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Community Validation of Threatened Species in Coastal Wetland Areas of Negros Occidental, Philippines

ABSTRACT

This research aims to identify threatened bird species in wetland areas and define temporal changes occurring among species based on local observations and experiences. Survey, ethnobiology workshops, key informant interviews and focus group discussions were approaches employed in the collection of primary data from the chosen participants residing in the coastal communities in Central Negros, Philippines. The threatened wetland bird species in these sites are generally perceived as "abundant" as indicated by their perceived common presence. The ten sites also shared two vulnerable species, Egretta eulophotes,locally known as as Tulabong by locals and Anas luzonica called Pato ilahas by the natives. The Numenius madagascariensis is considered endangered and eight near threatened bird species (IUCN Red list), Numenius arquata, Limnodromus semipalmatus, Charadrius peronii, Limosa limosa, Limosa lapponica, Tringa brevipes, Calidris ruficollis and Calidris ferruginea, were validated by locals in almost all of the study sites. However, some threatened species were observed to have disappeared and declined in these areas. An updated list of threatened species found in coastal wetland cities and municipalities in the central area of Negros Occidental was produced that shall serve as basis for crafting relevant programs to properly manage, conserve and develop these wetland areas.

Keywords: *community validation, threatened species, coastal, wetland areas*

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INTRODUCTION

Wetlands are vital for human survival. They are among the world's most productive environments (*www.ramsar.org*). The central area of Negros Occidental, Philippines covering the cities of Bago, Himamaylan and Kabankalan and the municipalities of Pulupandan, Valladolid, San Enrique, Pontevedra, Hinigaran, Binalbagan, and Ilog have contiguous wetlands spanning a total of 109.52 km coastline. These 10 local government units (LGUs) are known for their rich and biodiverse coastal resources particularly shellfishes, fishes, mangroves and waterbirds in lieu of coral reefs. Recently, Irrawaddy dolphins were also found to inhabit the waters of Pulupandan and Bago City (*https://www.eaaflyway.net*). Ten species of marine mammals, including the dugong (Dugong dugon), have been stranded in the NOCWCA for the past ten years emphasizing the significance of these areas as essential habitats of these species (*Aguilar and Tabujara, 2022*) Fisherfolk organizations were engaged in conservation-based alternative livelihood and protection of the habitats (*De la Paz et.al. 2021*)..

As a fishery product, shellfish like the 'diwal' (*Pholas orientalis*), nylon shell (*Paphia textile*), green mussel (*Perna viridis*) and oyster (*Crossostrea* sp.), have gained much prominence for Central Negros. They have been grown, harvested and sold to local and regional markets for decades.

In 2011, the Philippine Biodiversity Conservation Foundation, Inc. (PBCFI) visited the waterbird area. Then in 2012, they conducted an annual waterbirds assessment in the coastal wetlands of central and southern Negros with the Negros Forest and Ecological Foundation, Inc. (NFEFI), the Department of Environment and Natural Resources (DENR) and the Provincial Environment Management Office (PEMO) (*Paguntalan et. al. 2013*).

Migratory birds are abundant in the wetland and coastal areas of the cities of Bago, Himamaylan and Kabankalan and the municipalities of Pulupandan, Valladolid, San Enrique, Pontevedra, Hinigaran, Binalbagan, and Ilog and that bird counts for certain species bore significance on a global scale.

The little stint (*Calidris minuta*) which was only recorded in the country in 1903, was found to occur in

the area. This is the first record of the species in Negros since 1888. The survey also resulted in the 4th country record of the *Hydroprogne caspia* (Caspian tern) in the Philippines with the highest number of individuals so far recorded. The 4th record in the Philippines and 2nd record in Negros of the sanderling (*Calidris alba*) were similarly obtained while the 3rd country record of the *Limicola falcinellus* (broad-billed sandpiper) was likewise made (*San Jose, GIZ-PAME proposal 2014*). These results affirm the Province's global importance in terms of biodiversity and conservation. They also boost the potential of Negros Occidental as an important birding site in the Philippines, paving the way for nature-based tourism and ecotourism.

Motivated to enhance the status of the coastal wetlands in light of these developments, the Province of Negros Occidental through its PEMO, organized the Negros Occidental Coastal Wetlands Area Management Alliance (NOCWAMA) with the goal of harmonizing the conservation initiatives of the ten LGUs in order to wisely manage the wetlands resources. With the inclusion of NGOs such as PBCFI, and academic institutions such as Carlos Hilado Memorial State College (CHMSC), Central Philippines State University (CPSU) and University of Saint La Salle (USLS), the effort to conserve and manage grew in scope and prompted the move to nominate the area as a wetland of global significance. It is anticipated that the entire site spanning 10 LGUs will be recognized as a Ramsar site. The Ramsar Convention on Wetlands is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources (*https://www.rsis.ramsar.org*).

The PEMO is currently receiving support from the GIZ Protected Area Management Enhancement (PAME) project in implementing its Project "Conservation and Protection Management of Coastal Wetlands in Negros Occidental" in partnership with its co-members of the NOCWAMA. The project's main objective is to improve and wisely manage the coastal wetlands through the establishment of 10 local conservation areas that are envisioned to be sustainably managed and protected by the coastal communities.

The main objective of this threatened species validation was to solicit the inputs of selected members of the community to identify the threatened wetland bird species in the area and to define the temporal changes occurring among the species based on local observations and experiences. The actual output of the study is an updated list of threatened species found in the coastal wetland areas of the 10 Local Government Units in Negros Occidental that shall serve as basis for crafting relevant programs to properly manage, conserve and develop these wetland areas.

MATERIALS AND METHODS

The descriptive research design used various data gathering methods. Primary data were gathered through key informant interviews, ethnobiology workshops and focus group discussions.

Respondents of the study were residents of the communities located along the perimeter of the coastal barangays. A total of 283 households were considered for the survey as the source of primary data.

Description of the Study Sites

The project sets its priority in studying the coastal barangays found in the 10 LGUs spanning the NOCWAMA area identified to be part of the RAMSAR Sites. This includes selected barangays in the Cities of Bago, Himamaylan and Kabankalan as well as the towns of Pulupandan, Valladolid, San Enrique, Pontevedra, Hinigaran, Binalbagan and Ilog (**Figure 1**).

These barangays stretch along the 110 kilometers coastline of Negros Island. Selection of the area gave priority to those without any available baseline data to answer the need for the crafting of relevant programs and interventions to properly manage, conserve and develop these wetland areas.

Sampling Sites

The community validation study was conducted after the completion of the Socio-Economic Profiling of the Negros Occidental Coastal Wetland Area project held on different locations spread throughout Negros Occidental that focused on the socioeconomic profile, social issues and human threats to the wetlands in the LGUs of NOCWAMA. Likewise various bird assessments were done by a group of expert team prior to the conduct of this project (*Van Weerd and Van der Ploeg 2004; Alcala et al. 2004; Bucol and Bacosa 2009; Oracion et al. 2022*).

The threatened species validation was therefore conducted to solicit the inputs of selected members of the community to identify the threatened wetland bird species in the area and to define the temporal changes occurring among the species based on observations, experiences, and their local knowledge gained through their close

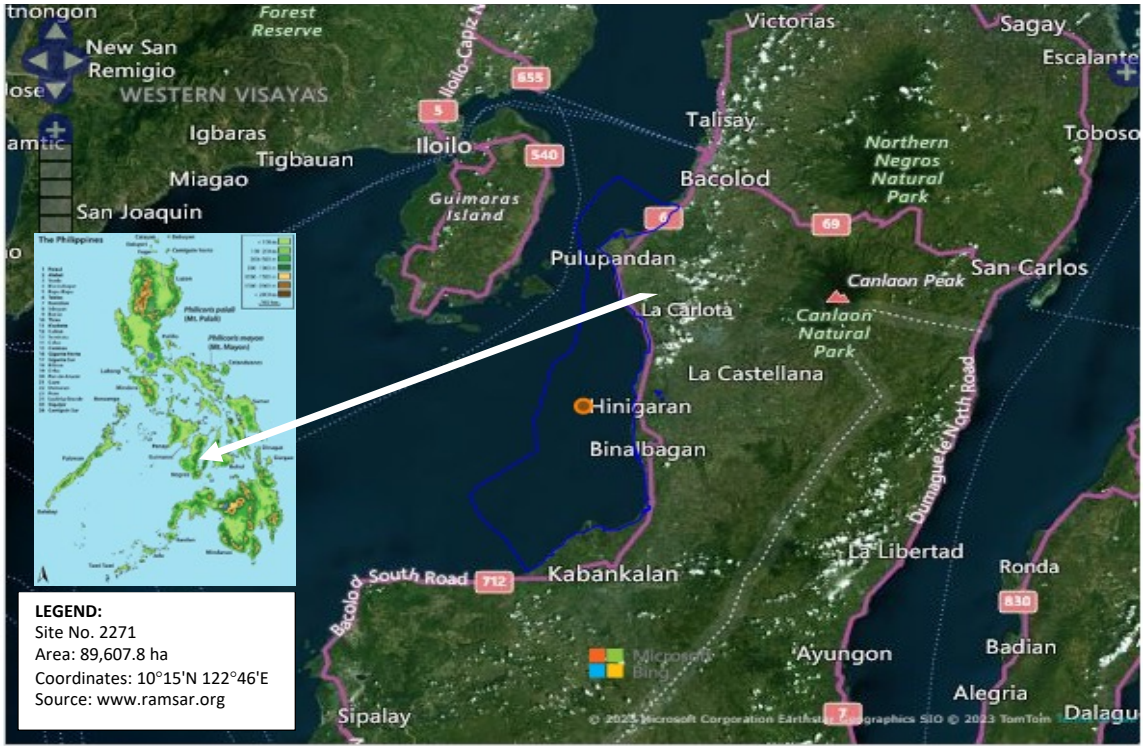

Figure 1. Map of the Negros Occidental Coastal Wetlands Conservation Area (NOCWCA) Negros, Philippines located in the coastal barangays found in the 10 LGUs spanning the NOCWAMA area (*https://www.ramsar.org*)

encounter of these species in the area as residents of the community and inhabitants of the coastal areas.

A total of 20 barangays covering only the coastal areas of the 10 cities and municipalities identified by NOCWAMA comprise the study sites. These areas were chosen based on the premise that these are wetlands of significant importance since they are strategically located in the Negros Occidental Migratory Shorebirds Flyway and contains many important migratory birds and other species most of which are considered threatened.

The two barangays that were part of the study area at Bago City are Sampinit and Poblacion. Three barangays were surveyed at Pulupandan namely, Barangays Tapong, Canjusa and Zone 6. Barangay Zone 5 is the only barangay identified as survey site in the municipality of Valladolid. Two barangays were included in the survey sites at San Enrique namely Barangays Tibsoc and Nayon while Barangay I and Barangay Nanunga are the only single site included in the survey from the Municipalities of Pontevedra and Hinigaran. The municipality of Binalbagan has two barangays surveyed namely, Barangays Canmuros and San Juan.

Four barangays in Himamaylan City, namely, are Talaban, Caradio-an, Tooy and Suay were also part of the study. One barangay of Daan Banwa is situated in Kabankalan City while three sites are found in Barangays 1, II and Andulauan all from Ilog, Negros Occidental.

Sampling Technique and Participants of the Study

A total of 283 participants were selected as samples for the study (**Table 1**). A purposive cluster sampling technique was used in the selection of the sampling units. This is giving due accord in the selection of representative respondents from cluster barangays within the coastal areas of the 10 cities and municipalities considered within the Negros Migratory Shorebirds Flyway. The participants of the ethnobiology workshop are members of the Bantay Dagat, Bantay Katunggan and fisherfolks. These members are familiar with their coastal environment including all wildlife, birds and marine species and fishing activities in their community being local fisherfolks thus gives premium and importance to the contribution of their local knowledge to future conservation initiatives and programs of the local government units in these coastal areas.

Data Gathering Procedure

A separate meeting with a group of selected key informants were conducted using the focus group discussion (FGD) and key informant interview (KII) approaches. These methods were used to gather primary

Table 1. Distribution of household sample size in the coastal barangays of Central Negros, Philippines.

Sampling Area	Barangay	Sample	Percent
Bago City		**16**	5.65
	Sampinit	4	
	Poblacion	12	
Pulupandan		**58**	20.50
	Tapong	20	
	Canjusa	19	
	Zone 6	19	
Valladolid	Zone 5	14	4.95
San Enrique		15	5.30
	Brgy. Tibsoc		
	Nayon		
Pontevedra	Barangay 1	18	6.36
Hinigaran	Nanunga		
Binalbagan		**16**	5.65
	Canmuros	12	
	San Juan	4	
Himamaylan City		**95**	33.57
	Talaban	20	
	Caradio-an	17	
	Tooy	41	
	Suay	17	
Kabankalan City	Daan Banwa	11	3.89
Ilog		**40**	14.13
	Brgy. I	12	
	Brgy. II	14	
	Andulauan	14	
	TOTAL	283	100.00

data on the threatened wetland bird species in these coastal areas.

Before the actual data gathering commenced, Prior Informed Consent and letter of requests to conduct the survey were sought and approved. All the data gathered for this research undertaking and primary key informant interviews were organized, analyzed and used to validate and fill up data gaps during the interviews.

Primary Data Collection

Ethnobiology Workshop. This method was used to gather data on the community's perceptions of their environment and wildlife, as well as the community's use of wildlife and natural resources (*Albuquerque et al. 2014*). Data generated from this workshop provided valuable information on the status of wildlife and wildlife trade within the wetland sites, as well as other practices of wildlife extraction.

Members of the People's Organizations in various local communities in selected wetland areas in Negros, members of the Bantay Dagat and Bantay Katunggan, barangay officials and fisherfolk were invited to the workshop. They were selected as key informants based on the criteria: knowledgeable about the place and the community; and being residents in the area for most of their lives.

The participants were clustered according to the communities where they reside to let them feel at ease with the company of people they know. They were shown the images of wildlife found in the area through the use of Powerpoint presentations. They were then asked to determine the status of wildlife in their respective coastal areas.

Each species was described according to its relative numbers and perceived abundance (**Figure 2**). A species is considered "madamo" if regularly seen by locals (e.g., during hunting or patrolling) or if seen in substantial numbers. A "medyo damo" is applied if the species is less frequently found or in few numbers. On the other hand, a species is considered "diutay" if rarely observed and or found in very small numbers. Moreover, a species may be considered stable if the pattern of observation remains the same over several decades. Conversely, a species is considered "declining" if the observation of the species continuous to decline (reduced observation). A species is considered "recovering" if an earlier low observation is followed by an increased observation (*Posadas 2000*).

The participants of the workshops were asked to identify the birds and determine the population trend of the species for a period of time (*Strange 2000*) (**Figure 3**). A total of 52 species (mainly threatened species) were presented during the workshops conducted with 20 barangays on various periods and sites (**Table 2**).

Key Informant Interviews and Informal talks. The informant interviews and informal talks contained topics and information needed for the research. These key informants were chosen based on the criteria that they are

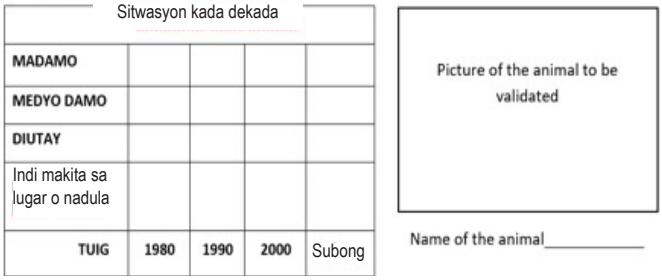

Figure 2. Format of the Powerpoint slide presented during the ethnobiological workshop.

very knowledgeable about the place and the community, being residents in the study area for most of their lives. All are members of the Bantay Dagat with rich exposure to the different species of birds and wildlife in the coastal areas of Central Negros.

Figure 3. Sample species of birds presented in a Powerpoint during the workshops

Focus Group Discussion. A meeting with a group of Bantay Dagat, Bantay Katunggan, Barangay Officials and selected members of the barangay in the area were conducted using the focus group discussion approach. This method was used to gather information on wildlife extraction in coastal wetland areas. The significance of this method is to solicit personal views and observations that would unearth environmental issues and concerns in the wetland area.

Before the start of the activity, the participants were oriented on the purpose of the focus group discussion to clarify any misconceptions about the activity. It started with a light conversation and acquiantance portion so as to keep the participants at ease with the presence of theresearch team and encourage them to answer any of the researcher's follow up questions freely.

Secondary Data Collection. Secondary data were also gathered such as maps of the project site, land area, demographic data from Local Government Units,

Table 2. Participants of the ethnobiological workshops conducted to participants in selected Negros Occidental Coastal Wetlands Area Management Alliance sites in Negros Occidental, Philippines.

Sampling Area (City/Municipality)	Barangay	No. of Participants		Engaged in Fishing	Percentage
Bago City			16	7	43.8
	Sampinit	4			
	Poblacion	12			
Pulupandan			58	47	88.7
	Tapong	20			
	Canjusa	19			
	Zone 6	19			
Valladolid	Zone 5		14	10	76.9
San Enrique			15	13	92.9
	Brgy. Tibsoc				
	Nayon				
Pontevedra	Barangay 1		18	18	100.0
Hinigaran	Nanunga				
Binalbagan			16	13	86.7
	Canmuros	12			
	San Juan	4			
Himamaylan City			95	78	86.7
	Talaban	20			
	Caradio-an	17			
	Tooy	41			
	Suay	17			
Kabankalan City	Daan Banwa		11	9	69.2
Ilog			40	37	94.9
	Brgy. I	12			
	Brgy. II	14			
	Andulauan	14			
	Total	283		233	82.33

government agencies and non-government organizations through the Provincial Environment Management Office, Province of Negros Occidental.

RESULTS AND DISCUSSION

Ethnobiological Workshops

The community validation of six wetland bird species (based on expected number of species) was conducted to ten coastal communities identified as Negros Occidental Coastal Wetlands Area Management Alliance (NOCWAMA) sites in Negros, Philippines using focus group discussion with the goal of validating the presence of wetland bird species in the areas (**Table 3**).

In this ethnobiological workshop, the key informants were presented Powerpoint presentations of different species of birds and were requested to identify and recall species that were observed regularly during migratory season or locally present in abundance "perme", species not commonly observed during migratory season or locally present in few numbers "talagsa" and species not observed or unfamiliar "wala".

Participants identified two vulnerable species, one endangered and eight near threatened species (IUCN Red List) in 10 NOCWAMA Sites in Negros.

The validation of the 52 wetland bird species resulted in the identification of two vulnerable species, one endangered and eight near threatened species (IUCN Red List).

The two vulnerable species are the *Egretta eulophotes*, named as "Tulabong" by locals and *Anas luzonica* called "Pato ilahas" by the natives. The *Numenius madagascariensis* is considered endangered. The eight near threatened bird species (IUCN Red List) were; *Numenius arquata*, *Limnodromus semipalmatus*, *Charadrius peronii*, *Limosa limosa*, *Limosa lapponica*, *Tringa brevipes*, *Calidris ruficollis* and *Calidris ferruginea*; these were validated by locals in almost all of the study sites (**Table 4**).

The wetland site with the highest number of regular sightings was Ilog with 51 species out of 52 species. based on the validation of the locals. This is followed by Kabankalan City with 49 species and San Enrique with regular sightings of 47, 47, and 30 species respectively.

The survey site with the lowest sightings was Bago City recorded at 18 and 22 regular sightings. The local sightings of these species varied from one validation site to another. The 10 sites in the cities of Bago, Himamaylan and Kabankalan and the municipalities of Pulupandan, Valladolid, San Enrique, Pontevedra, Hinigaran, Binalbagan, and Ilog,shared one endangered, two vulnerable, and eight near threatened species.

Vulnerable Species. Based on the primary data gathered during validation of bird species, two vulnerable species were sighted on the survey sites. These were *Egretta eulophotes* and *Anas luzonica* (**Figure 4**). These species were observed regularly during migratory season or locally present in abundance in most of the study sites (**Table 5**).

Endangered Species. Existence of one endangered species, *Numenius madagascariensis,* was also validated in most of the survey sites (**Figure 5**). This is found still abundant in eight sites except in Pulupandan and Valladolid where these species were not commonly observed during migratory season or locally present but few in numbers.

Near Threatened Species. Eight near threatened bird species, *Numenius arquata, Limnodromus semipalmatus, Charadrius peronii, Limosa limosa, Limosa lapponica, Tringa brevipes, Calidris ruficollis* and *Calidris ferruginea,* were validated by the locals in almost all of the study sites (**Figure 6**).

Commonly Observed Avifauna. The total number of commonly observed or frequently sighted species (including threatened species) were 52 which is very high in terms of detectability. Ilog had the highest number of observed species at 51 while Kabankalan validated 49 commonly observed species followed by San Enrique with 45, Pontevedra with 44, Pulupandan with 41, Binalbagan at 35, Hinigaran with 33, Valladolid with 29 and Bago with the least number of observed sightings at 22 species (**Table 6**). The local sightings of these species varied from one coastal area to another (*Delany and Scott 2002; Wetlands International 2017; www.wetlands.org*.).

Occasionally Sighted Species. The highest number of occasionally sighted species was validated by the participants from Valladolid which totalled to 18 including one vulnerable species, *Anas luzonica*, endangered species. *Numenius madagascariensis,* and two near threatened species, *Numenius arquata* and *Limosa limosa*. Participants from Hinigaran validated 14 species, Binalbagan group identified 12 species and 10 specieswere validated by participants from Bago City (**Table 6**). Ilog appears to have no identified species because most of them were reportedly found in the Municipality.

Table 3. Summary of the results of the ethnobiological workshops conducted at 10Negros Occidental Coastal Wetlands Area Management Alliance Sites in Negros, Phlippines.

	SAN ENRIQUE			PULUPANDAN			VALLADOLID			HINIGARAN			PONTEVEDRA			BAGO			BINALBAGAN			HIMAMAYLAN			ILOG			KABANKALAN			TOTAL			
SPECIES	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	perme	talagsa	wala	STATUS
Egretta eulophotes (Tulabong)	2016			2016			2010-2016			2016			2016			2016			2016			2016			2016			2016			10	0	0	Vulnerable
Egretta Alba (Tulabong)	2016			2016			2010-2016						2016			2016			2016			2016			2016			2016			9	0	0	Least Concern
Ardea sumatrana (Dugwak)	2016			2016				2010-2016		2016	2010		2016			2016			2016			2016			2016			2016			9	2	0	Least Concern
egretta saca (Talabun-ok/Tulabong)	2016			2016			2010	2016			2016		2016			2016			2016			2016			2016			2016			9	2	0	Least Concern
numenius madagascariensis (Sansuyan)	2016				2016			2010-2016		2016			2016			2016			2016			2016			2016			2016			8	2	0	Endangered
numenius arquata (Sansuyan)	2016				2016			2016		2016			2016				2016			2016		2016			2016			2016			6	4	0	Near Threatened
anas luzonica (Pato Ilahas)	2016			2016				2016			2016		2016			2016			2016			2016			2016			2016			8	2	0	Vulnerable
dendrocygna arcuata (Bebe Ilahas)	2016			2016				2016		2016			2016			2016			2016			2016			2016			2016			9	1	0	Least Concern
limnodromus semipalmatus (Tiwis)	2016			2016			2010-2016			2016			2016			2016			2016			2016			2016			2016			10	0	0	Near Threatened
himantopus himantupos (No name)	2016			2016					2016	2016			2016			2016			2016			2016			2016			2016			9	0	1	Least Concern
Ardeola Bacchus (Talabun-ok)	2016			2016			2010-2016			2016			2016			2016			2016			2016			2016			2016			10	0	0	Least Concern
Ardeola speciosa (Talabun-ok)	2016			2016			2010-2016			2016			2016				2016		2016			2016			2016			2016			9	1	0	Least Concern
Nycticorax caledonicus (Talabun-ok)	2016			2016				2016		2016			2016				2016			2016			2016			2016			2016			6	4	0	Least Concern
Nycticorax nycticorax (Talabun-ok)	2016			2016				2014		2016			2016					2016		2016			2016			2016			2016			6	3	1	Least Concern
Charadrius peronii (Tiwis)	2016					2016		2016		2016			2016			2016			2016			2016			2016			2016			8	1	1	Near Threatened
Numenius Minutus (Tiwis)	2016			2016			2016			2016			2016			2016			2016				2016		2016			2016			9	1	0	Least Concern
Sterna caspia (Dagit)	2016			2016			2010-2016			2016			2016					2016	2016				2016		2016			2016			8	1	1	Least Concern
Sterna hirundo (Dagit)	2016			2016			2016			2016			2016					2016	2016			2016			2016			2016			9	0	1	Least Concern
Ardea cinerea (Tulabong)	2016			2016					2016	2016				2016				2016		2016		2016			2016			2016			6	2	2	Least Concern
Ardea Purpurea (Dugwak)	2016			2016			2010-2016			2016				2016		2016			2016			2016			2016			2016			9	1	0	Least Concern
Buturides Striatus (Talabun-ok)	2016			2016			2010-2016			2016			2016			2016			2016			2016			2016			2016			10	0	0	Least Concern
Ixobrychus sinensis (Unknown)	2016			2016			2010-2016			2016			2016					2016	2016			2016			2016			2016			9	0	1	Least Concern
Ixobrychus cinnamomeus (Unknown)	2016			2016				2016		2016			2016					2016	2016			2016			2016			2016			8	1	1	Least Concern
Charadius alexandrinus (Tiwis)	2016			2016			2010-2016			2016			2016			2016			2016			2016			2016			2016			10	0	0	Least Concern
Pluvialis squatarola (Pagsung)	2016			2016					2016	2016			2016				2016		2016					2016	2016				2016		6	2	2	Least Concern
Pluvialis fulva (Tiwis)	2016			2016				2016		2016			2016					2016		2016		2016			2016			2016			7	2	1	Least Concern
Charadrius dubius (Tiwis)	2016			2016			2016				2016			2016				2016		2016			2016			2016			2016			5	4	1	Least Concern
Charadrius mongolus (Tiwis)	2016			2016			2016				2016		2016			2016				2016		2016			2016			2016			8	2	0	Least Concern
Charadrius leschenaultii (Tiwis)	2016			2016				2016			2016		2016				2016		2016			2016			2016			2016			7	3	0	Least Concern
Numenius phaeopus (Sansuyan)	2016			2016			2016			2016			2016				2016		2016			2016			2016			2016			9	1	0	Least Concern
Tringa totanus (Unknown)		2016		2016					2016		2016				2016			2016		2016				2016	2016				2016		2	4	4	Least Concern
Tringa nebularia (Sansuyan)	2016					2016	2016				2016		2016				2016			2016		2016			2016			2016			6	3	1	Least Concern
Tringa ochropus (Sansuyan)	2016			2016			2016					2016	2016					2016	2016			2016			2016			2016			8	0	2	Least Concern
Tringa glareola (No name)	2016			2016			2016			2016			2016				2016		2016			2016			2016			2016			9	1	0	Least Concern
Actitis hypoleucos (no name)	2016			2016			2016			2016			2016					2016	2016			2016			2016			2016			9	0	1	Least Concern
Limosa limosa (Unknown)		2016		2010		2016		2016		2016				2016				2016		2016			2016		2016			2016			4	5	2	Near Threatened
Limosa lapponica (unknown)	2016					2016			2010-2016		2016			2016				2016			2016		2016			2016			2016		2	4	4	Near Threatened
Arinaria interpres (unknown)			2016			2016		2016				2016		2016				2016			2016			2016	2016			2016			2	2	6	Least Concern
Tringa brewipes (no name)	2016			2016			2010-2016			2016			2016			2016			2016			2016			2016			2016			10	0	0	Near Threatened
Calidris ruficollis (Tiwis)	2016					2016	2016				2016		2016				2016			2016		2016			2016			2016			6	3	1	Near Threatened
Calidris ferruginea (Sansuyan)	2016			2016			2016				2016		2016				2016		2016			2016			2016			2016			8	2	0	Near Threatened
Calidris minnata (Tiwis)	2016			2016				2016		2016			2016			2016			2016			2016			2016			2016			9	1	0	Least Concern
Tachybaptus ruficollis (Dakit)		2016		2016			2016				2016		2016					2016		2016		2016			2016			2016			6	3	1	Least Concern
Porphyrio porphyrio (Pakuro)	2016			2016			2010-2016			2016			2016			2016			2016			2016			2016			2016			10	0	0	Least Concern
Gallinula chloropus (Pakuro)	2016			2016				2016				2016	2016					2016			2016	2016			2016			2016			6	1	3	Least Concern
Porzana pusilla (Unknown)	2016			2016			2016					2016	2016					2016	2016				2016				2016	2016			6	1	3	Least Concern
amaurornis phoenicurus (unknown)	2016				2016		2016			2016			2016					2016	2016				2016				2016	2016			7	2	1	Least Concern
Bubulcus ibis (Tulabong)	2016			2016			2010-2016			2016			2016			2016			2016			2016			2016			2016			10	0	0	Least Concern
Pandion haliaetus (Dapay)	2016				2016			2016		2016	2016		2016					2016	2016			2016						2016			7	3	1	Least Concern
haliastur indus (Tikwi)		2016				2016		2016						2016				2016			2016	2016			2016			2016			3	3	3	Least Concern
Sterna albifrons (Dakit)	2016			2016			2016				2016		2016			2016					2016	2016			2016			2016			8	1	1	Least Concern
Gelochelidon nilotica (Dakit)	2016			2016			2010-2016					2016	2016			2016			2016			2016			2016			2016			9	0	1	Least Concern
TOTAL	47	4	1	42	4	7	30	18	5	33	14	5	44	7	1	22	10	20	35	12	5	40	9	3	51	0	1	49	3	0	393	81	48	

Table 4. Species sighted at Negros Occidental Coastal Wetlands Area Management Alliance sites in Negros, Occidental, Philippines.

Coastal Community	Percentage of Species Validation by Locals (N=52)	Number of Species	No. of Species Regularly Sighted (Perme Makita)	Number of Threatened Species (IUCN Red List)	Status (IUCN Red List)
1. Bago Poblacion	61.5	32	22	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Sampinit	53.8	28	18	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
2. Binalbagan	90	47	35	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
3. Himamaylan To-oy	92	48	36	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Talaban	88	46	30	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Caradio-an	92	48	34	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Suay	94	49	40	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
4. Ilog Barangay 1	98	51	51	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Barangay 2	98	51	51	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Andualuan	98	51	51	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
5. Kabankalan	100	52	49	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
6. Hinigaran	90	47	33	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
7. Pontevedra	98	51	44	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
8. Pulupandan Canlusa	84.6	44	25	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Tapong	98	51	47	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Zone 6	48	25	20	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
9. San Enrique Tibsok	98	51	47	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
Nayon	98	51	47	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened
10. Valladolid	92	48	30	2	-Vulnerable
				1	-Endangered
				8	-Near Threatened

Threatened Species Not Sighted. A number of species reported to have disappeared were also validated by the respondents. Out of 52 bird species, 20 of them were reported to be not sighted at all in Bago City, which is considered as the largest number compared to all survey sites. Kabankalan City, however, stood as the only survey

Figure 4. Vulnerable species: *Egretta eulophotes* (right) and *Anas Luzonica* (left) (Source: IUCN Red List)

Figure 5. An endangered Species (IUCN): *Numenius madagascariensis* (Source: IUCN Red List)

site having sighted all bird species in either occasional or regular category (**Table 7**).

To establish baseline data by which to measure and compare conservation actions, a number of profiling activities were conducted throughout the ten LGUs to serve as guide by local conservation area managers in the succeeding years. Hence, in addition to the validation of threatened species in coastal wetland areas, the participants were likewise asked about important issues and challenges to the wetland sites, which could impact the bird populations and other wildlife living in the area.

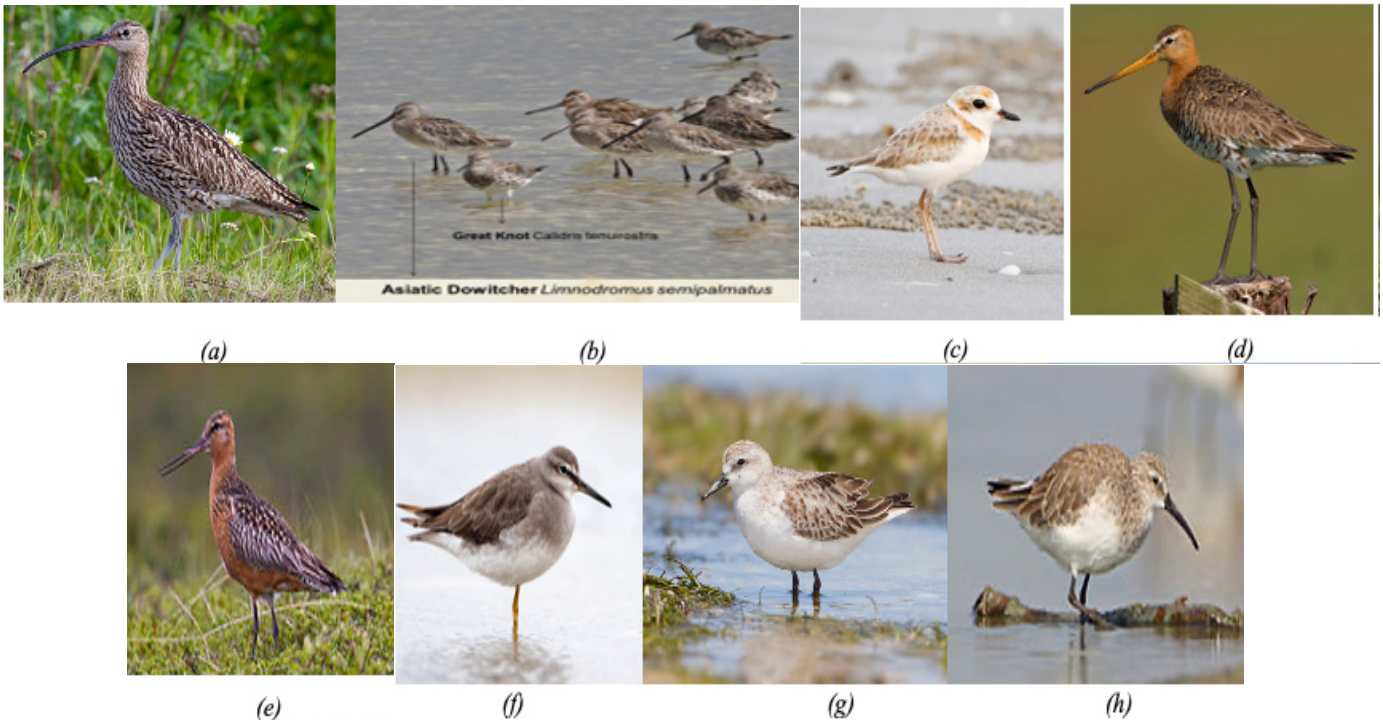

Figure 6. Near Threatened Species identified in the Negros Occidental Coastal Wetlands Area Management Alliance (NOCWAMA) sites Negros, Philippines

Note: (a) *Numenius arquata*, (b) *Limnodromus semipalmatus*, (c) *Charadrius peronii*, (d) *Limosa limosa*, (e) *Limosa lapponica*, (f) *Tringa brevipes*, (g)*Calidris ruficollis* and (h) *Calidris ferruginea*. (Source: IUCN Red List).

Table 5. Commonly observed species validated by Negros Occidental Coastal Wetlands Area Management Alliance (NOCWAMA) in Negros Occidental, Philippines.

Species	Local Name	Conservation (IUCN Red List)	Community									
			San Enrique	Pulupandan	Valladolid	Hinigaran	Pontevedra	Bago	Binalbagan	Himamaylan	Ilog	Kabankalan
Egretta eulophotes	Tulabong	Vulnerable	√	√	√	√	√	√	√	√	√	√
Egretta Alba	Tulabong	Least Concern	√	√	√		√	√	√	√	√	√
Ardea sumatrana	Talabun-ak/ Tulabong	Least Concern	√	√		√	√	√				
Egretta sacra	Sansuyan	Least Concern	√	√	√		√	√	√	√	√	√
Numenius madagas cariensis	Sansuyan	Endangered	√			√	√	√	√	√	√	√
Numenius arquata	Sansuyan	Near Threatened	√	√		√	√			√	√	√
Anas luzonica	Pato Ilahas	Vulnerable	√	√			√	√	√	√	√	√
Dendrocygna arcuata	Bebe Ilahas	Least Concern	√	√		√	√	√	√	√	√	√
Limnodromus semipalmatus	Tiwis	Near Threatened	√	√	√	√	√	√	√	√	√	√
Himantopus himantupos	No name	Least Concern	√	√		√	√	√	√	√	√	√
Ardeola bacchus	Talabun-ak	Least Concern	√	√	√	√	√	√	√	√	√	√
Ardeola speciosa	Talabun-ak	Least Concern	√	√	√	√	√		√	√	√	√
Nycticorax caledonicus	Talabun-ak	Least Concern	√	√		√	√				√	√
Nycticorax nycticorax	Talabun-ak	Least Concern	√	√		√	√				√	√
Charadrius peronii	Tiwis	Near Threatened	√			√	√	√	√	√	√	√
Numernius minitus	Tiwis	Least Concern	√	√	√	√	√	√	√		√	√
Sterna caspia	Dagit	Least Concern	√	√	√	√	√		√		√	√
Sterna hirundo	Dagit	Least Concern	√	√	√	√	√		√	√	√	√
Ardea cinerea	Tulabong	Least Concern	√	√		√				√	√	√
Ardea purpurea	Dugwak	Least Concern	√	√	√	√		√	√	√	√	√
Buturides striatus	Talabun-ak	Least Concern	√	√	√	√	√	√	√	√	√	√
Ixobrychus sinensis	Unknown	Least Concern	√	√	√	√	√		√	√	√	√
Ixobrychus cinnamomeus	Unknown	Least Concern	√	√		√	√		√	√	√	√
Charadius alexandrinus	Tiwis	Least Concern	√	√	√	√	√	√	√	√	√	√
Pluvialis squatarola	Pagsung	Least Concern	√	√		√	√		√		√	
Pluvialis fulva	Tiwis	Least Concern	√	√		√	√			√	√	√
Charadrius dubius	Tiwis	Least Concern	√	√	√						√	√
Charadrius mongolus	Tiwis	Least Concern	√	√	√		√	√		√	√	√
Charadrius leschenaultii	Tiwis	Least Concern	√	√			√		√	√	√	√
Numenius phaeopus	Sansuyan	Least Concern	√	√	√	√	√		√	√	√	√
Tringa totanus	Unknown	Least Concern		√							√	
Tringa nebularia	Sansuyan	Least Concern	√		√		√			√	√	√
Tringa ochropus	Sansuyan	Least Concern	√	√	√		√		√	√	√	√
Tringa glareola	No name	Least Concern	√	√	√	√	√		√	√	√	√
Actitis hypoleucos	No name	Least Concern	√	√	√	√	√		√	√	√	√
Limosa limosa	Unknown	Near Threatened		√		√					√	√
Limosa lapponica	Unknown	Near Threatened	√								√	
Arinaria interpres	Unknown	Least Concern									√	√
Tringa brevipes	No name	Near Threatened	√	√	√	√	√	√	√	√	√	√
Calidris ruficollis	Tiwis	Near Threatened	√		√		√			√	√	√
Calidris ferruginea	Sansuyan	Near Threatened	√	√	√		√		√	√	√	√
Calidris minnota	Tiwis	Least Concern	√	√		√	√	√	√	√	√	√
Tachybaptus ruficollis	Dakit	Least Concern		√	√		√			√	√	√
Porphyrio porphyrio	Pakuro	Least Concern	√	√	√	√	√	√	√	√	√	√
Gallinula chloropus	Pakuro	Least Concern	√	√			√			√	√	√
Porzana pusilla	Unknown	Least Concern	√	√	√		√		√			√
Amaurornis phoenicurus	Unknown	Least Concern	√		√	√	√		√		√	√
Bubulcus ibis	Tulabong	Least Concern	√	√	√	√	√	√	√	√	√	√
Pandion haliaetus	Dapay	Least Concern	√			√	√		√	√	√	√
Haliastur indus	Tikwi	Least Concern								√	√	√
Sterna albifrons	Dakit	Least Concern	√	√	√		√	√		√	√	√
Gelochelidon nilotica	Dakit	Least Concern	√	√	√		√	√	√	√	√	√
TOTAL	N=52		45	41	29	33	44	22	35	40	51	49

Human Activities that have Negative Effects on the Coastal Area

The workshop participants were also asked of the activities being done by the community that have negative effects on the coastal areas. The most prevalent activities point to disposal of garbage on the coastal area (45.8%), illegal fishing (13.5%), and illegal logging (9.7%) according to the majority. Relatively, research show that reduction in forest area result in a reduction of its number of species that threatens some lowland birds and mammals to extinction in the insular Southeast Asia (*Brooks et al. 1999; Brooks et al. 1997*).

Table 6. List of Commonly Observed Species Validated by Negros Occidental Coastal Wetlands Area Management Alliance (NOCWAMA) Participants in Negros Occidental, Philippines.

Species	Local Name	Conservation	Community									
			San Enrique	Pulupandan	Valladolid	Hinigaran	Pontevedra	Bago	Binalbagan	Himamaylan	Ilog	Kabankalan
Egretta eulophotes	Tulabong	Vulnerable							√			
Egretta Alba	Tulabong	Least Concern										
Ardea sumatrana	Talabun-ak/ Tulabong	Least Concern			√	√						
Egretta sacra	Sansuyan	Least Concern			√	√						
Numenius madagas cariensis	Sansuyan	Endangered		√	√			√	√			
Numenius arquata	Sansuyan	Near Threatened		√	√			√	√			
Anas luzonica	Pato Ilahas	Vulnerable			√	√						
Dendrocygna arcuata	Bebe Ilahas	Least Concern			√							
Limnodromus semipalmatus	Tiwis	Near Threatened										
Himantopus himantupos	No name	Least Concern										
Ardeola bacchus	Talabun-ak	Least Concern										
Ardeola speciosa	Talabun-ak	Least Concern						√				
Nycticorax caledonicus	Talabun-ak	Least Concern			√			√	√	√		
Nycticorax nycticorax	Talabun-ak	Least Concern			√				√	√		
Charadrius peronii	Tiwis	Near Threatened			√							
Numernius minitus	Tiwis	Least Concern								√		
Sterna caspia	Dagit	Least Concern								√		
Sterna hirundo	Dagit	Least Concern										
Ardea cinerea	Tulabong	Least Concern					√		√			
Ardea purpurea	Dugwak	Least Concern					√					
Buturides striatus	Talabun-ak	Least Concern										
Ixobrychus sinensis	Unknown	Least Concern										
Ixobrychus cinnamomeus	Unknown	Least Concern			√							
Charadius alexandrinus	Tiwis	Least Concern										
Pluvialis squatarola	Pagsung	Least Concern						√				√
Pluvialis fulva	Tiwis	Least Concern			√				√			
Charadrius dubius	Tiwis	Least Concern				√	√		√	√		
Charadrius mongolus	Tiwis	Least Concern				√			√			
Charadrius leschenaultii	Tiwis	Least Concern			√	√		√				
Numenius phaeopus	Sansuyan	Least Concern						√				
Tringa totanus	Unknown	Least Concern	√			√			√			√
Tringa nebularia	Sansuyan	Least Concern				√		√	√			
Tringa ochropus	Sansuyan	Least Concern										
Tringa glareola	No name	Least Concern						√				
Actitis hypoleucos	No name	Least Concern										
Limosa limosa	Unknown	Near Threatened	√		√		√		√	√		
Limosa lapponica	Unknown	Near Threatened				√	√			√		√
Arinaria interpres	Unknown	Least Concern			√		√					
Tringa brevipes	No name	Near Threatened										
Calidris ruficollis	Tiwis	Near Threatened				√		√	√			
Calidris ferruginea	Sansuyan	Near Threatened				√		√				
Calidris minnota	Tiwis	Least Concern			√							
Tachybaptus ruficollis	Dakit	Least Concern	√			√			√			
Porphyrio porphyrio	Pakuro	Least Concern										
Gallinula chloropus	Pakuro	Least Concern			√							
Porzana pusilla	Unknown	Least Concern								√		
Amaurornis phoenicurus	Unknown	Least Concern		√						√		
Bubulcus ibis	Tulabong	Least Concern										
Pandion haliaetus	Dapay	Least Concern		√	√	√						
Haliastur indus	Tikwi	Least Concern	√		√		√					
Sterna albifrons	Dakit	Least Concern				√						
Gelochelidon nilotica	Dakit	Least Concern										
TOTAL	N=52		4	4	18	14	7	10	12	9	0	3

Activities Being Done by the Residents in the Community

Results of the interview on the activities done by the residents in the community revealed the following: dumping garbage into the coastal areas (27.6%), clearing of mangrove forest (20.2%), cutting of trees (19.3%), quarrying sand and gravels (12.4%), and building houses and structures along the riverbanks (8.6%). They also observed that some locals still practice cyanide fishing in the coastal area (1.9%).

Table 6. List of commonly observed species validated by Negros Occidental Coastal Wetlands Area Management Alliance (NOCWAMA) Participants in Negros Occidental, Philippines.

Species	Local Name	Conservation (IUCN Red List)	Community									
			San Enrique	Pulupandan	Valladolid	Hinigaran	Pontevedra	Bago	Binalbagan	Himamaylan	Ilog	Kabankalan
Egretta eulophotes	Tulabong	Vulnerable										
Egretta Alba	Tulabong	Least Concern										
Ardea sumatrana	Talabun-ak/ Tulabong	Least Concern										
Egretta sacra	Sansuyan	Least Concern										
Numenius madagas cariensis	Sansuyan	Endangered										
Numenius arquata	Sansuyan	Near Threatened										
Anas luzonica	Pato Ilahas	Vulnerable										
Dendrocygna arcuata	Bebe Ilahas	Least Concern										
Limnodromus semipalmatus	Tiwis	Near Threatened										
Himantopus himantupos	No name	Least Concern			√							
Ardeola bacchus	Talabun-ak	Least Concern										
Ardeola speciosa	Talabun-ak	Least Concern										
Nycticorax caledonicus	Talabun-ak	Least Concern										
Nycticorax nycticorax	Talabun-ak	Least Concern						√				
Charadrius peronii	Tiwis	Near Threatened		√								
Numernius minitus	Tiwis	Least Concern										
Sterna caspia	Dagit	Least Concern						√				
Sterna hirundo	Dagit	Least Concern						√				
Ardea cinerea	Tulabong	Least Concern			√			√				
Ardea purpurea	Dugwak	Least Concern										
Buturides striatus	Talabun-ak	Least Concern										
Ixobrychus sinensis	Unknown	Least Concern						√				
Ixobrychus cinnamomeus	Unknown	Least Concern						√				
Charadius alexandrinus	Tiwis	Least Concern										
Pluvialis squatarola	Pagsung	Least Concern			√					√		
Pluvialis fulva	Tiwis	Least Concern						√				
Charadrius dubius	Tiwis	Least Concern						√				
Charadrius mongolus	Tiwis	Least Concern										
Charadrius leschenaultii	Tiwis	Least Concern										
Numenius phaeopus	Sansuyan	Least Concern										
Tringa totanus	Unknown	Least Concern			√		√	√		√		
Tringa nebularia	Sansuyan	Least Concern		√								
Tringa ochropus	Sansuyan	Least Concern				√		√				
Tringa glareola	No name	Least Concern										
Actitis hypoleucos	No name	Least Concern						√				
Limosa limosa	Unknown	Near Threatened		√				√				
Limosa lapponica	Unknown	Near Threatened		√	√			√	√			
Arinaria interpres	Unknown	Least Concern	√	√		√		√	√	√		
Tringa brevipes	No name	Near Threatened										
Calidris ruficollis	Tiwis	Near Threatened		√								
Calidris ferruginea	Sansuyan	Near Threatened										
Calidris minnota	Tiwis	Least Concern										
Tachybaptus ruficollis	Dakit	Least Concern						√				
Porphyrio porphyrio	Pakuro	Least Concern										
Gallinula chloropus	Pakuro	Least Concern				√		√	√			
Porzana pusilla	Unknown	Least Concern				√		√			√	
Amaurornis phoenicurus	Unknown	Least Concern						√				
Bubulcus ibis	Tulabong	Least Concern										
Pandion haliaetus	Dapay	Least Concern						√				
Haliastur indus	Tikwi	Least Concern		√				√	√			
Sterna albifrons	Dakit	Least Concern							√			
Gelochelidon nilotica	Dakit	Least Concern				√						
TOTAL	N=52		1	7	5	5	1	20	5	3	1	0

Activities Needed to Revive and Sustain the Life of the Rivers and Seas.

When asked what should be done to revive and sustain the life of the sea, 29.8% suggested that there is a need to protect and give care, while 20% felt a need to conduct clean-up drives. Others think that it is important to conduct mangrove planting (10.7%) and some cited that simple avoidance of dumping garbage on bodies of water will help revive the river and seas.

Existing Programs being Implemented by Local Government to Sustain, Preserve, and Rehabilitate the NOCWAMA Areas

Respondents also shared their views of the programs being implemented by the local government that resulted to the sustainability, preservation and rehabilitation ofthe coastal areas. The most prominent of these were; Bantay Dagat (41.7%) mangrove planting (17.7%), bantay katunggan (16.5%) and coastal clean-up (7.5%).

Major Concerns, Perceived Environmental Issues and Problems in the Protected Areas

Issues and concerns perceived by respondents in the protected areas include the dredging or disposal of the soil which affects one of their livelihoods like the hipon production. They also felt the need for information dissemination and trainings among the people of the town particularly, and the fisherfolks. Likewise the solid waste management along coastal area creates greater impact to the degradation of their local marine area.

In a study on coastal wetland loss, consequences and challenges, *Li et al. (2018*) stressed that the world wetland loss and degradation was accelerated in the last three decades caused by both anthropogenic and natural factors hence, multidisciplinary efforts are needed to address the challenge.

Suggested Programs for the Government to Support the Coastal Areas

The following were common recommendations given by the household-respondents to support NOCWAMA coastal areas: Livelihood program, mangrove planting, support existing organizations and programs, activate and support the Bantay Dagat/Katunggan, protect the sea and all the Flora and Fauna Species, proper implementation of the law, protect the mangrove, clearing or clean-up drive, planting more trees and prevention of illegal activities.

CONCLUSION AND RECOMMENDATIONS

The threatened wetland bird species of NOCWAMA sites in Negros Occidental, Philippines covering the cities of Bago, Himamaylan and Kabankalan and the municipalities of Pulupandan, Valladolid, San Enrique, Pontevedra, Hinigaran, Binalbagan, and Ilog are generally perceived as "abundant" as indicated by their perceived common presence. The 10 sites also shared two vulnerable species, *Egretta eulophotes*. The *Numenius madagascariensis* is considered endangered and eight near threatened bird species (IUCN Red list), *Numenius arquata, Limnodromus semipalmatus, Charadrius peronii, Limosa limosa, Limosa lapponica, Tringa brevipes, Calidris ruficollis* and *Calidris ferruginea*, were validated by the locals in almost all of the study sites. However, there were some threatened species observed to have disappeared and declined in these coastal wetland areas. According to *Kirby et. al.* (*2008*) efforts to conserve migratory birds would be less effective if unaddressed threats are reducing these species' populations and habitats elsewhere.

To sustain the abundance of the wetland bird species of NOCWAMA sites, the following recommendations are provided; To continue with the monitoring of threatened species (and common species) and investigate the decline of certain species, the Local Government Units and other concerned agencies and institutions may consider investing more on wildlife and habitat protection.

The presence of endangered, vulnerable and near threatened species in the coastal areas warrants the protection of these species and their habitat and in consonance with the designation of Negros Occidental Coastal Wetlands Conservation Area (NOCWCA) as the 7th Ramsar Site in the country (www.ramsar.org).

The Local Government Units that fall within the service area of the NOCWAMA sites should endeavor to provide livelihood support and implement program (s) and project (s) for the alleviation and improvement of the socio-economic conditions in the area.

Implement support program (s) in the coastal areas that encourage reduction of dependence on resource use and have low negative environmental impact. Similarly, these programs should facilitate the promotion of social awareness and good cultural values of the local folks and the community.

The management of the coastal areas can be synchronized with the provincial government through NOCWAMA and the local government units to harmonize critical policies (e.g., illegal fishing and bird hunting, the imposition of marine protection zones, resource access).

Additional incentives may be provided to the Bantay Dagay/Katunggan to improve their socio-economic situation, enticing and to motivate them to work harder. These incentives may be in the form of scholarships for their children, monetary benefits, tools, equipment, monitoring facilities and specific livelihood assistance.

Develop and strengthen the conduct of appropriate Communication, Capacity Building, Education, Participation and Awareness (CEPA) programs for continuous education to the public and enhance awareness of the importance of protection and preservation of the coastal resources.

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