

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R9-ES-2010-0099; MO 92210-0-0010 B6]

RIN 1018-AX50

Endangered and Threatened Wildlife and Plants; Four Foreign Parrot Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; 12-month finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose 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 Endangered Species Act of 1973, as amended (ESA). We are taking this action in response to a petition to list the following four parrot species: Crimson shining parrot (*Prosopeia splendens*), Philippine cockatoo (*Cacatua haematuropygia*), white cockatoo (*C. alba*), and yellow-crested cockatoo (*C. sulphurea*) as endangered or threatened under the ESA. This document, which also serves as the completion of the status review and as the 12-month finding on the petition, announces our finding that listing is not warranted for the crimson shining parrot. We also propose a special rule for the white cockatoo in conjunction with our proposed listing as threatened for this species. We seek information from the public on the proposed listing, proposed special rule, and status review for these species.

DATES: We will consider comments and information received or postmarked on or before October 11, 2011.

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

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the instructions for submitting comments on Docket No. FWS-R9-ES-2010-0099.
- *U.S. mail or hand-delivery:* Public Comments Processing, Attn: FWS-R9-ES-2010-0099, Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042-PDM; Arlington, VA 22203.

We will not accept comments by e-mail or fax. We will post all comments on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see the Information Requested section below for more information).

FOR FURTHER INFORMATION CONTACT:

Janine Van Norman, Chief, Branch of Foreign Species, Endangered Species Program, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 420, Arlington, VA 22203; 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

Background

Section 4(b)(3)(B) of the ESA (16 U.S.C. 1531 *et seq.*) requires that, for any petition to revise the Federal Lists of Endangered and Threatened Wildlife and Plants that contains substantial scientific or commercial information that listing the species may be warranted, we make a finding within 12 months of the date of receipt of the petition ("12-month finding"). In this finding, we determine whether the petitioned action is: (a) Not warranted, (b) warranted, or (c) warranted, but immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are endangered or threatened, and expeditious progress is being made to add or remove qualified species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Section 4(b)(3)(C) of the ESA requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, that is, requiring a subsequent finding to be made within 12 months. We must publish these 12-month findings in the **Federal Register**.

If the listing of a species is found to be warranted but precluded by higher-priority listing actions, then the petition to list that species is treated as if it is a petition that is resubmitted on the date of the finding and is, therefore, subject to a new 12-month finding within one year. The Service publishes an annual notice of resubmitted petition findings (annual notice) for all foreign species for which listings were previously found to be warranted but precluded.

In this document, we announce that listing Philippine cockatoo and yellow-crested cockatoo as endangered is warranted, and we are issuing a proposed rule to add those species as endangered under the Federal Lists of Endangered and Threatened Wildlife and Plants. We find that listing the crimson shining parrot as endangered or threatened is not warranted. We further find that listing white cockatoo as threatened is warranted, and we are issuing a proposed rule to add that species as threatened under the Federal

Lists of Endangered and Threatened Wildlife and Plants.

Prior to issuing a final rule on this proposed action, we will take into consideration all comments and any additional information we receive. Such information may lead to a final rule that differs from this proposal. All comments and recommendations, including names and addresses of commenters, will become part of the administrative record.

Previous Federal Actions

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 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 July 21, 2010, a settlement agreement was approved by the Court (CV-10-357, D. D.C.), in which the Service agreed to (in part) submit to the **Federal Register** by July 29, 2011, a determination whether the petitioned action is warranted, not warranted, or warranted but precluded by other listing actions for no less than four of the

petitioned species. This **Federal Register** document complies with the first deadline in that court-ordered settlement agreement. We will announce the 12-month findings for the remaining parrot species for which a 90-day finding was made on July 14, 2009 (74 FR 33957) in subsequent **Federal Register** notices.

Information Requested

We intend that any final actions resulting from this proposed rule will be based on the best scientific and commercial data available. Therefore, we request comments or information from other concerned governmental agencies, the scientific community, or any other interested parties concerning this proposed rule. We particularly seek clarifying information concerning:

(1) Information on taxonomy, distribution, habitat selection and trends (especially breeding and foraging habitats), diet, and population abundance and trends (especially current recruitment data) of these species.

(2) Information on the effects of habitat loss and changing land uses on the distribution and abundance of these species (particularly the conversion of habitat to biofuel production on Halmahera Island and any data on Bacan Island related to the white cockatoo).

(3) Information on the effects of other potential threat factors, including live capture and hunting, domestic and international trade, predation by other animals, and any diseases that are known to affect these species or their principal food sources.

(4) Information on management programs for parrot conservation, including mitigation measures related to conservation programs, and any other private, nongovernmental, or governmental conservation programs that benefit these species.

(5) The potential effects of climate change on these species and their habitats.

Please include sufficient information with your submission (such as full references) to allow us to verify any scientific or commercial information you include. Submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination. Section 4(b)(1)(A) of the ESA directs that determinations as to whether any species is an endangered or threatened species must be made "solely on the basis of the best scientific and commercial data available."

Public Hearing

At this time, we do not have a public hearing scheduled for this proposed rule. The main purpose of most public hearings is to obtain public testimony or comment. In most cases, it is sufficient to submit comments through the Federal eRulemaking Portal, described above in the **ADDRESSES** section. If you would like to request a public hearing for this proposed rule, you must submit your request, in writing, to the person listed in the **FOR FURTHER INFORMATION CONTACT** section by September 23, 2011.

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; or

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

In considering what factors might constitute threats, 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 four species of parrots: crimson shining parrot, Philippine cockatoo, white cockatoo, and yellow-crested cockatoo. For each of these parrots, we evaluate the five factors under ESA Section 4(a)(1) on the species. In some cases, we found under a factor that 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

A. Crimson Shining Parrot (*Prosopeia splendens*)

Taxonomy and Species Description

The crimson shining parrot (*Prosopeia splendens*, Peale, 1848) is endemic to Fiji, where it is found in forests, on agricultural lands, and around human habitation (International Union for Conservation of Nature (IUCN) 2008). Its most closely related species are *P. personata* (G. R. Gray, 1848), masked shining parrot, which occurs on Viti Levu; and *P. tabuensis* (Gmelin, 1788), maroon (red) shining parrot, which occurs on Vanua Levu and Taveuni. *P. splendens* and these two other species are recognized by the Integrated Taxonomic Information System (ITIS) (ITIS 2011, <http://www.itis.gov>) as valid species. Absent peer-reviewed information to the contrary and based on the best available information, we consider *P. splendens* to be a valid species.

The crimson shining parrot's head, neck, and underparts are a bright red. It is a medium-sized parrot, with a length of 45 centimeters (cm) (18 inches (in)). It has been observed in flocks of up to 40 birds in the past, but more recently in flocks of up to 12 birds. During the day, this species is generally quiet and becomes vocal towards dusk, at which time it becomes more active. A blue collar extends across the back of its neck; its back and rump are bright green. Its flight feathers and tail are green, strongly covered with blue. Its bill and feet are black, and its irises are orange. Males and females are similar morphologically; however, the bill of males is larger, and the head of males is more square-shaped than females. It differs from the maroon shining parrot in its size and coloration; crimson shining parrots are generally smaller than maroon shining parrots. Rump feathers on the crimson shining parrot do not have the red edges that can be seen on the maroon shining parrot. The main visible features that distinguish the crimson shining parrot from the masked shining parrot and the maroon shining parrot are the scarlet rather than maroon underparts and the blue collar at the back of the neck.

Distribution, Habitat, Biology

There is little to no information available regarding this species. The crimson shining parrot, also known as the Kadavu musk parrot, is endemic to the islands of Kadavu and Ono in Fiji. These two islands are separated by a narrow channel, often navigated by kayaks and other small boats. This species has also been reported on the island of Viti Levu in the Upper Navua Conservation Area (Tokadua 2008, pp. 5, 7), where they are thought to be escaped pet birds. There are no known records of this species successfully breeding other than on the islands of Kadavu and Ono (<http://www.NatureFiji.org>, accessed January 4, 2011). The island of Kadavu is remarkable in that it has the highest number of endemic birds per land area in the world. It hosts two areas designated by BirdLife International (BLI) as Important Bird Areas (IBAs), including Mount Nabukelevu which is located on the southwestern end of Kadavu Island. Mt. Nabukelevu, has the largest area of montane forest on the island. These IBAs are a way to identify conservation priorities (BLI 2008j, pp. 1–2) and are considered to be globally important areas for the conservation of bird populations. A site is recognized as an IBA based on the occurrence of key bird species that are vulnerable to global extinction or whose populations are otherwise irreplaceable. These key sites for conservation are small enough to be conserved in their entirety and large enough to support self-sustaining populations of the key bird species. Mount Nabukelevu's montane forest is critical for five globally threatened bird species, including the crimson shining parrot (BLI 2011d, p. 1; BLI 2010c, p. 1).

Very little is known about the ecology of this species in the wild (NatureFiji 2011, pp. 1–2). Although in captivity this species has been known to exhibit aggression in males, it is a social species in the wild (Lin and Lee 2006, p. 188). It has been observed in flocks of up to approximately 40 birds (Tabaranza 1992 as cited in BLI 2001, p. 1679) but more recently it has been observed in flocks of up to 12 individuals. Flocking is thought to serve several purposes including mate selection, and learning food sources and eating techniques (Cameron 2007, pp. 115, 144).

In 2004, the population estimate was 6,000 mature birds, with a declining population (Jackson and Jit 2004 in BLI 2010a, p. 1). However, the species' population estimate was inferred from population surveys conducted on another species, the Masked Shining-Parrot (*Prosopaea personata*) (BLI 2010a,

pp. 1–2). Surveys found that the crimson shining parrot occurred at similar population densities as that of the masked shining parrot. In two BirdLife International surveys, 86 crimson shining parrots were recorded in 38 standardized observer-hours, similar to the mean of 1.9 masked shining parrots per hour recorded at 18 sites across Viti Levu (BLI 2010a, pp. 1–2). Masked shining parrots were estimated to occur at approximately 29 birds per km² in lowland native forest. The 2004 crimson shining parrot population was estimated using the density of masked shining parrots and the estimated 225 km² (87 mi²) area of dense and medium-dense forest on Kadavu (Jackson and Jit 2004 in BLI 2010a, p. 1). However, we do not have detailed information about how the surveys on Kadavu were conducted; they may have occurred at a time when the species is not active or visible. There is no evidence that the survey protocol used is appropriate to infer the population density of this species. Nor is there evidence suggesting the two species have the same ecological characteristics, levels of disturbance, and habitat requirements. For example, Viti Levu has a more dense human population than that on the islands of Kadavu and Ono, and human population density often directly influences species population density. Additionally, we do not know the historical population of the crimson shining parrot; this species may never have had a large population, as it is only known to be endemic to Kadavu and Ono Islands, so we do not know if this species has experienced a decrease in population size or if its population has been fairly consistent. Furthermore, species that are endemic to islands tend to have smaller population sizes due to a smaller carrying capacity of the island. This species is described as being “widespread and common” on Kadavu and population information on the East Kadavu IBA also lists this species as common (BLI 2011a, p. 1; BLI 2011f, unpaginated). Additionally, notes from a 2006 birding trip report indicate that the crimson shining parrot would be “hard to miss” on Kadavu (Skevington and Mathieson 2006, unpaginated). Although the best scientific information available indicates the population of crimson shining parrots number 6,000 individuals, there is no historical population data to indicate this species has declined or is currently declining. Given the reports from BirdLife International (BLI 2011a, p. 1; BLI 2011f, unpaginated) and the lack of support for a declining population, we

consider the crimson shining parrot to be common on Kadavu.

Its range is estimated to be 460 km² (178 mi²). However, BLI (2000, pp. 22, 27) defines a species' “range” as the “extent of occurrence,” which is “the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred, or projected sites of present occurrence of a species, excluding cases of vagrancy.”

Kadavu is the fourth largest of Fiji's islands, at 410 km² (158 mi²). Kadavu has a human population of 8,700 people and is a mountainous, rugged island with high peaks and precipitous cliffs (Fiji Guide 2011). There are few roads and is therefore mainly accessible by boat. The Kadavu Island group is 83 km (45 nautical miles) south of Viti-Levu, Fiji's main island. Kadavu is rugged and mountainous with few roads. The Kadavu Island group also includes nearby Ono Island, off the eastern tip of Kadavu, as well as a number of smaller islands. Ono is 30 km² (12 mi²) in size (Planetary Coral Reef Foundation (PCRF) 2010). This island group has 12,000 Fijians living in 72 traditional village communities (PCRF 2010), and there is one airstrip. The primary means of income is subsistence agriculture and fishing.

Conservation Status for the Crimson Shining Parrot

Fiji is actively involved in forest protection efforts; a new Forest Policy was adopted in 2007 (Fiji Ministry of Fisheries and Forestry 2009, p. 1). Crimson shining parrot is also protected by Fiji's Endangered and Protected Species (EPS) Act of 2002. Additionally, Fiji's first national nongovernmental organization (NGO), Nature Fiji, was established recently, and its goal is conservation of its wildlife. Nature Fiji is working closely with BLI to develop a conservation program to protect endangered wildlife in Fiji such as the crimson shining parrot.

In 1981, the crimson shining parrot 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 agreement 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 is achieved by regulating import, export, and re-export of CITES-listed animal and plant species and their parts and products through the use of a permitting system (

www.cites.org). CITES entered into force in 1975, and is an international treaty among 175 nations, including Fiji and the United States. 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.*).

Appendix II includes species that are not necessarily threatened with extinction, but may become so unless trade is subject to strict regulation to avoid utilization incompatible with the species' survival. 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).

In 1988, the crimson shining parrot was described by the IUCN as lower risk/least concern, and the status changed to vulnerable in 2000 (IUCN 2008; BLI 2010a), which is its current IUCN classification. The authority for compilation of information and determining the appropriate risk extinction category for bird species on the IUCN Red List is Birdlife International, and is cited frequently throughout this document. However, IUCN rankings do not confer any actual protection or management.

Evaluation of Factors Affecting the Crimson Shining Parrot

This section contains an assessment in which we evaluate the effects of any of the five factors listed in section 4(a)(1) of the ESA on the species. Listing actions may be warranted based on whether any of the five factors under section 4(a)(1), singly or in combination, places the species in danger of extinction now or in the foreseeable future. Each evaluation is specific to this species identified unless we specify that the evaluation is for more than one species.

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

There is little to no evidence of destruction, modification, or curtailment of this species' habitat, in fact, there is recent evidence of reforestation efforts and conservation of the species' habitat taking place (BLI 2011a, p. 1; Fiji Daily Post 2007, 2009, unpaginated). It was suggested that this

species is roughly estimated to be declining at the rate of forest loss, which had been estimated to be 0.5 to 0.8 percent per year across Fiji (Claasen 1991 in BLI 2011a, p. 1), and that forest loss may be higher on Kadavu due to fires in recent years (BLI 2011a, p. 1). However, there is no information on the extent of past or current forest loss. Not only does the United Nations describe deforestation in Fiji as modest when compared with the rest of Melanesia (UN 2011, p. 1), but also local communities on Kadavu are implementing reforestation efforts and conservation of this species' habitat as described above (Fiji Daily News 2007, unpaginated). Although the eastern part of the island is experiencing pressures from agricultural encroachment, there is no evidence that agricultural encroachment or forest loss due to fires currently threatens the crimson shining parrot (NatureFiji 2011, pp. 1–2).

Forests on Kadavu were heavily logged in the late 1960s and early 1970s, and habitat loss and degradation of habitat for agricultural purposes continues. However, approximately 75 percent of the island remains forested; East Kadavu IBA is reported to have the largest area of old-growth forest in Kadavu, including extensive areas of lowland rainforest. Furthermore, the crimson shining parrot is reported to use degraded habitats extensively (BLI 2011a, p. 1; BLI 2011f, unpaginated). Most river estuaries and bays still hold large areas of mangroves, which are used by the crimson shining parrot for feeding (and possibly breeding), and pressure on mangrove forest here is not currently significant (BLI 2011a, p. 1).

BLI and Nature Fiji are working with landowners on Kadavu to conserve these forested natural areas and to increase awareness of the value of maintaining these areas in a little-disturbed state (BLI 2011e, p. 1). NGOs are working with the landowners in the Mount Nabukelevu area to create awareness about the value of their forests and the benefits of establishing "Permanent Forest Estates" (PFEs) (described below) on their lands. These NGOs are also working to help build the capacity of indigenous communities to continue forest conservation on their own (BLI 2011e, p. 3). BLI, through the Darwin Initiative, has worked with the Kadavu's Department of Forestry and local communities on Kadavu to protect this species' habitat. The Darwin Initiative, implemented by the United Kingdom, assists countries that are rich in biodiversity but poor in financial resources to meet their objectives under one or more of the three major biodiversity conventions. BLI conducted

a workshop on Kadavu to teach sustainable agricultural practices and ways to reduce soil erosion which subsequently supports community livelihoods. Later, the villages of Lomati, Nabukelevuira, Qalira, and Daviqele committed to protect 1,500 hectares (3,707 ac) of their forest that had been designated as an Important Bird Area (IBA) on Mount Nabukelevu in Kadavu (Fiji Daily News 2007).

On Kadavu, particularly in the area of Mount Nabukelevu, many forest-owning mataqalis (clan or landowning units) are under pressure to convert their forests into agricultural land (BLI 2011e, p. 1). In 2010, 10 mataqalis signed an agreement with an NGO to protect the forests of Mount Nabukelevu for the next 20 years (BLI 2011f; NatureFiji 2011). The community-declared protected area now includes 10 mataqali (clan) lands plus a native reserve. Additionally, the Government of Fiji recognizes that maintaining forests is critically important for Fiji's people and biodiversity and has taken steps to preserve its country's resources. In 2007, Fiji introduced the Fiji Forest Policy, which promotes sustainable forest management. One of the foundations of the new Forest Policy is the concept of "Permanent Forest Estates" (PFEs). The policy promotes sustainable management of healthy forests by providing sustainable development incentives for landowners. In addition, the government of Fiji initiated a campaign to plant one million trees in 2010 to halt or slow ecological degradation associated with the depletion of the world's forests. Fiji launched its One Million Trees Campaign in support of the 2010 International Year of Biodiversity, and in 2011 as the International Year of Forests. Fiji indicated that they had surpassed their goal, and participants had succeeded in planting over one million trees (Fiji Ministry of Information 2011).

Although forest loss may be occurring within the range of the crimson shining parrot, we have no information on the extent of forest loss or evidence to suggest that this loss has impacted or is currently affecting this species. The crimson shining parrot is found in forests, agriculture lands, around human habitation, and is known to use degraded habitats extensively. Furthermore, there is no information indicating this species is declining. Additionally, we have no information to suggest that habitat loss may become a threat to this species in the future such that it may contribute to the risk of extinction of this species. Fiji has implemented proactive policies and

protections with respect to its forests. Local conservation activities are occurring on Kadavu; indigenous communities are interested in preserving this species and its habitat. Therefore, we do not find that the present or threatened destruction, modification, or curtailment of its habitat or range is a threat to the crimson shining parrot now or in the foreseeable future.

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

Conservation projects on Kadavu are believed to have reduced the numbers of parrots trapped for trading, but this species is still thought to be captured in small numbers for domestic and international trade (BLI 2010a, p. 1). As indicated above, this species has been listed in Appendix II of CITES since 1981. The United Nations Environment Programme—World Conservation Monitoring Centre (UNEP–WCMC) manages a CITES Trade Database on behalf of the CITES Secretariat. We queried the UNEP–WCMC CITES Trade Database for gross data on export and import of this species since 2000, and found no record of trade in this species (UNEP–WCMC 2011, accessed January 4, 2011.)

Each Party to CITES is responsible for compiling and submitting annual reports to the CITES Secretariat regarding their country's trade in species listed in the CITES Appendices. The data from submitted annual reports is compiled into the database, and it provides a mechanism by which CITES trade can be assessed. Due to the time needed to compile the data, the most recent year for which comprehensive trade statistics are available is normally 2 years prior to the current year. UNEP–WCMC acknowledges that the data are not always accurate (UNEP–WCMC 2011, p. 5). They indicate that it is not uncommon for the quantity of specimens traded to be considerably less than the amount specified on the permits and that the quantity specified on the permits is frequently the quantity that is reported in annual reports. They further clarify that trade transactions that may have been authorized by the issuance of permits but never have taken place, as well as inaccurately reported volumes of trade, will exist in the UNEP–WCMC CITES database. UNEP–WCMC also acknowledges that gross and net outputs from the CITES database are often overestimates of the quantities traded because in cases where different quantities are reported by the importing and exporting countries, the CITES database program selects the

larger quantity. Errors do occur in the database, and the numbers may not be entirely accurate, but they do provide an approximate representation of international trade that is occurring through CITES. However, we consider the UNEP–WCMC CITES trade data to be the best available information pertaining to international trade in CITES-listed species.

Although it has been reported that birds are taken as gifts and there is some illegal trade overseas, it is thought to occur in small numbers (BLI 2010a, p. 1). Conservation projects described under Factor A have reduced the numbers of birds trapped for the pet bird trade (BLI 2011a, p. 1). BLI reports that four communities have set up village protected areas on Kadavu, and they conduct regular bird surveys under their own initiative. Additionally, it is protected by law against trading and transfers out of Kadavu and Ono (NatureFiji 2011, p. 2). There appears to be substantial protection, awareness, and local conservation of this species occurring. Because there is no evidence of poaching (*i.e.*, hunting by people to gain at least a temporary living from the activity) or illegal trade of this species occurring at levels such that it may contribute to the risk of extinction of the crimson shining parrot, or information indicating poaching or trade may increase in the future and rise to the level of a threat, we believe that overutilization for commercial, recreation, scientific, or educational purposes is not a threat to the species.

We are unaware of any other information currently available that addresses overutilization for commercial, recreation, scientific, or education purposes that may be affecting the crimson shining parrot. We found no evidence of overutilization due to historic or cultural use of this species by local populations. Based on the best available scientific and commercial information, we find that overutilization for commercial, recreational, scientific, or educational purposes is not a threat to the crimson shining parrot now or in the foreseeable future.

Factor C. Disease or Predation

Predation by introduced mammals such as feral cats (*Felis catus*) and rats (*Rattus* spp.) were identified as possible factors affecting this species. There was little to no information found regarding the occurrence of predation or disease in Fiji, particularly with respect to the crimson shining parrot. As is the case on many remote islands, Fiji has no native terrestrial mammals. Introduced mammals such as rats, mongoose

(*Herpestes javanicus*), cats and dogs prey heavily on Fiji's native wildlife (Morley 2004 in Olson *et al.* 2009, p. 1). However, the mongoose is not present on Kadavu Island and the only current predator definitely known to occur on Kadavu is cats. Cats on Kadavu are known to threaten ground-nesting birds, particularly on the coasts, but they are not known to threaten the crimson shining parrot. There are no known predators on Ono Island to our knowledge. Studies have found that predation rates by introduced predators are lowest in natural forests more than 4.5 km (2 mi) from forest edges or roads (Olson *et al.* 2006). Kadavu's terrain consists of volcanic, mountainous, dense rainforest; sandy beaches; rocky coastline; and mangrove swamps. The island has a significant portion of relatively undisturbed forested areas. The islands' forested areas may act as refugia from predation by alien predators, such as the feral cat, for native species such as the crimson shining parrot.

Researchers suggest that maintaining minimally-disturbed forests is one of the most cost-effective strategies for protecting species (Olson *et al.* 2009, p. 1). Because this species resides in dense forests far from edges and roads, this species is not likely to be significantly affected by nonnative predators. The crimson shining parrot likely has natural predators, but we were unable to find information that any natural predators are having an impact on this species. Although predation occurs in Fiji, particularly by nonnative species, the best available information does not indicate that predation is a threat to the crimson shining parrot on Kadavu or Ono now, or may become a threat in the future.

We are not aware of any occurrence of disease that may be affecting the crimson shining parrot. In conclusion, we find that neither disease nor predation is a threat to the crimson shining parrot in any portion of its range now or in the foreseeable future.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

Various regulatory mechanisms are in place to protect the crimson shining parrot. This species is listed on Fiji's Endangered and Protected Species (EPS) Act of 2002 which is the legislation that implements CITES. As discussed under Factor B, the government of Fiji is adequately controlling international trade. According to a review conducted for CITES with respect to national legislation to determine each country's ability to implement CITES effectively, Fiji meets the requirements for

implementing CITES (CITES 2011a; <http://www.cites.org>, SC59 Document 11, Annex p. 1). In addition to the absence of legal trade, there is no indication that this species is traded illegally at levels such that it may contribute to the risk of extinction of the crimson shining parrot. Based on the lack of trade, and as discussed under Factor B, we do not consider international trade to be a threat to the crimson shining parrot. Therefore, protection under CITES is an adequate regulatory mechanism.

Wild Bird Conservation Act

The import into the United States of all of these species: the crimson shining parrot, Philippine cockatoo, white cockatoo, and yellow-crested cockatoo, 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 all trade involving the United States is sustainable and is not detrimental to the species. The WBCA is a stricter conservation measure than CITES, and import of these parrot species into the United States requires issuance of a WBCA import permit. 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 four 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.

Under the provisions of WBCA, any individual importing their pet bird to the United States for the first time must reside outside of the United States for at least 12 continuous months. In addition, in order to control diseases, the U.S. Department of Agriculture's Animal and Plant Health Inspection Service requires veterinary health certificates and health inspections for pet birds, and implements quarantine procedures for birds imported into the United States. 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 the WBCA largely curtailed the import of wild parrots; we find it is an adequate regulatory mechanism for all four of these parrot species.

As discussed under Factor B, local protections are in place on the islands where this species exists. The governmental institutions responsible for oversight of the conservation of this species have a good legal framework to manage wildlife and their habitats. Not only are local NGOs involved in conservation activities for this species, but there also appears to be adequate capacity at various levels to protect this species and its habitat. The forestry regulations appear to be effective; there are no reports of illegal logging on the islands of Kadavu and Ono. Most of Fiji's forests are managed or owned by local communities, which have incentive to protect the native habitat. Ownership of native lands is not transferable through land sales, but user rights can be transferred via land leases (Leslie and Tuinivanua 2010, p. 10). These landowning groups are deeply attached to their lands and Fiji's forestry policy supports the local ownership of its lands. Within this species' habitat, the forested areas are being adequately managed and protected by these mataqalis.

Environmental education, conservation initiatives, and restoration efforts are occurring on Kadavu. Another NGO working on Kadavu to protect this species is the Matava Foundation (<http://foundation.matava.com/2011-projects>) which is a local NGO associated with a resort on the island. In addition to the conservation efforts in place, the remoteness of these islands likely serves as an additional protection for this species. The crimson shining parrot occurs on two islands, and both islands are extremely remote and fairly undeveloped. These factors all likely serve as additional protections for this species.

In summary, the existing regulatory mechanisms appear to be adequate. There are no current records of this species in international trade, and the government of Fiji is actively conducting environmental stewardship projects. There is nothing to suggest that this factor is a threat to the species. Local conservation activities involving indigenous communities are occurring on Kadavu and this species and its habitat appear to be well protected. Fiji has enacted various laws and regulatory

mechanisms to protect and manage wildlife and their habitats. As described above in our review, we found that the government of Fiji and NGOs are implementing many projects and mechanisms that will likely have a positive impact on this species and its habitat. Reforestation and conservation efforts are occurring. The best scientific and commercial information available indicates that the crimson shining parrot is not in danger of extinction or likely to become so within the foreseeable future due to inadequate regulatory mechanisms.

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

In this section, we examined whether invasive species are threats to the crimson shining parrot. The eastern part of Kadavu supports several bird species that are endemic to Kadavu. BLI indicated that logging and roads (see Factor A) may be facilitating the movement of invasive species. Logging enables alien invasive species such as rats and cats, and in some cases, Indian or common mynahs (*Acridotheres tristis*), jungle mynahs (*Acridotheres fuscus*), and *Spathodea campanulata* (African tulip trees), to invade the forests along logging roads and clearings. The island of Kadavu may be experiencing invasive species, but there is no evidence that invasive species are occurring to an extent that they are threats to the crimson shining parrot. Nor is there evidence that invasive species are a threat on Ono Island, where the crimson shining parrot is also known to occur. BLI is creating community-based conservation groups at Fiji's key conservation sites such as Kadavu Island, and is working with communities to address issues such as effectively dealing with invasive species (BLI 2011g, p. 3). We found no other natural or manmade factors that might affect the continued existence of the crimson shining parrot now or in the future. Based on the best available information, we find that there are no other natural or manmade threats to the continued existence of the crimson shining parrot throughout its range now or in the foreseeable future.

Significant Portion of the Range

Having determined that the crimson shining parrot is not in danger of extinction or likely to become so within the foreseeable future throughout all of its range, we must next consider whether there are any significant portions of the range where the crimson shining parrot is in danger of extinction

or is likely to become endangered in the foreseeable future.

The Act defines an endangered species as one “in danger of extinction throughout all or a significant portion of its range,” and a threatened species as one “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The term “significant portion of its range” is not defined by the statute. For the purposes of this finding, a portion of a species’ range is “significant” if it is part of the current range of the species, and it provides a crucial contribution to the representation, resiliency, or redundancy of the species. For the contribution to be crucial it must be at a level such that, without that portion, the species would be in danger of extinction.

In determining whether a species is threatened or endangered in a significant portion of its range, we first identify any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be significant and threatened or endangered. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be significant, and (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the species’ range that clearly would not meet the biologically based definition of “significant” (*i.e.*, the loss of that portion clearly would not reasonably be expected to increase the vulnerability to extinction of the entire species to the point that the species would then be in danger of extinction), such portions will not warrant further consideration.

If we identify portions that warrant further consideration, we then determine their status (*i.e.*, whether in fact the species is endangered or threatened in a significant portion of its range). Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address either the “significant” question first, or the status question first. Thus, if we determine that a

portion of the range is not “significant,” we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is “significant.”

Applying the process described above for determining whether a species is threatened in a significant portion of its range, we considered status first to determine if any threats or potential threats acting individually or collectively threaten or endanger the species in a portion of its range. We have analyzed the potential threats and determined they are essentially uniform throughout the species’ range.

Finding for the Crimson Shining Parrot

Section 3 of the ESA defines an “endangered species” as “any species which is in danger of extinction throughout all or a significant portion of its range” and a “threatened species” as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” In this finding, we determine whether the petitioned action is: (a) Not warranted, (b) warranted, or (c) warranted but precluded (see Background, above).

As required by the ESA, we considered the five factors separately and in combination in assessing whether the crimson shining parrot 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 the crimson shining parrot. We reviewed the petition, information available in our files, and available published and unpublished information regarding this species and its habitat.

We do not have long-term population trend data for the crimson shining parrot. This species has always been an island endemic and may have always had a small population; island endemics tend to have smaller population sizes. Without historical population information, we do not know if this species has experienced a decrease in population size or if its population has been fairly consistent. Furthermore, this species is reported as common and widespread. During our review of the status of the species, we evaluated the potential threats to the crimson shining parrot including: habitat loss and habitat degradation, take for the pet trade, disease and predation, the inadequacy of regulatory mechanisms, and other natural or manmade factors

such as invasive species. We found no information that habitat loss is a threat to the crimson shining parrot. We conclude that the present or threatened destruction, modification, or curtailment of its habitat or range is not a threat to the crimson shining parrot. We found no information that poaching for the pet trade is a threat to the species. This species is not in international trade according to the UNEP–WCMC trade database. Additionally, education and public awareness campaigns are occurring in Kadavu. Fiji is actively involved in forest protection efforts; a new Forest Policy was adopted in 2007 (Fiji Ministry of Fisheries and Forestry 2009, p. 1). We found no evidence that disease or predation affects the wild crimson shining parrot population. In addition, this species is protected by laws against trading and transfers out of Kadavu and Ono. We also concluded that there are no other natural or manmade factors that are threats to the species (Factor E).

The best available information indicates that there is little disturbance on the islands where the crimson shining parrot naturally occurs. Habitat loss is often a threat to wildlife, however, in this case, there is no evidence that habitat loss is affecting the crimson shining parrot. On the contrary, this species is said to occupy altered habitat extensively. Conservation efforts for this species have been underway within the past few years to ensure long-term conservation of habitat where this species exists; local groups on Kadavu are implementing reforestation and conservation programs. Based on the lack of threats acting on this species throughout its range as described above, and the lack of information indicating the species population is in decline, we determine that this species is not in danger of extinction now, nor is it likely to become endangered within the foreseeable future, throughout all or a significant portion of its range. Therefore, we find that listing the crimson shining parrot as a threatened or endangered species is not warranted.

Species Information

B. Philippine Cockatoo (*Cacatua haematuropygia*)

Taxonomy and Species Description

The species was first taxonomically described by Müller in 1776 (BLI 2011b). We accept the species as *C. haematuropygia*, which follows the Integrated Taxonomic Information System (ITIS 2011).

Cockatoos are only found in Australasia—a few archipelagos in Southeast Asia (Philippines, Indonesia,

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

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). Cockatoos are a distinct group of parrots (order Psittaciformes), distinguished by the presence of an erectile crest (Collar 1989, p. 5; Cameron 2007, p. 1) 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).

Biology, Distribution, and Habitat

This species is endemic to the Philippines, an archipelago of approximately 7,000 islands. The total area of the Philippines is 30,000,000 ha (74,131,614 ac) (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 (IUCN 2008i). 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.).

The Philippine cockatoo 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). Interestingly, 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 (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 1994b in BLI 2001, p. 1683).

This species nests in tree cavities, and produces two to three eggs per season (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 ft) (BLI 2001, p. 1683), but nest heights between 12 and 35 m (39 to 114 ft) 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 in) (Widmann *et al.* 2001, p. 135). Some artificial nest boxes have been installed to increase nesting habitat; the species exhibits a preference for 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: Borneoteak, Moluccan ironwood, and merbau asam), as well as coconut trees (Lambert 1994b in BLI 2001, p. 1686). They also use *Garuga floribunda* (no common name [ncn]) and *Sonneratia alba* (ncn) (Cameron 2007, p. 35).

Population Estimates

Based on recent reports, it is likely that between 450 and 1,245 individuals remain in the wild. Surveys indicated that until around the 1980s, the Philippine cockatoo was fairly common within the Philippine archipelago (Collar *et al.* 1998; Boussekey 2000, p. 138, BLI 2010, p. 1). Historically, it was known to exist on 52 islands in the Philippines; now, it is believed to exist on eight islands (BLI 2011a, p. 1).

The species' current range is significantly reduced from its historic range. In the past, the species was reported to have been commonly found throughout the Philippines except for northern and central Luzon (Delacour and Mayr 1946; DuPont 1971 in Boussekey 2000, p. 138; Collar *et al.* 1999 in Widmann and Widmann 2008, p. 23). 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 1994b in BLI 2001, p. 1681).

Snyder *et al.* (2000) reported the following population surveys. A 1991 survey estimated between 800 and 3,000 birds exist on Palawan (Pandanas, Bugsok, and Bancalan Islands were thought to support 100 to 300 individuals and Dumarán 150 to 250 individuals), and possibly a few hundred were thought to exist in the Tawi-Tawi region (Lambert 1993b, 1994b). 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). On Masbate, birds were observed in 1993 (Curio 1994), and the species has been recorded a few times in singles or small numbers in Rajah Sikatuna National Park, Bohol since 1989 (Brooks *et al.* 1995b). In 1994, two pairs (Dutson in litt. 1997) were seen on Tawi-Tawi, and the species was considered widespread there in 1995–1996, although apparently more often seen in captivity than in the wild (two singles were observed in Batu-Batu and a single and a pair 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 Cebu (Brooks *et al.* 1995a) and Negros (Brooks *et al.* 1992). Recent population counts and estimates are below; however, this information is not a complete representation of the population, but is the best available information. Some islands may not hold viable populations and may be functionally extinct.

Between 2004 and 2010, the population estimate decreased from 1,000 to 4,000 individuals to 450 to 1,245 individual birds in the wild (Widmann and Widmann 2008, p. 23; BLI 2010b; Widmann and Widmann 2010, pers. comm.). This species currently is found in the Culasian Managed Resource Protected Area (CMRPA), Palawan, Dumarán Island (negligible population), Pandanan and Bugsok Islands, Polillo Island Group, Rasa Island, Tawi-Tawi, and possibly on Samar Island. An estimated additional 400 individuals may survive in the Sulu archipelago; however, only sparse information is available for this area (Widmann *et al.* 2007; Widmann *et al.* 2009a; Widmann *et al.* 2010a). Subpopulations away from Palawan and the Sulus are thought to be very small, and do not likely 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

Number of individuals based on recent observation, population count, or estimate	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.).

Culasian Managed Resource Protected Area

This area 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. Philippine cockatoos are thought to travel between Palawan Island and nearby Rasa 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 recent sightings there: four were observed in September 2009, and three were observed in December 2009 (Widmann *et al.* 2010a, p. 37). At least two Philippine cockatoos persist inside the protected area, but they have 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. In the small population that was protected only recently here, there are no indications that the species’ status is improving. Only one breeding pair exists outside of the reserve. Cockatoo poaching 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, extinction of this population is likely to occur suddenly due to lack of recruitment (Widmann and Widmann 2010, pers. comm.).

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 PCCP. 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.).

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 also recently observed roosting (Widmann *et al.* 2010c, p. 5). A large part of Pandanan Island itself is not easily accessible, and because it is privately managed, it is protected for the most part. PCCP is working on building a relationship with organizations to monitor and formally protect this island, and wardens are being hired as of 2010 (Widmann *et al.* 2010, pp. 26, 56).

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.* 2009a, p. 41; Widmann *et al.* 2010, p. 38). In part, because there were fewer than 20 birds prior to their protection, recovery is slow (Widmann and Widmann 2010, pers. comm.).

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.* 2008, p. 14; Widmann and Widmann 2008, p. 27; Widmann *et al.* 2009b, p. 5–6). Breeding success was 63 percent; 49 fledglings were banded (Widmann and Widmann 2008, p. 24). Population recruitment in years that experienced sufficient precipitation in 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). PCCP 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 50 birds on Rasa Island (Widmann and Widmann 2008, p. 24).

Other Islands

Little current data exists 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 were reported recently in Busuanga Island (Coron) and on Bellatan Island in the Tawi-Tawi region. KFI recently received a report from a member of the Wild Bird Club, Philippines, that approximately 30 to 40 individuals were sighted 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.).

An older survey 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, no longer likely to be an accurate population estimate (Lambert 1993, Dutson 1997, and Allen 1997 in Snyder 2000, p. 84; BLI 2010b, p. 1). 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 is now encouraging ecotourism (Philippines Department of Natural Resources (DENR) 2005; IUCN 2010b; Manila Bulletin 2010), 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 in the past, 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 has been reported to contain one of the Philippines' largest unfragmented tracts of lowland rainforest. There have been several reports of Philippine cockatoo sightings on Samar, but there is no current estimate of how many exist there other than the reported sightings (Widmann *et al.* 2006, p. 13; BLI 2010

p. 1; Widmann and Widmann 2010, pers. comm.).

Conservation Status for the Philippine Cockatoo

Protections exist through various national, local, and international mechanisms. This species was transferred from Appendix II to Appendix I of CITES in 1992 (refer to the discussions under Factors B and D for the crimson shining parrot above for more information about CITES). Inclusion in Appendix I means that international commercial trade is generally prohibited (<http://www.cites.org>). From 1981 to 1992, the Philippine cockatoo was listed in Appendix II of CITES. The species is protected under the Philippines Republic Act 9147, otherwise known as the Wildlife Resources Conservation and Protection Act of 2001 or the "Wildlife Act of 2001." It is classified as "Critically Endangered" by the government of the Philippines under this Act (DENR 2010b, p. 2). It is on the Philippines list of protected species (DENR 2010b, p. 2), under the Republic Act No. 9147. The Republic No. 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. It is also protected in the U.S. by the WBCA (refer to discussion under the Crimson Shining Parrot, factor D).

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

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 (Kummer 1991, p. 46; Galang 2004, p. 13). Forest cover decreased in Palawan from 10,703 km² (4,132 mi²) in 1950, to 6,605 km² (2,550 mi²) 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 (Lambert 1994b in BLI 2001, p. 1686; Galang 2004, p. 14). Many of Palawan's mangroves, which covered 46,000 ha (13,668 ac) in 1988, were also cleared for fishpond construction (Quinnell and Balmford 1988 in BLI 2001, p. 1686). As a result of the pressures for resources, much of the forest is now either secondary forest or has been converted to plantations or agriculture (Heaney *et al.* 1998, 88 pp.; Galang 2004, pp. 13–14). 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 that further degrades suitable habitat (Kummer 1991, p. 41), as demonstrated on Samar Island. In addition to habitat degradation and destruction through road construction, digging, removal of trees, and mining are causing secondary habitat degradation through severe erosion. During the rainy season, water creates deep clefts along the roads that are created for mining operations, causing road collapse. No mitigation measures have been put into place to reduce erosion (IUCN 2010, pp. 1–2). Virtually all chainsaw operations in Patnanungan and Burdeos are not registered with the appropriate authority (Widmann *et al.* 2010).

Cockatoos are highly impacted by selective logging of primary forests because they are large birds and subsequently require large 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 its favored nest tree and strangling figs (*Ficus* spp.) (Kinnaird *et al.* 2003, p. 227). These are 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 primary forest. 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.

It is well documented that habitat loss is one of the most significant effects

humans have on wild species (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 has been shown to be effective (Haddad *et al.* 2003, pp. 609–615; Cameron 2007, pp. 110–112). In the case of the Philippine cockatoo, a “virtual” corridor is being created by artificially transplanting captive-reared cockatoos into suitable, relatively protected habitat; however, it is unclear how much this species naturally moves from one island habitat to another. This species in the past 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, habitat fragmentation causes habitat patches to be reduced in size and to be isolated from one another, and gene flow between patches is decreased (Blanchet *et al.* 2010, p. 291). Because this species’ population reduction and fragmentation has occurred so recently and rapidly, it is unlikely that there are significant genetic differences 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). The human population of the Philippines in 2009 was estimated at 91,983,000 (United Nations (UN) 2009, p. 41) and is experiencing a growth 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 losses and pressures described within this section.

Despite the protection measures that are in place to prohibit mining and other activities that degrade habitat, mining operations and oil palm plantations are being developed on Palawan Island (IUCN 2010c, pp. 1–3; 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, pers. comm.). Although mining does not occur directly within Philippine cockatoo habitat, it indirectly adds to habitat loss and degradation on the island (Novellino *et al.* 2010, pp. 1–48). These threats to the ecosystem still exist despite legislative protections in Palawan (refer to Factor D).

Rasa Island 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 PCCP staff (Widmann *et al.* 2010a, b, c). While this population is reasonably protected, in part due to island’s undesirable characteristics for human settlement such as the lack of potable water, any deforestation and habitat loss here are significant factors affecting the species. This is because so little of the species’ habitat remains and because they are experiencing other pressures as well, such as poaching, described under Factor B, below.

On Dumarán Island, the pending implementation of a *Jatropha* plantation is occurring within the few remaining forest patches left (Widmann *et al.* 2010a, pp. 6, 32, 46). *Jatropha curcas* trees produce a fruit with an inedible oil that contains a high energy content and is being explored as an alternative fuel (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 touted as a mechanism for carbon credits. However, because this species occurs in areas that are managed and protected by the PCCP, the Omoi Cockatoo Reserve and the Manambaling Cockatoo Reserve (Widmann *et al.* 2009b, p. 7), we do not find that pending implementation of a *Jatropha* plantation is a threat to the species on Dumarán Island.

PCCP currently manages three areas on Dumarán Island, including a newly acquired buffer area in Omoi (Widmann *et al.* 2010, p. 32). Dumarán 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 are now replaced with grass and shrubland, and dense stands of bamboo, as a consequence of this practice. Due to lack of water, irrigation systems, and level areas, lowland rice cultivation is very restricted. However, permanent forms of cultivation are coconut and cashew plantations. Forest and grass

fires are common, particularly during the dry season. Fire is not only used to clear areas for cultivation, but also to further growth of fresh grass for pastures.

In the other areas where this species exists, the current extent of the present and threatened 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 (BLI 2010b; 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 lead 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 operated 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 (Kummer 1991, pp. 70–75; Galang 2004, pp. 12, 17, 22; Laurence 2007, p. 1544), 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 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 initiated since the late 1990s to increase understanding of why these birds should not be removed from the wild for pets, and these campaigns are 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 2010, 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).

In recent years, several programs to combat the poaching problem, such as public awareness programs and the rehabilitation and release of confiscated parrots were established by the PCCP to support the conservation of the Philippine cockatoo. PCCP 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, especially with children, because the image of the endemic Philippine cockatoo is unique (Widmann *et al.* 2010, pp. 21–22). PCCP 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, PCCP began an initiative specifically targeted towards anti-poaching in the CMRPA. Former poachers were identified and converted into wildlife wardens. This “conversion” practice is common in developing countries that have human populations that rely heavily on forests and wildlife for their survival (Cribb 2006, p. 3). These converted poachers-now-wardens safeguard the 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 1994b in BLI 2001, p. 1681), relatively high numbers were legally traded internationally in the 1980s (*e.g.*, 422 reported in 1983; BLI 2010, p. 1).

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 is still a problem for parrot species, particularly in poorer countries (Dickson 2005, p. 548; <http://www.philippinecockatoo.org>, accessed February 14, 2011). In areas with extreme poverty, poaching can be a lucrative and relatively risk-free source of income (Dickson 2005; Cribb 2007; Widmann *et al.* 2010c, p. 22). In many cases, poachers have limited income prospects (Widmann *et al.* 2010a, p. 37). A common conservation practice is to provide poachers with alternative sources of income. 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.

PCCP also broadcasts local radio programs raising conservation awareness. For example, in August 2010, they broadcast an interview regarding wildlife trade and a recent confiscation 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 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 is a threat to the Philippine cockatoo throughout all of its range.

International Trade and CITES

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. Refer to the Factor B discussion above under the crimson shining parrot for additional information about CITES. 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 made prior to issuance of a CITES permit 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 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 only need to be accompanied 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. There is one CITES-registered captive-breeding operation in the Philippines that is authorized to export captive bred specimens of this species (http://www.cites.org/common/reg/e_cb.html, accessed December 12, 2010). 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/register.shtml>.

We queried the UNEP–WCMC CITES Trade Database for data on exports and imports of this species from 2000 to 2009, and there were very few exports from the Philippines reported as “wild” origin. Between 2000 and 2009, CITES Party countries reported to UNEP–WCMC that a total of 91 live Philippine cockatoos were imported (<http://www.unep-wcmc-apps.org/citestrade>) into their countries, at an average of 10 birds per year. The majority of these (78) originated from the Philippines; 77 of these live shipments 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. As the Philippine cockatoo is listed as an Appendix-I

species under CITES, legal commercial international trade is very limited. Based on the low numbers of live, wild Philippine cockatoos in international trade since 2000, and because the trade was in parts and products from wild specimens, rather than live birds, we believe that international trade controlled via valid CITES permits is not a threat to the 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 international trade controlled via valid CITES permits is a threat to the species, we do find that poaching for the pet trade in the Philippines continues to be a threat to the Philippine cockatoo.

Factor C. Disease or Predation

In the information provided and the literature reviewed, there were suggestions that diseases, particularly a fungal disease, in the wild may be a threat to this species. It was suggested that Viscerotropic Velogenic Newcastle Disease, Psittacine Beak and Feather Disease (PBFD), or the psittacid herpes virus (PsHV-1 or PsHV-2) were indicated as possible threats and may have been introduced into the wild population, possibly by the release of captive birds (Lambert 1994 in BLI 2001, p. 1686; BLI 2010b, p. 1). 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

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 organs 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, there is 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 infect some 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 (Waugh 1996, p. 112; Kistler *et al.* 2008, p. 1). 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.

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 called a mesia (*Leiothrix* spp.) from Taiwan. The *Department for Environment, Food and Rural Affairs, United Kingdom* (DEFRA) stated that it was not possible to say whether the virus isolated came from the parrot tissue or 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-Clerk *et al.* 2007, p. 208). Although in the Philippines, 339 smuggled parrots were euthanized following confiscation even though 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 (Tabaranza 1992; Lambert 1994 in BLI 2001, p. 1686). The Philippine cockatoo is likely a latent carrier of *Aspergillus* (Burr 1981, p. 23); however, based on a review of the best available information, there is no recent 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.* 2001, p. 146; Widmann *et al.* 2010a, pp. 6, 38). Mites, a form of arachnid, 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 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, there is no evidence that mites

significantly contribute to chick mortalities. We conducted a search of available information, and there is no other information indicating that lice and mites significantly affect the species, although mites may occur more frequently during dryer seasons (Widmann *et al.* 2010a, p. 38; Widmann *et al.* 2010c, pp. 39, 45). It was 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, and, in this case, we did not find evidence that any disease or predator rises to the level of a threat that is affecting this species in the wild. After conducting a literature search (Johnson *et al.* 1986, pp. 813–815; Latimer *et al.* 1992, pp. 165–168; de Kloet 2004, pp. 2393–2412;

Tomaszewski *et al.* 2006, pp. 536–544), we found no indication that disease or predation is a threat to the Philippine cockatoo 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. Therefore, we find that the Philippine cockatoo is not threatened 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 from unsustainable 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 (Galang 2004, p. 17; Laurance 2007, p. 1544; Palawan Council for Sustainable Development (PCSD) 2007, p. 1–3). These are discussed below.

Domestic Regulatory Mechanisms

In the late 1980s and early 1990s, efforts were already underway to protect the Philippine cockatoo (Boussekey 2000, p. 140; Galang 2004, p. 17). 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 National Integrated Protected Areas System Act (NIPAS Act of 1992) was adopted in order to protect and maintain the Philippines' biological diversity. In 1994, the PAWB signed a memorandum of agreement (MOA) regarding the conservation of this species (Boussekey 2000, p. 138, Philippines DENR 2009, pp. 1–2). 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 underway 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 (Galang 2004, pp. 12–17; Laurance 2007, p. 1544; Rose 2008, p. 232).

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 (Cultural Survival 2010 and Survival International 2010, both accessed November 18, 2010). 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 (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 it 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 there are five areas designated as being "protected," under Philippine law, the levels of protection 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 hampered 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 threats to 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 there are five areas 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 PCCP, the Philippine government, and individuals concerned with the conservation of this species have actively worked to protect the Philippine cockatoo since 1998. The PCCP 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, PCCP 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 (Boussekey, pers. comm. in Cahill *et al.* 2006, p. 166; Widmann *et al.* 2010). 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.

Recent efforts are being focused on Pandanan Island (south of Palawan Island), which has excellent habitat for

this species, and has recently been targeted by PCCP 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 make a good recovery because there is excellent forest cover due in part to the protections provided by the Jewelmer Corporation. This company holds a marine mining concession in the area of Pandanan. Due to this concession, no human inhabitants are legally allowed on Pandanan Island. In January 2010, PCCP 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 PCCP has been working to establish a local warden program (Widmann *et al.* 2010a, p. 50) on the island to address this issue. Security has recently improved in the area where a viable cockatoo population has been confirmed, but the species is still threatened by poaching (Widmann *et al.* 2010a, p. 15). The PCCP 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, Philippine cockatoo activity is observed through wardens monitoring, and patrols occur 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 has a viable population.

In summary, while laws to protect this species are in place, enforcement often is severely lacking or 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 a leading cause of forest degradation in the Philippines (Galang 2004, pp. 12–17; Laurance 2007, p. 1544; Rose 2008, p. 232). Laws and regulations are frequently ignored, which further reduces the effectiveness of regulatory mechanisms (Galang 2004, pp. 12–17), and this species continues to suffer a 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, as CITES regulates international trade of wildlife. The Treaty requires CITES Parties to have in place adequate legislation for its implementation. Through Resolution Conf. 8.4 (Rev. CoP15), the Parties to CITES adopted a process, termed the National Legislation Project, to evaluate whether Parties have adequate domestic legislation to successfully implement the Treaty. In reviewing a country’s national legislation, the CITES Secretariat evaluates factors such as whether a Party’s domestic laws designate the responsible Scientific and Management Authorities, prohibit trade contrary to the requirements of the Convention, have penalty provisions in place for illegal trade, and provide for seizure of specimens that are illegally traded or possessed. The Philippines has enacted domestic legislation to implement CITES. That legislation is currently being reviewed by the Secretariat to determine if it meets all the necessary criteria (CITES 2011a).

With respect to international trade, we found CITES to be an adequate existing regulatory mechanism for this species (see our analysis under Factor B for legal trade). See our analysis for the crimson shining parrot for additional discussion on how we made this determination. 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). With respect to trade, 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 PCCP 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 relatively common in areas that are not protected. In addition, laws and regulations 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 (Laurance 2007, pp. 1544–1555; Rose 2008, p. 231). 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.* 2001, pp. 139–140; Widmann *et al.* 2007a, pp. 76–77, 79). 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 PCCP 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, it 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 km² (0.6 mi²) 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. There was a second starvation event 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 PCCP, 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 PCCP. At this time, there is no evidence that bees or nest flooding are threats to the species.

Small and Declining Population

The Philippine cockatoo has a contracted geographic range and a small, rapidly declining population, primarily due to poaching. There are between 450 and 1,245 individuals left remaining in the wild, distributed on eight islands (BLI 2011, p. 1). In many cases, the Philippine cockatoo is now geographically isolated from other populations. 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 (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 (Boussekey 2000, p. 138; Cameron 2007, p. 34). 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. PCCP suggests that a rapid population reduction may occur in the future based on low recruitment in recent years, especially for unprotected populations (Widmann 2011a, pers. comm.). In the Rizal (South Palawan) area, which was protected only recently, there are no indications of recovery. Only one breeding pair exists outside of this cockatoo reserve, and this area was poached within the past 2 years. Breeding here did not occur in the 2009–2010 season. Since all nests have been systematically poached in this area over many years, extinction of this population might occur suddenly due to lack of reproduction 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 they have 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 1 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’ status 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. We reviewed the petition, information available in our files, and other available published and unpublished information, 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 and poaching for the pet trade. Habitat loss associated with logging, an expanding human population and associated development, conversion of lowland forests to agriculture are the some of the greatest threats to the continued survival of this species (BLI 2001, p. 1685; Galang 2004, pp. 5–22; Posa *et al.* 2008, pp. 231–236; Widmann and Widmann 2008, p. 23; Widmann *et al.* 2010, p. 14). Habitat loss due to the above activities continues to occur; this species’ population is declining range wide 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 hampered by the lack of

resources, its remote island habitat, and by the nature of this species’ life-history characteristics (such as the tendency to mate for life and they do not 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 slowly increase 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 now 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 2010b). 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. This species no longer exists in many of the areas where it occurred historically. This species is in competition with humans for habitat;

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 reduction in the future based on low recruitment in recent years, 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 propose to list the Philippine cockatoo as endangered under the ESA.

Species Information

C. 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 2010). 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 (MacKinnon *et al.* 1995; Snyder *et al.* 2000, p. 67), 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 (Lambert 1993a; Snyder *et al.* 2000, p. 671; BLI 2010c, p. 1). BLI reported that the total population is between 43,000 and 183,000 mature individuals; however, this population estimate is based on 1993 data (Lambert 1993 in BLI 2010). Burung Indonesia estimated that based on surveys conducted in 2008 and 2009, there are between 8,629 and 48,393 white cockatoos remaining in the wild (Burung Indonesia 2010, pers. comm.) on Halmahera Island.

Distribution, Habitat, Biology

While the exact life span is unknown, reports of the white cockatoo's lifespan vary between 20 and 50 years in captivity (Lambert 1993, p. 147; Jordan 2010, pers. comm.). Wild-caught birds have been reported not to breed until they are 6 years old. The highest productive period 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 reside 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 ft) (IUCN 2008h). 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 (BLI 2010). Historically, its range has been the islands of Halmahera, Bacan, Ternate, Tidore, Kasiruta and Mandiole in North Maluku (Snyder *et al.* 2000, p. 67; BLI 2010c). 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.). Now the white cockatoo is thought 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 (BLI 2009; Burung International 2011), but the species seems to tolerate some habitat modification. White cockatoos inhabit mangroves, plantations (including coconut), and agricultural land (BLI 2010c). 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 to be 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, the number of districts on the island has recently 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. A recent human population estimate is between 13,000 and 59,000 individuals, and the majority resides 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 1993a, b), but this may be an overestimate of the population size based on the survey methods used (Gibaldi 2011, pers. comm.).

Accuracy of survey methodologies varies (Thomas 1996, pp. 49–58; Pollack 2006, p. 882; Thomas *et al.* 2009, pp. 5–14), and there are limits to how much confidence we can place in various population surveys (Royle and Nichols 2003). One researcher pointed out that differing 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 (Marsden 1999, pp. 377–390; Pollack 2006, p. 891). In some areas, suitable habitat may have been recently 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. 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. A recent survey indicated that the population density estimation for this species in the Aketajawe block was between 1.6 and 8.9 individuals per km² (Burung 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 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 (Marsden 1999, pp. 377–390; Royle and Nichols 2003, p. 777; Pollock 2006, p. 882). 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 there were anywhere between 8,629 and 48,393 individuals on Halmahera in 2009 and there was an estimated 49,765 to 212,430 individuals in 1992, this trend in population estimates indicates a decrease in the population. This decrease is extremely likely based on the negative effects of habitat loss and poaching that are commonly known to occur on this island.

Recent local anecdotal accounts of this species' population also vary. One recent observation was that the population of white cockatoos was thought to be "very sparse" (WCS 2010, pers. comm.) and rapidly declining (BLI 2010c, 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 recent 5-day trip to Halmahera (WCS 2010, pers. comm.). However, local people consider them to have declined from former population levels.

We have no recent 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 only found 76 cockatoos. We are unsure of the population trend. Further, in 1993, there were reported to be over 100 people who 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. It is listed on the 2010 IUCN Red list as vulnerable. It is also protected in the U.S. by the WBCA (refer to discussion under the Crimson Shining Parrot,

factor D). 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 there is a national ban against harvest for the white cockatoo, the quota is not effective at eliminating poaching in the wild. Cockatoos are still poached and smuggled into local markets illegally (ProFauna Indonesia 2008, pp. 1–9; ProFauna 2010). 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 fairly 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 impact (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 none is 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

It is commonly accepted that deforestation and habitat loss is a significant problem in Indonesia (Galang 2004, p. 14; Laurance 2007, p. 1544; BLI 2010k, p. 1). Indonesia consists of 17,508 islands and 33 provinces. It is a rapidly developing country, with a population of 230 million (United Nations 2009, p. 11). It 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 more scarce, companies and humans move towards 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 and human development move to the island.

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 km² (34,740 mi²). 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 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). Jepson and Ladle (2005, pp. 442–448) concluded that illegal logging was becoming semi-legal and the *de facto* arrangement for governing Indonesia's forests. Illegal logging is pervasive, and the Indonesian government has been unable to enforce protected forest boundaries (Barr 2001, p. 40; Laurance 2007, pp. 1544–1547). 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, 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 fell, 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). The most recent 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, as

selective logging targets mature trees, it can have a disproportionate impact on hole-nesters, such as cockatoos, because fewer nest sites remain (BLI 2008k, p. 6).

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 (USAID 2004, pp. 3, 9; Laurence 2007, p. 1544).

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 towards 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, and is now 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 (Vetter 2009, pp. 2, 14, 15; WCS 2010, pers. comm.). 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 has submitted an environmental monitoring plan (PT Weda Bay Nickel 2009, 204 pp.; Cardiff 2010, pp. 1–14). The footprint of the mining operation appears to be within the boundaries of Aketajawe-Lolobata National Park (Vetter 2009, p. 19; Cardiff 2010, p. 1), 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). It is unclear whether this mining operation will be approved, or if there will be mitigation measures required; however, it is clear that the extractable resources on Halmahera are desirable, and mining will very likely have a significant negative impact on this species and its habitat.

Biofuel Production

Indonesia is investing in the planting of *Jatropha curcas* trees and palm oil (*Elaeis guineensis*) (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>). 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, and *Jatropha curcas* trees require many years to reach a size that would be suitable for nesting. This will likely also have a negative impact on this species' suitable habitat due to road building, infrastructure development, other construction (Vetter 2009, pp. 1–10). Additionally, 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, agriculture, conversion to human habitat, resource extraction, agriculture, 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 (Cameron 2007, p. 177; Vetter 2009, p. 4). 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 targets mature trees, has a negative impact on cavity-nesters such as the white cockatoo. 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. Additionally, species are often found in secondary forest or recently altered forest habitat; however, this habitat tends to be marginal, and the effects on the species' population may not be evident. The trend of 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, agriculture, and human habitat, 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 (Jepson and Ladle 2005, p. 442; Defenders 2007, p. 7; ProFauna 2008; BLI 2010c). It is well established that illegal collection for the pet trade is a major problem for wild birds in Indonesia and is the primary threat to this species (BLI 2003, pp. 1–2; ProFauna 2008, pp. 1–9; ProFauna Indonesia 2010, pers. comm.). 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 population was captured for trade in 1991 alone (Lambert 1993, p. 160). As of 1999, there appeared to be no enforcement of the zero export quota; 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.). In addition, parrots are an important part of the Indonesian culture, which creates significant demand for parrots domestically (BLI 2008k, p. 10). In a survey on bird-keeping among households in five major Indonesian cities, Jepson and Ladle (2005, pp. 442–448) found that as many as 2.5 million birds are kept in the five cities. Of these, 60,230 wild-caught, native parrots were kept by 51,000 households, and 50,590 wild-caught, native parrots were acquired each year (changed hands, not an indication of birds taken from the wild each year). The study recommended a conservation intervention based on the level of bird-keeping among urban Indonesians. As of 2006, an average of 100 white cockatoos were found for sale in bird markets in Java annually (ProFauna Indonesia 2010, pers. comm.). The sale of live parrots can be a significant source of income. Parrots can sell for 75,000 to 500,000 Indonesian Rupiah (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 2008, p. 3; Sasaoka 2009, pers. comm., pp. 1–2; ProFauna Indonesia 2010, pers. comm.). In 1993, cockatoos were described as generally rare in the Java and Bali markets; only two white cockatoos, or 1.2 percent of parrots for sale, were seen in these markets visited (Lambert 1993, p. 158). However, of 381 parrots of 19 species observed at markets in Indonesia, white cockatoo was represented by 11 pets (9.7 percent) and 44 individuals (11.5 percent) in the market sample.

Between 1993 and 2002, although Indonesia had reported the export of 712 wild-caught birds, import records from other CITES countries recorded

1,646 (Cahill *et al.* 2006, p. 162; UNEP–WCMC 2010). Discrepancies in the UNEP–WCMC Trade Database are common. For example, the Service found a report in 2009 of one shipment of white cockatoo to the United Arab Emirates (UAE) from South Africa that was reported as 965 by the UAE; however, there was no corresponding export entry from South Africa (UNEP–WCMC 2010). The largest shipment from South Africa in 2009 to the UAE was 614, so we believe it to be a reporting error.

Even with government controls, the commercial hunting of cockatoos (*i.e.*, hunting by people to gain at least a temporary living from the activity) is relatively common. There is still a demand for this species as pets, 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 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. The commercial market for pet cockatoos is highly lucrative (Cantú-Guzmán *et al.* 2007, 121 pp.). Prior to 1992, when the U.S. Wild Bird Conservation Act 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.

Poaching poses 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, it is unclear what occurs to the birds.) Based on ProFauna's investigation, it appears that many of the birds being poached from the wild may be, "laundered with wild cockatoos possibly being 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 individual 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 2008; ProFauna Indonesia 2010, pers. comm.). Parrot poaching took place most frequently in the central part of Halmahera, as well as Bacan, Obi, and Mandioli (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 (Lambert 1993, p. 157; Cameron 2007, p. 163; Cantú-Guzmán *et al.* 2007, p. 60). 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 (Lambert 1993, p. 155; ProFauna 2008, p. 2). 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.

Undocumented illegal trade (international and domestic) is difficult to quantify (Thomsen *et al.* 1992, p. 3; Pain *et al.* 2006, p. 322), and a listing in Appendix I of CITES does not completely stop illegal trade (Pain *et al.* 2006, p. 328). Seizures reported to the CITES Secretariat since 1990, however, are small—1 live bird seized in Austria in 1997; 25 live birds seized in the

United Arab Emirates in 1998; and 4 live birds seized in Indonesia in 1999 (Sellar 2009, pers. comm., p. 2). Since 2000, 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 re-exported.

Illegal trade of parrot species occurs quite frequently; in fact, an investigative report recently conducted of the illegal parrot trade in Mexico demonstrates this (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 that occurs within many countries with endemic parrots.

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). There is no regular enforcement or patrol by the KSDA officers. An NGO working with this species indicated that they had recently 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. According to a recent investigation, 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 over 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. Despite the existence of legislation, this illegal trade of protected parrots continues. 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).

The presence of recent and upcoming mining projects in Halmahera is also likely to increase demand locally for birds (see to Factor A discussion above). Temporary workers are known to buy these birds as gifts. It is apparently a problem even among police and military personnel posted to the area (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. NGOs are encouraging both Indonesian and the Philippines governments to implement and enforce their wildlife laws and encouraging Indonesia to list *Cacatua alba* as a protected species (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 (Metz 2007c, p. 2; 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 of the white cockatoo for the pet trade is a significant threat to the species, and this species is undergoing a rapid 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. 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.

Despite ProFauna Indonesia and the Indonesian Institute of Sciences having requested that the Forestry Department of Indonesia list white cockatoo as a protected species, and the Sultan of Ternate Palace having 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

There is no evidence that either disease or predation is a threat to the white cockatoo in the wild. 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 (IPP 2006). 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 biodiversity, manage 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. 1544), and the country is unable to 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 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 2010c; ProFauna 2010, pers. comm.).

In general, the export of wild-caught parrots is subject to harvest and export quotas in Indonesia. However, because the white cockatoo is not on the Indonesian Government's list of protected species (Law No. 5 1990, pp. 1–44; Rhee *et al.* 2004, chap. 5, p. 2, App. VIII; ProFauna 2010a, pers. comm.), 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 since 1999 (BLI 2010c). 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), which translates to the 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.). Recent information indicates that there is no longer a catch quota (ProFauna 2010, pers. comm.), but that restriction 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; <http://www.thegabrielfoundation.org/indonesianparrots.html>).

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 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 the primary threat to the white cockatoo. There is some evidence that the actions of 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. There is no information 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 2008b, p. 1) 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.

Since 2000, there has generally been a downward trend in exports of the white cockatoo (UNEP–WCMC CITES Trade Database, accessed January 4, 2011). According to the CITES UNEP–WCMC Trade Database, there were 653 live exports of the white cockatoo in 2000, 269 in 2008, and 1,104 in 2009 (2009 may have been an anomaly). Between 2000 and 2009, 8,505 specimens of live white cockatoos were reported to have been exported. The bulk of these exports was exported from South Africa and was reported as captive-origin. Between 2000 and 2009, of the live shipments, there were 28 white cockatoos reported as wild origin. None of these live specimens reported as wild origin was exported directly from Indonesia. Of the live shipments, 8,435 specimens 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, 273 specimens were exported from Indonesia, 4,444 specimens were exported from South Africa, and 384 specimens were exported from the Philippines. Note that countries that are not Parties to CITES do not submit annual report trade data to UNEP–WCMC (also refer to the CITES discussion for the crimson shining parrot). 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.

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 re-export 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 has been 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 hampered 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 (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. There is no information 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, and there was even a video available online (http://www.youtube.com/watch?v=PEmEB-Zj_L4), 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 (see Factor A discussion). Halmahera is becoming increasingly more desirable to developers and investors as natural resources become more scarce.

We found that poaching for the pet trade is the most significant threat to the species, despite local public awareness campaigns. It is estimated that there are between 8,629 and 48,393 individuals of this species remaining 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 (Baula *et al.* 2003, pp. 1–12; BLI 2004, pp. 1–2, ProFauna 2008, pp. 3–4). 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). Ending 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 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 personal communication 2010, pp. 6–7) and there is little risk in 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 significantly affect 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.

Although diving activities are increasing near islands containing white cockatoo habitat, there is 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 proposing to list the white cockatoo as a threatened species throughout its range. Although 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 qualifies as a threatened species. The current distribution of white cockatoos within its range and its disbursed distribution on two islands provides resiliency to the population against the threats such that the species is not currently in danger of extinction, but may become so in the foreseeable future.

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. See our discussion under the crimson shining parrot for how we make this determination. 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

D. Yellow-Crested Cockatoo (*Cacatua sulphurea*)

Taxonomy and Description

There are four recognized subspecies of the yellow-crested cockatoo: *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 (IUCN 2008j; BLI 2010d, p. 1), but prefers primary lowland forest. Historically, it was found throughout the Lesser Sundas, on Sulawesi and its satellite islands, on Nusa Penida (off 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 ft) on Sulawesi and up to 800 m (2,625 ft), and sometimes 1,200 m (ft), in the Lesser Sundas (Collar 1994; Jones *et al.* 1995; Snyder 2000, p. 69). 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 (Phillimore 2010, pp. 42–53; James 2010, pp. 1–5; 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. Assessments of subspecies are only accepted by IUCN provided there is a global assessment of the species as a whole. These four subspecies may all be in fact species, but for the purpose of this proposed rule and 12-month finding, these four subspecies essentially 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, it is prudent to propose listing *C. sulphurea*, which includes all subspecies.

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 and may be confused. For example, the yellow-crested cockatoo is also referred to as the lesser sulphur-crested cockatoo, which is *Cacatua sulphurea*, but there is also the sulphur-crested cockatoo, which is *C. galerita*. Additionally, because there are four recognized subspecies of *C. sulphurea*, using their scientific names is more precise and clear. Finally, because there are various local common names, it is more effective to refer to these species by their scientific names.

General Biology

Nest holes have been observed to be 6 to 18 m (20 to 60 ft) above ground (Setiawan 1996 in Prijono 2008, p. 3). Two tree species used by *Cacatua sulphurea* for nesting include *Sterculia foetida* (wild almond tree) and *Tetrameles nudiflora* (Binong) (Widodo 2009, p. 85). There does not appear to be a set or restricted breeding season (Prijono 2008, p. 3); the breeding season 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).

Their diet includes *Mangifera indica* (mango); *Carica papaya* (papaya); *Ficus* spp. (fig); *Psidium guajava* (guava); *Eugenia malaccensis* (jambu bol); *Opuntia elation* (prickly pear); *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 niffo, 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 (Ling and Lee 2006, p. 188). Between 1986 and 2000, 11 feral yellow-crested cockatoos were observed 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

This species was formerly locally common throughout much of its range. There is evidence of substantial population declines on Sulawesi, where it may already be beyond recovery (Andrew and Holmes 1990; Cahyadin and Arif 1994; Gilardi 2011, pers. comm.), 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 (Butchart *et al.* 1993; Holmes in litt. 1994; Prijono *et al.* 2008, p. 7). 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 extinct 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 2010 Web site reported that there are between 2,500 and 9,999 mature individuals collectively remaining in the wild; however, these data have not been updated based on recent information reported from a local organization in Indonesia. Population estimates for each subspecies are as follows: *Cacatua sulphurea abbotti*, 40; *C. s. citrinocristata*, 100 to 2,000; *C. s. parvula*, 800 to 1500; *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 only known from a single island, Solombo kecil (or Masalembu kecil pulau), 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 Salembu 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 *Datisceae* 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, only about 30 individuals remain (Metz 2010, pers. comm.). The population of this subspecies as a whole has declined over 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.

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; Persulesy *et al.* 2003 in Prijono 2008, p. 5). Another 2002 survey by WCS found a density of 4.3 birds per km² 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* was 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 most recent survey is not publicly available, but the population on Sumba is now thought to be roughly

100 birds (Gilardi 2011a, 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 km² (4,633 mi²), 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 ft). 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 km² (521 mi²), were established on Sumba through Ministerial Decree No. 576/Kpts-II in 1998. Manupeu-Tanadaru (280 km² or 108 mi²) 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. Now this subspecies is found on Alor, Pantar, Komodo, and Sumbawa Islands. In the past 10 years, populations of more than 10 cockatoos have been found at only two locations (Setiawan *et al.* 2000; Prijono 2008, p. 6). In 1994, on Sumbawa, this subspecies was observed at three sites and reported by islanders to occur at 14 more, although in very low numbers (Setiawan *et al.* 2000; Widodo 2009, p. 84). In 2000, 80 individuals were observed on Alor Island; the population estimate was 678 to 784 individuals.

As of 2001, it was thought that West Timor and other small islands in the Lesser Sundas could only support a few individuals (PHKA/LIPI/BirdLife International-IP 1998; Setiawan *et al.* 2000; Agista & Rubyanto 2001). The most recent population estimate on Timor-Leste (East Timor) is 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 recent 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.* 2005).

- 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 three 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.* 2005, 2 pp.).

Cockatoo poaching is believed to be effectively eliminated due to surveillance and enforcement, and there is negligible loss of mature trees or forest loss due to illegal logging (Ciofi & 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 & 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 ft)) dominated by *T. indicus* (common name: date or tamarind) and *Sterculia foetida* (Java-olive, poon tree, or skunk tree) (Agista & 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.* 2005, p. 2) and about 100 individuals on Rinca Island (BLI 2010f).

Cacatua sulphurea sulphurea

The most recent information from local NGOs suggests that only about 100 to 150 individuals of this subspecies remain in the wild, and they are likely 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). This was 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 dryland 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 U.S. by the WBCA (refer to discussion under the Crimson Shining Parrot, factor D).

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*, it is unclear how effective it is; there are no clear indications that the species' situation is improving. Protections exist in several areas such as the Rawa Aopa Watumohai and Carante 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 “kabupaten” (district) of Madura. These decrees are out of date, but there are plans to update them and extend them locally to the islands of the Masalembu Archipelago themselves, 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.

There are only about 100 to 150 *Cacatua sulphurea sulphurea* left in the wild, solely on Sulawesi Island. IPP recently instituted a conservation program for this subspecies; however, it is still in its preliminary stages.

Evaluation of Factors Affecting the Yellow-Crested Cockatoo

We examine the effects on the species based on each of the 5 factors listed under the 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. The threats to the survival of this species occur throughout the species' range and are not restricted to any particular portion of its range. Accordingly, our assessment and proposed determination applies to the species throughout its entire range. Unless our status review finds that there is a unique threat to a particular subspecies, we will consider all of the subspecies to be facing equivalent threats, as 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 will 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 (Costin and Powell 2006, p. 2; Laurance 2007, p. 1,544). For example, on Solombo kecil Island, trees that have suitable habitat to provide food and nest holes for *C. s. abbotti* are logged. 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 or gone from the island. In the past, 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 there is no commercial logging 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 km² (Kinnaird *et al.* 2003 in Prijono 2008, p. 4). Jones *et al.* indicated that in order to protect the few remaining *C. s. citrinocristata*, the areas of remaining forest 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 includes 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 km² (701 mi²). Due to the dryer climate, wildfires are a problem (Imansyah, unpublished, in Imansyah *et al.* 2005, p. 2). Researchers believe that the species' decline may be due to the lack of nesting sites.

The yellow-crested cockatoo resides in lowland forests predominately between 100 to 600 m (328 to 1,968 ft) 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 (Prijono 2008, p. 1; Widodo 2009, p. 81). For example, research found that for every 100 km² (38.6 mi²) 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 km² of locally disturbed secondary forest that were converted to plantations, 600 birds were likely lost from the cockatoo population. Even when habitat is protected, there is generally little undisturbed habitat available, and it is of less suitable quality.

Cockatoos are highly impacted by selective logging of primary forests, especially since reduced-impact logging techniques are seldom applied. Selective logging, which targets mature trees, has a substantial negative impact on tree-cavity nesters such as *Cacatua sulphurea*. The abundance of cockatoos is positively related to the density of its preferred nest trees (large trees that would be impacted by logging).

Once the primary forest is logged, land use on other Indonesian islands shows that the secondary forest is generally converted to other uses or logged again rather than being allowed to return to primary forest. Therefore, although cockatoos may continue to inhabit secondary or degraded forests on their respective islands, their populations will be at substantially lower numbers. 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, has damaged *Cacatua sulphurea* habitat. In some areas, deforestation and habitat degradation are still occurring. The populations have decreased on all islands, and there is 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

Poaching for the pet trade is a factor that also affects *Cacatua sulphurea*. Not only are cockatoos desirable pets, but this species is also very vocal and conspicuous, making it an easy target for poaching (Jepson and Ladle 2005, pp. 442, 447; Prijono 2008, pp. 4–5). Extremely heavy trade during the 1970s and 1980s was indicated as the main cause of the decline of this species (BirdLife International-IP, 1998; BLI 2004 in Cahill *et al.* 2006, p. 161).

Between 1981 and 1992, 96,785 *C. sulphurea* were reported to have been exported from Indonesia (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 at a high level (ProFauna 2008, pp. 2–8). Many investigations indicate that these cockatoos could fairly easily be exported and at some point their origin would be unknown, yet indicated as captive-origin (BLI 2003, p. 2).

TABLE 2—LIVE EXPORTS OF *Cacatua sulphurea* BETWEEN 2000 AND 2009 (UNEP–WCMC 2010)

Total number of specimens exported	4,806
Total number of specimens exported as captive	4,719
Total number of specimens exported as wild	50
Total other or unknown	23
No source code reported	9
Top 3 exporters:	
Number of specimens exported from South Africa	1,799
Number of specimens exported from Indonesia	508
Number of specimens exported from the Philippines	481

Note: This number does not report specimens exported as *Cacatua sulphurea citrinocristata*. There was data reported in the UNEP–WCMC database for this subspecies but not for the other *C. sulphurea* subspecies (<http://www.unep-wcmc.org>).

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 one collector in Waikabubak exported 52 yellow-crested cockatoos to other islands (Persulesy *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 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 adults (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 catching 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 re-export 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 re-exported from Singapore between 1994 and 1999 (CITES 2001, AC17 Inf. 3 p. 4; WCMC 2001 in CITES 2004a, pp. 9–10). 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 all cockatoo species referenced in this rule, is a significant threat to this species as well.

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 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*. With respect to predation, two predators, a spotted kestrel (*Falco moluccensis*) and a white bellied sea-eagle (*Haliaeetus leucogaster*), have been observed attacking cockatoos (Priyono 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 predation 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, there was a reported average of 1,600 *C. s. citrinocristata* individuals 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 quite 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 now (BLI 2010d; Metz 2010, pers. comm.). In 1992, the Regent of West Sumba (Decree no. 147) banned trapping and transport of cockatoos. This 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, however, there are no CITES-registered operations for breeding *C. sulphurea* for commercial purposes (CITES 2010d, npn.).

When the proposal to transfer the *Cacatua sulphurea* from Appendix II to Appendix I (CITES CoP13, 2–14 October, Bangkok, Thailand) was being considered in 2004, BLI noted in their position paper that the difficulty in distinguishing captive-bred birds from wild ones is facilitating both 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 4,837 live specimens of *Cacatua sulphurea* were exported (subspecies are unknown). Between the same time period, an additional 1,648 live specimens of *C. s. citrinocristata* were reported to be exported. In 2009 alone, 11 live specimens of *C. s. citrinocristata* were exported from South Africa to the United Arab Emirates, one of the countries most frequently importing cockatoos (<http://www.unep-wcmc.org/citestrade>). Nearly all of these were documented as captive-bred, but wildlife laundering does still occur (ProFauna 2008; 2010; Cantú-Guzmán *et al.* 2007, 121 pp.) and is quite lucrative.

A 2003 IUCN review found that *Cacatua sulphurea* is readily available in Indonesian bird markets (BLI 2003, pp. 1–2). Poaching is relatively easy, poverty is widespread, and there is little incentive or awareness for local communities to conserve their resources. Although the species occurs within a number of protected areas and a recovery plan was initiated in 1998, declines are still occurring. Birds are still likely smuggled to and exported from Singapore and the Philippines, at a minimum (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, but they are inadequate to combat the threats facing the species according to a local NGO who works on the conservation of this species. For example, a local law for the protection of *C. s. abbotti* exists, which IPP assisted in obtaining in 2010 (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. 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. 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. Observations have been made of competition between the dragon and cockatoo when using the tree *Sterculia foetida* for nesting (Agista & Rubyanto 2001 in Prijono 2008, p. 4). Although individuals of *C. sulphurea* may be subject to occasional competition with Komodo dragons, there is no evidence that this is occurring at a level which 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. It is likely that fewer than 1,000 to 2,000 individuals representing each subspecies remain in the wild; in the case of *C. s. abbotti* and *C. s. sulphurea*, there are likely fewer than 100 of each subspecies (Metz 2010, pers. comm.) (see Table 3).

TABLE 3—YELLOW-CRESTED COCKATOO POPULATION ESTIMATES

Species	Where found and date of population estimate	Estimated number remaining in the wild
Yellow-crested cockatoo (<i>Cacatua sulphurea</i>)	Indonesia and Timor-Leste	2,500 to 6,000*
Subspecies:		
<i>C. s. abbotti</i>	Sulawesi Strait (2010)	30
<i>C. s. citrinocristata</i>	Sulawesi Strait (2002)	565 to 2,054
<i>C. s. parvula</i>	Sulawesi Strait (2000, 2009)	500 to 2,000
	Timor (2000, 2004)	500
<i>C. s. sulphurea</i>	Sulawesi Strait (2010)	100 to 150

* Number includes all four subspecies.

Species with limited geographic ranges and small, declining populations are extremely vulnerable. Demographic stochasticity may affect this species as well, and is defined as chance changes in the population growth rate for a species (Gilpin and Soulé 1986, p. 27). Population growth rates are influenced by individual birth and death rates (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 contribute to

demographic stochasticity (Gilpin and Soulé 1986, p. 27).

Genetic stochasticity is caused by changes in gene frequencies due to genetic drift, diminished genetic diversity, effects due to inbreeding (*i.e.*, inbreeding depression), or a combination of these factors (Lande 1995, p. 786). 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 or by reducing the overall fitness

of individuals in the population (Charlesworth and Charlesworth 1987, p. 231; Shaffer 1981, p. 131). Environmental stochasticity is defined as the susceptibility of small, isolated populations of wildlife species to natural levels of environmental variability and related “catastrophic” events (*e.g.*, severe storms, extreme cold spells, wildfire) (Dunham *et al.* 1999, p. 9; Mangel and Tier 1994, p. 612; Young 1994, pp. 410–412). Each risk will be analyzed specifically for each species.

Small, isolated populations of wildlife species that have gone through a reduction in population numbers can be

susceptible to demographic and genetic problems (Shaffer 1981, pp. 130–134). These threat factors, which may act in concert, include: Natural variation in survival and reproductive success of individuals; chance disequilibrium of sex ratios; 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 populations are also susceptible to natural levels of environmental variability and related catastrophic events, which we will refer to as environmental stochasticity (Dunham *et al.* 1999, p. 9; Mangel and Tier 1994, p. 612; Young 1994, pp. 410–412).

Based on the best scientific and commercial information available, we conclude that *Cacatua sulphurea*'s very small and rapidly declining populations are a threat to 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, take for the 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 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 (Priyono 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 there is 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 (Priyono 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 small, declining populations of *Cacatua sulphurea* are a threat to the species, particularly when combined with the other threats to the species (Factor E).

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 propose to list *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 at 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 proposed 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. 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 harass. When applied to captive wildlife, take does not include generally accepted animal husbandry practices, breeding procedures, or provisions of veterinary care for confining, tranquilizing, or anesthetizing, when such practices, procedures, or provisions are not likely to result in injury to the wildlife. When conducting an activity that could take or incidentally take wildlife, a permit under the ESA is required.

If adopted, the proposed special rule would allow 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. The proposed special rule would apply 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 proposes to allow 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 proposed special rule are defined in the regulations at 50 CFR 17.3 and refer to wildlife produced in a controlled environment that is intensively manipulated by man from parents that mated or otherwise transferred gametes in captivity. The proposed special rule would apply to

birds captive-bred in the United States and abroad. Import and export of specimen that have been held in captivity prior to the date this species is listed under the ESA or that was captive-bred would be allowed without a permit under the ESA provided the provisions of CITES and WBCA are met. With respect to captive-bred specimens, the CITES import and 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 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 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 protected by CITES, a treaty which contributes to the conservation of the species by monitoring international trade and ensuring that trade in Appendix II species is not detrimental to the survival of the species (see Conservation Status for the white cockatoo). 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 only extend within the jurisdiction of the United States, would not regulate such activities. Accordingly we find that the import and export requirements of the proposed special rule provide the necessary and advisable conservation measures that are needed for this species.

Interstate commerce. Under the proposed special rule, a person may deliver, receive, carry, transport, ship, sell, offer to sell, purchase, or offer to purchase a white cockatoos in interstate commerce. Although we do not have current data, we believe there are a large number of white cockatoos in the United States. Current ISIS (International Species Information

System) information shows 252 white cockatoos are held in U.S. zoos (ISIS 2008, p. 4). This number is an underestimate, as some zoos do not enter data into the ISIS database. 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. At the same time, the prohibitions on take under 50 CFR 17.31 would apply under this special rule, and any interstate commerce activities that could incidentally take cockatoos would require a permit under 50 CFR 17.32.

Pet Birds

A "Pre"-ESA (or "Pre-Act") specimen of a species is one that was made or obtained prior to the species being listed under the ESA and has not been involved in a commercial transaction since that time. Specimens of species held in captivity or in a controlled environment on (a) December 28, 1973, or (b) the date of publication in the **Federal Register** for a final species listing, whichever is later, are exempt from prohibitions of the ESA, provided such holding or any subsequent holding or use of the specimen was not in the course of a commercial activity (any activity that is intended for profit or gain). An affidavit and supporting material documenting pre-ESA status must accompany the shipment of any listed species. A pre-ESA exemption does not apply to wildlife, including parts and products, offered for sale. In order to export a pet bird, an owner would need to provide information that the specimen was acquired or held in a controlled environment on or before (a) December 28, 1973, or the date when the species was listed, and (b) has not entered into commerce (*e.g.*, been bought, sold, or offered for sale by you or anyone else) since December 28, 1973, or the date when listed. Any specimens of an endangered or threatened species born in captivity from pre-ESA parents are fully protected and are not considered pre-ESA. See <http://www.fws.gov/forms/3-200-23.pdf> for additional information.

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.

Peer Review

In accordance with our policy, “Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities,” that was published on July 1, 1994 (59 FR 34270), we will seek the expert opinion of at least three appropriate independent specialists regarding this proposed rule. The purpose of such review is to ensure listing decisions are based on scientifically sound data, assumptions, and analysis. We will send copies of this proposed rule to the peer reviewers immediately following publication in the **Federal Register**. We will invite 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 will consider all comments and information we receive during the comment period on this proposed rule during preparation of a final rulemaking. Accordingly, our final decision may differ from this proposal.

Required Determinations

Clarity of Rule

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

- (a) Be logically organized;
- (b) Use the active voice to address readers directly;

- (c) Use clear language rather than jargon;
- (d) Be divided into short sections and sentences; and
- (e) Use lists and tables wherever possible.

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

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

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

National Environmental Policy Act (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, Endangered Species Program, Branch of Foreign Species (see **FOR FURTHER INFORMATION CONTACT** section).

Author

The primary authors of this notice are staff members of the Branch of Foreign Species, Endangered Species 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.

Proposed Regulation Promulgation

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

PART 17—[AMENDED]

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

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

2. Amend § 17.11(h) by adding 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	<i>Cacatua haematuropygia</i>	Philippines	Entire	E	786	NA	NA
Cockatoo, white	<i>Cacatua alba</i>	Indonesia	Entire	T	786	NA	17.41(d)
Cockatoo, yellow-crested.	<i>Cacatua sulphurea</i>	Indonesia and Timor-Leste (East Timor).	Entire	E	786	NA	NA
*	*	*	*	*	*	*	*

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

§ 17.41 Special rules—birds.

- * * * * *

(d) White cockatoo (*Cacatua alba*).

(1) Except as noted in paragraphs (d)(2) and (d)(3) of this section, all prohibitions and provisions of §§ 17.31

and 17.32 of this part apply to the white cockatoo.

(2) *Import and export.* You may import or export a specimen without a permit issued under § 17.32 of this part only when the provisions of parts 13, 14, 15, and 23 of this chapter have been met and you meet the following requirements:

(i) *Captive-bred specimens:* The source code on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) document accompanying the specimen must be “F” (captive-bred),

“C” (bred in captivity), or “D” (bred in captivity for commercial purposes) (see 50 CFR 23.24); or

(ii) Specimens held in captivity prior to the date this species was listed under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*): You must provide documentation to demonstrate that the specimen was held in captivity prior to the date the species is listed under the ESA. Such documentation may include copies of receipts, accession or veterinary records, CITES documents, or wildlife declaration forms, which must be dated

prior to the date this species was listed under the Endangered Species Act of 1973, as amended.

(3) *Interstate commerce.* Except where use after import is restricted under § 23.55 of this subchapter, you may deliver, receive, carry, transport, ship, sell, offer to sell, purchase, or offer to purchase in interstate commerce a live white cockatoo.

Dated: July 26, 2011.

James J. Slack,

Director, U.S. Fish and Wildlife Service.

[FR Doc. 2011–19532 Filed 8–8–11; 8:45 am]

BILLING CODE 4310–55–P