Saving the Philippine Eagle: How Much would It Cost and are Filipinos Willing to Pay for It?

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LIST OF ACRONYMS

CPR……Center for Philippine Raptors

CVM……...Contingent Valuation Method

DENR…….Department of Environment and Natural Resources

FGD……Focus group discussion

IEC……. Information, education, and communication

IUCN……..International Union for the Conservation of Nature and Natural Resources

MOA…….. Memorandum of Agreement

MVP……...Minimum Viable Population

MBG……...Money-back guarantee

NOAA……National Oceanic and Atmospheric Administration

NGO……...Nongovernment organization

PEC…… Philippine Eagle Center

PACAP…….. Philippine-Australia Community Assistance Program

PERNC…….. Philippine Eagle Research and Nature Center

PRCP……. Philippine Raptors Conservation Program

PAMB ……Protected Area Management Board

PPM……Provision Point Mechanism

REWT ……Regional Eagle Watch Teams

UPLB……. University of the Philippines Los Baños

WTP……Willingness to pay

SAVING THE PHILIPPINE EAGLE: HOW MUCH WOULD IT COST AND ARE FILIPINOS WILLING TO PAY FOR IT?

Dieldre Harder, Rex Labao, and Florence Ivy Santos

EXECUTIVE SUMMARY

The Philippine Eagle, classified by the IUCN as an endangered species, has received limited funding support from the government and private organizations relative to the needed resources for enhanced conservation efforts. To address this gap, the study sought to answer this basic question: *Are Filipinos willing to pay to increase conservation efforts that would also improve the chances for survival of the Philippine Eagle?* Along with this are concerns on the amount Filipinos are willing to pay, motivations for paying, attitude toward the proposed conservation program, and factors affecting households' decision to pay. The study also addressed four methodological issues on payment vehicle effect, scope sensitivity, extent of the market and effect of using colored or black and white photographs.

In general, results show that the potential aggregate benefits on the national level outweigh conservation costs by almost 10 times despite low support for endangered species conservation. Across subsamples, only 23-31 percent are willing to support the Mindanao Eagle Conservation Program as a monthly surcharge on their utility bill. Parametric and non-parametric willingness to pay (WTP) values range from PhP 20 (USD 0.40) to PhP 34 (USD 0.68) and from PhP 14 (USD 0.28) to PhP 22 (USD 0.44), respectively, across subsamples. The main reason for unwillingness to pay is economic constraint, which is consistent with the finding that economic problem is the main priority concern among Filipinos.

Findings also reveal that respondents are insensitive to the payment vehicle (voluntary vs. mandatory water bill), collection mechanism (mandatory water vs. electric bill), scope of the program (national vs. regional), and extent of the market (on-site vs. off-site). However, WTP was found to be influenced significantly by questionnaire packaging (colored vs. black and white photographs).

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1.0 INTRODUCTION

The Philippine Eagle (*Pithecophaga jefferyi*) is one of the largest and most powerful birds in the world. Like most raptors, it has a massive, narrow-arched bill and enormous claws. It measures one meter in height and has a wingspan of about two meters. It is monogamous and shares with its mate chick-rearing responsibilities. The eaglet is usually cared for over 17 months, on a nest found on top of a tree about 30 m above the ground. The Philippine Eagle lives in forests and is highly territorial. It was discovered in 1896 only, with the first nest found in 1963 (http://www.brainyencyclopedia.com). It is found on four islands only of the country: Luzon, Samar, Leyte, and Mindanao. Sightings have been reported mostly in Mindanao, where conservation efforts are currently concentrated. However, the bird has been seen also recently in Samar and the Sierra Madre in Luzon (www.philippineeagle.org).

The bird was placed under a protected status during the Marcos Administration in 1970 reportedly through persistent lobbying by Charles Lindbergh[1] who described the Philippine Eagle as the "world's noblest of fliers." It was subsequently declared as the national bird during the Ramos regime in 1995[2]. Recently, the World Center for Birds of Prey based in Boise, Idaho has named it as the rarest of all large forest eagles (Agence France-Presse 2004). Bueser et al. (2003) placed the number of Philippine Eagles in Mindanao at somewhere between 82 and 233 pairs, based on an analysis of 1991-1998 data on remaining forest land area and using the mean nearest neighbor distance between breeding pairs of 12.74 km. According to the Regional Eagle Watch Teams (REWTs)[3], however, only 153 Philippine Eagles have been actually seen and recorded as of March 2004.

Source: Discovery, July 1995

Deforestation accounts for the rapid decimation of this important bird species; hence, one can say that the status of this national bird reflects the status of the Philippine forests. For this reason, the conservation of the Philippine Eagle has been used by several nongovernment organizations (NGOs) as their rallying point regarding the country's forest conservation efforts since the 1980s.

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1 Charles Lindbergh, an American pilot best known for making the first solo trans-Atlantic flight in 1927. He worked as representative of the World Wildlife Fund (WWF) and traveled to the Philippines several times from 1969 to 1972.

2 The Philippine Eagle was declared as the national bird on 4 July 1995 through Presidential Proclamation No. 79. This status makes hunting it illegal and enables allocation in the national budget for its protection.

3 The REWTs are made up of volunteers who monitor sightings of the Philippine Eagle in selected sites.

2.0 CONSERVATION EFFORTS FOR THE PHILIPPINE EAGLE

The Government's efforts to save the Philippine Eagle started in 1970 with the creation of the Monkey-eating Eagle Conservation Program. (Monkey-eating Eagle was the original name given to the species upon discovery.) This move was a long-delayed response to the call made during the 1965 Conference on the International Union for the Conservation of Nature and Natural Resources (IUCN) in Southeast Asia held in Bangkok, Thailand. Specifically, the wounding, taking, selling, exchange and/or export, possession, and killing of the Philippine Eagle are prohibited under Presidential Administrative Order No. 235 passed on 25 August 1970. The following month (9 November 1970), the Philippine Eagle was declared as a protected bird through Republic Act 6147. This Act provides for the preservation of the eagle and appropriation of funds for such purpose (Molinyawe et al. 1999).

In 1977, the Government established the Philippine Eagle Research and Nature Center (PERNC) in Davao City. PERNC, now known as the Philippine Eagle Center (PEC), is the center of Philippine Eagle conservation efforts in the country (Molinyawe et al. 1999). It focuses on: (a) captive breeding[4], (b) research on its habitat and breeding habits, and (c) information dissemination. With the declining number of Philippine eagles due to the continued destruction of their forest habitat and illegal hunting and capture for illicit trade, the conservationists face a big challenge.

In 1986, the Department of Environment and Natural Resources (DENR) placed PERNC under the Protected Area Management Board's (PAMB) Philippine Raptors Conservation Program based in Manila.[5] Not wanting to leave Davao City, the PERNC staff resigned and formed the Philippine Eagle Foundation, Inc.[6] (PEF). This group has since then continued the various conservation activities initiated in Mindanao as an NGO.

PEF has faced tough challenges. In the absence of government funding, its staff worked without pay for several months in 1987. It was only in late 1988 when PEF was able to obtain funding from the Frankfurt Zoological Society for the construction of staff quarters, a reception building, and new cages. Later, it also received a grant from MacArthur Foundation, enabling it to expand its 2.0-hectare forest habitat to its current 8.5-hectare Philippine Eagle Center. It likewise received funds from Canada Fund, Philippine-Australia Community Assistance Program (PACAP), Peregrine Fund, and Japanese Embassy to build its education building in support of grassroots education initiatives.

In 1995, the PEF Board of Trustees launched an intensive campaign to raise funds from the corporate sector, realizing that external donor funds may not be sustainable. It launched the 'adopt-an-eagle/nest-scheme', which costs USD 1,800 per eagle. Several private firms, such as Caltex Oil Company, American Express, Pilipinas Shell, and Bank of Philippine Islands, participated in the scheme. The Foundation also launched "A Peso for Pag-asa[7] Campaign." Del Monte (an agribusiness firm in Mindanao) supported this campaign

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4 The female Philippine Eagle reaches sexual maturity after five years, and the male at seven years. The female nests once every two years, laying one egg only (Molinyawe et al. 1999). .

5 The DENR argued that conservation activities for the Philippine Eagle should not only be done in Mindanao, but on the other islands as well.

6 PEF is a non-stock, non-profit organization, independent of the government, dedicated to the conservation and protection of the Philippine Eagle.

7 Pag-asa (Tagalog for 'hope') is the first Philippine Eagle born in captivity.

by promoting the Philippine Eagle's protection in its packaging materials and offering a counterpart amount equivalent to whatever the PEF could raise from the said campaign. A similar scheme was also adopted by Pilipinas Bank, which launched the 'wildlife savings account' that offers a PhP 100 rebate to PEF for every PhP 1,000 deposit made through this account. These fund-raising programs have had varying levels of success; some were short-lived and no longer active.

Additional funds come from entrance fees – about 150,000 people visit the center each year. The Foundation also raises revenues through training activities and from the use of its production facilities. Funds from these sources are used to support the Center's operations.

The improved financial situation boosted the breeding program of PEF. It had its first fertile egg laid in 1987, although it failed to hatch. After the training of its two staff members in the United States with support from the Peregrine Fund, PEF successfully hatched its first two eagles in captivity in 1992[8]. To complement these captive breeding initiatives, the Foundation launched the 'adopt-a-nest scheme' wherein villagers get paid for finding and protecting eagle nests. It initiated livelihood projects in some areas to obtain community participation in protecting the eagles and their habitat (www.philippineeagle.org.). As of 2004, PEF has 29 Philippine Eagles in its care. Fifteen of these were bred in the Foundation's 8.5 hectares of lush green rainforest which is home also to a wide variety of native birds and wildlife. The Foundation took the first major step of releasing a captive bred eagle in April 2004.

Outside of Mindanao, the Protected Area and Wildlife Bureau (PAWB) is responsible for protecting the Philippine Eagle and other endangered bird species. This government agency is under the DENR's Philippine Raptors Conservation Program (PRCP) initiated in 1989. PRCP aims to: (a) conserve the Philippine Eagle and other endangered birds of prey in the wild and in captivity; (b) expand scientific research; and (c) provide a venue for an extensive public education on the Philippine Eagle and other wildlife. Basically, these are the same objectives as those of the PEF in Mindanao, but carried out with much limited resources as PRCP is totally dependent on government funding. Its conservation efforts are largely seen in the maintenance of the Center for Philippine Raptors (CPR) within the Makiling Botanic Gardens of the University of the Philippines Los Baños (UPLB) in Laguna Province, northern Philippines. The CPR serves as a rescue and rehabilitation center for confiscated, donated, and abandoned raptors. It is also a venue for scientific research, public education, and captive breeding facility.

The Mindanao Program under the PEF and the programs in the rest of the country were finally coordinated in May 1995, through a five-year Memorandum of Agreement (MOA) with DENR. This agreement re-established a formal partnership between the government and the private sector toward the conservation of the Philippine Eagle. Another five-year MOA between the two parties was signed on 26 February 2001, allowing the PEF to implement the Philippine Eagle Conservation Program (PECP) in Mindanao. The PEF remains as the leading organization in conservation breeding, population habitat study, monitoring, protection, rehabilitation, and information, education and communication (IEC) activities for Philippine Eagle conservation in the country.

[8] The Captive Breeding Program uses a combination of natural pairings and cooperative artificial insemination of females.

3.0 THE CHALLENGE: MEETING THE COST OF A CONSERVATION PROGRAM

The preceding discussion shows the status of the Philippine Eagle and the threats to its survival. Saving the Philippine Eagle, an endangered species threatened everyday by the loss of its forest habitat, seems an insurmountable task. While the PEF has played a major role in its conservation, available funds are limited to sustain enhanced conservation efforts against the rising threats.

Insufficient funds are a ubiquituous problem facing conservation programs everywhere, however, it is more serious in developing countries like the Philippines. Government funds to conserve the Philippines Eagle, for instance, ranged from merely less than half a million pesos (USD 8,900) in 1991 to at most PhP 25 million (USD 446,591) in 1998 (Table 1). The 1998 level has been unsurpassed in subsequent years, which only had annual budgets of close to five million pesos (USD 8,900). This budget represents roughly less than 0.01 percent of the total DENR budget, but accounts for a substantial part (15%) of the Protected Area Wildlife Bureau (PAWB) budget in 2004.

Table 1. Government Funds for the Conservation of the Philippine Eagle.

Year	Maintenance and Other Operating Expenses	Personnel Services	Capital Outlay	Total Annual (PhP)
1990	741,000			741,000
1991	441,000			441,000
1992	580,000	161,000		741,000
1993	615,000	126,000		741,000
1994	1,000,000			1,000,000
1995	815,000			815,000
1996	856,000			856,000
1997	8,084,000			8,084,000
1998	22,836,000		3,000,000	25,836,000
1999	9,029,000			9,029,000
2000	7,029,000			7,029,000
2001	5,245,000			5,245,000
2002	4,978,000			4,978,000
2003	4,978,000			4,978,000
2004	4,978,000			4,978,000

Source: Project Profile of Philippine Raptors Conservation Program

The government budget is supplemented by allocation from private institutions, mainly, the Philippine Eagle Foundation, (PEF) Inc. The PEF's 2004 Annual Report indicates that it was able to raise PhP 17.5 million, significantly higher than the PhP 12.4 million raised in 2003 and the PhP 11.6 million in 2002. PEF's contribution comes from various sources (e.g., grants and donations, proceeds from the "Eagle Adoption Program," and visitors' entrance fee to the PEC).

While the PEF has been relatively successful in generating funds to support its activities, it recognizes that a lot of effort still needs to be done to conserve the Philippine Eagle. For one, it hopes to expand the land area of its present full-capacity breeding center. It also wants to enhance protection efforts for eagles in the wild through more community-based projects. Presently, there is a big knowledge gap on the science aspect of the eagle's conservation. PEF hopes to intensify efforts on field research to understand better the bird's breeding habit, lifespan, nesting habits, among others. Two other main expansion areas are in the extension of the program's activities to the other parts of the country and in helping in the habitat restoration efforts for the Philippine Eagle, particularly in Eastern and Central Mindanao where most of the wild population exists. All these activities will require more resources (manpower, financial, expertise) than what the PEF and other players in the field could afford (Dennis Salvador, personal communication). The various elements of a Comprehensive Mindanao Philippine Eagle Conservation Program, based on consultations with PEF scientists, are presented in Appendix 1.

The research team estimated the budgetary requirement for a 10-year Comprehensive Mindanao Philippine Eagle Conservation Program (Table 2). The budget amounts to PhP 1.13 billion, given some assumptions on the cost and level of activities (Appendix 2: Box 1). It includes provision for communities that will participate in protecting the eagle's habitat. These communities will be compensated for the opportunity cost of their time, based on similar actual expenditures in PEF pilot sites. As Table 2 shows, the amount needed to support a 10-year comprehensive conservation program is much higher than what the government (PhP 5 million annually) and even PEF (PhP 17 million in 2004, a big component of which goes to personnel cost) can provide, given their current budget/revenue situation. The question then that begs to be asked is: From where could the additional funding for the conservation program be secured? Note that the PEF is already getting support from a number of international donors and private/corporate sector to support its activities in Mindanao. These efforts, albeit successful, still fall short of what could be accomplished given more funds.

This research project was motivated by the basic question: Are Filipinos willing to pay to increase conservation efforts that would improve the probability of survival of the Philippine Eagle? From this, other concerns are raised. In particular, for those who are willing to pay, how much are they willing to contribute? What motivates households' decision to pay or not pay? What factors affect decision to pay and what do citizens think about the proposed conservation program to save the Philippine Eagle?

Table 2. Budgetary Requirements for a 10-year Operation of the Mindanao Comprehensive Philippine Eagle Conservation Program, 2005.

Budget Item	Sub-component	Budget (PhP)
Education	Teachers' Education	5,560,000
	Broadcasters' Education	2,560,000
	Hunting/Gatherer's Education	2,380,000
	Forest resources users' Education	3,010,000
Habitat preservation	Field Research	33,680,000
	Protected Area Establishment	100,000,000
	Comprehensive site development	480,000,000
Population augmentation	Conservation breeding (5 eaglets)	10,000,000
	Pre-release (site characterization)	5,000,000
	Post-release Monitoring	40,000,000
Limiting or modifying human activity and development	Management of Philippine Eagle	300,000,000
Critical habitat protection	Critical Habitats (Livelihood support)	150,000,000
TOTAL (Present value over a period of 10 years)		1,132,190,000
Annualized value (at 4% real rate of discount)		139, 588, 774

4.0 OBJECTIVES AND SIGNIFICANCE OF THE STUDY

4.1 Research Objectives

The specific objectives of this study are:

1. To assess the importance Filipinos attached to endangered species conservation vis-à-vis other societal concerns; and their general awareness and knowledge of the situation of the Philippine Eagle;

2. To determine the Filipinos' willingness to pay (WTP) for a Comprehensive Philippine Eagle Conservation Program;

3. To assess the extent of the 'market' for estimation of potential benefits from the conservation program;

4. To determine if WTP is sensitive to the type of payment vehicle (voluntary vs. mandatory payment), collection mechanism (surcharge on water utility bill vs. surcharge on electricity bill), scope of the good/conservation program (national vs. regional), and manner of survey presentation (colored vs. black and white pictures)

5. To determine how WTP values are affected by the respondents' socioeconomic and attitudinal characteristics; and

6. To compare potential revenues/benefits based on WTP responses to the cost of the comprehensive eagle conservation program.

4.2 Significance of the Study

The Philippine Eagle is ecologically important. Like human beings, they are on top of the food chain; they regulate the population of flying lemurs, bats, and snakes, including other animals that oftentimes become pests in agricultural lands, such as monkeys and rodents. The extinction of the eagle could result in overpopulation of their preys, thus, disturbing the balance of nature (Molinyawe et al. 1999).

In its mission statement, the Philippine Eagle Foundation "*believes that the fate of the vanishing Philippine Eagle, the health of our environment, and the quality of Philippine life are inextricably linked. We are therefore committed to promote* (sic) *the survival of the Philippine Eagle, the biodiversity it represents, and the sustainable use of our forest resources for future generations to enjoy*." This statement reflects the connection between saving the eagle and its habitat and rescuing thousands of other threatened plants and animals.

The Philippine Eagle, being the national bird, is a source of pride for the country. It symbolizes hope, power, and strength. As such, one could surmise that Filipinos would regard its continued existence as a priority concern. However, the Philippine Eagle conservation is just one of the many environmental concerns facing Filipinos. Most likely, environmental problems may just be one of the concerns of Filipinos. A study that maps out the priorities of Filipinos is thus important to provide a proper perspective among conservation organizations in the development of their programs, particularly, if they concern mobilizing support from the public.

More to the point, the possibility of generating funding support from the public for the conservation program is an important contribution of this study. The study is designed with the premise that the importance one attaches to a 'good' could be inferred from how much one is willing to pay to secure that good. So, if the Philippine Eagle is important to the people, one would then expect that they would be willing to pay an amount of money for its conservation and protection to prevent its extinction. Is this observation true among Filipinos, many of whom are considered poor? Would they consider the Philippine Eagle conservation a priority concern? How many do so and are willing to pay to support this program? Does the form of collection (mandatory vs. voluntary) and payment vehicle (water utility bill vs. electric utility bill) matter to people? If citizens (or some of them) are in fact willing to pay (WTP), is it important to assess the potential revenue from their WTP relative to the cost of implementing a comprehensive conservation program? Answers to these questions are going to be useful in designing fund-raising activities in support of conservation efforts for the Philippine Eagle.

Finally, on theoretical grounds, the study hopes to contribute to four areas.

First, the study allowed us to assess the extent of the market for conservation program such as this. Specifically, it sought to answer: Do citizens' treat the Mindanao Comprehensive Eagle Conservation Program as a local good (something that only those from Mindanao should pay) or is it viewed as a national/public good (the Philippine Eagle, being a national bird)? To determine the extent of the market, we tested if the WTP of Metro Manila households differ (hypothesized to be lower—they being farther from Mindanao) from the WTP of Davao households. If the difference in WTP values between the on-site (Davao) and off-site (Metro Manila) households was not significant, this means the conservation program

could be viewed as a national good and that the eagle's conservation is just as important to off-site residents as it is to local or on-site residents. The market extent could therefore be viewed as national.

Second, the study establishes whether the public is sensitive to the scope of the conservation program—is the WTP for a National Comprehensive Eagle Conservation Program higher than the WTP for a Mindanao Comprehensive Eagle Conservation Program? For this test, only the data generated from the Davao households were utilized.

Third, the study analyzed if Filipino households are sensitive to the mode of payment. Two sub-tests were carried out to address this issue: 1) Is the WTP of voluntary donation different from the WTP if payment is made mandatory? 2) Is the WTP from an electric surcharge different from the WTP using surcharge to water bill?

Fourth, given that contingent valuation methodology (CVM) is a costly tool to use — will the use of black and white (B&W) photographs (an attempt to bring down cost) affect the resulting WTP value? Put another way; is the use of colored photographs value enhancing?

While these various tests are methodological in nature, their results could have important implications in the policy recommendations presented at the end of this paper. Moreover, each of these methodological concerns is the subject of a more in-depth analytical discourse in four separate papers, written together with this research report.

5.0 REVIEW OF RELATED AND RELEVANT LITERATURE: VALUATION OF ENDANGERED SPECIES USING CONTINGENT VALUATION METHODOLOGY

This review focuses on the analysis of the costs of conservation and the various facets of CVM as applied in the valuation of endangered species conservation. The latter includes issues such as extent of the market, scope effect, payment vehicle bias/effect, effects on WTP of colored photographs, and aggregation of benefits from eagle conservation.

5.1 Costs of Endangered Species Conservation

The cost of conservation programs covers both the direct cost of implementing the various component activities and the indirect costs or foregone income that resources devoted to conservation program could have generated. In forest ecosystems that are traditionally used by communities within and/or in villages surrounding the forests, the foregone 'income' would normally include the value of forest products collected from the forest and/or the income from use of the land for agricultural and tree-farming activities. A conservation program would normally limit or cease some of these economic but extractive activities in the areas covered by the program. The same situation is faced by many private landowners in developed countries, whose lands have been identified as hosts to endangered species. Under the Endangered Species Act of 1973, for instance, private landowners are not allowed to do development activities in their own land if such activities would disturb the endangered species. Thus, conservation programs impose a huge cost not only to de facto owners of State-managed natural resources in many developing countries but also to private landowners in developed countries.

Matthews et al. (2000) cited that in 1990, the United States spent USD 770 million to be able to recover 70 percent of its endangered species to a self-sustaining level. At that time, its funding level was only USD 50 million a year (cited from Barker 1993). The estimate for Canada is similarly high. In 1998, the estimated cost of recovering 61 endangered species was placed at USD 165 million while funding in 1998 totaled USD 5 million only. These figures show that the costs of conservation are quite high and that even developed countries are unable to meet all the cost requirements. The situation is expected to be more difficult in developing countries where resources are low and many programs compete for them.

The cost is particular high for endangered species conservation since habitat conservation occupies an important part of any species conservation program. Damania and Bulte (2001) presented some cost estimates of protecting animals from poaching. In Africa, the cost ranges from USD 200 to USD 500 per hectare (cited from Parker and Graham 1989; Simmons and Kreuter 1989; Burton 1999). These values are said to be much lower than the actual expenditures on enforcement, thus, accounting for the difficulty of fighting poaching threats to wildlife.

5.2 Valuation of Endangered Species Conservation

5.2.1 Use of Contingent Valuation Methodology to Value Protection of Endangered Species

The contingent valuation method (CVM) has gained popularity for eliciting willingness to pay (WTP) values for specific changes in the level of environmental quality or provision of public goods. The ability of this tool to generate estimates that satisfy *construct validity* is well recognized in the case of familiar public goods with predominant use values (Carson et al. 1996; Carson and Mitchell 1993; Cummings and Harrison 1995). However, the same cannot be said for public goods that have predominant passive-use (non-use) values (Cummings and Harrison 1995; Hanemann 1994) such as endangered species preservation. Nonetheless, the tool is oftentimes the only means available to evaluate non-use values; hence, the application of CVM on endangered species valuation has been numerous and widespread.

The study by Reaves et al. (1999) on valuation of the red-cockaded woodpecker and restoration of its habitat after a natural disaster tested three CV question formats (open-ended, payment card, and double-bounded dichotomous choice). Their study differed from other similar studies since it did not only compare the mean WTPs across elicitation techniques but also the survey response rates, item non-response rates, and protest bids. The study found that the dichotomous choice technique generated higher non-response rates and protest bids while the payment card was observed to exhibit desirable characteristics. Ekstrand and Loomis (1998), on the other hand, used two dichotomous choice contingent valuation models (standard vs. one with respondent's uncertainty) to estimate the economic benefits of protecting critical habitat for nine threatened and endangered fish species in Colorado, Green, and Rio Grande River basins. Using the standard dichotomous choice model, a value of USD 268 per household was obtained. The value ranges from USD 50 to USD 330, under varying levels of uncertainty. The study concludes that incorporating respondent's uncertainty could increase the goodness of fit and decrease the standard error of estimated mean WTP, as borne by the results in one of the five models tested. Loomis and Ekstrand (1998) had the same finding.

Stevens et al. (1991) analyzed how existence values for wildlife preservation behave over time. Using panel data, they found that despite the relative stability of existence values, many individuals responded to contingent valuation by bidding their fair share or largely for the satisfaction of being able to contribute to a good cause. The values obtained may thus represent a lower bound estimate of existence value; but then, this may or may not really be closely related to the value of the resource at all. Kotchen and Reiling (2000) analyzed how WTP for endangered species (peregrine falcons and shortnose sturgeons) is affected by environmental attitudes. They found that respondents with stronger pro-environmental attitudes have higher WTP and are more likely to provide legitimate yes/no responses. Those who have weaker environmental attitudes tend to protest the hypothetical CV scenarios.

Bulte and Van Kooten (1999) compared the benefit values for: (a) preventing a species from extinction and (b) preserving numbers above the minimum viable population (MVP) level. They contend that total WTP value may be the proper measure to use in case (a) but it is the marginal WTP that is relevant for case (b). They posited that the use of marginal values is the correct approach in CV surveys for endangered species. This was supported by Gilpin and Soulé (1986) who contend that a better approach in wildlife valuation context is to link existence value to MVP. MVP is the reference point wherein any population density less than the MVP would mean species extinction. It is therefore defined as the population that is deemed too small to ensure species survival in the long run.

5.2.2 Effect of Payment Mechanisms on WTP

A number of studies in developed countries found evidence that the payment vehicle influences WTP for public goods (Rowe et al. 1980, Brookshire et al. 1983). However, there have been mixed findings on which payment vehicle, voluntary or mandatory, is best suited in CV applications. Some studies have shown that mandatory tax is more incentive compatible than voluntary contributions or donations. The latter, though widely used and may be the only way to generate financing for some type of goods (Berrens et al. 2002, Champ et al. 1997), is considered prone to strategic overbidding as a result of warm glow and free riding. However, Ledyard (1995), in his review of this issue, concluded that although voluntary contribution mechanism is not incentive compatible, empirical evidence has consistently shown that pure free-riding occurs far less frequently than what expected utility theory predicts.

Methods have also been devised to correct for the hypothetical bias inherent in voluntary mechanisms. In an experimental context, Murphy et al. (2005) used the voluntary contribution scheme with an added feature that included a provision point mechanism (PPM) with a money-back guarantee (MBG). His results show that PPM with MBG can reduce hypothetical bias.

In some cases, respondents may resist the idea of being compelled to make the payments while others may not wish to impose a cost on those who would not otherwise contribute voluntarily (Champ et al. 1997). It is also worthy to note that the researcher has no taxing authority and this could make compulsory payments (taxes, utility bills) problematic or highly unrealistic to the respondents. Bateman et al. (1995) and Jacobsson and Dragun (2001) found that income tax in support for environmental protection had larger WTP values than donations or trust fund contributions. The landscape amenity study of Kato and Hidano (2002) also yielded significantly lower WTP values for the voluntary mechanism, which was perceived to be inequitable especially if even those who will not benefit from the resource will be made to pay.

Vehicle neutrality, on the other hand, is suggested by the results of Hackl and Pruckner (2003) when valuing health related Red Cross services. They found that WTP estimates are insensitive to payment vehicle for both spike and double-bounded models.

However, the sensitivity of WTP to payment mechanisms has not yet been tested in developing countries where income constraints could pose a significant factor on households' decision-making.

5.2.3 Scope Sensitivity of WTP for Endangered Species Conservation

The scope sensitivity issue in CV studies remains controversial. Insensitivity to scope conflicts with the rational choice behavior assumed for agents in the neo-classical economic model. Based on the assumption of non-satiation of wants, WTP is predicted to increase with increasing numbers of the (normal) commodity; it is expected also to be higher for a comprehensive good than for a subset of that good.

The critics of CV claim that stated WTP for preserving endangered species does not relate to economic choice behavior but reflects more the good *cause dump* or the *purchase of moral satisfaction* (Kahneman and Knetsch 1992). The scope or size of the project therefore would not matter.

Harrison (2002), commenting on the NOAA *blue ribbon panel* conclusion, says insensitivity to scope (*perfect embedding*) is "perhaps the most important internal argument against the reliability of the CV approach." Citing a study that shows the lack of significant differences in the WTP values to protect 2,000 migratory birds vs. 20,000 birds vs. 200,000 birds, he contends that the real problem lies with the way information is provided to the respondents. In the particular study he cited, respondents were given the approximate percentage of the total bird population to be protected, wherein the smallest and largest amounts were respectively listed as "much less than 1%" and "about 2%." It is therefore quite possible that the respondents considered the share of population as essentially the same. This observation is consistent with the point made by Carson and Mitchell (1993) that apparent scope insensitivity is primarily due to flaws in survey design.

Veisten et al. (2004) performed a scope test (internal and external) for preserving endangered species in Norwegian forests using four sub-samples of respondents and two elicitation formats (open-ended with payment card versus open-ended without payment card). Unlike most CV studies on endangered species that involved charismatic or known species, this study focused on "low-profile" species, i.e., insects and cryptogams, together with flowers and birds — this being more representative of what the authors considered a 'complex environmental amenity' with predominant passive-use values. The results show that while indeed some respondents are insensitive to scope, this is a minority group; hence, they do not significantly affect the final outcomes. Interestingly, the study found that elicitation format had a more decisive effect in that the open-ended elicitation format without any payment card resulted in more respondents not answering the WTP question or stating a possibly untrue zero WTP. Thus, it concluded that the observed insensitivity to scope is due to flaws in survey design and amenity misspecification and is thus not an inherent weakness of CVM.

Others find nothing wrong with the insensitivity to scope behavior. Rollins and Lyke (1998), for instance, argue that the observed insensitivity to scope could result from

diminishing marginal values. Hence, with successive quantities of the public good (e.g., protected areas), each additional unit put under protection would receive a positive but lower value. Income effects could be another explanation. With limited budget, optimization of spending on private and public goods is constrained (Randall and Hoehn 1996). Thus, even if the valuation is hypothetical, respondents are expected to limit their stated total WTP according to their ability to pay.

5.2.4 Extent of the Market

Aggregation of benefits for pure public good is simply summing the WTP of all agents of the relevant population, since enjoyment of the good by one agent does not necessarily preclude others from enjoying the same good (Just et al. 1982). Thus, the aggregation of individual benefits is linked to the question on which relevant population these benefits accrue. Whether benefits are confined to a certain locality, region, country, or even the world has implication on financing and provision. While relatively few studies deal with the aggregation issues, authors argue that this could be more relevant than simply refining the per-unit estimates (Smith 1993; Loomis 2000; Bateman et al. 2005).

For example, choosing a geographic area that includes beneficiaries only while ignoring the benefits that might accrue to non-beneficiaries could undervalue WTP estimates. On the other hand, assuming similar per unit benefit to the population when this is not the case would lead to overvaluation.

While there are studies in developed countries devoted to examining the extent of the market (Loomis 2000; Pate and Loomis 1997; Bateman et al. 2005), the application of CV in developing countries on the issue of spatial range of environmental goods is scant. Refining CV studies in order to adapt to the context of developing countries and to come up with reliable and credible results is evident in several studies (Whittington et al. 1992; Hadker et al. 1997; Lauria et al. 1999; Choe et al. 1996; Shultz et al. 1998; Barton 1998; Alam 2005). However, investigating the population on which to multiply these derived values is still missing in the literature.

5.2.5 Effect of Colored Pictures on WTP

Most CV studies focused on the level of information as a significant factor affecting respondents' valuation of the commodity (Samples et al. 1986; Bergstrom et al. 1990; Ajzen et al. 1996). Less attention has been given to the effect of visual presentation (i.e., use of colored photographs in survey questionnaires) despite its wide recognition as a significant perception factor in other fields. Le Grange (2000) mentioned that *"...photographs hold the promise of engaging those who may be less educated or who do not speak the language of researchers…"*

Some CV researchers do try to carefully test their survey materials. For instance, undesirable reactions to the use of photographs led Shyamsundar and Kramer (1996) to drop visual aids from their survey instrument. In addition, the observation that respondents were indicating WTP out of a sense of coercion led the researchers to rephrase the valuation question in favor of eliciting willingness to accept (WTA) to forgo access to forest areas.

The use of visual aids and communication devices has been applied on mortality-risk reduction studies. For instance, Loomis and duVair (1993) evaluated the effect of alternative risk communication devices on WTP, using two versions of the CV questionnaire, which

differed in the device used to communicate risks from hazardous waste. Both risk communication devices provide WTP functions, which vary statistically with absolute risk reduction. Similarly, the study of Corso et al. (2000) shows that visual aids are value enhancing; they found significant differences in the effect of alternative visual aids on sensitivity of estimated WTP values to magnitude of mortality-risk reduction.

While the use of large and impressive photographs may be an effective means of conveying information and holding the interest in the CV interview, Arrow et al. (1993) express concern on the use of misleading photographs and suggest that all such visual information should be subjected to particular scrutiny and pilot testing. Loomis et al. (1994) similarly emphasizes the importance of empirically testing any recommendations (i.e., NOAA panel) aimed at enhancing the CV method[9].

6.0 RESEARCH DESIGN AND METHODOLOGY

6.1 CVM: Pre-survey and Survey Activities

The draft survey instrument was developed, in consultation with PEF (particularly on conservation program components), and subjected to a series of focus group discussions (FGDs). Five FGDs were carried out involving households from different communities (location, income, and occupational groups) within and outside the proposed study sites. The FGDs concentrated on getting feedbacks on various sections of the questionnaire, specifically the valuation scenario (how realistic they think it is) and their reactions to the payment vehicle (mandatory vs. donations), collection mechanism (electricity surcharge vs. other schemes), time of payment (monthly vs. annual), levels of bids, and proposed data collection scheme (personal interview vs. drop-off survey). To facilitate the discussions, the invited FGD participants were given a copy of the questionnaire in advance.

The FGDs enabled the research team to narrow down the bid levels to: PhP 10, PhP 30, PhP 50, PhP 100, and PhP 150[10]. It also established the acceptability of the drop-off technique, despite some reservations expressed by participants on this approach. The participants also clearly preferred voluntary payment, as some found the 'obligatory' element of the mandatory option objectionable. This topic generated discussions as others saw the merit of making the payment mandatory to avoid free riding by some households. For the collection mechanism, the use of utility bill was judged to have the most merit given that it covers most households, will enable monthly contributions, and has a collection mechanism already in place. Still, many expressed disagreement over the use of electric utility surcharge as the country has had a series of increases in electricity rates prior to the FGDs. (We initially decided to try the electricity bill surcharge for the pretests to validate the negative reaction toward this collection mechanism.) Various cheap talks[11] were added as well as some follow-up questions to find out reasons for their responses.

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[9] This was made after they found that the inclusion of reminders of substitute and budget constraints in the questionnaire, as suggested by the NOAA panel, did not significantly influence respondents' valuation of the benefits from reducing fire hazards to old-growth forests in Oregon.

[10] USD 1=PhP 50.

[11] Cheap talks are statements to encourage truthful responses from respondents (e.g., citing that past studies tend to overestimate WTP because of its hypothetical nature; reminding them that even if the situation is hypothetical, they should reveal responses as if they are confronted with a real situation).

After revising the survey instrument, it was pretested on 120 households in the two sites (Metro Manila and Davao Province). The pretests led the team to come up with five final bids: PhP 5, PhP 10, PhP 30, PhP 50, and PhP 100/150 for the actual survey. The choices for the collection mechanism (electricity surcharge vs. water surcharge) and payment vehicle (mandatory vs. voluntary) were still contentious based on some of the feedbacks during the pretests. As a consequence, we decided to test for both payment vehicles and collection mechanisms in the survey. In addition, we wanted to test the extent of the market (on-site vs. off-site valuation) and scope effect (regional vs. national conservation program), as well as the effect of colored photographs might make on the WTP value generated. The final research design is shown in Figure 1, with the sample size given per sub-group of respondents.

The data collection strategy adopted the drop-off approach. The purpose of the study was explained in the cover letter of the questionnaire, including a reminder that respondents have the right to refuse the survey. The drop-off approach was supplemented by personal interviews (where needed) done at the time the questionnaire was picked up. The additional personal interviews were done only when there were items with no response and when respondents may have some questions that needed to be clarified before they are able to complete the questionnaire. De-briefing letters were given to inform the respondents that different households received different WTP bid levels.

The study areas were Davao Region and Metro Manila. In Davao Region,[12] which is the seat of the Mindanao Philippine Eagle Conservation Program, three out of five cities were selected as study sites: Tagum, Digos, and Davao City. Metro Manila represents the off-site location where people from various origins and walks of life could be found, thus serving as a microcosm of the entire country. Quezon City, Pasig, and Manila, representing the most populous cities in Metro Manila, were selected as study sites. *Barangays* and subsequently households were randomly selected from these major cities. A total of 1,208 usable questionnaires were obtained from about 1,500 households covered in the survey.

The survey instrument had the following sections:

Introductory part:

This is a letter addressed to the respondents. It introduces the researcher and the purpose of the study. It also specifies the expected length of time needed to accomplish the interview and the right of the respondents to refuse to participate in the survey. Their reason for refusal was solicited.

Section 1: Environmental Concerns in Relation to Other Social Concerns

Respondents were asked about their priority concerns, of which environmental concern and endangered species conservation are included in the choices given.

Section 2: Attitudinal and Knowledge Questions

[12] Consisting of Davao del Norte, Davao del Sur, Davao City, Davao Oriental, and Compostela Valley. Samples were only taken from the first three.

This part assesses the respondents' awareness level and familiarity/knowledge of endangered species in general and the Philippine Eagle in particular.

Section 3: Valuation Questions: WTP for a Comprehensive Philippine Eagle Conservation Program

This part describes the Philippine Eagle's rate of loss, the current efforts and programs to protect it, and the success of these programs. The remaining problems/threats to the Philippine Eagle are also presented.

The respondents were then shown the two scopes/levels of the conservation scenarios.

> **Scenario I**: Comprehensive Mindanao Philippine Eagle Conservation Program
>
> The current conservation program would be expanded to cover the whole Mindanao region. This means that the current area of 300,000 hectares will be increased to about 4.3 million hectares, representing almost 80 percent of Mindanao's estimated forest areas. The conservation activities will include habitat/forest protection, in-situ breeding activities, conservation education program, and community-based (with a livelihood component) protection initiatives. These activities are expected to increase the survival rate of the Philippine Eagle from "fair" to "good".
>
> **Scenario II**: National Comprehensive Eagle Conservation Program
>
> The current Conservation Program will be expanded to cover the four regions of the country known to be habitats of the Philippine Eagle. The area to be placed under protection is close to 8 million hectares. The conservation activities will include habitat/forest protection, in-situ breeding activities, conservation education program, and community-based (with a livelihood component) protection initiatives. These activities are expected to increase the Philippine Eagle's survival rate from "fair" to "excellent".

Under both scenarios, a management group will be created, to be led by the Philippine Eagle Foundation, in consortium with the DENR, local government units, business sector, and nongovernment organizations supporting the cause. Funding of the Conservation Program's activities will come from the Philippine Eagle Trust Fund, where household payments will be channeled. All sectors in the country (government, business, nongovernment organizations) and Filipino households are expected to contribute to this Fund.

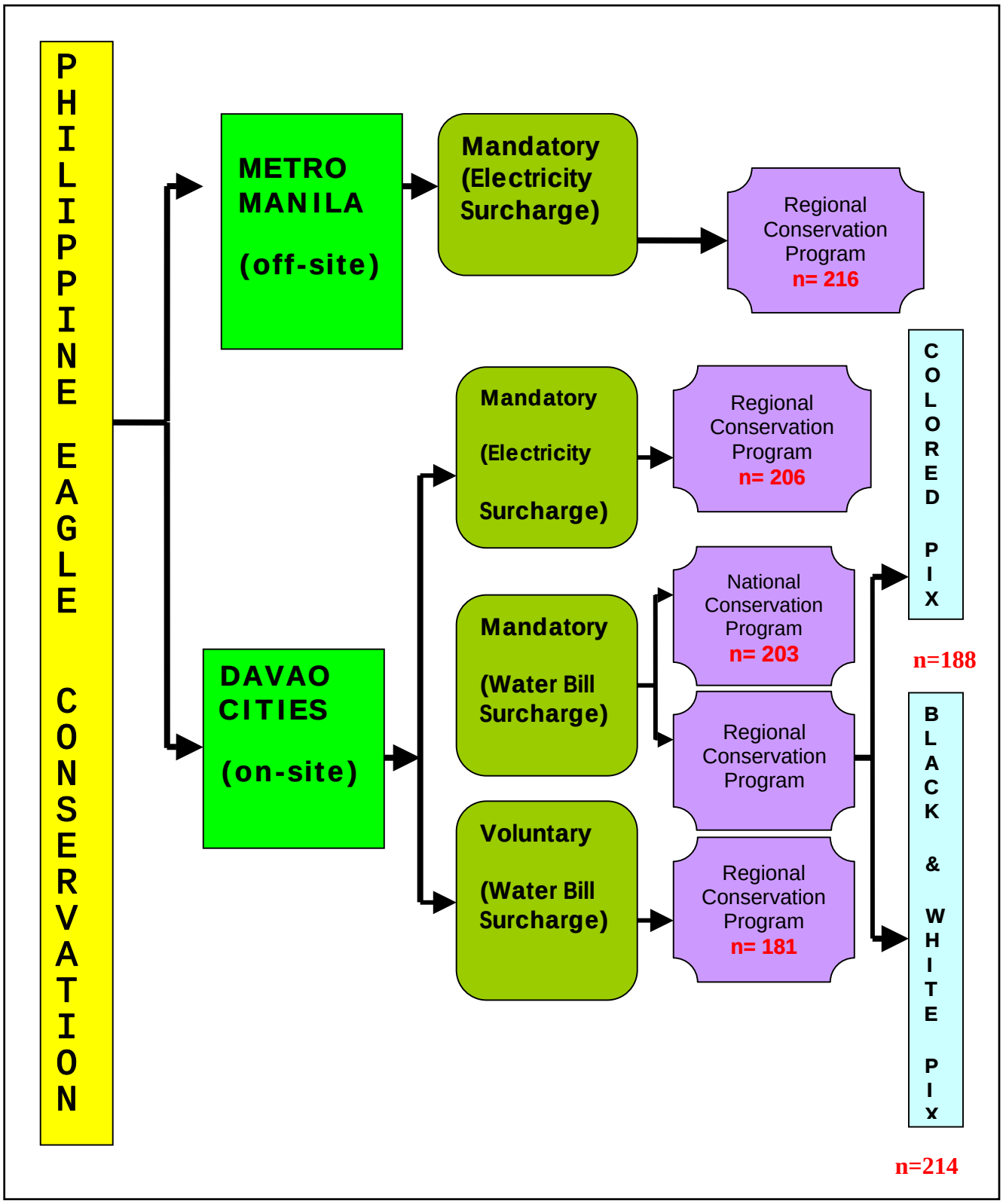

Figure 1. Research Design for the Households' WTP Survey for the Philippine Eagle Conservation Program.

Two valuation scenarios were presented to two subsets of household respondents:

For the Mandatory Payment Vehicle

"Would you vote to support the Conservation Program (scenario I/scenario II) to protect the Philippine Eagle and its habitat if it would cost your household a monthly payment of PhP _____to be added to your utility (electricity/water) bill over the next five years?"

The following was also stated: "Suppose that the Management Group and the Philippine Eagle Trust Fund will only be created if the Comprehensive Eagle Conservation Program gets the majority vote of the people. In particular, let us suppose that the Group and the Fund would only be created if 60 percent of the Filipino households would vote to support the Conservation Program, given that this would cost them some amount of money in terms of monthly contribution to be paid on top of the electricity bill. Once this majority vote is obtained, every household will be made to pay the agreed amount. Assume further that a Law will be passed to ensure that all contributions to the Philippine Eagle Trust Fund will be spent ONLY to support the various Philippine Eagle Conservation activities mentioned earlier. "

For the Voluntary Payment Vehicle

"Would you support the Conservation Program (scenario I/scenario II) to protect the Philippine Eagle and its habitat if it would cost your household a monthly donation of PhP_____ to be added to your water bill over the next five years"

Just like in the Mandatory Payment Vehicle, the Management group and the Philippine Eagle Trust Fund will be created. But unlike in a referendum decision setting, in this case "*…the program will only push through if 50 percent of the annual amount required for eagle conservation can be raised from household contributions at the end of the first year. A matching grant will likewise be raised from private donors to match household donations. Otherwise, if the program fails to meet the target, those who volunteered to contribute will be refunded through subsequent deductions in their utility bill."*

Cheap talks such as given below were added to reduce potential hypothetical bias in this part.

"The survey you are participating in today is only meant to find out about your opinion on this matter, that is, whether you will support such a referendum or not—if you are asked to make a decision.

"Past studies have found that many people say YES to a referendum in support of the proposed Program like this when they are asked of their opinion in a survey, but they would vote NO when faced by the actual situation. In other words, respondents seem to have a tendency to say they would vote for the referendum even if they do not really mean it.

"Researchers are not sure why people do this. It may be because it feels good to say yes in a survey when people do not actually have to pay. Or it could be to please the person dropping off the survey.

"Try to tell us how you would answer in an actual situation. Please say yes only if you are really willing to contribute to support the Conservation Program."

Section 4: Socioeconomic Demographic Characteristics of the Household Respondents

Variables of particular interests are income levels, age structure of household members, educational attainment and occupation of household head, asset indicators, and membership to environmental organizations.

6.2 Analytical Tools

6.2.1 Parametric WTP Estimation

Dichotomous choice WTP responses (Y) are regressed against a constant bid amount (BID) together with a vector of socioeconomic variables (X) using a logistic function (Hanemann 1989):

$$Y = \frac{1}{1 + \exp\left[-\left(\beta_0 + \beta_1 BID + \mathrm{X}'\beta_2\right)\right]}$$

The logistic function gives the probability of the individuals' willingness to purchase a particular good or service. Y is a dichotomous choice, which takes the value of 1 for a 'yes' response and 0 for a 'no' response.

Regression coefficients, β_2, β_0 and β_1, are then used to calculate mean WTPs.

To calculate the mean WTP from the logistic distribution, the formula for the mean of a non-negative random variable is used:

$$\text{Mean WTP} = 1/B_1 * (\ln (1+\exp (B_0 + \sum(B_n(Z_n)$$

.

The median is calculated by:

$$\text{Median WTP} = (B_0 + \sum(B_n(Z_n)))/ B_1$$

where B_n is the vector of coefficients, $B_1$is the coefficient of the bid variable, and Z_n is the means of the associated independent variables.

6.2.2 Non-parametric Approach

Turnbull (1976) developed a distribution-free method that eliminates the possibility of negative WTP values inherent in linear parametric models. Under this technique, the data are grouped by intervals based on bid amounts. The probability density function per bid amount, p_i, corresponds to the proportion of individuals that voted 'no' to an offered bid amount (c_{j-1}). This proportion must be less than or equal to the proportion of 'no' votes in the succeeding higher bid amount (c_j). Therefore, it provides that the estimated probability of the individuals' maximum WTP values would fall within the interval of c_{j-1} to $c_j P_i = P\left(c_{j-1} < WTP < c_j\right)$

The likelihood function can be written as:

$$L(p;N,K)=\sum_{i=1}^{M}\left[N_j \ln\left(\sum_{i=1}^{n} p_i\right)+K_j \ln\left(1-\sum_{i=1}^{j} p_i\right)\right]$$

where *N* denotes the number of individuals who voted 'no' to *cj*, *K* is the number of individuals who voted 'yes', and M is the number of bid amount used. Under this method, a monotonically decreasing probability sequence is required. This can be calculated using a simple algorithm:

$$p_i = \frac{k_i}{n_i}$$

If the data set is not monotonic, adjacent values are pooled using the formula:

$$p_i = \frac{k_i - k_{i-1}}{n_i - n_{i-1}}$$

This will permit the derivation of the probability density function and the cumulative density function. The mean WTP is calculated by multiplying the monotonic probabilities (*pi*) by the bid amounts (*cj*) [Giraud et al. 2001].

6.2.3 Adjustments for Protest Responses and Certainty Factor

Protest Response

The total number of usable questionnaires was screened for protest responses. Those who answered 'no' to the specified bid price were asked if they were willing to pay a lower amount. Those who subsequently answered 'no' were asked to give their reasons, which were used to isolate protest responses. As a general rule, those who cited reasons other than financial constraint and zero value for the good were considered protest responses. These reasons include disapproval of the payment vehicle or other components of the hypothetical conservation scenario, perception of corruption, and other related political issues associated with implementers and government in general. Twenty-six percent and 17 percent of the usable questionnaires were classified as protest for the Metro Manila and the Davao Region sub-samples, respectively. The total usable questionnaires was 172 for Davao and 159 for Metro Manila on the extent of the market sub-sample. The higher protest response in Metro Manila was expected, it being the seat of raging political problems associated with the current head of the country. Protests against the country's major electricity service provider had also occurred in the area just prior to the conduct of the study.

Certainty Calibration

Respondents were asked how certain they were of making the payment if the proposed conservation program would be implemented. The choices given were: completely sure, sort of sure, not so sure, and not sure at all. Those who answered 'yes' to WTP question but are either 'not so sure' or 'not sure at all' were re-classified as 'no' respondents. This approach is similar to the method used by Champ et al. (1997 where 'yes' respondents who expressed degrees of uncertainty to the dichotomous choice WTP question were reclassified as 'no' respondents. More (29%) Davao respondents were uncertain about their decision to pay than Metro Manila respondents (13%).

7.0 RESEARCH FINDINGS AND IMPLICATIONS

7.1 Priority Concerns of Filipinos and Attitudes toward Philippine Eagle Conservation

Economic problems (inflation or rising prices of basic commodities, economic crisis, etc.) were indicated as the top priority concern of the respondents in both study sites (Metro Manila - 49%, Davao Region - 45%). This is followed by poverty, which was ranked first by 19 percent and 18 percent of respondents from Davao and Manila, respectively (Table 3). Some Metro Manila (13%) and Davao (14%) households considered governance as the first priority. On the other hand, a significant portion of the respondents felt that all the problems posed to them are serious and should be given priority by the government. Very few respondents (less than 1%) considered environmental problem as a top priority. In fact, only 9 percent and 7 percent of Davao and Manila respondents, respectively, included environmental problem in their top three priority concerns.

Table 3. Priority Social and Environmental Problems in the Philippines, 2005.

Problem	Davao	Metro Manila
	1st priority (%)	
Problems of the country		
a. Economic (e.g., inflation)	45	49
b. Poverty	19	18
c. Education	<1	2
d. Health	-	<1
e. Crime/violence, inequality	<1	1
f. Government and governance	14	12.5
h. Environment	<1	<1
i. Terrorism	-	<1
k. Others	<1	-
Did not provide ranking/deemed many of the concerns as equally important	20	16
Environmental problems		
a. Air pollution	14.5	31
b. Water pollution	5	4
c. Solid wastes	29	28
d. Loss of endangered species	6	3
e. Deforestation	22	12
f. Traffic noise/problems	-	3
g. Soil erosion	<1	1
i. Enhanced greenhouse effect	2	2
j. Destruction of coral reefs	1	-
|Did not provide ranking/deemed many of the concerns as equally important	20	16

When asked of their topmost environmental concerns, Manila respondents mostly cited air pollution (31%) and solid wastes (28%). In Davao, solid wastes (29%) was indicated as number one, followed by deforestation (22%) and air pollution (15%). Less than 1 percent

of respondents from both Metro Manila and Davao chose endangered species conservation as a paramount environmental problem. However, it was included in the top 10 environmental priorities by 46 percent of respondents in Davao and 26 percent in Metro Manila.

Overall, the survey shows that environment concerns, specifically endangered species conservation, have a low priority among Filipino households. The poor economic performance of the country and rising poverty level for many years now have led Filipinos to clamor for economic reforms to address poverty/equity as well as concerns on political governance. Among the environmental concerns, those closely linked to human welfare like pollution, solid wastes, and deforestation are deemed more important than animal protection, for example. This is consistent with results obtained during the FGDs wherein human-welfare related concerns were viewed far more important than concerns for the welfare of endangered species in the country.

The same conclusion can be drawn by looking closely at the information in Appendix Table 1 obtained from Davao households using mandatory water bill surcharge as the payment mechanism. The respondents were classified into two groups; each group was given a different scale of the conservation program (national vs. Mindanao conservation program). As shown, the top three social problems are economic, good governance, and poverty. Environment remains of low priority.

Among the environmental problems, deforestation was the primary concern of households in Davao, followed by solid wastes and air pollution. Endangered species conservation ranked fourth to fifth only. When probed further, the Philippine Eagle emerged as the priority endangered species, followed by marine turtle. Dugong was a far third. It is highly plausible that the respondents chose the Philippine Eagle because the study was about it. The problem on anchoring is one aspect that should be rectified by similar studies in the future.[13]

How do Filipinos view endangered species conservation as an environmental cause?

Consistent with the information obtained from Table 3 and Appendix 3, Table 4 shows that the majority of the respondents view other environmental concerns as more important than endangered species conservation, with 58 percent saying that the government should invest more on helping people than on the protection of endangered species. Still, it is worth noting that 90 percent viewed it as everybody's duty to protect plants and animals to ensure their continued existence, and that 84 percent agreed that poaching of wildlife species should be punishable by law. Despite this strong sentiment, only 54% agreed that citizens should contribute cash money for this cause (70% in Metro Manila and 40% in Davao). Only a few (22%) favored the use of tax money to fund this cause.

[13] It is possible not to reflect in the title that the study is particularly about the Philippine Eagle, but endangered species conservation in general, since, indeed, the latter is the real focus of the study.

Table 4. Attitudes and Perceptions of Filipinos on Endangered Species Conservation, 2005.

Attitude and Perception	Agree and Strongly Agree Response (%)		
	Manila n=159	**Davao** n=172	**Pooled** n=331
a. The government should raise more funds to deal with environmental programs in this country.	83	77	80
b. There are more important environmental concerns than endangered species conservation.	71	67	69
c. Poaching of wildlife species should be punishable by law.	84	83	84
d. It is everyone's duty to ensure that plants and animals as we know them today will exist for mankind in the future.	92	88	90
e. Citizens should contribute to endangered species conservation by making cash donations to this cause.	70	40	54
f. The government should raise taxes to pay for more endangered species conservation.	19	25	22
g. The government should invest in helping people before it spends money on endangered species.	65	52	58
h. Households who earn more income should pay higher taxes in order to pay for endangered species conservation.	53	52	53
i. Endangered species conservation should not be a priority concern of the government.	12	28	20
j. Endangered species are important even if I don't get to see or interact with them	77	76	76

Are Filipinos familiar with their national bird and its plight?

Filipinos have a high degree of familiarity with the Philippine Eagle and its endangered status, including some of the recent development on this species (e.g., naming a Philippine Eagle after the country's Vice President and the captive breeding program for this species (Table 5). The majority of household respondents from both study sites knew that the Philippine Eagle is the country's national bird. As can be expected, more households in Davao had seen a live eagle (85%) and visited the Philippine Eagle Center run by PEF (76%) compared with only 59 percent and 16 percent in Metro Manila, respectively. However, a greater number (83%) of respondents in Metro Manila were well acquainted with the status of Philippine Eagle as an endangered species than in Davao (60%). This information was most likely obtained through the media. Interestingly, many (40%) in Davao did not believe that the Philippine Eagle is threatened. It is possible that the greater visibility of the eagles in the area accounts for this belief.

Table 5. Knowledge of the Philippine Eagle, Metro Manila and Davao Region, 2005.

	Davao	**Metro Manila**	**Chi^2**	**Sig**
Seen a live Philippine Eagle	146 (85)	94 (59)	30.3	0.00***
Believe the Philippine Eagle is threatened	103 (60)	132 (83)	18.7	0.00***
Visited the PEF Center	130 (76)	26 (16)	116	0.00***
The Philippine Eagle is the national bird	156 (91)	133 (84)	2.75	0.10*
First captive-bred eagle is Pag-asa	142 (83)	90 (57)	25.1	0.00***
An eagle was named after Vice President Noli De Castro	138 (80)	113 (71)	3.47	0.06*

Note: Figures in parenthesis are percent of total.

7.2 Willingness to Support Philippine Eagle Conservation Program

Will the low priority given by the respondents to environmental concerns in general and endangered species conservation in particular be reflected in their willingness (or lack thereof) to support an endangered species conservation program, such as the one for the Philippine Eagle? The answer appears to be affirmative as shown in Appendix 7 and Figures 2a-2e.

(Note: in the succeeding discussion, the bar figures provided/cited seem not to offer substantiation of the results because they don't readily indicate the percentages quoted in the text)

Twenty-six percent of on-site and off-site respondents who received different bid levels were willing to support the proposed conservation program. In general, Figure 2a shows that a greater percentage of Metro Manila respondents (30%) were willing to pay for the program compared with Davao respondents (23%) across all bid levels. This could be due to the fact that the Philippine Eagle is the national bird and is thus considered a national good.

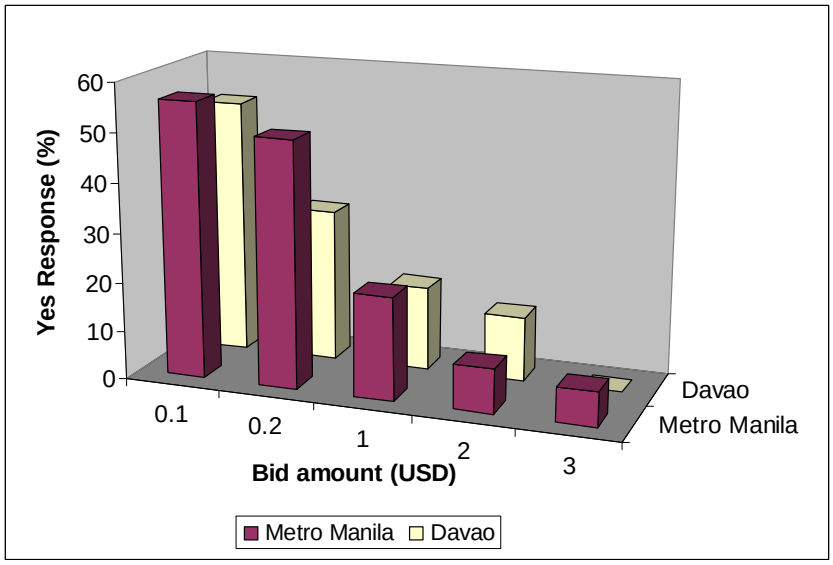

Figure 2a. Distribution of 'Yes' Responses per Bid Level by Extent of Market.

Similarly, Appendix 7 shows that only 26 percent gave their overall support for the scope of conservation (regional vs. national program). Except for the highest bid, more Davao respondents indicated willingness to pay for a national rather than just a regional eagle conservation program (Figure 2b). This could imply that respondents wanted an expansion of the current conservation efforts to Leyte and other parts of Luzon known to be habitats also of the Philippine Eagle.

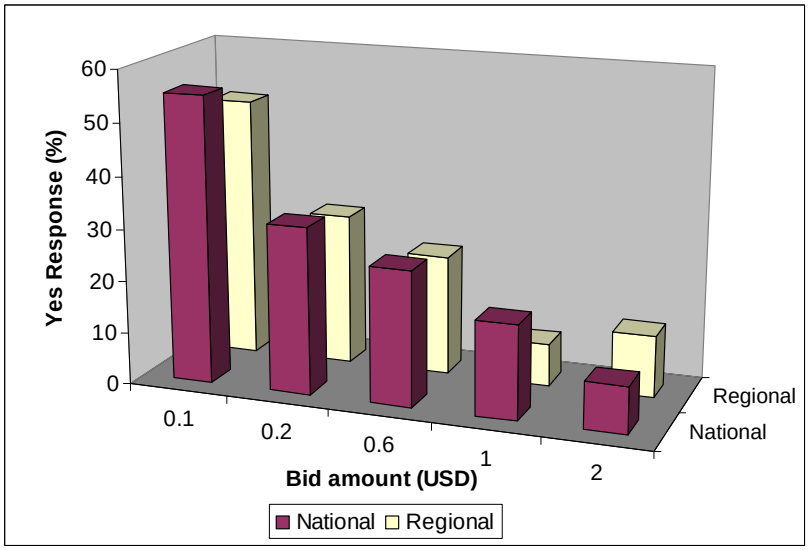

Figure 2b. Distribution of 'Yes' Responses per Bid Level by Scope of Market

With regards the payment vehicle, less than a fourth (23%) of the respondents expressed their support for the Mindanao Comprehensive Eagle Conservation Program. While it appears in Figure 2c that the majority of respondents prefer the voluntary over mandatory scheme for some bid levels (USD 0.2, USD 1, and USD 2), Appendix 7 shows that the same percentage (23%) of respondents in each sample expressed support to the program across all bid levels.

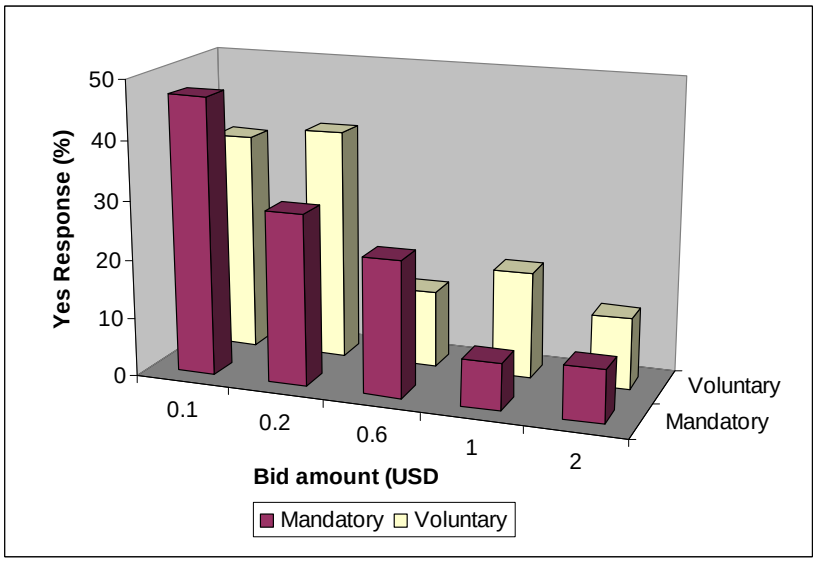

Figure 2c. Distribution of 'Yes' Responses per Bid Level by Payment Vehicle

The sub-sample on collection mechanism generated only 24 percent affirmative WTP responses for the program (Appendix 7). In general, given the different bid levels, a slightly higher number of respondents in the electric bill sample were willing to pay compared with the water bill respondents (Fig 2d). As discussed earlier, both collection mechanisms were controversial due to pending tariff rate increases.

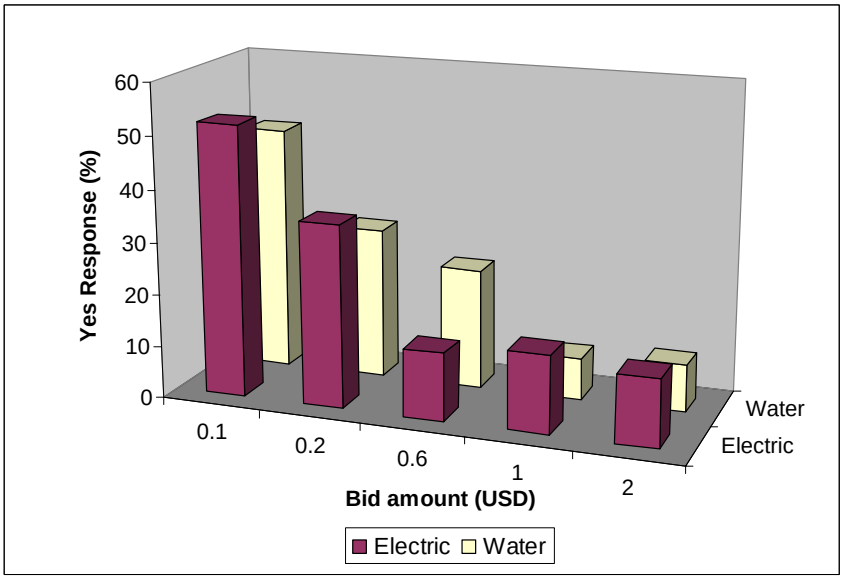

Figure 2d. Distribution of 'Yes' Responses per Bid Level by Collection Mechanism

With regards presentation formats, those who received questionnaires with colored pictures registered a higher percentage of respondents who were willing to support the program than those who were given questionnaires with black and white pictures (Fig. 2e). Overall, 28 percent of all respondents in this sub-sample were willing to pay for eagle conservation (Appendix 7). This indicates that presentation formats affected the respondents' decision whether or not to support the regional eagle conservation program.

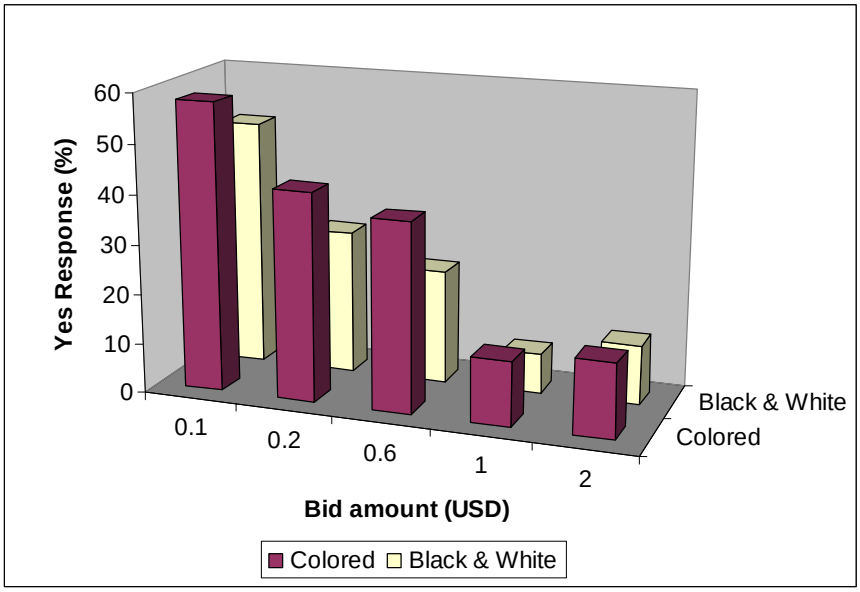

Figure 2e. Distribution of 'Yes' Responses per Bid Level by Questionnaire Packaging

In general, the demand behavior of respondents for this 'environmental good' was consistent with the demand theory for any normal economic good. This means that the proportion of those who are WTP/saying 'yes' to the 'environmental good' decreases as price/bid level[14] increases. Overall, the proportion of those willing to support the program ranged from 23 percent to 30 percent only, with slight variations across sub-samples of household respondents (see Table 8).

The data clearly show that the referendum, which asked if Filipinos would vote to support the proposed conservation program, did not pass — bad news for those promoting conservation of endangered species in the country.

Why are the majority of household-respondents not willing to support the proposed Philippine Eagle Conservation Program?

To assess if the hypothetical nature of the product was influencing the WTP decision, respondents were asked a series of follow-up questions on the various aspects of the conservation scenario.

It appears that the description provided in the survey instrument on the status of the Philippine Eagle and the threats it faces was found believable by 80 percent of Metro Manila respondents but 60 percent only of the Davao respondents. As noted earlier, the closer interaction of Davao residents with the Philippine Eagle seems to convey to some that the eagles' existence is not really under threat. Also, some respondents opined that the implementation of this program would be hindered by corruption. Similarly, 65 percent and 70 percent of the Metro Manila and Davao respondents, respectively, found the proposed conservation program credible; some indicated that they see no reason to doubt the scientific soundness of the various components and their importance to the conservation program. Appendix 4 provides more details on the responses on this topic by the different sub-groups of respondents.

On the credibility of the proposed institution to spearhead the conservation program, about 60 percent for both Metro Manila and Davao respondents believed that the PEF is the best organization for this task, given its experience. Those who expressed doubt on PEF's capacity cited as reasons its limited manpower and support base in the entire island of Mindanao. They would like the program to be managed by a government agency.

More than half (about 60%) of the respondents though did not like the payment vehicle and the proposed collection mechanism (i.e., a surcharge to the utility bill). The main reasons given are: (1) they doubt that the utility company would agree to making the collection for and in behalf of the conservation program without charging a fee and because it has no legal mandate to do so; and (2) they were unwilling to have their utility bill increased further (either due to income constraint or lack of trust on the utility company).

Except for problems associated with the payment vehicle (which most probably reflects also the problem with making the payment per se, in general), it appears that the the majority of respondents found the overall conservation scenario credible. If the scenario is deemed credible enough, what then are the major reasons for the respondents not wanting to support the conservation program?

[14] The five bid levels were derived from a series of focus group discussions with various groups of people; these were subsequently randomly assigned to the household respondents.

The main reason is income constraint (62%), which is consistent with the respondents' prioritization of the country's problems as discussed in the earlier section (Table 6). Many (56%) opined that asking the poor to pay for/contribute to this program would be too much of a burden to them[15], a reason closely related with the income constraint. A few (11%) said there are more pressing concerns affecting human beings that should be given priority over concerns for animals. Those who expressed distrust on the government and implementers of the program also cited this as main reasons for not paying. The latter answer is considered a protest bid, and hence, was dropped from the analysis.

Table 6[16]. Reasons for 'No' Response across Location, Manila and Davao Region, 2005.

Reason for 'No' Bids	Manila	Davao	All
1. Cannot afford the amount	63 (60)	75 (64)	138 (62)
2. Philippine Eagle conservation is not worth doing	2 (2)	1 (1)	3 (1)
3. Other species are more important than the Philippine Eagle	12 (11)	3 (2.5)	15 (7)
4. Majority of the poor will be affected	61 (58)	64 (55)	125 (56)
5. Prefer giving money to humanitarian cause	11 (10.5)	14 (12)	25 (11)
6. Only people who directly benefit from eagle conservation should pay		1 (1)	
7. Higher income group should pay more		15 (13)	
8. Other reasons	6 (6)	6 (5)	12 (5)
Willing to pay lower amount (for 'no' bids)	40 (38)	34 (29)	74 (33)
Average lower amount	19.87	13.19	16.72
Unwilling to pay any lower amount	65 (62)	83 (71)	148 (67)
Reasons for unwillingness to pay a lower amount			
1. Cannot afford to pay the amount	42 (65)	39 (50)	81 (55)
2. Only people who directly benefit from eagle conservation should pay	5 (8)	4 (5)	9 (6)
3. Only those with higher income should pay	15 (23)	27 (32.5)	42 (28)
4. Others	7 (11)	7 (8)	14 (9)

Note: Figures in parenthesis are percent of total.

The main reasons of the respondents who expressed support for the conservation program are mainly (Table17): (a) The Philippine Eagle is the national bird (symbol of the country) and therefore must be protected (70%); b) This effort could lead to the protection of other endangered species in the country (50%); and c) The comprehensive program will be effective in saving the Philippine Eagle (40%).

15 In fact, the survey instrument indicated that the very poor will be exempted from the program.

16 Appendix 5 shows the reasons for 'no' response for the various sub-groups of respondents.

Table 7[17]. Reasons for 'Yes' Response across Location, Metro Manila and Davao Region, 2005.

Reason for 'Yes' Bids	Metro Manila (%)	Davao Region (%)	All (%)
1. The Philippine Eagle is a symbol of the country	68	72	70
2. The comprehensive conservation program can protect the Philippine Eagle	38	41	40
3. Trust in the leadership of the Philippine Eagle Foundation	38	33	36
4. Filipinos should do their share in protecting the national bird.	41	41	41
5. Effort will lead to protection of other endangered species	53	46	50
6. Others	2	8	5

7.3 How Much are Filipino Households Willing to Pay?

The mean WTP for the various sub-groups of household respondents was estimated using the analytical techniques given in section 6.2.1 for parametric approach following the logistic distribution formula for the mean of a non-negative random variable used by Hanemann (1989) and the non-parametric technique by Turnbull (1976). The latter was also used to estimate the median WTP. Table 8 shows the mean and median WTP per month of households who responded 'yes' to the conservation program. The WTP estimates using the parametric and non-parametric approaches are close to each other, implying robustness of the estimates.

Table 8. Willingness to Pay Estimates using Parametric and Non-parametric Approaches.

	Parametric Restricted Mean WTP	Non-parametric Turnbull Mean (Median)
By Location (% Yes)		
Manila (30)	34	22 (27)
Davao (23)	26	17 (18)
All (26)	30	19 (23)
By Scope (% Yes)		
National (29)	25	18 (23)
Regional (24)	21	15 (19)
All (26)	23	17 (21)
By Payment Vehicle (%Yes)		
Mandatory (23)	20	14 (18)
Voluntary (24)	26	16 (22)
All (26)	22	15 (20)
By Collection Mechanism (%Yes)		

[17] Reasons given for the 'yes' response for the different sub-groups of respondents are shown in Appendix 6.

Electric (24)	25	17 (22)
Water (23)	20	14 (18)
All (24)	22	16 (20)
By Photograph Presentation (%Yes)		
Colored (33)	31	22 (28)
Black & white (24)	21	15 (19)
All (28)	26	18 (23)

For Metro Manila respondents, the mean WTP is PhP 34 per month as surcharge to the electricity bill; the Davao respondents are willing to pay PhP 26 per month. A statistical test (log likelihood ratio test) shows no significant difference in these values, showing that on-site and off-site communities have the same WTP for this environmental good/cause, regardless of whether the conservation program is going to be implemented only in Mindanao. This could also be interpreted to mean that the conservation program is viewed as a national 'good,' rather than a local one.

By income group, the non-parametric estimates for the pooled sample of Davao and Metro Manila respondents show that willingness to pay increases with income. The WTP is PhP 23/month, PhP 22/month, and PhP 14/month for high, middle, and low-income groups, respectively. This is consistent with the 'yes' responses to the WTP question for Philippine Eagle conservation, which decline with income. Parametric WTP estimates by income level for mandatory vs. voluntary, water vs. electric bill, national vs. regional, and colored vs. black and white are given in Appendix 7.

The above observations are likewise consistent with the scope test results for the conservation good. The test of significant difference reveals similarity in the mean WTP value for the national conservation program (PhP 25/month) and the regional conservation program (PhP 21/month). This insensitivity to scope implies that household respondents are willing to pay a certain minimal amount for conservation of endangered species; it is up to the program implementers to decide on the scale of activities to be supported by the collected amount. Moreover, the respondents are willing to spare so much amount only and would not likely pay more for a greater scope of the environmental good.

Regarding payment vehicle, the voluntary mean WTP of PhP 26 monthly, though higher than the PhP 21 per month for mandatory payment, is also not significantly different. Again, this indicates that Filipinos are only willing to commit a given sum of money to support this cause and are indifferent in the way the payment is to be made, whether mandatory or voluntary.

Of the two utility bill surcharges considered, the mean WTP for electricity surcharge is PhP 25 per month while it is PhP 20 per month for water surcharge. Just like in the other comparative analysis of mean WTPs, the log likelihood test of statistical difference indicated no significant difference between the two utility bill payment schemes. This means that it does not matter if collection will be made through the water bill or electricity bill. In the final analysis, however, what will matter is where potential revenue collection will be greater. This would tend to favor electricity bill collection because electric service covers a greater area than the water service.

Does the use of colored photographs affect the household-respondents' willingness to support the program and, consequently, their WTP amount?

The statistical test shows it does. Thirty-three percent of the household respondents who received survey instruments with colored photographs said 'yes' to the conservation program while only 24 percent of respondents with black & white photographs gave affirmative answers. Also, the mean WTP of those with colored pictures is PhP 31/month, which is significantly higher than the PhP 21/month WTP from the other group -- a difference of about 48 percent. This implies that 'packaging' of the good tends to be value adding and influences the overall perception on the importance of the good being evaluated.

The findings further suggest that fund-raising efforts to mobilize contributions to support conservation goals will meet greater success if the 'good' is presented in color. The study was not able to probe in-depth the reasons for the value-adding element of the use of colored photographs but this can be subjected to further analysis using FGDs in future research, preferably as a pre-survey activity, which was also suggested in the NOAA Panel Recommendations on CVM Guidelines (1993).

Moreover, while data collection can be less costly using black & white photographs, this could result in underestimation of the value of the environmental good, particularly when the use of colored photographs, being a closer approximation of reality, would lead to the revelation of the good's truer value.

The factors influencing the decision to pay were determined using the logistic regression model. The results for the sub-groups used in the on-site vs. off-site comparison are given in Table 9. As shown, bid levels, income, and gender have significant effects on the WTP of household respondents from Davao Region, with males being more likely to pay for the program than females. Income is likewise the only significant variable. For the various sub-groups analyzed in this project, only income and bid levels significantly affected the WTP decision. These variables exhibit theoretical validity as both are shown to be a decreasing function of willingness to pay.

Table 9. Determinants of WTP for Davao (on-site) and Metro Manila (off-site), 2005.

Variable	Davao Region (on-site)	Metro Manila (off-site)	Pooled
Bid	-.0238825***	-.0257912***	-.0251625***
	(-4.20)	(-4.89)	(-6.50)
Age	-0.0076785	-0.0154097	-0.0111035
	(-0.45)	(-1.09)	(-1.04)
Gender	.715139*	0.495512	.5989815**
(male=1; 0 otherwise)	-1.65	-1.16	-2.03
Hhy	.0000324*	0.00000814	.0000195*
	-1.9	-0.5	-1.66
Constant	-0.4878993	0.7447976	-0.3168919
	(-0.60)	-1.01	(-0.57)
LR chi2 (4)	30.52	39.24	70.1
Prob>chi	0	0	0
Pseudo R square	0.1676	0.2098	0.1889

* - significant at 10%; **- significant at 5%; ***- significant at 1%

7.4 Benefit Aggregation and Comparison with Cost of Conservation

Earlier it was mentioned that the referendum did not pass since less than 60 percent of the respondents voted to support the proposed conservation program; in fact only 23-31 percent said 'yes' to the program (Table 8).

This section looks into the question of whether or not the proposed conservation program will pass the benefit-cost criterion, on the assumption that only those who said 'yes' would in fact pay for the program. In other words, ***will the benefit derived by this segment of the populace exceed the cost of the Philippine Eagle Conservation Program?***

Table 10 presents the basic data used for this analysis and the resulting estimated values. The analysis adopts two sets of assumptions: (1) only those from the Davao Region households would pay for the conservation program and (2) the relevant households from the whole country will pay. The survey data reveal that on the average, 26 percent of the household-respondents for both Metro Manila and Davao Region were willing to pay a mean WTP of PhP 30 per month (or PhP 360 per year) as a surcharge to their electricity bill to support the Mindanao Comprehensive Philippine Eagle Conservation Program.

Table 10. Benefit-Cost Comparison, Proposed Mindanao Comprehensive Philippine Eagle Conservation Program, 2005.

Aggregate Benefits and Costs	Davao Region	Philippines
Number of households (2005)	1,067,764	17,571,495
Percentage of households with electric connection (2004)	65%	87%
Percentage of respondents willing to pay (Pooled data based on Davao and Metro Manila respondents)	26%	26%
Mean WTP per month (PhP)	30	30
Mean WTP per year (PhP)	360	360
Potential total benefits (WTP) per year	64,962,762	1,430,881,981
Cost of conservation per year (annualized value using 4% real discount rate, PhP)	139, 588, 774	139,588,774
Potential net benefit per year (PhP)	-74,626,012	1,291,293,207
Benefit-cost ratio	0.46	10.25

The estimated potential benefits (aggregate WTP) from those who said 'yes' to the program amount to PhP 64.9 million for Davao Region only, or up to PhP 1.43 billion, if the whole country is considered as the relevant population. This assumes that only 26 percent of the households will actually be willing to pay.

The simple comparison of benefits and costs shows that the benefit-cost criterion would not be met if the benefit would be estimated for Davao Region only. Significantly, a

very high benefit-cost ratio of about 10.25 is realizable if the relevant population would be the entire country.

Disaggregating Davao Region and the whole country by income level (high, middle, and low) enabled the estimation of the willingness to pay per group (Table 11). The total benefits summed across income groups fall short of the conservation cost if applied only for Davao Region. However, benefits are nearly eight times the projected cost if they include the whole country.

Table 11. Benefit-Cost Comparison by Income Level, Proposed Mindanao Comprehensive Philippine Eagle Conservation Program, 2005.

Aggregate Benefits and Costs	Davao Region	Philippines
Number of households (2005)	1,067,764	17,571,495
Percent (%) of HH per income group		
- high income	10	11
- middle income	53	46
- low income	37	43
Percent (%) of respondents willing to pay		
- high income	22	30
- middle income	30	29
- low income	13	21
Mean WTP per year (PhP)		
- high income	384	276
- middle income	240	264
- low income	120	168
Potential Total Benefits (WTP) per year (PhP)		
- high income	9,444,432	162,660,032
- middle income	40,676,683	621,785,484
- low income	6,101,502	264,086,918
Total (PhP)	**56,222,618**	**1,048,532,435**
Cost of conservation per year (annualized value using 4% real discount rate, pesos)	139,588,773	139,588,774
Potential net benefit per year (pesos)	-83,366,156	908,943,661
Benefit-cost ratio	0.40	7.5

One of the analyses done in this project indicated that there is no significant difference in the WTP values of on-site and off-site household-respondents. This implies that the geographic extent of the market could indeed be national, and probably something that is to be expected a priori — the Philippine Eagle being the national bird. If the country will be used as the project area, then the conservation program is worth undertaking. It is to be noted that even if only a tenth (a very conservative estimate) of those who said 'yes' would end up paying, the conservation program would still pass the benefit-cost criterion.

One could easily point out that the cost of collecting the Fund has not yet been taken into account. However, even if the cost of the conservation program is assumed to increase

several folds (anything less than 10X or 8X), the conservation program could still make it in terms of efficiency.

One could also design a fund-raising program to target only major cities and it is likely that funds could be raised, even if the WTP per household is small. This is because while the individual household is willing to pay a low amount of less than a dollar per month, the aggregate potential amount of revenue that could be raised can be substantial and could already pay for a big part (if not all) of the cost of the proposed endangered species conservation program.

8.0 CONCLUSIONS AND POLICY RECOMMENDATIONS

Overall, the study showed that funds may be raised for endangered species conservation activities by mobilizing citizens' willingness to pay for the Philippine Eagle Conservation. This is despite findings that environmental concerns in general and endangered species conservation in particular are not priority concerns among Filipinos.

The aggregate benefits of conservation turned out to be 10 times greater than the cost of conservation at the national scale. This calculation includes the provision of a big allowance for cost of collection (not included in the cost calculation) and the possibility of targeting only the major cities in the country for such fund-raising efforts. Measures to tap this potential should be explored by conservation groups, especially since the study indicated a high level of awareness among Filipinos of the endangered status of the Philippine Eagle as well as a high level of knowledge and appreciation of its importance to society.

The above main result was achieved despite the following observations:

- Only a small percentage of the population is willing to pay. The referendum on mandatory payment presented to close to 1,300 households in Davao Region and Metro Manila obtained a vote ranging from 23 percent to 31 percent only of the household-respondents. Only 24 percent of the close to 200 household respondents expressed willingness to donate to support a similar program, even if the payment scheme would be voluntary.

- The high proportion of "no" response is mainly due to income constraint and concern for the poor who will be affected by the mandatory scheme, and the belief that humanitarian concern should be given higher priority over concern for animals. The lack of belief on the willingness of the utility company to accept the collection responsibility is also a major concern for many of the respondents. A few expressed the belief that the money will end up being used for a different purpose, given the reported corruption in government agencies.

- The parametric mean WTP values are generally small, ranging from PhP 20 to PhP 34 per month as surcharge to the utility bill; the non-parametric mean is even lower at PhP 14-PhP 22 per month. There are slight variations in the mean WTP by scope of market (Davao vs. Metro Manila); by scope of the conservation program (national vs. regional/Mindanao); by payment vehicle (mandatory vs. voluntary), and by collection mechanism (water utility surcharge vs. electricity utility surcharge), but the differences are statistically insignificant.

The results also point out that the households' willingness to pay is insensitive to the scope of the program, mode of payment, and payment vehicle. The lack of significant difference between on-site and off-site respondents also implies a wider scope of market for the good -- the Philippine Eagle being the national bird. Interestingly, the use of colored photographs tends to have a value-adding effect on the WTP for the environmental good. This point to the importance of packaging the environmental good and indicates that the respondents' appreciation of the environmental good can be heightened by visual presentation. A more in-depth analysis of the reasons for value-enhancing effects is recommended.

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APPENDIX 1
The Comprehensive Mindanao Philippine Eagle Conservation Program[18]

To abate habitat loss, bolster the wild population, and protect breeding pairs and ensure the survival and productivity of the Philippine Eagle on Mindanao Island, five mitigation techniques are being proposed, each having a set of activities to be conducted within a span of 10 years. This approach would conserve four major forest blocks in Eastern, Central, and Southern Mindanao (Appendix Table 1) along with eagle nest sites and territories found there. Combined, these forest blocks would cover 4,275,084 hectares of forest, which is almost 78 percent of the total forest cover (5,470,302.00) for Mindanao Island as of the 1997 spot mapping data of DENR.

Appendix Table 1. List of Major Forest Blocks Targeted for Preservation and Management in Mindanao Island for the Next 10 Years.

Forest Block	Province	Forest Cover (ha)	Total per forest block (ha)
Eastern Mindanao Corridor	Agusan del Sur	674,922	2,173,053
	Agusan del Norte	192,399	
	Surigao del Sur	322,600	
	Surigao del Norte	152,329	
	Davao Oriental	315,502	
	Davao del Norte	515,301	
Mount Apo Range	Cotabato Province	506,618	1,021,919.00
	Davao City/Davao del Sur	515,301	
Central Mindanao	Bukidnon	493,383	675,427
	Misamis Oriental	182,044	
Mount Busa and Sarangani	South Cotabato/Sarangani Province		404,685.00
Total Area			**4,275,084**

The plan's population augmentation component will also result in the soft release (i.e., hacking) of five eaglets at Mount Apo Natural Park where a semi-permanent release site (i.e., hack site) is being maintained. One eaglet will be released every two years. Once each eaglet has learned to hunt on its own (this can last at least two years), it will be translocated to suitable habitats elsewhere in Mindanao. Below are the major mitigation techniques.

A) Education – the education component of this 10-year program will implement problem-specific education projects (i.e., projects to discourage deforestation, hunting and shooting, and irresponsible use of forest resources) to resolve direct conflicts between humans and eagles. These specific projects are:

1. Teacher's Education Project: change attitude and create awareness on the youth
2. Broadcaster's Education Project: change public attitude through broadcast media
3. Upland Hunter's/Gatherer's Education Project: reduce shooting or trapping (whether done accidentally or deliberately) of eagles

[18] Designed by scientists of the Philippine Eagle Foundation.

4. Forest Land-user's Education Project: increasing awareness of the potential disturbances brought about by forest exploitation or land-use (e.g., logging, mining) that may affect the eagles.

B) Habitat Preservation –the eagle areas will be declared as critical habitats, municipal or provincial wildlife sanctuaries, critical watersheds, or protected areas.

This technique will involve field research to gather ecological information on which to base management plans for eagle habitats. Activities toward the declaration of forest habitats as protected (e.g., critical eagle habitats, municipal watersheds, ancestral domains, protected areas, or whichever is appropriate) will also be included.

To sustain research and monitoring and to regulate, if not deter, human disturbance within these sites, the capability of parabiologists, Regional Eagle Watch Teams, and LGU personnel will be strengthened. The parabiologists are local people trained to gather field data.

C) Population Augmentation – restocking or release of captive-bred birds to become surplus birds that will replace old or mature individuals that have died.

The main activities include: a) breeding through natural pairing techniques and cooperative artificial insemination; b) rearing in isolation; and c) hacking. Release of birds into the wild will be monitored closely to learn more about the behavior of the Philippine Eagle and to ensure its protection.

D) Limiting or Modifying Activity and Development – restrictive strategies to mitigate impacts from numerous types of development and human activity (e.g., logging and mining).

E) Declaration of Eagle Habitats as Protected Areas at Different Scales

The Philippine Eagle Foundation is working to conserve the Philippine Eagle through three levels of species conservation targets, namely: individual eagles, nesting territories, and home ranges. The declaration of nesting sites/territories as critical habitats at the local and national level seeks to protect important breeding grounds. The Philippine Eagle shows strong nest site fidelity (i.e., nesting on the same place and sometimes on the same tree for long years). Installing legal protection for nesting sites and implementing a sound management plan for these sites, which often overlap with human communities, are therefore important.

APPENDIX 2

Box 1: Assumptions for the Cost Estimation of the Comprehensive Mindanao Philippine Eagle Conservation Program[19]

Area Assumptions:

1. 10 new protected areas (PAs) will be established in the Mindanao region.
2. Each PA averages 50,000-60,000 hectares, covering 6-10 communities/sitios.
3. The habitat space requirement for a pair of eagles is 17,000 hectares.

Cost Assumptions:

1. The estimated cost of PA establishment is USD 20,000. This amount includes community education, advocacy, meetings, and site characterization until a PA bill is achieved.
2. For livelihood support, PhP 10 million/PA per year is needed over a period of three years.
3. Site development is estimated to cover 2,400 hectares per PA (buffer zone). This zone needs rehabilitation and development. The cost is placed at PhP 48 millions/PA or PhP 20,000/ha (DENR figure).
4. Pre-release cost is PhP 5 million (10 sites at PhP 0.5 million/site) for 10 years; Post release monitoring is PhP 4 million/year for 10 years.
5. Survival: 2 out of 10 eagles in the wild (w/o human intervention); increasing the area under protection increases the chances of survival to 60 percent.
6. Critical habitat area: 6 critical habitat/forest blocks or a total of 24 critical habitats ; 2-3 sitios compose each critical habitat; livelihood support would be PhP 200,000/community or sitio over 3 years.

Project Outputs

1. A total of 4,275,084 hectares of forests are protected at different scales.
2. Nesting sites/territories inherent within these forest blocks are declared as critical habitats at the local and national level.
3. Ten captive-bred eaglets are released into the wild.
4. There will be better understanding of the Philippine Eagle's ecology and the factors limiting population numbers within four major forest blocks.
5. More breeding pairs are secured and breeding success is ensured.

[19] Based on discussions with PEF scientists.

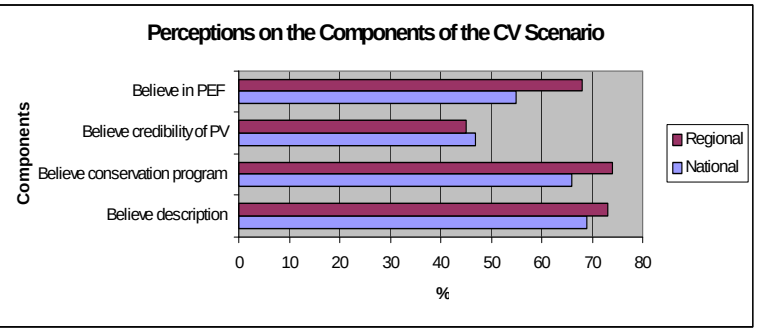
APPENDIX 3
Social, Environmental, and Endangered Species Priority Concerns

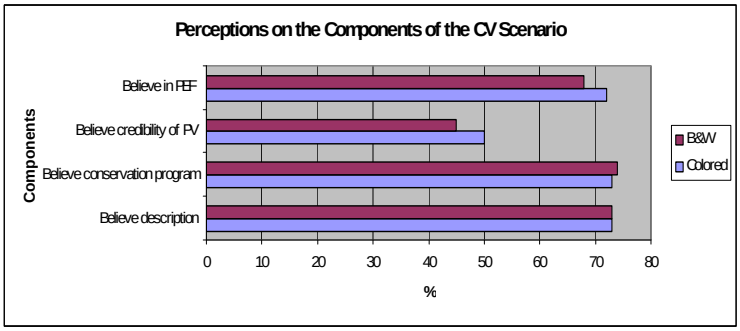
Appendix Table 3a. Priority Concerns of Davao Residents, 2005.

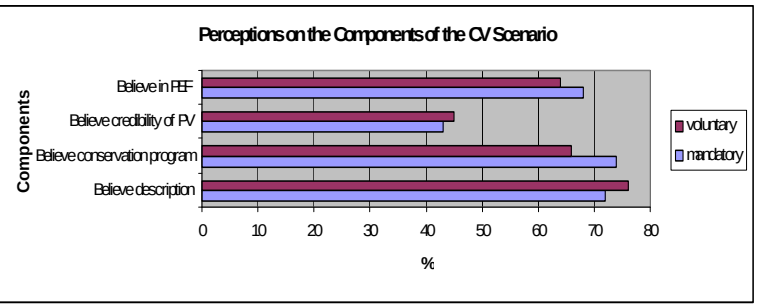
Social Problem	National		Regional		All	
	Freq (%)	Rank	Freq (%)	Rank	Freq (%)	Rank
a. Economic (e.g., inflation)	96 (57)	1	108 (59)	1	204 (58)	1
b. Poverty	24 (14)	2.5	17 (9)	3	41 (12)	3
c. Education	4 (2)	4.5	10 (5)	4	14 (4)	4
d. Health	3 (2)	4.5	0		3 (1)	
e. Crime/violence, inequality	1 (1)		1 (1)		2 (1)	
f. Government and governance	24 (14)	2.5	32 (17)	2	56 (16)	2
g. Infrastructure	1 (1)		0		1 (.3)	
h. Environment	1 (1)		1 (1)		2 (1)	
i. Terrorism	1 (1)		1 (1)		2 (1)	
j. Relations with other countries	0		0		0	
Others	3 (2)		1 (1)		4 (1)	
Did not rank, wrong ranking, no answer	12 (7)		12 (7)		24 (7)	
Environmental Problem	**National**		**Regional**		**All**	
	Freq (%)	**Rank**	**Freq (%)**	**Rank**	**Freq (%)**	**Rank**
a. Air pollution	31 (18)	3	28 (15)	3	59 (17)	3
b. Water pollution	15 (9)	4	10 (5)	5	25 (7)	4.5
c. Solid waste	42 (25)	2	55 (30)	1	97 (27)	2
d. Loss of endangered species	9 (5)	5	15 (8)	4	24 (7)	4.5
e. Deforestation	52 (31)	1	47 (26)	2	99 (28)	1
f. Traffic noise/problems	3 (2)		5 (3)		8 (2)	
g. Soil erosion	2 (1)		1 (1)		3 (1)	
h. Enhanced greenhouse effect	3 (2)		8 (4)		11 (3)	
i. Destruction of coral reefs	2 (1)		1(1)		3 (1)	
Did not rank, no answer	11 (7)		13 (7)		24 (7)	
Priority Species	**National**		**Regional**		**All**	
	Freq (%)	**Rank**	**Freq (%)**	**Rank**	**Freq (%)**	**Rank**
a. Dugong	9 (5)	3	14 (8)	3	23 (6)	3
b. Rhino	2 (1)		0		2 (1)	
c. Marine Turtle	23 (14)	2	17 (9)	2	40 (11)	2
d. Whale Shark	2 (1)		3 (2)		5 (1)	
e. Spoon Bill	2 (1)		0		2 (1)	
f. Philippine Eagle	125 (74)	1	143 (78)	1	268 (76)	1
Did not rank, no answer	7 (4)		6 (3)		13 (4)	

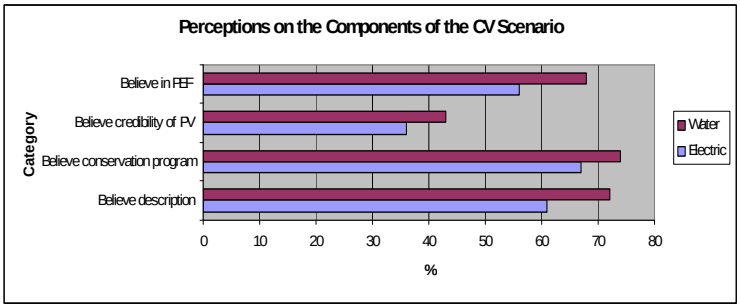
APPENDIX 4
Respondents' Perception of the Contingent Valuation Scenario

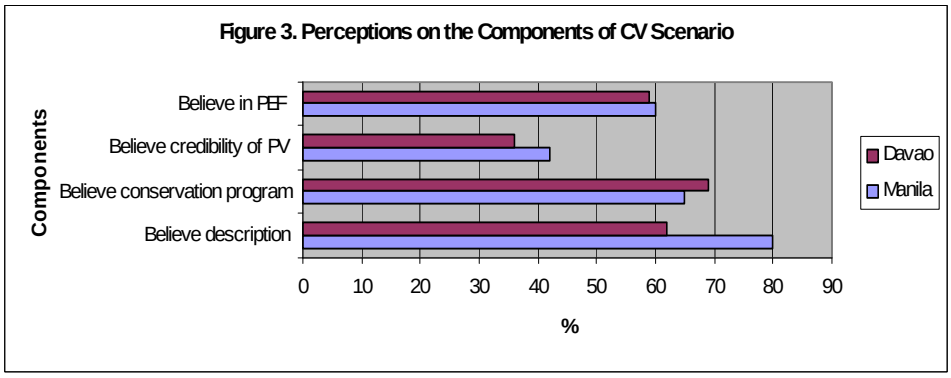
(Note: please correct figure labels/text so that 'Manila' would be "Metro Manila')











APPENDIX 5
Reasons for 'No' Response by Different Sub-groupings of Respondents

Appendix Table 5a. 'No' Response across Scope, National vs. Regional Program.

	National	Regional	All
Reason for 'no' response			
1. Cannot afford the amount	66 (62)	84 (65)	150 (64)
2. Philippine Eagle conservation is not worth doing	7 (7)	5 (4)	12 (5)
3. Other species are more important than the Philippine Eagle	5 (5)	5 (4)	10 (4)
4. Majority of the poor will be affected	58 (54)	62 (48)	120 (51)
5. Prefer giving money to humanitarian cause	14 (13)	14 (11)	28 (12)
6. Only people who directly benefit from eagle conservation should pay	15 (14)	11 (9)	26 (11)
7. Higher income group should pay more	25 (23)	28 (22)	53 (22)
8. Other reasons	7 (7)	9 (7)	16 (7)
Willing to pay lower amount (for 'no' bids)	35 (33)	47 (36)	82 (35)
Average lower amountt (PhP)	10.38	8.36	9.19
Unwilling to pay any lower amount	72 (67)	82 (64)	154 (65)
Reason for unwillingness to pay a lower amount			
1. Cannot afford to pay the amount	41 (57)	38 (46)	79 (51)
2. Only people who directly benefit from eagle conservation should pay	14 (19)	8 (10)	22 (14)
3. Only those with higher income should pay	27 (38)	29 (35)	56 (36)
4. Others	4 (6)	8 (10)	12 (8)

Note: Figures in brackets are percent of total responses.

Appendix Table 5b. 'No' Response across Payment Vehicle, Mandatory vs. Voluntary.

	Mandatory	Voluntary	All
Reason for 'no' response			
1. Cannot afford the amount	83 (65)	91 (69)	174 (67)
2. Philippine Eagle conservation is not worth doing	4 (3)	6 (5)	10 (4)
3. Other species are more important than the Philippine Eagle	5 (4)	11 (8)	16 (6)
4. Majority of the poor will be affected	61 (48)	58 (44)	119 (46)
5. Prefer giving money to humanitarian cause	14 (11)	20 (15)	34 (13)
6. Only people who directly benefit from eagle conservation should pay	11 (9)	11 (8)	22 (8.5)
7. Higher income group should pay more	28 (22)	19 (14)	47 (18)
8. Other reasons	11 (9)	11 (8)	22 (8.5)
Willing to pay lower amount (for 'no' bids)	47 (37)	28 (21)	75 (29)
Average lower amount (PhP)	8.36	12.35	10.36
Unwilling to pay any lower amount	80 (63)	104 (79)	184 (71)
Reason for unwillingness to pay a lower amount			
1. Cannot afford to pay the amount	37 (46)	51 (49)	88 (47.5)
2. Only people who directly benefit from eagle conservation should pay	8 (10)	9 (9)	17 (9.5)
3. Only those with higher income should pay	29 (36)	28 (27)	57 (31.5)
4. Others	8 (10)	11 (11)	19 (10.5)

Note: Figures in brackets are percent of total responses.

Appendix Table 5c. 'No' Response across Collection Mechanism, Electricity vs. Water.

	Electricity	Water	All
Reason for 'no' response			
1. Cannot afford the amount	69 (63)	83 (65)	152 (64)
2. Philippine Eagle conservation is not worth doing	-	4 (3)	4 (1.5)
3. Other species are more important than Philippine Eagles	3 (3)	5 (4)	8 (3.5)
4. Majority of the poor will be affected	62 (56)	61 (48)	123 (52)
5. Prefer giving money to humanitarian cause	15 (14)	14 (11)	29 (12.5)
6. Only people who directly benefit from eagle conservation should pay	3 (3)	11 (9)	14 (6)
7. Higher income group should pay more	8 (7)	28 (22)	36 (14.5)
8. Other reasons	6 (6)	11 (9)	17 (8)
Willing to pay lower amount (for 'no' bids)	34 (31)	47 (37)	81 (34)
Average lower amount (PhP)	PhP 10.81	PhP p8.36	PhP 9.59
Unwilling to pay any lower amount	76 (69)	80 (63)	156 (66)
Reason for unwillingness to pay a lower amount			
1. Cannot afford to pay the amount	35 (46)	37 (46)	72 (46)
2. Only people who directly benefit from eagle conservation should pay	5 (7)	8 (10)	13 (8.5)
3. Only those with higher income should pay	27 (36)	29 (36)	68 (36)
4. Others	8 (11)	8 (10)	16 (10.5)

Note: Figures in brackets are percent of total responses.

Appendix Table 5d. 'No' Response across Presentations, Colored vs. Black and White.

	Colored	B&W	All
Reason for 'no' response			
1. Cannot afford the amount	71 (76)	84 (65)	155 (70)
2. Philippine Eagle conservation is not worth doing	4 (4)	5 (4)	9 (4)
3. Other species are more important than the Philippine Eagle	6 (6)	5 (4)	11 (5)
4. Majority of the poor will be affected	42 (45)	62 (48)	104 (47)
5. Prefer giving money to humanitarian cause	5 (5)	14 (11)	19 (9)
6. Only people who directly benefit from eagle conservation should pay	9 (10)	11 (9)	20 (9)
7. Higher income group should pay more	20 (21)	28 (22)	48 (22)
8. Other reasons	5 (5)	9 (7)	14 (6)
Willing to pay lower amount (for 'no' bids)	33 (35)	47 (36)	80 (36)
Average lower amount (PhP)	10.33	8.36	9.18
Unwilling to pay any lower amount	61 (65)	82 (64)	143 (64)
Reason for unwillingness to pay a lower amount			
1. Cannot afford to pay the amount	26 (43)	38 (46)	64 (45)
2. Only people who directly benefit from eagle conservation should pay	8 (13)	8 (10)	16 (11)
3. Only those with higher income should pay	22 (36)	29 (35)	51 (36)
4. Others	3 (5)	8 (10)	11 (8)

Note: Figures in brackets are percent of total responses.

APPENDIX 6
Reasons for 'Yes' Response by Different Sub-groupings of Respondents

Appendix Table 6a. 'Yes' Response across Scope, National vs. Regional Program.

	National	Regional	All
1. The Philippine Eagle is a symbol of the country	43 (88)	34 (77)	77 (83)
2. The comprehensive conservation program can protect the Philippine Eagle	28 (57)	22 (50)	50 (54)
3. Trust in the leadership of the Philippine Eagle Foundation	14 (29)	23 (52)	37 (40)
4. Filipinos should do their share in protecting the national bird.	18 (37)	17 (39)	35 (38)
5. Effort will lead to protection of other endangered species	31 (63)	20 (45)	51 (55)

Note: Figures in brackets are percent of total responses.

Appendix Table 6b. 'Yes' Response across Collection Mechanism, Electricity vs. Water.

	Electricity	Water	All
1. The Philippine Eagle is a symbol of the country	26 (63)	33 (80)	59 (71.5)
2. The comprehensive conservation program can protect the Philippine Eagle	17 (41)	20 (49)	37 (45)
3. Trust in the leadership of the Philippine Eagle Foundation	13 (32)	23 (56)	36 (34)
4. Filipinos should do their share in protecting the national bird.	16 (39)	15 (37)	31 (38)
5. Effort will lead to protection of other endangered species	20 (49)	20 (49)	40 (49)
6. Others	3 (7)	-	3 (3.5)

Note: Figures in brackets are percent of total responses.

Appendix Table 6c. 'Yes' Response across Payment Vehicle, Mandatory vs. Voluntary.

	Mandatory	Voluntary	All
1. The Philippine Eagle is a symbol of the country	33 (80)	31 (74)	64 (77)
2. The comprehensive conservation program can protect the Philippine Eagle	20 (49)	18 (43)	38 (46)
3. Trust in the leadership of the Philippine Eagle Foundation	23 (56)	13 (31)	36 (43.5)
4. Filipinos should do their share in protecting the national bird.	15 (37)	18 (43)	33 (40)
5. Effort will lead to protection of other endangered species	20 (49)	23 (55)	43 (52)

Note: Figures in brackets are percent of total responses.

Appendix Table 6d. 'Yes' Response across Presentations, Colored vs. Black and White.

	Colored	B&W	All
1. The Philippine Eagle is a symbol of the country	39 (74)	34 (77)	73 (75)
2. The comprehensive conservation program can protect the Philippine Eagle	27 (51)	22 (50)	49 (51)
3. Trust in the leadership of the Philippine Eagle Foundation	21(40)	23 (52)	44 (45)
4. Filipinos should do their share in protecting the national bird.	22 (42)	17 (39)	39 (40)
5. Effort will lead to protection of other endangered species	28 (53)	20 (45)	48 (49)
6. Others	1 (2)	0	1 (1)

Note: Figures in brackets are percent of total responses.

APPENDIX 7
Willingness to Pay (WTP) and 'Yes' Response by Income Level and Subgroup of Respondents

Income Level	NATIONAL		REGIONAL		ALL	
	Mean WTP	'Yes' Response (%)	Mean WTP	'Yes' Response (%)	Mean WTP	'Yes' Response (%)
High	59	63	28	40	35	53
Middle	26	29	26	28	32	28
Low	16	17	13	15	16	16
Total	(25)	29	(21)	24	(26)	26
Income Level	COLORED		BLACK & WHITE		ALL	
	Mean WTP	'Yes' Response (%)	Mean WTP	'Yes' Response (%)	Mean WTP	'Yes' Response (%)
High	49	56	28	40	35	46
Middle	40	40	26	28	32	33
Low	21	21	13	15	16	18
Total	(32)	33	(21)	24	(26)	28
Income Level	MANDATORY		VOLUNTARY		ALL	
	Mean WTP	'Yes' Response (%)	Mean WTP	'Yes' Response (%)	Mean WTP	'Yes' Response (%)
High	25	40	73	57	47	48
Middle	25	28	26	26	26	27
Low	12	14	12	15	13	15
Total	(19)	23	(21)	23	(21)	23
Income Level	WATER		ELECTRIC		ALL	
	Mean WTP	'Yes' Response (%)	Mean WTP	'Yes' Response (%)	Mean WTP	'Yes' Response (%)
High	25	40	17	25	27	31
Middle	25	28	17	29	27	28
Low	12	14	17	17	14	15
Total	(19)	23	(26)	24	(22)	24
Income Level	MANILA		DAVAO		ALL	
	Mean WTP[a]	'Yes' Response (%)	Mean WTP[a]	'Yes' Response (%)	Mean WTP[a]	'Yes' Response(%)
High	21	37	32	22	23	30
Middle	23	29	20	30	22	29
Low	19	28	10	13	14	21
Total	-	30	-	23	-	26

[a] Non-parametric mean WTP (all entries on mean WTP, except for Metro Manila and Davao, are parametric estimates), Figures in parenthesis are midpoint WTP for parametric estimates.