
SURVEY OF THE COASTAL WETLANDS OF SIARGAO ISLAND, PHILIPPINES*

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The interest on wetlands of Mindanao is but an offshoot of the workshop conducted by the Asian Wetland Bureau-Philippines on Rapid Assessment of Wetlands on April 22-25, 1987 held in Cebu and Mactan. After the workshop came the identification, survey, assessment and on-site visits of a number of wetland areas in Mindanao. The concern for wetlands was further reinforced by the brief visit of Dr. Ronald Petocz of the World-Wide Fund for Nature.

Of the 7,107 islands of the Philippines, Mindanao, which is the second largest island, ranks first in having the most number of important wetlands areas. Its natural resources, both aquatic and terrestrial, are the richest and most diverse. In terms of hectarage of mangrove forest and other wetland types, Mindanao has the most extensive. It is then logical for the government to reconsider the prospect of putting in more investment in the region than in Luzon or the Visayas.

One of the hundreds of islands around Mindanao with a vast expanse of mangrove forest is Siargao Island, off the northeastern tip of Mindanao. This island has an estimated 4,000 hectares of mangrove forest with more than 3,000 hectares concentrated on the southeastern coast. This area excludes the adjacent tidal flats which presumably support a variety of plants and animals. From Siargao Island extending southward along the Pacific coast of Mindanao is found extensive mangrove areas including that of Lanuza Bay, Hinatuan Bay and Bislig Bay.

The survey revealed important aspects of the status of the wetland and marine resources of the island:

1. No scientific study and survey have been done on the extant wetland and marine resources.
2. The marine resources are depleted as a result of over-exploitation for the shellcraft industry and illegal fishing.
3. The mangrove forest is by far the most healthy and extensive in that part of Mindanao.
4. The utilization of the mangrove trees is at a subsistence level.

Objectives of the Survey

The survey was undertaken with the following objectives:

1. To assess the status and to determine the extent of exploitation of the mangrove forest of the island.
2. To collect specimens for taxonomic, instructional and museum purposes.
3. To assess the status of the marine resources of the island, particularly the marine mollusks.
4. To survey the species and number of waterbirds of the island.
5. To gather information on the threats on the mangrove forest.

Field Methodology

Maps prepared by the Philippine Coast and Geodetic Survey were studied and attention was focused on the coastal mangrove areas of Namancia, Dapa and vicinity and the tidal areas in General Luna, in the south and western part of Siargao Island. Within the survey sites observation by foot on vegetation, substratum and extent of exploitation was made.

Bird identification and count were made in all the survey sites using binoculars and prescribed bird references. Numancia, Dapa and General Luna were accessible by jeep while the rest of the survey sites adjacent to Dapa were approached using outrigger boats. Except for the flocks of terns and small waders, the counts for the other birds were close to 100% accuracy.

Interview of the local officials was conducted concerning proposed and existing development programs affecting the mangrove areas. Project maps and development charts were also studied. Actual ocular observation was also made on the site where mangrove parts are harvested.

Shallow areas in the eastern coast of General Luna were sampled for marine mollusks by snorkeling, wading and overturning rocks and coral rubble. Day and night dives were made daily. The methods used in cleaning and preparing the specimens were those of S.P. Dance (1976).

Photographs were taken using a 110 Crown All-Weather camera.

The survey team was composed of Apolonio Kintao, Danilo Paise, Bonifacio Cane, Felomino Duron, Renato Anuengo, Henry Cocos and Amuerfino Mapalo himself, all of Mindanao State University in Marawi City.

Scope of the Report

This is a report on the results of the survey conducted on April 26, 1988 in the southern and western coasts of Siargao Island, and includes all the observations on the mangrove forest, avifauna and marine mollusks. A list of bird species and count are found in several tables while the list of marine mollusks collected are presented in the appendix and tables.

The Survey Sites

All survey sites were located in the southern and western coasts of Siargao and at least seven sites were surveyed, namely, Monserrat, Bancuyo, Abanay, Lahi, Kubang, Numancia and General Luna. Siargao is bordered in the east by the southern part of the Philippine Sea and the Pacific Ocean. In the south it is bordered by the islands of Daco, East Bucas, Bancuyo, Abanay, Middle Bucas and Bucas Grande Island. In its southwestern border lies Dapa Channel which separates it from Bucas Grande Island.

Of the seven survey sites, General Luna is the only one with a sandy substratum. The remaining sites have a sandy muddy substratum.

The most eastern of the sites is General Luna which directly faces the Pacific Ocean. Farther west from General Luna is Dapa and just south and adjacent to it are Monserrat, Bancuyo, Abanay, Lahi, and Kubang areas. The most western is Numancia.

The Mangrove Forest

The major part of the observation of mangrove forest was done in Dapa and the mangrove areas in Monserrat, Lahi, Bancuyo, Abanay, and Kubang, and the mangrove forest of Numancia.

A. *Mangrove Forest of Dapa and Vicinity.* The mangrove forest of Dapa and the localities of Monserrat, Bancuyo, Abanay, Lahi and Kubang covers an area of about 75 hectares. The most dominant mangrove species in these areas is *Rhizophora apiculata*. It was observed that some of the trees were flowering while others were already with droppers. Most of the trees, however, did not have flowers or droppers. The other species, *Rhizophora mucronata*, is also present but not as common as the former species. In Monserrat, a northern town in the island of East Bucas just north of Dapa, a healthy stand of coastal mangrove forest consisting of *Rhizophora* species with an almost uniform height can be found. The species composition of the mangrove forest in Bancuyo is the same as that of Monserrat, with *Rhizophora* species dominating in the area. It was in this mangrove area that two trees of the *Avicennia marina* were sighted.

In Lahi and Kubang the same mangrove picture can be seen. The luxuriant growth of *Rhizophora apiculata* in the area seemed not to allow the presence of other mangrove species.

The substratum in all of the sites in the mangrove areas and in the tidal flat is muddy-rocky. The mud component contains much rotting plant matter which makes it a little bit clayish. The color of the substratum is dark brown. The substratum was about one foot thick and under this layer of mud can be felt the hard coralline flat.

This may indicate that the area was once a reef flat which later became covered with soil, mud other organic matter.

Most of the mangrove forest in Dapa are privately owned but despite this the areas have not been developed into fishponds, as indicated by the absence of dikes. One valid reason for this is the fact that the island is very often visited by typhoons, which can be very destructive to both the mangrove forest and fishponds.

The waters close to the mangrove areas are utilized for fishing, swimming and navigation. The channel in front of Dapa and between the other adjoining islands are used as navigational ways for boats and other vessels navigating between Surigao and Siargao Island. East of the Kubang Mangrove area are located a mussel farm and five fishpens which are all privately owned.

B. Numancia Mangrove Forest. This area covers a total of P3,000 hectares of mangrove forest dominated by *Rhizophora* and *Bruguiera* species. Other species which have been identified belong to the genera of *Xylocarpus* and *Ceriops*, the latter having been planted by the local fisherman.

Just as in Dapa, there are no operational or existing fishponds within the mangrove area, but the local official who was interviewed revealed that there are applications to develop fishponds, but due to some reasons, mainly financial, fishpond construction has not been started.

The mangrove trees are being exploited but only at a subsistence level. Mangrove poles/sticks are being used as firewood, timber and as roofing and fencing materials. A bundle of firewood six inches in diameter was sold for P1.00, and the local government attempted once to regulate the exploitation of the mangroves and to augment the local treasury by collecting from the firewood dealers P0.02 for every bundle sold. This practice, however, was discontinued.

The municipal government of Numancia has already reclaimed a portion of the mangrove forest for its existing wharf and market projects. At the time of the survey it was gathered that the government was about to implement another reclamation project that would cost the government some P1,500,000.00 and the proposed area

which was about 1.5 hectares was located right beside the present market site.

It may appear surprising that with Numancia's population of about 17,000, very few people are engaged in cutting down mangrove trees, despite their abundance in the area. One of the reasons might be the alleged presence of giant man-eating crocodiles in the mangrove forest which discourages the local people from going into the forest. There have been several reports of people disappearing or having been mutilated as a result of crocodile attacks. One report has it that a 19-foot crocodile has been seen devouring a human being, and in another incident a fisherman was killed allegedly by a 35-foot crocodile. The species of the crocodile, however, has not been determined as there was no specimen available for identification.

The Avifauna

Very few species of birds have been identified and enumerated during the time the survey team was in Siargao Island from April 27 to May 3, 1988. Only those species seen in the ricefields and those observed in the coastal areas have been recorded.

The only flock of terns, the species of which cannot be determined, numbering about 60 individuals, was observed flying northward directly over the base camp.

On the first day in the island, three individuals of *Fregata ariel* were observed hovering over the camp. They later disappeared, apparently scared of the researchers.

Only one *Tringa hypoleucos* was seen atop the seawall in front of the camp. The bird just flew away after a little boy came after it. It was seen three times during the first few days on the island.

In the afternoon of the second day, three *Arenaria interpres* were seen feeding on the sandy shoreline north of the camp. On the following day, the same species was seen again on the same site but this time there were four of them.

Three individuals of *Butorides stratus* were frequently observed flying very close to the water just in front of the camp.

One species which has been observed only once was *Charadrius alexandrinus* and three individuals of the species were seen feeding together with *Arenaria interpres*.

Two *Egretta eulopnetes* were seen flying possibly to a ricefield north of the camp.

One *Numenius phaeopus* flew over the camp in the northward direction.

One black heron and two other white ones were seen together flying in the northward direction. The species cannot be ascertained as they were very far from the observation post.

In Dapa, eight species of birds were identified and observed. *Haliastur indus* and *Haliaeetus leucogaster* were seen hovering right over Dapa Channel. *Egretta garzetta* was seen feeding in the ricefield north of Dapa. *Bubulcus ibis* was sporting breeding plumage when seen feeding in the ricefield together with *Egretta garzetta*. *Butorides striatus* and *Halcyon chloris* were sighted in the mangrove forest in Bancuyo. Six unidentified terns were also seen in the same mangrove area.

Gallicrex cinerea was sighted flying over the ricefield where 18 individuals of *Egretta sarzetta* were feeding. Two individuals of *Nycticorax nycticorax* were seen in one of the houses in Numancia.

The Marine Mollusks

The list of marine mollusks is presented in Appendix A.

A total of 851 specimens were collected, representing 137 species belonging to 59 genera and 39 families from three classes.

In Table 2, fifteen species of gastropods are listed as very common in the area having been represented in the collection by 19 or more specimens. The rest of the species are not very common.

All species listed were collected from shallow areas up to a depth of about three fathoms. None of the species can be considered rare or common, but it was observed that most of the species were not well represented. Except for the species listed in Table 2, all the other

species have been poorly represented. A total of 52 species were represented by only one specimen each and another 18 species had two representative specimens each. There were other 14 species which had three representative specimen each.

One factor that is largely responsible for the decline of the population of common molluskan species in the island is over-collection to meet the demand of the shellcraft industry. It was revealed that shell traders coming from as far as Cebu and Bohol frequent the island to buy shells. It is rather unfortunate that no legislation has been enforced to protect and regulate the collection of seashells. It is certain from the way this marine resource is being exploited that the time is not far when the shellcraft industry will just be a thing of the past in the Philippines.

The list of species is by no means complete but is certainly representative of the major molluskan fauna of the island. This listing indicates the extent of abundance and variety of the shell species in the island.

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APPENDIX A

LIST OF MARINE MOLLUSKS FROM SIARGAO ISLAND, PHILIPPINES

Species	No. of Specimens	Species	No. of Specimens
Class Gastropoda		Family Trochidae	
Family Haliotidae			
<u>Haliotis asinina</u> (Linne)	4	<u>Chrysostoma paradoxum</u> (Born)	22
<u>Haliotis varia</u> (Linne)	1	<u>Tectus fenestratus</u> (Gmelin)	21
		<u>T. pyramis</u> (Born)	23
		<u>T. conus</u> (Gmelin)	7
Family Acmaeidae		<u>T. niloticus</u> (Linne)	6
<u>Acmaea saccharina</u> (Linne)	6	<u>Trochus incrassatus</u> (Lamarck)	4

<u>T. laciniatus</u> (Reeye)	44	<u>C. moneta</u> (Linne)	10
Family Angariidae		<u>C. nebrites</u> (Melville)	24
<u>Angaria delphinus</u> (Linne)	20	<u>C. tigris</u> (Linne)	14
Family Turbinidae		<u>C. vitellus</u> (Linne)	7
<u>Astraea calcar</u> (Linne)	36	Family Naticidae	
<u>A. haematraga</u> (Menke)	7	<u>Natica sagittata</u> (Menke)	1
<u>A. rhodostroma</u> (Lamarck)	16	<u>Polinices flemingiana</u> (Reclus)	7
<u>Turbo argyrostomus</u> (Linne)	3	<u>P. maurus</u> (Lamarck)	3
<u>T. chrysostomus</u> (Linne)	5	<u>P. tumidus</u> (Swainson)	2
<u>T. petholatus</u> (Linne)	5	Family Cassididae	
Family Neritidae		<u>Phalium bandatum</u> (Perry)	1
<u>Nerita albicilla</u> (Linne)	2	<u>Casmaria erinaceus</u> (Linne)	1
<u>N. plicata</u> (Linne)	1	Family Cymatiidae	
<u>N. versicolor</u> (Gmelin)	5	<u>Distorsio anus</u> (Linne)	2
Family Cerithidae		Family Bursidae	
<u>Cerithium aluco</u> (Linne)	1	<u>Bursa granularis</u> (Roding)	1
<u>C. asper</u> (Linne)	2	<u>B. ranelloides</u> (Reeve)	5
<u>C. columna</u> (Sowerby)	1	<u>B. rosa</u> (Perry)	1
<u>C. sinensis</u> (Gmelin)	2	Family Tonnidae	
<u>C. nodulosum</u> (Bruguiere)	20	<u>Tonna canaliculata</u> (Linne)	11
<u>C. vertagus</u> (Linne)	35	<u>T. perdix</u> (Linne)	4
Family Strombidae		<u>Malea pomum</u> (Linne)	1
<u>Terebellum terebellum</u> (Linne)	6	Family Muricidae	
<u>Strombus auristiane</u> (Linne)1		<u>Chicoreus brunneus</u> (Linne)	3
<u>S. incisus</u> (Wood)	1	<u>Drupa morum</u> (Roding)	3
<u>S. gibberulus</u> (Linne)	31	<u>Drupa ricinus</u> (Linne)	2
<u>S. lentiginosus</u> (Linne)	22	<u>Morula sguamosa</u> (Pease)	2
<u>S. luhuanus</u> (Linne)	60	<u>Morula uva</u> (Roding)	1
<u>S. mutabilis</u> (Swaihson)	2	<u>Purpura intermedia</u> (Kiener)	3
<u>S. sinuatus</u> (Lightfoot)	1	<u>Thais tuberosa</u> (Roding)	1
<u>Lambis lambis</u> (Linne)	30	Family Coralliphilidae	
Family Cypraeidae		<u>Coralliophila violascens</u> (Kiener)	1
<u>Cypraea annulus</u> (Linne)	37	Family Buccinidae	
<u>C. arabica</u> (Linne)	12	<u>Cantharus fumosus</u> (Dillwyn)	1
<u>C. asellus</u> (Linne)	1	<u>Engina alveolata</u> (Kiener)	1
<u>C. caputserpentis</u> (Linne)	1		
<u>C. carneola</u> (Linne)	1		
<u>C. erosa</u> (Linne)	2		
<u>C. erroneus</u> (Linne)	2		
<u>C. lynx</u> (Linne)	6		

Family Fasciolariidae		<u>C. rattus</u>	3
		<u>C. striatellus</u> (Link)	1
<u>Fasciolaria trapezium</u> (Linne)	25	<u>C. striatus</u> (Linne)	1
<u>Pleuroplaca filamentosa</u> (Roding)	1	<u>C. varius</u> (Linne)	1
<u>Latirus polygonus</u> (Gmelin)	1	<u>C. vexillum</u> (Gmelin)	4
<u>Fusinus forceps</u> (Perry)	1	<u>C. virgo</u> (Linne)	5
Family Olividae		Family Terebridae	
<u>Oliva miniacea</u> (Roding)	3	<u>Terebra Affinis</u> (Gray)	8
Family Mitridae		<u>T. crenulata</u> (Linne)	1
<u>Vexillum vulpecula</u> (Linne)	12	<u>T. dimidiata</u> (Linne)	1
<u>Mitra ermitarium</u> (Roding)	1	<u>T. guttata</u> (Roding)	1
<u>Mitra mitra</u> (Linne)	5	<u>T. maculata</u> (Linne)	8
<u>Mitra stictica</u> (Linne)	2	<u>T. subulata</u> (Linne)	19
<u>Pterygia dactylus</u> (Linne)	1	Family Bullidae	
Family Vasidae		<u>Bulla ampulla</u> (Linne)	4
<u>Vasum turbinellum</u> (Linne)	30	Family Milampidae	
Family Harpidae		<u>Pythia scarabaeus</u> (Linne)	1
<u>Harpa amouretta</u> (Roding)	1	Family Atyidae	
Family Volutidae		<u>Atya cornuta</u> (Pilsbry)	1
<u>Cymbiola vespersilio</u> (Linne)	16	Class Scaphopoda	
Family Conidae		Family Dentaliidae	
<u>Conus anomatus</u> (Hwass)	3	<u>Dentalium bisexangulatum</u> (Sowerby)	1
<u>C. aulicus</u> (Linne)	1	Family Glycemerididae	
<u>C. capitaneus</u> (Linne)	8	<u>Glycemeris amboienensis</u> (Gmelin)	1
<u>C. challeus</u> (Roding)	1	Family Spondylidae	
<u>C. coromatus</u> (Gmelin)	3	<u>Spondylus ducalis</u> (Roding)	1
<u>C. ebrasus</u> (Linne)	3	Family Limidae	
<u>C. glans</u> (Linne)	12	<u>Lima lima</u> (Linne)	1
<u>C. imperialis</u> (Linne)	1	Family Lucinidae	
<u>C. litheglyphus</u> (Hwass)	2	<u>Codakia tigerina</u> (Linne)	3
<u>C. litteratus</u> (Linne)	14	<u>Codakia punctata</u> (Linne)	9
<u>C. magus</u> (Linne)	22		
<u>C. marmoreus</u> (Linne)	1		
<u>C. miles</u> (Linne)	1		
<u>C. muriculatus</u> (Sowerby)	1		
<u>C. planorbis</u> (Born)	2		
<u>C. pulicarius</u> (Hwass)	16		
<u>C. purourascens</u> (Sowerby)	2		
<u>C. guercinus</u> (Solander)	4		

Family Fimbriidae		<u>T. maxima</u> (Roding)	8
		<u>T. squamosa</u> (Lamarck)	4
<u>Fimbria fimbriata</u> (Linne)	3	<u>Hippopus hippopus</u> (Linne)	2
Family Cardiidae		Family Psammodiidae	
<u>Trachycardium flavum</u> (Linne)	1	<u>Asaphis violascens</u> (Forsk.)	2
<u>Corculum cardissa</u> (Linne)	6	Family Veneridae	
<u>C. unedo</u> (Linne)	2	<u>Venus clathrata</u>	1
Family Tridacnidae			
<u>Tridacna crocea</u> (Lamarck)	3		

Table 1. Summary of marine mollusks identified in Siargao Island.

	GASTROPODS	SCAPHOPODS	BIVALVES	TOTAL
No. of specimens	801	2	48	851
No. of species	119	2	16	137
No. of Genera	46	1	12	59
No. of Families	28	1	10	39

Table 2. Most common species collected in Siargao Island.

SPECIES	NO. OF SPECIMENS
<i>Strombus luhuanus</i>	60
<i>Trochus laciniatus</i>	44
<i>Cypraea annulus</i>	37
<i>Cerithium vertagus</i>	35
<i>Strombus gibberulus</i>	31
<i>Lambis lambis</i>	30
<i>Vasum turbenellum</i>	30
<i>Fasciolaria trapezium</i>	25
<i>Tectus pyramis</i>	23
<i>Strombus lentiginosus</i>	22
<i>Conus magus</i>	22
<i>Tectus fenestratus</i>	21
<i>Angaria delphinus</i>	20
<i>Cerithium nodulosum</i>	20
<i>Terebra subulata</i>	19

Table 3. Individual count of species of birds identified in General Luna, Siargao Island.

SPECIES	NO. OF INDIVIDUALS
<i>Fregata ariel</i>	3
<i>Tringa hypoleucos</i>	1
<i>Arenaria interpres</i>	4
<i>Butorides striatus</i>	3
<i>Charadrius alexandrinus</i>	3
<i>Egretta eulophotes</i>	2
<i>Numenius phaeopus</i>	1
<i>Sterna sp.</i>	60
Unidentified herons	3
Unidentified waders	20

Table 4. Individual count of species of birds identified in Dapa, Siargao Island.

SPECIES	NO. OF INDIVIDUALS
<i>Haliastur indus</i>	1
<i>Egretta garzetta</i>	19
<i>Butorides striatus</i>	2
<i>Halcyon chloris</i>	3
<i>Haliaeetus leucogaster</i>	1
<i>Bubulcus ibis</i>	4
Unidentified terns	6

Table 5. Bird species and count in Numancia, Siargao Island.

SPECIES	NO. OF INDIVIDUALS
<i>Gallicrex cinerea</i>	1
<i>Egretta Eulophotes</i>	18
<i>Nycticorax Nycticorax</i>	2