Supplementary Materials

Appendix A.

CRAAVED Components

Concealable. During the period of data collection (pre-2018), 12 of the 89 species in Indonesia could not be legally trapped and are therefore harder to conceal from law enforcement. Species are thus divided into a dichotomous measure, where '1' = protected species and '0' = unprotected species pre-2018 in Indonesia (Republic of Indonesia PP7/1999).

Removable. Previous studies in the field only measured the removability of species as it pertained to nesting behavior (Pires and Clarke, 2012; Tella and Hiraldo, 2014), but not all species are commonly taken at the nest. Consequently, species were independently coded by two parrot experts in Indonesia on how easy they were removed from the wild based on a variety of methods, and average scores were used. On a scale of 1 (easiest) to 3 (most difficult), methods were classified in the following manner: '1' = removing chicks from nests near to the ground, '2' = using glue/tree sap technique or mist netting, '3' = using noose techniques to capture at perching trees or climbing up to very high nests.

Accessible. Species found in areas where there is a greater number of people may be at an increased risk of trade due to the ease of removal in the local area (Pires and Clarke, 2012; Tella and Hiraldo, 2014). Thus, species found exclusively in remote locations uninhabited by people are theoretically less *accessible*. To measure the overlap of species with human populations, we downloaded range distribution for all 89 Indonesian parrot species (IUCN 2019) and used only the polygons with birds' presence (i.e. 'Extant' attribute) to avoid the overestimation of access to possibly extinct populations of birds. The GHS-POP dataset (expressed as the number of people per cell) of the Global Human Settlement Layer (GHSL) was used for the years of 2000 and

2015 in WGS84 coordination system with 9-arcsec resolution clipped to the total extent of Indonesia (Schiavina *et al.*, 2019). This dataset was utilized because it is the best available global map of human population density at the smallest scale. Zonal statistics were used in QGIS 3.8 (https://www.qgis.org) to calculate the total number of humans living in the range of each parrot species within Indonesia. Population values were calculated for both 2000 and 2015 and used in the past and recent analyses accordingly. For the overall analysis, we averaged the sum population values for 2000 and 2015 for each species range.

Abundance. Prior studies used a 1–5 scale of "how common" species are within their range in the absence of estimated population size for most species. In this study, more complete data on the total population size of each species were obtained (Juniper and Parr, 1998; IUCN Red List, 2018). In total, 35 of the 89 Indonesian species are endemic, and thus, population estimates of such species represent the Indonesian population size. For non-endemic species, the estimates are global. To reduce variability between global and Indonesian estimates, average population sizes were then converted to a scale of 1–4 ('1' = 1–9,999; '2' = 10,000–49,999; '3' = 50,000–99,999; '4' = 100,000–5 million wild individuals).

Valuable. Price data were missing for the vast majority of species, so we assumed value is proportional to rarity (Pires and Clarke, 2012; Tella and Hiraldo, 2014). The IUCN RedList categorization is a widely used proxy for value, and rarer species were found significantly more expensive when rarity was compared to other variables (Courchamp *et al*., 2006; Vall-llosera and Cassey, 2017). Using the IUCN Red List, species' values were measured on a scale of 1–5 from '1' = Least Concern up to '5' = Critically Endangered. This equal step scale of the categories is regularly used in practice and in comparative studies (e.g. Regan *et al.*, 2005; Olah *et al*., 2016), as weighted indices are dominated overwhelmingly by CR species (Butchart *et al.*, 2004).

Enjoyable. Each species varies in its attractiveness to potential customers. This is likely to be contingent on the number of different colors on the body, percentage of body that is brightly colored, body length, and ability to mimic sounds (Tella and Hiraldo, 2014). For mimicry ability, *Cacatua* spp., *Lorius garrulus*, and *Eclectus roratus* were considered the only species to mimic human sounds. Each species was scored a low ('1') or high ('2') value on each of the four factors, whereby low scores were inputted for species falling below the mean for the factors, colors and size, as well having a body that is mostly not brightly colored. This resulted in a composite value range of 4–8 (where '8' = most attractive).

Disposable. The ease with which species can be sold in illicit or licit markets may impact their desirability as targets of theft. It is expected that species that are exported in higher numbers are more disposable. Consequently, we used the number of legally exported "live" parrot specimens from Indonesia to any countries between the years 1997 and 2018 as the best available proxy for market demand measured by the CITES trade database (https://trade.cites.org). We calculated the number of exported specimens for each species between 1997 and 2005 for the 'past' and 2006–2018 for the 'recent' analysis and then summed for the overall analysis.

Appendix A.1. Likelihood of Indonesian parrot species being traded in different time-periods. Presented are results from statistical models evaluating the importance of each CRAAVED variable: the Wald statistic and chi-square *P* values (P_{GLM}) from logistic regression (GLM) models; *P* values (P_{PGLS}), estimates, and lambda (λ) values from phylogenetic generalized least squares (PGLS) regression models with corresponding standard deviation values (SD); and mean decrease in Gini and relative importance of each variable from random forest machine learning (RFML) models. *P* values lower than 5% are presented in bold.

Time-period	Variable	Wald test	P_{GLM}	P_{PGLS} (SD)	PGLS Estimate (SD)	λ (SD)	Gini	Relative Importance
Past (1997–2005)	Concealable	0.17	0.861	0.874 (0.049)	-0.02 (0.009)	0.04 (0.052)	0.6	4.1%
	Removable	-0.22	0.824	0.454 (0.027)	-0.02 (0.001)		4.2	15.3%
	Accessible	1.58	0.115	0.286 (0.045)	0.002 (0)		8.1	23.5%
	Abundance	1.12	0.264	0.885 (0.012)	0.007 (0)		2.5	12.4%
	Valuable	1.23	0.22	0.246 (0.039)	0.063 (0.002)		1.9	8.7%
	Enjoyable	1.89	0.058	0.054 (0.004)	0.138 (0.003)		3.9	13.5%
	Disposable	3.19	**0.001**	**0.014** (0.005)	0.009 (0)		13.2	22.6%
Recent (2012–2018)	Concealable	1.50	0.133	0.886 (0.074)	-0.01 (0.014)	0.346 (0.044)	1.8	6%
	Removable	-0.06	0.948	0.857 (0.043)	0 (0.001)		3.4	14.8%
	Accessible	1.87	0.061	0.177 (0.02)	0.002 (0)		7.9	22.9%
	Abundance	0.5	0.614	0.75 (0.047)	0.019 (0.003)		2.3	12.7%
	Valuable	0.29	0.772	0.356 (0.031)	0.054 (0.003)		2.1	10.4%
	Enjoyable	2.03	**0.043**	**0.02** (0.002)	0.146 (0.004)		4	13.9%
	Disposable	3.19	**0.001**	**0.004** (0.002)	0.015 (0)		10.2	19.4%
Overall (1997–2018)	Concealable	1	0.315	0.586 (0.088)	-0.08 (0.022)	0.402 (0.1)	1	4.7%
	Removable	0.67	0.504	0.943 (0.06)	0 (0.003)		4.1	14.9%
	Accessible	1.85	0.065	0.195 (0.037)	0.003 (0)		9.3	24%
	Abundance	0.61	0.543	0.665 (0.063)	0.03 (0.006)		2.5	12%
	Valuable	1.05	0.293	0.286 (0.037)	0.07 (0.005)		2	9.1%
	Enjoyable	1.44	0.151	0.09 (0.015)	0.126 (0.006)		3.9	12.3%
	Disposable	3.53	**<0.001**	**0.033** (0.015)	0.008 (0)		14.3	23%

Appendix A.2. Pearson correlation test results among the CRAAVED components within each time-period. Correlation coefficients are presented above diagonal and *P* values below diagonal (values lower than 5% are presented in bold).

Time-period	Variable	Concealable	Removable	Accessible	Abundance	Valuable	Enjoyable	Disposable
Past (1997–2005)	**Concealable**	-	0.301	-0.009	-0.151	0.348	0.057	-0.13
	Removable	**0.004**	-	0.003	-0.252	0.21	0.202	-0.031
	Accessible	0.931	0.981	-	-0.088	0.076	0.113	0.14
	Abundance	0.157	**0.017**	0.412	-	-0.609	0.047	0.326
	Valuable	**0.001**	**0.048**	0.476	**<0.001**	-	0.135	-0.113
	Enjoyable	0.595	0.058	0.291	0.66	0.209	-	0.293
	Disposable	0.223	0.771	0.192	**0.002**	0.292	**0.005**	-
Recent (2012–2018)	**Concealable**	-	0.301	-0.005	-0.151	0.348	0.057	0.127
	Removable	**0.004**	-	-0.005	-0.252	0.21	0.202	-0.028
	Accessible	0.961	0.961	-	-0.073	0.064	0.117	-0.06
	Abundance	0.157	**0.017**	0.495	-	-0.609	0.047	0.263
	Valuable	**0.001**	**0.048**	0.549	**<0.001**	-	0.135	-0.023
	Enjoyable	0.595	0.058	0.275	0.66	0.209	-	0.249
	Disposable	0.237	0.792	0.577	**0.013**	0.829	**0.018**	-
Overall (1997–2018)	**Concealable**	-	0.301	-0.007	-0.151	0.348	0.057	-0.068
	Removable	**0.004**	-	-0.002	-0.252	0.21	0.202	-0.033
	Accessible	0.947	0.988	-	-0.08	0.07	0.115	0.1
	Abundance	0.157	**0.017**	0.455	-	-0.609	0.047	0.336
	Valuable	**0.001**	**0.048**	0.515	**<0.001**	-	0.135	-0.097
	Enjoyable	0.595	0.058	0.282	0.66	0.209	-	0.306
	Disposable	0.526	0.758	0.35	**0.001**	0.366	**0.004**	-