Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
BIRDS							
*	*	*	*	*	*		*
Goshawk, Queen Charlotte	*Accipiter gentilis laingi*	Canada (That portion of British Columbia that includes Vancouver Island and its surrounding islands, the mainland coast west of the crest of the Coast Range, and the Queen Charlotte Islands)	Entire, except Queen Charlotte Islands	T		NA	NA
Goshawk, Queen Charlotte	*Accipiter gentilis laingi*	Canada (That portion of British Columbia that includes Vancouver Island and its surrounding islands, the mainland coast west of the crest of the Coast Range, and the Queen Charlotte Islands)	Queen Charlotte Islands	E		NA	NA
*	*	*	*	*	*		*

Dated: October 20, 2009.

Sam D. Hamilton,

Director, Fish and Wildlife Service.

[FR Doc. E9–26154 Filed 11–2–09; 8:45 am]

BILLING CODE 4310–55–S

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R9-IA-2009-0056]
[90100-1660-1FLA B6]

[RIN 1018-AW00]

Endangered and Threatened Wildlife and Plants; Listing the Salmon-Crested Cockatoo as Threatened Throughout Its Range with Special Rule

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the salmon-crested cockatoo (*Cacatua moluccensis*) as threatened, with a special rule, under the Endangered Species Act of 1973, as amended (Act). This proposal, if made final, would extend the Act's protections to this species and amend the regulations at 50 CFR part 17 to create a special rule under authority of section 4(d) of the Act that provides measures that are necessary and advisable for the conservation of the salmon-crested cockatoo. The Service seeks data and comments from the public on this proposed listing and special rule.

DATES: We will accept comments received or postmarked on or before February 1, 2010. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by December 18, 2009.

ADDRESSES: You may submit comments by one of the following methods:

- Federal eRulemaking Portal: *http://www.regulations.gov*. Follow the instructions for submitting comments on Docket No. FWS-R9-IA-2009-0056.
- U.S. mail or hand-delivery: Public Comments Processing, Attn: FWS-R9-IA-2009-0056; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, Suite 222; Arlington, VA 22203.

We will not accept e-mails or faxes. We will post all comments on *http://www.regulations.gov*. This generally means that we will post any personal information you provide us (see the Public Comments section below for more information).

FOR FURTHER INFORMATION CONTACT: Douglas Krofta, Chief, Branch of Listing, Endangered Species Program, U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Room 420, Arlington, VA 22203; telephone 703–358–2171; facsimile 703–358–1735. If you use a telecommunications devise for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Public Comments

We intend that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, we are requesting comments from other government agencies, the scientific community, industry, or any other interested party concerning this proposed rule. We particularly seek comments concerning:

- Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this species and regulations that may be addressing those threats;
- Additional information concerning the range, distribution, and population size of this species;
- Any information on the biological or ecological requirements of this species;
- Current or planned activities in the areas occupied by this species and possible impacts of these activities on this species;
- Any information concerning the effects of climate change on this species or its habitats;
- Any information concerning numbers of this species held in captivity in the United States, breeding success, and types of activities that should be addressed in the special rule; and
- The appropriate conservation status for the salmon-crested cockatoo.

If you submit a comment via *http://www.regulations.gov*, your entire comment—including any personal identifying information—will be posted on the Web site. If you submit a hardcopy comment that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy comments on *http://www.regulations.gov*.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.govor* by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Room 420, Arlington, VA 22203; telephone 703–358–2171.

Background

Section 4(b)(3)(A) of the Act requires us to make a finding (known as a ''90–day finding'') on whether a petition to add a species to, remove a species from, or reclassify a species on the Federal Lists of Endangered or Threatened Wildlife and Plants has presented substantial information indicating that the requested action may be warranted. To the maximum extent practicable, we make the finding within 90 days following receipt of the petition and publish our finding promptly in the **Federal Register**. If we find that the petition has presented substantial information indicating that the requested action may be warranted (a positive finding), section 4(b)(3)(A) of the Act requires us to commence a status review of the species if one has not already been initiated under our internal candidate assessment process. In addition, section 4(b)(3)(B) of the Act requires us to make a finding within 12 months following receipt of the petition on whether the requested action is warranted, not warranted, or warranted but precluded by higher priority listing actions (this finding is referred to as the ''12–month finding''). Section 4(b)(3)(C) of the Act requires that a finding of warranted but precluded for petitioned species should be treated as having been resubmitted on the date of such finding, and is, therefore, subject to a new finding within 1 year and subsequently thereafter until we take action on a proposal to list or withdraw our original finding. The Service publishes an annual notice of review (ANOR) of findings on resubmitted petitions for all foreign species for which listings were previously found to be warranted but precluded.

Previous Federal Action

On May 6, 1991, we received a petition (1991 petition) from the International Council for Bird Preservation to add 53 foreign birds to the List of Endangered and Threatened Wildlife, including the salmon-crested cockatoo. 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 salmon-crested cockatoo, 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 salmon-crested cockatoo, as published in our ANOR on May 21, 2004 (69 FR 29354).

Per the Service's listing priority guidelines (September 21, 1983; 48 FR 43098), our 2007 ANOR identified the listing priority numbers (LPNs) (ranging from 1 to 12) for all outstanding foreign species. The LPN for the salmon-crested cockatoo was LPN 2. With the exception of listing priority ranking of 1, which addresses monotypic genera that face imminent threats of high magnitude, category 2 represents the Service's highest priority.

On July 29, 2008 (73 FR 44062), we published in the **Federal Register** a notice announcing our annual petition findings for foreign species. We announced that listing was warranted for 30 foreign bird species, including the salmon-crested cockatoo, which is the subject of this proposed rule, and stated that we would ''promptly publish proposals to list these 30 taxa.''

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 regarding alleged violations of section 4 of the Act for the 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), the Service must submit to the **Federal Register** a proposed listing rule for the salmon-crested cockatoo by October 30, 2009. Below, we summarize our analysis of the best available scientific and commercial data on the status of this species.

Species Description

Cockatoos are a distinct group of parrots (order Psittaciformes), distinguished by the presence of an erectile crest (Cameron 2007, p. 1; Collar 1989, p. 5) and the lack of dyck texture in their feathers, which produces blue and green coloration in the plumage of other parrots (Brown & Toft 1999, p. 141). The salmon-crested cockatoo (also known as the Seram, Moluccan, pink-crested, or rose-crested cockatoo) is the largest and the most striking of Indonesia's white cockatoos (Kinnaird 2000, p. 14). Its body length is 46–52 centimeters (cm) (15.6–20 inches (in)), and its plumage varies from pale salmon-pink to whitish-pink. It has a long backward-curving, deep salmon-pink crest; the bill is large and gray-black; and the underwing and undertail are yellow-orange (BirdLife International (BLI) 2000, p. 242; Forshaw 1989, p. 141; Juniper & Parr 1998, pp. 280–281; Sweeney 2000, p. 130). Sexual dimorphism is exhibited by iris color (del Hoya *et al.* 1997, p. 278; Forshaw1989, p. 141; Peratino 1979, p. 125).

Taxonomy

In 1751, Edwards described and pictorially delineated the salmon-crested cockatoo (Lint 1951, p. 223) and, in 1788, J.F. Gmelin named the species *Psittacus moluccensis* (Forshaw 1989, p. 141; Lint 1951, p. 223). In 1937, Peters (1937, p. 175) used the name *Kakatoe moluccensis* (Gmelin) in the *Check-list of Birds of the World*. In 1992, Andrew (1992, p. 21) used the name *Cacatua moluccensis* in the first published checklist of the birds of Indonesia. This name continues to be the recognized scientific name (Integrated Taxonomic Information System (ITIS) 2008, p. 1; Sibley & Monroe 1990, p. 112), and the alternative genus name *Kakatoe* is now obsolete (del Hoya *et al.* 1997, p. 278).

Some references (ITIS 2008, p. 1; Sibley & Monroe 1990, p. 112) place cockatoos in the family Psittacidae with lories and true parrots, whereas others (Cameron 2007, p. 1; Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 2008a, p. 1) place cockatoos in a separate family, Cacatuidae. Of the 21 cockatoo species, 11 are in the genus *Cacatua* (Cameron 2007, pp. 1–3).

The closest relatives of the salmon-crested cockatoo, which is restricted to the South Moluccas, Indonesia (in the east central Indonesian island chain), are the umbrella cockatoo, which is restricted to the North Moluccas, and the blue-eyed cockatoo, which is restricted to the island of New Britain off the northeast coast of New Guinea (Cameron 2007, pp. 38–39, 51). In a biogeographic analysis of the mitochondrial DNA (mtDNA) phylogeny, Brown and Toft (1999, pp. 150–151) suggest that these three species may have had a common ancestor that occupied an ancient landmass comprising Halmahera (a North Moluccan island) and Bismarck. The breakup of this landmass created

two populations, and the subsequent dispersal of cockatoos from the North Moluccas to the South Moluccas created another population, which became the salmon-crested cockatoo (Cameron 2007, p. 56).

Range and Distribution

Cockatoos are only found in Australasia—a few archipelagos in Southeast Asia (Philippines, Indonesia, East Timor, Tanimbar, Bismarck, and Solomon), New Guinea, and Australia—suggesting that the modern species arose after the breakup of Gondwanaland, a southern supercontinent that existed 200–500 million years ago. The 19th century naturalist Alfred Russel Wallace was among the first to note the break in Australasian and Asian fauna. Wallace's line runs between the islands of Bali and Lombok, Borneo and Sulawesi, and south of the Philippines. Cockatoos are present on Lombok and Sulawesi, but not on Bali and Borneo. The line represents the western edge of a zone of overlap between Australasian and Asian fauna (known as Wallacea), with the eastern edge defined by the Australian continental shelf (Lydekker's Line) (Cameron 2007, pp. 1–3; White & Bruce 1986, p. 32).

The oceanic islands of Wallacea have a high level of endemism, which resulted in many islands being identified as Endemic Bird Areas (EBA) (Cameron 2007, p. 56). BLI designates EBAs by mapping bird species with restricted ranges of less than 50,000 square kilometers (km^2) (19,300 square miles (mi^2)) that overlap. The unique biodiversity concentrated in these small areas is particularly vulnerable; thus, EBAs represent priority areas for global biodiversity conservation (BLI 2008i, p. 1; Collar 2000, p. 27; Stattersfield *et al.* 1998, pp. 39, 45). The salmon-crested cockatoo is included in the Seram EBA (BLI 2003, p. 1; Stattersfield *et al.* 1998, pp. 528–531).

Seram. The salmon-crested cockatoo is endemic to the island of Seram (alternate spelling, Ceram), with records from adjacent islands of Haruku, Saparua, and Ambon (formerly called Ambonia) in the South Moluccas (BLI 2001, p. 1662; Forshaw 1989, p. 141; Juniper & Parr 1998, p. 281; Peters 1937, p. 175). The species resides in lowland rain forests up to 1,000 meters (m) (3,608 feet (ft)), remains locally common in Manusela National Park, and appears to be mostly distributed in the eastern part of the island (BLI 2008a, p. 2; Isherwood *et al.* 1998, p. 18). For a listing of specific distribution records of the salmon-crested cockatoo, see BLI (2001, p. 1662).

Ambon. Whether this species is native or introduced to Ambon is uncertain. Stresemann (1934, p. 16) reported that the salmon-crested cockatoo did not occur on Ambon. Thus, some scientists follow the view that the species may have been introduced to this island (Forshaw 1989, p. 141; Lever 1987, p. 245; Long 1981, p. 247; Smiet 1985, p. 189; van Bemmel 1948, as cited in White & Bruce 1986, p. 212). The salmon-crested cockatoo was formerly traded in significant numbers, and shipments of birds from Seram transited through Ambon (the capital of the Maluku Province), where undoubtedly some birds escaped. Other scientists suggest that the cockatoos may well be wild birds (Marsden 1992, pp. 12–13; Poulsen & Jepson 1996, pp. 159–160), with the persistence of a small population in northeast Ambon (Poulsen & Jepson 1996, p. 159).

Haruku and Saparua. The status of the salmon-crested cockatoo on Haruku and Saparua is unknown (Metz 1998, p. 10), and the species may be extinct on these two islands (Metz 2002, p. 1; Snyder *et al.* 2000, p. 68). For Haruku, there is one unspecified locality and date of observation reported (Stresemann 1934, p. 16), but Poulsen and Jepson (1996, p. 160) did not find the species in 1994 or 1996. For Saparua, there is one specimen in the RMNH (Rijksmuseum van Natuurlijke Histoire (Leiden, Netherlands)) recorded in 1923 (BLI 2001, p. 1663).

For purposes of this proposal, we consider the salmon-crested cockatoo's natural range to include Seram and the three islands of Ambon, Haruku, and Saparua. Although the status of the salmon-crested cockatoo is unknown on Haruku and Saparua, the species has been reported from these islands, and we are unaware of any survey that has conclusively found that the species no longer occurs there.

Habitat

The salmon-crested cockatoo is believed to be a specialist of primary lowland forests (Kinnarid *et al.* 2003, p. 228). It occurs at altitudes between 100 and 1,000–1,200 m (328 and 3,608–3,926 ft) (BLI 2008a, p. 2; Bowler & Taylor 1993, p. 149; Juniper & Parr 1998, p. 281), but rarely occurs above 600–900 m (1,968–2,952 ft) (Cameron 2007, p. 77; Marsden 1992, p. 11; Juniper & Parr 1998, p. 281; Smiet 1985, p. 189). Marsden (1992, p. 11) found that cockatoos tended to be recorded in mature, open-canopied lowland forests with some very large, tall trees and some low vegetation. Kinnaird *et al.* (2003, p. 227) found that cockatoo abundance was significantly associated with the presence of potential nest trees (*Octomeles sumatranus*) and strangling figs (*Ficus* spp.). Cameron (2007, pp. 77–78) noted that island cockatoos prefer lowland forests over montane forests because lowland forests contain greater plant diversity and, thus, have a more diverse and abundant food supply. They also support larger trees, which are more likely to have cavities needed for nesting—a critical resource because cockatoos are incapable of excavating their own nest cavities. The salmon-crested cockatoo prefers flat or gently sloping terrain.

The highest densities of birds occur in little-disturbed, lowland forests below 300 m (984 ft), and the lowest densities occur in recently logged forests and in non-forested areas (Marsden 1992, p. 9; Marsden 1998, p. 608). However, Marsden and Fielding (1999, p. 444) were unable to find differences in the species' presence based on habitat associations, and Kinnaird *et al.* (2003, p. 227) found densities did not correspond closely to habitat differences across study sites. Marsden (1992, p. 11) suggested that the apparent differences in cockatoo densities between young logged forests and secondary forests, which have similar vegetation parameters, may be caused by differential trapping pressures and patterns of disturbance, differences in tree species compositions and overall habitat heterogeneity, and differences in cockatoo densities in areas before logging.

Lower densities of birds occur in transition and submontane forests and on the edges of cultivated areas. Birds also occur in open canopy forests with low vegetation and in riverine forests (Juniper & Parr 1998, p. 281). Despite trapping pressure, birds still occur in mature lowland forests near settlements (Juniper & Parr 1998, p. 281; Marsden 1992, p. 11), but they are rarely seen near human habitation (Smiet 1985, p. 189). Marsden (1992, pp. 9, 11) found cockatoos to be rare or irregular in other habitats, including plantations, grassland, rank scrub, and agricultural lands. The species previously occurred in coastal areas (Juniper & Parr 1998, p. 281), before land was converted to human uses (FAO 1981, as cited in Marsden 1992, p. 7). Small numbers of salmon-crested cockatoo have been observed in forested hills on Ambon. No other information was available on the habitat of this species on Ambon, Haruku, and Saparua.

Topography. Seram is a densely wooded island (Metz 1998, p. 10) of 18,625 km^2 (7,189 mi^2) (Smiet 1985, p. 183)—about the size of New Jersey (Morrison 2001, p. 1). The topography is

extremely variable and the interior of the island is rugged and mostly mountainous (Kinnaird *et al.* 2003, p. 228). The island lies between latitudes 2° 46' and 3° 53' south of the Equator. It is approximately 340 kilometers (km) (211 miles (mi)) long and 55–70 km (34–43 mi) wide in the center. Its highest point is Gunung Binaiya at approximately 3,027 m (9,929 ft) above sea level. It is the second largest island in the Moluccas. This group of about 1,000 islands is also known as the Spice Islands, because they include the original home of both nutmeg (*Myristica fragrans*) and cloves (*Syzgium aromaticum*) (Edwards 1993, p. 1).

Forests. Seram's wet climate supports mainly evergreen forests (Marsden 1998, p. 606). The alluvial plains originally supported tall lowland forests characterized by the only endemic dipterocarp on the island, *Shorea selanica* ('meranti'), and also *Canarium, Elaeocarpus sphaericus*, *Calophyllum, Intsia*, and *Myristica* (Coates & Bishop 1997, pp. 16–17; Smiet & Siallagan 1981, p. 7). *Shorea selanica* has developed remarkable dominance in the lowland forests of north Seram, representing about 30 percent of individual trees and 76 percent of the basal area (Edwards *et al.* 1993, p. 66). The forest is relatively open-crowned with a sparse understory, with the floor being swept clean by floods during the wet season. Along the major rivers, the lowland forest is characterized by *Octomeles sumatrana, Eucalyptus deglupta*, *Pometia pinnata, Casuarina equisetifolia*, *Ficus, Litsea*, and *Eugenia* (Coates & Bishop 1997, pp. 16–17).

Climate. Most of Seram receives between 2,500 and 3,000 millimeters (mm) (97.5 and 117 inches (in)) of rain per year, with more in the east and northeast. The long monsoonal seasons (Metz 1998, p. 11; White & Bruce 1986, p. 24) and mountainous terrain affect the amount of rainfall. Annual and monthly rainfall is not uniform and varies by region (Kinnaird *et al.* 2003, p. 228). The island lies outside the main zone of cyclonic storms (Coates & Bishop 1997, p. 22). The lowlands have a humid tropical climate with temperatures at sea level of 25–30 °Celsius (C) (77–86 °Fahrenheit (F)). Temperature decreases with altitude, with a fall of approximately 6 °C (10.8 °F) for every rise of 1,000 m (3,280 ft), leading to a marked temperature gradient within the mountain areas (Edwards 1993, p. 6).

Land use. The human population of Seram is concentrated in low-lying areas along the coast and in the west. The mountainous interior supports very few villages (Edwards 1993, p. 7). The majority of Seram is lowland forest or montane forest (see Table 1). While only about 11 percent of the island has been converted to agricultural lands, settlements, and plantations or is considered unproductive, logging concessions cover nearly 50 percent of the island. About 85 percent of Seram lies below 600 m (1,968 ft) and another 10 percent lies between 600 and 1,000 m (1,968 and 3,280 ft). Within this elevation where cockatoos occur, ''...most of the forest has been classified as production or conversion forest, categories that permit land clearing and forest disturbance'' (Kinnaird *et al.* 2003, p. 230).

TABLE 1. HABITAT AND LAND USE FOR SERAM AND ESTABLISHED AND PROPOSED PROTECTED AREAS

(data are based on landsat images from late 1989 and early 1990) (NP=National Park; NR=Nature Reserve) (Kinnaird et al. 2003, p. 230).

Habitat/Land Use	Area			
	Seram	Manusela NP	Gunung Sahuwai NR	Proposed Wai Bula NR
Lowland Forest	14,026.5 km^2(5,414.2 mi^2)	1,522.5 km^2(587.7 mi^2)	118.9 km^2 (45.9 mi^2)	561.8 km^2 (216.9 mi^2)
Mangrove Forest	77.6 km^2 (30 mi^2)	—	—	9.6 km^2 (3.7 mi^2)
Montane Forest	1,065.3 km^2 (411.2 mi^2)	693.9 km^2 (267.8 mi^2)	—	—
Swamp Forest	203.5 km^2 (78.6 mi^2)	—	—	14.6 km^2 (5.6 mi^2)
Water Body	1.2 mi^2(3.0 km^2)	—	—	—
Agriculture	789.1 km^2 (304.6 mi^2)	50 km^2 (19.3 mi^2)	—	9.6 km^2 (3.7 mi^2)
Plantation	22.0 km^2 (8.5 mi^2)	—	—	—
Settlement	21.3 km^2 (8.2 mi^2)	3.2 km^2 (1.2 mi^2)	—	0.5 km^2 (0.2 mi^2)
Unproductive Lands	1,082.2 km^2 (417.7 mi^2)	53.6 km^2 (20.7 mi^2)	3.9 km^2 (1.5 mi^2)	—
Total	17,288.7 km^2 (6,676.0 mi^2)	2,323.2 km^2 (896.8 mi^2)	122.8 km^2 (47.4 mi^2)	596.1 km^2 (230.1 mi^2)

Important Bird Areas (IBAs)

BLI (2008b, p. 2) has identified five IBAs that include the salmon-crested cockatoo. A site is recognized as an IBA when it meets criteria ''...based on the occurrence of key bird species that are vulnerable to global extinction or whose populations are otherwise irreplaceable.'' These key sites for conservation are small enough to be conserved in their entirety and large enough to support self-sustaining populations of the key bird species. IBAs are a way to identify conservation priorities (BLI 2008j, pp. 1–2). The following briefly describes the IBAs for the salmon-crested cockatoo:

Gunung Sahuwai. Located on the western peninsula of Seram, Gunung Sahuwai contains 122.8 km^2 (47.4 mi^2) of land that was declared a Nature Reserve on November 30, 1993 (SK Menteri Kehutanan No. 805/Kpts-II/1993) (BLI 2008c, p. 2). The Nature Reserve contains 96.8 percent lowland forest and 3.2 percent unproductive lands (see Table 1) (Kinnaird *et al.* 2003, p. 230). The number of cockatoos here is unknown. The coastal area contains 14 settlements. Most people work as farmers and fishermen. The main commodities are cloves, nutmeg, and coconut for copra. The local people hunt and collect forest products. Conservation concerns relate to the clearance of natural habitat for plantation, shifting agriculture, and collection of birds (BLI 2008c, pp. 1–2).

Gunung Salahutu. The habitat is forest, and the topography is hilly up to 1,038 m (3,405 ft). The cockatoo was found in this area at one time, but is probably extinct here now. The coastal area contains two villages. Most of the people work as dry land farmers and fishermen. The main commodities are clove, nutmeg, cacao, and marine products. Conservation concerns relate to forest clearance for plantation, firewood collection, and hunting of animals for consumption or pets (BLI 2008d, pp. 1–2).

Manusela. This area consists of forests and wetlands (BLI 2008e, pp. 1–2). Manusela National Park is located in the central part of Seram and stretches from the north coast to within 5 km (3 mi) of the south coast (Edwards 1993, p. 6). It is 2,323.2 km^2 (896.8 mi^2) in size and covers approximately 10 to 11 percent of Seram (BLI 2008e, p. 2; Bowler & Taylor 1993, p. 158; Kinnaird *et al.* 2003, p. 228; Marsden 1992, p. 7; Smiet & Siallagan 1981, p. 3). It was declared a national park in 1982 (SK Menteri Pertanian No. 736/Mentan/X/1982 on October 14, 1982) (BLI 2008e, p. 2). Based on landsat images from late 1989 and early 1990, habitat and land use for Manusela National Park can be summarized as: 65.5 percent lowland forest; 29.9 percent montane forest; and 4.6 percent agriculture, settlement, and unproductive lands (see Table 1) (Kinnaird *et al.* 2003, p. 230). Approximately, 26 percent of the park is above 1,000 m (3,608 ft), an altitude where the salmon-crested cockatoo generally does not occur, and only 27 percent is below 500 m (1,640 ft), an altitude preferred by the salmon-crested cockatoo (Marsden 1992, p. 7). A road has been built through the park, which increases the risks of logging (Metz 1998, p. 10). Five villages of indigenous people exist as an enclave of the park. Most of the people work as dry land farmers; they also hunt and collect forest products, such as sago, rattan, resin, eaglewood, and parrots (BlI 2008e, p. 1). In 1980, 999 people lived within the park boundaries, and 19,102 lived within 10 km (6 mi) of its boundaries (Smiet & Siallagan 1981, App. 6). Clearing of the land for agriculture and gardens has resulted in a patchwork of cleared fields, secondary vegetation (including large bamboo thickets), old growth forests, and undisturbed primary forests. Conservation concerns relate to logging, road development, encroachment by plantation companies, mining (MacKinnon & Artha 1981; Monk *et al.* 1997, as cited in BLI 2008e, p. 2), shifting agriculture, and parrot catching for trade (BLI 2008e, pp. 1–2).

Pegunungan Taunusa. The habitat is forest and the area has a mountain with the highest peak in Seram. The southern coastal area contains five villages. Most of the people work as farmers and fishermen. Main products are coconut for copra, clove, and cacao (BLI 2008f, p. 1). The Service was unable to find information on the number of salmon-crested cockatoos in this area or activities that may be affecting the conservation of the species in Pegunungan Taunusa.

Wai Bula. The habitat is forest in northeastern Seram. BLI (2008f, p. 1) estimates that Wae Wufa, an area inside Wai Bula that is primary lowland and lower montane evergreen forests, has around 40–60 salmon-crested cockatoos. Approximately 596.1 km^2 (230.1 mi^2) of Wai Bula was proposed as a Nature Reserve in 1981, but the area has never been officially designated as a reserve (Kinnaird *et al.* 2003, p. 228). Land use for the proposed Nature Reserve can be summarized as follows: 94.2 percent lowland forest; 1.6 percent mangrove forest; 2.4 percent swamp forest; and 2.5 percent agriculture and settlement (see Table 1). Based on density estimates derived from surveys in western Seram, researchers estimated that the area provides habitat for a minimum of 2,500 cockatoos (Kinnaird *et al.* 2003, pp. 230, 233) (see Factor A for discussion). This estimate differs significantly from the number of cockatoos estimated by BLI to occur inside Wae Wufa. We were unable to reconcile these estimates because we could not find information on the area of Wae Wufa, how much of the cockatoo's suitable habitat within Wai Bula occurs in Wae Wufa, and the basis for the BLI estimate. The coast contains four villages. Most people work as farmers and fishermen. The main plantation products are coconut for copra, cacao, and coffee. The conservation concern relates to logging (BLI 2008g, pp. 1–2).

Natural History

Behavior. The salmon-crested cockatoo is most active in early morning and late afternoon (Juniper & Parr 1998, p. 281; Metz *et al.* 2007, p. 36), calling loudly when leaving and returning to roost. The cockatoo's call is a wailing cry, which can be heard from a distance of 1 km (0.6 mi), and roosts can easily be located due to the noise. The species is shy and flies off when disturbed. Birds move slowly through the canopy in the early morning and are usually not seen or heard during the heat of the day. They are found in groups of up to 16 birds, although the size of non-breeding flocks appear to have been dramatically reduced due to the recent population decline (Juniper & Parr 1998, p. 281). They fly using a few rapid wing beats, followed by gliding, and then a few more wing beats (Forshaw 1989, p. 141; Juniper & Parr 1998, p. 281).

Food. This species feeds on fruit of the kenari tree (*Canarium commune, C. vulgare*, and *C. indicum*) (Metz *et al.* 2007, p. 37), nuts, seeds, berries, and insects (Forshaw 1989, p. 141; Juniper & Parr 1998, p. 281). Their abundance is positively related to the density of strangling figs, a potentially important food resource (Kinnaird *et al.* 2003, p. 233). Research by O'Brien *et al.* (1998, p. 668) showed that figs may be a keystone plant resource for many fruit-eating birds. On the average, figs contain calcium levels 3.2 times higher than other fruits, promoting eggshell deposition and bone growth. Salmon-crested cockatoos are suspected of taking *Pandanus* spp. fruits (Bishop in prep., as cited in BLI 2001, p. 1665). They pick larvae from fallen, rotting tree trunks (Metz *et al.* 2007, p. 37). They also eat young coconuts (*Cocos nucifera*) by chewing through the tough outer covering to get at the pulp and water inside (Forshaw 1989, p. 141; Juniper & Parr 1998, p. 281; Wallace 1864, p. 279). In general, island cockatoos are thought to need to exploit all the available food in order to maintain a healthy population because islands typically contain fewer plant species and the quantity of food is restricted by an islands' relatively small size (Cameron 2007, p. 83).

Breeding. Its favored nest tree is *Octomeles sumatranus* (Kinnaird *et al.* 2003, p. 230). During times of nest building, brooding, and fledging, birds stay close to the nest tree (Metz *et al.* 2007, p. 36). Courtship display can last up to 20 minutes, with the male and female perched in the top of an emergent or dead forest tree, raising and lowering their crests, fanning their large face and neck feathers forward to increase the size of the head (Cameron 2007, p. 57), calling loudly, breaking twigs, and making short, weak, fluttering flights. The nest is a high hole in a mature tree (Juniper & Parr 1998, p. 281). The salmon-crested cockatoo removes the bark immediately surrounding the entrance to help prevent predators, such as snakes or monitor lizards, from gaining access to the eggs or chicks, and may also clear the surrounding foliage perhaps to have a better view for the brooding hen. The nest site is fiercely guarded from competitors, such as the Eclectus parrot (*Eclectus roratus*) (Metz *et al.* 2007, p. 37).

Little is known about seasonality and breeding biology of the salmon-crested cockatoo in the wild (Kinnaird *et al.* 2003, p. 228), or other demographic information, such as reproductive effort and success and age-specific mortality rates—information that is important to determine where the primary weak points in the life equation lie (Snyder *et al.* 2000, p. 9). The cockatoo is thought to breed between July and August or September, and probably a second time at the beginning of the year (Metz & Zimmermann n.d., p. 1). Stresemann (1914, p. 86) observed a pair in a nesting cavity about 25 m (82 ft) up the truck of a living tree in early May. The cockatoo lines the cavity with wood chips, and usually lays two white eggs, although only one is raised (Metz & Zimmermann n.d., p. 1). Both parents help to incubate the eggs during the 28–day incubation period. Young birds take 4–5 years to reach maturity (Juniper & Parr 1998, p. 281).

Population Estimates

Seram—historical population estimates. Historically, there are few quantitative observations of this species in the wild. In 1864, Wallace (1864, p. 279) described the salmon-crested cockatoo as ''abundant'' on Seram. In 1911, Stresemann (1914, p. 86) reported that the species was fairly common in coastal regions. The species was regarded as locally common in 1970 (Juniper & Parr 1998, p. 281). During 1980 and 1981 (Forshaw 1989, p. 141), Smiet (1985, p. 189) observed that this species was locally common in primary forests up to 900 m (2,952 ft) in the interior and in undisturbed forests, where 10 to 16 birds were seen congregating in roosting trees. He did not see any birds on the western part of the island, although the cockatoo was said to be common there until about 1970. In 1980, small flocks were observed in the south of the island (White & Bruce 1986, p. 212), and cockatoos were frequently seen throughout Manusela National Park below 900 m, except in the southern part of the Mual Plains in the center of the park where they were not common (Smiet & Siallagan 1981, p. 9). In September 1983, Bishop (1992, p. 2) observed four cockatoos in secondary woodland in southwest Seram.

Rangers at the Manusela National Park commented on a dramatic decline in the species in the mid-1980s (Collar & Andrew 1988, p. 69). By 1987, it was the rarest parrot in Manusela National Park (Bishop 1992, p. 2). Due to the international pet trade, Bishop considered the species to be endangered and in need of critical management to avoid imminent extinction (Bishop 1992, p. 1). Between July 20 and September 25, 1987, an Operation Raleigh team found the species to be ''very scarce and absent from large tracts of suitable habitat'' in Manusela National Park (Bowler 1988, p. 6). During 40 days of field work, they made 54 sightings, resulting in a maximum of 20 individual birds in prime habitat. In addition, birds were observed either singly or in pairs, never in flocks. Encounter rates were the lowest of any parrot species at 0.3 birds per hour in lowland rain forests around Solea at about 100 m (328 ft) and 0.1 per hour in the Kineka area at 600–900 m (1,968–2,952 ft) (Bowler 1988, p. 6; Bowler & Taylor 1989, p. 17). Marsden (1992, pp. 11–12) suggested that the densities of cockatoos, which Bowler and Taylor found in the Manusela National Park enclave, may be naturally low because the forest has been heavily disturbed and the area is at the upper end of the species' altitudinal range. He found it difficult to relate Bowler and Taylor's low figures for lowland forests around Solea to what he found in 1989 (see below). BLI also questioned the validity of the numbers, because Bowler and Taylor are now judged to have worked mainly at higher elevations in Manusela (BLI 2001, pp. 1664, 1668). Metz (1998, p. 10) suggested that the stronghold of this cockatoo is likely on Seram, almost exclusively outside of the borders of the national park.

During 5 weeks from December 19, 1989, Marsden (1992, pp. 7–8; Marsden 1998, p. 606) collected field data in Manusela National Park and in lowland habitats in central and northeast Seram, using the variable circular plot method to estimate densities of the salmon-crested cockatoo. Encounter rates were 1.0 bird per hour in primary forests, 2.5 birds in disturbed primary forests, and 0.4 birds in secondary and in recently logged forests. While cockatoo densities were similar in primary (9.1 birds per 1 km^2 (0.386 mi^2)) and disturbed primary forests (9.8 birds), densities were lower in secondary forests (6.4 birds), and much lower in recently logged forests (1.9 birds), suggesting that large-scale logging might adversely affect the species' population.

Between July and September 1996, the *Wai Bula '96* (a conservation expedition from Cambridge University and Universitas Pattimura, Ambon) found the salmon-crested cockatoo to be widely dispersed in northeast Seram in the Wae Fufa Valley (primary lowland and lower montane evergreen forests) and in degraded coastal forests near Hoti (coastal secondary lowland forests), where pairs and small flocks were a common sight. They suggested that the bulk of the population probably occurs in eastern Seram (Isherwood *et al.* 1998, p. 18). Juniper & Parr (1998, p. 281) reported that the world population was ''thought still to be above 8,000.''

Seram—recent population estimates. The most recent research (Kinnaird *et al.* 2003, p. 232) estimated the total salmon-crested cockatoo population to be 110,385 birds (with confidence limits of a minimum 62,416 and a maximum of 195,242). Based on the research assumptions (see below), we agree with BLI (2001, p. 1664) that ''...the figure of 62,400 is chosen as the appropriate population figure.''

These numbers were generated by joint population surveys conducted by the Wildlife Conservation Society Indonesia Program, BLI Indonesia Program, and Pelastarian Hutan Dan Konservasi Alam, Ministry of Forestry, Government of Indonesia in May–September 1998. Cockatoo censuses were conducted at seven sites in western and central Seram using line-transect methods (Kinnaird *et al.* 2003, pp. 228, 230, 234). Five of the sites were considered primary lowland forest and two had been previously logged or were disturbed by humans (Kinnaird *et al.* 2003, p. 228). Cockatoos were observed at all sites as single individuals or pairs. Estimates of density varied widely among locations, ranging from 0.93 birds per 1 km^2 (0.386 mi^2) at Kawa to 17.25 birds per 1 km^2 at Roho. The mean density was 7.87 birds per 1 km^2, which was considered indicative of all sites because it included estimates from primary and logged forests. The researchers were unable to complete the census before the outbreak of civil war; thus, data from the western part of Seram were used to estimate the number of cockatoos on all of Seram.

The estimated population was generated by working with GIS-based estimates of lowland forest habitat on Seram (14,026 km^2 (5,414.2 mi^2)) below 600 m (1,968 ft) and assuming that all lowland forests provide adequate habitat for cockatoos and that densities remain constant across the island (Kinnaird *et al.* 2003, p. 232). Because these assumptions are unlikely, Kinnaird (2000, p. 15) explained the scenarios considered by the researchers. Cockatoos are fairly tolerant of degraded habitat, but they still need nesting trees and have a preference for areas with lots of large strangling figs. So, the first scenario looked at involved the number and extent of logging concessions operating on Seram during the 10–year-period from 1989–1999, which resulted in a reduction of 1,200 km^2 (463 mi^2) of lowland forest habitat for cockatoos.

The population estimate still hovered between 90,000 and 100,000 birds. The second scenario looked at continued logging and habitat loss during the next decade, projecting that the population size would decline by another 10 percent. These estimates may have underestimated cockatoo population size because many logging concessions are not working at full capacity. On the other hand, the estimates ignored additional losses due to the capturing of birds for the pet trade. The population estimate also ignored the variability in how logging companies harvest their concessions (i.e., greater or less than the legal maximum intensity). If logging concessions harvest timber in a conventional manner of up to 1,000 hectare (ha) (2,470 acre (ac)) per year, Kinnaird *et al.* (2008, p. 233) assumed that cockatoos will persist but at possibly lower densities.

In 1985, Smiet (1985, pp. 193–194) suggested that the relative resilience of most Moluccan parrots under trade pressure and habitat destruction can be attributed to a combination of factors, including: (1) A great reproductive capacity (especially in the smaller species); (2) adaptability to habitat alteration (which tends to provide a relative abundance of flowering and fruiting plants); (3) persistence of some original, undisturbed habitat; and (4) island isolation and lack of predators, parasites, and competitive species. Metz (2005, p. 34), however, cautioned that the current population estimate should not be a ''cause for complacency.'' He suggested that the number of birds capable of breeding, or the breeding success rate, might be low for this species since: they have a long life span, and many birds might be past breeding age; there is a very high poaching pressure and trappers mostly take adult birds, which depletes the number of breeding birds; and the salmon-crested cockatoo has a slow reproductive cycle and unknown, but possibly low, fledging success rate. These opinions point out the need for further research on this species to better understand its population size and its ability to adapt to the habitat destruction and trade that is occurring on Seram.

Ambon. Very small numbers of salmon-crested cockatoos are thought to occur in remaining natural forests in the more remote regions of Ambon (Poulsen & Jepson 1996, p. 160). While Smiet (1985, p. 189) lived on the island from 1980 to 1981, he did not see the species there; however, he wrote that the species was said to be common on Ambon until about 10 years ago. In 1992, Marsden (1992, pp. 12–13) reported seeing eight salmon-crested cockatoos and three unidentified cockatoos during brief searches of remaining forest patches on Ambon. He suggested that most free flying salmon-crested cockatoos on Ambon may be wild birds, either resident and possibly breeding or visiting birds from Seram. Local people told him that cockatoos were still present in the area, but rare in other forested areas on the island. Poulsen and Jepson (1996, pp. 159–160) confirmed that wild populations of salmon-crested cockatoos occur on Ambon. On May 28 and June 11, 1995, they observed six to eight cockatoos, in forested hills behind Hila on the north coast of the Hitu Peninsula, overlooking a forested valley at about 300 m (984 ft) and in forest edge around shifting cultivation at about 500 m (1,640 ft).

Conservation Status

The salmon-crested cockatoo is protected from capture and trade under Indonesian laws (Republic of Indonesia Law No. 5, 1990, and Law No. 7, 1999) (Kinnaird 2000, p. 14; Kinnaird *et al.* 2003, p. 228). Intentional violations may lead to imprisonment of up to 5 years and fines up to 100 million IDR (Indonesian rupiah) (which amounts to approximately 10,000 USD (U.S. dollar)). Negligent violations may lead to imprisonment of up to 1 year and fines up to 50 million IDR (5,000 USD). The government may seize and confiscate specimens of protected animals. The Department of Forest Protection and Nature Conservation is responsible for implementing the law, and the Natural Resources Conservation Agency, working with police, Customs, and other enforcement agencies, is responsible for enforcing the law (Shepherd *et al.* 2004, p. 4).

The species is listed on the IUCN (International Union for Conservation of Nature) Red List as 'Vulnerable' because it has suffered a rapid population decline as a result of trapping for the pet bird trade and because of deforestation in its small range. BLI (2004, p. 1) projects that the decline will continue and perhaps accelerate. Current populations are estimated at 62,400 individuals (Kinnaird *et al.* 2003, p. 232), with a decreasing population trend; the decline for the past and the future 10 years or 3 generations is estimated at 30 to 49 percent (BLI 2008b, p. 1). The current trend is justified by the suspected rapid decline of the species due to ongoing and prolific capture for the domestic pet trade (BLI 2008b, p. 2). Ongoing threats are habitat loss and degradation due to selective logging and clear-cutting, agriculture, infrastructure development (settlement and hydroelectric projects), and harvesting (hunting and gathering for the domestic and international pet trade) (BLI 2004, pp. 1–2).

The cockatoo is also protected by CITES, one of the most important means of controlling international trade in wild animals and plants. CITES is an international agreement where countries work together to ensure that international trade in CITES-listed animals and plants is not detrimental to the survival of wild populations by regulating import, export, and re-export. Although almost all Psittaciformes species were included in CITES Appendix II in 1981 (CITES 2008a, p. 1), the salmon-crested cockatoo was transferred to CITES Appendix I effective January 18, 1990, because populations were declining rapidly due to uncontrolled trapping for the pet bird trade (CITES 1989a, pp. 1–7). An Appendix-I listing includes species threatened with extinction whose trade is permitted only under exceptional circumstances, which generally precludes commercial trade. The import of an Appendix-I species requires the issuance of both an import and export permit. Import permits are issued only if findings are made that the import would be for purposes that are not detrimental to the survival of the species and that the specimen will not be used for primarily commercial purposes (CITES Article III(3)). Export permits are issued only if findings are made that the specimen was legally acquired and trade is not detrimental to the survival of the species (CITES Article III(2)). The United States and Indonesia, along with 173 other countries, are members to CITES (CITES 2009, p. 1).

The import of salmon-crested cockatoos into the United States is also regulated by the Wild Bird Conservation Act (WBCA) (16 U.S.C. 4901 *et seq.*), which was enacted on October 23, 1992. The purpose of the WBCA is to promote the conservation of exotic birds by ensuring that all trade involving the United States is sustainable and is not detrimental to the species. Permits may be issued to allow import of listed birds for scientific research, zoological breeding or display, or personal pet purposes when certain criteria are met. The Service may approve cooperative breeding programs and subsequent import permits under such programs. Wild-caught birds may be imported into the United States if they are subject to Service-approved management plans for sustainable use. At this time, the salmon-crested cockatoo is not part of a Service-approved cooperative breeding program and does not have an approved

management plan for wild-caught birds (FWS 2008, p. 1).

The IUCN *Status Survey and Conservation Action Plan 2000–2004 for Parrots* (Snyder *et al.* 2000, p. 66) identified a need to clarify the status of the salmon-crested cockatoo in the wild, including: (1) determining the species' relative abundance in each habitat type and (2) collecting information on the size and distribution of habitat types, trapping, timber extraction, and breeding success of cockatoos in primary and secondary forests because it is unknown if the salmon-crested cockatoo will survive in degraded secondary forests in the long term. At present, inadequate information on the species, its habitat, and the effects of human activities on the species makes it difficult to make recommendations on regional development, such as reserve boundaries, land-use zoning, and possible new provincial forestry and agriculture policies, to ensure the species' survival. The information would also provide a baseline for monitoring and determining the degree to which trade affects the status of this species (Snyder *et al.* 2000, pp. 66, 69).

Species Information and Factors Affecting the Salmon-crested Cockatoo

Under section 4(a) of the Act (16 U.S.C. 1533(a)(1)) and regulations promulgated to implement the listing provisions of the Act (50 CFR part 424), we may list a species as threatened and endangered on the basis of five factors. The five factors are: (A) 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) inadequacy of existing regulatory mechanisms; or (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. Below is the Service's five-factor analysis for the salmon-crested cockatoo.

Foreseeable Future

Although section 3 of the Act uses the term ''foreseeable future'' in the definition of a threatened species, it does not define the term. For purpose of this proposed rule, we defined ''foreseeable future'' to be the extent to which, given the amount and quality of available data, we can anticipate events or effects, or extrapolate trends of a threat, such that reliable predictions can be made concerning the future of the species. In the analysis of the five factors below, we consider and describe how the foreseeable future relates to the status of the salmon-crested cockatoo in view of population trends and threats to the species.

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

The lowland forest habitat of the salmon-crested cockatoo is being impacted by logging (including the failure to use wise logging practices during selective logging), illegal logging, conversion of forests to agriculture and plantations, transmigration of people, oil exploration, and infrastructure development.

Logging. Commercial timber extraction is listed by the IUCN Red List to be a continuing major threat to the salmon-crested cockatoo, with a medium impact and a slow decline of the species (BLI 2008b, p. 3). Research that looked at species-area relationship suggested that deforestation affects endemic bird species restricted to single islands most severely (Brooks *et al.* 1997, p. 392).

In Indonesia as a whole, between 2000 and 2005, forest cover declined by more than 90,000 km^2 (34,740 mi^2). Lowland areas, which offer important habitat for Indonesia's cockatoos, have been the most severely impacted (Cameron 2007, p. 177; Rhee *et al.* 2004, chap. 1 p. 2). On the islands of Sumatra and Kalimantan (Indonesian islands to the far west of Seram), the World Bank predicted that all lowland rain forests outside of protected areas would be degraded by 2005 and 2010, respectively (Rhee *et al.* 2004, p. xviii). In many areas of Indonesia, most commercially valuable forests have already been logged. Thus, major commercial logging enterprises are now focused on islands in Maluku Province, including Seram (BLI 2008k, p. 6; Smiet 1985, p. 181).

The impact of logging has steadily increased on Seram, with logging becoming more intense during the 1990s (BLI 2008k, p. 6). Deforestation in some areas has been extensive through selective logging of *Shorea* spp. (Ellen 1993, p. 201), such that by 2001, about a fifth of the original forest cover had been cleared (Morrison 2001, p. 1), with most of the coastal areas converted to grassland, agriculture, plantations, or scrub (Marsden 1992, p. 7). Although large areas of contiguous, intact forests remain (Morrison 2001, p. 1), 50 percent of forest, which are spread over the island, are under logging concessions. The north dipterocarp forests are still dominated by the endemic *Shorea selanica*, a tree especially vulnerable to logging as it grows tall and straight and is much favored by Western and Japanese markets (Edwards 1993, p. 9). Once the primary forest is logged, experience on nearby Indonesian islands shows that secondary forest is generally converted to other uses or logged again rather than being allowed to return to primary forest (Barr 2001, pp. 64, 67; Grimmett & Sumarauw 2000, p. 8; Jepson *et al.* 2001, p. 859).

Selective logging is the primary technique for the extraction of timber in Indonesia (BLI 2008k, p. 6). In selective logging, the most valuable trees from a forest are commercially extracted (Johns 1988, p. 31), and the forest is left to regenerate naturally or usually with some management until subsequently logged again. Johns (1988, p. 31), looking at a West Malaysian dipterocarp forest, found that mechanized selective logging in tropical rain forests, which usually removes a small percent of timber trees, causes severe incidental damage. The extraction of 3.3 percent of trees destroyed 50.9 percent of the forest. He concluded that this type of logging reduced the availability of food sources for frugivores (fruit-eaters). Edwards (1993, p. 9) observed a similar problem on Seram. Timber companies, operating under a selective logging system, caused considerable damage to the surrounding forest, both to trees and soil. Forests selectively logged 15 years before had an open structure with skeletons of incidentally killed trees, serious gulley erosion, and vegetation on waterlogged sites that had been compacted by heavy vehicles. Also, commercial logging uses a network of roads, which can lead to secondary problems (BLI 2008k, p. 6), such as providing access to trappers of parrots.

Since selective logging targets mature trees, it can have a disproportionate impact on hole-nesters, such as cockatoos, because fewer nest sites remain (BLI 2008k, p. 6). Also, unsustainable logging practices that destroy the forest canopy reduce habitat available to the salmon-crested cockatoo. Kinnaird *et al.* (2003, pp. 233–234) found that the abundance of cockatoos was positively related to the density of its favored nest tree, *Octomeles sumatranus*, and strangling figs, a potentially important food resource. These trees would be impacted by logging, emphasizing the need to implement wise logging practices, such as those based on reduced-impact logging techniques. However, these techniques, which are recommended under Indonesia's selective logging system, are seldom applied because of the lack of control over harvesting practices, limited

understanding of how to implement the measures, and high financial costs (Sist *et al.* 1998, p. 1). Specifically, the pre- and post-logging inventories are not conducted properly or are not reported truthfully; over-cutting above the annual plan occurs; frequent cutting outside approved boundaries occurs; re-logging is more frequent than recommended; and supervision by the Ministry of Forestry has been ineffective (Thompson 1996, p. 9).

The salmon-crested cockatoo is dependent on little-disturbed lowland forests. In a field study conducted from December 19, 1989, for 5 weeks, Marsden (1992, pp. 7–13) looked at the distribution, abundance, and habitat preferences of the salmon-crested cockatoo on Seram. Results suggested that while cockatoo densities were similar in primary and disturbed primary forests, densities were lower in secondary forests, and much lower in recently logged forests (Marsden 1992, p. 9). In total, 84 cockatoos were recorded at 132 stations, either singly or in pairs, on 34 occasions. Groups of more than 4 birds were recorded 3 times, with the maximum group size of 10. Although cockatoos were found at different densities in different land-use types, more cockatoos were present where habitat alterations occurred on a small scale. Cockatoos tended to be recorded in mature, open-canopied lowland forests with some very large, tall trees and some low vegetation. Most significantly, Marsden found that there may have been a reduction of the cockatoo population by about 700 birds for each 100 km^2 (86 mi^2) of Seram's primary forests that had been selectively logged in the last 6 years. Similarly, the conversion of 100 km^2 of locally disturbed secondary forests to plantation could result in the loss of around 600 birds (Marsden 1992, p. 12).

Marsden (1998, pp. 605–611) also looked at changes in bird abundance following selective logging on Seram. Field work was conducted in forested areas in the central and northeast parts of the island. Logged forests usually had sparser canopy and mid-level vegetation cover and denser ground cover than unlogged forests (Marsden 1998, pp. 605, 607–608). Using a point count method to estimate population densities, Marsden (1998, p. 608; 1999, p. 380) found that salmon-crested cockatoo density estimates in unlogged forests below 300 m (984 ft) were more than double those in logged forests. Because the cockatoo is caught for the pet trade, Marsden was unable to separate the effects of habitat change, such as loss of nest holes, from possible effects of logging on capture rates (for example, increased accessibility to trappers) (Marsden 1998, p. 610). Although Kinnaird *et al.* (2003, p. 233) found the highest cockatoo densities in primary forest habitat with good structure and lower densities in logged or disturbed sites, they did not find a statistically significant difference in cockatoo densities between logged and unlogged forests. They surmised this may have been because of the intensity of logging or, more likely, reflected the mosaic of habitat types found within their sampling sites. They speculated that there is a continuum of cockatoo densities in logged forests depending on the intensity of logging and access provided to trappers.

Logging concessions are spread over the island, except there are no concessions in Gunung Sahuai Nature Reserve and only 15 percent of Manusela National Park is under concessions (Kinnaird *et al.* 2003, p. 231). About half the island (8,271 km^2 (3,193 mi^2)) is held within logging concessions, with more than 75 percent within lowland habitat favored by the salmon-crested cockatoo (Kinnaird *et al.* 2003, pp. 227, 233). This means that less than 30 percent of the island's lowland forests (5,096 km^2 (1,967 mi^2)) is unoccupied by logging concessions. In 1998, Kinnaird *et al.* (2003, pp. 233–234) were unable to find out the area of land scheduled for logging. However, Kinnaird (2000, p. 15) was able to obtain information from the Ministry of Forestry that showed 12 logging concessions have been operating on Seram during the 10–year period from 1989–1999. If the concessions have been logged at a maximum intensity of 10 km^2 (3.86 mi^2)/year/concession and that logging was conducted in a conventional manner that results in 70 percent damage to the canopy, lowland forest habitat for cockatoos would be reduced by 1,200 km^2 (463 mi^2), or 8.5 percent, in 10 years. The researcher concluded in 2000 that overall the loss of habitat has not reached a level where it is perceived as a serious threat to cockatoos. However, the cockatoo remains under threat (Kinnaird 2000, p. 15). We have no reason to believe that the effects of logging on the species will be ameliorated in the foreseeable future, but may increase because commercial logging enterprises are now focused on the Moluku Province, including Seram.

The researchers were forced to leave the island because of civil unrest. They suggested that the pressure for land conversion will accelerate dramatically once social and economic stability returns to Seram, especially in the lowlands, and this will be made worse by the 1999 regional autonomy laws that allow for local authorities to determine licensing of forest concessions and exploitation of natural resources. They concluded that the proper management of Seram's logging concessions would determine the future of the salmon-crested cockatoo (Kinnaird *et al.* 2003, p. 234).

Approximately 14 percent of Seram's forests (or 11.5 percent of lowland forests) are protected in Manusela National Park (2,216.4 km^2 (855.5 mi^2)) and Gunung Sahuwai Nature Reserve (118.9 km^2 (45.9 mi^2)). In Manusela National Park, 15 percent of the forest is within logging concessions. In 1981, Smiet and Siallagan (1981, pp. 11–12, 22) reported that large patches of forest in the coastal region of the Mual Plains had been disturbed by logging activities—forests along the southeastern boundary of the park had been cleared up to 400 m (1,312 ft) and planted with clove and coconut plantations. They advocated the development of a buffer zone between the park and the densely populated coastal area because more and more forests at increasing altitudes were being cleared. Kinnaird *et al.* (2003, p. 233) estimated that the protected areas in Seram provide habitat for a minimum of 7,300 salmon-crested cockatoos based on density estimates derived from their surveys. However, logging has recently occurred inside Manusela National Park, and, once logging has concluded, there are pressures to change the land use to agriculture or plantations (BLI 2008k, p. 7). Kinnaird *et al.* (2003, p. 233) also estimated that the proposed Wai Bula nature reserve, 561.8 km^2 (216.9 mi^2) of lowland forests located in the northeastern part of Seram, provides habitat for a minimum of 2,500 cockatoos. We believe that this population estimate, which is based on the availability of suitable habitat, may be an overestimate because the Wai Bula area is currently not protected (it was proposed as a nature reserve in 1981 and the probability of it being officially designed is now low) and 93 percent of the area is under logging concessions.

Illegal logging. Illegal logging is considered to be a leading cause of forest degradation in Indonesia (Rhee *et al.* 2004, chap. 6 p. 7). It is pervasive, and the Indonesian government has been unable to enforce its own forest boundaries (Barr 2001, p. 40). Illegal logging includes overharvesting beyond legal and sustainable quotas, harvesting of trees from steep slopes and riparian habitat, timber harvesting and land encroachment in conservation areas and protection forests, and falsification of documents. Overexploitation of the forests and illegal logging are driven by

the wood-processing industry, which consumes at least six times the officially allowed harvest (Rhee *et al.* 2004, pp. xvii, chap. 6 p. 8). Illegal logging in the national parks also is reported with regularity, and the persons involved are armed and ruthless (Whitten *et al.* 2001, p. 2).

Although the Indonesian government issued Presidential Instruction No. 4/2005 to eradicate illegal logging in forest areas and distribution throughout Indonesia (see Factor C) (FAOLEX 2009, p. 1), illegal logging continues. The Center for International Forestry Research estimated that between 55 and 75 percent of logging in Indonesia is illegal (U.S. Agency for International Development (USAID) 2004, p. 1). Contributing factors include poor forest governance, rapid decentralization of government, abuse of local political powers, complicity of the military and police in some parts of the country, inconsistent enforcement of the law, and dwindling power of the central government (USAID 2004, pp. 3, 9). Jepson *et al.* (2001, pp. 859–861) found illegal logging crews operating freely in December 2000 in protected areas and forest concessions in Sumatra and Kalimantan, Indonesia. Local government officials were in collusion with illegal loggers by turning a blind eye to the practice or providing permits for timber transport. Some government officials, who wanted to stop illegal logging, faced serious intimidation. Jepson *et al.* concluded that illegal logging was becoming semi-legal and the de facto arrangement for governing Indonesia's forests.

Conversion of forests to agriculture and plantations. Indonesia is a rapidly developing country with a projected population of 235 million by 2015 (Snyder *et al.* 2000, p. 59). A growing population on Seram has converted forest into cultivated land, with human settlements and plantations typically located in lowland coastal areas (Smiet 1985, pp. 181, 183). Based on data from landsat images from late 1989 and early 1990 (Kinnaird *et al.* 2003, p. 230), land use in Seram is as follows: 4.6 percent in agriculture, 0.1 percent in plantations, and 0.1 percent in settlements (see Table 1 below). Although these percentages are low, forests continue to be converted for agriculture and plantations.

Near the coast, forests have been replaced with plantations of coconut, oil palm, and spices. Inland, forests on rich alluvial soil, once timbered, are liable to be converted to agricultural fields. Part of the Indonesian government's long-term planning strategy is to develop more efficient agriculture through improved and appropriate techniques to help alleviate poverty. If the plan is carefully implemented, improved agricultural techniques could reduce pressure on areas of natural habitat (BLI 2008k, pp. 7–8). However, Snyder *et al.* (2000, p. 66) cautioned that, since most of Seram's forests are under timber concessions, the island's development priority could mean that forests over good soil may be converted to wet rice cultivation and other crops. The salmon-crested cockatoo is unable to exist in this type of habitat (Snyder *et al.* 2000, p. 66).

Approximately 6,220 km^2 (2,401 mi^2) of Seram's lowland forest is slated for conversion to agriculture or plantations (45 percent within logging concessions). By 2028, most of this land will probably be converted to these uses that provide no habitat for cockatoos, resulting in habitat loss for at least 31,000 cockatoos and reducing the total island population to around 30,400 individuals (Kinnaird *et al.* 2003, p. 233).

Transmigration. Indonesia has long had a policy to resettle people, mainly from Java, to develop the less populated regions of the country, with the Maluku Province being a major destination (BLI 2008k, p. 8). From 1969–1989, some 730,000 families were relocated in Indonesia (Library of Congress 1992, p. 1). While the scale of transmigration has been reduced over the past decade, the recent unrest in Maluku led to large-scale movement of people. In some areas, these movements of people have had serious negative effects on the environment, involving land disputes with indigenous inhabitants (Library of Congress 1992, p. 1), forest clearance for agriculture, unsustainable slash-and-burn farming (BLI 2008k, p. 8), and introduction of wet rice cultivation (Ellen 1993, p. 200).

Oil exploration. In 1993, a significant oil discovery was made in eastern Seram—the Non-Bula Block, which occupies an area of about 4,572 km^2 (1,765 mi^2). Development was delayed until 2002 (Lion Energy Limited 2009, p. 2). The average output from the main oil field in the first half of 2006 was 4,300 barrels per day (Entrepreneur 2009, p. 1). The main field in the Seram Non-Bula Block is the Oseil Field. The gross oil reserves in that field have been estimated to be about 39 million barrels—7 million barrels of proven reserves, 6 million barrels of probable reserves, and 26 million barrels of possible reserves (International Business Times 2009, p. 1). In 2008, oil was discovered in a new well, which lies 4 km (2.5 mi) from the Oseil Field. The investment firm is currently petitioning the Indonesian government to begin production and export operations from the new field (E&P Magazine 2008, p. 1). Generally, oil development areas cover large tracts of land, but the area occupied by permanent facilities including pipelines and refineries are relatively small. However, oil development can have significant negative impacts on nearby habitat through construction of roads and other buildings, discharge of refineries, and oil spills and leaks (Rhee *et al.* 2004, chap. 6 p. 31).

Infrastructure development. Seram is remote, with no airport and only rudimentary ground transportation (Morrison 2001, p. 5). An essential part of regional development is the improvement of roads. However, new roads can cause serious environmental problems (BLI 2008k, p. 8), as shown by the Trans-Seram Highway, which threatens forest habitat by illegal logging, land clearance, and soil erosion (Morrison 2001, p. 5). The excavation of sand for local road construction has affected some habitat on Seram. Previous proposals for a large cement factory, with a quarry and hydroelectric dam, close to Manusela National Park appear to have been abandoned (BLI 2008k, p. 8).

Summary of Factor A

The salmon-crested cockatoo resides in lowland forests predominately between 100–600 m (328–1,968 ft) throughout the island, with the highest densities of birds occurring in little-disturbed forests. Logging and illegal logging are primary threats to the habitat of this species, with the threats occurring throughout the island in lowland forests.

Cockatoos are highly impacted by selective logging of primary forests. Selective logging, which targets mature trees, has a negative impact on hole-nesters, such as the salmon-crested cockatoo. Research found that the abundance of cockatoos was positively related to the density of its favored nest tree and strangling figs, trees that would be impacted by logging, especially since reduced-impact logging techniques are seldom applied.

Research also found that for every 100 km^2 (38.6 mi^2) of Seram's primary forests that were selectively logged in the last 6 years, 700 birds were likely lost from the cockatoo population. Similarly, for every 100 km^2 of locally disturbed secondary forest that were converted to plantations, 600 birds were likely lost from the cockatoo population. The cockatoo's density estimates in logged forests below 300 m (984 ft) were more than half those in unlogged forests, although researchers were

unable to separate the effects of habitat change from the possible effects of logging on trapping rates (see Factor B).

Once the primary forest is logged, experience on other nearby Indonesian islands shows that the secondary forest is generally converted to other uses or logged again rather than being allowed to return to primary forest. Therefore, although cockatoos may continue to inhabit secondary forests on Seram, the population will be at a substantially lower number. The trend of high loss of primary forests and degradation of secondary forests is of concern because little is known about the reproductive ecology of the salmon-crested cockatoo in the wild, including breeding success in mature forests versus secondary forests, and whether the cockatoo will survive in degraded forests in the long term. Also, the size of groups of cockatoos observed was drastically smaller in research conducted in 1998, where 75 percent of birds were observed as single individuals and 22 percent in pairs, compared to earlier reports, where groups of up to 16 birds were seen.

By 2001, approximately 20 percent of the original forest cover on Seram had been cleared. About 50 percent of the island's forests were held under logging concessions, with more than 75 percent within the salmon-crested cockatoo's favored lowland habitat. Based on information from the Ministry of Forestry in Indonesia, researchers estimated that the cockatoo lost 1,200 km^2 (463 mi^2), or 8.5 percent, of habitat between 1989 and 1999 due to logging. Although we have no information on the current status of logging concessions or actual logging (legal and illegal) activity on Seram since 1999, we anticipate that the rate of loss of cockatoo habitat due to logging will continue at the 1989-1999 level or increase because commercial logging enterprises are now focused on Seram. We have no information that indicates that this trend will be reversed in the foreseeable future.

In addition, approximately 44 percent of Seram's lowland forests (6,220 km^2 (2,401 mi^2)) is designated as conversion forest, of which 45 percent is within logging concessions. It is predicted that by 2028 up to 50 percent of the current population (at least 31,000 cockatoos) may be lost as a result of conversion of forests to agriculture and plantations, which provide no habitat to the cockatoo.

Approximately 11.7 percent of Seram's lowland forests are protected in Manusela National Park and Gunung Sahuwai Nature Reserve. Researchers estimated that these protected areas could provide habitat for up to 7,300 salmon-crested cockatoos. However, about 15 percent of the national park is under logging concessions and illegal logging has been occurring. Once the land is logged, the land use is often changed to agriculture.

The resettlement of people on Seram has had negative effects on the environment and the habitat of the salmon-crested cockatoo. These negative effects include forest clearance for agriculture, unsustainable slash-and-burn farming, and introduction of wet rice cultivation. The relatively recent development of oil production on Seram most likely has adversely affected the cockatoo's habitat. Potential development of such a large part of Seram (the current Non-Bula Block occupies one-quarter of the island) is a concern because at one time the salmon-crested cockatoo appeared to be mostly distributed in the eastern part of the island. Although we do not know what forest habitat has been destroyed, we do know that oil development on Seram will have a negative impact on nearby habitat through road building and other construction, discharge of refineries, and oil spills and leaks. Further, an essential part of regional development is infrastructure development, primarily the improvement of roads, which leads to illegal logging and land clearance, as well as facilitates bird trapping.

In summary, extensive logging and conversion of lowland forests to agriculture and plantations, combined with transmigratory human resettlement, oil exploration, and infrastructure development, are likely to destroy much of the lowland rain forests of Seram, the salmon-crested cockatoo's habitat by 2025. Therefore, we find that habitat destruction is a threat to the continued existence of this species throughout all of its range in the foreseeable future.

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

The salmon-crested cockatoo is a very popular pet bird. In the 1980s, it suffered a rapid population decline due to trapping largely for international trade. Below we analyze the impact of international and domestic trade and other uses for recreational, scientific, or educational purposes. We also consider and describe programs on Seram to support the conservation of the cockatoo—the release of confiscated cockatoos and local involvement.

International and domestic commercial trade. International wildlife trade is big business and has been identified as contributing to the decline of a number of bird species, including the salmon-crested cockatoo (BLI 2008h, p. 1). The majority of wild-caught birds in international trade are sold as pets (Thomsen *et al.* 1992, p. 5). In addition, in Indonesia, pet birds, particularly parrots, are an important part of the culture, creating a massive demand for parrots internationally and domestically (BLI 2008k, p. 10). In a survey of bird-keeping among households in five major Indonesian cities, Jepson and Ladle (2005, pp. 442–448) found that as many as 2.5 million birds are kept in the five cities. Of these, 60,230 wild-caught native parrots were kept by 51,000 households, and 50,590 wild-caught native parrots were acquired each year (changed hands, not an indication of birds taken from the wild each year). The researchers concluded that the level of bird-keeping among urban Indonesians calls for a conservation intervention.

Parrots have been traded for hundreds of years by people living in the Moluccas. Heinroth (1902, p. 120) reported that at the start of the 20th century trade significantly impacted the salmon-crested cockatoo. Bowler (1988, p. 6) wrote that the salmon-crested cockatoo was severely threatened by extensive trapping for the pet bird trade in the late 1970s, with the government apparently having little control over the number of birds taken from the wild. In the 1980s, extensive trapping of the salmon-crested cockatoo was the most important factor in the species' decline (BLI 2008k, p. 10; Forshaw 1989, p. 141). Smiet reported that trade in live birds flourished on Seram. The salmon-crested cockatoo was a popular pet traded in large numbers, accounting for 15 percent of the export (Smiet 1985, pp. 181, 189). Smiet (1982, pp. 324–325) also found live cockatoos readily available in the Ambon market.

Based on the most recent CITES annual report data, 74,838 salmon-crested cockatoos were reported as exported from Indonesia between 1981 and 1990, with international imports averaging 10,482 annually (UNEP-WCMC 2009a, p. 1; 2009b, p. 3). The species was listed in CITES Appendix II in 1981, but the high volume of trade led the CITES Significant Trade Working Group to identify this species as one of particular concern (CITES 1989b, p. 121). A review of CITES annual report trade data available at the time showed that the level of international trade of live birds was having a detrimental effect on wild populations (Inskipp *et al.* 1988, pp. 185–186, 188). The trade data showed imports of live salmon-crested cockatoos continued to be high in 1986 and 1987, with the 1987 Indonesian

harvest quota being exceeded by 3,661 birds (CITES 1989a, p. 5) or 72 percent. The Indonesian government decreased the annual harvest quota from 10,250 in 1984 to 1,000 in 1989, but a CITES' document suggested that these national measures to control trade had been ineffective (CITES 1989b, p. 121). Thus, the CITES Parties voted to transfer the salmon-crested cockatoo to CITES Appendix I, effective January 18, 1990. In 1990, field work on Seram revealed a ''sharp decline in visible trade'' in the salmon-crested cockatoo, although small numbers of birds were still leaving the island (Taylor 1992, p. 14).

Although CITES annual reports are of great value in assessing levels of legal trade and trends of trade, the number of cockatoos traded is much higher than the data reflect. The numbers do not include data from countries that are not CITES Parties or CITES Parties that did not submit annual reports (Inskipp *et al.* 1988, p. viii). Also, the numbers do not include deaths of birds before export, birds illegally traded, and birds domestically traded—doubling the numbers according to Cameron (2007, p. 163). ProFauna Indonesia, an animal protection nongovernmental organization, estimated that parrot smuggling in North Maluku, Indonesia, results in approximately 40 percent mortality (5 percent during glue trapping, 10 percent during transportation, and 25 percent during holding to sell in bird markets (malnutrition, disease, and stress)) (ProFauna Indonesia 2008, p. 5). Undocumented illegal trade (international and domestic) is difficult to quantify (Pain *et al.* 2006, p. 322; Thomsen *et al.* 1992, p. 3), and a listing in Appendix I of CITES does not totally stop illegal trade (Pain *et al.* 2006, p. 328). Seizures reported to the CITES Secretariat since 1990, however, are small—1 live bird seized in Austria in 1997; 25 live birds seized in the United Arab Emirates in 1998; and 4 live birds seized in Indonesia in 1999 (John Sellar 2009, pers. comm., p. 2). Since 1999, the U.S. Fish and Wildlife Service, Office of Law Enforcement, has seized only two salmon-crested cockatoos for lack of proper permits (FWS 2009, p. 1).

While CITES reported trade markedly fell after 1989 with an average annual worldwide import of 159 cockatoos (UNEP-WCMC 2009c, p. 5), illegal hunting and trade of the salmon-crested cockatoo continue today, with high domestic consumption. Extrapolating from figures obtained during interviews with parrot trappers in 1998, an estimated 4,000 salmon-crested cockatoos are trapped each year on Seram (BLI 2008k, p. 10; Cameron 2007, p. 164), which is approximately 6.4 percent of the population (Kinnaird *et al.*, in litt., as cited in BLI 2001, p. 1666). Direct evidence of continuing illegal trade is the sighting of glue traps (Kinnaird 2000, p. 15). Poachers use glue traps by cutting a suitable perching branch out of a tree and replacing that branch with one that has been smeared with sticky glue. Then a tame decoy bird lures wild birds into the glue trap (ProFauna Indonesia 2008, p. 2). Birds are also captured using nylon fishing-line snares or by tracing adults to their nesting sites so that the young can be taken (Bowler 1988, p. 6; Juniper & Parr 1998, p. 218). Metz (2005, p. 35) described local declines in the salmon-crested cockatoo, based on statements from trappers. When cockatoos became scarce on the western part of the island in 1991–92, poachers moved to the eastern and northern parts of the island.

Even with government controls, the commercial hunting of cockatoos (i.e., hunting by people to gain at least a temporary living from the activity) is relatively common on Seram (Ellen 1993, p. 199). Field research conducted in 2003–2005 in a small village (320 people, 60 households) located in the Manusela Valley led to the conclusion that collecting wild parrots, including the salmon-crested cockatoo, is a way for villagers to supplement their income during times of hardship (Sasaoka 2008, p. 158; Sasaoka 2009, pers. comm., p. 1). Most trapping was sporadic and the number of parrots caught was low. Traps are set in fruit trees such as durian (*Durio* spp.) and breadfruit (*Artocarpus heterophyllus*) from January to May, and traps are set in resting sites at any time of the year. In 2003, 21 salmon-crested cockatoos were trapped in the research site by 3 households; in 2004, 25 cockatoos by 5 households; and in 2005, 26 cockatoos by 10 households. Villagers sometimes kept the cockatoos for several months while waiting for the best price, but normally did not keep them as pets. Trappers received 70,000–100,000 IDR (7–10 USD) for an adult cockatoo and 200,000–250,000 IDR (20–25 USD) for a baby cockatoo, selling the birds to middlemen in coastal areas (Sasaoka 2009, pers. comm., pp. 1–2). In studying the forest peoples of Seram, social anthropologists have reported that parrot catching accounts for 25 to 30 percent of forest people's cash income, and that young men among the Halafara people of the Manusela Valley catch and sell parrots to raise their bride price (S. Badcock in litt. 1997 as cited in Snyder *et al.* 2000, p. 60).

The scope of the illegal trade in the salmon-crested cockatoo is unknown. After conducting an investigation from December 2003 to May 2004, ProFauna Indonesia reported that smuggling and trade in protected birds continues despite legislation that prohibits such activities. According to the report, at least 9,600 parrots, including salmon-crested cockatoos (numbers of birds by species not given in this article), are caught on Seram and sold to bird exporters in Jakarta via Ambon each year (ProFauna 2006, p. 1). The illegal practice involved Ambon's largest bird trader and Seram's most prominent bird collector and trader (Jakarta Post 2004, p. 2). A principal broker on Seram might have 20–50 salmon-crested cockatoos at any one time (Metz & Nursahid 2004, p. 8), even though legal trapping quotas are zero. A single trapper can capture up to 16 cockatoos each month within Manusela National Park. However, finding and trapping birds have become harder, and the price paid trappers has increased (Metz 2008, pp. 2–3).

Cockatoos are taken to the coast, sold, and transported to Ambon on boats in packed cages (Juniper & Parr 1998, p. 281) in hidden compartments surrounded by legally shipped lories and lorikeets (Metz & Nursahid 2004, p. 9) or by hiding birds in thermos bottles (Metz 2005, pp. 35–36; Metz & Nursahid 2004, p. 9) or sections of bamboo (Cameron 2007, p. 164). Some birds are flown to Jakarta and may receive a police escort to the market (Metz & Nursahid 2004, p. 9). Illegally exported cockatoos are reported from Indonesian markets in Medan and Sumatra or international markets in Singapore and Bangkok (Kinnaird 2000, p. 15), or they may pass through Singapore, China, Taiwan, and Malaysia, with Thailand now a major importer (Metz n.d., p. 1). Cockatoos also may be smuggled directly out of Indonesia and sent by boat to the Philippines and Singapore, which act as distribution points for worldwide illegal trade (Cameron 2007, p. 164).

Most Indonesian towns have either a bird market or a stall selling birds within the main market (Shepherd *et al.* 2004, p. 2). Birds in Indonesian markets are most likely sold for domestic use, although some birds will go into international trade (Cameron 2007, p. 163). Metz (2007b, p. 2) estimated that 80 percent of salmon-crested cockatoos illegally traded remain in Indonesia. Some cockatoos remain as pets where they are trapped, but most are sold to homes in the cities in western Indonesia, where the salmon-crested cockatoo is a symbol of wealth and prestige (Metz n.d., p. 1). This cockatoo is still sold openly in the markets of Ambon and elsewhere in Indonesia.

Cameron (2007, p. 163) noted that in 1998, Margaret Kinnaird and co-workers saw up to 40 salmon-crested cockatoos at any time in Ambon markets. In an analysis of the pet trade in Medan, Sumatra, between 1997 and 2001, Shepherd *et al.* (2004, p. 12) concluded that the salmon-crested cockatoo was common in trade in Medan, with 71 cockatoos being recorded in the markets. Most of the birds at the Medan market were sold as live pets (Shepherd *et al.* 2004, p. 24).

Stopping illegal trade is complicated by the vast size of Indonesia's coastline, government officials with limited resources and knowledge to deal with the illegal pet trade and corruption (Metz 2007c, p. 2). ProFauna claimed that illegal traders exploited the religious conflict between Muslims and Christians in the Maluku Islands in May of 2004, flooding the markets in Jakarta with salmon-crested cockatoos. Animal activist and Chairman of the Balikpapan Orangutan Survival Foundation, Willie Smith, suggested that it would be difficult to stop the illegal trade in cockatoos because much of the smuggling was backed or carried out by the Indonesian military and because the departments responsible for protecting natural resources were hampered by conflicts of interests and a lack of willingness to take action (Jakarta Post 2004, pp. 3, 4). Until recently, the wildlife protection laws have not been vigorously enforced, but this may be changing. For example, in September 2004, National Park Officers arrested a long-term bird buyer and confiscated nine salmon-crested cockatoos. The buyer was sentenced to 2 months' jail time and given a fine (Metz n.d., p. 1).

To combat the illegal wildlife trade, Southeast Asian countries, including Indonesia, formed the Association of South East Asian Nations–Wildlife Enforcement Network (ASEAN–WEN) in 2005 to protect the region's biodiversity (Gulf Times 2008, p. 1). ASEAN uses a cooperative approach to law enforcement (Cameron 2007, p. 164). It focuses on the gathering and sharing of intelligence, capacity building, and better cooperation in anti-smuggling and Customs controls across Southeast Asia (Lin 2005, p. 192). For example in 2008, Indonesian police officers and forestry and Customs officers participated in an intensive Wildlife Crime Investigation Course to help the government tackle poaching and smuggling (Wildlife Alliance 2008, p. 2).

Assessing the effects of trade on wild populations of parrots, such as the salmon-crested cockatoo, is difficult because the threats of habitat loss and trade occur at the same time (Snyder *et al.* 2000, pp. 2, 68). The loss of habitat due to logging, conversion of forests to agriculture and plantations, increased human settlement, and infrastructure development, leads to more exposure to bird trapping. Thus, it is difficult to distinguish between the effects of habitat loss and trade on the cockatoo. In addition, little information is available on the number and age of birds being taken from the wild and when and where the birds are being trapped. For example, the trapping of large numbers of breeding-age adults from a population is apt to have a larger overall adverse impact than the removal of a similar number of juveniles (Thomsen *et al.* 1992, p. 10). Coates and Bishop (1997, pp. 39–41) reported that trapping the salmon-crested cockatoo for international and domestic markets, in combination with ongoing destruction of lowland forests, was having a major negative impact on wild populations. They concluded that, despite the protection given to the cockatoo by Manusela National Park, this cockatoo was being trapped to extinction.

Recreational, scientific, or educational purposes. While conducting research in one village in central Seram, Dr. Sasaoka (pers. comm. 2009, p. 2) wrote that hunting with air guns for food started in 2000. Although the use of air guns was not common in his research site, about 10 villagers were using air guns to hunt Columbidae species (pigeons and doves). If a hunter encountered a salmon-crested cockatoo in the forest or garden by chance, the hunter would shoot it for food. Based on Dr. Sasaoka's unpublished field data, about 40 salmon-crested cockatoos were shot and killed by air gun hunting in 2003. This information raises questions on the use of air guns on Seram. Without additional data, however, we are unable to assess the possible impact air gun hunting may be having or will have on the survival of salmon-crested cockatoos. We are not aware of any overutilization of the salmon-crested cockatoo for recreational, scientific, or educational purposes that is a threat to the species now or in the foreseeable future.

Release of confiscated cockatoos. In recent years, small numbers of confiscated salmon-crested cockatoos have been rehabilitated and released into the wild. In 2005, the Kembali Bebas Avian Center for the rescue and rehabilitation of Indonesian parrots was established on Northern Seram (IPP 2008c, p. 1; Price 2008, p. 2). In March 2006, three illegally trapped salmon-crested cockatoos, which had been confiscated from local trappers by forestry officials in 2004, were released on Seram. The birds were tested for diseases, observed for wild behaviors, fitted with a leg band, and tagged with a microchip to allow for long-term monitoring (IPP (Indonesian Parrot Project) 2008a, p. 2). In January 2008, six more salmon-crested cockatoos were released, and in February 2008, seven more were released. The project provides the government a means of disposing of confiscated parrots. It also gives local villagers pride in their native birds and teaches them the principles of conservation (ireport 2008, pp. 2–3). Because releasing birds has the risk of introducing diseases into wild populations, the Center uses the IUCN and CITES guidelines (Metz 2007c, p. 7). However, among some parrot experts, the release of confiscated birds is generally the least favorable conservation option and should be avoided because of the risk of introducing diseases into wild populations (Snyder *et al.* 2000, pp. 22–24).

Local involvement. Indonesia is a culturally diverse country and the values and perceptions of many Indonesians may differ from those of western conservationists. Many rural villagers are unaware that birds have restricted distributions and do not understand the concept of extinction. Thus, they may think that, when a population declines, the birds moved into the hills or are getting smarter and, therefore, harder to catch. In addition, using and trading natural resources is a basic part of Indonesian culture and economy (Snyder *et al.* 2000, pp. 60–61). As a result, one of the most important components of successful conservation programs is local education that promotes optimism, cooperation, and collaboration and helps people discover and understand the underlying causes of environmental problems (Snyder *et al.* 2000, pp. 14–15).

Others also have recognized the need for a strong awareness campaign concerning the legal and conservation status of the salmon-crested cockatoo (BLI 2001, p. 1668; Metz 1998, p. 11). The IPP is a nonprofit organization dedicated to the conservation of wild Indonesian parrots, with goals to teach the principles and value of conservation, replace trapping of parrots with sustainable economic alternatives, work with the Indonesian authorities to rehabilitate and release confiscated parrots back into the wild, conduct scientific research, and provide information (Metz 2007c, p. 6). IPP started a Conservation-Awareness-Pride (CAP) program to reach adults and

children in the villages where the birds are trapped and in the cities where the birds are most often shipped for sale (Metz 2007a, p. 1). The program is using the salmon-crested cockatoo as a flagship species for conservation to familiarize the people, especially the children, of Maluku Province with the image of its unique endemic parrots (IPP 2008b, p. 1). In 2007, IPP reported that almost 4,500 students have participated in the CAP program, which was showing progress (Metz 2007a, p. 1–2). A new nongovernmental organization was formed to help carry out this work (IPP 2008b, p. 2).

Other anti-poaching programs of the IPP include providing sustainable income for local villagers to reduce trapping and smuggling (IPP 2008c, p. 2). Former parrot poachers earn a living by providing the day-to-day care of rescued parrots at the Kembali Bebas Avian Center for the rescue and rehabilitation of Indonesian parrots. Villagers also are employed to collect and process the nuts of the kenari tree (*Canarium* spp.), which are part of the diet of larger cockatoos. The nuts are sold to parrot owners outside of Indonesia and all proceeds are used to pay workers (Metz 2007c, p. 13).

Ecotourism can provide economic benefits to local communities and lead them to value and protect species and ecosystems (Snyder *et al.* 2000, p. 16). The development of tourism is one of the priorities of Maluku Province. In 1981, Smiet & Siallagan (1981, p. 18) wrote that the scenic beauty and colorful wildlife of Seram would be great tourist attractions. The *Proposed Manusela National Park Management Plan 1982–1987*suggested that tourist accommodations be developed in the Manusela Valley of the park (Smiet & Siallagan 1981, p. 32). However, Edwards (1993, p. 11) suggested that the irregular and difficult means of transportation and lack of infrastructure and facilities for tourists are unlikely to encourage large numbers of visitors. Despite these difficulties, in 2001, Project Bird Watch led its first eco-tour of Seram (St. Joan 2005, p. 24), followed by additional tours (IPP 2009, p. 1). These tours provide ex-trappers and other villagers income by acting as bird guides, porters, and cooks. The local people see that their birds can attract people from others parts of the world, providing money and hopefully instilling pride in Indonesian birds (Metz 2007c, p. 12). Other ecotourism has developed on a small scale. In 2008, a few Internet sites advertised or reported on bird watching tours to Seram (Bird Tour Asia 2008, pp. 1–3; Eco-Adventure in Indonesia 2008, p. 1; King Bird Tours 2007, pp. 1–6).

Summary of Factor B

Keeping pet birds, especially parrots, plays an important role in Indonesian culture, creating a massive demand for parrots internationally and domestically. By the 1980s, uncontrolled trapping of salmon-crested cockatoos for the pet bird trade was adversely impacting the species. Based on CITES records, 74,838 birds were exported from Indonesia between 1981 and 1990, with international imports averaging 10,482 annually. Because trade was having a detrimental effect on wild populations, the CITES countries voted to transfer the species to CITES Appendix I, effective January 18, 1990.

An Appendix-I listing generally precludes commercial trade in wild-caught birds, but it is difficult to quantify undocumented illegal international and domestic trade.

Illegal trapping and trade in wild-caught salmon-crested cockatoos continues today, with high domestic consumption. Hunting of parrots by people to supplement their income is relatively common on Seram. Interviews in villages suggested that perhaps as many as 4,000 salmon-crested cockatoos (approximately 6.4 percent of the population) are captured annually, with an estimated 80 percent sold within Indonesia and 20 percent put in international trade. The salmon-crested cockatoo is still sold openly in the markets of Ambon and elsewhere in Indonesia. Generally, little is known about how the domestic trade in birds in Indonesia is affecting wild populations. Little information is available on the number and age of birds being taken from the wild and when and where the birds are being trapped. In addition, it is difficult to assess the effects of trade on wild populations because trade is occurring at the same time as the loss of the species' habitat.

Illegal trade is difficult to control because Indonesia has a vast coastline; government officials have limited resources and knowledge to deal with the illegal pet trade, have conflicts of interest, and lack a willingness to take action; and there is widespread corruption. Indonesia is a member of ASEAN–WEN and has made an effort to train some of their police, forestry, and Customs officers in methods to tackle poaching and smuggling. However, outside of a recent sting operation involving the salmon-crested cockatoo, the wildlife protection laws have not been vigorously enforced for this species.

Recent information that hunters from one small village in central Seram used air guns to kill 40 salmon-crested cockatoos for food in one year is of concern. Without additional information, however, we are unable to assess the possible impact air gun hunting may be having or will have on the survival of the salmon-crested cockatoo.

In recent years, several programs—rehabilitation and release of confiscated parrots, public awareness program, economic incentive program, and ecotourism—were established on Seram to support the conservation of the salmon-crested cockatoo. It is too soon to assess if these programs have been successful in gaining local support and reducing poaching. At this time, poaching of the salmon-crested cockatoos for the commercial pet trade and use of wild-caught salmon-crested cockatoos as pets in Indonesia continues.

In summary, we find that uncontrolled, illegal domestic and international trade of salmon-crested cockatoos as pets is a threat to the continued existence of this species throughout all of its range in the foreseeable future. Although the recent use of air guns to hunt salmon-crested cockatoos for food is of concern, based on the best available information, we find that overutilization of the cockatoo for recreational, scientific, or education purposes is not a threat to the continued existence of this species in any portion of its range now or in the foreseeable future.

Factor C. Disease or Predation

Diseases—general. One of the most serious diseases found in cockatoo species is beak and feather disease. All cockatoo species are likely susceptible to this disease. The disease affects wild and captive birds, with chronic infections resulting in feather loss and deformities of beak and feathers. Birds usually become infected in the nest by ingesting or inhaling virus particles. Birds develop immunity, die within a couple of weeks, or become chronically infected. No vaccine exists to immunize populations (Cameron 2007, p. 82). In Indonesia's Kembali Bebas Rescue and Rehabilitation Center on Seram, 50 cockatoos have been screened for beak and feather disease. None of the birds was found to be positive for the virus, but a number had positive antibodies to the virus (Metz 2007b, p. 3).

Another serious disease that has been reported to infect cockatoos is proventricular dilatation disease (PDD). It is a fatal disease that poses a serious threat to domesticated and wild parrots

worldwide, particularly those with very small populations (Kistler *et al.* 2008, p. 1; Waugh 1996, p. 112). This contagious disease causes damage to the nerves of the upper digestive tract, so that food digestion and absorption are negatively affected. The disease has a 100 percent mortality rate. In 2008, researchers discovered a genetically diverse set of novel avian bornaviruses that are thought to be the causative agents, and developed diagnostic tests, methods of treating or preventing bornavirus infection, and methods for screening for the anti-bornaviral compounds (University of California at San Francisco 2008, p. 1). We are unaware of any reports that this disease occurs in salmon-crested cockatoos in the wild.

Disease—avian influenza. Wild birds, especially waterfowl and shorebirds, are natural reservoirs of avian influenza. Most viral strains have low pathogenicity and cause few clinical signs in infected birds. However, strains can mutate into highly pathogenic forms, which is what happened in 1997 when highly pathogenic avian influenza H5N1 first appeared in Hong Kong (USDA *et al.* 2006, pp. 1–2). The H5N1 virus is mainly propagated by commercial poultry living in close quarters with humans. The role of migratory birds is less clear (Metz 2006a, p. 24). Scientists increasingly believe that at least some migratory waterfowl carry the H5N1 virus, sometimes over long distances, and introduce the virus to poultry flocks (WHO 2006, p. 2). The H5N1 virus has infected and caused death in domestic poultry, people, and some wild birds in Asia, Europe, and Africa. About half of infected people die from the disease (FWS 2006, p. 1). As of September 10, 2008, Indonesia confirmed its 136th human case (WHO 2008, p. 26). As of December 2006, avian influenza was not present in fowl in the Maluku Province (Metz 2006b, p. 42).

There has been only one documented case of avian influenza H5N1 in parrots—a parrot held in quarantine in the United Kingdom was diagnosed with the disease. However, from 2004–2006 (Metz 2006a, pp. 24–25), fears of the avian influenza H5N1's risk to human health resulted in the culling of wild and pet birds in Asia and Europe, including the salmon-crested cockatoo. In the Philippines, 339 smuggled parrots were euthanized following confiscation. In Taiwan, 28 palm and salmon-crested cockatoos were euthanized at the airport out of fear that they might harbor the disease. In Indonesia, Agriculture officials announced that all birds, including pet birds, within a given radius of chickens infected with avian influenza would be culled. Except, when avian influenza struck Ragunan Zoo in Jakarta, parrots and cockatoos were not euthanized unless testing showed they had the disease (IPP 2006, p. 1).

Predation. Man probably introduced rats, mice, pigs (*Sus celebensis*), deer (*Cervus timorensis*), civit (*Paradoxurus hermaphroditus*), and oriental civit (*Viverra tangalunga*) to Seram (Smiet & Siallagan 1981, p. 8). Goats, horses, cows, and water buffalo (*Bubalus bubalis*) also have been introduced. Although the deer as grazers have some adverse effect on low forest brush (Ellen 1993, pp. 193, 201), we are unaware of an adverse effect to the salmon-crested cockatoo's habitat. The cockatoo has natural predators, such as snakes and monitor lizards, that raid the nest for eggs and chicks (Metz *et al.* 2007, p. 37).

Summary of Factor C

Disease and predation associated with salmon-crested cockatoos in the wild are not well documented. Although some serious diseases—such as beak and feather disease and PDD—occur in cockatoos in the wild, we found no information that these diseases occur in salmon-crested cockatoos in the wild. Cases of avian influenza H5N1 are continuing to occur in Indonesia; however, parrots generally are not considered to be natural reservoirs of this disease. While there is the potential for captive-held salmon-crested cockatoos to be euthanized, especially smuggled ones that have been seized at ports, the number of birds euthanized is small and not a threat to the species.

A number of introduced mammals occur on Seram, but we are unaware of any predation on the salmon-crested cockatoo from these introduced mammals. The salmon-crested cockatoo has natural predators, but we were unable to find information that these natural predators are having any significant negative impact on the productivity of this species. Thus, we find that neither disease nor predation is a threat to the salmon-crested cockatoo in any portion of its range now or in the foreseeable future.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

As described below, Indonesia has laws and regulations in place to conserve biodiversity, manage forest, regulate trade, provide species protection, and develop and manage protected areas.

Biodiversity. The Indonesian Government has passed legislation to control activities that have an adverse impact on the environment and to conserve biodiversity. In 1991, it drafted the Biodiversity Action Plan (BAP), which became a comprehensive framework for biodiversity conservation, advocating a wide range of policy and institutional reforms to slow the rate of biodiversity loss. In 1997, the government produced Agenda 21-Indonesia, a National Strategy for Sustainable Development. These two documents recognize a complex mix of problems, including increasing population, poor implementation of regulations, conversion of forests to agricultural lands, transmigration projects, disregard of land tenure, breakdown of traditional community management, unsustainable logging, and poaching.

The main objectives of the BAP are to slow the loss of primary forests and other habitats, expand data on Indonesia's biodiversity, and foster sustainable use of biological resources. Agenda 21-Indonesia broadly develops the BAP. For example, *in situ* conservation would include establishing an integrated protected area system, gaining local support for protected areas, developing sustainable means of funding for protected areas, and supporting donor activities to maximize conservation efforts (Murdoch University 2000, pp. 1–2).

The U.S. Agency for International Development (USAID) assessed the status of biodiversity in Indonesia under the Foreign Assistance Act and concluded that threats to biodiversity had worsened since 1998 and decentralization had led to increased exploitation of biodiversity (Rhee *et al.* 2004, p. xvii). Most managers at the district level are generally unaware or uncaring of biodiversity issues (Jepson *et al.* 2001, pp. 859–860).

Forest management. The Indonesian government has laws and regulations in place to support sustainable forest management. The primary law is the Basic Forestry Law (Act No. 41). It provides for the management of forest conservation, protection, and production; defines main forest functions; and deals with forest management, planning, research, development, education, training, and enforcement (Act 1999, pp. 11–14; FAOLEX 2008b, p. 1; Rhee *et al.* 2004, chap. 2 p. 3). Presidential Instruction No. 4/2005 describes the duties of the different responsible government entities and addresses the eradication of illegal logging by taking action against anyone who harvests or collects timber forest without a license; receives, buys, or sells timber collected illegally; or carries, controls, or has timber without

a certificate of legitimacy (Indonesia 2005, pp. 1–3; FAOLEX 2009, p. 1).

Agenda 21-Indonesia identifies the major shortcomings in the management of production forests to include current concession policies and logging practices (Murdoch University 2000, p. 1). A major threat to Indonesia's forest resources is conflict: (1) Among local communities and between local communities and concessions over management and extraction rights; and (2) between different levels of government over licensing and regulation of timber extraction and forest conversion (Rhee *et al.* 2004, chap. 6 p. 9). Land tenure and access in forests are contentious issues. The Indonesian government has jurisdiction over all resources, but has often ignored the land use or ownership claims of local peoples (Rhee *et al.* 2004, chap. 2 pp. 21–22).

In addition, the laws and regulations are frequently ignored, in part because of widespread corruption (BLI 2008k, p. 7). The Indonesian economic crisis that led to the downfall of the Suharto regime resulted in the government instituting a rapid and far-reaching decentralization that gave local government greater autonomy (Down to Earth 2000, p. 1). Decentralization resulted in confusion of roles and responsibilities, and implementation of decentralization has been slow and uncertain because of conflicting interpretation of policies and priorities and the lack of capacity or experience of local governments to manage (Rhee *et al.* 2004, chap. 2 p. 20).

USAID also assessed the status of forests in Indonesia under the Foreign Assistance Act and concluded that threats to forests had worsened since 1998 and decentralization had led to worse forestry practices and increased conflict over land tenure (Rhee *et al.* 2004, p. xvii). The responsibility for the management of forests was placed at the district level within provinces, but criteria and standards were still set by the central government. Most districts do not have the capacity for planning for sustainable development and have limited capacity to govern. Today, Indonesia is torn apart by economic and political crises, and the gap between sustainable forest management and the reality of current mismanagement is wide (Jepson *et al.* 2001, pp. 859–860).

In 2008, the Indonesian Government reported to the Commission on Crime Prevention and Criminal Justice on its strategic plan on forestry, outlining its priorities of fighting illegal logging, controlling forest fires, restructuring the forestry sector, rehabilitating and conserving forest resources, and decentralizing forest management. The Government said it was committed to intensifying the fight against illegal logging by implementing a forest crime case tracking system, prosecuting forest crimes, and enhancing collaboration by sharing information on forest crime and illegal timber shipments (Commission on Crime Prevention and Criminal Justice 2008, p. 4).

International wildlife trade. Indonesia has been a member of CITES since December 28, 1978. It has designated Management, Scientific, and Enforcement authorities to implement the treaty (CITES 2008b, p. 1) and has played an active role in CITES meetings.

Species protection and management plans. Indonesian Law 5/1990, Conservation of Biodiversity and Ecosystems, establishes the basic principles and general rules for the management, conservation, and use of biological resources, natural habitats, and protected areas. Protected species may not be captured, collected, displaced, killed, destroyed, transported, or traded except for the purposes of research, science and safeguarding the plants or animals. People that violate the Act are subject to fines and punishment (Act 1990, pp. 1–44; FAOLEX 2008a, p. 1).

The salmon-crested cockatoo is on the Indonesian Government list of protected species (Rhee *et al.* 2004, chap. 5 pp. 2, App. VIII). While laws to protect species are in place, enforcement often is severely lacking (Shepherd *et al.* 2004, p. 4) or difficult, given the thousands of islands that make up Indonesia (Nichols *et al.* 1991, p. 1) and considering that illegal activities remain socially acceptable at the local level. Thus, the law is generally disregarded and only sporadically enforced (Kinnaird 2000, p. 14). Few enforcement officers are trained in species identification, and the enforcement agency lacks capacity and incentive. To further complicate enforcement, some bird dealers claim that members of the Department of Forest Protection and Nature Conservation are involved in the trade (Shepherd *et al.* 2004, p. 4) (see Factor B for a discussion of the problems relating to stopping illegal trade in salmon-crested cockatoos).

In 1982, Indonesia used the best principles of conservation biology to plan a national protected area system, with the development of a national conservation plan (NCP) (Jepson *et al.* 2002, p. 40). Large areas were proposed as conservation areas. Subsequently, forests were also allocated for production, watershed protection, or conservation, and Indonesia endorsed the principles of sustainable forest management. However, these principles were never fully reconciled with national policy and practice (Jepson *et al.* 2001, p. 859). As a result, reserves generally have not been added to the proposed network of the NCP, and existing reserves have not been managed effectively (Whitten *et al.* 2001, p. 1). Agenda 21-Indonesia identifies problems faced in managing protected areas, including the ''lack of public participation, lack of management framework, the need for regional income, insufficient funding and lack of law enforcement'' (Murdoch University 2000, pp. 1–2).

In reviewing the efficacy of the protected area system of East Kalimantan Province, Indonesia, Jepson *et al.* (2002, pp. 31, 39–40) found that key reserves either had not been established or were degraded (i.e., moderate and widespread habitat modification or populations of key fauna significantly reduced). They concluded that turning reserve planning into practice had failed because of local-level sociopolitical realities. The ability of the Indonesian government to manage and protect reserves or to establish reserves that were proposed in the NCP in East Kalimantan, and in Indonesia as a whole, had been severely constrained by problems, including insufficient funding, workforce shortages, weak penalties, a general lack of support for conservation in society, corruption, and the aggressive use of resources by migrants.

We are unaware of any review of the efficacy of protected areas in Seram, but find that the general conclusion of the East Kalimantan study applies. Wai Bula, an area in the northeastern part of Seram (Kinnaird *et al.* 2003. p. 230), illustrates the inability of the Indonesian government to implement the NCP. Wai Bula, proposed as a nature reserve in 1981, was never officially designated and has a low probability of future protection (Kinnaird *et al.* 2003, p. 231). It has been identified as an IBA (see above) with primary lowland and lower montane forests and a current population of cockatoos (BLI 2008f, p. 1). It was proposed as a nature reserve, but 93 percent is also under logging concessions (Kinnaird *et al.* 2003, p. 231). Resolution of these conflicting land use designations would have a considerable impact on the amount of protected habitat available for the salmon-crested cockatoo (Kinnaird *et al.* 2003, p. 231).

Habitat protection. The unique wildlife and plants of Seram are somewhat protected by Manusela National Park, an area of 2,323.2 km^2 (896.8 mi^2) in the center of the country,

and Gunung Sahuwai Nature Reserve, an area of 122.8 km² (47.4 mi²) on the western peninsula. Under Act No. 5 of 1990 on the conservation of biological resources and their ecosystems, the use of biological resources and their ecosystems in protected areas is to be sustainable, and plants and animals are to be managed with consideration of their long-term survival and maintenance of their diversity. Research, education, improvement of the species, and recreational activities are permitted, but other activities are prohibited (FAOLEX 2008a, pp. 1–2).

Although 14 percent of the forests on Seram are in protected areas, 15 percent of Manusela National Park is under logging concessions and 4.6 percent has been converted to other land uses. A road has been built through the park, which increases the risk of logging and human encroachment. Five villages of indigenous people, who mainly work as dry land farmers and hunt and collect forest products (including parrots), exist in the park. In 1980, 999 people lived within the park boundaries, and 19,102 people lived within 10 km (6 mi) of its boundaries. We are unaware of logging concessions in Gunung Sahuai Nature Reserve, and it has experienced less (3.1 percent) land conversion and human encroachment (Kinnaird *et al.* 2003, pp. 230–231).

The regulations and management of the protected areas are ineffective at reducing the threats of habitat destruction (see Factor A) and poaching for the pet trade (see Factor B). Reserve management is at the national level—the responsibility of the Directorate General of Forest Protection and Nature Conservation. Effective reserve management is hampered by a shortage of staff, expertise, and money, and the remoteness of protected areas. The recent civil unrest forced a reduction in conservation programs, with some protected areas virtually unsupervised (BLI 2008k, p. 9).

Summary of Factor D

While Indonesia has a good legal framework to manage wildlife and their habitats, implementation of its laws and regulatory mechanisms has been inadequate to reduce the threats to the salmon-crested cockatoo. As discussed in Factor A, we found that logging and conversion of forests to agriculture and plantations are primary threats to the habitat of the salmon-crested cockatoo. Laws and regulations are frequently ignored, and illegal logging is considered a leading cause of forest degradation in Indonesia. The decentralization of government has led to worse forestry practices, increased exploitation of resources, and increased conflict over land tenure. Current concession policies and logging practices hamper sustainable forestry. Because nearly 50 percent of Seram's forests are held under logging concessions, with more than 75 percent within the salmon-crested cockatoo's favored lowland habitat, the proper management of these logging concessions could determine the survival of this species.

The salmon-crested cockatoo is listed in Appendix I of CITES (see discussion in Conservation Status above), which appears generally to have controlled international trade. However, as discussed in Factor B, uncontrolled illegal domestic and international trade continues to adversely impact the salmon-crested cockatoo. The species is on Indonesia's list of protected species, and the law provides prohibitions, including capture and trade, and lays out fines and punishment. However, the law is generally ignored and only sporadically enforced.

Manusela National Park and Gunung Sahuwai Nature Reserve provide some protection to the salmon-crested cockatoo. Management of these protected areas, however, is hampered by staff shortages, lack of expertise and money, and remoteness of the areas. Another Important Bird Area, Wai Bula, was proposed as a nature reserve in 1981, but was never officially designated. Resolution of its designation would increase the amount of protected habitat available for the salmon-crested cockatoo, but the delay in making such a designation reflects the inability of the Indonesian government to implement the national conservation plan.

In summary, we find that the existing regulatory mechanisms, as implemented, are inadequate to reduce or remove the current threats to the salmon-crested cockatoo. There is no information available to suggest these regulatory mechanisms will change in the foreseeable future.

Factor E. Other Natural or Manmade Factors Affecting the Continued Existence of the Species

Forest fires. Fires in tropical forests are becoming increasingly common (Cochrane 2003, p. 913; Kinnaird & O'Brien 1998, p. 954; Uhl & Kauffman 1990, p. 437; Woods 1989, p. 290). For example, in 1983, disastrous, large-scale El Niño wildfires occurred in the tropical forests of Borneo, although severe droughts had occurred previously without causing extensive fires. Woods (1989, p. 290) concluded that the extensive fires were the result of forests becoming more fire-prone due to logging, road building, and cultivation. He also found that potential recovery of forest structure is not good in logged forests, especially if further burning occurs. The 1997–98 El Niño fires in Indonesia devastated vast tracts of forest, especially in the islands of Sumatra and Kalimantan (islands to the far west of Seram) and Irian Jaya (a neighboring island to the east of Seram) (Kinnaird & O'Brien 1998, p. 954). The forest fires were mainly caused by poor logging practices, burning of agriculture land, and land clearing for plantations (Grimmett & Sumarauw 2000, pp. 6, 8; Kinnaird & O'Brien 1998, p. 954).

Forest fires are often part of El Niño events, which are expected to increase in number and severity due to global climate change. Using a global climate model that had successfully predicted the 1997–98 El Niño, Timmermann *et al.* (1999, pp. 694–696) looked at the effect of future greenhouse warming on El Niño frequency. They concluded that, if emissions of greenhouse gases continue to increase, events typical of El Niño will become more frequent and variations may become more extreme. Because more tropical forests are becoming disturbed and because the number of El Niño events is predicted to increase and be more severe, serious fires in Indonesia, including Seram and other areas of the tropics, are likely to remain a critical conservation concern (Adeney *et al.* 2006, p. 292).

Fires can lead to the long-term decline of the rain forest, with destruction of leaf litter and the seedling-sapling layer, increased invasion of exotic plants, increased tree mortality, and changes in the soil. Although many animals have the ability to escape direct mortality from fire, they also may be negatively affected by loss of food, shelter, and territory. For example, the number of frugivorous and omnivorous birds declined after the 1997–98 El Niño fire in Indonesia, with helmeted and rhinoceros hornbills (*Buceros rhinoceros* and *B. vigil*) declining by 50 percent in one study area (Kinnaird & O'Brien 1998, p. 955).

At the current time, high impact fires are not adversely affecting the habitat of the salmon-crested cockatoo. In 1985, Ellen (1985, p. 567) wrote that fires seldom get out of hand in Seram when land is cleared for agriculture. In 1998, Metz (1998, p. 11) reported that the 1997–98 EL Niño fires in Indonesia are said to have not affected Seram. However, because devastating El Niño fires have been shown to occur more frequently in logged or disturbed forests and Seram has extensive logging planned and ongoing clearing of land for plantations and agriculture, El Niño-

related fires will likely have a severe impact on Seram in the future (Kinnaird *et al.* 2003, p. 234).

Civil unrest. Unlike the rest of Indonesia, which is 90 percent Muslim, the Moluccas have equal numbers of Christian and Islamic followers. Under the Suharto government, primarily Muslim transmigrants moved to Seram, and the government assigned officials, police, and military from outside the region. Rioting between Muslim and Christain citizens became an ongoing problem in Seram. In 1999 and 2001, as Indonesia plunged into a deep economic crisis, resentments erupted and thousands of people were killed (Javaman 2009, p. 1). It is unknown if the civil unrest affected the salmon-crested cockatoo, but the violence temporarily stopped development. On the other hand, soldiers like parrots, and a heavy military presence led to a rise in cockatoo trade (Kinnaird 2000, p. 15).

Persecution. In 1864, Wallace (p. 279) reported that the salmon-crested cockatoo was considered a harmful pest in coconut palms around villages on Seram. The cockatoos gnawed through shells of young coconuts to reach the pulp and water inside. Historically, the cockatoo was persecuted (BLI 2004, p. 2; Metz 1998, p. 10), but BLI (2008b, p. 2) reports this persecution is in the past and unlikely to return.

Summary of Factor E

Forest fires negatively impact birds by direct mortality or the loss of food, shelter, and territory. Research has shown that frugivorous and omnivorous birds may decline by 50 percent as a result of fires in areas of disturbed tropical rain forests. Forest fires are becoming more common in tropical rain forests, occurring more frequently in logged or disturbed areas. As discussed in Factor A above, logging and conversion of land to agriculture and plantations is ongoing and will likely increase in the future on Seram. Approximately 75 percent (8,271 km^2 (3,193 mi^2)) of the lowland habitat favored by the salmon-crested cockatoo is under logging concession. Approximately 44 percent (6,220 km^2 (2,401 mi^2)) of Seram's lowland forest is slated for conversion and, by 2028, most of this land will be converted to agriculture or plantations. Therefore, we find that, even though fires are not currently adversely affecting the salmon-crested cockatoo, fires will be a threat to this species throughout all of its range in the foreseeable future due to the extensive planned logging and clearing of land for agriculture and plantations and predicted increase in number and severity of El Niño events due to global climate change.

Civil unrest is an ongoing problem on Seram, but we are unaware that it has adversely impacted the salmon-crested cockatoo other than a possible increase in sporadic illegal trade, which is discussed under Factor B. The persecution of salmon-crested cockatoo as pests in coconut palm groves does not appear to be a problem today. Thus, we find that neither civil unrest nor persecution is a threat to the salmon-crested cockatoo in any portion of its range now or in the foreseeable future.

Status Determination for the Salmon-crested Cockatoo

We have carefully assessed the best available scientific and commercial information regarding the past, present, and potential future threats faced by the salmon-crested cockatoo. The species is at risk of extinction in the foreseeable future throughout all of its range primarily due to extensive logging and conversion of lowland forests to agricultural lands and plantations (Factor A) and uncontrolled, illegal trapping for the domestic and international pet trade (Factor B). Also, existing regulatory mechanisms, as implemented, are inadequate to mitigate the current threats to the salmon-crested cockatoo (Factor D). Although El Niño forest fires are not currently adversely affecting the salmon-crested cockatoo, fires will be a threat in the foreseeable future due to the extensive planned logging and clearing of land and predicted increase in number and severity of El Nio events due to global climate change (Factor E).

The salmon-crested cockatoo is endemic to the island of Seram, with records from three small adjacent islands. Current populations are estimated at 62,400 individuals, with a decreasing population trend. The cockatoo is largely a resident of lowland rain forests, predominately between 100–600 m (328–1,968 ft), with the highest densities of birds occurring in little-disturbed forests. It requires large, mature trees for nesting.

Logging and conversion of forests to agriculture and plantations are primary threats to the habitat of the salmon-crested cockatoo in the foreseeable future. By 2001, about 20 percent of the original forest cover had been cleared. Nearly 50 percent of the island's forests are held under logging concessions, of which 75 percent are held within lowland forests, prime salmon-crested cockatoo habitat. Unsustainable logging practices destroy the forest canopy and dramatically reduce habitat available for cockatoos, especially if large nest trees and strangling figs are harvested. Between 1980 and 1990, an estimated 1,200 km^2 (463 mi^2) of the salmon-crested cockatoo's habitat was lost. In addition, about 44 percent of lowland forest is designated as conversion forest. Researchers predict that by 2028, up to 50 percent of the current salmon-crested cockatoo population (at least 31,000 cockatoos) may be lost as a result of conversion of forests to agriculture and plantations. Although about 14 percent of the forests are within protected areas, logging concessions are held in 15 percent of these areas, and small-scale illegal logging and human encroachment also occur there. By 2028, extensive logging and conversion of lowland forests to agriculture and plantations, combined with transmigratory human resettlement, oil exploration, and infrastructure development, are likely to destroy much of the salmon-crested cockatoo's habitat.

Illegal trapping of the salmon-crested cockatoo for the pet trade is widespread. Pet birds are an important part of Indonesian culture, with large numbers of wild-caught parrots traded domestically and internationally. In the late 1970s, the salmon-crested cockatoo was extensively trapped for the pet bird trade. By the 1980s, the pet bird trade was adversely impacting the species. Between 1981 and 1990, 74,838 birds were exported from Indonesia and international imports averaged 10,482 annually. Although the salmon-crested cockatoo was transferred to Appendix I of CITES, trappers reportedly remain active, and wild-caught birds are openly sold in domestic markets. Interviews in villages suggest that perhaps as many as 4,000 birds, or 6.4 percent of the current estimated population, are still being captured annually, with 80 percent traded domestically and 20 percent internationally. Ending illegal trade is hampered by Indonesia's large coastline, officials with limited resources and knowledge, and corruption. The continuing illegal trade of the salmon-crested cockatoo is a threat to the survival of the species in the foreseeable future.

Indonesia has a good legal framework to manage wildlife and their habitats, but implementation of its laws and regulatory mechanisms has been inadequate to address the threats to the salmon-crested cockatoo. Logging laws and policies are frequently ignored and rarely enforced, and illegal logging is rampant, even occurring in national parks and nature reserves. Current concession policies and logging practices hamper sustainable forestry. The salmon-crested cockatoo is a protected species in Indonesia, and the

law provides prohibitions on capture and trade and also provides for fines and punishment. Again, the law is generally ignored and only sporadically enforced. Illegal bird trade is socially acceptable, making it difficult to enforce laws. Public awareness programs, economic incentive programs, and ecotourism are in their infancy, and it is too early to tell if they are helping to control poaching on the island. The illegal trade of the salmon-crested cockatoo for the domestic trade, and to a smaller extent international trade, continues to occur.

Fires are becoming more common in tropical rain forests where logging, road building, and clearing of land for agriculture occur. Fires can lead to the long-term decline of the rain forest, and many animals may be negatively affected by loss of food, shelter, and territory. Currently, high impact fires are not adversely affecting the habitat of the salmon-crested cockatoo, but due to future planned extensive logging and clearing of land for agriculture and plantations and predicted increase in number and severity of El Niño events, fires will be a threat to this species in the foreseeable future.

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.'' The salmon-crested cockatoo population estimate is approximately 62,400 and the threats of habitat loss and trade are not at a level to consider the species to be in danger of extinction at this time. Densities are highest in primary and disturbed primary forest, but the cockatoo persists in secondary forest although at lower densities. However, logging and forest conversion continue to adversely affect the cockatoo's habitat. Based on the analysis of the five factors discussed above, we determine that the salmon-crested cockatoo is likely to become an endangered species within the foreseeable future throughout all of its range.

Significant Portion of the Range Analysis

Having determined that the salmon-crested cockatoo meets the definition of threatened under the Act, we considered whether there are any significant portions of the range where the species is in danger of extinction. The term ''significant portion of its range'' in the definition of an ''endangered species'' and ''threatened species'' is not defined by the Act. For purposes of this finding, a significant portion of a species' range is an area that is important to the conservation of the species because it contributes meaningfully to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability to conserve the species.

The first step in determining whether a species is endangered in a significant portion of its range is to identify any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be significant and where the species is not in danger of extinction. To identify those portions that warrant further consideration, we determine whether there is substantial information indicating that (i) the portions may be significant and (ii) the species may be in danger of extinction there. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the range that are unimportant to the conservation of the species, such portions will not warrant further consideration.

If we identify any portions that warrant further consideration, we then determine whether in fact the species is threatened or endangered in any significant portion of its range. Depending on the biology of the species, its range, and the threats it faces, it may be more efficient for the Service to address the significance question first, or the status question first. Thus, if the Service determines that a portion of the range is not significant, the Service need not determine whether the species is threatened or endangered there. If the Service determines that the species is not threatened or endangered in a portion of its range, the Service need not determine if that portion is significant. If the Service determines that both a portion of the range of a species is significant and the species is threatened or endangered there, the Service will specify that portion of the range where the species is in danger of extinction pursuant to section 4(c)(1) of the Act.

The terms ''resiliency,'' redundancy,'' and ''representation'' are intended to be indicators of the conservation value of portions of the range. Resiliency of a species allows the species to recover from periodic disturbance. A species will likely be more resilient if large populations exist in high-quality habitat that is distributed throughout the range of the species in such a way as to capture the environmental variability found within the range of the species. In addition, the portion may contribute to resiliency for other reasons—for instance, it may contain an important concentration of certain types of habitat that are necessary for the species to carry out its life-history functions, such as breeding, feeding, migration, dispersal, or wintering. Redundancy of populations may be needed to provide a margin of safety for the species to withstand catastrophic events. This does not mean than any portion that provides redundancy is a significant portion of the range of a species. The idea is to conserve enough areas of the range such that random perturbations in the system act on only a few populations. Therefore, each area must be examined based on whether that area provides an increment of redundancy that is important to the conservation of the species. Adequate representation ensures that the species' adaptive capabilities are conserved. Specifically, the portion should be evaluated to see how it contributes to the genetic diversity of the species. The loss of genetically based diversity may substantially reduce the ability of the species to respond and adapt to future environmental changes. A peripheral population may contribute meaningfully to representation if there is evidence that it provides genetic diversity due to its location on the margin of the species' habitat requirements.

To determine whether any portion of the range of the salmon-crested cockatoo warrants further consideration as possibly endangered, we reviewed the entire supporting record for this proposed listing determination with respect to the geographic concentration of threats and the significance of portions of the range to the conservation of the species. As previously mentioned, we evaluated whether substantial information indicated that (i) the portions may be significant and (ii) the species in that portion may be currently in danger of extinction. The salmon-crested cockatoo is endemic to Seram and the three small, neighboring Indonesian islands of Ambon, Haruku, and Saparua. Very limited information is available on the status of the species on Ambon, Haruku, and Saparua. Whether this species is native or introduced to Ambon is uncertain, and a very small number of cockatoos (sightings of six to eight birds) are

thought to occur in remaining natural forests in the more remote regions of the island. The status of the salmon-crested cockatoo is unknown on Haruku and Saparua. For Haruku, there is one unspecified locality and observation reported in 1934; for Saparua, there is one specimen recorded for 1923. Even less information is available on the habitat and the threats to the species on these islands. Thus, we find that these three islands are not significant portions of the range of the salmon-crested cockatoo and do not require further consideration as to whether the species is endanger of extinction there.

The relatively larger population size in high-quality habitat on Seram suggests that this area may be a significant portion of the range. The salmon-crested cockatoo primarily occurs in lowland forests throughout the island of Seram; its current population is estimated to be approximately 62,400 birds; and the species persists in high densities in primary and disturbed primary forests on Seram. Therefore, having determined Seram may be a portion of the range that is significant, we proceeded to evaluate whether the species within this portion would qualify as endangered.

Under our five-factor analysis above, we determined that the species is threatened by logging and conversion of forests to agriculture and plantations, illegal trapping for the pet trade, inadequacy or regulatory mechanisms, and fires resulting from El Niño events throughout its entire range. The species is threatened by each of these factors uniformly throughout Seram. There is no information to suggest that the species is currently in danger of extinction because of the reasonably large population size of the species on the island and its occurrence throughout the lowland forests of Seram in primary and disturbed primary forest habitat, as well as secondary forest habitat.

Therefore, the best scientific and commercial data allows us to make a determination that there are no significant portions of the range in which the salmon-crested cockatoo is currently in danger of extinction. Although we do not believe that the species is currently endangered, we believe it is likely that the salmon-crested cockatoo will become endangered throughout its range in the foreseeable future. Thus, we propose to list the salmon-crested cockatoo as a threatened species throughout all of its range under the Act.

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 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 and with respect to its critical habitat, if any is being designated. However, given that the salmon-crested cockatoo is not native to the United States, we are not proposing critical habitat for this species under section 4 of the Act.

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 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. These prohibitions, at 50 CFR 17.21 and 17.31, in part, make it illegal for any person subject to the jurisdiction of the United States to ''take'' (take includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt any of these) within the United States or upon the high seas; import or export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any endangered wildlife species. It also is 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 and 17.32 for threatened species. For endangered wildlife, a permit may be issued for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. For threatened species, a permit may be issued for the same activities, as well as zoological exhibition, education, and special purposes consistent with the Act.

Special Rule

Section 4(d) of the Act states that the Secretary of the Interior (Secretary) may, by regulation, extend to threatened species prohibitions provided for endangered species under section 9. Our implementing regulations for threatened wildlife (50 CFR 17.31) incorporate the section 9 prohibitions for endangered wildlife, except when a special rule is promulgated. For threatened species, section 4(d) of the Act gives the Secretary discretion to specify the prohibitions and any exceptions to those prohibitions that are appropriate for the species, provided that those prohibitions and exceptions are necessary and advisable to provide for the conservation of the species. A special rule allows us to include provisions that are tailored to the specific conservation needs of the threatened species and which may be more or less restrictive than the general provisions at 50 CFR 17.31.

The proposed special rule for the salmon-crested cockatoo, in most instances, adopts the existing conservation regulatory requirements of CITES and the WBCA as the appropriate regulatory provisions for the import and export of certain captive salmon-crested cockatoos. It would also allow interstate commerce. However, import and export of birds taken from the wild after January 18, 1990, take, and foreign commerce will need to meet the requirements of 50 CFR 17.31 and 17.32. ''Take'' under the Act includes both harm and harass. When applied to captive wildlife, take does not include generally accepted animal husbandry practices, breeding procedures, or provisions of veterinary care for confining, tranquilizing, or anesthetizing, when such practices, procedures, or provisions are not likely to result in injury to the wildlife. When conducting an activity that could take or incidentally take wildlife, a permit under the Act is required.

The proposed special rule would, if adopted, allow import and export of certain salmon-crested cockatoos and interstate commerce of this species without a permit under the Act as explained below.

Import and export. The proposed special rule would apply to all commercial and noncommercial

international shipments of live salmon-crested cockatoos and parts and products, including the import and export of personal pets and research samples. It proposes to allow a person to import or export a specimen that was held in captivity prior to January 18, 1990 (the date the species was transferred to CITES Appendix I) or that was captive-bred provided the import is authorized under CITES and the WBCA and export is authorized under CITES. The terms ''captive-bred'' and ''captivity'' used in the proposed special rule are defined in the regulations at 50 CFR 17.3 and refer to wildlife produced in a controlled environment that is intensively manipulated by man from parents that mated or otherwise transferred gametes in captivity. The proposed special rule would apply to birds captive-bred in the United States and abroad. Import and export is allowed without a permit under the Act provided the provisions of CITES and WBCA are met. The CITES permit needs to indicate that the specimen was not taken from the wild by using a source code on the face of the permit other than U (unknown) or W (taken from the wild). If the specimen was taken from the wild prior to January 18, 1990, the importer or exporter needs to demonstrate that the cockatoo was taken from the wild prior to that date. Under the special rule, a person needs to provide records, receipts, or other documents when applying for permits under CITES and WBCA to show the specimen was held in captivity prior to January 18, 1990.

We assessed the conservation needs of the salmon-crested cockatoo in light of the broad protections provided to the species under the WBCA and CITES. The purpose of the WBCA is to promote the conservation of exotic birds and to ensure that international trade involving the United States does not harm exotic birds (see Conservation Status). The salmon-crested cockatoo is also protected by CITES, a treaty which contributes to the conservation of the species by monitoring international trade and ensuring that trade in Appendix I species is not detrimental to the survival of the species and is not for commercial purposes (see Conservation Status). International trade of the salmon-crested cockatoo has been substantially reduced since the listing of the species in Appendix I under CITES and protection under the WBCA. A review of the CITES data, shows that in the 17 years between 1991 and 2007, 297 salmon-crested cockatoos were imported into the United States. Many of these birds are personal pets that owners took with them when travelling out of and returning to the United States. The best available commercial data indicates that the current threat to the salmon-crested cockatoo stems from illegal trade in the domestic and international markets of Indonesia and surrounding countries. Thus, the general prohibitions on import and export contained in 50 CFR 17.31, which only extend within the jurisdiction of the United States, would not regulate such activities. The Service also did not identify how import and export of salmon-crested cockatoos under the proposed special rule is associated with the threat of the species' habitat destruction. Thus, we find that the import and export requirements of the proposed special rule provide the necessary and advisable conservation measures that are needed for this species.

Interstate commerce. Under the proposed special rule, a person may deliver, receive, carry, transport, ship, sell, offer to sell, purchase, or offer to purchase a salmon-crested cockatoo in interstate commerce. Although we do not have current data, we believe there are a large number of salmon-crested cockatoos in the United States. Current ISIS (International Species Information System) information shows 123 salmon-crested cockatoos are held in U.S. zoos (ISIS 2008, p. 4). This number is an underestimate as some zoos do not enter data into the ISIS database. In addition, CITES annual report data shows that 58,484 salmon-crested cockatoos were imported into the United States between 1981 and 1989 (UNEP-WCMC 2009b, p. 2). We believe that a number of these birds are still held in captivity in the United States. In 1990 and 1991, surveys of captive breeding by U.S. aviculturists showed 820 and 625 salmon-crested cockatoos were held by 239 and 194 survey respondents, respectively (Allen & Johnson 1991, p. 17; Johnson 1992, p. 46). We have no information to suggest that interstate commerce activities are associated with threats to the salmon-crested cockatoo or will negatively affect any efforts aimed at the recovery of wild populations of the species. At the same time, the prohibitions on take under 50 CFR 17.31 would apply under this special rule, and any interstate commerce activities that could incidentally take cockatoos would require a permit under 50 CFR 17.32. Therefore, we find that it is not necessary or advisable for the conservation of the salmon-crested cockatoo to regulate interstate commerce of this species.

Peer Review

In accordance with our policy, ''Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities,'' that was published on July 1, 1994 (59 FR 34270), we will seek the expert opinion of at least three appropriate independent specialists regarding this proposed rule. The purpose of such review is to ensure listing decisions are based on scientifically sound data, assumptions, and analysis. We will send copies of this proposed rule to the peer reviewers immediately following publication in the **Federal Register**.

Public Hearings

The Act provides for one or more public hearings on this proposal, if we receive any requests for hearings. We must receive your request for a public hearing within 45 days after the date of this **Federal Register** publication (see DATES). Such requests must be made in writing and be addressed to the Chief of the Branch of Listing at the address shown in the **FOR FURTHER INFORMATION CONTACT** section. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** at least 15 days before the first hearing.

Required Determinations

Paperwork Reduction Act

This proposed rule does not contain any new collections of information that require approval by the Office of Management and Budget (OMB) under 44 U.S.C. 3501 *et seq*. The regulation 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

We have determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted under section 4(a) of the Act. A notice outlining our reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(a) Be logically organized;

(b) Use the active voice to address readers directly;

(c) Use clear language rather than jargon;

(d) Be divided into short sections and sentences; and

(e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

References Cited

A list of the references used to develop this proposed rule is available upon request (see **FOR FURTHER INFORMATION CONTACT** section).

Author

The primary authors of this notice are staff members of the Division of Scientific Authority, U.S. Fish and Wildlife Service.

List of Subjects in 50 CFR Part 17

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

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as follows:

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 new entry for ''Cockatoo, salmon-crested'' 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							
*	*	*	*	*		*	
Cockatoo, salmon-crested	*Cacatua moluccensis*	Seram, Haruku, Saparua, and Ambon, Indonesia	Entire	T		NA	17.41(c)

* * * * *

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

§17.41 ***Special rules—birds.***

* * * * *

(c) Salmon-crested cockatoo (*Cacatua moluccensis*).

(1) Except as noted in paragraphs (c)(2) and (c)(3) of this section, all prohibitions and provisions of §§17.31 and 17.32 of this part apply to the salmon-crested cockatoo.

(2) *Import and export.* The import or export of any salmon-crested cockatoo taken from the wild after January 18, 1990, requires a permit under §17.32. You may import and export a live salmon-crested cockatoo and its parts and products provided:

(i) The import or export of the specimen is authorized under the Wild Bird Conservation Act (WBCA, 16 U.S.C. 4901–4916) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, TIAS 8249);

(ii) The specimen was captive-bred and the source code on the CITES document for the specimen is not U (unknown) or W (taken from the wild); or, for a specimen that was held in captivity prior to January 18, 1990, and was not captive-bred, you provide records, receipts, or other documents when you apply for an import or export permit under CITES or an import permit under WBCA to demonstrate that the specimen was held in captivity prior to January 18, 1990; and

(iii) The person carrying out the activity has complied with all terms and conditions that apply to that activity under the provisions of the WBCA and CITES and their implementing regulations. Violation of WBCA or CITES would constitute a violation of the Act.

(3) *Interstate commerce.* You may deliver, receive, carry, transport, ship, sell, offer to sell, purchase, or offer to purchase in interstate commerce a live salmon-crested cockatoo and its parts and products.

(4) All applicable provisions of 50 CFR parts 14, 15, 17, and 23 must be met.

Dated: October 21, 2009.

Rowan W. Gould,

Deputy Director, U.S. Fish and Wildlife Service.

[FR Doc. E9–26131 Filed 11–2– 09; 8:45 am]

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