), designated for inclusion in the Ramsar List of Wetlands of International Importance (Ramsar 2009, p. 1). Peru acceded to Ramsar in 1992. As of 2009, Peru had 13 sites on the Ramsar list, comprising 6.8 million ha (16.8 million ac) (Ramsar 2009, p. 5). In reviewing five Ramsar sites, experts noted that Ramsar designation may provide nominal protection (protection in name only) by increasing both international awareness of a site's ecological value and stakeholder involvement in conservation (Jellison et al. 2004, pp. 1, 4, 19). However, activities that negatively impact these two species within this Ramsar wetland include livestock grazing, severe water fluctuations, and contamination resulting in poor health. These activities that negatively impact both species are ongoing throughout this wetland. Therefore, the Ramsar designation has not mitigated the impact of threats on the Junín grebe or Junín rail.

In 2002, the Peruvian Government passed an emergency law to protect Lake Junín. This law makes provisions for the cleanup of Lake Junín, and placed greater restrictions on extraction of water for hydropower and mining activities (Fjeldsá *in litt.* 2003, as cited in BLI 2007, p. 3). However, this law has not been effectively implemented, and conditions around the lake may even have worsened after passage of this law (BLI 2009c, p. 1). The Ministry of Energy and Mining has implemented a series of Environmental Mitigation Programs (PAMAs) to combat mine waste pollution in the Junín National Reserve (ParksWatch 2009 p. 3). The PAMAs were scheduled to have been completed by 2002, but extensions were granted, indicating that many of the mines currently in operation are still functioning without a valid PAMA. Reductions in pollution are reported; some mining companies have begun to use drainage fields and recycle residual water. However, analysis of existing PAMAs indicate that they do not address specific responsibilities for mining waste discharged into the San Juan River and delta, nor do they address deposition of heavy metal-laced sediments in Lake Junín (ParksWatch 2009, p. 3; ParksWatch 2006, p. 21). Recent information indicates that mining waste contamination in the lake continues to be a source of pollution (Lebbin et al 2010, p. 382; ParksWatch

2006, pp. 20–21; Fjeldså 2004, p. 124). Therefore, neither this law nor other protections in place are effective at mitigating the threat of habitat degradation and health issues associated with contamination and small population size of either species.

Summary of Factor D—Junín grebe and Junín rail

Peru has enacted various laws and regulatory mechanisms for the protection and management of wildlife and their habitats. The entire populations of both species occur within one protected area. As discussed under Factor A, the distribution, breeding success and recruitment, and food availability for both species on Lake Junín has been curtailed, and are negatively impacted due to habitat destruction that is caused by artificial water fluctuations and water contamination from human activities. These species are endemic to this lake, they have populations of between 100 and less than a few thousand individuals, and their populations have declined in the recent past. These habitat-altering activities are ongoing throughout these two species' ranges. Thus, despite the species' status and presence within a designated protected area, laws governing wildlife and habitat protection in Peru are inadequately enforced or ineffective at protecting the species or mitigating ongoing habitat degradation, impacts from contaminants, and concomitant population declines, and in the case of the Junín rail, predation. Therefore, we find that the existing regulatory mechanisms are inadequate to mitigate the threats to the continued existence of the Junín grebe and Junín rail throughout their ranges.

Peruvian plantcutter

The Peruvian plantcutter is considered endangered by the Peruvian Government under Supreme Decree No. 034–2004–AG (2004, p. 276854). This Decree prohibits hunting, take, transport, and trade of protected species, except as permitted by regulation.

The Peruvian plantcutter occurs within two nationally protected areas, the Pómac Forest Historical Sanctuary and the Murales Forest (both in the Lambayeque Region on the northwestern coast of Peru). The Pómac Forest Historical Sanctuary supports an estimated 20 to 60 Peruvian plantcutters (BLI 2009a, p. 2; BLI 2009e, p. 1; Walther 2004, p. 73). Resources within the Pómac Forest Historical Sanctuary are managed for various purposes including the preservation of the

archeological site, *P. pallida* dry forest, and wildlife species. However, habitat destruction and alteration, including illegal forest clearing for farming, timber and firewood cutting, and grazing, continually threaten the sanctuary (ParskWatch 2005; Williams 2005, p. 1). For 8 years, more than 250 families illegally occupied and farmed land in the Sanctuary. During the illegal occupancy, the inhabitants logged 2,000 ha (4,942 ac) of *P. pallida* trees for firewood and burned many other trees for charcoal production (Andean Air Mail and Peruvian Times 2009, p. 1). The logged forest was subsequently converted to agricultural crops, while remaining forest habitat was continually degraded by firewood cutting, charcoal production, and grazing of goats (Flanagan *et al. in litt.* 2009, p. 8). In January 2009, the government forcibly removed the inhabitants, but it is too soon to determine the effect that habitat destruction has had on the suitability of the habitat for the Peruvian plantcutter. There is insufficient information to conclude that recent efforts to stop the illegal human occupancy of the area will have a positive impact on the species or remaining habitat within the protected area. Therefore, any protections afforded by this sanctuary have not mitigated the threats to the species from ongoing habitat loss and associated population decline.

The Murales Forest is a designated archeological reserved zone (BLI 2009a, p. 3; Stattersfield *et al.* 2000, p. 402; BLI 2000, p. 401) and contains a declining population of Peruvian plantcutters. According to Peruvian law, designation as a reserved zone allows for temporary protection while further study is under way to determine the area's importance (BLI 2008, p. 1; Rodríguez and Young 2000, p. 330). Although strict monitoring has protected some habitat (BLI 2009a, p. 3), the actual dry forest is not protected. In 1999, land rights to sections of the forest were sold for agricultural conversion, and government intervention has been necessary to prevent further sales of land for conversion to agriculture (BLI 2009a, p. 3). In 1999, Murales Forest and adjacent areas contained approximately 494 ha (1,221 ac) of habitat, and reportedly supported 140 Peruvian plantcutters (BLI 2000, p. 402). In 2004, the population was estimated to be 20 to 40 individuals (Walther 2004, p. 73). The decline in population indicates that threats to the species from ongoing habitat loss and associated population decline have not been mitigated.

Other incidences of illegal activity that occur throughout the species' range also impact the Peruvian plantcutter.

Ongoing firewood cutting and charcoal production degrades the small amount of remaining dry forest habitat within the species' range (BLI 2009d, pp. 1–2; Rodríguez *et al.* 2007, p. 269; Williams 2005, p. 1; Snow 2004, p. 69; Ridgely and Tudor 1994, p. 734). In Talara Province (in the Piura Region, north of the Lambayeque Region), a recent increase in the illegal extraction of crude oil has generated further demand for *P. pallida* firewood, which is used as fuel to heat-distill the oil. According to Flanagan *et al. (in litt.* 2009, p. 8), enforcement to combat this illegal activity is difficult. This further illustrates how existing laws are ineffective at mitigating the ongoing threat of habitat destruction.

Summary of Factor D—Peruvian plantcutter

Peru has enacted various laws and regulatory mechanisms to protect and manage wildlife and their habitats. The Peruvian plantcutter is endangered under Peruvian law and occurs within two protected areas in Peru. As discussed under Factor A, the Peruvian plantcutter inhabits *P. pallida* dry forest. This habitat has been drastically reduced, and remaining habitat comprises small remnant patches of dry forest that are separated by great distances. Habitat throughout the species' range has been and continues to be destroyed and altered as a result of human activities, primarily conversion to agriculture, and continual degradation by timber and firewood harvest and charcoal production, and grazing by goats. These activities are ongoing, including within protected areas and despite the species' endangered status. This indicates that the laws governing wildlife and habitat protection in Peru are either inadequate or inadequately enforced to protect the species or to mitigate ongoing habitat loss and population declines. Therefore, we find that the existing regulatory mechanisms are inadequate to mitigate the current threats to the continued existence of the Peruvian plantcutter throughout its range.

E. Other Natural or Manmade Factors Affecting the Continued Existence of the Species' Small, Declining Population

An additional factor that affects the continued existence of these six species is their small, declining population sizes. Small, declining population sizes, in concert with other threats, and the lack of connectivity based on habitat fragmentation leads to an increased risk of extinction (Harris and Pimm 2008, p. 169). All six species have limited and increasingly fragmented geographic

ranges in addition to small population sizes (see Table 2). One of IUCN and BirdLife's criteria to determine if a species is categorized as threatened is a breeding range of under 20,000 km². In

most cases, their existing populations are extremely localized, and sometimes geographically isolated from one another, leaving them vulnerable to localized extinctions from habitat

modification and destruction, natural catastrophic changes to their habitat (e.g., flood scour, drought), and other stochastic disturbances.

TABLE 2—POPULATION ESTIMATES FOR SIX BIRD SPECIES FOUND IN BOLIVIA AND PERU

Peruvian species	Population estimate	Estimate of population decline in past 10 years
ash-breasted tit-tyrant (<i>Anairetes alpinus</i>), also native to Bolivia	780	between 10 and 19 percent.
royal cinclodes (<i>Cinclodes aricomae</i>), also native to Bolivia	50–250	between 30 and 49 percent.
white-browed tit-spinetail (<i>Leptasthenura xenothorax</i>)	500–1,500	between 10 and 19 percent.
Junín grebe (<i>Podiceps taczanowskii</i>)	100–300	14 percent.
Junín rail (<i>Laterallus tuerosi</i>)	1,000–2,499	between 10 and 19 percent.
Peruvian plantcutter (<i>Phytotoma raimondii</i>)	500–1,000	between 1 and 9 percent.

A small, declining population size renders a species vulnerable to any of several risks. Extinction risk is heightened in small, isolated, declining populations because they are more susceptible to environmental fluctuations and demographic shifts such as reduced reproductive success of individuals and chance disequilibrium of sex ratios (Harris and Pimm 2008, p. 163; Pimm *et al.* 1988, pp. 757, 773–775; Shaffer 1981, p. 131). Additionally, the increasing isolation of populations due to ongoing habitat loss and degradation (fragmentation), unless the population is managed, greatly affects dispersal and other movement patterns of individuals between subpopulations.

1. *Ash-breasted tit-tyrant*. The ash-breasted tit-tyrant is considered to have a very small population of less than 1,000 individuals (see table 2; BLI 2009o, p. 1). Its population declined at a rate between 10 and 19 percent in the past 10 years, and this decline is expected to continue in close association with continued habitat loss and degradation (BLI 2009o, p. 1). The ash-breasted tit-tyrant is currently confined to restricted and severely fragmented forest patches in the high Andes of Peru and Bolivia, where it is estimated that approximately only 2 percent of the dense woodlands preferred by the species remains (Fjeldsá 2002a, p. 114; Smith 1971, p. 269).

2. *Junín grebe*. The current population of the Junín grebe is estimated to be 100–300 individuals, however, only a small number of adults remain (BLI 2009b, pp. 1, 3; BLI 2008, p. 1). The species is restricted to the southern portion of Lake Junín (BLI 2009b, p. 1; Gill and Storer, pers. comm. As cited in Fjeldsá 2004, p. 200; Fjeldsá 1981, p. 254). The Junín grebe underwent a severe population decline in the latter half of the 20th century, and experienced extreme population

fluctuations (Fjeldsá 1981, p. 254). For example, in 1993, the population size declined to below 50 individuals, of which fewer than half were breeding adults (BLI 2009b, p. 2; BLI 2008, p. 3). Even if the population estimate of 100–300 individuals is correct, the number of mature individuals is likely to be far smaller, perhaps only half (Fjeldsá *in litt.* 2003, as cited in BLI 2009b, p. 2). Therefore, 100–300 individuals likely overestimates the species' effective population size (the number of breeding individuals that contribute to the next generation). The population has declined by at least 14 percent in the last 10 years and is expected to continue to decline, as a result of declining water quality and extreme water level fluctuations (BLI 2009b, pp. 1, 4, 6–7).

3. *Junín rail*. BLI placed the Junín rail in the population category of between 1,000 and 2,499 individuals (BLI 2009b, p. 2), and considers the population to be likely very small and presumably declining (BLI 2009b, p. 1; BLI 2000, p. 170). The Junín rail is known from two localities (Ondores and Pari) on the southwestern shore of Lake Junín in central Peru. The population has declined at a rate between 10 and 19 percent in the past 10 years, and this decline is expected to continue as a result of the declining quality of habitat within its small, restricted range (BLI 2009b, pp. 4–5).

4. *Peruvian plantcutter*. BLI placed the Peruvian plantcutter in the population category of between 500 and 1,000 individuals (BLI 2009g, p. 1). The Peruvian plantcutter has experienced a population decline of between 1 and 9 percent in the past 10 years due to habitat loss. This decline is expected to continue in close association with continued habitat loss and degradation. There is insufficient information on similar species (i.e., the other South American plantcutters) to understand whether the Peruvian plantcutter's

population size is small relative to other plantcutters. However, there are several indications that this number of individuals represents a small, declining population.

First, the Peruvian plantcutter's population size—which is defined by BLI as the total number of mature individuals—is not the same as the effective population size—the number of individuals that actually contribute to the next generation (Shaffer 1981, pp. 132–133; Soulé 1980, pp. 160–162). Not all individuals in a population will contribute to reproduction each year. Therefore, the estimated population size for the Peruvian plantcutter may be an overestimate of the species' effective population size. Moreover, the population structure and extent of interbreeding are unknown. If the species does not breed as a single population, its effective population size would be further reduced.

Second, the extant Peruvian plantcutter population occurs primarily in two disjunct subpopulations—Talara and Pómac Forest Historical Sanctuary (BLI 2009g, pp. 1–2; Walther 2004, p. 73)—and in several smaller sites (Flanagan *et al. in litt.* 2009, pp. 2–7; Williams 2005, p. 1; Walther 2004, p. 73; Flanagan and More 2003, pp. 5–9). Talara and Pómac Forest Historical Sanctuary are approximately 257 km (160 mi) apart (FCC (Federal Communications Commission—Audio Division 2009). Its habitat is heavily degraded and localities are small, severely fragmented, and widely separated (Flanagan *et al. in litt.* 2009, pp. 1–9; Bridgewater *et al.* 2003, p. 132; Ridgely and Tudor 1994, p. 18). It is possible that the distance between patches of suitable habitat is too far to support interbreeding between localities, so that the extant occurrences of this species would function as genetically isolated subpopulations.

5. *Royal cinclodes*. Based on recent observations in Peru and Bolivia, the total population of royal cinclodes is between 50 and 250 mature individuals (BLI 2011e; Auca-Chutas 2007, pp. 4, 8; Gómez *in litt.* 2007, p. 1). The royal cinclodes has undergone a population decline between 30 and 49 percent in the past 10 years in close association with the continued loss and degradation of the *Polylepis* forest (BLI 2009i, p. 6). It is an intrinsically low-density species. The exacerbated small population size, lack of connectivity (isolation), and small areas of remaining habitat which are localized and highly fragmented, all affect the continued existence of this species (Lloyd 2010, pers. comm.). Engblom *et al.* (2002, p. 57) noted that the royal cinclodes may descend from the mountains to forage in the valleys during periods of snow cover at the higher altitudes. Thus, interbreeding may occur at least among localities with shared valleys, but there is insufficient information to determine that the species breeds as a single population. It is currently restricted to high-elevation, moist, moss-laden patches of semihumid woodlands in Peru and Bolivia (BLI 2009i, p. 6; Fjeldså and Kessler 1996, as cited in Fjeldså 2002a, p. 113). Remaining *Polylepis* woodlands are highly fragmented and degraded, and it is estimated that approximately only 2 percent of the dense woodlands preferred by the species remain (del Hoyo *et al.* 2003, p. 253; Engblom *et al.* 2002, p. 57).

6. *White-browed tit-spinetail*. BLI has placed the white-browed tit-spinetail in the population category of between 500 and 1,500 individuals (BLI 2009d, pp. 1, 5). The white-browed tit-spinetail is currently confined to high-elevation, semihumid patches of forest in the Andes of Peru, and its population has declined at a rate between 10 and 19 percent in the past 10 years, in close association with the continued loss and degradation of the *Polylepis* forest (BLI 2009d, pp. 5–6).

Summary of Factor E

Based on their small, declining population size and fragmented distribution, combined with the threat of disease (Junín rail and Junín grebe), we have determined that all six species addressed in this final rule are vulnerable to the threat of adverse natural events that exacerbate human activities (e.g., deforestation, habitat alteration, and infrastructure development) that, alone or in combination, destroy individuals and their habitat. The stochastic risks associated with small, declining populations are exacerbated by ongoing

human activities that continue to curtail the species' habitat throughout their range. We expect that the risks associated with small, declining populations will continue to impact these six species and may accelerate if habitat destruction continues unabated. We recognize that reforestation efforts are occurring in some areas, but these efforts will take years to have a positive effect on these species. Therefore, we find that these species' small, declining populations, in concert with their restricted ranges, habitat loss, and heightened vulnerability to adverse natural events and manmade activities are threats to the continued existence of these six species throughout their ranges.

Finding

Section 3 of the Act defines an endangered species as any species which is in danger of extinction throughout all or a significant portion of its range and a threatened species as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. We have carefully assessed the best scientific and commercial information available regarding threats to each of these six bird species. Significant effects have already occurred as a result of habitat loss, and some populations have likely been extirpated. The most significant threat to the six species in this rule is habitat loss and alteration. Various past and ongoing human activities and their secondary influences continue to impact all of the remaining suitable habitats that may still harbor each of these six species. We expect that any additional loss or degradation of habitats used by these species will have a greater, cumulative impact on these species. This is because with each contraction of an existing subpopulation, the likelihood of interchange with other subpopulations within patches decreases, while the likelihood of their reproductive isolation increases.

Under the Act and our implementing regulations, a species may warrant listing if it is threatened or endangered throughout all or a significant portion of its range. Each of the species in this listing rule is highly restricted in its range. In each case, the threats to the survival of these species occur throughout the species' range and are not restricted to any particular portion of that range. Accordingly, our assessment and determination apply to each species throughout its entire range.

We find that each of these six species is presently in danger of extinction throughout its entire range, based on the

immediacy, severity, and scope of the threats described above. Although there are ongoing attempts to alleviate some threats, no populations appear to be without current significant threats, and many threats are without obvious or readily available solutions. NGOs are conducting conservation efforts including educational programs and reforestation; however, these efforts are not adequately mitigating the threats to these species. We expect that these species will continue to experience an increased vulnerability to local extirpations into the future. On the basis of the best available scientific and commercial data, these six species meet the definition of endangered species under the Act, rather than threatened species, because these species are in danger of extinction at the present time. Therefore, endangered status is appropriate for all six species in accordance with the Act.

Status Determination for the Ash-breasted Tit-tyrant

The total population of the ash-breasted tit-tyrant is estimated to be approximately 780 individuals. We have carefully assessed the best available scientific and commercial information regarding the past, present, cumulative, and potential future threats faced by the ash-breasted tit-tyrant and have concluded that there are three primary factors that threaten the continued existence of the ash-breasted tit-tyrant: (1) Habitat destruction, fragmentation, and degradation; (2) limited size and increasing isolation of remaining populations; and (3) inadequate regulatory mechanisms.

The ash-breasted tit-tyrant population is small and declining, rendering the species particularly vulnerable to the threat of adverse natural events and human activities (e.g., deforestation and habitat alteration) that destroy individuals and their habitat. Ongoing human activities that curtail the species' habitat throughout its range exacerbate the demographic risks associated with small population sizes. The population has declined 10–19 percent in the past 10 years, and is predicted to continue declining commensurate with ongoing habitat loss. Habitat loss was a factor in the ash-breasted tit-tyrant's historical population decline, and the species is considered to be declining today in association with the continued reduction in habitat.

A species may be affected by more than one threat in combination. We have identified multiple threats that may have interrelated impacts on the species. However, it is not necessarily easy to determine (nor is it necessarily

determinable) which potential threat is the operational threat. These threats, either individually or in combination, are occurring at a sufficient geographical or temporal scale to significantly affect the status of the species.

Based on the immediate and ongoing threats to the ash-breasted tit-tyrant throughout its range, as described above, we determine that the ash-breasted tit-tyrant is in danger of extinction throughout all of its range. Therefore, on the basis of the best available scientific and commercial information, we are listing the ash-breasted tit-tyrant as endangered throughout all of its range.

Status Determination for the Junín Grebe

The Junín grebe, a flightless grebe, is endemic to Lake Junín, where it resides year-round. The species' population size is estimated as 100–300 individuals, although the number of mature individuals may be half this amount. We have carefully assessed the best available scientific and commercial information regarding the past, present, and potential future threats faced by the Junín grebe and have concluded that there are four primary factors that threaten the continued existence of the Junín grebe: (1) Habitat destruction, fragmentation, and degradation; (2) disease; (3) limited size and isolation of remaining populations; and (4) inadequate regulatory mechanisms.

Junín grebe habitat continues to be altered by human activities, conversion, and destruction of habitat, which reduce the quantity, quality, distribution, and regeneration of habitat available for the Junín grebe on Lake Junín. Population declines have been correlated with water availability, and droughts have caused severe population fluctuations that have likely compromised the species' long-term viability. The Junín grebe population is small and believed to be declining, rendering the species vulnerable to the threat of adverse natural events and human activity (e.g., water extraction and contaminants from mining) that destroy individuals and their habitat. The population has declined 14 percent in the past 10 years, and this decline is predicted to continue commensurate with ongoing threats from habitat destruction and water contamination. Based on the immediate and ongoing threats to the Junín grebe throughout its range, as described above, we determine that the Junín grebe is in danger of extinction throughout all of its range. Therefore, on the basis of the best available scientific and commercial information, we are

listing the Junín grebe as an endangered species throughout all of its range.

Status Determination for the Junín Rail

The Junín rail is a ground-nesting bird endemic to Lake Junín, where it resides year-round. The current estimated range of the species is 160 km² (62 mi²), and its population size is estimated to be 1,000–2,499. However, both of these figures are likely to be overestimates. We have carefully assessed the best available scientific and commercial information regarding the past, present, and potential future threats faced by the Junín rail and have concluded that there are four primary factors that threaten the continued existence of the rail: (1) Habitat destruction, fragmentation, and degradation; (2) disease and predation; (3) limited size and isolation of remaining populations; and (4) inadequate regulatory mechanisms.

Junín rail habitat continues to be altered by human activities, which results in the continued degradation and destruction of habitat and reduces the quality and distribution of remaining suitable habitat. The Junín rail population is small, increasing the species' vulnerability to the threat of adverse natural events (e.g., demographic or environmental) and human activities (e.g., water contamination, water level manipulation, cattail harvest, and overgrazing) that destroy individuals and their habitat. The Junín rail population has declined at a rate between 10 and 19 percent during the past 10 years, and this decline is predicted to continue commensurate with ongoing threats from habitat destruction, water contamination, overgrazing, and cattail harvest and burning.

Based on the immediate and ongoing threats to the Junín rail throughout its range, as described above, we determine that the Junín rail is in danger of extinction throughout all of its range. Therefore, on the basis of the best available scientific and commercial information, we are listing the Junín rail as an endangered species throughout all of its range.

Status Determination for the Peruvian Plantcutter

The Peruvian plantcutter is endemic to semiarid lowland dry forests of coastal northwestern Peru. The species' population size is estimated to be 500–1,000 individuals.

We have carefully assessed the best available scientific and commercial information regarding the past, present, and potential future threats faced by the Peruvian plantcutter and have

concluded that there are three primary factors that threaten the continued existence of the Peruvian plantcutter: (1) Habitat destruction, fragmentation, and degradation; (2) limited size and isolation of remaining populations; and (3) inadequate regulatory mechanisms.

Human activities that degrade, alter, and destroy habitat are ongoing throughout the Peruvian plantcutter's range. Widespread land conversion to agriculture has removed the vast majority of *P. pallida* dry forest habitat throughout the range of the Peruvian plantcutter.

The Peruvian plantcutter's population is small, rendering the species particularly vulnerable to the threat of adverse natural events and human activities (e.g., deforestation and firewood extraction) that destroy individuals and their habitat. Ongoing human activities that cause habitat loss throughout the species' range exacerbate the stochastic and demographic risks associated with small population sizes. The population has been estimated to have declined 1–9 percent in the past 10 years, in association with continued habitat loss. Habitat loss was a factor in this species' historical decline—the Peruvian plantcutter has been extirpated from 11 of its 14 historical sites—and the species is considered to be declining today in association with the continued reduction in habitat. Based on the immediate and ongoing significant threats to the Peruvian plantcutter throughout its range, as described above, we determine that the Peruvian plantcutter is in danger of extinction throughout all of its range. Therefore, on the basis of the best available scientific and commercial information, we are listing the Peruvian plantcutter as an endangered species throughout all of its range.

Status Determination for the Royal Cinclodes

The royal cinclodes, a large-billed ovenbird, is native to the high-altitude, semihumid *Polylepis* or *Polylepis-Gynoxys* woodlands of the Bolivian and Peruvian Andes, where it occupies a narrow range of distribution at elevations between 3,500 and 4,600 m (11,483 and 12,092 ft). The species has a highly restricted and severely fragmented range and is found only in the Peruvian administrative regions of Apurímac, Cusco, Junín, and Puno, and in the Bolivian Department of La Paz. The population of the royal cinclodes is estimated to be fewer than 300 individuals.

We have carefully assessed the best available scientific and commercial information regarding the past, present,

and potential future threats faced by the royal cinclodes and have concluded that there are three primary factors impacting the continued existence of the royal cinclodes: (1) Habitat destruction, fragmentation, and degradation; (2) limited size and isolation of remaining populations; and (3) inadequate regulatory mechanisms. Only 2–3 percent of the dense *Polylepis* woodlands preferred by the species likely remain (ABC 2010, p. 1). Limited by the availability of suitable habitat, the species occurs today only in some of these fragmented and disjunct locations. Royal cinclodes habitat is particularly vulnerable to the drying effects associated with diminished forest cover. Because the royal cinclodes population is small and declining, the species is particularly vulnerable to the threat of adverse natural events (e.g., demographic or environmental) and human activities (e.g., deforestation and habitat alteration) that destroy individuals and their habitat. The population has declined 30–49 percent in the past 10 years, and is predicted to continue declining commensurate with ongoing habitat loss.

Based on the immediate and ongoing threats to the royal cinclodes throughout its range, as described above, we determine that the royal cinclodes is in danger of extinction throughout all of its range. Therefore, on the basis of the best available scientific and commercial information, we are listing the royal cinclodes as an endangered species throughout all of its range.

Status Determination for the White-browed Tit-spinetail

The white-browed tit-spinetail is restricted to high-altitude woodlands of the Peruvian Andes. The species has a highly restricted and severely fragmented range, and is currently known from only a small number of sites in the Apurímac and Cusco regions in south-central Peru. The population of the white-browed tit-spinetail is estimated to be approximately 500 to 1,500 individuals. We have carefully assessed the best available scientific and commercial information regarding the past, present, and potential future threats faced by the white-browed tit-spinetail. There are three primary factors impacting the continued existence of the white-browed tit-spinetail: (1) Habitat destruction, fragmentation, and degradation; (2) limited size and isolation of remaining populations; and (3) inadequate regulatory mechanisms.

Widespread deforestation and the conversion of forests for grazing and agriculture have led to the

fragmentation of habitat throughout the range of the white-browed tit-spinetail. Researchers estimate that only one percent of the dense *Polylepis* woodlands preferred by the species remain. Limited by the availability of suitable habitat, the species occurs today only in a few fragmented and disjunct locations. The species' severely restricted range, combined with its small population size, renders it particularly vulnerable to the threat of adverse natural and manmade (e.g., deforestation, habitat alteration, wildfire) events that destroy individuals and their habitat. The species has experienced a population decline of between 10 and 19 percent in the past 10 years, and is predicted to continue declining commensurate with ongoing habitat loss and degradation. Based on the immediate and ongoing threats to the white-browed tit-spinetail throughout its range, as described above, we determine that the white-browed tit-spinetail is in danger of extinction throughout all of its range. Therefore, on the basis of the best available scientific and commercial information, we are listing the white-browed tit-spinetail as an endangered species throughout all of its range.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and encourages and results in conservation actions by Federal and State governments, private agencies and interest groups, and individuals.

Section 7(a) of the Act, as amended, and as implemented by regulations at 50 CFR part 402, requires Federal agencies to evaluate their actions within the United States or on the high seas with respect to any species that is proposed or listed as endangered or threatened.

Section 8(a) of the Act authorizes the provision of limited financial assistance for the development and management of programs that the Secretary of the Interior determines to be necessary or useful for the conservation of endangered and threatened species in foreign countries. Sections 8(b) and 8(c) of the Act authorize the Secretary to encourage conservation programs for foreign endangered and threatened species and to provide assistance for such programs in the form of personnel and the training of personnel.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply

to all endangered and threatened wildlife. As such, these prohibitions would be applicable to these species. These prohibitions, under 50 CFR 17.21, in part, make it illegal for any person subject to the jurisdiction of the United States to take (take includes to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) any endangered wildlife species within the United States or upon the high seas; or to import or export; to deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or to sell or offer for sale in interstate or foreign commerce any endangered wildlife species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken in violation of the Act. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered and threatened wildlife species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 for endangered species. With regard to endangered wildlife, a permit may be issued for the following purposes: For scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities.

Required Determinations

Paperwork Reduction Act (44 U.S.C. 3501 et seq.)

This final rule does not contain any new collections of information that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act. This rule will not impose new recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. We may not conduct or sponsor, and you are not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (NEPA)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), need not be prepared in connection with regulations adopted under section 4(a) of the Act. We published a notice outlining our reasons for this

determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited in this rule is available on the Internet at <http://www.regulations.gov> or upon request from the Endangered Species Program, U.S. Fish and Wildlife Service (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are the staff members of the Branch of Foreign Species, Endangered Species Program, U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Arlington, VA 22203.

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—[AMENDED]

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

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

■ 2. Amend § 17.11(h) by adding entries for “Cinclodes, royal”, “Grebe, Junín”, “Plantcutter, Peruvian”, “Rail, Junín”, “Tit-spinetail, white-browed”, and “Tit-tyrant, ash-breasted” in alphabetical order under Birds to the List of Endangered and Threatened Wildlife, as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Birds.							
* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
Cinclodes, royal	<i>Cinclodes aricomae</i>	Bolivia, Peru	Entire	E	799	NA	NA
Grebe, Junín	<i>Podiceps taczanowskii</i>	Peru	Entire	E	799	NA	NA
Plantcutter, Peruvian	<i>Phytotoma raimondii</i>	Peru	Entire	E	799	NA	NA
Rail, Junín	<i>Laterallus tuerosi</i>	Peru	Entire	E	799	NA	NA
Tit-spinetail, white-browed.	<i>Leptasthenura xenothorax</i>	Peru	Entire	E	799	NA	NA
Tit-tyrant, ash-breasted.	<i>Anairetes alpinus</i>	Bolivia, Peru	Entire	E	799	NA	NA
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Dated: June 28, 2012
Daniel M. Ashe,
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