DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R9–ES–2010–0099; 450 003 0115]

RIN 1018–AX50

Endangered and Threatened Wildlife and Plants; Three Foreign Parrot Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a final rule to list the Philippine cockatoo *(Cacatua haematuropygia)* and the yellow-crested cockatoo *(C. sulphurea)* as endangered, and to list the white cockatoo *(C. alba)* as threatened under the Endangered Species Act of 1973, as amended (ESA). We are taking these actions in response to a petition to list these three cockatoo species as endangered or threatened under the ESA. We also finalize the special rule for the white cockatoo in conjunction with our final listing as threatened for this species.

DATES: This final action will be effective on July 24, 2014.

ADDRESSES: This final rule is available on the Internet at *http://www.regulations.gov* at Docket No. FWS–R9–ES–2010–0099. Comments and materials we received, as well as supporting documentation used in the preparation of this rule, are available for public inspection, by appointment, during normal business hours at: U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Suite 400, Arlington, VA 22203.

FOR FURTHER INFORMATION CONTACT: Janine Van Norman, Chief, Branch of Foreign Species, Ecological Services Program, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 420, Arlington, VA 22203; telephone 703–358–2171. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

I. Purpose of the Regulatory Action

We are listing the Philippine cockatoo and the yellow-crested cockatoo as endangered and the white cockatoo as threatened under the Endangered Species Act (Act) (16 U.S.C. 1531 *et seq.*) because of habitat loss and degradation and poaching for the pet trade, which are the primary threats to the continued survival of these species.

II. Major Provisions of the Regulatory Action

This action lists the Philippine cockatoo and the yellow-crested cockatoo as endangered on the List of Endangered and Threatened Wildlife at 50 CFR 17.11(h). This action also lists the white cockatoo as threatened on the List of Endangered and Threatened Wildlife at 50 CFR 17.11(h), and allows the import into and export from the United States of certain captive-bred white cockatoos, and allows certain acts in interstate commerce of white cockatoos, without a permit under 50 CFR 17.32.

Background

The Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), is a law that was passed to prevent extinction of species by providing measures to help alleviate the loss of species and their habitats. Before a plant or animal species can receive the protection provided by the Act, it must first be added to the Federal List of Endangered and Threatened Wildlife or the Federal List of Endangered and Threatened Plants. Section 4 of the Act and its implementing regulations at 50 CFR part 424 set forth the procedures for adding species to these lists.

Previous Federal Actions

In our proposed rule, published August 9, 2011 (76 FR 49202), we announced that listing the Philippine cockatoo and yellow-crested cockatoo as endangered was warranted, and we issued a proposed rule to add these two species as endangered on the List of Endangered and Threatened Wildlife at 50 CFR 17.11(h). We found that listing the crimson shining parrot *(Prosopeia splendens)* as endangered or threatened was not warranted. We further found that listing the white cockatoo as threatened was warranted, and we issued a proposed rule to add that species as threatened on the List of Endangered and Threatened Wildlife at 50 CFR 17.11(h) as well as a proposed special rule under section 4(d) of the Act for white cockatoo.

During the public comment period, which ended on October 11, 2011, we received 234 comments from the public (see *http://www.regulations.gov,* docket number FWS–R9–ES–2010–0099). All comments, including names and addresses of commenters, have become part of the administrative record.

Petition History

On January 31, 2008, the Service received a petition dated January 29, 2008, from Friends of Animals, as represented by the Environmental Law Clinic, University of Denver, Sturm College of Law, requesting that we list 14 parrot species under the ESA. The petition clearly identified itself as a petition and included the requisite information required in the Code of Federal Regulations (50 CFR 424.14(a)). On July 14, 2009 (74 FR 33957), we published a 90-day finding in which we determined that the petition presented substantial scientific and commercial information to indicate that listing may be warranted for 12 of the 14 parrot species.

In our 90-day finding on this petition, we announced the initiation of a status review to list as endangered or threatened under the ESA the following 12 parrot species: Blue-headed macaw (*Primolius couloni*), crimson shining parrot (*Prosopeia splendens*), great green macaw (*Ara ambiguus*), grey-cheeked parakeet (*Brotogeris pyrrhoptera*), hyacinth macaw (*Anodorhynchus hyacinthinus*), military macaw (*Ara militaris*), Philippine cockatoo (*Cacatua haematuropygia*), red-crowned parrot (*Amazona viridigenalis*), scarlet macaw (*Ara macao*), white cockatoo (*Cacatua alba*), yellow-billed parrot (*Amazona collaria*), and yellow-crested cockatoo (*Cacatua sulphurea*). We initiated the status review to determine if listing each of the 12 species is warranted, and initiated a 60-day public comment period to allow all interested parties an opportunity to provide information on the status of these 12 species of parrots. The public comment period closed on September 14, 2009.

On October 24, 2009, and December 2, 2009, the Service received a 60-day notice of intent to sue from Friends of Animals and WildEarth Guardians, for failure to issue 12-month findings on the petition. On March 2, 2010, Friends of Animals and WildEarth Guardians filed suit against the Service for failure to make timely 12-month findings within the statutory deadline of the Act on the petition to list the 14 species (*Friends of Animals, et al.* v. *Salazar,* Case No. 10 CV 00357 D.D.C.).

On July 21, 2010, a settlement agreement was approved by the Court (*Friends of Animals, et al.* v. *Salazar,* Case No. 10 CV 00357 D.D.C.), in which the Service agreed to submit to the **Federal Register** by July 29, 2011, September 30, 2011, and November 30, 2011, determinations whether the petitioned action is warranted, not

warranted, or warranted but precluded by other listing actions for no less than 4 of the petitioned species on each date.

On August 9, 2011, the Service published in the **Federal Register** a 12-month status review finding for the crimson shining parrot (a finding that listing was not warranted) and a proposed rule for the following three parrot species: Philippine cockatoo, white cockatoo, and yellow-crested cockatoo (76 FR 49202).

On October 6, 2011, we published a 12-month status review finding for the red-crowned parrot (76 FR 62016); on October 11, 2011, we published a 12-month status review and proposed rule for the yellow-billed parrot (76 FR 62740); and on October 12, 2011, we published a 12-month status review for the blue-headed macaw and grey-cheeked parakeet (76 FR 63480).

On September 16, 2011, an extension to the settlement agreement was approved by the Court (CV–10–357, D. DC), in which the Service agreed to submit a determination for the remaining four petitioned species to the **Federal Register** by June 30, 2012.

On July 6, 2012, the Service published in the **Federal Register** a 12-month status review finding and proposed rule for the four following parrot species: Great green macaw and the military macaw (77 FR 40172), hyacinth macaw (77 FR 39965), and the scarlet macaw (77 FR 40222).

Upon publication in the **Federal Register** on August 9, 2011, of the 12-month status review finding and proposed rule for these species (76 FR 49202), we initiated a 60-day public comment period, which ended on October 11, 2011.

Summary of Comments

We base this action on a review of the best scientific and commercial information available, including all information we received during the public comment period. In the August 9, 2011, proposed rule, we requested that all interested parties submit information that might contribute to the development of a final rule. We also contacted appropriate scientific experts and organizations and invited them to comment on the proposed listing.

We reviewed all comments we received for substantive issues and new information regarding the proposed listing of these species, and we address those comments below. We received 243 comments, three of which were from peer reviewers; these comments are available at *http://www.regulations.gov* under Docket No. FWS–R9–ES–2010–0099. Many of the commenters supported the listings, some commenters objected to the rule, although many of the commenters did not appear to understand the criteria for listing under the Act. Therefore, we are providing clarification below. Many comments either simply opposed or objected without providing scientific or commercial information. The following summarizes the comments received and our responses.

Comments Regarding Special 4(d) Rule

Many commenters, while not opposed to the listing of the species, asked for a special rule under section 4(d) of the Act (also called a ''4(d) rule'') that would allow interstate trade of these species to occur.

Response

Section 4(d) of the Act allows the Service to establish special regulations only for species determined to be threatened under the ESA. The ESA specifies that 4(d) rules must be ''necessary and advisable to provide for the conservation of such species.'' Special rules cannot be applied to species listed as endangered under the Act. Because we determined that listing the Philippine cockatoo and yellow-crested cockatoo as endangered under the ESA was warranted, we are prohibited from developing a special rule allowing interstate commerce for these two species. We proposed and are finalizing a special rule for the white cockatoo, in conjunction with our final rule to list the species as threatened, which would allow for interstate trade in this species without an ESA permit.

Comment Regarding Similarity in Appearance of Yellow-Crested Cockatoo to Sulphur-Crested Cockatoo

One commenter expressed concern that the similarity in appearance between the yellow-crested cockatoo (*Cacatua sulphurea*), native to Indonesia, and another species, the sulphur-crested cockatoo (*Cacatua galerita*), native to Australia, could lead to confusion by a law enforcement official.

Response

We acknowledge that these two species may be difficult to distinguish. In fact, the yellow-crested cockatoo (*Cacatua sulphurea*), which is the subject of this rule, is often inappropriately referred to as the sulphur-crested cockatoo. There are physical differences between the species. The yellow-crested cockatoo is smaller both in size and weight than the sulphur-crested cockatoo and can usually be distinguished by the lack of pale yellow coloring on its cheeks. The average weight of the sulphur-crested cockatoo is more than twice that of yellow-crested cockatoo, and the sulphur crested cockatoo length is an average 50 cm (19.69 inches), while the yellow-crested average length is 33 cm (13 in). The Service's Division of Law Enforcement is aware of both the similarity of appearance and the differences in legal status of these two species. Both species receive protections under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Wild Bird Conservation Act (WBCA). See Conservation Status for the Philippine Cockatoo section for a discussion of these two regulatory mechanisms. To assist pet owners in identifying their cockatoo, we have developed a factsheet which is available on our Web site. Please visit *http://www.fws.gov/endangered* for additional information.

Comment Suggesting Withdrawal of Proposed Listing Determinations

Several commenters, including bird breeders and the American Federation of Aviculture, objected to our findings (see *http://www.regulations.gov,* docket number FWS–R9–ES–2010–0099) and requested that the proposed listing determination be withdrawn.

Response

We thank all the commenters for their interest in the conservation of these species and thank those commenters who provided information for our consideration in making this listing determination. Under section 4(b) of the ESA, the Service is required to make determinations solely on the basis of the best scientific and commercial data available after conducting a review of the status of the species. When we published our proposed rule, we opened a public comment period during which we requested any additional information on the species being evaluated. In making this finding, we reviewed information provided within the petition, contacted species experts, and ensured that we have the most current information on these three species. Therefore, we have obtained and considered the ''best scientific and commercial data available'' in our species status review and in our listing determination. After careful consideration, we conclude that these listings under the Act are necessary for the conservation of the 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 sought the expert opinion of at least three appropriate independent specialists regarding this rule. The purpose of such review is to ensure listing decisions are based on scientifically sound data, assumptions, and analysis. We sent copies of the proposed rule to the peer reviewers immediately following publication in the **Federal Register**. We invited these peer reviewers to comment, during the public comment period, on the specific assumptions and the data that are the basis for our conclusions regarding the proposal to list as endangered the Philippine cockatoo (*Cacatua haematuropygia*) and the yellow-crested cockatoo (*C. sulphurea*), and to list as threatened the white cockatoo (*C. alba*), under the ESA. We received information from three peer reviewers.

We considered all comments and information we received during the comment period from peer reviewers on the proposed rule during preparation of this final rulemaking, and all comments have been documented for the final record.

Summary of Changes From Proposed Rule

This final rule incorporates changes to our proposed listing determination based on the comments that we received that are discussed above and newly available scientific or commercial information. Peer reviewers generally commented that the proposed rule was thorough and comprehensive. We made some technical corrections based on new, although limited, information. For example, one commenter pointed out that, with respect to white cockatoos, which require large nesting cavities (in large trees), the nonnative *Jatropha curcas* is cultivated as a large shrub rather than a tree. Therefore, it will never produce cavities large enough to be suitable for cockatoos. None of the information, however, changed our listing determinations.

Special rule for the white cockatoo. On March 12, 2013, we published in the **Federal Register** (78 FR 15624) a final rule listing the yellow-billed parrot as threatened with a special rule under section 4(d) of the Act, and correcting the salmon-crested cockatoo special rule under section 4(d) of the Act. In the preamble of that rule, we explained that we were adopting for yellow-billed parrot and correcting for salmon-crested cockatoo a provision that would allow certain acts in interstate commerce for yellow-billed parrots and salmon-crested cockatoos that may be conducted without a threatened species permit under 50 CFR 17.32. The provisions of that special rule, found at 50 CFR 17.41(c), are similar to and consistent with our intent in proposing the exceptions contained in the 4(d) rule for the white cockatoo. As discussed in further detail below, we are amending the regulations found at 50 CFR 17.41(c) to include the white cockatoo among the species in the parrot family to which 50 CFR 17.41(c) applies (see Special Rule).

Factors Affecting the Species

Section 4 of the ESA (16 U.S.C. 1533) and implementing regulations (50 CFR 424) set forth procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the ESA, a species may be determined to be endangered or threatened based on any one or a combination of the following five factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms;

(E) Other natural or manmade factors affecting its continued existence.

In considering what factors might constitute a threat; we look beyond the actual or perceived exposure of the species to the factor to determine how the species responds to the factor and whether the factor causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant a factor it is. If the factor is significant, it may drive or contribute to the risk of extinction of the species such that it is considered to be a threat. In some cases, there is little information available regarding the status of the species, in part due to their remoteness.

This finding addresses the following three cockatoo species: Philippine cockatoo, white cockatoo, and yellow-crested cockatoo. For each of these species, we evaluated the five factors under ESA Section 4(a)(1) on the species. In some cases, we found that, under a particular factor, a threat was contributing to the extinction risk for multiple species, while some factors constituted a threat for some of the species, but not others. In some cases, the factors affecting species are the same or very similar, and in other cases the factors are unique. In each evaluation, we clearly identify what species is being addressed, and if the threat applies to more than one species.

Species Information

Cockatoos are found only in Australasia—a few archipelagos in Southeast Asia (Bismarck, East Timor, Indonesia, Philippines, Tanimbar, and Solomon), New Guinea, and Australia. Cockatoos are present on Lombok and Sulawesi, but not on Bali and Borneo (Cameron 2007, pp. 1–3). These oceanic islands have high levels of endemism, meaning the species that occur there are unique to those islands. 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. Dyck texturing is a microscopic texturing that produces blue and green coloration and is present in the plumage of other parrots (Brown and Toft 1999, p. 141).

A. Philippine cockatoo (*Cacatua haematuropygia*)

Taxonomy and Species Description

The species was first taxonomically described by Müller in 1776 (BLI 2013a, p. 5). We accept the species as *C. haematuropygia,* which follows the Integrated Taxonomic Information System (ITIS 2011). The Philippine cockatoo, or red-vented cockatoo, is locally known as the ''katala'' and ''kalangay,'' and has a helmet crest and a red undertail (Rowley 1997 in Boussekey 2000, p. 137).

Population Estimates

The population is estimated to be between 370–770 mature individuals, roughly equivalent to 550–1,200 individuals in total (BLI 2013a, p. 6). Surveys indicated that until around the 1980s, the Philippine cockatoo was fairly common within the Philippine archipelago (BLI 2013a; Boussekey 2000, p. 138; Collar et al. 1998). Historically, it was known to exist on 52 islands in the Philippines; currently it is believed to exist on 8 islands (BLI 2011, p. 1).

The species' current range is significantly reduced from its historical range. In the past, the species was reported to have been commonly found throughout the Philippines, except for northern and central Luzon (Collar et al. 1999 in Widmann and Widmann 2008, p. 23; DuPont 1971 in Boussekey 2000, p. 138). It was common throughout the Philippines as recently as the 1950s. Between 1980 and 2000, there was a 60 to 90 percent population decline throughout its range (Boussekey 2000, p.

138). In the early 1990s, the population was estimated to be between 1,000 and 4,000 (Tabaranza 1992 and Lambert 1994 in BLI 2001, p. 1,681).

Snyder et al. (2000) reported the following population surveys. A 1991 survey estimated between 800 and 3,000 birds exist on Palawan. Pandanan, Bugsok, and Bancalan Islands were thought to support 100 to 300 individuals and Dumaran 150 to 250 individuals, and possibly a few hundred were thought to exist in the Tawi-Tawi region (Lambert 1994; 1993). A single pair was found on Siquijor in 1991 (Evans et al. 1993). A few were found at Mount Isarog, Luzon in 1988 (Goodman and Gonzales 1990), and a few pairs were found in Mindoro at Malpalon (Dutson et al. 1992). Some birds were observed on the island of Masbate in 1993, and the species has been recorded a few times in singles or small numbers in Rajah Sikatuna National Park, on the island of Bohol since 1989 (Brooks et al. 1995b in BLI 2001, p. 1676). In 1994, two pairs were seen on Tawi-Tawi (Dutson in litt. 1997), and the species was considered widespread at that location in 1995–1996, although apparently more often seen in captivity than in the wild (two single specimens were observed in Batu-Batu and a single bird and a pair were observed in Buan) (Allen in litt. 1997). Three birds were observed on Simunul, Tawi-Tawi in 1996 (Allen in litt. 1997; Dutson et al. 1996). The species is considered extinct on the islands of Cebu (Brooks et al. 1995) and Negros (Brooks et al. 1992). Some islands may not hold viable populations, and may be functionally extinct.

Between 2004 and 2010, the population estimate decreased from between 1,000 and 4,000 individuals to between 450 and 1,245 individual birds in the wild (BLI 2013a; BLI 2010; Widmann and Widmann 2010, pers. comm.; Widmann and Widmann 2008, p. 23). This species currently is found in the Culasian Managed Resource Protected Area (CMRPA), the Polillo Island Group, Palawan, Dumaran Island, Pandanan and Bugsok Islands, Rasa Island, Tawi-Tawi, the Calamian group of islands, Malampaya, San Vicente, and possibly on Samar Island (Widmann and Widmann 2011, pers. comm.). An estimated additional 400 individuals may survive in the Sulu archipelago; however, only sparse information is available for this area (Widmann et al. 2010a; Widmann et al. 2009a; Widmann et al. 2007). Subpopulations away from Palawan and the Sulus are thought to be very small, and likely do not have viable populations (Widmann 2010, pers. comm). The extent these populations are interbreeding is unclear at this time. Detailed discussion of each of these areas follows.

TABLE 1—POPULATION COUNTS AND ESTIMATES OF PHILIPPINE COCKATOO BETWEEN 2007 AND 2010 ON ISLANDS IN THE PHILIPPINES

[Widmann et al. 2010a; Widmann et al. 2009a; Widmann et al. 2007].

Number of individuals	Location
60	Bugsok Island (40 to 80 estimated)
20	Burdeos, Polillo Islands
3	CMRPA, Palawan Island
23	Dumaran, Lagan
80	Pandanan Island
2	Patnanungan, Polillo Islands
280	Rasa Island
4	Samar
200	Tawi-Tawi (100 to 400 estimated)
672	TOTAL *

* Note: This is not a full population survey; it documents birds actually counted, observed, or estimated (Widmann 2010, pers. comm.).

Biology, Distribution, and Habitat

The Philippine cockatoo is endemic to the Philippines, an archipelago of approximately 7,000 islands. The total area of the Philippines is 30,000,000 hectares (74,131,614 acres) (Kummer 1991, p. 44). The Philippine cockatoo requires lowland primary or secondary forests with suitable nesting tree cavities and food sources, within or adjacent to riparian or coastal areas with mangroves (BLI 2013a). The species is reported to use regenerating forest and even heavily degraded forest, as long as emergent nest trees survive. However, its nest sites are restricted to lowlands (Widmann and Widmann 2010, pers. comm).

This species is a food generalist; its diet varies based on the seasons. It consumes seeds, legumes, fruit, flowers, buds, and nectar. It will also eat agricultural crops such as corn and rice, and has been observed feeding on *Moringa oleifera* (commonly known as malunggay or horseradish tree). The government of the Philippines introduced a bill in 2010, in the Fifteenth Congress of the Republic of the Philippines, First Regular Session, to encourage planting *Moringa oleifera* due to economic benefits, although it is not native to the Philippines (Senate Bill 1349 2010, pp. 1–7). The Philippine cockatoo has also been observed feeding on the fruits of *Sonneratia,* a mangrove species (Tabaranza 1992; Lambert 1994 in BLI 2001, p. 1683). In the Philippines, the common name for *Sonneratia alba* is Pagatpat (Widmann and Antonio 2011, pp. 20–21).

This species nests in tree cavities, and produces two to three eggs per season; in some exceptional cases, four eggs have been recorded (Widmann pers. comm. 2011, p. 1; Cameron 2007, p. 140). Breeding generally occurs March through June (BLI 2001, p. 1684), and both sexes participate in nest building (Widmann et al. 2001, p. 135). The period between incubation and fledging is generally about 95 days (Cameron 2007, p. 140). The species prefers nests high in the tree canopy, generally around 30 m (98 feet) (BLI 2001, p. 1683), but nest heights between 12 and 35 m (39 to 114 feet) have also been observed (Widmann et al. 2001, p. 135). The diameter of the cavity openings observed has been between 10 and 25 cm (4 and 10 inches) (Widmann et al. 2001, p. 135). Some artificial nest boxes have been installed to increase nesting habitat; the species prefers horizontal rather than vertical nest boxes (Low 2001, p. 3). Some of the tree species they use for roosting include *Dipterocarpus grandiflorus* (common names: Apitong, tempudau, tunden, lagan bras aput) and *Intsia bijuga* (common names: Borneo-teak, Moluccan ironwood, and merbau asam), as well as coconut trees (Lambert 1994 in BLI 2001, p. 1686). They also use *Garuga floribunda* (no common name [ncn]) and *Sonneratia alba* (Cameron 2007, p. 35).

Culasian Managed Resource Protected Area (CMRPA)

The CMRPA is in the south of Palawan Island and is 1,954 hectares (ha) (4,828 acres (ac). The total land area of Palawan is approximately 1.5 million ha (3.7 million ac), including the 1,767 islands and islets surrounding the main island. This species exists both within the actual designated protected area (CMRPA) and in the areas surrounding the protected area on Palawan Island. This species has been known to fly from the mainland to offshore islands as far as 8 km (5 mi) away from the mainland to roost and breed. No roosting sites are known in the CMRPA and surrounding areas (Widmann et al. 2010a, p. 23); however, there have been sightings there: Four birds were observed in September 2009, and three were observed in December 2009 (Widmann et al. 2010a, p. 37). As of 2011, at least two Philippine cockatoos persisted inside the protected area, but they had not bred in the last 4 years.

CMRPA has been described as exhibiting the ''empty forest syndrome.'' Although its forest is largely intact, little wildlife remains due to hunting

pressure and poaching. As of the date of this publication, there are no indications that the species' status is improving. Only one breeding pair exists outside of the reserve. As of 2010, cockatoo poaching had occurred in this area within the past 3 years, and breeding in the 2009–2010 season failed. Because all nests have been systematically poached over many years, extirpation of this population is likely to occur suddenly due to lack of recruitment (Widmann and Widmann 2010, pers. comm.).

Polillo Islands Group

This group of islands is approximately 110 km (68 mi) east of Manila, in Quezon Province in the northern Philippines. Patnanungan Island is part of the Polillo Island Group and is not yet very developed. Polillo Island itself is 1,000 km² (386 mi²). As of 2009, within the Polillo group of islands, Patnanungan Island was known to contain a population of the Philippine cockatoo (Widmann et al. 2010, p. 15). However, no roosting sites have been identified on this island (Widmann et al. 2010, p. 23). Patnanungan Island is mainly covered with secondary vegetation and coconut plantations (Widmann et al. 2010, p. 22). Seven nest trees are being monitored in this area (Widmann et al. 2009b, p. 7). To the best of our knowledge, there is not a viable population on Polillo Island, although the species has been observed there. In 2009, in Burdeos, six Philippine cockatoos were spotted in Duyan-Duyan Forest in the Anibawan Barangay, where it is regularly heard (Widmann et al. 2010, p. 38; Widmann et al. 2009a, p. 41). In part, because there were fewer than 20 birds prior to their protection, recovery in this area is slow (Widmann and Widmann 2010, pers. comm.).

Province of Palawan

The distribution of the Philippine cockatoo within the Palawan region includes the Calamian group of islands, Malampaya, San Vicente, Dumaran, Sabang and Babuyan River, Iwahig, Rasa, Rizal (CMRPA), Pandanan, Bugsuk, and Balabac. Key Philippine cockatoo habitat locations within these islands are discussed below.

Dumaran Island

On Dumaran Island, which is off the northeastern coast of Palawan, three areas are managed by the Katala Foundation's Philippine Cockatoo Conservation Programme (PCCP). Two of those are protected areas: The Omoi Cockatoo Reserve and the Manambaling Cockatoo Reserve (Widmann et al. 2009b, p. 7). The third area is Lagan, which is also monitored and managed by the Katala Foundation (KFI). On Dumaran Island, the protected suitable forest patches are each very small: 1.5 and 0.6 km² (0.6 and 0.2 mi²), respectively (Widmann and Widmann 2008, p. 24). On this island in 2008, although 10 eggs were counted, only two birds fledged (Widmann et al. 2009b, p. 6). Recovery is slow; they started with fewer than 20 birds before protection started (Widmann and Widmann 2010, pers. comm.). Currently, there are an estimated 30 individuals on Dumaran Island (Widmann and Widmann 2011, pers. comm.).

Pandanan and Bugsok Islands

Pandanan and Bugsok (119 km²) (46 mi²) are small islands south of Palawan, within the Balabac Island Region. It is likely that Pandanan holds possibly the second-most important population of Philippine cockatoos, containing at least 80 individuals (Widmann and Widmann 2010, pers. comm.). Approximately 40 birds were observed in a coconut plantation in 2009 on Malinsuno Island, a 10-hectare (24-acre) nearby island that is part of the Pandanan Barangay (equivalent to county or province) (Widmann et al. 2010c, p. 5; Widmann and Widmann 2010, pers. comm.). On Bugsok Island, Balabac, also in the Pandanan Barangay, approximately 40 cockatoos were observed roosting (Widmann et al. 2010c, p. 5). A large part of Pandanan Island itself is not easily accessible; it is privately managed, and is protected for the most part. KFI is working on building a relationship with organizations to monitor and formally protect this island, and wardens were being hired as of 2010 (Widmann et al. 2010, pp. 26, 56).

Rasa Island

Rasa Island is a protected 8 km² (3 mi²) island off the east coast of Narra, Palawan. This island was declared a wildlife sanctuary in 2006 (Widmann et al. 2010, p. 15). As of 2007, 1.75 km² (0.6 mi²) of the island was coastal and mangrove forest. In 2008, 32 nest trees were found to be occupied, 21 pairs had successful fledglings, and the population was estimated to be 205 individuals (Widmann et al. 2009b, pp. 5–6; Widmann et al. 2008, p. 14; Widmann and Widmann 2008, p. 27). Breeding success was 63 percent; 49 fledglings were banded (Widmann and Widmann 2008, p. 24). In years that experienced sufficient precipitation, the increase of Philippine cockatoos on Rasa has been good. As of 2009, Rasa Island had 64 nest trees, and its cockatoo population was approximately 280 individuals, making it the area with the highest natural density of Philippine cockatoos (Widmann 2010b). KFI estimates that Rasa Island contains about 20 percent of the total Philippine cockatoo population (Widmann et al. 2010c, p. 19). The success of cockatoos on this island is likely due to the lack of potable water, which makes it unattractive to human settlement (BLI 2001, p. 1687). The Philippine cockatoo population on this island has grown due to intense management; in 1997, there were only about 25 birds on Rasa Island (Widmann and Widmann 2008, p. 24).

Other Islands

Currently, very little information is available regarding the status of the Philippine cockatoo on other islands, such as Samar and Tawi-Tawi, in part because these areas are extremely remote. The Katala Foundation, Inc. (KFI) surveyed Samar in 2002, at which time only two individual Philippine cockatoos were verified. Sightings have been reported on Coron Island and on Bellatan Island in the Tawi-Tawi region. In 2010, KFI reported that a member of the Wild Bird Club, Philippines, had observed approximately 30 to 40 individuals on Bellatan Island (Widmann and Widmann 2010, pers. comm.). Sightings of this species on Dinagat, Surigao del Norte, and Samal Islands, Davao, have been reported, but they remain unverified (Widmann and Widmann 2010, pers. comm.).

As of 2010, BLI indicated that possibly 100 to 200 Philippine cockatoos existed in the Tawi-Tawi region; however, those data are from over 20 years ago, and, therefore, are no longer likely to be an accurate population estimate (BLI 2010a, p. 1; Dutson 1997, and Allen 1997 in Snyder 2000, p. 84; Lambert 1993). Tawi-Tawi is in the southwestern part of the Philippines in the Sulu Archipelago. Tawi-Tawi consists of 107 islands and islets and is approximately 1,197 km² (462 mi²) in area. The island of Tawi-Tawi itself is 484 km² (187 mi²) (Dutson et al. 1996, p. 32) and is part of the Autonomous Region in Muslim Mindanao (ARMM). This area has experienced problems with logging, military activity, and insurgency but as of 2010 is encouraging ecotourism (Manila Bulletin 2010; IUCN 2010b; Philippines Department of Natural Resources (DENR) 2005), which may have positive effects on the Philippine cockatoo.

Samar is the third largest island in the Philippines archipelago. It experienced threats from logging and mining prior to

1989, but in 1989, an unexpected natural disaster resulted in initiation of conservation actions (Samar Island Natural Park 2010, p. 1). Due to the intense landslides that occurred as a result of logging activities, a logging moratorium was put into place that year. Samar Island Natural Park was subsequently established on the island, which may have positive results for the Philippine cockatoo. Samar Island has been reported to contain one of the Philippine's largest unfragmented tracts of lowland rainforest. While several Philippine cockatoo sightings have been reported on Samar, researchers have no current estimate of how many exist there other than the reported sightings (BLI 2010a; Widmann and Widmann 2010, pers. comm.; Widmann et al. 2006, p. 13).

Conservation Status for the Philippine Cockatoo

Protections exist through various national, local, and international mechanisms for this species. The species is on the Philippines list of protected species under the Philippines Republic Act 9147, otherwise known as the Wildlife Resources Conservation and Protection Act of 2001 or the ''Wildlife Act of 2001'' (DENR 2010, p. 2). This species is classified as critically endangered by the Government of the Philippines under this Act (DENR 2010, p. 2). The Republic Act No. 9147 provides for the conservation and protection of wildlife resources and their habitats. It prohibits certain activities such as capture and trade of live wildlife, including the Philippine cockatoo. This species has received further protections in the United States under the Wild Bird Conservation Act (WBCA), which is described under Factor B, below.

In 1981, the Philippine cockatoo was listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). At that time, almost all Psittaciformes species (i.e., parrots) were included in Appendix II. CITES is an international treaty among 178 nations where member countries work together to ensure that international trade in CITES-listed animals and plants is not detrimental to the survival of wild populations. This goal is achieved by regulating import, export, and re-export of CITES-listed animal and plant species and their parts and products through a permitting system (*http://www.cites.org*). Appendix II includes species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival; and other species which must be subject to regulation in order that trade in specimens of certain species threatened with extinction which are or may be affected by trade may be brought under effective control (CITES Article II(2)). International trade in specimens of Appendix II species is authorized when: (1) The CITES Scientific Authority of the country of export has determined that the export will not be detrimental to the survival of the species in the wild; and (2) the CITES Management Authority of the country of export has determined that the specimens to be exported were legally acquired (*http://www.cites.org/eng/disc/how.shtml,* accessed June 24, 2010). In the United States, CITES is implemented through the U.S. Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*). This species was transferred from Appendix II to Appendix I of CITES in 1992. Appendix I includes species threatened with extinction which are or may be affected by trade, and international trade is permitted only under exceptional circumstances (CITES Article II(1)). Trade in Appendix I specimens for primarily commercial purposes is generally prohibited.

The Philippine cockatoo is also listed as Critically Endangered in the 2010 IUCN Red List. Critically endangered is IUCN's most severe category of extinction assessment, which equates to an extremely high risk of extinction in the wild. IUCN criteria include rate of decline, population size, area of geographic distribution, and degree of population and distribution fragmentation; however, IUCN rankings do not confer any actual protection or management.

Evaluation of Factors Affecting the Philippine Cockatoo

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The loss of dry coastal forest is a significant factor affecting the Philippine cockatoo. Mangroves are not optimal cockatoo habitat; however, they are important for the species presently, since they are the largest lowland forests still present in the Philippines (Widmann and Widmann 2011, pers. comm). Widespread deforestation and destruction of native mangroves have affected the habitat of the Philippine cockatoo. The loss of this species' habitat through deforestation largely occurred prior to the 1980s (Galang 2004, p. 13; Kummer 1991, p. 46). Forest cover decreased in Palawan from 10,703 km^2 (4,132 mi^2) in 1950, to 6,605 km^2 (2,550 mi^2) in 1987 (Kummer 1991, p. 57). In the 1990s, commercial logging on Palawan, the primary location of the Philippine cockatoo, was suspended by presidential decree; however, nearly all of the island's forests were already leased to logging operations (Galang 2004, p. 14; Lambert 1994 in BLI 2001, p. 1686). Many of Palawan's mangroves, which covered 46,000 ha (13,668 ac) in 1988, were also cleared for construction of fish ponds (Quinnell and Balmford 1988 in BLI 2001, p. 1686). As a result of the pressures for resources, much of the forest is either secondary forest or has been converted to plantations or agriculture (Galang 2004, pp. 13–14; Heaney et al. 1998, 88 pp.). In most areas within the range of the Philippine cockatoo, there is a severe shortage of timber and firewood; consequently, illegal logging is widespread. In addition to mangrove logging, slash-and-burn farming (referred to as ''kaingin'' in the Philippines) is a problem in many areas, particularly in the Polillo Island Group.

Soil erosion is a secondary impact to this species' habitat that occurs as a result of deforestation that further degrades suitable habitat (Kummer 1991, p. 41), as demonstrated on Samar Island. Removal of trees, digging, and mining are causing secondary habitat degradation through severe erosion in addition to habitat degradation and destruction that occurs due to road construction. During the rainy season, water creates deep clefts along the roads that are created for mining operations, causing roads to collapse. Virtually all chainsaw operations in Patnanungan and Burdeos are not registered with the appropriate authority (Widmann et al. 2010). No mitigation measures have been put into place to reduce erosion (IUCNb 2010, pp. 1–2).

Cockatoos are severely impacted by selective logging of primary forests because they require large trees that can accommodate their nests. Selective logging, which targets mature trees, has a negative impact on tree-cavity nesters such as the Philippine cockatoo. Research has found that the abundance of cockatoos is positively related to the density of their favored nest tree (Kinnaird et al. 2003, p. 227). Loggers prefer large trees, so these are the trees that would be impacted by logging, especially since reduced-impact logging techniques are seldom applied. Once the primary forest is logged, the secondary forest is generally converted to other uses, or logged again rather than being allowed to return to forested habitat. Therefore, although cockatoos may continue to inhabit secondary

forests, the population is usually at a substantially lower number due to a decrease in suitable nesting sites.

Habitat loss is well documented as one of the most significant effects humans have on wild species (Coverdale et al. 2013, p. 69; Swift and Hannon 2010, p. 50; Fahrig 1997, p. 603; Vitousek et al. 1997). In some cases, corridors are established to promote connectivity between populations of species to reduce the effects of habitat fragmentation, and this approach has been shown to be effective (Cameron 2007, pp. 110–112; Haddad et al. 2003, pp. 609–615). In the case of the Philippine cockatoo, a virtual corridor is being created by artificially transplanting captive-reared cockatoos into suitable, relatively protected habitat. It is unclear how much this species naturally moves from one island habitat to another; however, this species has been known to fly from the mainland to nearby islands at distances of 8 km (5 mi). Researchers point out that at the metapopulation scale (spatially separated populations of the same species that interact at some level), habitat fragmentation causes habitat patches to be reduced in size and to be isolated from one another, and as a result, gene flow between patches is decreased (Blanchet et al. 2010, p. 291). Because this species' population has decreased in size so rapidly and fragmentation of its habitat has occurred so recently and rapidly, it is unlikely that significant genetic differences occur between the existing populations. However, habitat loss and fragmentation are affecting this species.

The Palawan Islands Region is essentially the last area where Philippine cockatoos have a viable population. Although Palawan has been seen as a center for environmental preservation (McNally 2002, p. 9), it still faces many threats, in part due to a burgeoning human population (IUCN 2010b, p. 1; Laurance et al. 2010, p. 377). In 2009, the human population of the Philippines was estimated at 91,983,000 (United Nations (UN) 2009, p. 41), and the human population in the country is increasing at a rate of 1.7 percent annually (UN 2009, p. 51). Palawan, in particular, has experienced rapid human population growth (McNally 2002, pp. 8–9). As of 2002, ''Palawan remains a highly attractive place of destination for migrants from other areas within the Philippines'' (McNally 2002, p. 11). While the burgeoning human population on Palawan may not directly affect the Philippine cockatoo, it does indirectly affect the species by contributing to the habitat loss and other factors described within this rule.

Despite the protection measures that are in place to restrict mining and other activities that degrade habitat, mining operations and oil palm plantations are being developed on Palawan Island (Novellino 2010, pp. 2–48). The Philippine cockatoo has not been recorded in areas in southern Palawan where mining and oil palm plantations exist (Widmann and Widmann 2010, in litt.). Although mining does not occur directly within Philippine cockatoo habitat, it does indirectly affect the species by contributing to the habitat losses and pressures described within this section (Novellino et al. 2010, pp. 1–48). These factors are negatively impacting the ecosystem despite legislative protections (refer to Factor D) in Palawan.

Rasa Island has been formally designated as a wildlife reserve and contains a large percentage of the Philippine cockatoo population, although small in actual numbers. In addition to the formal protection measures in place on Rasa Island, this population is actively monitored and protected by KFI staff, which is reported to be very effective. As of 2011, no individuals had been poached from this island since 1999 (Widmann 2011, pers. comm; Widmann et al. 2010a, b, c). In addition to this formal and active protection, the island's lack of potable water has discouraged subsequent deforestation and habitat loss in this location. However, because much of the species' habitat in other locations remains fragmented and this species is thought to migrate between Rasa Island and Palawan Island, other pressures such as poaching continue to remain a potential threat to the species.

On Dumaran Island, the conversion of habitat to a Jatropha plantation is occurring in the few remaining suitable forest patches left (Widmann et al. 2010a, pp. 6, 32, 46). *Jatropha curcas* trees produce a fruit with oil that, although inedible, contains high energy content and is being explored as an alternative source of energy (Mendoza et al. 2007, p. 1). A hectare of Jatropha has been claimed to produce 1,892 liters (500 gallons) of fuel. Many industries such as the air transportation industry are considering this as a biofuel source, and it is also being described as a mechanism for carbon credits. This cockatoo species occurs in areas that are managed and protected such as the KFI's Omoi Cockatoo Reserve and the Manambaling Cockatoo Reserve (Widmann et al. 2009b, p. 7). However, cockatoos use other areas that are not protected, and information as of 2011 suggests that the implementation of a Jatropha plantation would likely negatively affect this species on Dumaran Island (Widmann, personal communication).

KFI currently manages three areas on Dumaran Island, including a newly acquired buffer area in Omoi (Widmann et al. 2010, p. 32). Dumaran Island also experiences widespread slash-and-burn agriculture, which has begun to affect more forested areas on steeper slopes here (Widmann 2008a, p. 19). Larger forested parts of the island have been replaced with grass, shrub-land, and dense stands of bamboo as a consequence of this practice. Due to factors such as the lack of water or level areas, and the development of subsequent irrigation systems, lowland rice cultivation is very restricted. However, permanent forms of cultivation include coconut and cashew plantations. Human-caused forest and grass fires are common, particularly during the dry season. Fire is used not only to clear areas for cultivation, but also to promote growth of fresh grass for pastures.

In the other areas where this cockatoo species exists, the current extent of the present and future destruction, modification, or curtailment of the species' habitat is unclear; however, it is likely that the pressures on the species are similar, if not worse, to those documented in this section (BLI 2010a; Widmann et al. 2010, p. 15). Human encroachment and concomitant increasing human population pressures exacerbate the destructive effects of ongoing human activities throughout the Philippine cockatoo's habitat. Increased urbanization and mining has led to increased infrastructure development. Road building and mining projects further facilitate human access to remaining forest fragments throughout the species' range, including protected areas. Mining projects, such as those proposed or occurring on Palawan, open new areas to exploitation and attract people seeking employment; these pressures from human development will likely spill over into nearby Philippine cockatoo habitat.

Summary of Factor A

We have identified a number of threats to the habitat of the Philippine cockatoo that have occurred in the past, are impacting the species now, and will continue to impact the species. Habitat loss and degradation from past events, such as selective and commercial logging, conversion to plantations or agriculture, and mining, have decreased this species' suitable habitat; and these activities are still occurring. Illegal

logging (discussed under Factor D) is widespread in the Philippines (Laurence 2007, p. 1544; Galang 2004, pp. 12, 17, 22; Kummer 1991, pp. 70–75), which adds to any pressures of legal deforestation. Based on the best available scientific and commercial data available, we find that the present and threatened destruction, modification, or curtailment of the species' habitats, particularly in the Palawan area, is a threat to the Philippine cockatoo throughout all of its range.

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

Illegal Pet Trade

The Philippine cockatoo, like all cockatoos, is a desirable pet (Cameron 2007, p. vii). In the Philippines, cockatoos are reported to be popular pets due to their ability to mimic human voices (Catigob-Sinha 1993 in Boussekey 2000, p. 138). On Palawan, Pandanan, and Samar Islands, trapping these cockatoos for pets is a particularly serious threat (Widmann et al. 2010a, pp. 21–22; Widmann et al. 2010c, p. 16) and is still considered to be one of the most significant threats to the species. Awareness campaigns have been implemented since the late 1990s to increase understanding of why these birds should not be removed from the wild for pets, and these campaigns are thought to be somewhat effective (Widmann et al. 2010). Due to the high value of these birds (valued at $160 U.S. dollars (USD) in Manila in 1997, and $300 USD in 2006 (BLI 2010a, p. 1), chicks are taken from virtually every accessible nest on these islands (Widmann et al. 2010a, pp. 21–22). A researcher observed that, in the 1980s, up to 10 Philippine cockatoos were trapped per day (Tabaranza 1992 in BLI 2001, p. 1685).

Several programs to combat the poaching problem, such as public awareness programs and the rehabilitation and release of confiscated parrots were established by the KFI to support the conservation of the Philippine cockatoo. KFI started these awareness programs to educate adults and children in villages near areas where the birds are concentrated. The programs use the Philippine cockatoo as a flagship species for conservation of native wildlife, especially with children, because the image of the endemic Philippine cockatoo is unique (Widmann et al. 2010, pp. 21–22). KFI focuses in areas where this species is found in the wild, such as the CMRPA, to educate the local communities in an attempt to reduce poaching. In 2005, on Palawan Island, KFI began an initiative specifically targeted toward anti-poaching in the CMRPA. Former poachers were identified and converted into wildlife wardens. This ''conversion'' practice is common in developing countries where human populations rely heavily on forests and wildlife for their survival (Cribb 2006, p. 3). These converted poachers-now-wardens safeguard the Philippine cockatoo nesting trees, and patrol and monitor inside CMRPA in the southwest region of Palawan (Widmann et al. 2010).

Because illegal trade is difficult to monitor and quantify, it is unclear to what extent poaching for the pet trade is affecting this species. Considering that, in the early 1990s, the population was estimated to be only between 1,000 and 4,000 birds (Tabaranza 1992 and Lambert 1994 in BLI 2001, p. 1681), relatively high numbers were legally traded internationally in the 1980s (e.g., 422 birds were reported to have been exported in 1983; BLI 2010a, p. 1). Additionally, there is evidence that this species is still being poached in the wild (Widmann et al. 2010).

Although we are unsure of the magnitude of the pet trade and its effect on the survival of this species, several reports describe how poaching remains a problem for parrot species, particularly in poorer countries (Dickson 2005, p. 548; *http://www.philippinecockatoo.org,* accessed February 14, 2011 and May 21, 2014). In areas with extreme poverty, poaching can be a lucrative and relatively risk-free source of income (Widmann et al. 2010c, p. 22; Dickson 2005, p. 548). In many cases, poachers have limited income prospects (Widmann et al. 2010a, p. 37). A common practice in conservation is to reform poachers with alternative sources of income so that they do not remove birds from the wild. After the benefits of species and habitat conservation are explained to them, they are generally receptive to resource conservation and ultimately gain a sense of stewardship of the resources. This technique has been effective in the past, but it is resource-intensive and has only a localized effect.

KFI also broadcasts local radio programs to increase awareness of the issues affecting this species. For example, in August 2010, KFI broadcast an interview regarding wildlife trade and a confiscation that had recently occurred in Palawan (Widmann et al. 2010c, p. 73). Conservation-focused radio programs have occurred here since 1996 (Boussekey 2000, p. 140). However, even with these education programs and conservation measures in place, poaching still occurs in the Philippines (Widmann et al. 2010c). Based on the available information and the relatively small number of Philippine cockatoos remaining in the wild, we find that poaching for the pet trade in the Philippines negatively affects the Philippine cockatoo throughout all of its range.

International Trade and CITES

In 1981, almost all Psittaciformes species (i.e., parrots) were included in Appendix II of CITES. As described under the Conservation Status for the Philippine Cockatoo section above, regulating import, export, and re-export of CITES-listed animal and plant species and their parts and products is done through the use of a permitting system *(http://www.cites.org)*. In the United States, CITES is implemented through the U.S. Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*).

The Philippine cockatoo was transferred to CITES Appendix I in June 1992 because populations were declining rapidly due to uncontrolled trapping for the pet bird trade. 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 in the wild 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 Appendix III(2)). These two findings are made prior to issuance of a CITES permit and are designed to ensure that international trade in a CITES-listed species is not detrimental to that species.

An exception to permitting requirements for international trade of Appendix I species exists for specimens originating from a CITES-registered captive-breeding operation. Under the exception in the CITES Treaty and Resolution Conf. 12.10 (Rev. CoP15), specimens of Appendix-I species originating from CITES-registered captive-breeding operations can be traded for commercial purposes, and shipments need to be accompanied only by an export permit issued by the exporting country. An import permit is not required because these specimens

are treated as CITES Appendix-II species. One CITES-registered captive-breeding operation in the Philippines is authorized to export captive-bred specimens of this species (*http://www.cites.org/common/reg/e_cb.html,* accessed May 19, 2014). Countries operating CITES-registered operations must ensure that the operation ''will make a continuing meaningful contribution according to the conservation needs of the species'' (CITES 2007b, pp. 1–2). Countries that are parties to CITES are advised to restrict their imports of Appendix-I captive-bred specimens to those coming only from CITES-registered operations. Additional information on CITES-registered operations can be found on the CITES Web site at *http://www.cites.org/eng/resources/registers.html.*

We queried the United Nations Environment Programme World Conservation Monitoring Centre (UNEP–WCMC) CITES Trade Database for data on exports and imports of this species from 2000 to 2009, and again between 2009 and 2013, and very few exports from the Philippines were reported as ''wild'' origin. Little to no trade data was available for 2013. Between 2000 and 2009, CITES Party countries reported to UNEP–WCMC that a total of 91 live Philippine cockatoos was imported (*http://trade.cites.org*) into their countries, for an average of 9 birds per year. The majority of these (78) originated from the Philippines; 77 of these 78 live birds were reported to be of captive origin, and only one was indicated to be of wild origin. Additionally, in 2009, the UNEP–WCMC CITES Trade Database indicated that only two live birds were exported from the Philippines. Because the Philippine cockatoo is listed as an Appendix-I species under CITES, legal commercial international trade is very limited. The trade report we ran in 2014 (which only has trade data up to 2013), indicated that there were captive-origin exports of the Philippine cockatoo, but no exports of wild-origin Philippine cockatoos. In summary, 233 total specimens were traded 2000–2012. Of the 244 traded over this period, only 4 were from the wild and from the Philippines. Based on the low numbers of live, wild Philippine cockatoos in international trade since 2000, and because international trade is controlled via valid CITES permits, we believe that trade is not a threat to the species.

Wild Bird Conservation Act

The import into the United States of all three of these species is regulated by the Wild Bird Conservation Act (WBCA) (16 U.S.C. 4901 *et seq.*), which was enacted on October 23, 1992. The WBCA is implemented under 50 CFR part 15 and has limited or prohibited imports of exotic bird species into the United States since 1992. The purpose of the WBCA is to promote the conservation of exotic birds by ensuring that importation of species covered under the Act (i.e., CITES-listed species, with several exceptions) into the United States is sustainable and is not detrimental to the species.

WBCA permits may be issued to allow import of listed birds for various purposes, such as scientific research, zoological breeding or display, or personal pets, when certain criteria are met. The Service may approve cooperative breeding programs and subsequently issue import permits under such programs. Under the cooperative breeding program, wild-caught birds may be imported into the United States if they are a part of Service-approved management plans for sustainable use. At this time, none of the three parrot species discussed in this document is part of a Service-approved cooperative breeding program, and there are no approved management plans for wild-caught birds of these species.

A report published in 2006 showed that imports of parrot species to the United States declined from the mid-1980s to 1991 (Pain et al. 2006, pp. 322–324). Parrot imports to the United States were already declining before the enactment of the WBCA, but because the WBCA largely curtailed the import of wild parrots, we find it is an adequate regulatory mechanism for all three of these parrot species.

Summary of Factor B

In summary, cockatoos are popular pets, and poaching for the pet trade still occurs, particularly on Pandanan Island (Widmann et al. 2010c, p. 13). Although we do not find that legal international trade negatively impacts this species, we do find that poaching for the pet trade in the Philippines continues to negatively impact the Philippine cockatoo.

Factor C. Disease or Predation

In the information provided and the literature reviewed, we found suggestions that diseases, particularly a fungal disease, in the wild may be a threat to this species. Velogenic viscerotropic newcastle disease, psittacine beak and feather disease (PBFD), or the psittacid herpes virus (PsHV–1 or PsHV–2) were indicated to be possible threats and may have been introduced into the wild population, possibly by the release of captive birds (BLI 2010a, p. 1; Lambert 1994 in BLI 2001, p. 1686). Cockatoo species are widely distributed throughout Australasia, and some avian species have developed resistance to some diseases (Commonwealth of Australia 2006, p. 1). These diseases affect each cockatoo species differently.

Psittacine Beak and Feather Disease

PBFD is a viral disease that originated in Australia and affects both wild and captive birds, causing chronic infections resulting in either feather loss or deformities of beak and feathers (Cameron 2007, p. 82). PBFD causes immunodeficiency and affects body parts such as the feathers, liver, and brain. Suppression of the immune system can result in secondary infections due to other viruses, bacteria, or fungi. The disease can occur without obvious signs (de Kloet and de Kloet 2004, p. 2394). Birds usually become infected in the nest by ingesting or inhaling viral particles. Infected birds develop immunity, die within a couple of weeks, or become chronically infected. No vaccine exists to immunize populations (Cameron 2007, p. 82). While some cockatoo species are susceptible to this virus, we found no indication that PBFD adversely affects the Philippine cockatoo at the population level in the wild.

Proventricular Dilatation Disease

Another serious disease that has been reported to affect cockatoos is proventricular dilatation disease (PDD). PDD is a fatal disease that may pose 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 affected birds, although the exact manner of transmission between birds is unclear. Although this is a particularly virulent virus that affects cockatoos in general, we are unaware of any reports that this disease occurs in Philippine cockatoos in the wild, possibly due to its remote location.

Avian Influenza

Wild birds, especially waterfowl and shorebirds, are natural reservoirs of avian influenza (also known as ''bird flu''). Most strains of the avian influenza virus have low pathogenicity and cause few clinical signs in infected birds. Pathogenicity is the ability of a pathogen to produce an infectious

disease in an organism. However, strains can mutate into highly pathogenic forms, which is what happened in 1997, when the highly pathogenic avian influenza virus (called H5N1) first appeared in Hong Kong (USDA et al. 2006, pp. 1–2). H5N1 is mainly propagated by commercial poultry living in close quarters with humans. The effect on migratory birds is less clear (Metz 2006a, p. 24).

Scientists increasingly believe that at least some migratory waterfowl carry H5N1, sometimes over long distances, and introduce the virus to poultry flocks (World Health Organization 2006, p. 2). H5N1 has infected and caused death in domestic poultry, people, and some wild birds in Asia, Europe, and Africa. About half of humans infected die from the disease (Service 2006, p. 1). A parrot held in quarantine in the United Kingdom was incorrectly diagnosed with H5N1 in 2005. The original identification of H5N1 was made from a pool of tissues derived from a *Pionus* parrot (from Surinam) and another avian species commonly known as a mesia (*Leiothrix* spp.) from Taiwan. The Department for Environment, Food and Rural Affairs, United Kingdom (DEFRA) stated that it was unclear whether the virus isolated came from the parrot tissue, the mesia tissue, or both (DEFRA 2005, p. 34). However, they concluded that the source was more likely the sample from the mesia (DEFRA 2005, p. 34). Later, it was determined that the samples had been mixed, and the parrot did not have the disease (Gauthier-Clerc et al. 2007, p. 208). In the Philippines, 339 smuggled parrots were euthanized following confiscation to determine if these parrots had the virus; however, none were confirmed to have the virus (Metz 2006a, pp. 24–25), we are unaware of any reports that this disease occurs in Philippine cockatoos in the wild.

Aspergillosis

Aspergillosis is an infection or allergic response to the *Aspergillus* fungus. A literature review found that cases of Aspergillosis were being reported in captive-held, wild-origin Philippine cockatoos in the Philippines at the U.S. Air Force Base, Clark Field, Angeles City (Burr 1981, p. 21). In all known cases according to the report, stress, such as enclosure in a small bird cage, was indicated to be a factor prior to death. Observations indicated that free-flying birds in aviaries showed no signs of stress, and there were no deaths recorded in these birds. Natural incidence of Aspergillosis in the wild occurs in the Philippine cockatoo; however, it appears to be more prevalent in captive birds. During one survey, *Aspergillus* spores were found below nest holes in Palawan (Lambert 1994 in BLI 2001, p. 1686; Tabaranza 1992). The Philippine cockatoo is likely a latent carrier of *Aspergillus* (Burr 1981, p. 23); however, from our review of the best available information, we found no information indicating that this disease negatively affects this species at the population level in the wild (Widmann et al. 2010c, p. 45).

Lice and Mites

Ectoparasitism by lice and mites was documented as the possible cause of death in some chick mortalities on Rasa Island (Widmann et al. 2010a, pp. 6, 38; Widmann et al. 2001, p. 146). Mites (arachnids) were found in some monitored nests where chicks had died. Although nests are being routinely monitored on Rasa Island, mites are not commonly found in these nests. Mites have evolved in a symbiotic relationship with avian species. Not all bird-mite relationships are parasitic; some might be benign or even beneficial (Proctor and Owens 2000, pp. 358, 362). Many mites are nonparasitic scavengers and use the nest or bird feathers as habitat. Despite the presence of mites found in nests where chick mortalities were observed, we conducted a search of available information and found no information indicating that lice and mites significantly affect these species, although mites may occur more frequently during dryer seasons (Widmann et al. 2010a, p. 38; Widmann et al. 2010c, pp. 39, 45). Some research suggested that unusually high temperature, rather than mites, may have contributed to the lack of nest success in 2001 (Widmann et al. 2010c, p. 45); however, the actual reasons for nest failures (mortalities) are unclear.

Summary of Factor C

When conducting a status review, we evaluate the magnitude of each factor that may be affecting a species. In this case, we did not find evidence that any disease or predation rises to the level of a threat that is affecting this species in the wild. Although individual Philippine cockatoos may be subject to occasional infections or predation, there is no evidence that either of these is occurring at a level that may affect the status of the species as a whole to the extent that it is considered a threat to the species. After conducting a literature search (Tomaszewski et al. 2006, pp. 536–544; de Kloet 2004, pp. 2393–2412; Latimer et al. 1992, pp. 165–168; Johnson et al. 1986, pp. 813–815), we found no indication that disease or predation is a threat to the Philippine cockatoo in the wild. Therefore, we find that the Philippine cockatoo is not negatively impacted due to disease or predation.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

Several regulatory mechanisms are in place at the national and local levels that serve to conserve this species and the habitat on which it depends; however, the mechanisms are ineffective at adequately protecting the Philippine cockatoo. We find that CITES effectively protects the species through legal international trade. Factors hampering the regulatory mechanisms in place include remoteness of protected areas, poverty that causes locals to unsustainably use this species' habitat or to poach, and the lack of resources to adequately enforce laws and regulations (Laurance 2007, p. 1544; Palawan Council for Sustainable Development (PCSD) 2007, pp. 1–3; Galang 2004, p. 17). These are discussed below.

Domestic Regulatory Mechanisms

In the late 1980s and early 1990s, efforts were already under way to protect the Philippine cockatoo (Galang 2004, p. 17; Boussekey 2000, p. 140). In 1987, the Government of the Philippines established the Protected Areas and Wildlife Bureau (PAWB) through the DENR, under Executive Order 192. Its responsibilities are in part to manage and protect the country's protected areas. In 1992, the Philippines adopted the National Integrated Protected Areas System Act (NIPAS Act of 1992) to protect and maintain the country's biological diversity. In 1994, the PAWB signed a memorandum of agreement (MOA) regarding the conservation of this species (Philippines DENR 2009, pp. 1–2; Boussekey 2000, p. 138). This MOA has been implemented by a nongovernmental organization, the Katala Foundation, since 2006 through the PCCP. Under this MOA, an intensive species conservation program has been under way to conserve this species and its habitat. The PCCP accomplishes its mission through intense local management of the species. Some aspects of the conservation program are to educate local communities about the benefits of conserving endemic wildlife, protect and restore nesting sites and habitat, conduct research, and reintroduce the species into the wild (Widmann et al. 2010, p. 22).

As a protected species (DENR 2010b, p. 2), under the Republic Act No. 9147, certain activities such as capture and trade of live wildlife are prohibited. Republic Act No. 9147 provides for fines and penalties for prohibited acts.

However, within the Philippines, the laws are generally ignored and only poorly enforced (Rose 2008, p. 232; Laurance 2007, p. 1544; Galang 2004, pp. 12–17).

Additional protections exist under the Philippines' Executive Order No. 247, which protects the rights of local people with respect to the use of natural resources (*http://www.elaw.gov*, accessed January 4, 2011). This Executive Order mandates that prospecting of biological and genetic resources shall be allowed within the ancestral lands and domains of indigenous cultural communities only with the prior informed consent of such communities. Involving local tribal communities adds an additional conservation measure. For example, the Batak tribe (Boussekey 2000, p. 144) in northern Palawan has shown interest in participating in wildlife conservation. The protection of endemic natural resources has been demonstrated to benefit native tribes and local communities near sites that have unique features (Widmann et al. 2010b, p. 36). Locals may be recruited as wardens, or these areas can be developed for ecotourism. However, in this case, it is likely that only around 300 to 400 members of the Batak tribe survive today, so the effectiveness in the long term is unclear (*http://www.culturalsurvival.org/search/site/batak*, accessed November 18, 2010 and May 22, 2014). These regulatory mechanisms could have a positive effect on the species, but currently it is unclear whether Executive Order No. 247 is benign or actually constructive.

As discussed under Factor B, the Philippine cockatoo is monitored and managed in some, but not all, areas where it exists. Some areas are designated as protected specifically for the Philippine cockatoo, and wardens are employed for their protection (Widmann et al. 2010a, pp. 18–22; and refer to Conservation Status for the Philippine Cockatoo section above). An increase in the population is occurring in some areas where this species is protected, such as on Rasa Island, but in other areas where protections are not robust, the population is declining (Widmann et al. 2010a, p. 32). Although five areas are designated as being ''protected'' under Philippine law, the levels of protection in each area vary. In 2006, Rasa Island, the area containing the densest population of the Philippine cockatoo, was declared a wildlife sanctuary by President Arroyo (Widmann 2006, p. 1). The protected area consists of 1,983 ha (4,900 ac). While this area is fairly well protected and monitored, effective reserve management here is hindered by a shortage of staff, technical expertise, and financial support (Widmann 2010, pers. comm.). In addition, the remoteness of protected areas makes enforcement of activities such as poaching and illegal logging difficult. Overall, the management of protected areas is insufficient. For example, in 2010, despite management of the species, 15 hatchlings died and 17 eggs did not hatch on Rasa Island during an extreme weather event (refer to Factor E discussion) (Widmann et al. 2010a, p. 38). Even in areas, such as Narra, that are monitored by wardens, poaching occurs (Widmann et al. 2010a, p. 6). The protections in place for this species are ultimately ineffective at reducing the factors that negatively impact this species. This species resides in other areas that are not protected and habitat destruction (see Factor A discussion above) and poaching for the pet trade (see Factor B discussion above) still occur even in protected zones.

The Philippine cockatoo is carefully monitored and managed in some, but not all, areas where it exists. The species exists in five protected areas: (1) Rasa Island Wildlife Sanctuary (Narra, Palawan), (2) Puerto Princesa Subterranean River National Park (Palawan), (3) Omoi and Manambaling Cockatoo Reserves in Dumaran (Dumaran, Palawan), (4) Mt. Mantalingahan Protected Landscape (CMRPA) in Rizal, Palawan, and (5) Samar Island Natural Park. Each protected area in Palawan has its own unique protections in place and legislation to protect the species and its habitat (Widmann and Widmann 2010, pers. comm.).

Although five areas are designated as being ''protected,'' the levels of protection vary. An increase in the population is occurring in some areas, but in other areas where protections are not as robust; the population is declining, in part due to poaching. The KFI, the Philippine Government, and individuals concerned with the conservation of this species have actively worked to protect the Philippine cockatoo since 1998. The KFI is a nonprofit organization dedicated to the conservation of wild Philippine cockatoos. Its goals are to teach the principles and value of conservation, work to rehabilitate Philippine cockatoos back into the wild, and conduct scientific research. As of 2000, the local communities that live within the range of this species have been aware that it is illegal to capture or trade this species (Boussekey 2000, p. 143).

At most sites where a viable population appears to exist, KFI is actively managing this species to try to increase the populations. For example, artificial nest boxes for the Philippine cockatoo were installed on Rasa Island and the mainland (Palawan) (Widmann and Widmann 2008, p. 27). Recovery of the Philippine cockatoo on Rasa Island has been fairly effective, where nest-guarding by local people has virtually stopped poaching (Boussekey, pers. comm. in Cahill et al. 2006, p. 166). Breeding success on Rasa Island has been high (averaging 2.6 hatchlings per nest in 2002, for example). On this island, a population of approximately 20 birds increased four-fold between 1998 and 2003 (Widmann et al. 2010; Boussekey, pers. comm. in Cahill et al. 2006, p. 166). In Patnanungan, Polillo Islands, the first artificial nest box for the Philippine cockatoo was installed in November 2009 (Widmann et al. 2010, p. 13), and reforestation efforts are occurring. These activities are somewhat effective but slow because the protection efforts are not able to completely combat the negative factors such as poaching and selective logging that affect this species in many cases.

Efforts are being focused on Pandanan Island (south of Palawan Island), which has excellent habitat for this species, and is a focus area of KFI for protection of the Philippine cockatoo. A grant under the U.S. Fish and Wildlife Service's Wildlife Without Borders, Critically Endangered Species Conservation Fund, for the Pandanan project was approved in September 2009 (Widmann et al. 2010, p. 5). This island has the potential for the species to recover well because there is excellent forest cover due in part to the protections provided by the Jewelmer Corporation. This company holds an aquaculture concession in the area of Pandanan. Due to this concession, human inhabitants are allowed on Pandanan Island but activities are carefully and closely monitored and regulated. In January 2010, KFI obtained formal permission from the Palawan Council for Sustainable Development (PCSD) to conduct conservation efforts on the island (Widmann et al. 2010b, p. 5). Poaching still needs to be abated, but KFI has been working to establish a local warden program (Widmann et al. 2010a, p. 50) on the island to address this issue. As of 2010, security had improved in the area where a viable cockatoo population has been confirmed, but the species was still threatened by poaching (Widmann et al. 2010a, p. 15). The KFI indicates that it is likely that, with the warden program in place, they can eliminate or reduce poaching.

As resources allow, other protections and conservation actions are in place for this species. On Dumaran, Rizal, and Patnanungan Islands, wardens monitor Philippine cockatoo activity, and patrolling is done at protected areas and roost sites. Monitoring of the population trend on Rasa and Dumaran Islands is done through counting individuals at traditional roost sites. Due to both a lack of funding and logistics, not all Philippine cockatoo sites are actively monitored and managed. This is primarily because it is more efficient to focus resources in the Palawan Islands Region where the Philippine cockatoo is known to have a viable population.

In summary, while laws to protect this species are in place, enforcement often is difficult, given the many islands that make up the Philippines and considering that illegal activities in many cases remain socially acceptable at the local level. Illegal logging is considered to be a leading cause of forest degradation in the Philippines (Rose 2008, p. 232; Laurance 2007, p. 1544; Galang 2004, pp. 12–17). Laws are frequently ignored, which further reduces the effectiveness of regulatory mechanisms (Galang 2004, pp. 12–17), and contributes to this species' continued decline in population numbers. Therefore, we find that, although the Philippines has a good legal framework to manage wildlife and their habitats, actual implementation of its laws and regulatory mechanisms is inadequate to reduce the threats to the Philippine cockatoo.

CITES

The evaluation of the effectiveness of CITES as a regulatory mechanism is cross-referenced under Factor B.

With respect to international trade, we find CITES to be an adequate existing regulatory mechanism for this species (see our analysis under Factor B for legal trade). As discussed under Factor B, very few Philippine cockatoos have been legally exported from the Philippines since 2000. One operation in the Philippines is registered to export captive-bred specimens of this species for commercial purposes and appears to be adequately monitored and regulated. Based on the information available, CITES and the Government of the Philippines have effectively controlled legal international trade of this species.

Summary of Factor D

In summary, we find that the Government of the Philippines appears to have controlled legal international trade through CITES (see discussion under Factor B above). However, the existing domestic regulatory mechanisms within the Philippines, as implemented, are inadequate to reduce or remove the current threats to the Philippine cockatoo in the wild based on reports of poaching. As discussed under Factor B above, uncontrolled illegal domestic trade continues to adversely impact the Philippine cockatoo. Measures in place via the MOA and the KFI provide some protection to the Philippine cockatoo. Through the MOA, this species is carefully monitored and managed in key areas where the species has a good chance of recovery, particularly in the Rasa Island Wildlife Sanctuary (Narra, Palawan). Despite efforts, management of protected areas encompassing this species' habitat is hindered due to the remoteness of protected areas, staff shortages, lack of technical expertise, and lack of funding; this is acknowledged by the local NGO (Widmann et al. 2010a).

Even with government controls, poaching of cockatoos is reported to be relatively common in areas that are not protected. In addition, laws are frequently ignored, in part due to the difficulty in monitoring and enforcement throughout the multitude of islands in the Philippines. As discussed under Factors A and B above, we found that poaching, logging, and conversion of forests to agriculture and plantations are threats to the Philippine cockatoo. Despite regulatory mechanisms in place, illegal logging continues to be a leading cause of forest degradation in the Philippines (Rose 2008, p. 231; Laurance 2007, pp. 1544–1555). There is no information available to suggest these threats will change in the foreseeable future; therefore, we find that the existing regulatory mechanisms, as implemented, are inadequate to reduce or remove the current threats to the Philippine cockatoo.

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

Various other factors have been cited as being potential threats to this species. In addition to poaching, trapping, and deforestation (Boussekey 2000, p. 138) (refer to the discussions under Factors A and B, above), hunting (to protect crops), harassment by bees, and nest flooding have been observed to affect this species (Widmann et al. 2007a, pp. 76–77, 79; Widmann et al. 2001, pp. 139–140). Because this species has been viewed as an agricultural pest, it was often killed if it was thought to be consuming crops (Widmann and Widmann 2008, p. 23). However, there is no indication that this practice still occurs. Nest flooding during a thunderstorm was observed to affect clutch survival during the 2000–2001 breeding season on Rasa Island (Widmann et al. 2001, pp. 139–140). Although nest flooding may occur occasionally, the KFI indicates that it is not a common occurrence, and we do not consider this to be a threat to the species.

Bees have been observed to attack cockatoos. In 2005, on Patnanungan Island, bees were documented attacking Philippine cockatoos (Widmann et al. 2007a, pp. 76–77, 79). These cockatoos were unable to nest due to the close proximity of a beehive. The extent of competition with bees for nesting sites is not clear. Philippine cockatoos have been monitored for many years, and this is the only known report of nest site competition with bees. Therefore, competition from bees does not appear to be a significant factor affecting this species.

Other factors affecting the species include food shortages due to drought and the lack of suitable nesting cavities (Widmann and Widmann 2008, p. 25). The lack of suitable nesting sites in general is addressed under Factor A. In 2005, this species suffered from starvation on Rasa Island due to a food shortage during an El Niño drought year. However, several fledglings were rescued. Of these, 10 developed normally and were subsequently released (Widmann and Widmann 2008, p. 25). Additional factors affecting the species include the lack of suitable nesting cavities (in large, decayed trees) and possibly the lack of adequate food sources (Widmann et al. 2010a, p. 6). Because this species has specific nutrition and habitat requirements, it was suggested that Rasa Island may be at carrying capacity due to limited habitat and food availability (Widmann and Widmann 2008, p. 25). Because Rasa Island is very small, with only 1.75 km^2 (0.6 mi^2) of the island being coastal and mangrove forest, its suitable habitat is limited. As of 2009, Rasa Island had 64 nest trees, and as of 2010, there were 280 individual Philippine cockatoos on this island. A second starvation event occurred in 2010 (Widmann et al. 2010a, p. 6). At this time, we are unable to determine if limited food availability on this island and starvation due to drought are threats; however, the Rasa Island population is carefully monitored by the KFI, and they intervene and manage the species if needed. Although in some years limited food availability may be a concern, we do not find that this factor rises to the level of a threat to the species. Further, the lack of suitable nesting cavities is being monitored and addressed by the KFI. At

this time, we have no evidence that bees or nest flooding are threats to the species.

Small and Declining Population

The Philippine cockatoo has a constricted geographic range and a small, rapidly declining population, primarily due to poaching. Researchers estimate between 450 and 1,245 individuals remain in the wild, distributed on 8 islands (BLI 2011, p. 1). In many cases, the Philippine cockatoo is geographically isolated from other populations due to the distance between islands. Additionally, because it is an island species that generally mates for life and is long-lived, it is extremely vulnerable to localized extinctions. Species with small populations are significantly influenced by individual birth and death rates (Holsinger 2000, pp. 64–65; Young and Clarke 2000, pp. 361–366; Gilpin and Soulé 1986, p. 27), immigration and emigration rates, and changes in population sex ratios. Natural variation in survival and reproductive success of individuals and chance disequilibrium of sex ratios may act in concert to negatively affect reproduction (Gilpin and Soulé 1986, p. 27).

Prior to the 1980s, the Philippine cockatoo was common throughout the Philippines (Cameron 2007, p. 34; Boussekey 2000, p. 138). Its existing populations are extremely localized due to habitat loss and its preference for lowland primary and secondary forest, which is also preferred human habitat. KFI suggests that a rapid population reduction may occur in the future based on low recruitment (successful development of chicks into breeding adults), especially for unprotected populations (Widmann 2011a, pers. comm.). In the Rizal (South Palawan) area, there are no indications of recovery of this species. Only one breeding pair exists outside of this cockatoo reserve, and the area had been poached at least once between 2008 and 2011. Breeding here did not occur during the 2009–2010 season. Because all nests have been systematically poached in this area over many years, extinction of this population might occur suddenly due to lack of reproductive success. This is partly a consequence of mating characteristics of this species: It is long-lived and generally mates for life. At least two birds persist inside the protected area, but as of 2011, they had not bred in the past 4 years (Widmann 2011a, pers. comm.).

Small, isolated populations of wildlife species such as the Philippine cockatoo that have gone through a reduction in population numbers can be susceptible to demographic and genetic problems (Shaffer 1981, pp. 130–134). Factors that could affect their susceptibility include: Natural variation in survival and reproductive success of individuals; changes in gene frequencies due to genetic drift; diminished genetic diversity and associated effects due to inbreeding (i.e., inbreeding depression); dispersal of just a few individuals; a few clutch failures; a skewed sex ratio in recruited offspring over just one or a few years; and chance mortality of just a few reproductive-age individuals. These small, rapidly declining populations are also susceptible to natural levels of environmental variability and related ''catastrophic'' events (e.g., severe storms, extreme cold spells, wildfire), which we refer to as environmental stochasticity (Dunham et al. 1999, p. 9; Mangel and Tier 1994, p. 612; Young 1994, pp. 410–412).

Threats to species typically operate synergistically. Initial effects of one threat factor can later exacerbate the effects of other threat factors (Gilpin and Soulé 1986, pp. 25–26). Any further fragmentation of populations may likely result in the further removal or dispersal of individuals. The lack of a sufficient number of individuals in a local area or a decline in their individual or collective fitness may also cause a decline in the population size, despite the presence of suitable habitat patches.

The combined effects of habitat loss and fragmentation (Factor A) and threats associated with small, declining, and isolated populations (Factor E) on a species' population are referred to as patch dynamics. Patch dynamics can have profound effects on fragmented populations and can potentially reduce a species' effective population by orders of magnitude (Gilpin and Soulé 1986, p. 31). For example, an increase in habitat fragmentation can separate populations to the point where individuals can no longer disperse and breed among habitat patches, causing a shift in the demographic characteristics of a population and a reduction in genetic fitness (Gilpin and Soulé 1986, p. 31). Furthermore, as a species' population continues to decline, often as a result of deterministic forces such as habitat loss or overutilization, it becomes increasingly vulnerable to a broad array of other forces. Despite the mitigation and conservation measures in place, if this trend continues, its ultimate extinction due to one or more stochastic events becomes more likely. Given the species' dispersed nature, the fact that it is a long-lived species that generally mates for life, and that the largest population is approximately 280 individuals, we find that this factor threatens the continued existence of this species. Based on the best scientific and commercial information available, we conclude that, based on its small, rapidly declining population, the Philippine cockatoo is at risk of extinction, particularly when combined with the other threats.

Summary of Factor E

Several other factors were identified as affecting the success of this species, such as harassment by bees, nest flooding, and starvation. These factors are a normal occurrence in the ecology of this species, and we do not find that these factors significantly affect this species such that they rise to the level of a threat. However, we find that its small, rapidly declining population, when combined with the other threats of habitat loss and poaching, is a threat to the species throughout its range.

Finding for the Philippine Cockatoo

We considered the five factors in assessing whether the Philippine cockatoo is endangered or threatened throughout all of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by the Philippine cockatoo, and we consulted with recognized Philippine cockatoo experts and local and international NGOs.

The primary factors affecting the Philippine cockatoo include habitat loss and habitat degradation (Factor A) and poaching for the pet trade (Factor B). Habitat loss associated with logging, an expanding human population and associated development, and conversion of lowland forests to agriculture are some of the greatest threats to the continued survival of this species (Widmann et al. 2010, p. 14; Posa et al. 2008, pp. 231–236; Widmann and Widmann 2008, p. 23; BLI 2001, p. 1685; Galang 2004, pp. 5–22). Habitat loss due to the above activities continues to occur; this species' population is declining rangewide as a result.

Based on the best available information, poaching is still occurring, despite education and public awareness campaigns and protections in place at the national level (Widmann et al. 2010c., p. 13). Awareness campaigns have been conducted on Mindanao, Palawan, and Polillo Islands (Widmann 2010, pers. comm.). On Dumaran Island, the Katala Pride Campaign has focused on raising awareness among students and farmers. Trilingual conservation posters have been distributed throughout the Philippines, and in

1992, a captive-breeding program was initiated. This species is being intensely managed in some areas, but the management and protection of the species is hindered by the lack of resources, its remote island habitat, and by this species' life-history characteristics (such as the tendency to mate for life and not to reproduce until a late age). Efforts to improve the habitat of this species (e.g., reforestation, building of nest boxes) are continuing and may improve its habitat and population numbers. In Polillo, Dumaran, and Rasa, the species may be slowly increasing in population numbers, but in other areas, the species' population continues to decline. The best population estimates of this species were compiled in the early 1990s, at which time the population was estimated to be between 1,000 and 4,000 individuals (Snyder et al. 2000). Experts believe the population is between 450 and 1,245 individuals, and most populations are fairly well monitored (Widmann et al. 2010); however, poaching for the domestic pet trade continues to be a threat to the species. It is unlikely that this species' rapidly declining and small population can withstand this level of poaching. Therefore, we find overutilization for commercial, recreational, scientific, or educational purposes (Factor B) is a threat to the Philippine cockatoo.

We found no evidence that diseases significantly affect the wild Philippine cockatoo population. Other avian species, particularly cockatoo species, are susceptible to avian diseases, but there was no evidence that disease occurs in the wild to an extent that it is a threat to this species. Predation was not found to affect Philippine cockatoo populations. Based on the best available information, we conclude that disease and predation (Factor C) are not threats to the species.

The Philippine cockatoo is classified as a protected species by the Philippine Government. The current range of the Philippine cockatoo is much smaller than its historical range (BLI 2013a, p. 6). However, as a result of conservation efforts by the various entities working to ensure long-term conservation of the Philippine cockatoo, its range may slowly increase, but current efforts are indicating mixed levels of success. Despite conservation efforts of various entities, we have determined that existing regulatory mechanisms continue to be inadequate because habitat loss and poaching are still occurring (Factor D). In summary, we conclude that inadequate regulatory mechanisms are a threat to the Philippine cockatoo.

This species has a small and rapidly declining population that no longer exists in many of the areas where it occurred historically; it is in competition with humans for habitat as development and related infrastructure take the place of its habitat. Within its current range, where there are few viable populations remaining, the PCCP is managing the species to the best of its ability; however, the PCCP acknowledges that this species still faces a rapid population decline in the future based on low recruitment, especially for unprotected populations. When combined with other threats, and when considering its fragmented population, we conclude that its small, rapidly declining population is a threat to the species (Factor E). Due to this species' extremely small, declining, and fragmented population and due to the existing threats (Factors A, B, D, and E), it is currently in danger of extinction.

Despite the conservation measures in place, this species faces severe threats, and the population trend for this species continues to decline. Based on our review of the best available scientific and commercial information pertaining to the five factors, we find that the Philippine cockatoo is in danger of extinction (endangered) throughout all of its range. We do not find that the effects of current threats acting on the species are likely to be sufficiently ameliorated in the foreseeable future. These threats are consistent throughout its range. Therefore, we find that listing the Philippine cockatoo as endangered is warranted throughout its range, and we are listing the Philippine cockatoo as endangered under the ESA.

Species Information

B. White cockatoo (*Cacatua alba*)

Taxonomy and Species Description

The white cockatoo is also known as the umbrella cockatoo. ITIS, CITES, and BirdLife International recognize the species as *Cacatua alba* (BLI 2013b, p. 5). Therefore, we accept the species as *C. alba.* The white cockatoo is completely white except for the underside of its wings and tail, which are pale yellow. It has a long, backward-curving white crest on its head. Its bill is grey-black, and it has a white bare eye-ring. The bird has either yellowish-white or slightly grey-blue legs.

Population Estimates

Population estimates for the white cockatoo vary, in part due to the remoteness of the islands where this species exists. Population estimates prior to 2000 indicated that the Lalobata protected area on Halmahera Island contained between 28,500 and 42,900 white cockatoos (Snyder et al. 2000, p. 67; MacKinnon et al. 1995), although they did not survey lowland forest, which they thought may contain more white cockatoos. The white cockatoo was described as being common in the early 1990s. Survey work carried out in 1991 and 1992 suggested a population estimate of between 49,765 and 212,430 birds (BLI 2013b, p. 6; Snyder et al. 2000, p. 671; Lambert 1993). The total population has been estimated to be between 43,000 and 183,000 mature individuals; however, this population estimate is based on 1993 data (Lambert 1993 in BLI 2013b). A discussion in a BLI forum offers strong evidence that it could decline by 50–79 percent over the next 39 years (Taylor in BLI 2013d, p. 2). Burung Indonesia (a local NGO devoted to protecting wild birds and their habitats through working with people for sustainable development) estimated that, based on surveys conducted in 2008 and 2009, between 8,629 and 48,393 white cockatoos remain in the wild (Burung Indonesia 2010, pers. comm.) on Halmahera Island.

Biology, Distribution, and Habitat

While the exact lifespan is unknown, reports of the white cockatoo's lifespan vary between 20 and 50 years in captivity (Jordan 2010, pers. comm.; Lambert 1993, p. 147). Wild-caught birds have been reported not to breed until they are 6 years old. The greatest productive breeding age for the white cockatoo is between 6 and 20 years (Jordan 2010, pers. comm.). However, some pairs have been recorded to breed well into their thirties, and a few exceptions have been reported with pairs or individuals that have reproduced into their forties or fifties (Lambert 1993, p. 147). Clutch-size of white cockatoos in captivity is reported to be 2 to 3 eggs per season, and incubation takes 25 to 28 days; nestlings remain in the nest approximately 90 days before fledging (Cameron 2007, p. 140). Both parents share responsibility for raising chicks, and the species is thought to be monogamous for life.

The white cockatoo is endemic to a few islands in North Maluku, Indonesia, and it inhabits primary, logged, and secondary forests possibly up to 900 m (2,953 feet) (Vetter 2009, pp. 25–26). It is not thought to inhabit forests on ultra-basic rock (BLI 2001, p. 1674). This species is believed to occur in three protected areas: Gunung Sibela Strict Nature Reserve on Bacan Island (although this site is threatened by agricultural encroachment and gold prospecting), and Aketajawe Nature

Reserve, and the Lalobata Protected Forest (ALNP), both on Halmahera Island (Indonesian Parrot Protection for Life 2014, p. 4). Historically, its range has been the islands of Halmahera, Bacan, Ternate, Tidore, Kasiruta and Mandiole in North Maluku (BLI 2013b, p. 6; Snyder et al. 2000, p. 67). ALNP consists of approximately 167,300 hectares (413,407 acres) of primary and secondary forest. This total area represents 7.5 percent of Halmahera Island (Burung International 2010, pers. comm). The white cockatoo is believed to only inhabit Halmahera and Bacan Islands (Wildlife Conservation Society (WCS) 2010, pers. comm.). The Bacan Island group, also known as Palau Batjan, is about 16 km (10 mi) southwest of Halmahera Island. Little is known about the status of the species other than on Halmahera Island. Due to the lack of information, this status review only addresses its status on Halmahera Island unless otherwise specified.

The Maluku Islands are also known as the Moluccas or the Spice Islands, and they are between Sulawesi and New Guinea, below the Philippines. The white cockatoo, like most cockatoos, is a resident (nonmigratory) species, but cockatoos are strong fliers, and they will likely travel to nearby islands in search of habitat or food, if it is not readily available. The highest densities of this species occur in primary (old-growth) forest (Burung International 2011; BLI 2009), but the species seems to tolerate some habitat modification. White cockatoos inhabit mangroves, plantations (including coconut), and agricultural land (BLI 2013d, p. 1). This species requires large trees for nesting and roosting, is often observed feeding in large flocks, and eats seeds, fruit, and insects. Their preferred nesting holes were observed to be situated at points where large branches had broken off the main trunk (Lambert 1993, p. 146).

Halmahera (also known as Jilolo or Gilolo Island) is the largest island in the North Maluku province, and is 17,780 km² (6,865 mi²) in size. Its annual precipitation is 2,000 to 3,000 mm (79 to 118 in). Halmahera, a four-pronged island, is considered a biodiversity hotspot (Myers et al. 2000 in Setiadi et al. 2010, p. 560). North Maluku province consists of eight provincial districts: North Halmahera, West Halmahera, East Halmahera, Central Halmahera, South Halmahera, Ternate Municipality, Tidore City and Islands, and Sula Islands. In North Halmahera, as of 2011, the number of districts on the island had increased to 22, and the number of villages has increased from 174 to 260. The human population in Maluku Province in 2010 was estimated to be 1,531,402 (Badan Pusat Statistik Provinsi Maluku 2010). Aketajawe-Lolobata National Park, established in 2004, was the first national park established in North Maluku (Keputusan Menteri Kehutanan No. SK.397/MenHut-II/2004), and is described as being one of the most pristine and unvisited areas in all of Indonesia.

Bacan, a smaller island to the southwest of Halmahera, is also inhabited by the white cockatoo, although very little is known about the status of the species here. This remote, sparsely populated island is not well known. It is 1,900 km² (733 mi²) in area and still contains relatively undisturbed forests. On Bacan, as of 2011, the human population estimate is between 13,000 and 59,000 individuals with the majority residing on the west side of the island, in the capital (Labuha) and nearby villages. The current number of white cockatoos on the island is unknown. Reports from locals indicated that the species had declined on Bacan due to trapping between the 1970s and 1980s (Lambert 1993, p. 146). Surveys conducted here in 1985 found only 76 white cockatoos. In 1991, the population on Bacan and its satellite islands was estimated to be 7,220 to 29,300 white cockatoos (Lambert 1993), but this may be an overestimate of the population size based on the survey methods used (Gilardi 2011, pers. comm.).

Accuracy of survey methodologies varies (Thomas et al. 2009, pp. 5–14; Pollack 2006, p. 882; Thomas 1996, pp. 49–58), and there are limits to how much confidence we can place in the various population surveys (Royle and Nichols 2003). One researcher pointed out that differing survey methodologies can result in differences in at least an order of magnitude. In situations where species are rare or have small populations, the number of observations made per survey may be very small and the number of sites limited, and, therefore, estimates and projections may not be accurate (Pollack 2006, p. 891; Marsden 1999, pp. 377–390).

In some areas, suitable habitat may be disturbed due to habitat modification and infrastructure development. As a result, species' breeding, nesting, and forage habitat have subsequently been destroyed, and the birds are dispersing out of their previously used habitat in search of other suitable areas. It may appear as though the population is larger than it actually is, due to sightings in new locations or the perception that the species is more common because it has been displaced from its original habitat.

In the case of white cockatoos, the population estimate may not be accurate based on the survey methodology used and the inferences made. As of 2011, the population density estimation for this species in the Aketajawe block was between 1.6 and 8.9 individuals per km² (Burung Indonesia 2011, pp. 1–5). From this survey, a projection was made to the surrounding area of 5,462 km² (2,109 mi²) of the remaining natural forest area in the vicinity of the national park. Based on this projection, Burung Indonesia (a nongovernmental organization in Indonesia that partners with BirdLife International to protect wild birds and their habitat) estimated the population in the western Halmahera natural forests was 8,630 to 48,393 individuals. This estimate may be optimistic based, in part, on the studies described above (Pollock 2006, p. 882; Royle and Nichols 2003, p. 777; Marsden 1999, pp. 377–390). In addition, because the survey extrapolated the population density for the surrounding area outside of the Aketajawe block (which contains less suitable habitat for the species and is more accessible to poachers) from the estimated density within the Aketajawe Nature Reserve (which contains the preferred habitat for the species and is less accessible to poachers), the density levels outside of the Aketajawe Nature Reserve may be an overestimate. Assuming that between 8,629 and 48,393 individuals were on Halmahera in 2009 and an estimated 49,765 to 212,430 individuals were there in 1992; this trend in population estimates suggests a decrease in the population. As we noted earlier in this document, it is difficult to infer a trend from these estimates because survey methodologies were different. A decrease in the species' population is extremely likely based on the negative effects of habitat loss and poaching that are commonly known to occur on this island.

Local anecdotal accounts of this species' population also vary. The population of white cockatoos is thought to be ''very sparse'' (WCS 2010, pers. comm.) and rapidly declining (BLI 2013d, p. 1). Populations were conversely described as still being relatively widespread across Halmahera Island, and birds were occasionally observed in flocks (WCS 2010, pers. comm.). In November 2010, this species was observed daily, with flocks up to 23 birds observed during a 5-day trip to Halmahera (WCS 2010, pers. comm.). However, local people consider them to have declined from former population levels.

As of 2014, we have no current estimate of the population on Bacan

Island. Although the last estimate, in 1993, was between 7,220 to 29,300 individuals on Bacan Island, a 1985 survey found only 76 cockatoos. We are unsure of the population trend. Further, in 1993, more than 100 people regularly trapped parrots on Bacan, and this practice was a major source of income (Lambert 1993, p. 155). Poaching is a common practice in Indonesia, and it likely still occurs with regularity on Bacan Island.

Conservation Status for the White Cockatoo

The white cockatoo has been listed in Appendix II of CITES since 1981. Appendix II includes species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival; and other species which must be subject to regulation in order that trade in specimens of certain species threatened with extinction which are or may be affected by trade may be brought under effective control (CITES Article II(2)). International trade in specimens (dead or live) of Appendix II species is authorized through permits or certificates. International trade in specimens of Appendix II species is authorized when: (1) The CITES Scientific Authority of the country of export has determined that the export will not be detrimental to the survival of the species in the wild; and (2) the CITES Management Authority of the country of export has determined that the specimens to be exported were legally acquired (UNEP–WCMC 2008a, p. 1).

This species is listed on the 2010 IUCN Red list as vulnerable; however, the IUCN Red list confers no legal protections. It is also protected in the United States by the WBCA. 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. Although Indonesia has a national ban against harvest of the white cockatoo, the quota is not effective at eliminating poaching in the wild. Cockatoos are still poached and smuggled into local markets (ProFauna 2010; ProFauna Indonesia 2008, pp. 1–9). The white cockatoo is not listed as a protected species by the Indonesian Republic Forestry Ministry (WCS 2010, pers. comm.).

Information available suggests that a few local protections are in preliminary stages but occurring. Existence of the Aketajawe-Lolobata National Park on Halmahera may serve to reduce hunting pressure and habitat loss if game wardens are monitoring the park. Also on Halmahera, some of the foreign-owned mining operations are considering their environmental impacts (see Factor A discussion on mining). Very few private or nongovernmental organizations (NGOs) operate in the area, in part due to the lack of funding available. Burung Indonesia (*http://www.burung.org*) does some work in this area, mostly in relation to the national park, and there is another local NGO, Konservasi Alam Maluku Utara (KAMU), that is working to try to protect this species (Wildlife Conservation Society (WCS) 2010, pers. comm.). There may be carbon-funded forest protection projects starting in the area that also may convey protection measures, but we know of none operating yet.

Evaluation of Factors Affecting the White Cockatoo

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

Researchers commonly accept that deforestation and habitat loss is a significant problem in Indonesia (Lee et al. 2013, p. 25; Laurance 2007, p. 1544). Indonesia consists of 17,508 islands and 33 provinces. It is a rapidly developing country, with a population of approximately 230 million (United Nations 2009, p. 11), and is the world's fourth most populous country (United Nations 2009, p. 11). Countries with the highest human population growth rates tend to have the highest rates of deforestation as well (Laurance 2007, p. 1545). As available land becomes scarcer, companies and humans move toward more remote areas in search of resources (BLI 2008, p. 100). Human settlements and plantations are typically located in lowland coastal areas, which is the white cockatoo's preferred habitat (Smiet 1985, pp. 181, 183). The habitat required by the white cockatoo has been impacted by activities such as conversion of its habitat to uses such as development of towns, mining, and logging (particularly illegal logging, which generally fails to use sustainable logging practices) (Lambert 1993, p. 146). Pressure on the islands' resources is increasing (*http://www.indonesia-tourism.com/north-maluku/halmahera_history.html*), in part from the increase in human population on the island, a demand for more resources such as biofuel and agriculture, and to a lesser extent, an increase in ecotourism. Historically, 75 percent of the population on Halmahera has depended on farming or fishing for their livelihood, but this is changing as investors move to the island bringing increased development.

Part of the Indonesian Government's long-term planning strategy is to develop more efficient agriculture to help alleviate poverty. For example, the Government of Indonesia has sold land to a company called the Sustainable Pacific Corporation (SPC), which purchased 300,000 ha (750,000 ac) of land to be used for organic agriculture and livestock breeding, agricultural packing houses, warehouses, tourism, and a sea port (*http://www.associatedcontent.com/article/2412420/halmahera_a_world_sustainable_development.html?cat=3* and *http://worldteakplantation.itrademarket.com/profile/sustainable-pacific-corp.htm,* accessed February 23, 2011). An essential part of this process is infrastructure development, primarily the improvement of roads, which can lead to further illegal logging and land clearance, and also facilitates bird trapping (poaching). This initiative will likely convert land that is currently suitable white cockatoo habitat into land for other uses that are no longer suitable for this species, such as *Jatropha curcas* plantations, which are discussed below.

Logging

Illegal logging is considered to be a leading cause of forest degradation in Indonesia (Rhee et al. 2004, chap. 6, p. 7). Between 2000 and 2005, Indonesia's forest cover declined by more than 90,000 km^2 (34,740 mi^2). Unsustainable logging practices that destroy the forest canopy also reduce habitat available to the white cockatoo (Lusli 2008, p. 22). Logging creates a network of roads, which can lead to secondary problems (BLI 2013b, p. 7; Benítez-López et al. 2010, p. 1307; BLI 2008k, p. 6), such as providing access for poachers. The Center for International Forestry Research estimated that between 55 and 75 percent of logging in Indonesia is illegal (*http://www.cifor.cgiar.org,* accessed December 10, 2010). Illegal logging is pervasive, and the Indonesian Government has been unable to enforce protected forest boundaries (Laurance 2007, pp. 1544–1547; Barr 2001, p. 40). Illegal logging activities include: Overharvesting beyond legal and sustainable quotas, harvesting trees from steep slopes and riparian habitat, illegal timber harvest and land encroachment in conservation areas and protected forests, and falsification of documents. Overexploitation of the forests and illegal logging are driven by the wood-

processing industry, which is reported to consume at least six times the officially allowed harvest (Rhee et al. 2004, p. xvii, chap. 6, p. 8). Illegal logging in national parks is reported with regularity, and the people involved have in the past been armed and described as being ruthless (Whitten et al. 2001, p. 2).

Selective logging is the primary legal method used 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 with some management until being subsequently logged again. Johns (1988, p. 31), studying a West Malaysian dipterocarp forest (tall hardwood tropical trees of the family Dipterocarpaceae), found that mechanized selective logging in tropical rain forests, which usually removes a small percentage of timber trees, caused severe incidental damage. The extraction of 3 percent of trees destroyed 51 percent of the forest. He concluded that this type of logging reduced the availability of food sources for frugivores (fruit-eaters). Loggers occasionally find parrots, including *Cacatua alba,* in commercially valuable trees that they cut down, such as *Anisoptera* (locally known as mersawa) in the Dipterocarpaceae family. The white cockatoo has been observed in commercially valuable trees such as *Anisoptera* and *Canarium* species (kenari or kiharpan) (Lambert 1993, p. 146). As of 2008, the BLI assessment stated that much of the habitat for the species was still intact, and even where degraded, the species used degraded areas. This was confirmed by WCS, which indicated that the islands of Halmahera and Bacan still have extensive forest cover; however, because selective logging targets mature trees, it can have a disproportionate impact on tree cavity nesting species such as cockatoos because fewer nest sites remain (BLI 2008k, p. 6).

Although almost 80 percent of its original forest is still intact, the Halmahera Rain Forests ecoregion (including Bacan Island) still faces habitat deforestation threats. As the forests are lost on other Indonesian islands, there is an increasing potential for forestry operations to move to Halmahera and other islands with large, desirable trees. Despite Presidential Instruction No. 4/2005 to eradicate illegal logging in forest areas and distribution of illegally cut timber throughout Indonesia (FAOLEX 2009, p. 1), illegal logging continues (refer to Factor D discussion). Contributing factors include poor forest management practices, rapid decentralization of government, abuse of local political powers, complicity of the military and police in some areas of the country, inconsistent law enforcement, and dwindling power of the central government (Laurence 2007, p. 1544; USAID 2004, pp. 3, 9).

Although illegal logging still occurs, the Indonesian Government is actively working to conserve its resources. The year 2011 was declared the International Year of Forests. Many countries, including Indonesia, are working toward reducing emissions from deforestation and forest degradation (termed REDD) (Ministry of Forestry of the Republic of Indonesia 2008, 185 pp.). Despite these efforts, illegal logging still occurs within this species' range.

Mining

Mining and its associated impacts is a fairly new factor affecting this species. Several companies have mining rights in the Maluku area, particularly on Halmahera (WCS 2010, pers. comm.). PT Antam, the largest mining company in Indonesia, currently operates three nickel mines on the northeast prong of Halmahera (PT Antam 2009). Another mining company, PT Nusa Halmahera Mineral (NHM), is a joint venture company between Newcrest Mining of Australia and PT Antam Tbk, an Indonesian-owned company. They have an exploration license for Bacan and nearby islands to look for gold and other minerals. A third mining company has a license to mine nickel near Ake Tajawi on Halmahera (WWF 2010a).

Two gold mines have been in operation on Halmahera (Newcrest Mining 2010, p. 1). The Gosowong mine was an open-pit, cyanide-leach mine that operated from 1999 to 2002, but has closed. The Toguraci mine began operation in 2004. Toguraci is located 2 km (1.2 mi) southwest of the original Gosowong pit mine. This mining operation is operated by a joint venture company, Pt Nusa Halmahera Minerals (PTNHM) and PT Aneka Tambang. Development of this mine began in July 2003, after approval of a feasibility study and environmental impact statement by the Indonesian Minister of Mines. Actual mining of ore and the first gold production began in February 2004. This mine has been the subject of conflict between local residents and the mining company. Between October and December 2003, several illegal miners occupied the Toguraci mine site. Additionally, the mine is located in a forested area that, according to local residents, is protected under Indonesian law, and, therefore, mining operations should not be allowed. The current operating status of the Toguraci mine is unclear; however, local NGOs indicate that mining on Halmahera does affect the white cockatoo (WCS 2010, pers. comm.; Vetter 2009, pp. 2, 14, 15). Mining activities can affect the white cockatoo's habitat either directly or indirectly, through pressures such as illegal poaching or human encroachment and habitat disturbance.

Yet another mining company, PT Weda Bay Nickel, proposed a nickel and cobalt mining project in 2009 on the island and submitted an environmental monitoring plan (Cardiff 2010, pp. 1–14; PT Weda Bay Nickel 2009, 204 pp.). The footprint of the mining operation appears to be within the boundaries of Aketajawe-Lolobata National Park (Cardiff 2010, p. 1; Vetter 2009, p. 19), which could have significant detrimental effects on Halmahera's wildlife, including the white cockatoo. A review of the proposed mining project indicated that it would likely destroy between 4,000 and 11,000 hectares (9,884 and 27,182 acres) of tropical forest, and between 2,000 and 6,000 ha (4,942 and 14,826 ac) of protected forested area (Cardiff 2010, pp. 6, 9, 12). The review indicated that mining activities are extremely destructive to this habitat. Based on deforestation projections, the population of the white cockatoo is projected to decline more than 65 percent over three generations due to deforestation (Vetter 2009, pp. 25, 26, 51). However, although it is clear that the extractable resources on Halmahera are desirable, as of 2013, the project was not funded by the World Bank.

Biofuel Production

Indonesia is investing in the planting of *Jatropha curcas* trees and palm oil *(Elaeis guineesis)* (Department for Environment, Food and Rural Affairs, United Kingdom 2008, pp. xvii, 47, 64, 65). Rapid expansion of biofuel plantations has led to intense international concern about wide-scale environmental impacts. On Halmahera, at least 500 hectares (3,750 acres) have been allotted for cultivating the Jatropha tree (Consulate General of the Republic of Indonesia 2006, pp. 5–6). Many industries, such as the air transportation industry, are considering the use of fuel from Jatropha as a biofuel source, and it is also being encouraged as a mechanism for carbon credits (*http://www.jatrophabiodiesel.org, http://www.jatrophaworld.org, http://www.jatropha-alliance.org,* accessed May 20, 2014). This oil has been reported to produce energy similar to diesel fuel. Although this species may

yield 4 times as much fuel per hectare as soybeans, and possibly 10 times that of corn, it requires 5 times more water to produce than corn. It is also reported to be desirable to developing countries because its carbon emissions footprint is thought to be relatively small when burned.

Conversion of land to monocultures destroys white cockatoo habitat. Monocultures are generally not suitable habitat for wildlife. White cockatoos require large trees, which provide large enough nesting cavity sites. *Jatropha curcas* is not cultivated as a tree, instead it is cultivated as a large shrub (Gilardi 2011, pers. comm.). As such it will never produce cavities large enough to be suitable for any cockatoo nest. Land conversion will also likely have a negative impact on this species' suitable habitat due to road building, infrastructure development, and other construction (Vetter 2009, pp. 1–10). Because there is currently no effective enforcement body to monitor sustainable land development (also refer to Factor D discussion) on Halmahera, these activities threaten white cockatoo habitat. Therefore, we find that conversion of forests to monocultures for biofuel, particularly Jatropha, is a threat to the white cockatoo.

Summary of Factor A

Deforestation affects endemic bird species restricted to single islands more severely than it affects other species (Brooks et al. 1997, p. 392). Monocultures such as exotic tree plantations and agriculture, as well as resource extraction and logging, are forms of deforestation and habitat loss affecting endemic island species such as the white cockatoo in Indonesia (Laurance 2007, p. 1544). Lowland areas that offer vital habitat for Indonesia's cockatoos have been the most severely impacted (Vetter 2009, p. 4; Cameron 2007, p. 177). As islands become more inhabited and deforested, humans move to other islands that contain available resources (Laurance 2007, p. 1544).

Cockatoos are highly impacted by selective logging of primary forests. Selective logging, which primarily targets mature trees, has a negative impact on cavity-nesters such as the white cockatoo. Vetter 2009 used remote sensing techniques to track the rate and spatial pattern of forest loss in the North Maluku Endemic Bird Area between 1990 and 2003, and projected rates of deforestation over the next three generations for restricted range bird species found in this region (BLI 2013d, pp. 1–2; Vetter 2009). This study estimated the rate of forest loss within the geographic and elevation range of white cockatoo to be approximately 20 percent between 1990 and 2003, and projected the loss of approximately 65 percent of forest in its range over the next three generations.

Research found that the abundance of cockatoos is positively related to the density of its favored nesting trees (large trees that would be impacted by logging), especially since reduced-impact logging techniques are rarely applied. 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. Although cockatoos may continue to inhabit secondary forests, the population will be at a substantially lower number. There is generally a delay between deforestation and bird extinctions (Brooks et al. 1999, p. 1,140). During this conversion process, the deforested area is in a state of flux; some bird species are no longer able to exist due to the lack of adequate resources needed for survival (nesting, feeding, and breeding). The high loss of primary forests and degradation of secondary forests is a concern, in part because little is known about the reproductive ecology of white cockatoos in the wild, including breeding success in mature forests versus secondary forests, and whether this species of cockatoo will survive in degraded forests in the long term.

In summary, habitat modification and deforestation activities, such as conversion of primary or secondary forests to exotic tree plantations for biofuel production and agriculture, combined with selective logging and resource extraction (mining), are likely to destroy much of the white cockatoo's habitat (the lowland rain forests of Halmahera) in the near future. While this species may be tolerant of secondary-growth forests or other disturbed sites, these areas do not represent optimal conditions for the species. Based on these factors, we find that the present and threatened destruction, modification, or curtailment of its habitat is a threat to the continued existence of the white cockatoo throughout all of its range.

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

The primary threat to white cockatoos is poaching from the wild to meet the demand for the pet trade (BLI 2013b, p. 7; ProFauna 2008; Jepson and Ladle 2005, p. 442). Illegal collection for the pet trade is a major problem for wild birds in Indonesia and is the primary threat to this species (ProFauna Indonesia 2010, pers. comm.; ProFauna 2008, pp. 1–9; BLI 2003, pp. 1–2). Bird-keeping is a popular pastime in Indonesia, with deep cultural roots (Jepson and Ladle 2005, p. 442). Parrots have been traded for hundreds of years by people living in the Moluccas. One report indicated that 17 percent of the global white cockatoo population was captured for trade in 1991 alone (Lambert 1993, p. 160). As of 1999, there appeared to be no enforcement of the country's national harvest ban; cockatoos were widely available in local markets.

In 2002, an investigation found 500 white cockatoos were caught to supply the pet trade (ProFauna Indonesia 2010, pers. comm.). Parrots are an important part of the Indonesian culture, which creates significant demand for parrots 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 as pets 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 (they changed hands, not an indication of birds taken from the wild each year). The study recommended a conservation intervention based on the level of bird-keeping among urban Indonesians. As of 2006, an average of 100 white cockatoos was found for sale in bird markets in Java annually (ProFauna Indonesia 2010, pers. comm.).

The commercial market for pet cockatoos is highly lucrative (Cantú-Guzmán et al. 2007, 121 pp.). Parrots can sell for 75,000 to 500,000 Indonesian Rupiahs (IDR or Rp) each, which equates to between $7.50 and $50 U.S. dollars. A young cockatoo can sell for $20 to $25 USD (ProFauna Indonesia 2010, pers. comm.; Sasaoka 2009, pers. comm., pp. 1–2; ProFauna 2008, p. 3). Because parrots have a high value relative to locals' income, the sale of live parrots can be a significant source of revenue.

Even with government controls, poaching of cockatoos (i.e., hunting by people to gain at least a temporary living from the activity) is relatively common. A demand for this species as pets still exists, and wild-origin birds are less expensive to obtain than captive-bred birds (Reynolds 2010, pers. comm.; Horsfield 2010, pers. comm.). Field research conducted in 2003 through 2005 in a small village (320 people, 60 households) located in the Manusela Valley, Seram, led to the conclusion that collecting wild parrots,

including cockatoos, is a way for villagers to supplement their income during times of economic hardship (Sasaoka 2009, pers. comm., p. 1; Sasaoka 2008, p. 158). In 2003, 21 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. These researchers found that villagers sometimes kept the cockatoos for several months while waiting for the best price, but normally did not keep them as pets.

Exploitation for commercial purposes prior to 1992 is widely accepted as the primary cause of drastic, rangewide population decline of many parrot species. Prior to 1992, when the WBCA was enacted, critical scientific studies to address issues of detriment to populations, appropriate management of species and sustainable levels of trade had not been undertaken for most CITES Appendix-II bird species in trade. Even in 1992, there was serious concern that the international commercial trade in wild-caught birds was contributing to the decline in the wild of some species of birds listed in CITES Appendix II. However, the implementation of WBCA in addition to CITES has curtailed much of the trade into the United States.

Within Indonesia, however, poaching continues to pose a serious threat to the species. The scope of the illegal trade in white cockatoos is unknown. ProFauna's investigation in 2008 found that this species is regularly poached from the wild and shipped to the Philippines. After reaching the Philippines, what occurs to the birds is unclear. Based on ProFauna's investigation, many of the birds being poached from the wild may be ''laundered and described as being of captive-origin.'' In general, it is difficult, if not impossible, to determine the source of cockatoos (BLI 2003, p. 1).

ProFauna found that around 9,800 parrots, including white cockatoos, are poached every year (ProFauna 2008, p. 3). An investigation completed in 2008 found that the white cockatoo is poached from Maluku and smuggled into the Philippines (ProFauna Indonesia 2010, pers. comm.; ProFauna 2008). Parrot poaching was found to take place most frequently in the central part of Halmahera, as well as Bacan, Obi, and Mandioli (ProFauna 2008, p. 7). The investigation indicated that approximately 10 percent of the 4,000 parrots smuggled annually were white cockatoos. In their investigation, they found bird poachers in Togawa, for example, were able to catch 15 individuals of white cockatoo in a week (ProFauna 2008, p. 3).

During the illegal trade process, many birds die prior to being exported (Cameron 2007, p. 163; Cantú-Guzmán et al. 2007, p. 60; Lambert 1993, p. 157). Methods used for poaching lead to significant mortality. In some cases, white cockatoos in the past have been caught with gum or glue, which would stick to their feathers and cause fatal injuries (ProFauna 2008, p. 2; Lambert 1993, p. 155). Some trappers reported mortality rates between 77 and 80 percent before parrots reach customers, and nestlings experience a higher mortality rate (Cantú-Guzmán et al. 2007, p. 60). ProFauna Indonesia 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 (due to malnutrition, disease, and stress) (2008, p. 5)). The estimates do not always include deaths of birds before export, smuggled birds, and birds domestically traded. Others estimate that as few as one-fourth of those poached survive the process of removal from their native, wild habitat to captivity.

A 2007 investigative report of the illegal parrot trade in Mexico revealed the magnitude of illegal trade of parrot species (Cantú-Guzmán et al. 2007, 121 pp.). The investigation found that documents are frequently forged to smuggle desirable and increasingly rare parrot species (p. 38). The organization that seizes parrots in Mexico, the Federal Attorney for the Protection of the Environment (PROFEPA), indicated that their most serious problem is combating the illegal bird trade (p. 45). Although this investigation was done in Mexico, it reflects a problem in many countries where parrots occur.

The extent of undocumented illegal trade (international and domestic) is difficult to quantify (Pain et al. 2006, p. 322; Thomsen et al. 1992, p. 3). Cases of seizures reported to the CITES Secretariat since 1990 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 (Sellar 2009, pers. comm., p. 2). Between 2000 and 2010, the United States refused import clearance for three birds reported as *Cacatua* species. One bird was described as *C. alba* in 2010; the other two birds were unknown *Cacatua* species. All three birds were reexported.

Additionally, discrepancies in the UNEP–WCMC Trade Database are common, so it is difficult to understand the full extent that this species is in trade. Between 1993 and 2002, although Indonesia had reported the export of 712 wild-caught birds, import records from other CITES countries recorded 1,646 (UNEP–WCMC 2010; Cahill et al. 2006, p. 162). The Service found a report in 2009 that included an export to the United Arab Emirates (UAE) from South Africa for which South Africa reported 614 captive-bred live birds exported and the UAE reported 965 captive-bred birds imported. Despite these discrepancies, the best available information suggests that this species is a desirable pet, and its removal from the wild is still occurring.

Locally, a high level of parrot poaching in north Halmahera is due in part to the lack of supervision by Natural Resources Conservation (KSDA) officers in the Forestry Department (ProFauna 2008, p. 3). The KSDA officers do not conduct regular enforcement or patrol. An NGO working with this species indicated that they had received several white cockatoos from Indonesian authorities who had confiscated them from poachers (Metz 2010, pers. comm.). Most of the Indonesian parrots come from Halmahera Island and are shipped to the Philippines. A 2008 investigation found that 40 percent of parrots were smuggled to the Philippines from the port in Pelita Village, Galela District in northern Halmahera (ProFauna 2008, p. 5). The birds are apparently smuggled to Balut Island or to General Santos in the Philippines. The journey to smuggle parrots from Halmahera, Indonesia, to General Santos, the Philippines, takes more than 9 hours, not including the time it takes to transport birds from the forest, to villages, and then to the port. The transactions are done offshore or in the sea, where the Philippine dealers collect the parrots from Indonesian ships. Upon arrival at General Santos, the birds are sent to Cartimar market in Manila, the capital of the Philippines (ProFauna 2008, p. 4). Since there is little disincentive for locals, it is a low-risk and lucrative source of income. Law No. 5, 1990, governing the conservation of biological resources and their ecosystems, was enacted to protect natural resources and the ecosystems (Yeager 2008, pp. 3–4); however, poaching and illegal trade continue to occur (also see discussion under Factor D). Despite the existence of legislation, this illegal trade of protected parrots continues.

The presence of mining projects in Halmahera is also likely to increase demand locally for birds (see Factor A discussion above). Temporary workers are known to buy these birds as gifts, and even police and military personnel posted to the area have contributed to

this problem (WCS 2010, pers. comm.). ProFauna has encouraged the Navy of Indonesian Armed Force (TNI) and the Indonesian Marine Police to improve the patrol of marine boundaries between Indonesia and the Philippines in order to decrease this illegal trade. The governments of both Indonesia and the Philippines are working to enforce their wildlife laws (ProFauna 2008, pp. 8–9); however, poaching continues.

Stopping illegal trade is further complicated by the vast size of Indonesia's coastline, and government officials have limited resources and knowledge to deal with the illegal pet trade (Laurence 2007, p. 1544). To combat 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 (*http://www.asean.org,* accessed March 3, 2011). ASEAN–WEN 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 presented by the U.S. Fish and Wildlife Service to help the government tackle poaching and smuggling (Wildlife Alliance 2008, p. 2). Despite these efforts, illegal trade of white cockatoo still occurs within Indonesia.

Summary of Factor B

In summary, overutilization (poaching of the white cockatoo for the pet trade) is a significant threat to the species contributing to the species' population decline. Poaching and illegal trade is difficult to control, in part because Indonesia has a vast coastline, and because income derived from poaching can be a significant source of income for local people. Birds are clearly being poached and shipped to the Philippines, and there is strong demand for this species within Indonesia. Additionally, having a parrot as a household pet is a common part of Indonesian culture. Government officials have limited resources to deal with the illegal pet trade. Indonesia is a founding member of ASEAN–WEN and has made an effort to train its police, forestry, and Customs officers in methods to tackle poaching and smuggling. However, the wildlife protection laws are not vigorously enforced at local levels for this species.

Although ProFauna Indonesia and the Indonesian Institute of Sciences have requested that the Forestry Department of Indonesia list the white cockatoo as a protected species, and the Sultan of Ternate Palace has forbidden the poaching of this species (ProFauna Indonesia 2010, pers. comm.), poaching and illegal cross-border trade still occur. The ProFauna investigation in 2008 found that enforcement in both Indonesia and the Philippines is lacking. In part because this species does not begin to reproduce until approximately 6 years of age, and because this species is thought to be monogamous and usually mates for life, this level of poaching for the pet trade is a considerable threat to the species in its ability to maintain its population. Based on the best available information, we find that overutilization is a threat to the continued existence of this species.

Factor C. Disease or Predation

We are unaware of any reports of diseases negatively affecting white cockatoos in the wild. Since disease and predation associated with this species in the wild are not well documented, we extrapolate from what is known about cockatoos in general (see analysis under Factor C for the Philippine cockatoo). 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 cockatoos in the wild in Indonesia. Cases of avian influenza (H5N1) do occur in Indonesia, but parrots, particularly cockatoos, are not considered to be natural reservoirs of this disease (Indonesian Parrot Project 2006, pp. 1–2). With respect to predation, the white cockatoo has natural predators, but we were unable to find information that these natural predators are having a negative impact on the productivity of this species. Therefore, we find that the white cockatoo is not threatened due to disease or predation.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

Domestic Regulatory Mechanisms

Indonesia has laws and regulations in place to conserve its biodiversity, manage its forests, regulate trade, provide species protection, and develop and manage protected areas. However, these laws and regulations are frequently ignored (BLI 2008k, p. 7; Laurance 2007, p. 1,544), and the country is unable to adequately monitor its vast area, which consists of 17,508 islands. The Indonesian economic crisis that led to the downfall of the Suharto regime resulted in the government instituting a decentralization policy that gave local governments greater autonomy (Vetter 2009, p. 15). However, this decentralization resulted in confusion of roles and responsibilities, and implementation of decentralization has been slow and uncertain. Conflicting interpretation of policies and priorities and the lack of capacity or experience of local governments have occurred (Rhee et al. 2004, chap. 2, p. 20).

According to ProFauna, the high level of parrot poaching in north Halmahera is in part due to the lack of monitoring by Natural Resources Conservation (KSDA) officers in the Forestry Department (ProFauna 2008, p. 3). There is no regular enforcement or patrol by the KSDA officers (ProFauna 2008, p. 3). The North Maluku Government and ProFauna Indonesia have proposed to the Forestry Ministry that the species be classified as a protected species (BLI 2013b, p. 7; ProFauna 2010, pers. comm.).

In Indonesia, the export of wild-caught parrots is generally subject to harvest and export quotas. However, because the white cockatoo is not on the Indonesian Government's list of protected species (ProFauna 2010a, pers. comm.; Rhee et al. 2004, chap. 5, p. 2, App. VIII; Law No. 5 1990, pp. 1–44), Indonesia has no legal export quota for wild-caught specimens of this species (IPP 2010). In 1988, the Indonesian Government began issuing quotas on trapping for the white cockatoo; however, these trapping quotas were poorly enforced. In 1999, no quota was issued, and all capture was reported to be illegal after 1999 (BLI 2013b, p. 7). However, an NGO reported that there was a catch quota of the white cockatoo for 2007. It was issued by the General Director of Perlindungan Hutan dan Konservasi Alam (PHKA; Forest Protection and Nature Conservation under the Indonesian Ministry of Forestry), and the catch quota was for 10 pairs that were to be used only for breeding (ProFauna 2008, p. 3). However, that quota was exceeded (ProFauna 2010, pers. comm.). As of 2010, information indicated that there was no longer a catch quota (ProFauna 2010, pers. comm.), but that restrictions may apply to commercial purposes, rather than breeding. According to WCS (2010, pers. comm.), this species is trapped and sold, and this can include trapping on a ''commercial'' scale by professionals, or farmers trapping occasional birds and then selling them to wholesalers. In 2007, at least 200 white cockatoos were caught from the wild in North Halmahera, which far

exceeded the quota of 10 pairs (ProFauna 2008, p. 3).

Additionally, in 2010, the Sultan of Ternate Palace issued a *fatwa* (order) forbidding the poaching of cockatoos in the wild. However, as stated before, enforcement often is severely lacking (Shepherd et al. 2004, p. 4) or difficult, and therefore, illegal activities remain socially acceptable at the local level. Illegal trade has been reported to the Natural Resource Conservation Agency, which is responsible for enforcing the law, but to date enforcement efforts remain ineffective (ProFauna Indonesia 2004, p. 8). To further complicate enforcement efforts, some bird dealers claim that members of the Department of Forest Protection and Nature Conservation are involved in the illegal trade of this species (Shepherd et al. 2004, p. 4).

Existing regulatory mechanisms within Indonesia, as implemented, are inadequate to reduce or remove the current threats to the white cockatoo. Even with government controls, poaching of cockatoos is relatively common (WCS 2010, pers. comm.). As discussed under Factor B, we found that poaching is a significant factor affecting the white cockatoo. There is some evidence that the actions of the Indonesian government agencies and the military are changing; however, if penalties are not enforced for illegal trade, trapping from the wild will continue (ProFauna Indonesia 2004, pp. 9–11). In conclusion, we find that the existing regulatory mechanisms are inadequate to reduce or remove the current threats to the white cockatoo. No information is available to suggest that these regulatory mechanisms will improve in the foreseeable future.

CITES

Indonesia has been a member of CITES since December 28, 1978. It has designated Management, Scientific, and Enforcement authorities to implement the Treaty (CITES 2013) and has played an active role in CITES meetings. Because this species is not listed in Appendix I, which would mean that commercial trade would be prohibited except under certain circumstances, legal international trade is still occurring for this species.

Between 2000 and 2009, there was generally a downward trend in international trade in the white cockatoo (UNEP–WCMC CITES Trade Database, accessed January 4, 2011). According to the CITES UNEP–WCMC Trade Database, 1,321 live white cockatoos were exported in 2000, 741 in 2008, and 1,574 in 2009. Between 2000 and 2009, trade in 12,321 live white cockatoos was reported. The majority of these birds were exported from South Africa and were reported as captive origin. Between 2000 and 2009, only 28 live white cockatoos were reported as wild origin. None of these live specimens reported as wild origin was exported directly from Indonesia. Of the shipments of live birds, 8,435 were described as captive origin, 19 were described as ''unknown'' origin, and 20 were described as pre-Convention, seized, or confiscated. Of the countries that reported the most exports of live white cockatoos, 371 specimens were reported as exported from Indonesia, 5,009 specimens were reported as exported from South Africa, and 1,044 specimens were reported as exported from the Philippines. Since discrepancies often arise between the numbers of animals reported by both exporting and importing countries, these values are derived using the reported trade from both the exporting countries and the importing countries. Note that countries that are not Parties to CITES do not submit annual report trade data to UNEP–WCMC. However, Parties, in their annual reports, do include data on their trade with non-parties, and these data are recorded in the UNEP–WCMC Trade Database. Also, while the Database does not include CITES annual report trade data from CITES Parties that did not submit annual reports, it does include CITES trade data from Parties that submitted their annual reports and engaged in CITES trade with those non-submitting Parties.

Between 2010 and 2012 (complete trade data was not available for 2013), the trade database indicates that this species is commonly in trade (*http://trade.cites.org,* accessed May 19, 2014). However, very few were reported as being exported from Indonesia, and none of those from Indonesia were reported as wild origin. In 2010, none were reported as being exported from Indonesia; in 2011, 30 were reported as being exported from Indonesia, and in 2012, the trade database indicated 20 captive-origin white cockatoos from Indonesia.

The purpose of CITES is to ensure that international trade in animal and plant species is not detrimental to the survival of wild populations by regulating the import, export, and reexport of CITES-listed animal and plant species. The best available data indicate that the current threat to this species of cockatoo stems from illegal trade in the domestic markets of Indonesia and international surrounding countries. As discussed under Factor B above, uncontrolled illegal poaching for the pet trade continues to adversely impact white cockatoos. Despite illegal trade, CITES is adequately regulating legal international trade.

Summary of Factor D

In summary, we find that the existing regulatory mechanisms within Indonesia, as implemented, are inadequate to reduce or remove the current threats to white cockatoos. Local protections in place provide some protection to white cockatoos. While Indonesia has a good legal framework to manage wildlife and their habitats, implementation of its laws and regulatory mechanisms is inadequate to reduce the threats to white cockatoos. The national parks on Halmahera may provide some protection to white cockatoos; however, management of protected areas is hindered by staff shortages and lack of expertise and money. As discussed under Factors A and B above, we found that habitat destruction and poaching are threats to white cockatoos. Deforestation and illegal activities are still rampant in Indonesia (Sau 2013, pp. 1–2; Gaveau et al. 2009, p. 2165; Laurance 2007, pp. 1–7). The national and local regulations and management of this species' habitat are ineffective at reducing the threats of habitat destruction (see Factor A) and poaching for the pet trade (see Factor B). The white cockatoo is listed in Appendix II of CITES (see discussion under Conservation Status for the White Cockatoo above), and CITES appears to be an adequate regulatory mechanism to address legal international trade.

Even with government restrictions, poaching of cockatoos (i.e., hunting by people to gain at least a temporary living from the activity) is still relatively common in Indonesia. Nestlings are more desirable as pets, yet their mortality rate when taken from the wild is greater than that of adults (ProFauna 2008). Laws and regulations are frequently ignored, and this adds to the inability to enforce them due to the remoteness of the areas where this species is located. No information is available to suggest regulatory mechanisms within Indonesia will be adequate to protect this species in the foreseeable future; therefore, we find that the inadequacy of regulatory mechanisms is a threat to the white cockatoo throughout its range.

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

Ecotourism

The Halmahera region is an emerging diving destination (WWF 2010a, p. 2).

An Internet search found several Web sites offered diving trips that are in the Halmahera region; there is a video available online (*http://www.youtube.com/watch?v=PEmEB-Zj_L4,* accessed May 22, 2014), entitled ''Diving travel: The North Halmahera Experience.'' Although the Halmahera region is remote and few diving operations exist, there is the potential for the diving industry to expand and exert more of an effect on the islands in this area. However, at this time, the best available information does not indicate that diving-related activities on or near Halmahera negatively affect the white cockatoo. We are not aware of any tourist activities occurring on Bacan Island. We found no other natural or manmade factors affecting the continued existence of the white cockatoo. Therefore, we find there are no threats to this species under this factor.

Finding for the White Cockatoo

As required by the ESA, we considered the five factors in assessing whether the white cockatoo is endangered or threatened throughout all or a significant portion of its range. We analyzed the potential threats to the white cockatoo including: Habitat loss and degradation, poaching for the pet trade, disease and predation, the inadequacy of regulatory controls, and other natural or manmade factors, such as the conversion of habitat to monocultures for biofuel, and ecotourism activities such as diving. We found that habitat loss, particularly due to selective logging, and conversion of forests to agriculture, mining, or biofuels, is a threat to the white cockatoo; the population is declining rangewide (Factor A). Halmahera is becoming increasingly more desirable to developers and investors as natural resources become scarcer.

We found that poaching for the pet trade is the most significant threat to the species, despite local public awareness campaigns. Researchers estimate that between 8,629 and 48,393 individuals of this species remain in the wild on Halmahera; the number of white cockatoos remaining on Bacan Island is unknown, though poaching of wild birds on this island is believed to be occurring. Pet birds are an important part of not only Indonesian culture, but also Asian culture, with large numbers of wild-caught parrots traded domestically and internationally (ProFauna 2008, pp. 3–4; BLI 2004, pp. 1–2; Baula et al. 2003, pp. 1–12). Trappers reportedly remain quite active. Wild-caught birds are openly sold in Asian markets, particularly in the nearby Philippines (ProFauna 2008, pp. 3–4; BLI 2003, pp. 1–2). An investigation conducted by NGOs in Indonesia in 2002 and 2003 found evidence of wild birds in local markets, and sellers reported that they were destined to go to countries such as Europe (BLI 2004, pp. 1–2). The attempt to end illegal trade is hampered by Indonesia's large coastline and officials with limited resources and knowledge.

Unsustainable poaching is particularly detrimental to the white cockatoo because of its estimated small and rapidly declining population. Excessive removal of individuals from the wild for illegal trade is particularly harmful to species such as the white cockatoo, which are a monogamous, long-lived species that do not begin breeding until they are 6 years of age. Additionally, because this species has a high monetary value (Basile *in litt.* 2010, pp. 6–7) and little risk is associated with poaching, poaching is financially lucrative. The Act describes 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 best available information indicates that poaching and trade are not at a level to consider the species to be in danger of extinction at this time. However, based on the analysis of the five factors discussed above, we determine that the white cockatoo is likely to become an endangered species within the foreseeable future. Therefore, we find overutilization for commercial, recreational, scientific, or educational purposes (Factor B), specifically poaching for the pet trade, is a threat to the white cockatoo throughout its range.

We found no evidence that disease or predation (Factor C) significantly affects the wild white cockatoo population throughout its range.

The white cockatoo is not currently classified as a protected species by the Indonesian Government. Although Indonesia has a good legal framework to manage wildlife and their habitats, implementation of its laws and regulatory mechanisms has been inadequate to address the threats to the white cockatoo, in part due to the remoteness of the white cockatoo's habitat. 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. Threats to the species have not decreased; local NGOs indicate the population trend is declining. Despite numerous laws and regulatory mechanisms to administer and manage wildlife and their habitats, existing laws are inadequate (factor D) to protect the species and its habitat from these other factors.

Although diving activities are increasing near islands containing white cockatoo habitat, we have no evidence that ecotourism is a threat to this species now or in the foreseeable future. Therefore, we conclude that there are no other natural or manmade factors that are threats to the species throughout its range (Factor E).

Under the ESA, an ''endangered species'' is defined as ''any species which is in danger of extinction throughout all or a significant portion of its range.'' The ESA defines 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.'' Based on our review of the best available scientific and commercial information pertaining to the above five factors, we find that the white cockatoo meets the definition of a ''threatened species'' under the ESA, and we are finalizing our rule to list the white cockatoo as a threatened species throughout its range. Our rationale for proposing to list this species as threatened rather than endangered is due to its current distribution within its range and its dispersed distribution on two islands, which provides resiliency to the population against threats such that the species is not currently in danger of extinction. However, white cockatoo is likely to become in danger of extinction in the foreseeable future throughout its range.

BLI indicates that this species is undergoing a rapid population decline of 30–49 percent over the past three generations (estimated to be approximately 39 years based on an estimated generation length of approximately 13 years), principally due to unsustainable levels of exploitation. This rapid population decline is likely to continue into the foreseeable future unless revised trapping quotas are effectively enforced (BLI 2013d, pp. 1–2). As stated previously, existing regulatory mechanisms in Indonesia are inadequate to reduce or remove the current threats to the white cockatoo and no information is available to suggest that these regulatory mechanisms will improve in the foreseeable future. BLI also offers strong evidence that the white cockatoo population could decline by 50–79 percent over the next 39 years (BLI 2013d, p. 2). Based on deforestation

projections, the population of the white cockatoo is projected to decline more than 65 percent over three generations due to deforestation (Vetter 2009, BLI 2013d). Although the best available information indicates that the species is not currently in danger of extinction and, thus, does not qualify as an ''endangered species'' under the ESA, we conclude that the species is likely to become endangered in the foreseeable future and qualifies as a threatened species.

Significant Portion of the Range

Having determined that the white cockatoo meets the definition of threatened throughout its range, we must next consider whether there are any significant portions of its range that meet the definition of endangered. For the purpose of this analysis, we consider a portion of the white cockatoo's range to be significant if it is important to the conservation of its range because it contributes meaningfully to the representation, resiliency, or redundancy of its range (see Redford et al. 2011). The best available information indicates that threats to the species occur throughout its range. Although declines on Halmahera have been quantified to some extent, the lack of any information, including quantitative population trend information for Bacan Island, precludes a comparison of the declines in these two portions of its range. Further, we found no information indicating that the threats are of greater magnitude or extent in any portion of its range on Halmahera Island. The limited information available for the white cockatoo does not allow us to determine what portion of the range if any, would be impacted to a significant degree more than any other. Therefore, we conclude that the threats to the species are uniform throughout its range, and no portion of its range is currently in danger of extinction.

Species Information

C. Yellow-crested cockatoo (*Cacatua sulphurea*)

Taxonomy and Description

The yellow-crested cockatoo has four recognized subspecies: *Cacatua sulphurea abbotti* (Oberholser, 1917), *C. s. citrinocristata* (Fraser, 1844), *C. s. sulphurea (*Bonaparte, 1850), and *C. s. parvula* (Gmelin, 1788). IUCN and BLI recognize *C. sulphurea* at the species level only. All four subspecies are recognized by ITIS (*http://www.itis.gov*). These four subspecies are endemic to Timor-Leste (an independent state which is adjacent to West Timor, a part of Indonesia) and Indonesia. The yellow-crested cockatoo inhabits forest, forest edge, scrub, and agricultural land (BLI 2013c, p. 2), but prefers primary lowland forest. Historically, it was found throughout the Lesser Sundas, on Sulawesi and its satellite islands, on Nusa Penida (near Bali), and the Masalembu Islands (in the Java Sea). These subspecies (hereafter collectively referred to as the species) are found in forested habitat in the lowlands up to 500 m (1,640 feet) on Sulawesi and up to 800 m (2,625 feet) and sometimes 1,200 m (3,937 feet) in the Lesser Sundas (Snyder 2000, p. 69; Jones et al. 1995; Collar 1994). They prefer large, mature trees with nesting areas higher in the canopy, and they prefer internal forested areas to forest edges (Jones et al. 1995, pp. 27–28, 39).

There is substantial discussion in scientific literature that debates the classification of island species and whether they deserve species status rather than subspecies status (James 2010, pp. 1–5; Phillimore 2010, pp. 42–53; Pratt 2010, pp. 79–89). This is sometimes significant with respect to conservation measures, particularly when considering the criteria used by organizations such as the IUCN. IUCN accepts assessments of subspecies only if a global assessment of the species as a whole has occurred. These four subspecies may all be in fact species, but for the purpose of this rule, these four subspecies face the same threats, are all generally in the same region of Indonesia, and all have quite small populations. Absent peer-reviewed information to the contrary, and based on the best available information, we recognize all four subspecies as being valid. For the purpose of this rule, listing *C. sulphurea,* which includes all subspecies, is prudent.

Use of Scientific Names in This Section

It is generally our practice to use the scientific name of the species in the beginning of the document for avian species, and, subsequently, refer to each species by their common name; however, in this section, we will generally refer to the species by their scientific names. There are many similar cockatoo species, some of which have similar sounding common names, which may cause some confusion. For example, the yellow-crested cockatoo is also referred to as the lesser sulphur-crested cockatoo, which is *Cacatua sulphurea,* but the sulphur-crested cockatoo, which is *C. galerita,* is endemic to Australia. Additionally, because there are four recognized subspecies of *C. sulphurea,* using their scientific names is more precise and clear. Finally, because the common names vary by locality, referring to these species by their scientific names is more effective.

Biology

Two tree species used by *Cacatua sulphurea* for nesting include *Sterculia foetida* (wild almond tree) and *Tetrameles nudiflora* (Binong) (Widodo 2009, p. 85). Nesting cavities have been observed to be 6 to 18 m (20 to 60 feet) above ground (Setiawan 1996 in Prijono 2008, p. 3). The breeding season does not appear to be set or restricted (Prijono 2008, p. 3), and it may coincide with the availability of nutrients in food sources. Incubation is shared by both parents. Incubation lasts 28 days, and the nestling period is 65 days until fledging (Cameron 2007, p. 140).

C. sulphurea's diet includes *Mangifera indica* (mango); *Carica papaya* (papaya); *Ficus* spp. (fig); *Psidium guajava* (guava); *Eugenia malaccensis* (jambu bol); *Opuntia elation* (prickly pear cactus); *Annona squamosa* (srikaya); flowers of *Cocos nucifer* (coconut); *Tamarindus indica* (tamarind); flowers and fruit of *Avicennia* (mangrove); fruit of *Dehaasia* (marangtaipa) and young leaves of *Sonneratia* (mangrove); and ninifo, thought to be within the *Canarium* genus (Nandika 2006, p. 10).

Feral Populations

Feral populations of released or escaped captive-held yellow-crested cockatoos have established themselves outside of their native range; however, they exist in low numbers (Lin and Lee 2006, p. 188). Between 1986 and 2000, researchers observed 11 feral yellow-crested cockatoos in Taiwan (Ling and Lee 2006, p. 190). *Cacatua sulphurea* has also become feral in places such as Singapore, Hong Kong, New Zealand, and Western Australia. In 1998, the species was described as being locally common in south and east Singapore, including the islets of St John's and Sentosa, and reportedly breeding in gardens and parks, with possibly between 30 and 50 birds existing there (PHPA/LIPI/BirdLife International-IP 1998 in BLI 2001, p. 1652).

Population Estimates

C. sulphurea was formerly common throughout much of its range. There is evidence of substantial population declines on the island of Sulawesi, where it may already be beyond recovery (Gilardi 2011, pers. comm.; Cahyadin and Arif 1994; Andrew and Holmes 1990), and the Lesser Sundas, where it is believed to be close to extinction on Sumbawa and Flores. It is

still fairly common in the Komodo National Park (Prijono et al. 2008, p. 7; Butchart et al. 1996). As of 2001, *Cacatua sulphurea sulphurea* only existed in tiny remnant numbers, except perhaps for a small population in Rawa Aopa Watumohai National Park (BLI 2001, p. 1648). *C. sulphurea* is extirpated on Lombok (BirdLife-IP in litt. 1997). *C. s. abbotti* is at a critically low population level; *C. s. parvula* is doing fairly well on Komodo in Komodo National Park; and *C. s. citrinocristata* persists but was steadily declining on Sumba (BLI 2001, p. 1648). On Nusa Penida, this subspecies was last recorded in 1986 (van Helvoort in van Balen 1994).

Population estimates for each subspecies vary in part due to the remoteness of the islands where they exist. The BLI Web site reported as of 2013 that 1,500–7,000 mature individuals are estimated to remain in the wild (BLI 2013c, accessed September 26, 2013). We believe, based on reports from local researchers and NGOs as we describe below, that the populations may be significantly less. However, there is consensus that the numbers of this species are rapidly declining in the wild (BLI 2013c, pp. 1–2). Population estimates for each subspecies are as follows: *Cacatua sulphurea abbotti,* 40; *C. s. citrinocristata,* 100 to 2,000; *C. s. parvula,* 800 to 1,500; *C. s. sulphurea,* 100 to 150. The population estimates and a discussion of the subspecies' status are presented in more detail below.

Cacatua sulphurea abbotti

Abbott's cockatoo, the largest of the yellow-crested cockatoos, is known only from a single island in the Masalembu Archipelago, which is 500 ha (1,235 ac) and in the Masalembu Archipelago in the Sulawesi Strait. This island is in the Java Sea, north of the cities of Surabaya and Bali, and east of southern Sumatra. The subspecies is considered to be extirpated from Masalembu Island (also known as Salembo Besar) (Indonesian Parrot Project 2010). *C. s. abbotti* has a mostly white body with a brilliant yellow, forward-curving crest, and slight yellow on its ear covert feathers. The species prefers very large trees within the *Datiscaceae* family for nesting (Snyder 2000, p. 69). When Abbott first found the endemic form *abbotti* in 1907, he ''reported it in hundreds'' on Masalembu (Oberholser 1917 in BLI 2001, p. 1651). Only between 8 and 10 individuals of the subspecies *abbotti* were located in 1993 on the Masalembu Islands (Jones et al. in prep. in Cahyadin and Arif 1994), and 6 to 8 birds were found in 1998. In 2008, a few individuals were found on Solombo Kecil Island. In IPP's last population survey, they found that, on Solombo Kecil, fewer than 30 individuals remain (Metz 2010, pers. comm.). The population of this subspecies as a whole has declined more than 80 percent within three generations (45 years). Although the Indonesian Parrot Project has started a conservation program for this subspecies, it is too early to report on progress of the conservation program (BLI 2013c, pp. 1–2).

Cacatua sulphurea citrinocristata

The subspecies *citrinocristata* is found on Sumba where the 2002 estimate of the population was between 565 and 2,054 individuals (Cahill et al. 2006, p. 265; Persulessy et al. 2003 in Prijono 2008, p. 5). Another 2002 survey by WCS found a density of 4.3 birds per km^2 within the two national parks, Manupeu-Tanadaru and Laiwangi-Wanggameti (Kinnaird 2003 in Prijono 2008, p. 5). On Sumba, *C. s. citrinocristata*'s population in 1995 was estimated to be just over 3,000 (Jones et al. 1995, p. 39). Earlier surveys in 1989 and 1992 (Marsden 1995 in Prijono 2008, p. 5) estimated the total population of *C. s. citrinocristata* to be between 1,150 and 2,644 birds. On Sumba, *C. s. citrinocristata* populations increased between 1992 and 2002, likely due to moratoria on international trade and local protections (Cahill et al. 2006, p. 162). The population on Sumba is thought to be roughly 100 birds (Gilardi 2011, pers. comm.). The earlier population estimates may have been overly optimistic based on surveying techniques, or the population has rapidly declined.

Sumba Island is located in the Lesser Sundas in southeastern Indonesia. The island is 12,000 km^2 (4,633 mi^2), 210 km (130 mi) in length, and 50 km (31 mi) south of Flores Island. Its highest point is Gunung Wanggameti at 1,225 m (4,019 feet). Precipitation is between 500 and 2,000 mm annually (20 to 79 inches). As of 1995, forest covered less than 11 percent of the island (McKnight et al. in prep in Jones et al. 1995, p. 22) and was confined to relatively small and fragmented pockets.

The two national parks, covering 1,350 km^2 (521 mi^2), were established on Sumba through Ministerial Decree No. 576/Kpts-II in 1998. Manupeu-Tanadaru (280 km^2 or 108 mi^2) seems to have the healthiest population of cockatoos. It had the highest density of cockatoos when surveyed both in 1992 and 2002 (Cahill et al. 2006, p. 164). However, of 33 forest patches surveyed, cockatoos were recorded in only 17 (O'Brien et al. 1997 in Cahill et al. 2006, p. 166).

Cacatua sulphurea parvula

Historically, *C. s. parvula* was found on most of the Lesser Sunda Islands (also known as Nusa Tenggara) including Penida, Lombok, Sumbawa, Moyo, Komodo, Flores, Pantar, Alor, Timor, and Semau Islands. Currently, this subspecies is found on Alor, Pantar, Komodo, and Sumbawa Islands. As of 2008, in the past 10 years, populations of more than 10 cockatoos had been found at only 2 locations (Prijono 2008, p. 6; Setiawan et al. 2000). In 1994, on Sumbawa, this subspecies was observed at 3 sites and reported by islanders to occur at 14 more locations although in very low numbers (Widodo 2009, p. 84; Setiawan et al. 2000). In 2000, 80 individuals were observed on Alor Island; the population estimate was 678 to 784 individuals on this island.

As of 2001, it was thought that West Timor and other small islands in the Lesser Sundas could support only a few individuals (Agista and Rubyanto 2001; Setiawan et al. 2000; PHKA/LIPI/BirdLife International–IP 1998). In 2004, the population estimate on Timor-Leste (East Timor) was between 500 and 1,000 individuals (Trainor et al. *in litt.* 2004). On Timor-Leste, *C. s. parvula* was recorded in six locations (Tilomar, Fatumasin, Sungai Clere, Lore, Monte Paitchau–Iralalora, Mount Diatuto) (Trainor 2002, pp. 93–99). Below is a summary of observations and population estimates for this subspecies.

- Alor Island: 80 individuals observed; population estimate was 678 to 784 individuals (Setiawan et al. 2000 in Widodo 2009, p. 84).
- Flores Island: 14 individuals observed (Ria; Watubuku forest, part of Lewotobi area, see Butchart et al. 1996 in Widodo 2009, p. 84).
- Komodo Island: 137 individuals observed; population estimate was 150 (Imansyah et al. 2008).
- Moyo Island: 10 individuals observed (Setiawan et al. 2000).
- Pantar Island: 29 individuals observed; population estimate was 444 to 534 individuals (Setiawan et al. 2000).
- Sumbawa Island: 14 individuals observed in 1996; subspecies observed at 3 sites and reported by islanders to occur at 14 more, although in very low numbers (Setiawan et al. 2000).
- East Timor (Timor-Leste): Population estimate was 500 to 1,000 individuals in 2004 (Trainor et al. 2005, pp. 121–130).
- West Timor: 8 individuals observed (Setiawan et al. 2000).

The largest known population, which is on Komodo Island (311 km² (120 mi²) in size) in Komodo National Park, was previously thought to be doing well, but the subspecies' population is declining even here although the exact reasons are unclear (Imansyah et al. 2008, 2 pp.). Cockatoo poaching is believed to be effectively eliminated due to surveillance and enforcement, and loss of mature trees or forest loss due to illegal logging is negligible (Ciofi and de Boer 2004 in Prijono 2008, p. 8). Flocks of 20 to 30 birds were seen during observations between 1989 and 1995, and, in 1999, an estimated 100 birds were observed (Agista and Rubyanto 2001 and BirdLife 2001 in Prijono 2008, p. 8). In Komodo National Park, *C. s. parvula* was still relatively common prior to 2001, and was most frequently recorded in dry tropical forest (from sea level to 350 m (1,148 feet)) dominated by *T. indicus* (common name: date or tamarind) and *Sterculia foetida* (Java-olive, poon tree, or skunk tree) (Agista and Rubyanto 2001). The total population size in Komodo National Park, which spans several islands, is estimated to be approximately 150 individuals on Komodo Island (Imansyah et al. 2008, p. 2) and about 100 individuals on Rinca Island (BLI 2013c, pp. 1–2).

Cacatua sulphurea sulphurea

Information from local NGOs suggests that only about 100 to 150 individuals of this subspecies remain in the wild, and they are likely found only on Sulawesi Island. *C. s. sulphurea* was formerly widely distributed in Sulawesi (formerly called Celebes); however, since the early 1980s, this subspecies has become very rare (Prijono 2008, pp. 2–3) due to high rates of poaching (CITES 2004a, p. 2). In 2001, between 7 and 15 individuals were observed on Pasoso Island; however, the south and central parts of the island have limited suitable habitat consisting of mixed secondary forest, scrub, and dry land agricultural plots (Agista et al. 2001 in Prijono 2008, p. 5).

Now, the subspecies is believed to occur only in a small region of Sulawesi (Metz 2010, pers. comm.). Approximately 10 years ago, it was documented in Rawa Aopa Watumohai National Park (RAWNP) (Agista et al. 2001 in Prijono 2008, p. 5). Older studies suggested that, although some small populations of this subspecies may exist elsewhere, the remaining cockatoos were likely confined to two locations in southern Sulawesi: RAWNP and Buton Island and in central Sulawesi on Pasoso Island. Of these, RAWNP is clearly the most significant site. RAWNP is unique because it has seven ecosystem types: Tidal mudflats, mangrove forest, wooded savannas, hill forest, swamp forest, peat swamp, and cultivation. Therefore this is a significant site to concentrate conservation efforts. However, it is unlikely that this species occurs here currently, although a separate species, *C. galerita,* is believed to occur in this park.

Conservation Status for the Yellow-Crested Cockatoo

In 1981, *Cacatua sulphurea* (and all of its subspecies) was listed in CITES Appendix II. In 2005, it was uplisted to Appendix I, thus commercial trade is generally prohibited (see above discussion with respect to CITES for additional information). *C. sulphurea* is listed on the IUCN Redlist as Critically Endangered. It is also protected in the United States by the WBCA.

It is against Indonesian law to capture *Cacatua sulphurea* for the export trade. *C. sulphurea* is protected by the Act on the Conservation of Biological Resources and their Ecosystems (Act No. 5 of 1990), and there has been no catch quota for this species since 1994. Violation of this law by capture, possession, or trade in this species could result in up to 5 years in prison and a fine of up to 200 million rupiahs ($22,870 USD; Prijono 2008, p. 13). In 1997, *C. sulphurea* was protected within Indonesia by Forestry Ministerial Decrees No. 350/Kpts-II/1997 and No. 522/Kpts-II/1997. Although a cooperative recovery plan has been developed and put into place for *C. sulphurea,* its effectiveness is unclear as there are no clear indications that the species' situation is improving. Protections exist in several areas such as the Rawa Aopa Watumohai and Caraente National Parks (on Sulawesi), which may support approximately 100 individuals (Nandika 2006, pp. 10–11); Suaka Margasatwa Nature Reserve on Pulau Moyo; Komodo National Park; and two national parks on Sumba, Manupeu-Tanahdaru and Laiwangi-Wanggameti. The Nini Konis Santana National Park in Timor also may have a population of approximately 100 birds (Trainor 2002 in Prijono 2008, p. 9). In Timor-Leste, BirdLife International identified 16 Important Bird Areas (IBAs). Although this designation does not confer any measure of protection, some of these IBAs may be vital to this species, particularly since the majority of the IBAs are located in coastal areas (BirdLife International 2007).

For *Cacatua sulphurea abbotti,* the Indonesian Parrot Project (IPP) initiated an intensive conservation program on Solombo Kecil Island. Visits were made to junior and senior high schools to teach students about the principles of conservation, increase their awareness of the plight of this species, and foster pride in this species, emphasizing that it is their rare and unique bird. Laws to protect these birds have been passed but only in the distant ''kabupatan'' (district) of Madura. These decrees are out of date, but officials plan to update them and extend them locally to the islands of the Masalembu Archipelago, where they are more likely to be enacted. Officers from the local armed forces and police were taught about the protections already in place nationally and internationally, and were encouraged to conserve the birds (IPP 2008, pp. 3–4). Nest boxes and use of wardens are other conservation methods used. Konservasi Kakatua Indonesia (KKI, also known as Cockatoo Conservation Indonesia) is another NGO working to protect this species.

Only about 100 to 150 *Cacatua sulphurea sulphurea* are left in the wild, solely on Sulawesi Island. Although IPP instituted a conservation program for this subspecies as of 2011, it is still in its preliminary stages.

Evaluation of Factors Affecting the Yellow-Crested Cockatoo

We examined the factors affecting the species based on section 4(a)(1) of the ESA. Under the ESA and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. The yellow-crested cockatoo is highly restricted in its range, and the threats to it occur throughout its range. Therefore, we assessed the status of the species throughout its entire range. We consider all of the subspecies to be facing equivalent threats; their habitats are very similar, and they are all island endemics in the same region. Like the white cockatoo, the greatest threats to cockatoos in Indonesia and other range countries is poaching from the wild for the illegal pet trade (usually nestlings are taken), logging, and other forms of deforestation and habitat destruction. In order to be efficient, if the threats are the same threats affecting a species discussed above, we summarize these threats and refer to a discussion in the document above if it is not unique to this species or subspecies.

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

Habitat destruction such as that described above for white cockatoos

also threatens *Cacatua sulphurea.* Deforestation is pervasive throughout Indonesia and Timor-Leste (Lee et al. 2013, p. 1; Laurance 2007, p. 1,544; Costin and Powell 2006, p. 2). For example, on one island inhabited by this species, trees that are preferred by this species to provide food and nest holes for *C. s. abbotti* have been eliminated due to logging. Their habitat on this island has been essentially destroyed and replaced with coconut palms. Almost total destruction of habitat flora, such as kapuk trees *(Ceiba pentandra)* and mangrove *(Avicennia apiculata),* which are preferred by the species, has occurred (IPP 2008, p. 3). Cockatoos consume fruit of tall timber trees such as ''kayu besi'' *(Intsia bijuga),* the source of ''ironwood'' for building, and tangkalase (scientific name unknown), a deciduous hardwood tree (Nandika 2006, p. 10). These trees are disappearing from the island. Researchers noted that cockatoo nests seemed to be safe from trappers if they were sufficiently high. The decrease in such trees likely played a vital role in the species' decline (Marsden and Jones 1997 in Snyder 2000, p. 70) in two ways: By decreasing suitable trees for nesting sites and by forcing cockatoos to locate nesting sites lower in the canopy.

This type of habitat loss affects all four subspecies. In the case of *Cacatua sulphurea abbotti,* coconut palms have been planted, displacing their favored habitat flora such as kapuk trees and mangrove. The main cause of forest loss for *C. s. citrinocristata* has been the clearing and repeated burning of vegetation to provide land for grazing and cultivation, although between 1992 and 2002, there was no evidence of additional forest loss (Cahill et al. 2006, p. 165). Removal of trees for local use occurs, but no legal commercial logging occurs on Sumba. In many areas, as a result of the shifting cultivation and annual burning for cattle grazing, the original vegetation has been replaced by fire-resistant trees, shrubs, and grasses. Where grazing and burning have been particularly intensive, the grasslands have become degraded and soil erosion is evident. A study found that, on Sumba Island, birds were absent or rare in forest areas of less than 10 km^2 (Kinnaird et al. 2003 in Prijono 2008, p. 4). Jones et al. indicated that, in order to protect the few remaining *C. s. citrinocristata,* remaining forest areas on Sumba Island must be preserved (1995, p. 49).

For *Cacatua sulphurea parvula,* the largest population is thought to be on Komodo Island in Komodo National Park. This park extends over three major islands: Komodo, Rinca and Padar, in addition to several smaller islands (*http://www.komodonationalpark.org,* accessed March 3, 2011). Its total marine and land surface area is 1,817 km^2 (701 mi^2). Due to the dryer climate, wildfires are a problem (Imansyah, unpublished, in Imansyah et al. 2008, p. 2). Researchers believe that the species' decline may be due to the lack of nesting sites.

C. sulphurea predominately resides in lowland forests at elevations between 100 to 600 m (328 to 1,968 feet) throughout these islands, with the highest densities of birds occurring in little-disturbed forests. The locations where the subspecies is thought to exist currently, as well as the most recent population estimates, may be found below under the Factor B discussion. Both legal and illegal logging have been the primary threats to the habitat of this species, with the threats occurring throughout the islands in lowland forests, decreasing available habitat (Widodo 2009, p. 81; Prijono 2008, p. 1). For example, research 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 (Marsden 1992, p. 12). 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. Even when habitat is protected, generally little undisturbed habitat is available, and it is of less suitable quality.

Cockatoos are highly impacted by selective logging of primary forests, especially because reduced-impact logging techniques are seldom applied (Lee et al. 2013, pp. 1–3; Kim et al. 2013, pp. 1–7). Selective logging, which targets mature trees, has a substantial negative impact on tree-cavity nesters such as *Cacatua sulphurea* because the species requires large trees for nesting. The abundance of cockatoos is often related to the density of its preferred nest trees (trees that would be impacted by logging).

After the primary forest is logged, land use surveys on other Indonesian islands show that the secondary forest is generally converted to other uses or logged again rather than being allowed to return to forested land. Therefore, although cockatoos may continue to inhabit secondary or degraded forests on their respective islands, their populations will be at a substantially fewer 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 *Cacatua sulphurea* in the wild, including breeding success in mature forests versus secondary forests, and whether these cockatoos will survive in degraded forests in the long term. However, surveys indicate that the species is declining in the wild.

In summary, extensive logging, both legal and illegal, is a threat to *Cacatua sulphurea* habitat. In some areas, deforestation and habitat degradation are still ongoing. The populations have decreased on all islands, with no sign of improvement. Therefore, we find that the present and threatened destruction, modification, or curtailment of its habitat is a threat to the continued existence of this species throughout all of its range.

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

Cacatua sulphurea is also affected by poachers who sell the species as pets for the pet trade. Not only are cockatoos desirable as pets, but this species is also very vocal and conspicuous, making it an easy target for poachers (Prijono 2008, pp. 4–5; Jepson and Ladle 2005, pp. 442, 447). Extremely heavy trade during the 1970s and 1980s was indicated as the main cause of the decline of this species (BLI 2004 in Cahill et al. 2006, p. 161; BirdLife International-IP, 1998). Between 1981 and 1992, exports from Indonesia of *C. sulphurea* were reported to have been 96,785 (UNEP–WCMC, in Cahill 2006, p. 162). In 1992, cockatoos were worth approximately $55 USD to the wholesalers who export birds to Java (Marsden 1995 in Cahill et al. 2006, p. 165).

From the data collected by ProFauna about animal markets in Java and Bali, the domestic trade in parrots is still high (ProFauna 2008, pp. 2–8). Many investigations indicate that these cockatoos could fairly easily be exported, and for some birds, their origin would be unknown, yet these birds may be listed as captive-origin (BLI 2003, p. 2).

On Sumba Island, evidence of cockatoo trapping was seen in 1996 (Kinnaird 1999), and shipments of cockatoos were confiscated on Sumba in 1998 and again in 2002 (when 32 were seized). In 2002, an investigation found that 1 collector in Waikabubak exported 52 yellow-crested cockatoos to other islands (Persulessy et al. 2003 in CITES 2004a, p. 6). In 2002, evidence was found of cockatoo trapping at Manupeu and Langgaliru, mainly in the form of snaring. Many trees with nests at Poronumbu even had ladders attached to them for nest raiding, suggesting that trapping activity was relatively high at

this site even in 2002 (Cahill et al. 2006, p. 166).

IPP, a local NGO which is actively working to protect *Cacatua sulphurea,* noted specific threats to the subspecies on Solombo Kecil Island. They found that usually nestlings, rather than adult birds, are taken. According to ProFauna, nestlings are worth 2 to 3 times more than adult cockatoos (2008, p. 8). Historically, cockatoos were trapped in large numbers by outside visitors who took them to Bali and Sumbawa Islands. Studies by social anthropologists of locals in Seram and Halmahera showed that parrot poaching accounted for 25 to 30 percent of their cash income (Badcock in litt. 1997, in Snyder et al. 2000, p. 60). Among the Halafara people of the Manusela valley on Seram, locals would catch and sell parrots to raise their bride price (Badcock in litt. 1997, in Snyder et al. 2000, p. 60). Now, with the marked decline in their numbers, the birds are even sought by government officials, who keep them as pets due to the prestige of owning such a rare bird (IPP 2008, p. 3).

Due to high demand for cockatoos and based on trade reports in 1993, the CITES Standing Committee recommended that countries suspend imports from Indonesia, pending surveys to assess the status of the species after a significant trade review (CITES 2001, AC17 Inf. 3 p. 4; CITES Notification to the Parties No. 737). Singapore continued to reexport wild-caught birds originating from Indonesia after the export suspension of Indonesia in 1994 (CITES 2001, AC17 Inf. 3 p. 4). In total, 1,229 wild-caught birds were reported to be reexported from Singapore between 1994 and 1999 (WCMC 2001 in CITES 2004a, pp. 9–10; CITES 2001, AC17 Inf. 3 p. 4). Although trade was recognized to be a problem, this species was not listed on Appendix I of CITES until 2005. Poaching for the pet trade, as with the other cockatoo species referenced in this rule, is a significant threat to this species.

Although some subspecies are monitored and are on remote islands, poaching still occurs. Poaching can be extremely lucrative, and there is relatively low risk involved in poaching. None of these subspecies is fully protected from the illegal pet trade. Based on our review, we find that overutilization, specifically poaching for the domestic pet trade, continues to be a threat to *Cacatua sulphurea* throughout its range.

Factor C. Disease or Predation

There is no evidence that disease or predation is a threat to *Cacatua sulphurea* in the wild. Our review did not find any indication that disease is a threat to *C. sulphurea;* however, we found reports of psittacine beak and feather disease (PBFD) in *C. sulphurea* when these birds were imported into the United States in the 1970s and 1980s. PBFD is a viral disease that originated in Australia and affects both wild and captive birds, causing chronic infections resulting in either feather loss or deformities of beak and feathers (Cameron 2007, p. 82). As described earlier in this document, although some cockatoo species are susceptible to this virus, we have no indication that PBFD adversely affects the *C. sulphurea* at the population level in the wild.

With respect to predation, two predators, a spotted kestrel *(Falco moluccensis)* and a white bellied sea-eagle *(Haliaeetus leucogaster),* have been observed attacking cockatoos (Prijono 2008, pp. 4–5). Although *C. sulphurea* has natural predators, to our knowledge, these predators are not having a negative impact on the species. After a review of the best scientific and commercial information, we conclude that neither disease nor predations are threats to *C. sulphurea.*

Factor D. The Inadequacy of Existing Regulatory Mechanisms

After surveys conducted in the late 1990s by the Directorate-General of Forest Protection and Nature Conservation (PHPA) and BirdLife International-Indonesia, it was determined that *Cacatua sulphurea* populations had collapsed (Snyder et al. 2000, p. 59). Prior to 1993, at which time legal trade was prohibited, a reported average of 1,600 *C. s. citrinocristata* individuals were being removed from Sumba annually, yet the 1992 population was only approximately 3,200 (Cahill et al. 2006, p. 161). This level of trade was obviously unsustainable. The population had increased, likely due to the moratorium on international trade and local protections (Cahill et al. 2006, p. 164); however, the population is declining again (BLI 2013c; Metz 2010, pers. comm.). In 1992, the Regent of West Sumba (Decree no. 147) banned trapping and transport of cockatoos. This action was followed by a similar decree in East Sumba (Decree no. 21), and in 1994, the government of Indonesia imposed a zero export quota (Cahill et al. 2006, p. 162). In 1997, this species was provided additional protection by the Forestry Ministerial Decrees No. 350/Kpts-II/1997 and No. 522/Kpts-II/1997.

According to a CITES 2004 proposal to uplist *Cacatua sulphurea* to Appendix I, the Philippines, Singapore, South Africa, and Indonesia were the main countries exporting captive-bred specimens of *Cacatua sulphurea.* In Indonesia and Singapore, there has been a ''sudden turn up of captive bred specimens since 1994, the time the legal trade in wild specimens stopped'' (CITES 2004, p. 5). In 2004, two captive-breeding operations of *C. sulphurea* were identified in Indonesia: PT. Bali Exotica Fauna and PT. Anak Burung Tropikana. Both of these companies were located in Bali Province (CITES 2004a, p. 5). Currently, there is one CITES-registered operation for breeding *C. sulphurea* for commercial purposes (CITES 2014, *http://cites.org/eng/common/reg/cb/summary.html,* Accessed May 20, 2014).

When the proposal to transfer the C*acatua sulphurea* from Appendix II to Appendix I (CITES CoP13, 2–14 October, Bangkok, Thailand) was under consideration in 2004, BLI noted in their position paper that the difficulty in distinguishing captive-bred birds from wild birds was facilitating illegal capture from the wild and illegal international trading of the captured birds (BLI 2003). They pointed to examples of these birds found in markets in Indonesia (BLI 2003 p. 2).

Between 2000 and 2009, the UNEP–WCMC Trade Database indicated that 6,485 live specimens of *Cacatua sulphurea* were exported (subspecies are unknown). Nearly all of these were documented as captive-bred, but wildlife laundering is quite lucrative and does still occur (ProFauna 2010; 2008; Cantú-Guzmán et al. 2007, 121 pp.).

Between 2010 and 2013 (complete trade data was not available for 2013), the UNEP–WCMC Trade Database indicated no exports of *Cacatua sulphurea* were from Indonesia (*http://trade.cites.org,* accessed May 19, 2014). CITES regulates international trade of this species, and we have no evidence to suggest that CITES is inadequate in regulating legal trade of this species.

A 2003 IUCN review found that *Cacatua sulphurea* was readily available in Indonesian bird markets (BLI 2003, pp. 1–2). As described above for the Philippine cockatoo, poaching is relatively easy and lucrative, poverty is widespread, and local communities have little incentive or awareness to conserve their resources. Although the species occurs within a number of protected areas, and a recovery plan was initiated in 1998, poaching is still occurring (ProFauna 2008). Birds are still likely smuggled to and exported from Singapore and the Philippines (ProFauna 2008). Continued trapping and large-scale logging that are not

sufficiently regulated or mitigated by the Indonesian Government remain threats to the species. For some subspecies, there are specific local protections in place. For example, a local law for the protection of *C. s. abbotti* exists, which IPP assisted in obtaining in 2010. However, these laws are inadequate to combat the threats facing the species according to a local NGO who works on the conservation of this species (Metz 2010, pers. comm.).

With respect to the adequacy of internal government controls within Indonesia, we find that they are inadequate (refer to discussion and finding under Factor D for the white cockatoo, which faces the same threats with respect to this factor). Poaching and illegal trade of this species continue to occur. This species continues to experience population declines, and the protections in place are inadequate to protect this species. Therefore, we find that the inadequacy of regulatory mechanisms is a threat to *Cacatua sulphurea* throughout its range.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

Interspecific Competition

The Komodo dragon *(Varanus komodoensis)* preys upon eggs and uses nests of *Cacatua sulphurea* during the species' arboreal phase. Competition between the dragon and cockatoo has been observed in attempts to use the tree *Sterculia foetida* for nesting (Agista and Rubyanto 2001 in Prijono 2008, p. 4). Although individuals of *C. sulphurea* may be subject to occasional competition with Komodo dragons, we have no evidence that this is occurring at a level that may affect the status of *C. sulphurea* on Komodo Island as a whole.

Small and Declining Population

All four subspecies of *Cacatua sulphurea* have very limited geographic ranges and small, declining populations. Their existing populations are extremely localized, and sometimes geographically isolated from one another, leaving them vulnerable to localized extinctions from habitat modification and destruction, natural catastrophic changes to their habitat (e.g., flood scour, drought), other stochastic disturbances, and decreased fitness from reduced genetic diversity. Fewer than 1,000 to 2,000 individuals likely represent each subspecies remaining in the wild; in the case of *C. s. abbotti* and *C. s. sulphurea,* likely fewer than 100 remain of each subspecies (Metz 2010, pers. comm.) (see Table 2).

TABLE 2—YELLOW-CRESTED COCKATOO POPULATION ESTIMATES

Species	Where found and date of population estimate	Estimated number remaining in the wild
Yellow-crested cockatoo (*Cacatua sulphurea*).	Indonesia and Timor-Leste	1,500 to ~ 5,000.*
Subspecies		
C. s. abbotti	Sulawesi Strait (2010)	fewer than 30.
C. s. citrinocristata	Sulawesi Strait (2002)	565 to 2,054.
C. s. parvula	Sulawesi Strait (2000, 2009)	500 to 2,000.
	Timor (2000, 2004)	500.
C. s. sulphurea	Sulawesi Strait (2010)	100 to 150.

* Number includes all four subspecies.

Small, isolated populations of wildlife species that have gone through a reduction in population numbers can be susceptible to demographic and genetic problems (Purvis et al. 2000, p. 1949; Shaffer 1981, pp. 130–134). A small, declining population size renders a species vulnerable to any of several risks including inbreeding depression, loss of genetic variation, and accumulation of new mutations. A species' small population size, combined with its restricted range, may increase the species' vulnerability to adverse natural events and manmade activities that destroy individuals and their habitat (Holsinger 2000, pp. 64–65; Young and Clarke 2000, pp. 361–366; Primack 1998, pp. 279–308). Inbreeding can have individual or population-level consequences either by increasing the phenotypic expression (the outward appearance or observable structure, function, or behavior of a living organism) of recessive, deleterious alleles (harmful gene sequences) or by reducing the overall fitness of individuals in the population (Charlesworth and Charlesworth 1987, p. 231; Shaffer 1981, p. 131). This, in turn, compromises a species' ability to adapt genetically to changing environments (Frankham 1996, p. 1,507) and reduces overall fitness of the species, thus increasing extinction risk (Reed and Frankham 2003, pp. 233–234).

Based on the best scientific and commercial information available, we conclude that *Cacatua sulphurea's* very small and rapidly declining populations is a factor that negatively affects the species throughout its range, particularly when combined with other threats to this species.

Finding for the Yellow-Crested Cockatoo

As required by the ESA, we considered the five factors in assessing whether *Cacatua sulphurea* is endangered or threatened throughout all or a significant portion of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by *C. sulphurea.* We reviewed the petition, information available in our files, and other available published and unpublished information.

We analyzed the potential threats to *Cacatua sulphurea,* including habitat loss and habitat degradation, poaching for the domestic pet trade, disease and predation, and the inadequacy of regulatory controls. We found that habitat loss as a result of deforestation is a threat to *C. sulphurea,* and the subspecies are declining rangewide. This species faces immediate and significant threats, primarily from the destruction and modification of its habitats from logging (Factor A). Efforts such as reforestation and building of nest boxes may continue to improve the habitat of this species, which may subsequently increase their numbers. However, no improvement has been seen yet as a result of conservation efforts (Metz 2010, pers. comm.). We conclude that the present or threatened destruction, modification, or curtailment of its habitat or range is a significant threat to *C. sulphurea.*

We found information that poaching for the domestic pet trade is also a

significant threat to the species. Illegal poaching of the cockatoo for the pet trade is still common, despite existing laws, education, and public awareness campaigns. Pet birds are an important part of Indonesian culture, with large numbers of wild-caught parrots traded domestically and internationally. Trappers remain active, and wild-caught birds are openly sold in Asian markets (Prijono 2008, p. 18). Efforts to curtail illegal trade are hampered by Indonesia's large coastline and enforcement officials with limited resources and knowledge. The continuing illegal trade of the cockatoo is a threat to the survival of the species. Therefore, we find overutilization for commercial, recreational, scientific, or educational purposes (Factor B) is a threat to *Cacatua sulphurea* throughout its range.

We found no evidence that diseases significantly affect *Cacatua sulphurea* in the wild. Other avian species may be susceptible to certain diseases but we have no evidence that disease occurs to an extent that it is a threat to this species. Predation was not found to affect *C. sulphurea* populations; however, we will continue to monitor this factor. Based on the best available information, we conclude that neither disease nor predation (Factor C) is a threat to the species throughout its range.

Although Indonesia has a good legal framework to manage wildlife and their habitats, implementation of its laws and regulatory mechanisms has been inadequate to address the threats to *Cacatua sulphurea.* Logging laws and policies are frequently ignored and rarely enforced, and illegal logging is rampant, even occurring in national parks and nature reserves (Prijono 2008). The illegal trade of this species continues to occur. The current range of *C. sulphurea* is much smaller than its historical range. The population estimates for each subspecies range from 30 to 2,054 individuals. Threats to *C. sulphurea* continue, and based on the best available information, the population trends are declining. Thus, we conclude that inadequate regulatory mechanisms are a threat to *C. sulphurea* throughout its range.

Finally, we conclude that effects that typically impact small, declining populations negatively affect this species, particularly when combined with the other threats affecting the species (Factor E).

Because of the uniformity of the threats throughout its range, we find that there are no other listable entities that may warrant a different determination of status. Despite the conservation measures in place, this species faces severe threats, and the population trend for this species continues to decline. Based on our review of the best available scientific and commercial information pertaining to the five factors, we find that *Cacatua sulphurea* is in danger of extinction (endangered) throughout all of its range. Therefore, we are listing *C. sulphurea* as endangered under the ESA.

Available Conservation Measures

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

The ESA 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'' (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, 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 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 ESA. 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 for endangered species are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued for the following purposes: For scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. For threatened species, a permit may be issued for the same activities, as well as zoological exhibition, education, and special purposes consistent with the ESA.

Special Rule

Section 4(d) of the ESA states that the Secretary of the Interior (Secretary) may, by regulation, extend to threatened species prohibitions provided for endangered species under section 9 of the ESA. Our implementing regulations for threatened wildlife in 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 ESA gives the Secretary discretion to specify the ESA prohibitions and any exceptions to those prohibitions that are appropriate for 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 finalized special rule for the white 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 white cockatoos. It would also allow interstate commerce. 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. The white cockatoo is also listed in Appendix II of CITES, a treaty that contributes to the conservation of the species by monitoring international trade and ensuring that trade in the species is not detrimental to its survival (see Conservation Status for the white cockatoo). However, import and export of birds taken from the wild after the date this species is listed under the ESA, take, and foreign commerce would need to meet the requirements of 50 CFR 17.31 and 17.32. ''Take'' under the ESA includes both harm and harassment. 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 ESA is required.

On March 12, 2013, we published in the **Federal Register** (78 FR 15624) a final rule listing the yellow-billed parrot with a special rule under section 4(d) of the Act, and correcting the salmon-crested cockatoo special rule under section 4(d) of the Act. In the preamble of that rule, we explained that we were adopting for yellow-billed parrot and correcting for salmon-crested cockatoo a provision similar to the one we proposed in the 4(d) rule for the white cockatoo, which would allow certain

acts in interstate commerce for yellow-billed parrot and salmon-crested cockatoos that may be conducted without a threatened species permit under 50 CFR 17.32. Consistent with our intent in proposing the exceptions contained in the 4(d) rule for the white cockatoo, we are amending the regulations found at 50 CFR 17.41(c) to include the white cockatoo among the species in the parrot family to which 50 CFR 17.41(c) applies, including the provision that certain acts in interstate commerce of white cockatoos may proceed without a permit under the Act. This final special rule allows import and export of certain white cockatoos and interstate commerce of this species without a permit under the ESA as explained below.

Import and export. This final special rule applies to all commercial and noncommercial international shipments of live white cockatoos and parts and products, including the import and export of personal pets and research samples. It allows a person to import or export a specimen that was held in captivity prior to the date this species is listed under the ESA 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 final 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 final special rule applies to birds captive-bred in the United States and abroad. Import and export of specimens that have been held in captivity prior to the date this species is listed under the ESA or that were captive-bred would be allowed without a permit under the ESA provided the provisions of CITES and the WBCA are met. With respect to captive-bred specimens, the CITES export permits would need 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 the date this species is listed under the ESA, the importer or exporter would need to demonstrate that the cockatoo was taken from the wild prior to that date. Under the special rule, a person would need to provide records, receipts, or other documents when applying for permits under CITES and the WBCA to show the specimen was held in captivity prior to the date this species is listed under the ESA.

We assessed the conservation needs of the white cockatoo in light of the broad protections provided to the species under the WBCA and CITES. The best available commercial data indicate that the current threat to the white 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 extend only within the jurisdiction of the United States, would not regulate such activities. Accordingly we find that the import and export requirements of the final special rule provide the necessary and advisable conservation measures that are needed for this species.

Interstate commerce. Under the special rule, a person may deliver, receive, carry, transport, or ship a white cockatoo in interstate commerce in the course of a commercial activity, or sell or offer to sell in interstate commerce a white cockatoo without a permit under the Act. At the same time, the prohibitions on take under 50 CFR 17.31 apply under this special rule, and any interstate commerce activities that could incidentally take white cockatoos or otherwise prohibited acts in foreign commerce require a permit under 50 CFR 17.32.

Although we do not have current data, we believe a large number of white cockatoos exist in the United States. ISIS (International Species Information System) information as of 2008 indicated that 252 white cockatoos were 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. We have no information to suggest that interstate commerce activities are associated with threats to the white cockatoo or would negatively affect any efforts aimed at the recovery of wild populations of the species. Therefore, because acts in interstate commerce within the United States have not been found to threaten the white cockatoo, the species is otherwise protected in the course of interstate commercial activities under the incidental take provisions and foreign commerce provisions contained in 50 CFR 17.31, and international trade of this species is regulated under CITES and the WBCA, we find this special rule adopts appropriate prohibitions from section 9(a)(1) of the Act and contains all the prohibitions and authorizations necessary and advisable for the conservation of the white cockatoo.

Pre-Act Exemptions. As stated previously, under the Special Rule, import and export of birds taken from the wild after the date this species is listed under the ESA, take, and foreign commerce would still need to meet the requirements of 50 CFR 17.31 and 17.32. However, under the terms of section 9(b)(1) of the Act, white cockatoos held in captivity or a controlled environment prior to the date the species is listed under the Act would be considered ''pre-Act'' and would not require permits for take or foreign commerce unless they are subsequently held or used in the course of a ''commercial activity.'' For example, if a taking by the owner of a pet bird occurred and that pet bird was (1) held in captivity prior to the listing date and (2) not subsequently held or used in the course of a commercial activity, then that taking would be exempt and not a violation of the ESA under the terms of section 9(b)(1). Section 3(2) of the Act and our regulations at 50 CFR 17.3 define ''commercial activity'' as all activities of actual or intended transfer of wildlife or plants from one person to another person in the pursuit of gain or profit, including, but not limited to, the buying or selling of commodities and activities conducted for the purpose of facilitating such buying and selling. For example, when a specimen is sold or offered for sale, it loses its pre-Act status. The Act also provides, however, that exhibition of commodities by museums or similar cultural or historical organizations is not included in the ESA's definition of ''commercial activity.'' For example, when a commodity containing a white cockatoo feather and acquired by a museum prior to the listing date is sold in foreign commerce for exhibition by a second museum after the listing date, it would not lose its pre-Act status (provided it was not held or used in the course of a commercial activity by a non-qualifying entity in the time between listing and the transaction between the two museums). You may obtain information about permits or other authorizations to carry out otherwise prohibited activities by contacting the U.S. Fish and Wildlife Service, Division of Management Authority, Branch of Permits, 4401 N. Fairfax Drive, Room 212, Arlington, VA 22203; telephone: (703) 358–2104 or (toll free) (800) 358–2104; facsimile: (703) 358–2281; email: *managementauthority@fws.gov;* Web site: *http://www.fws.gov/international/index.html.*

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 these species are not native to the United States, we are not designating critical habitat for these species under section 4 of the Act.

Required Determinations

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

We have determined that we do not need to prepare an environmental assessment, as defined under the authority of the National Environmental Policy Act of 1969, in connection with regulations adopted under section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A list of all references cited in this document is available at *http://www.regulations.gov,* Docket No. FWS–R9–ES–2010–0099, or upon request from the U.S. Fish and Wildlife Service, Ecological Services Program, Branch of Foreign Species (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this rule are staff members of the Branch of Foreign Species, Ecological Services Program, U.S. Fish and Wildlife Service.

List of Subjects in 50 CFR Part 17

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

Regulation Promulgation

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

PART 17—[AMENDED]

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

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

■ 2. Amend § 17.11(h) by adding new entries for ''Cockatoo, Philippine'', ''Cockatoo, white'', and Cockatoo, yellow-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, Philippine	*Cacatua haematuropygia.*	Philippines	Entire	E	786	NA	NA
*	*	*	*	*	*		*
Cockatoo, white	*Cacatua alba*	Indonesia	Entire	T	786	NA	17.41(c)
Cockatoo, yellow-crested.	*Cacatua sulphurea*	Indonesia and Timor-Leste (East Timor).	Entire	E	786	NA	NA
*	*	*	*	*	*		*

■ 3. Amend § 17.41 by revising paragraph (c) introductory text and paragraph (c)(2)(ii) introductory text, and adding paragraph (c)(2)(ii)(C), to read as follows:

§ 17.41 Special rules—birds.

* * * * *

(c) The following species in the parrot family: Salmon-crested cockatoo *(Cacatua moluccensis),* yellow-billed parrot *(Amazona collaria),* and white cockatoo *(Cacatua alba).*

* * * * *

(2) * * *

(ii) *Specimens held in captivity prior to certain dates:* You must provide documentation to demonstrate that the specimen was held in captivity prior to the applicable date specified in paragraphs (c)(2)(ii)(A), (B), or (C) of this section. Such documentation may include copies of receipts, accession or veterinary records, CITES documents, or wildlife declaration forms, which must be dated prior to the specified dates.

* * * * *

(C) *For white cockatoos:* July 24, 2014 (the date this species was listed under the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*)).

* * * * *

Dated: June 6, 2014.

Stephen Guertin,

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

[FR Doc. 2014–14624 Filed 6–23–14; 8:45 am]

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