

# *Luzon Regional Consultation*

*Punta Baluarte, Calatagan, Batangas*

*September 27 - 29, 2000*

NATIONAL BIODIVERSITY CONSERVATION PRIORITY - SETTING WORKSHOP

*"Saving the Hottest of the Hotspots"*



UNITED STATES  
AGENCY FOR  
INTERNATIONAL  
DEVELOPMENT



PROTECTED AREAS AND  
WILDLIFE BUREAU-  
DENR



UNIVERSITY OF THE  
PHILIPPINES  
BCP-CIDS



CONSERVATION  
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Philippine Council for Forestry & Natural Resources Research & Development (PCARRD); Forest Products Research and Development Institute (FPRDI); International Council for Living Aquatic Resources (ICLARM); Asean Regional Center for Biodiversity Conservation (ARCBC); Palawan Council for Sustainable Development Staff (PCSDS); University of the Philippines College Baguio (UPCB); Bureau of Fisheries and Aquatic Resources (BFAR); Coastal Resources Management Program (CRMP); Environmental Science for Social Change (ESSC); University of the Philippines Los Banos (UPLB); Laguna Lake Development Authority (LLDA); University of the Philippines Diliman (UPD); Kabang Kalikasan ng Pilipinas (KKP); Emilio Aguinaldo College (EAC); Palawan State University (PSU); PAWD-DENR Regional Offices; Plan International (PI); De LaSalle University; Bicol University (BU); Bookmark

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## LIST OF ACRONYMS

ADB	Asian Development Bank
ARCBC	Asean Regional Council for Biodiversity Conservation
AusAid	Australian Agency for International Development
BCP	Biodiversity Conservation Program
BFAR	Bureau of Fisheries and Aquatic Resources
BU	Bicol University
CI Phil	Conservation International - Philippines
CPPAP	Conservation of Priority Protected Areas Project
CRMP	Coastal Resource Management Program
DENR	Department of Environment and Natural Resources
DLSU	De La Salle University
EAC	Emilio Aguinaldo College
ERDB	Ecosystems Research and Development Bureau
ESSC	Environmental Science for Social Change
FPCI	First Philippine Conservation Inc.
FPE	Foundation for the Philippine Environment
FPRDI	Forest Products Research and Development Institute
GIS	Geographical Information System
GTZ	German Technical Assistance
Haribon	Haribon Foundation for the Conservation of Nature and Natural Resources
ICLARM	International Center for Living Aquatic Resources Management
IP	Indigenous People
IPAS	Integrated Protected Areas System
KKP	Kabang Kalikasan ng Pilipinas
LGU	Local Government Units
LLDA	Laguna Lake Development Authority
MCME	Makiling Center for Mountain Ecosystems
NAST	National Academy of Science and Technology
NBCPSW	National Biodiversity Conservation Priority-Setting Workshop
NBSAP	National Biodiversity Strategic Action Plan
NEDA	National Economic Development Authority
NGO	Non-Government Organization
NIPAP	National Integrated Protected Areas Project
NIPAS Law	National Integrated Protected Areas System Act of 1992
NSO	National Statistics Office
PA	Protected Area
PAMB	Protected Area Management Board
PASu	Protected Area Superintendent
PAWB	Protected Areas and Wildlife Bureau
PAWD	Protected Areas and Wildlife Division
PCAMRD	Philippine Council for Aquatic and Marine Resources Research and Development
PCARRD	Philippine Council for Agriculture, Forestry and Natural Resources Research and
PCSDS	Palawan Council Sustainable Development Staff
PNM	Philippine National Museum
PSU	Palawan State University
RDC	Regional Development Council
REECs	Resource, Environment and Economic Consultants, Inc.
UNDP	United Nations Development Programme
UP	University of the Philippines
UP CIDS	University of the Philippines Center for Integrative and Development Studies
UPD	University of the Philippines Diliman
UP Min	University of the Philippines Mindanao
UPCB	University of the Philippines - College of Baguio
UPLB	University of the Philippines Los Baños
UP-MSI	University of the Philippines - Marine Science Institute
USAID	United States Agency for International Development
WGL	Working Group Leader
WCSP	Wildlife Conservation Society of the Philippines

## **Executive Summary**

The Luzon Regional Consultation was held last September 27-29, 2000 at the Punta Baluarte, Calatagan, Batangas. This was the third of the series of regional consultations in preparation for the National Biodiversity Conservation Priority Setting Workshop (NBCPSW). A joint effort of the Protected Areas and Wildlife Bureau, Department of Environment and Natural Resources (PAWB-DENR), Conservation International - Philippines (CI-Phil), and the Biodiversity Conservation Program of the University of the Philippines Center for Integrative and Development Studies (BCP UP-CIDS), the Regional Consultations' purpose was geared towards optimizing data gathering and consolidation for the region, strengthening participation among experts and stakeholders, and facilitating network initiatives for future actions on Biodiversity Conservation. With funding support from the United States Agency for International Development (USAID), Foundation for Philippine Environment (FPE), Asian Development Bank (ADB) and Haribon Foundation, the workshop had specific objectives, similar to what it had for the Visayas and Mindanao, namely:

- To convene a small group of scientists, representatives from the NGOs and the government (PAWB, BFAR, LGUs, etc.), and academic institutions to make a preliminary assessment on the status of biodiversity conservation work in the region; and
- To agree on a work plan and responsibilities for the work ahead up to the national workshop.

A total of 74 participants, including local experts, staff, facilitators and guests attended the Mindanao Regional Consultation. Experts and representatives of 26 institutions from the Luzon, Mindoro and Palawan islands provided, consolidated and validated information enthusiastically, making the Luzon Consultation a successful endeavour. Although the expected outputs were similar in form with the Visayas and Mindanao consultation, such as updated information and data sources, results of the Luzon consultation was far more extensive due to the availability of more working maps and a high number of experts. The output consisted of a) corrected and/or additional map information, b) additional data sources, c) additional bibliography d) directory of experts in the Luzon region, e) commitment to submit data and positive response from the participants, f) nominations of Luzon representatives for the national workshop and lastly g) each working group defined the criteria for priority-setting.

This three-day workshop went through an updating of available data presented by the working group leaders, worked on through the maps by the different thematic groups who also added on and refined the criteria to be used for prioritization. On a scale of 1 to 5 (five being the highest, a relatively high rating of 4.4 resulted from a number of evaluation returns with suggestions that include advance invitations, invitations did not reach the regional office/concerned personnel they only received verbal communication from PAWB, more experts and strictness on time. Verbal commendations that was not explicit in the evaluation form was however common, clearly indicating that the Consultation was a success.

***Luzon Regional Consultation***  
Punta Baluarte, Calatagan, Batangas  
27-29 September 2000

*September 27, 2000, Wednesday*

The third in the series of regional consultations, the Luzon Regional Consultation commenced and culminated on September 27-29, 2000 in the isolated waterfronts of Punta Baluarte Resort in Calatagan, Batangas. Although having the same objectives as the first two consultations, this series is relatively the most representative, more highly attended and most unique and productive. The participants are most representative because the participants represent three big islands of the country: the largest, the third and the seventh in total land areas for Luzon, Palawan and Mindoro respectively; more agencies have also been invited for this workshop, having a total of 26 agencies. It was most highly attended because of the presence of a bigger number of the country's biodiversity experts and more active working groups had more intense efforts to work on maps and share data. The savings on plane fare allowed more to be invited and subsidized; only the Palawan group and one each from Northern and Southern Luzon took the plane to participate in the workshop. The uniqueness and high significance of the workshop leans on distinct biogeographical characterizations of each of the three faunal regions, known to be Greater Luzon, Greater Palawan and Greater Mindoro, also virtually implying the Bornean inclination of Palawan, the unique oceanic isolation of Mindoro and the richness of the isolated peaks and forests of Luzon, that have served as centers of endemism or even speciation. It was expected from the results of this workshop that the degree of data shall increase tremendously and data gathering shall also culminate, for the final preparations for the National workshop.

The advance party arrived at the venue at three in the afternoon of September 26 and did the final preparations of the venue and the materials. The following morning at 8:00 am was the registration. The Opening Program started with a song for an invocation led by Prof. Leticia Afuang and Ms. Joy Hibaya. Ms. Joy Navarro led the *National Anthem*. The welcome remarks was given by RED Vicente Paragas, Regional Executive Director, who also read the Keynote address of USEC Roño (Annex 1), DENR Undersecretary for International Commitment and Local Government Affairs. Luzon, Mindoro, Palawan Situationer was delivered by Ms. Mae Leonida, Luzon Regional Coordinator (Annex 2). Dr. Theresa Mundita Lim, PAWB ASST. Director/NBCPSW Convenor, delivered the NBCPSW backgrounder (Annex 3); Dr. Perry S. Ong, CI Philippines Country Director, and NBCPSW Co-Convenor presented NBCPSW Process (Annex 4). At 11:00am, orientation and leveling of expectations was facilitated by Prof. Leticia E. Afuang followed (Annex 5) by a sumptuous and overflowing lunch given at 12 to 1 pm.

The afternoon session started with the update on protected areas for Luzon, given by Ms. Norma Molinyawe of PAWB (Annex 6). At 2 pm, data updates were delivered by the working group leaders in a series, and were started by Dr. Rowie Boquiren, who gave a short overview on the tasks being undertaken by the socio-econ group (Annex 8). She had to express her burden on losing a Research Associate, and having to catch up on data gathering because of her late assumption of the job. Her enthusiasm and zeal to achieve as much as the other groups is highly encouraging. Prof. Blas Tabaranza Jr. followed with the updates both for the Birds and Mammals group (Annex 9). Arvin Diesmos, WGL for herps impressed the participants with beautiful and candid pictures of amphibians and reptiles in the field (Annex 10). Dr. Victor P. Gapud then presented the list of experts, data updates and the limitations of the data available for the arthropods. He also mentioned that there is a number of foreign experts working on insects and the

possibility of inviting some of them to the National Workshop (Annex 11). Dr. Leonila Raros also gave an overview on the status of Philippine mites and ticks (Annex 11.1). She mentioned that this is the first time that this group was included in this kind of endeavor. She also discussed the vast collection of Philippine mites in Chicago and Hawaii due to the extensive collection of Philippine vertebrates such as the Rabor Collection and Heaney's collection. Dr. Dan Lagunzad, Plant WGL gave the list of experts, data updates and accumulations, and limitations on certain suggested groups as representatives for the plant database. To work on the whole plant group for on such a limited time is clearly impossible. (Annex 12). Dr. Edwino S. Fernando, presented a scholarly report on the distribution of the palms (Annex 12.1). Dr. Perry Aliño presented the marine group criteria and updates, focusing on Marine Protected Areas and the way it relates with the whole CPW process (Annex 13). The last presenter was Lenie Borja who discussed the updates on freshwater developments (Annex 14). She also mentioned "Pagpahingahin ang Lawa" – no aquaculture program of the LLDA, which prohibited the establishment of fish pens in the Laguna Lake areas. Coming to the review of the lakes around the Region, she also mentioned a special lake in Palawan that won the cleanest lake award, which was Lake Manguao. Her inventory gave eighteen major lakes in Luzon, also including list of information on areas that have reports on endemism. "Dulong", which is a lake endemic fish in the Bicol Region has also been mentioned to have reached a high price of up to PHP 2,000/kilo because of its rarity and imminent extinction, if not protected.

The series of reports ended at 5:45 pm, which was followed by Oliver Coroza's introduction of PRISMA to the group (Annex 7). Enthusiasm was again raised because of the impressive pictures and functions that the software seemed to open to them. Everybody wanted to have a copy of the CD. Hands-on work on the material could not be accommodated in the day's schedule. Dinner and cocktails were waiting at the saltwater swimming pool down the seafront. People were asked to re-convene at 7pm.

The day's dinner was served at the windy and salty waterfront of the Bay. Good, overflowing food waited the refreshed group who sat beneath the shelters of some unidentifiable trees, under a moonless but starry, clear sky. There was no rain and the air was cool, and wind blew refreshingly. Dr. Edwino Fernando and Mae Leonida enjoyed hosting the program and providing gifts for the winners of games. Some outstanding prizewinners were Dr. Reynaldo dela Paz for the most unusual song, Blas Tabaranza for the most unique and funny Abbu Sayyaf version of "Mona Lisa", Lorie Tan for the funniest stand-up comedy with song and best group performers for the CI staff.

#### September 28, 2000, Thursday

The group woke up quite late because many of them stayed up late the night before. But at 8:30am orientation for the day's work plan was already given by Letty Afuang. The day's work included the updating of the Luzon statistics, the refinement of the criteria setting, the updating and paper mapping of information and the listing nominees for the national workshop. Everybody was bent on getting a full-days' work done. Most were hesitant to stand up for lunch but with the program coordinator's insistence, they stood up at 12:30 for a lunch break. Group picture had to be taken before lunch and every thematic group also had a group picture.

At 5:00-6:00pm dinner was served at the Pagapas Café. The work for the day is full and long but some of the groups went back to the function room to finish their work. The work went *ad infinitum* specially for the CPW staff who had to make the necessary

preparations for the next day's presentation. Tomorrow's major activity was a presentation of the reports and every group aims to bring out their best.

September 29, 2000, Friday

Although the CPW staff had a long day the previous night, they were back to the function room working as early as six in the morning. Final preparations for the presentations had to be finished by eight o'clock, the presentation time. The series of presentations was presented in the following sequence: Socio-econ group, Arthropods, Vertebrates, Freshwater, Marine and Plant group.

**SOCIO-ECON** (Annex 15)

After running through the corrections they made as well as the additional information they provided on the maps, Dr. R. Boquiren presented in brief the information generated by the group's discussions on the socio-econ criteria. In leveling-off the group's opinion on the definition of the different variables, scoring for some of these criteria was reversed. A relatively low per capita income of a certain area for example should call for high prioritization. Likewise, scoring for the variable cultural diversity was reversed, as high priority should be given to areas whose customary land rights, beliefs and practices have already been influenced by outside factors. The same is true for conservation initiatives and opportunities, to give high priority to areas to those without any conservation effort.

The major achievement of the socio-econ group was validation of information and testing of the criteria set for the socio-econ group. With the able facilitation of Dr. Boquiren, information and site experiences of the PASUs, DENR personnel and NGO representatives were used as pre-testing materials for the effectivity of the criteria for prioritization. Results came to show that there is consistency and effectivity in identifying priority sites for the socio-econ group.

*Criteria and scoring*

A. Leveling-off of experts' opinion on the definition of variables

1. Population pressure

In discussing the importance of identifying population pressures, the group touched on whether to consider "pressure points with on-going interventions/efforts" in setting priorities since efforts can otherwise be directed to other areas without conservation efforts. Since, disregarding these areas might lead to its "omission" in setting conservation priorities in the country, the group agreed to include areas with on-going interventions.

And in doing so, the following should further be identified:

- what and where are the pressure points
- are the interventions working?
- effect of Community Based Forest Management (CBFM) and Certificate of Ancestral Domain Claims (CADC)

a. density

The group agreed not to look at the standard definition of density but instead be "area-specific" depending on the site's relation to population pressures and resource utilization. This information will be gathered from the National Statistics Office (NSO) data as well as experts' opinion.

b. Migration

At the beginning of the discussion, it was raised that the definition of Indigenous Peoples (Ips) be qualified- a) original IPs; b) migrant IPs or "settlers". Finally, the original or historical definition of IPs was retained.

The group then tried to map out pressure points based on the influx of migrants in a certain area.

c. per capita income

d. poverty incidence

For per capita income and poverty incidence, the group decided to reverse the scoring to give high priority to areas with significantly lower per capita income.

e. tenurial issues

Comprehensive land use plans of the province would usually indicate tenurial issues. However there is a conflict between the land use system and the actual land use. Some argued that the comprehensive land use is still the basis of tenurial issues. Data providers would include the DENR, CBFM and CADC data. In identifying the tenurial status of the area, the number of hectares covered by each tenurial region should be identified, including big blocks of CADC areas.

However, there is a question on using the comprehensive land use of the province as the basis of tenurial issues and not the actual land use: the data may not realistically capture on-the-ground information. It was agreed that the Northern Sierra Madre National Park (NSMNP) be the test case to find a realistic picture of the matter.

2. Resource utilization issues

a. impact of resource utilization practices

b. economic trends

3. Cultural diversity

a. persistence of customary land rights and arrangements

b. NRM practices & beliefs (sustainable IKS)

Scoring for this particular criterion was likewise reversed as high priority should be given to areas whose customary land rights, beliefs and practices have been influenced by outside factors

4. Policy harmonization
  - a. identification of models in biodiversity-related policy harmonization
  - b. identification of issues in national and local intra- & inter-agency conflicts
5. Conservation initiatives and opportunities
  - a. institutionalization of conservation effort (sustained & supported by LGU and community)
  - b. community management

Scoring was also reversed for this particular criterion to give particular importance to areas without conservation initiatives and opportunities.

#### B. Test cases

Given the criteria identified above, test cases were done on NSMNP, Palawan, Mts. Makiling, Isarog and Guiting-guiting in identifying priority areas

### **ARTHROPODS** (Annex 16)

Dr. Gapud presented the details of their accomplishments for the workshop, primarily on the paper mapping of important arthropod groups based on the expertise of the three members of the group. He also expressed his great hope that he'll get more experts in the National workshop. Presently he said, and over the next few weeks, they'll be busy working on the map distributions.

### **VERTEBRATES** (Annex 17)

The Vertebrate group was headed by Prof. Blas Tabaranza and Arvin Diesmos. The group identified the protected areas in Luzon, Mindoro and Palawan, including the corresponding sources of information for each area. The criteria they have identified were tested on two sites, namely, Balbalasang in Northern Luzon and Palawan (see vertebrate presentation for details-Annex 17).

### **FRESHWATER** (Annex 18)

This is the first time that the freshwater working group was well represented, unlike in previous consultations. Ms. Lennie Borja, the working group leader, gave the agenda and got information on additional experts from different institutions. People in the group promised to email Ms. Borja these additional addresses of people working on freshwater. The group later validated the name and location of the lakes, rivers and marshes in Luzon, and also identified the areas with available data and the institution that is working on them. The criteria that was consolidated from the Visayas and Mindanao consultations, was then reviewed and refined to fit the freshwater group. To test the usability of the criteria, it was tested on two sample sites, which is familiar to all them: Taal Lake and Laguna de Bay (see Annex 20).

### **MARINE** (Annex 19)

Dr. Perry Alino of UP MSI headed the marine working group. The group was represented by different agencies such as UP MSI, UPLB, KKP, ICLARM, PAWB, DLSU and Bookmark.

The group defined the criteria that they will use in priority-setting (see presentation). It was also noted that the maps downloaded from the website [philreefs.org](http://philreefs.org) are the useful working maps for the marine group. Perry also mentioned that the marine would be divided into several taxa for the production of status reports for each taxon. Each taxon will be handled by experts involved in that particular field, for example, Dr. Rey dela Paz of DLSU and Rodolfo Reyes of ICLARM will be handling the museum collections of fishes.

## **PLANTS** (Annex 20)

### *A. Definition and Classification of Habitat Types*

- The group assessed that the definition of SITE / HABITAT used by the NBCPSW thematic groups should be standardized. There was a consensus that the standard type of habitat to be used should conform to global standards but should relate to what is actually on the ground.
- Habitat is a primary concern of the PLANT WORKING GROUP
- Whitmore's classification (abridged in Fernando's report - see Annex 21) was to be adapted but refinements were discussed using the group's knowledge on existing types of vegetation in the country. Dr. Fernando's unpublished paper on Vegetation of the Philippine Islands was also an extensive contribution to the discussion.
- The range of habitat types used by the vertebrate group was narrowed down to only 13 major types.
- The thorough discussion led to the development of a paper, giving samples of the area representing each classification type and the corresponding description of the sites.

### *B. Review and Prioritization of Criteria*

- Given a guide of criteria matrix developed by the Working Group Leaders from previous regional consultations, the plant group refined and clarified each criterion, taking into consideration its utility for prioritization of sites using plants as indicators.
- Another matrix was developed; each habitat type paired and given scores of prioritization (1 to 5 points, 1 being the highest) with each criterion (see Criteria Prioritization table in the Plant Group Workshop presentation). Further discussions gave emphasis on criteria present on-site and can be assessed by the experts in presence.
- Other criteria not given values were reserved for later fine-tuning of priorities to be used if there are sufficient data. It was recommended that all possible criteria be considered in the national workshop.

### *C. Mapping of Data and Sources*

- Maps of Luzon and Palawan with political boundaries were overlaid with protected-area maps to assess which (a) sites that have been well-studied and have sufficient data, (b) those that have been studied but no available literature and (c) those that have not been studied and have very limited information.
- Sites of collections of each working group members were also plotted on the maps.
- Sources of information detailed on the maps include:  
(a.) Published Literature (b.) Unpublished Reports (c.) Collection Reports

*D. Data Analysis and Validation*

- Each member was asked to evaluate and validate the data plotted on the maps. They contributed their own observation based on experiences and literature.

*E. Identification of Data Gaps*

- From the maps and data analyses, the group identified which sites have data gaps.
- Available information for the database was also assessed. To trim down the bulk of plant species to be used, the plant group agreed to concentrate on families earlier identified from previous meetings (see Plant Group presentation on Data Updates).

*F. Questions and Comments after the presentation:*

- Dr. Reynaldo de la Paz: The vegetation types need to be updated, incorporating the results from the Flora of the Philippines.
- For the laymen to better understand the results and proceedings of the workshops there is a need to provide common name or English equivalents for the mentioned scientific names.
- The use of the term "Tropical Rainforest (TRF)" in the titles would differentiate the classification from other Evergreen, Semi-deciduous ... forest types in other countries. The Vertebrate group has used the "Primary Rainforest (PRF)" in their classification.
- Dr. Vic Gapud: The discussion of vegetation types is appreciated and it is useful especially to the arthropods group for determining sites for prioritization. It is also recommended that this classification of habitats be shown on maps so that they may overlay their maps with these. The most recent extent of distribution range should be reflected on these maps to show the rate of destruction and so that they may relate it with insect and other arthropods' habitat.
- On a clarification to whether Mt. Makiling summit is classified as a mossy forest, the plant group explained that the occurrence of mossy forest could be on a site-to-site basis, but most often on 1,500 and above masl elevation.
- Carlo Custodio noted that Mt. Pulog is also classified as a sub-alpine forest with the same range as that of Mt. Halcon. The presence of reindeer moss in both mountains is a good indication of the habitat type.
- Most classifications are based mainly on elevation and availability of water.
- "Parang" was pointed out to be man-made or anthropogenic in nature.

Mr. Carlo Custodio, PAWB-NBCPSW Managing Counterpart, hosted the closing program, which came right after presentations. Dr. Prescillano Zamora handed the certificates to the participants with the assistance of the working group leaders. The day ended with goodbyes after lunch and ride to the two coasters that will bring them either to Los Baños or Manila.

Thanks for three day's work with great accomplishments. Well done to all and God bless!

KEYNOTE ADDRESS OF USEC MARIO ROÑO

I came to note that the Philippines has been identified as one of the 25 countries worldwide considered as priority hotspots, globally important biodiversity areas that are under severe threat. Data available on birds alone, showed that half of our country's endemic birds are threatened to extinction. Thus in 1995, the National Biodiversity Strategy and Action Plan (NBSAP) was formulated and then published two years later. This action plan presented a general overview and background of biodiversity in the Philippines. However, it did not provide substantial information on geographically specific recommendations or priorities for the investment of limited conservation resources. There is a sense of urgency to further strengthen and advance the operationalization of NBSAP. Lessons have been learned since the preparation and implementation of the action plan. Also, lessons can be gathered from various biodiversity conservation initiatives including two country-based programs that are almost in their final phases of implementation, the Conservation of Priority Protected Areas Program (CPPAP) and the National Integrated Protected Areas Program (NIPAP). Biodiversity conservation goes beyond scientific methodologies and strict legal prohibitions to preserve our biological resources. It should also include strengthening opportunities for our local communities particularly the rural poor, to benefit from the national biodiversity conservation efforts. Based on the preliminary assessment made, the variety of wildlife species have different geographic priorities, thus a more careful planned forum for integration and consensus building is necessary, hence this workshop.

In behalf of DENR, may I express our sincere appreciation for the participation of various sectors in this workshop. More importantly, I commend the efforts of the convenors and organizers in calling together such a large group of experts with such varied interests and professional disciplines and attempting to gather them in a discussion expectedly to arrive at a consensus on specific biodiversity conservation priorities.

I understand this process maybe too difficult for you initially because of the wide range of expertise and even conflicting concepts or priority. But it would make it easier probably if we don't lose focus on what we want to achieve. To provide a firmer and stronger support to maintain the balance between biodiversity conservation, rural development and poverty alleviation. This too is a commitment of the government for the Filipino people. This is a challenge for all of us. We may not have the luxury of time, the Philippines has been ranked first in the global hotspot category, ranked first in the threatened birds category, can't we rank first this time for doing something about it and doing it successfully? For the sake of our country and the generations to come, I hope we can.

The output of this workshop shall be a very valuable guiding principle for decision makers and policy implementers in leading our people out from the bondage of poverty and improving the quality of life in the Visayas without compromising biodiversity conservation, sacrificing the integrity of the protected areas and driving the remaining endangered flora and fauna to extinction. We recognize this priority setting workshop as one of the means to provide us the tools to give the earth. I'm counting on you.

Ladies and Gentlemen, thank you very much.

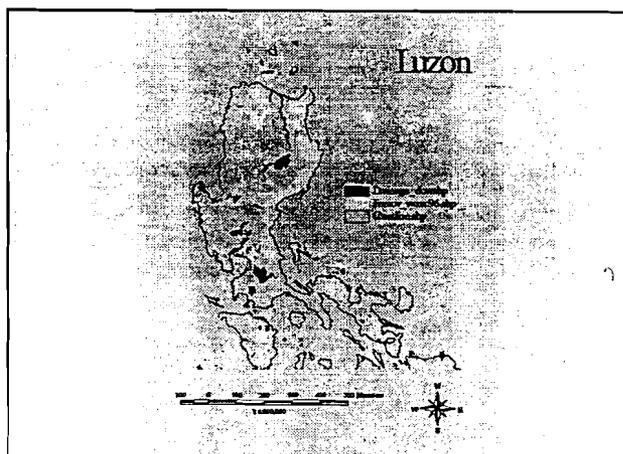
**PRESENTATIONS / MESSAGES FOR THE  
PROGRAM AND CONSULTATION**

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**LUZON SITUATIONER**  
by Ms. Mae Lowe S. Leonida

**LUZON STATISTICS**

Total No. of Regions: 5 Regions from Region I to V  
 Total Land Areas: 3,044,192.4 sq. km.  
 Total No. of Provinces: 33  
 Total No. of Mountains: 33  
 Total No. of Lakes: 9  
 Total No. of Rivers: 52  
 Total No. of Protected Areas:  
 Total No. of IP's: 89



**Greater Luzon**

- at present, less than 24% of Greater Luzon is forested
- four critical plant sites identified as center of plant diversity:
  - Mt. Arayat (Pampanga)
  - Mt. Makiling (Laguna)
  - Mt. Lobo (Batangas); and
  - Mt. Isarog (Camarines Sur)
- A similar pattern of endemismity also occurs for other faunal species
- 70% of non-flying mammals in this region are found nowhere else.
- Only 13.7 % of Greater Luzon are covered in National Parks

**Mindoro**

- In the 1998 estimate of forest cover, only 120 sq. km.
- Of forest (8.5% of the Island) remain, of which only a quarter is close canopy
- A total of 62 species of mammals, 273 birds, 62 reptiles and 15 amphibians are recorded

**Palawan**

Groups	Number of Species		Endemic Species		Threatened Species	
	Phils	Pal	Phils	Pal	Phils	Pal
Amphibians	83	23	58	6	34	3
Reptiles	254	70	168	23	3 (+7)	3
Birds	556	267	192	23	74	12
Mammals	180	62	110	19	52	6
Total	1073	422	528	71	163 (+7)	24
Insects	Philippines		Palawan			
Odonota	291 (142)		112 (50)			

**BACKGROUNDER ON NBCPSW  
by Dr. Theresa Mundita Lim**

**National Biodiversity  
Conservation Priority  
Setting**

***Regional Consultation  
Workshop  
for Luzon***

September 27-29, 2000  
Punta Baluarte  
Calatagan, Batangas



**OVERVIEW**

- BACKGROUND
- OBJECTIVES
- OUTPUTS
- REGIONAL CONSULTATION OBJECTIVES
- FUND SUPPORT
- COOPERATING AGENCIES

**Background**

- 1994, formulation of the PSCBD
- 1995, DENR started preparation of the UNEP-assisted PBCS.
- 1997, output of the PBCS was published – the **National Biodiversity Strategy and Action Plan (NBSAP)**
- subsequently, Presidential MO issued directing all gov't agencies to incorporate NBSAP in their work plans

**Background**



- In 1998, CI identified the Philippines as one of 17 megadiversity countries
- In 1999, CI further identified the Philippines as one of 25 global hotspots
- on a per unit area basis, the Philippines is the top megadiversity country and hottest of the hotspots
- There was a need to localize this information

**Background**

- April 1999, WCSP meeting, discussions arose on need to reconcile priorities for different taxa - Priority Setting Workshop Process was suggested as a tool to resolve the debate
- December 1999, PAWB endorsed proposal and agreed to execute and co-implement project with CI

**Objectives**

- 1. Identify, assess, and prioritize specific geographic areas for biodiversity conservation in the Philippines through an established process, which supplements published information with a consensus of the latest expert knowledge.



## Objectives

- 2. Make available an information base, which will assist policymakers, planners, and donors to incorporate biodiversity conservation objectives into their implementation plans.



## Objectives

- 3. Strengthen local capacity for conservation planning and management based on the development of an integrated conservation information system and related skills training, based on the latest available information using experts' knowledge.

## Objectives

- 4. Propose a program for training regional planning agencies in how to integrate the workshop results into their planning and implementation processes.



## Outputs

- 1. A preliminary planning report outlining the current context and lessons learned from previous biodiversity planning activities (NBSAP, CBD, CPPAP, NIPA).



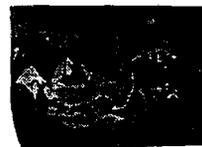
## Outputs

- 2. A final report, map, and CD-ROM with digital files presenting the latest scientific consensus on priority areas for conservation and including all major data gathered during the CPW process.



## Regional Consultation Objectives

1. To convene a small group of scientists, representatives from the NGO's and the government (PAWB, LGUs, etc.) to make a preliminary assessment of the status of biodiversity conservation work in the region



## Regional Consultation Objectives

- 2. To agree on a work plan and responsibilities for the work ahead up to the National workshop.



## Regional Consultation Objectives

- 3. To select representatives to the national workshop.



## General Funding Support



- United States Agency for International Development (USAID)
- Asian Development Bank (ADB)
- Conservation International (CI)
- United Nations Development Programme (UNDP) and the Environment and Natural Resources Accounting II-National Statistical Coordination Board (ENRAII-NSCB)
- First Philippine Conservation Inc. (FPCI)

## General Funding Support



- Foundation for the Philippine Environment (FPE)
- Haribon Foundation for the Conservation of Nature
- Biodiversity Conservation Program, UP Center for Integrative and Development Studies and the National Academy of Science and Technology (BCP, UP CIDS-NAST)

## In cooperation with



- Wildlife Conservation Society of the Philippines (WCSP)
- Haribon Foundation for the Conservation of Nature and Natural Resources (Haribon)
- Fauna and Flora International (FFI)
- Environmental Science for Social Change (ESSC)
- Resource Economics and Environment Center for Studies (REECs)

## In cooperation with

- University of the Philippines Diliman
- University of the Philippines Los Baños
- UP College of Baguio
- Laguna Lake Development Authority



### In cooperation with

- De La Salle University - Dasmarias
- Makiling Center for Mountain Ecosystems
- International Rice Research Institute
- ASEAN Regional Center for Biodiversity Conservation (ARCBC)



### In cooperation with

- Forest Products Research and Development Institute (FPRDI)
- Philippine Council for Agriculture Forestry and Natural Resources Research and Development (PCARRD)



### In cooperation with

- Bureau of Fisheries and Aquatic Resources (BFAR)
- Emilio Aguinaldo College
- Kabang Kalikasan ng Pilipinas



### In cooperation with

- International Council for Living Aquatic Resources Management
- Bookmark, Inc.
- Plan International



### In cooperation with

- Palawan State University
- Palawan Council for Sustainable Development
- Crocodile Farm Institute

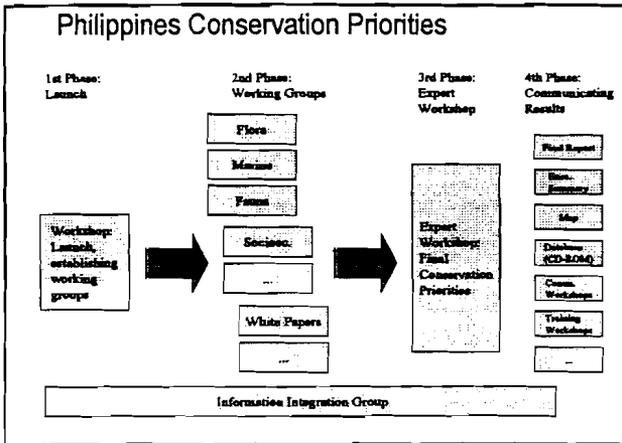


### In cooperation with

- CRMP Palawan
- DENR Project Agencies (CPPAP, NIPAP, NORDECO)



NBCPSW PROCESS  
by Dr. Perry S. Ong



**1st Phase: Workshop Objectives**

- ◆ Agree on approach, methods, rules
- ◆ Setting up working groups
  - ◆ what groups, themes
  - ◆ do we need white papers in addition?
- ◆ Agreeing on terms of reference for working groups
- ◆ Agreeing on timeline
- ◆ Presenting tools for phase 2

**Working Groups: approach**

- ◆ Select one coordinator per group, a top scientist in each theme.
- ◆ Ask him/her to propose a number of colleagues to involve in his group, both from Philippines and abroad
- ◆ provide resources to gather information and communicate with other experts

**Terms of Reference for Group Coordinators -1**

- ◆ Produce a paper on the state of knowledge of his/her theme, including priority areas for research and conservation.
  - ◆ This paper should receive the input and be reviewed by the working group as a whole but it is the coordinators' responsibility
  - ◆ Include list of priority areas for conservation / research
  - ◆ include assessment of value of existing protected areas for this taxa

**Terms of Reference for Group Coordinators -2.**

- ◆ He/She must also supply information about his/her theme for populating the database:
  - ◆ List of known species in Philippines
  - ◆ Detailed bibliography
  - ◆ List of experts, addresses, institutions
  - ◆ List of biological collections including description, quality, access, institutions, References
  - ◆ If possible, information on collected specimens with location and date

**Working Group Products**

- ◆ Report
- ◆ Preliminary maps of priority areas
- ◆ Database with bibliography,...

The maps and database would be integrated with the tools provided by and the help of the information group

## Conservation Priorities Process

### Pre-Workshop

- Data Collection and Synthesis
- Developing the Regional Information System
- Thematic Assessments / White Papers



### Workshop

- Thematic Priorities
- Integrated Recommendations (regional groups)
- Final Conservation Priorities Map and Database

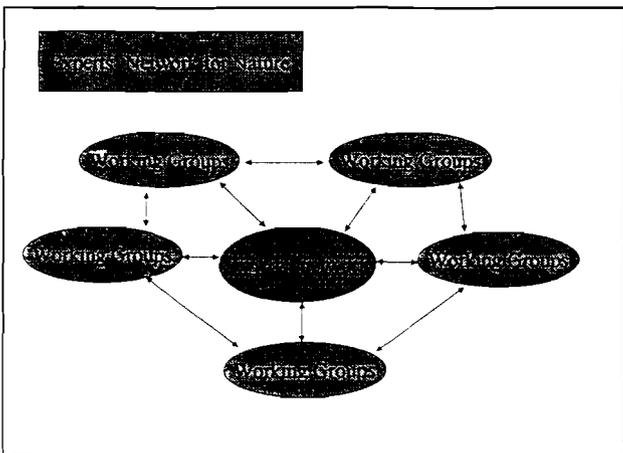
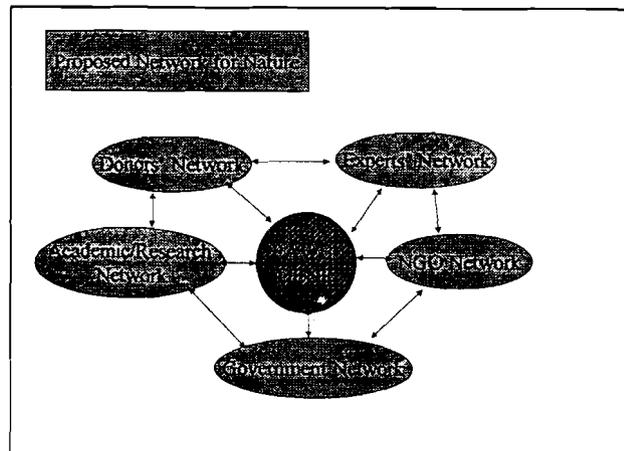
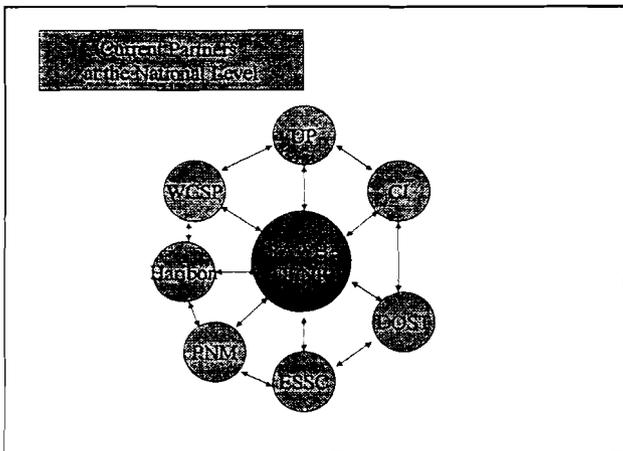
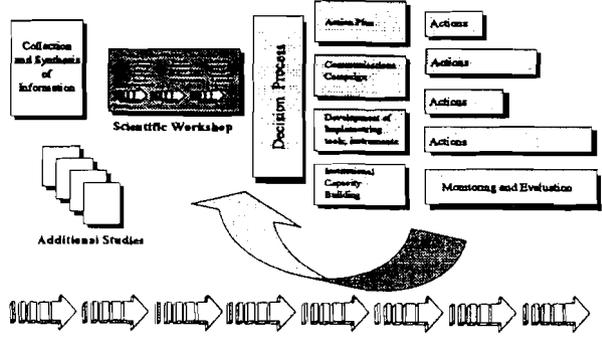


### Post-Workshop

- Reports and Publications
- Consolidation, Publication and Distribution of the Information
- Follow-up Activities



## Priorities Process and Follow-up Activities



ORIENTATION AND LEVELING-OFF OF EXPECTATIONS  
by Prof. Leticia E. Afuang

**Conservation Priority Setting Approach**

- ➔ Combine an extensive compilation and synthesis of information with the best expert knowledge to identify conservation priority areas through a highly participatory process
- ➔ Develop an information system to facilitate integration of the information
- ➔ Define a decision framework for priority setting
- ➔ Develop information products to distribute and socialize the framework
- ➔ Identify follow-up activities



**Objectives of the Regional Consultations**

I. To convene a small group of scientists, representatives from the NGOs and the government (PAWB, LGUs, etc.) to make a preliminary assessment on the status of biodiversity conservation work in the region.

II. To agree on a work plan and responsibilities for the work ahead up to the National Workshop



As agreed upon in the Planning Meeting the role of the Regional Consultation is to:

- ➔ introduce the process (NBCPSW) and its expected outputs to the local experts
- ➔ facilitate review of existing information and data validation
- ➔ enhance local data collection
- ➔ establish network in the Region



**Accomplishments in preparation for the Conservation Priority Workshop:**

Planning meeting: Jan 25-26, 2000; Definition of specific objectives and outlining of strategies;

Identification of working groups (themes), Working Group Leaders (WGL), and directory of experts;

Distribution of the "Highlights of the Planning Meeting" and Regional consultations with identified experts;

WGL meetings and TORs; technical group meetings;

Endorsement from DENR; full support from and regular meetings with PAWB;

**Accomplishments...**

MOU in progress: ESSC, PCARRD, PCMARD, ERSG; positive response of PNM;

Additional funding support from FPE, Haribon and ARCBC;

Data gathering and encoding; systematic monitoring of data reports;

Standard database format together with CI Washington staff (PRISMA and access);

**Accomplishments...**

Visayas Regional Consultation: July 18-20

Mindanao Regional Consultation: August 30-Sept 1 and reports;

Preparation for design of the program activities and key people both for the national workshop and press conference;

Preparations for publication requirements and final outputs

### What do we do in this workshop?

- We capture the right mindset that we do this for our Regions and the future generations of its people; and then focus.
- We make the necessary corrections and validation on the data and maps so far produced for Mindanao
- We contribute our own data and indicate our research sites or areas of concern for biodiversity
- We discuss among our thematic group and agree on our criteria for prioritization.
- We nominate and/or vote for our representatives to the National workshop using the specified ranking tool.

### What do we expect to produce out of this workshop?

Additional relevant data sets/information on the Region, possibly missed by the CPW working team (WGLs, RCs, staff)

An enriched and relatively comprehensive database for the Luzon Region and other Islands in the vicinity including Mindoro and Palawan

Validated maps and information on corrected or additional species site distributions

Important criteria guideline for prioritization of important areas for biodiversity conservation to be used in the National Workshop.

List of Luzon Regional representatives to the National Workshop



### Map themes

Baseline theme : coastlines and provincial boundaries

Theme 1: roads, contours, forest cover, coral reef, mangrove

Theme 2: watersheds, ancestral domain, alienable and disposable land, culture

Additional maps: Bathymetry, Protected areas, Ecoregions, Biogeographic regions/subregions

Source: Environmental Justice for Social Change (EJSC) 1999  
Source of the Philippine Forest



### Our House Rules

Please take note that we come here to work for our Region; your presence throughout the workshop is imperative.

Please be sure to be on time to facilitate forum and discussions.

For the lodging and board; you are entitled to one soft drink for meals; all excess food and drink will be your personal responsibility.

Breakfast at Pagapas Café: 6:30-7:30; Lunch at the Mulawin 12:00-1:00; Dinner at Pagapas Café: 6:30-7:30. There will be cocktails on September 27 at 6:30 pm at the shorefront.

**PROTECTED AREAS OF LUZON, MINDORO AND PALAWAN  
by Ms. Norma Molinyawe**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Regions CAR, 1,2,3,4 and 5**

- **Covers the proclaimed and proposed protected areas in Regions 1, 2, 3, 4, 5, and CAR**
- **Information was compiled based on the Resources Basic Inventories (RBI) and Protected Area Suitability Assessments (PASA) conducted by the DENR Regional Offices**
- **Information presented needs further verification and validation**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Cordillera Autonomous Region**

**Proclaimed areas:**

**Upper Agno River Basin Resource Reserve (Benguet, Nueva Vizcaya, Ifugao)  
Proc. 268, April 2000; 70,561 has.; low montane forest ; noted wildlife  
include diverse bird species, reptiles, cloud rats, shrike, Phil. Bulbul**

**Proposed sites:**

**12 areas covering a total of 92,015 hectares**

**Balbalasang-Balbalan Natural Biotic Area (Balbalan, Kalinga) 23,000 has.**

**Cassamata Hill PL (Bangued, Abra) 57 has**

**Lower Agno PL (Itogon, Benguet) 39,304 has**

**Mt. Kalawitan Natural Park (Mt. Province) 12,143 has**

**Marcos Highway Resource Reserve (Tuba, Benguet) 679 has**

**Mt. Pulag Ancestral Domain Park (Kabaya, Benguet, Tinoc, Ifugao, NV)  
11,550 has**

**Agora Wildlife Sanctuary (Pudtol, Apayao) 2,950 has**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Cordillera Autonomous Region**

**Proposed sites:**

**Ambongdolan PL (Ambongdoian, Tublay, Benguet) -no data available-**

**Aran Caves PL (Brgy. Twin Peaks and Camp 3, Tuba, Benguet) 107 has**

**Mt. Poswey Natural Park (Brgy. Poblacion & Bauyan, Boliney, Abra)  
3,168 has**

**Quiling Crystal Cave PL (Libtec, Dolores, Abra) 50 has**

**Roces Cave PL (Pakiling, Bucay, Abra) 7 has**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

Region 1

**Proclaimed sites:**

**6 areas with total area of 13,282.83 hectares**

**Lidlidda PL (Lidlidda and Banayoyo, Ilocos Sur)**

Proc. 266, April 2000; 1,157.42 has (BZ-78.18 has); lowland evergreen with secondary growth forest; 29 bird species (90% endemic)

**Bessang Pass Natural Monument (Cervantes, Ilocos Sur)**

Proc. 284, April 2000; 1,121 (BZ-427 has); pine and mossy forest; hawks, doves, finches, wild pig, monkey, monitor lizard, bats

**Agoo-Damortis PLS (Agoo, Rosario and Sto. Tomas, La Union)**

Proc. 277, April 2000; 10,648 has (BZ-135 has); patches of mangroves and reforestation species in the terrestrial portion; 15 species of birds

**Libunao PL (Sinait, Ilocos Sur)**

Proc. 280, April 2000; 46.7 has; secondary growth forest with patches of grasslands; 20 species of birds identified, monitor lizard, snakes, monkey, wild pig, deer

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

Region 1

**Bigbiga PL (Narvacan, Ilocos Sur)**

Proc. 290, April 2000; 135.71 has; vegetation comprises 40% brushland, 10% open grassland and mixed miscellaneous species of trees; 11 species of birds identified, monitor lizard, snake

**Sta. Lucia PL (Bgy. Balibed, Salcedo, Ilocos Sur)**

Proc. 297, April 2000; 174 has; 75% 'molave' forest; 11 species of birds identified

**Proposed PAs:**

**12 sites covering 41,821.42 has.**

**Paoay Lake PL (Paoay, Ilocos Norte) 498.15 has (BZ-114.62 has)**

**Tanap PL (Burgos, Ilocos Norte) 114 has (BZ-74 has)**

**Telbang PS (Alaminos, Pangasinan) 1,104 has (BZ-570 has)**

**Hundred Island PLS (Alaminos, Pangasinan) 2,281.14 (BZ-650.76 has)**

**Tirad Pass PL (Ilocos Sur) 7,430.92 has (BZ-1,045.04 has)**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 1**

**Proposed PAs:**

- Northern Luzon Heroes Hill PL (Sta. Maria and Narvacan, Ilocos Sur)  
1,316 has**
- Manleluag Spring Natural Park (Mangatarem, Pangasinan) 174 has**
- Ilocos Norte PL 2,458.15 has (BZ-392.77 has)**
- Naguilian PL (Brgy. Casilagan, Naguilian, La Union) 90.71 has**
- Kalbario Patapat NP (Pagudpud and Adams, Ilocos Norte)  
5,796.53 has (BZ-1,937.03 has)**
- San Nicolas-San Manuel PL (Mun. of San Nicolas and San Manuel, Pangasinan)  
15,628.82 has**
- Puad-Tubao, Aringay, PL (Pugo, Tubao and Aringay, La Union)  
4,929 has (BZ-548 has)**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 2**

**Proclaimed sites:**

**Covers 7 sites with a total area of 571,914.62 has.-land,  
71,652 has.-water**

**Casecnan PL (Nueva Vizcaya, Quirino and Aurora)  
Proc. 289, April 2000; 88,846 has**

**Penablanca PL (Penablanca, Cagayan)  
Proc. 416, June 1994; 4,136 has; 'molave' forest; bats, swiflets**

**Northern Sierra Madre Natural Park ( Palanan, Maconacon, Ilagan, Divilacan,  
San Mariano, Dinapigue, San Pablo, Cabagan and Tumauini, Isabela)  
Proc. 978, March 1997; 247,861 has-land, 71,652 has-water; vegetation  
consists of beach forest, mangrove, lower montane, limestone forest and  
forest on ultramafic substrate; wild pig, Phil.deer, sea turtle, Phil. Eagle  
and Koch's pitta are the noted wildlife in the area**

**Salinas Natural Monument (Bambang, Kayapa, and Aritao, Nueva Vizcaya)  
Proc. 275, April 2000; 6,675 has; Phil. Bulbul, fruit dove, Phil coucal,  
blue-headed fantail, Phil flycatcher, brahmny kite, cane grass warbler**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 2**

**Proclaimed sites:**

- Magapit PL (Gattaran and Lallo, Cagayan)**  
Proc. 285, April 2000; 3,403.62 has
- Palau Island Marine Reserve (Sta. Ana, Cagayan)**  
Proc. 447, August 1994; 7,415 has
- Batanes PLS (Batanes)**  
Proc. 335, February 1994; 213,578 has

**Proposed PAs:**

**4 sites covering 15,180.29 hectares**

- Fuyot Spring PL (Sta. Victoria, Ilagan, Isabela) 819 has**
- Wangag PL (Sta. Clara and Wangag, Gonzaga, Cagayan) 6,992 has**
- Baua River PL (Gonzaga, Cagayan) 6,992 has**
- Dupax PL (Dupax del Sur, NV) 377.29 has**

**For disestablishment:**

- Monte Alto Wilderness Area (Sitio Dinuman, Libertad, San Mariano, Isabela)**  
625 has.

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 3**

**Proclaimed sites:**

**2 sites covering 32,444 hectares**

- Masinloc and Oyon Bay Marine Reserve (Masinloc and Palauig, Zambales)**  
Proc. 231, August 1993; 7,568 has; tree sparrow, pygmy swiftlet, Phil turtle dove, shrike, monitor lizard, Phil monkey
- Roosevelt PL (Hermosa and Dinalupihan, Bataan)**  
Proc. 273, April 2000; 24,876 has; lowland evergreen; yellow-vented bulbul, wild pig, tarctic hornbill, rufous hornbill, Phil turtle dove, monitor lizard, monkey

**Proposed PAs:**

**10 sites with area of 64,617.14 hectares**

- Angat PL (Norzagaray, San Jose del Monte, Bulacan) 6,600 has**
- Mt. Arayat PL (Arayat and Magalang Pampanga) 3,704.44 has**
- Mt. Tapulao PL (Palauig, Zambales) 5,061 has**
- Pinagrealan PL (Bigte and Sitio Alinsangan, San Mateo, Norzagaray) 48.8 has**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 3**

**Proposed PAs:**

**Blak-na-Bato PL (Brgy. Sibul & Blak na Bato, San Miguel and Kalawakan, DRT, Bulalan) 659 has**

**Minalungao PL (Gen Tinio, Gapan, Nueva Ecija) 1,996.4 has**

**Talavera PL (Brgys. Joson, Piut, Capintalan, Putian, Minuli, Puncan and Salazar, NE) 387.5 has**

**Mariveles Watershed (Mariveles Bataan)\* 15,815 has**

**Pantabangan-Carranglan PL (Nueva Ecija) 30,297 has**

**Pinarealan PL (San Mateo, Norzagaray, Bulacan) 48 has**

\* includes Palanas Watershed, 324.57 has

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4A (Mainland)**

**Proclaimed sites:**

**8 sites with area of 21,348.36 hectares**

**Taal Volcano Island PL (Batangas)**

**Proc. 906, Oct 1996; 4,537 has; dominated by grasslands; large-billed crow, chestnut mannikin, tree sparrow, monitor lizard**

**Maulawin Spring PL (Guinayangan, Quezon)**

**Proc. 295, April 2000; 204 has; lowland evergreen; Phil cobra, monitor lizard, Phil deer, endemic bird species**

**Buenavista PL (Mulanay, Quezon)**

**Proc. 294, April 2000; 356 has; lowland evergreen; monitor lizard, quail, tarictic hornbill, civet cat, python**

**Dinadiawan River PL (Dipaculao, Aurora)**

**Proc. 278, April 2000; 3,387 has; lowland evergreen; no data available on fauna**

**Talaytay River PL (Dinalungan, Quezon)**

**Proc. 283, April 2000; 3,527.87 has; lowland evergreen; deer, monkey, monitor lizard, wild pig, pygmy woodpecker, Phil. Hanging parakeet, tree sparrow**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4A (Mainland)**

**Proclaimed sites:**

**Amro River PL (Casiguran and Dilasaga, Aurora)**

Proc. 274, April 2000; 6,470 has; lowland evergreen; monkey, wild pig, monitor lizard, python, bats, giant scops owl, hornbill, brahminy kite, kingfisher

**Simbahan-Talagas River PL (Dinalungan, Aurora)**

Proc. 267, April 2000; 2,266.49 has; lowland evergreen; rufous hornbill, Phil. Deer, Phil turtle dove, orioles, hawks, Phil monkey

**Pamitinan Cave PL (Rodriguez, Rizal)**

Proc. 901, October 1996; 600 has; no study yet conducted on fauna

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4A (Mainland)**

**Proposed PAs:**

**28 sites with area of 112,735.4 hectares**

**Aurora Memorial PL (Bongabon, Nueva Ecija and Baler, Quezon) 5,676 has**

**Mts. Palay-palay Mataas na Gulod PL (Ternate and Maragondon, Cavite and Nasugbu, Batangas) 4,000 has**

**Mts. Banahaw-San Cristobal PL (Majayjay, Laguna and Lucban, Tayabas, Quezon) 11,113.3 has**

**Hinulugang Taktak PL (Antipolo, Rizal) .89 has**

**Quezon PL (Atimonan, Padre Burgos and Pagbilao, Quezon) 535.08 has**

**Unnamed NP, WSGP-PD 1636 (Prov. Of Laguna, Quezon, Rizal, Bulacan) 34,681 has**

**Marikina Watershed Reservation (Antipolo, Montalban, Rizal) 18,965.86 has**

**Mulanay PL (Mulanay, Quezon) 26 has**

**Infanta PL (Infanta, Quezon) 384 has**

**Polillo PL (Polillo, Quezon) 130 has**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4A (Mainland)**

**Proposed PAs:**

Lopez PL (Lopez, Quezon) 418 has  
Calabgan PL (Casiguran, Aurora) 4,803 has  
Dipaculao PL (Dipaculao, Aurora) 1,786 has  
Calauag PL (Calauag, Quezon) 328 has  
Tibiang-Damagondong PL (Quezon, Quezon) 280 has  
Alabat PL (Alabat, Quezon) 688 has  
Binahaan River PL (Pagbilao, Mauban, Quezon) 465 has  
Sumuot Cave PL (Burdeous, Quezon - Pulilio Island)  
Minasawa Wildlife Sanctuary (Burdeous, Quezon)  
Kanan River PL (General Nakar, Quezon)  
Alibijaban Island PL (Ragay gulf, Bondoc Peninsula, Quezon) 430 has

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4A (Mainland)**

**Proposed PAs:**

Dibalo-Pingit-Zabali-Malayay PL (Baler, San Luis, Aurora) 4,528 has  
Aurora Watershed Forest Reserve (Baler, Quezon) 430 has  
Diteki River Watershed Forest Reserve (San Luis, Aurora) 12,970 has  
San Luis WFR (San Luis, Aurora) 2,789.37 has  
Pinamacan River WFR (Dilasag, Aurora) 2,904.9 has  
Bazal River WFR (Ma. Aurora, Aurora) 4,403 has  
Mapanghi Cave (Burdeous, Quezon- Pulilio Island)

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4B (Island Group)**

**Proclaimed sites:**

**Covers 7 sites with total area of 254,980.76 hectares**

**Apo Reef Natural park (Sablayan, Occ. Mindoro)**

Proc. 868, Sept 1996; 11,677 has; mangrove and beach forests; coral reefs, seagrasses and algal flat, and island lagoon; nicobar pigeon, green turtle, hawksbill turtle, dolphin, giant clam, reef fishes

**Naampias River Watershed Forest Reserve (Torrijos, Marinduque)**

Proc. 357, April 1994; 417 has; residual, brushland/grassland; monitor lizard, wild pig, deer, civet cat, hornbill, jungle fowl, brahminy kite, aquatic fishes

**Mt. Calavite Wildlife Sanctuary (Paluan, Occ. Mindoro)**

Proc. 292, April 2000; 18,016 has.; upper montane and mangrove forest; Phil. Tamaraw, deer, fruit bats, wild pigs, green imperial pigeon, blue-naped parrot, jungle fowl, hanging parakeet

**Malampaya Sound (Taytay, Palawan)**

Proc. 342, July 200; 119,786 has; vegetation consists of old growth forest, mossy forest, mangroves, residual forest and patches of farm lands (coconut, cashew and ricelands; Palawan bearcat, hornbill, Phil cockatoo, porcupine, scaly anteater, wild pig, dolphins (bottle-nosed and irrawaddy), dugong and marine turtles, tabon bird

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4B (Island Group)**

**Proclaimed sites:**

**El Nido Managed Resource PA (El Nido, Palawan)**

Proc. 32, Oct 1998; 89,134.76 has; major forest types present include lowland evergreen, semi-deciduous, forest over limestone, beach forest and mangrove forest, 3 major marine habitats present - seagrass/seaweeds, coral reefs and estuarines; identified 16 endemic spp of birds, 6 spp of terrestrial mammals endemic to Palawan, 4 endemic marine turtles, marine mammals, 45 genera of hard corals and 197 spp of fishes

**Ipil River Watershed Forest Reserve (San Fernando, Romblon)**

Proc. 394, May 1994; 685 has

**Mt. Guiting-guiting Natural Park (Magdiwang, Cajidiocan and San Fernando, Romblon)**

Proc. 746, February 1996; 15,265 has. heathland and grasslands, mossy forests, montane forests, lowland evergreen forests and forest over ultrabasic rocks, recorded an estimate of 700 vascular plant spp which include 54 endemic spp in Sibuyan Islands and 180 spp endemic in the Philippines; cinnamon bittern, celestial monarch, Phil. Hawk eagle, dugong, fruit bat, dolphins, narrow-disked, gekko and quadras flying lizard

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4B (Island Group)**

**Proposed PAs:**

**Covers 15 sites with total area of 397,488.55 hectares**

**Naujan Lake National Park (Socorro & Pola, Or. Mindoro) 21,655 has**  
**Torrijos Watershed Forest Reserve (Torrijos, Marinduque) 105 has**  
**Tres Reyes PLS (Gazan, Marinduque) 9,990 has**  
**Ambil Island PLS (Looc, Occ. Mindoro) 2,837 has**  
**Ursula GRBS (Bataraza and Balabac, Palawan) 761 has**  
**Lake Manguao Managed Resource Protected Area (Taytay, Palawan) 700 has**  
**Honda Bay PS (Puerto Princesa City) 129,503.18 ha**  
**Green island Bay PS (Roxas, Palawan) 55,070 has**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 4B (Island Group)**

**Proposed PAs:**

**Calatrava-San Andres, San Agustin PL (Romblon) 2,670 has**  
**Raza Island Wildlife Sanctuary (Brgy. Panacan, Narra, Palawan) 1,269.37 has**  
**F. B. Harrison GRBS (Sablayan, Sta.Cruz, Mamburao, Abra de Ilog, Occ Mindoro)  
123,000 has**  
**Tubbataha Reef National Marine Park (Cagayancillo, Palawan) 33,200 has**  
**Mts. Iglit-Baco Natural Park (Oriental Mindoro)**  
**Calauit Game Refuge and bird Sanctuary (New Busuanga, Palawan)  
3,400 has**  
**Mt. Kadangyasan PL (Baco, Calapan City, Naujan and San Teodoro, Oriental  
Mindoro) 13,328 has**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

Region 5

**Proclaimed sites:**

**6 sites with total area of 17,259 hectares**

**Chico Island Wildlife Sanctuary (Cawayan, Masbate)**

Proc. 272, April 2000; 7 has;

**Naro Island Wildlife Sanctuary (Cawayan, Masbate)**

Proc. 316, May 2000; 10,998 has; mangrove; Chinese egret, heron, Phil mallard, brahminy kite, white-breasted sea eagle, Mongolian plover

**Malabungot PLS (Brgy. Binagasbasan, Garchitora, Camarines Sur)**

Proc. 288, April 2000; 120 has; lowland evergreen; barred rail, zebra dove, kingfisher, Pacific swallow, yellow-vented bulbul, chestnut mannikin, mangrove blue flycatcher

**Lagonoy Natural Biotic Area**

Proc. 297, April 2000; 470 has; lowland evergreen; serpent eagle, jungle fowl, barred rail, painted snipe, fruit dove, hanging parakeet, kingfisher, pygmy woodpecker, chestnut mannikin, spotted green tree skink, Phil cobra

**Abasig-Matogdon Mananap Natural Biotic Area (Daet, Labo, Camarines Norte)**

Proc. 318, May 2000; 5,420 has; lowland evergreen; civet cat, Phil. Deer, wild pig, monitor lizard, fruit bats, Phil hawk eagle, rufous hornbill

**Bongsalay Mangrove Natural Park (Ticao Island)**

Proc. 319, May 2000; 244 has; mangrove forest; mangrove heron, egret, plover, sandpiper, kingfisher, bulbul, Phil leaf warbler, chestnut mannikin, black-naped oriole.

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

Region 5

**Proposed PAs:**

**13 sites with total area of 72,334.99 hectares**

**Mt. Isarog Natural Park (Camarines Sur) 10,112.34 has**

**Guinawayan Island Wilderness Area (Guinawayan, Placer, Masbate)  
20 has**

**Catanduanes Natural Park (Catanduanes) 45,584 has**

**Dahican Strict Nature Reserve (Dahican, San Jose, Panganiban, Cam Norte)  
42 has**

**Caramoan Natural Park (Caramoan, Cam Sur) 347 has**

**Bulusan Volcano Natural Park (Juban, Irosin, Bulusan, Barcelona, Sorsogon)  
3,673 has**

**Mayon Volcano Natural Park (Tabaco and Legazpi, Albay) 5,458.65 ha**

**Libmanan Natural Monument/Landmark (Camarines Sur) 19 has**

**Bicol Natural Park (Basud and Daet, Cam Norte) 5,201 has**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**Region 5**

**Proposed PAs:**

**Matang-tubig Watershed Forest Reserve (So. Matang-Tubig, Real, Monreal)  
600 has**

**Juban Magallanes Natural Biotic Area (Juban and Magallanes, Sorsogon)  
1,032 has**

**Tugbo Strict Nature Reserve (Masbate and Mobo)  
246 has**

**Magarasa Watershed Forest Reserve (Tabaco, Ligao, Oas and Daraga, Albay)**

**National Biodiversity Priority-Setting Workshop  
Luzon Consultative Workshop  
September 27-29, 2000**

**THANK YOU  
AND  
GOOD AFTERNOON!!!**

**PROTECTED AREAS AND WILDLIFE BUREAU**

PRISMA PRESENTATION  
by Dr. Oliver G. Coroza

*PRISMA: A Multi-media  
Database Publisher*

A Tool for Sharing Information

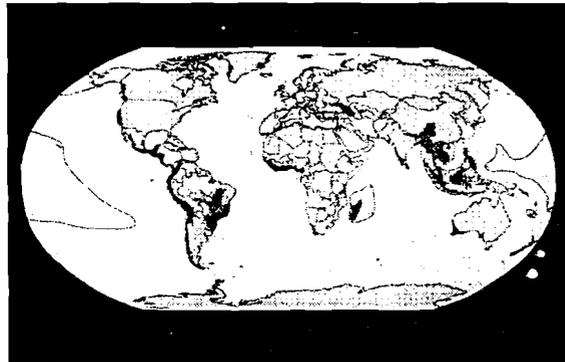
The Earth's natural heritage must be maintained if future generations are to thrive spiritually, culturally, and economically.

*We should strive...*



... to conserve the Earth's living heritage, our global biodiversity, and to demonstrate that human societies are able to live harmoniously with nature

Biodiversity Hotspots



- Exceptional plant & vertebrate endemism
- High degree of threat

*We should be able to conserve  
biodiversity through*



- Science & Research
- Policy & Economics
- Healthy Communities
- Alliance Building
- Awareness

*Expert Workshop Approach to Setting  
Conservation Priorities*

Bring together the best local and regional experts to set priorities rapidly

- Data: scarce, suspect, or non-existent
- Common resources managed independently with little coordination between countries
- Need for a quick biodiversity assessment to support national planning processes



## Conservation Priority-Setting Workshops



## Workshop Process

### Pre-Workshop

- Planning Meetings
- Data collection & synthesis
- Developing database system
- Thematic assessments
- Regional consultations



### Workshop

- Thematic priorities
- Integrated recommendations (regional groups)
- Final conservation priorities, map and database

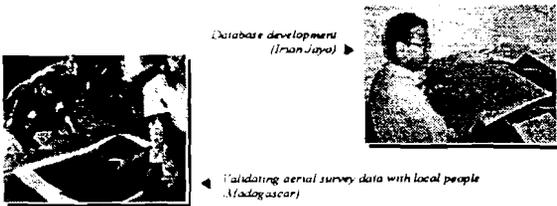


### Post-Workshop

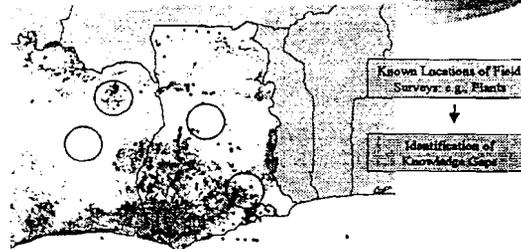
- Reports and publications
- Consolidation, publication and distribution of the information
- Follow-up activities



## Data Gathering



## Mapping the Information

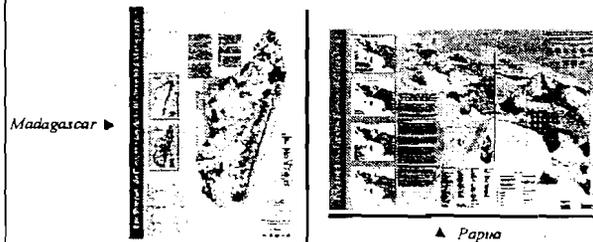


## Expert Meeting

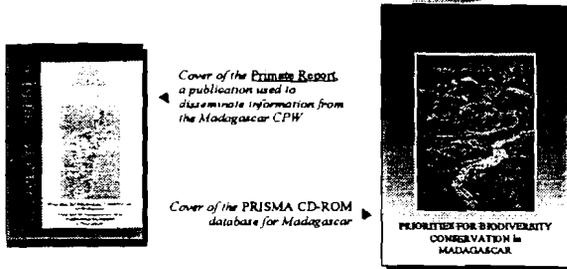
- Transparent
- Participatory



## Mapping the Results



## Information Dissemination



## The Need

- A tool for efficiently organizing all information on a region or project and for making this information available for decision processes

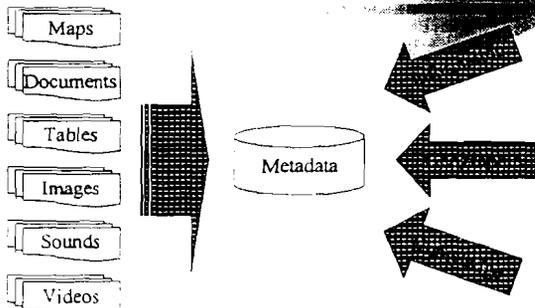
## Approach

- PRISMA organizes all documents, maps, images, tables, slides and videos on a project or region in one central database
- Helps document all information objects using a central metadata model

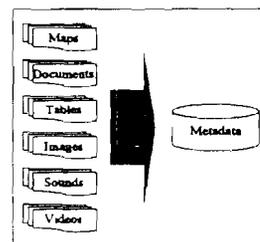
## Why?

- **Cost:** CD-ROMs are inexpensive for publishing large amounts of information (65 pesos per CD)
- **Convenience:**
  - Easy to use, no special equipment, easily sent by mail
  - Useable in the field, internet connection not required
- **Dynamic:** Incorporates variety of multi-media to reach a broad audience

## PRISMA Architecture



## Metadata



By using the metadata concept, each and every data object in PRISMA can be documented accordingly:

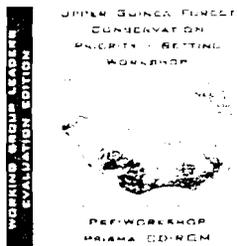
- Description of the data
- Formats
- Quality, state, timeliness
- Origin, method, history
- Ownership, use limits, reference
- Contact person & address

## PRISMA's Three Interfaces

- Knowledge
  - HTML driven; supports a variety of audio and video files
- Geographic
  - MapObjects based; user specific projects
- Information
  - Metadata, data gateway

## Inside PRISMA...

### Facilitates Data Review

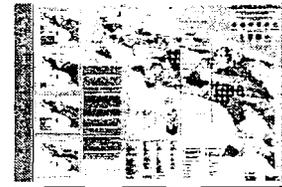


- Facilitates documenting and organizing the process of compiling information
- Use of information by working groups as the process develops

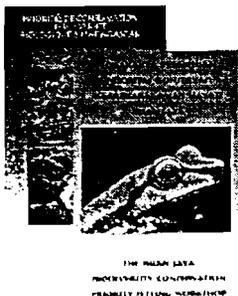
### Products of Conservation Priorities



- Make information accessible to the conservation community



### Products of Conservation Priorities



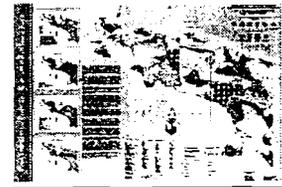
- Facilitate integration of conservation priorities into decision processes



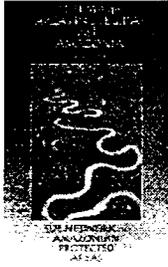
### Products of Conservation Priorities



- Encourage a minimum standard for information use / management / quality



### *Databases and Reports*



- Enables exchange information among scientists, institutions and other key government or private sectors
- Allows publication of scientific reports so that users can further analyze the information

### *Next Steps*

- Development of a new version of PRISMA
  - potential integration with web-based applications
  - develop a more user-friendly version
  - improve HTML capability
- Facilitate use of PRISMA by third parties
- Improve integration of PRISMA with other tools

### *Contact Information*

PROTECTED AREAS & WILDLIFE BUREAU  
(DENR)  
FMB Bldg., Visayas Avenue, Quezon City 1101  
(02) 928-2096

CONSERVATION INTERNATIONAL PHILIPPINES  
7 Cabanatuan Road, Quezon City 1101  
(02) 412-8194  
ciphil@csi.com.ph

CENTER FOR DEVELOPMENT STUDIES (UP)  
UP Campus, Diliman, Quezon City 1101  
(02) 929-3540

**STATUS REPORTS OF THE WORKING GROUP LEADERS**  
**AND**  
**WORKSHOP OUTPUTS OF THE THEMATIC WORKING GROUP**

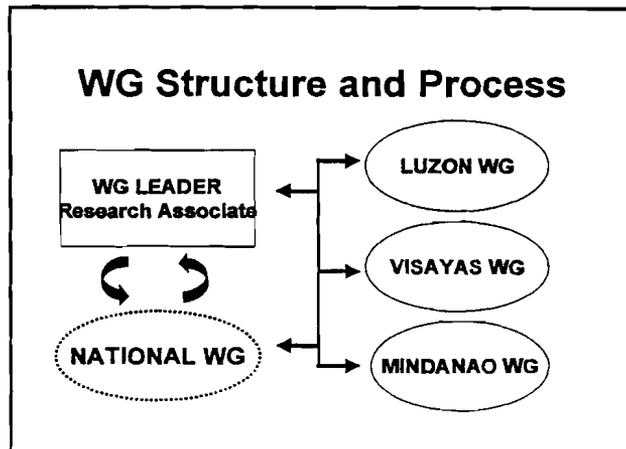
- Annex 8 : Status Report of the Socio-Econ Working Group by Rowena Reyes-Boquiren
- Annex 9 : Status Report of the Birds and Mammals Working Group by Blas R. Tabaranza
- Annex 10 : Status Report of the Herps Working Group by Arvin C. Diesmos
- Annex 11 : Status Report of the Arthropods Working Group by Victor P. Gapud
- Annex 11.1 : Data Update: Philippine Mites and Ticks by Leonila C. Raros
- Annex 12 : Status Report of the Plant Working Group by Daniel A. Lagunzad
- Annex 12.1 : Data Update: Philippine Palms by Edwino S. Fernando
- Annex 13 : Status Report of the Marine Working Group by Porfirio M. Alino
- Annex 14 : Status Report of the Freshwater Working Group by Adelina C. Santos-Borja
- Annex 15 : Workshop Output of Socio-Econ Working Group
- Annex 16 : Workshop Output of Arthropods Working Group
- Annex 17 : Workshop Output of Vertebrates Working Group
- Annex 18 : Workshop Output of Freshwater Working Group
- Annex 19 : Workshop Output of Marine Working Group
- Annex 20 : Workshop Output of Plant Working Group
- Annex 21 : Vegetation of the Philippine Islands by Edwino S. Fernando

**STATUS REPORT OF SOCIO-ECONOMIC & CULTURAL WORKING GROUP  
by Dr. Rowena R. Boquiren**

**SOCIO-ECONOMIC AND CULTURAL WORKING GROUP**

**Status Report :**  
**Luzon-Mindoro-Palawan Consultation**

- Working Group Structure and Process
- Status of Accomplishments
- Next Tasks



**Experts and data providers**

<b>SOCIAL SCIENTISTS</b>	<ul style="list-style-type: none"> <li>• <i>Academe</i></li> <li>• <i>Government</i></li> <li>• <i>Non-governmental organization</i></li> </ul>
<b>PLANNERS</b>	<ul style="list-style-type: none"> <li>• <i>Peoples Organizations</i></li> </ul>
<b>ADMINISTRATORS</b>	<ul style="list-style-type: none"> <li>• <i>Church groups</i></li> <li>• <i>Business sector</i></li> <li>• <i>Etc.</i></li> </ul>

**STATUS of Accomplishments**

- Selection and refinement of data attributes (criteria for priority setting) through workshops and review of available agency data (in-progress)
- Identification of experts and data providers
- Consultations and meetings
- Data collection and encoding : *bibliographies, maps, and socio-economic and cultural data*

**DATA ATTRIBUTES FOR SOCIO-ECONOMIC AND CULTURAL ASPECTS**

**Objective :** to identify biodiversity issues related to human impacts on the environment, as well as opportunities and initiatives for conservation.

<ul style="list-style-type: none"> <li>• <b>REFERENCE</b></li> <li><i>Cluster or Region</i></li> <li><i>Province</i></li> <li><i>Name of Protected Area/ project site</i></li> <li><b>PHYSICAL DATA</b></li> <li><i>Land Classification</i></li> <li><i>Land/ Water Use Area</i></li> </ul>	<ul style="list-style-type: none"> <li>• <b>SOCIO-DEMOGRAPHIC DATA</b></li> <li><i>Density and settlement pattern</i></li> <li><i>Migration pattern (direction)</i></li> <li><i>Tenurial status of population</i></li> </ul>
---	--

<ul style="list-style-type: none"> <li>• <b>LOCAL ECONOMY</b></li> <li><i>Sectoral share in GRDP</i></li> <li><i>Average annual per capita Y</i></li> <li><i>Poverty incidence</i></li> <li><i>Sources of environmental degradation (economic trends by sector, development plans, urbanization/ruralization trends) .</i></li> <li><i>Tourism trends</i></li> </ul>	<ul style="list-style-type: none"> <li>• <b>CULTURAL DIVERSITY</b></li> <li><i>Presence of indigenous cultural communities (name of group, population)</i></li> <li><i>Environmental resource management practices</i></li> <li><i>Degree of acculturation (relative to resource management practices)</i></li> </ul>
--	---

- R Utilization ISSUES (for forest, agriculture, mining, marine/freshwater resources)
- % of population dependent on the resource
- Level of technology/ introduction of invasive & exotic species
- Sources of environmental degradation
- Threats
- POLITICAL STABILITY
- Presence of political instability
- Source of instability
- CONSERVATION EFFORTS
- Presence of res. mgmt. plan
- LGU initiatives
- Line agency programs/projects (DENR, DA, etc.)

- PROPOSED CRITERIA & SCORING SCHEME**
- POPULATION PRESSURE**
- Density
    - 1 critical
    - 2 high
    - 3 moderate
    - 4 low
    - 5 insignificant
  - Migration
    - 1 high net in-migration
    - 2 moderate net in- migration
    - 3 stable in-out migration
    - 4 low net out-migration
    - 5 high net out-migration
- \* There is a need to determine critical levels according to ecological zone.

- Per capita income
  - 1 significantly higher
  - 2 slightly higher
- Poverty Incidence
  - 3 close to national ave.
  - 4 slightly lower
  - 5 significantly lower
 (indices relative to national standard)
- Tenurial Issues
  - 1 critical
  - 2 severe
  - 3 moderate
  - 4 weak
  - 5 insignificant

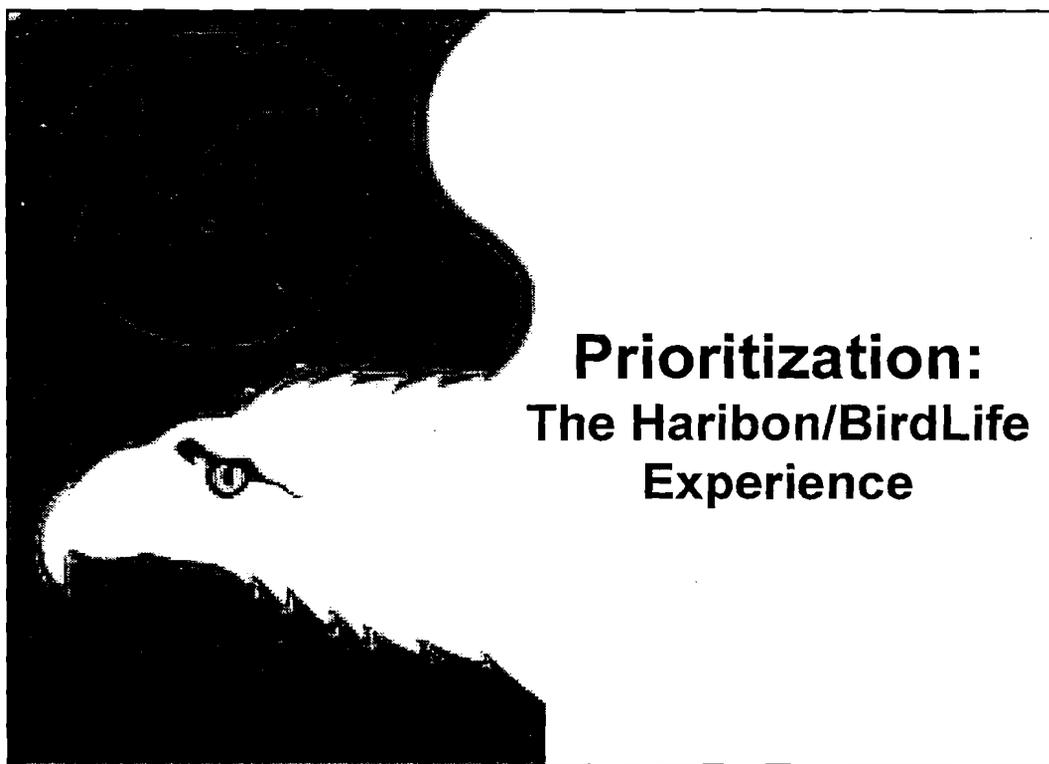
- RESOURCE UTILIZATION ISSUES**
- Impact of resource utilization practices
    - 1 critical
    - 2 severe
    - 3 moderate
    - 4 weak
    - 5 insignificant
 \*relative to a hierarchy of biodiversity threats
  - Economic trends
    - 1 critical
    - 2 severe
    - 3 moderate
    - 4 weak
    - 5 insignificant
 \*relative to a hierarchy of biodiversity threats
- CULTURAL DIVERSITY**  
(uniqueness and degree of acculturation/integration)
- persistence of customary land rights & arrangements
    - 1 very strong
    - 2 strong
    - 3 moderate
    - 4 weak
    - 5 insignificant
  - NRM practices & beliefs (IKS)
    - 1 very strong
    - 2 strong
    - 3 moderate
    - 4 weak
    - 5 insignificant

- POLICY HARMONIZATION**
- Identification of models in biodiversity-related policy harmonization
  - Identification of issues in national and local, intra- & inter-agency conflicts
- CONSERVATION INITIATIVES & OPPORTUNITIES**
- Institutionalization of conservation effort (sustained, supported by LGU & community)
    - 1 very strong
    - 2 strong
    - 3 moderate
    - 4 weak
    - 5 insignificant
  - Community mgmt.

- Next Tasks**
- Through workshops, data sharing and consultations :
- Validation, enrichment and analysis of consolidated data
  - Mapping of socio-economic and cultural attributes

STATUS REPORT OF THE BIRDS AND MAMMALS WORKING GROUP  
by Prof. Blas Tabaranza

**HARIBON**  
F O U N D A T I O N

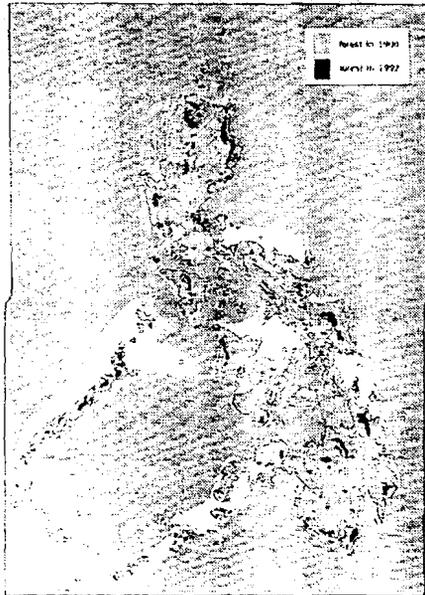


# Endemic Bird Areas of the World

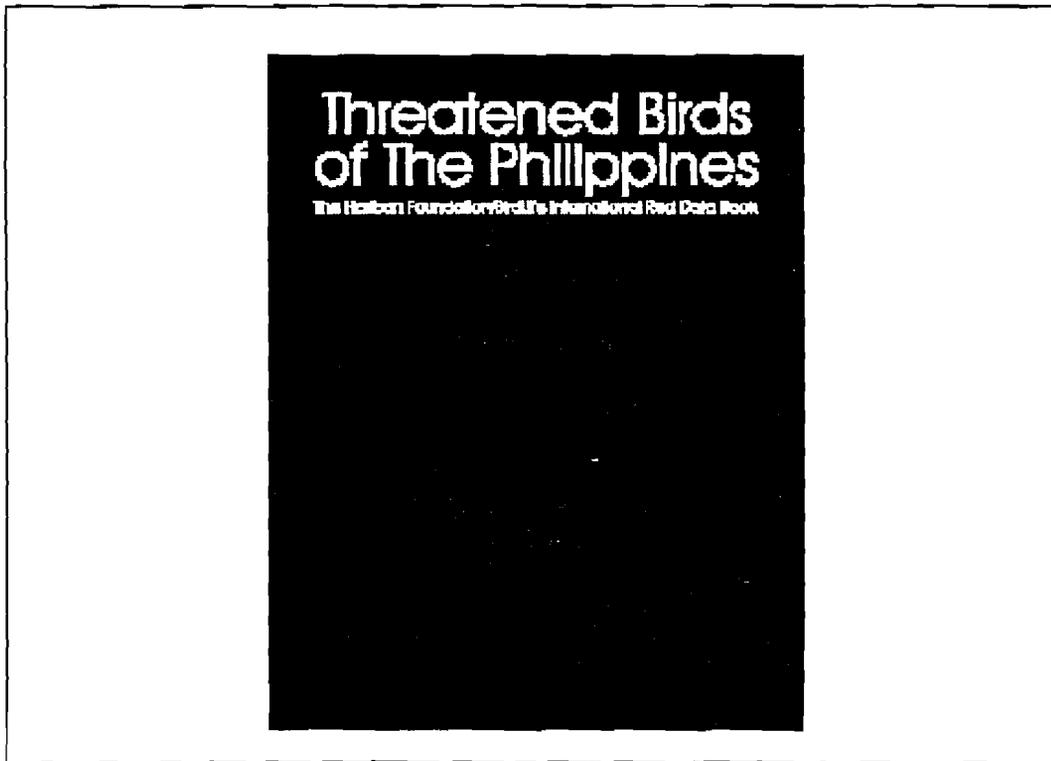
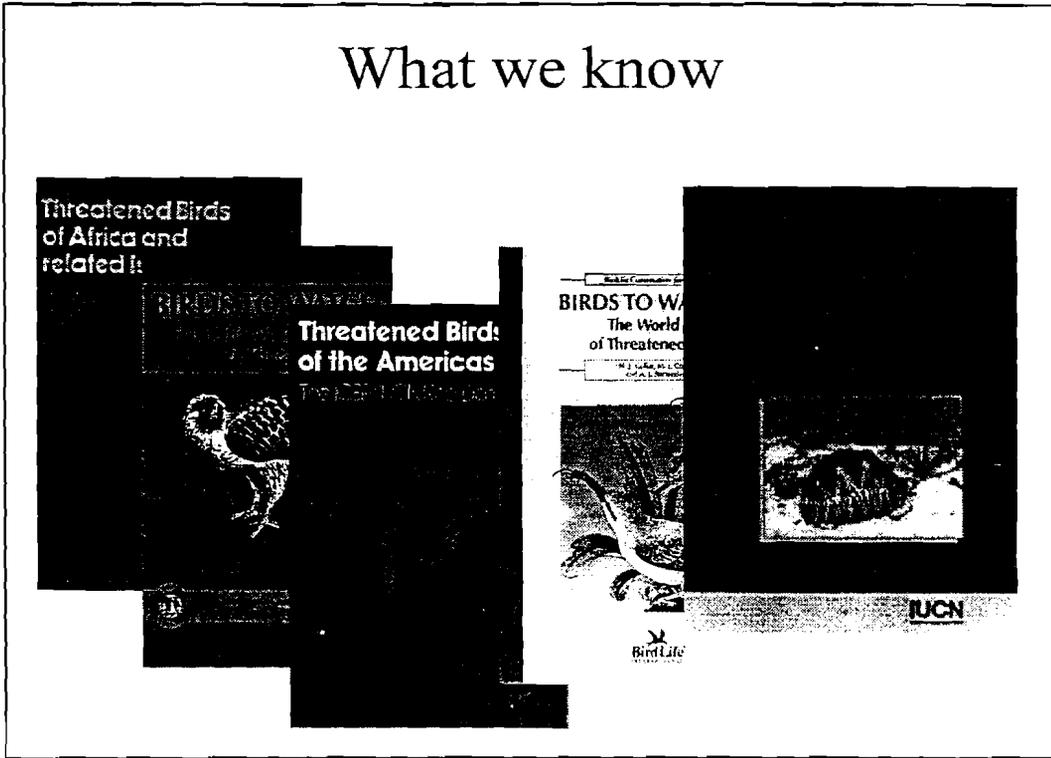


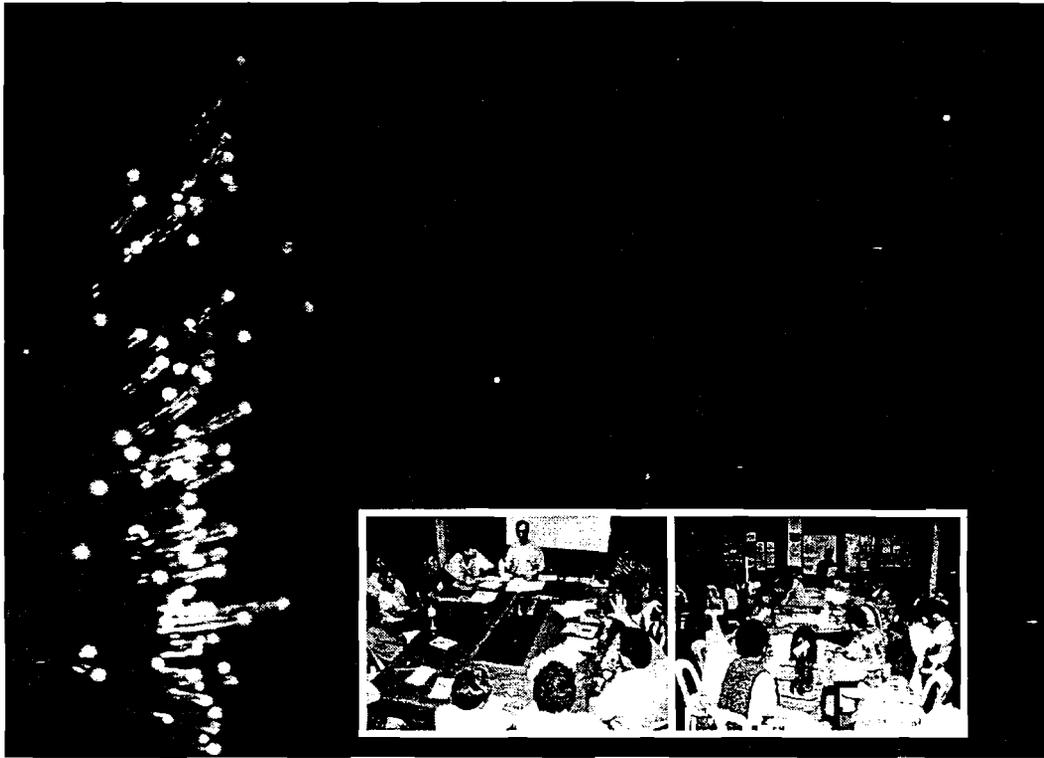
## OLD-GROWTH FOREST COVER, 1900 AND 1992

Old-growth rain forest covered about 70 percent of the Philippines in 1900. By 1992, that had been reduced to only about eight percent, in scattered, usually small, fragments.



# What we know



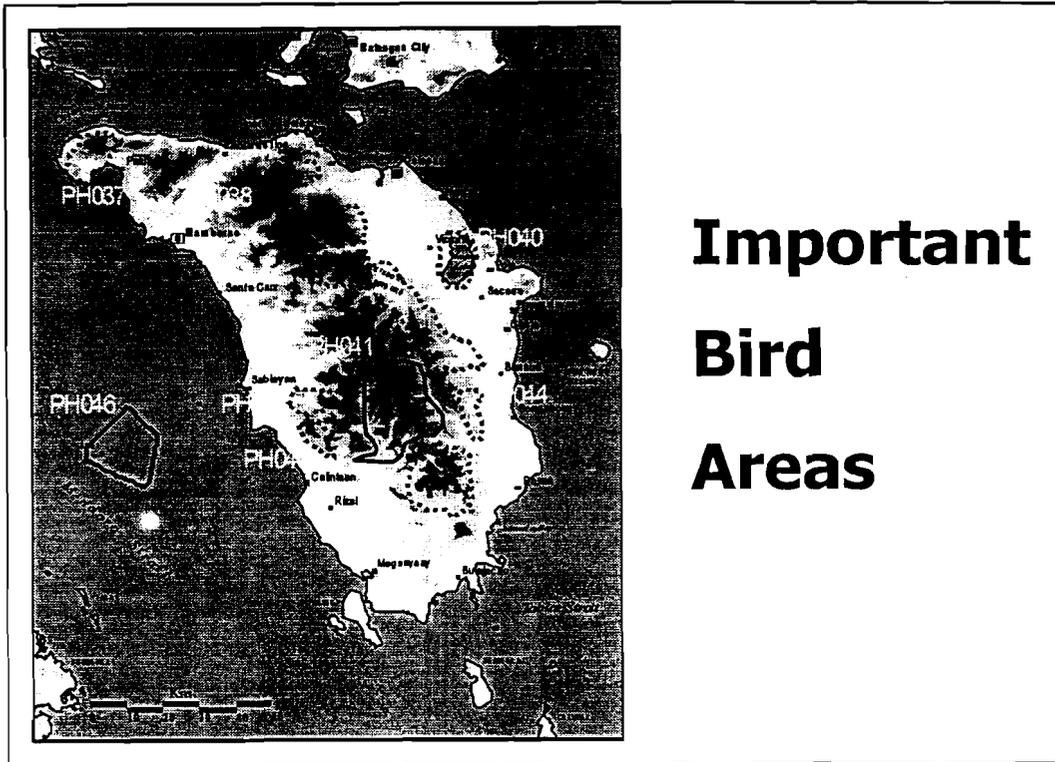


## Localities, maps and gazetteer

Introduction to the study of localities, maps and gazetteers. This section covers the historical development of cartography and the use of gazetteers in geographical research.



The map shows the continents of North America, South America, and Europe. The map is a stylized representation of the world, with the continents outlined in white against a dark background.



# Important Bird Areas

Microsoft Access - [IBA Data Form : Form]

**BirdLife International IBA DATA FORM** Delete Record

1 Compiler:  2 Date(ddmm/yyyy):

4 Temporary IBA Code:  5 Final IBA Code:

**GENERAL DATA**

6 National Site Name:  7 International Site Name:

8 Country:  9 Administrative Region (Level 1):

10 Administrative Region (Level 2):  11 Area:  (ha) 12 Area accuracy:

13 Central Coordinates (Lat):    13 Central Coordinates (Lon):    14 Altitude:   15 Map:  16 Management:  17 Owner:

18 General Descriptor:

Microsoft Access - IBA Data Form : Form

**CRITERIA**

19 EBA Code Proposed    21 Criteria Proposed for IBA    22 Criteria Notes

EBA151    [A1] A1    **100 birds in 1999**

20 Biome Code for Proposed    [A4] A4II

Biome I 4

**BIRD SPECIES DATA**

R	U	A	M	M	100 birds in 1999
					221242

**HABITATS AND % COVER**

**Forest and woodland**    33 Presence    34 % Cover

Lowland evergreen rain forest	<input checked="" type="checkbox"/>	10
Semi-evergreen rain forest	<input checked="" type="checkbox"/>	20
Peat swamp forest	<input checked="" type="checkbox"/>	30
Heath forest	<input checked="" type="checkbox"/>	40
Moist deciduous forest	<input checked="" type="checkbox"/>	50

Microsoft Access

Habitat Table Form

**Forest and woodland**    33 Presence    34 % Cover

Lowland evergreen rain forest	<input checked="" type="checkbox"/>	10
Semi-evergreen rain forest	<input checked="" type="checkbox"/>	20
Peat swamp forest	<input checked="" type="checkbox"/>	30
Heath forest	<input checked="" type="checkbox"/>	40
Moist deciduous forest	<input checked="" type="checkbox"/>	50
Dry deciduous forest	<input checked="" type="checkbox"/>	60
Dry evergreen forest	<input checked="" type="checkbox"/>	70
Thorn forest	<input checked="" type="checkbox"/>	80
Mangroove forest	<input checked="" type="checkbox"/>	90
Lower montane rain forest	<input type="checkbox"/>	0
Upper montane rain forest	<input type="checkbox"/>	0
Hill evergreen forest	<input type="checkbox"/>	0
Pine forest	<input type="checkbox"/>	0
Montane broadleaf evergreen forest	<input type="checkbox"/>	0
Montane broadleaf deciduous forest	<input type="checkbox"/>	0
Montane mixed broadleaf-coniferous forest	<input type="checkbox"/>	0
Montane coniferous forest	<input type="checkbox"/>	0
Broadleaf deciduous forest	<input type="checkbox"/>	0
Mixed broadleaf-coniferous forest	<input type="checkbox"/>	0
Coniferous forest	<input type="checkbox"/>	0
Riverline forest	<input type="checkbox"/>	0
Forest steppe	<input type="checkbox"/>	0
Forest tundra	<input type="checkbox"/>	0

Microsoft Access

Habitat Table Form

**Scrub** 33 Presence 34 % Cover

Temperate heath and scrub	<input type="checkbox"/>	0
Semi-desert scrub	<input type="checkbox"/>	0
Subalpine and alpine scrub	<input type="checkbox"/>	0
Secondary scrub	<input type="checkbox"/>	0

**Wooded grassland** 33 Presence 34 % Cover

Wooded grassland	<input type="checkbox"/>	0
------------------	--------------------------	---

**Grassland** 33 Presence 34 % Cover

Tundra	<input type="checkbox"/>	0
Steppe	<input type="checkbox"/>	0
Edaphic grassland	<input type="checkbox"/>	0
Alpine and subalpine grassland	<input type="checkbox"/>	0
Secondary grassland	<input type="checkbox"/>	0

**Marine areas** 33 Presence 34 % Cover

Shallow marine waters, coral reefs and keys	<input type="checkbox"/>	0
Sea inlets	<input type="checkbox"/>	0

Microsoft Access

Habitat Table Form

**Marine areas** 33 Presence 34 % Cover

Shallow marine waters, coral reefs and keys	<input type="checkbox"/>	0
Sea inlets	<input type="checkbox"/>	0
Open sea	<input type="checkbox"/>	0

**Wetlands** 33 Presence 34 % Cover

Estuary waters	<input type="checkbox"/>	0
Internal mud, sand or salt flats	<input type="checkbox"/>	0
Costal lagoons	<input type="checkbox"/>	0
Sand dunes and beaches	<input type="checkbox"/>	0
Shingle and stony beaches	<input type="checkbox"/>	0
Inland delta	<input type="checkbox"/>	0
Rivers and streams	<input type="checkbox"/>	0
Riverine floodplains	<input type="checkbox"/>	0
Freshwater lakes and pools	<input type="checkbox"/>	0
Artificial wetlands	<input type="checkbox"/>	0
Ephemeral wetlands	<input type="checkbox"/>	0
Saline lakes	<input type="checkbox"/>	0
Salt pans	<input type="checkbox"/>	0
Salt marshes	<input type="checkbox"/>	0
Permanent swamp	<input type="checkbox"/>	0
Raised and blanket bogs	<input type="checkbox"/>	0

Microsoft Access

Habitat Table Form

Oases

Polar desert

**Rocky areas**      33 Presence      34 % Cover

Sea cliffs and rocky shores

Rock stacks and islands

Inland cliffs and rocky slopes

Scree and boulders

Caves

**Artificial landscapes**      33 Presence      34 % Cover

Arable land

Rice paddies

Improved pasture land

Perennial crops, orchards and groves

Forestry and agro-industrial plantations

Small settlements, rural gardens

Urban areas

Abandoned farmland, disturbed ground

Microsoft Access - [Threats Table]

Type	37 Presence	38 Importance
Abandonment / reduction of land managemen	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Afforestation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Agricultural intensification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Aquaculture / fisheries	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Competition from introduced animal species	<input type="checkbox"/>	<input type="checkbox"/>
Construction of dykes / dams	<input type="checkbox"/>	<input type="checkbox"/>
Deforestation (commercial)	<input type="checkbox"/>	<input type="checkbox"/>
Disturbance to birds	<input type="checkbox"/>	<input type="checkbox"/>
Drainage	<input type="checkbox"/>	<input type="checkbox"/>
Dredging and canalization	<input type="checkbox"/>	<input type="checkbox"/>
Extraction industry (mining)	<input type="checkbox"/>	<input type="checkbox"/>
Filling in of wetlands	<input type="checkbox"/>	<input type="checkbox"/>
Forest grazing	<input type="checkbox"/>	<input type="checkbox"/>
Groundwater abstraction	<input type="checkbox"/>	<input type="checkbox"/>
Industrial / urban development	<input type="checkbox"/>	<input type="checkbox"/>
Infrastructure development	<input type="checkbox"/>	<input type="checkbox"/>
Intensified forest management	<input type="checkbox"/>	<input type="checkbox"/>
Introduction of exotic plan species	<input type="checkbox"/>	<input type="checkbox"/>
Natural events	<input type="checkbox"/>	<input type="checkbox"/>
Recreation, tourism	<input type="checkbox"/>	<input type="checkbox"/>
Selective logging / cutting	<input type="checkbox"/>	<input type="checkbox"/>
Undergrazing	<input type="checkbox"/>	<input type="checkbox"/>
Unsustainable exploitation	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>
Unknown	<input type="checkbox"/>	<input type="checkbox"/>

Microsoft Access - [Landuse Table]

Type	35 Presence	36 % Cover
Permanent agriculture	<input checked="" type="checkbox"/>	10
Shifting agriculture	<input checked="" type="checkbox"/>	20
Fisheries /aquaculture	<input checked="" type="checkbox"/>	30
Forestry	<input checked="" type="checkbox"/>	40
Military	<input checked="" type="checkbox"/>	50
Nature conservation	<input checked="" type="checkbox"/>	60
Tourism / recreation	<input checked="" type="checkbox"/>	70
Urban / industrial	<input checked="" type="checkbox"/>	80
Small settlements	<input checked="" type="checkbox"/>	90
Watershed management	<input checked="" type="checkbox"/>	0
Other	<input type="checkbox"/>	0
Not utilized	<input type="checkbox"/>	0
Unknown	<input type="checkbox"/>	0

Microsoft Access - [IBA Data Form : Form]

### PROTECTED AREAS

39 Code: [ ] 41 Political Units: [ ] 42 Full Name of Site: [ ] 43 Year: [0]

44 Designation: [ ] 45 IUCN category: [ ] 46 Area: [0] (ha)

47 Central Coordinates (Lat): [0] [0] 47 Central Coordinates (Lon): [0] [0] 48 Relationship to IBA: [ ] 49 Overlap: [0] (ha)

50 Notes: [ ]

### LOBBYING / CAMPAIGNING FOR LEGISLATION

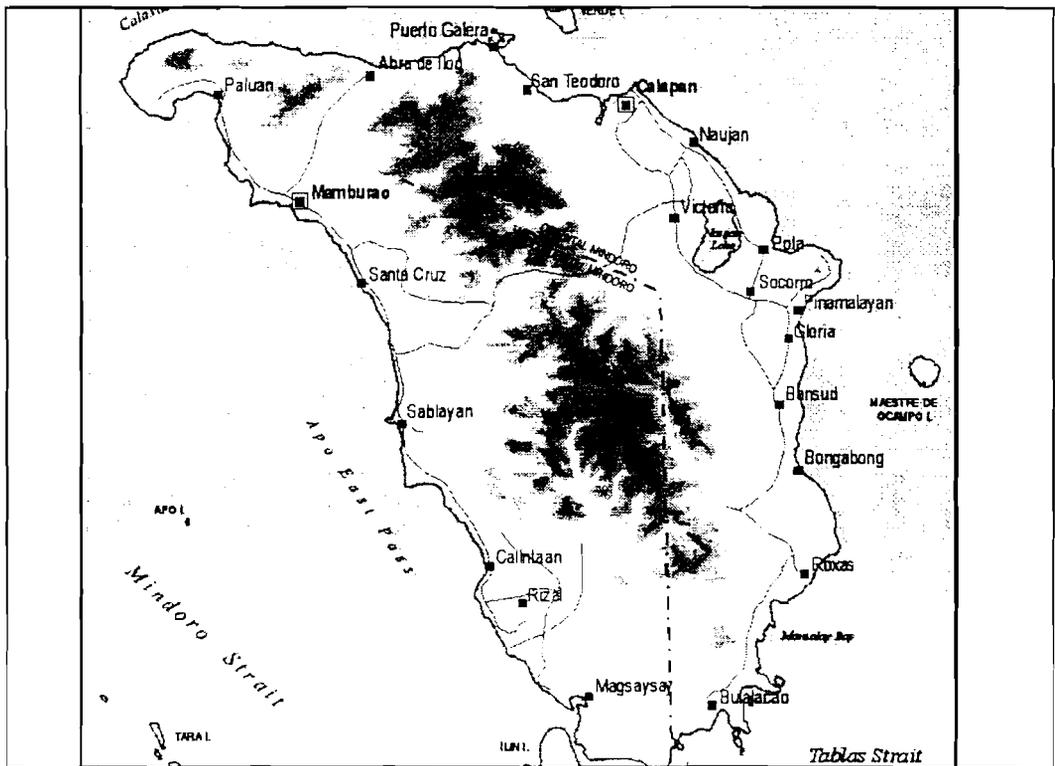
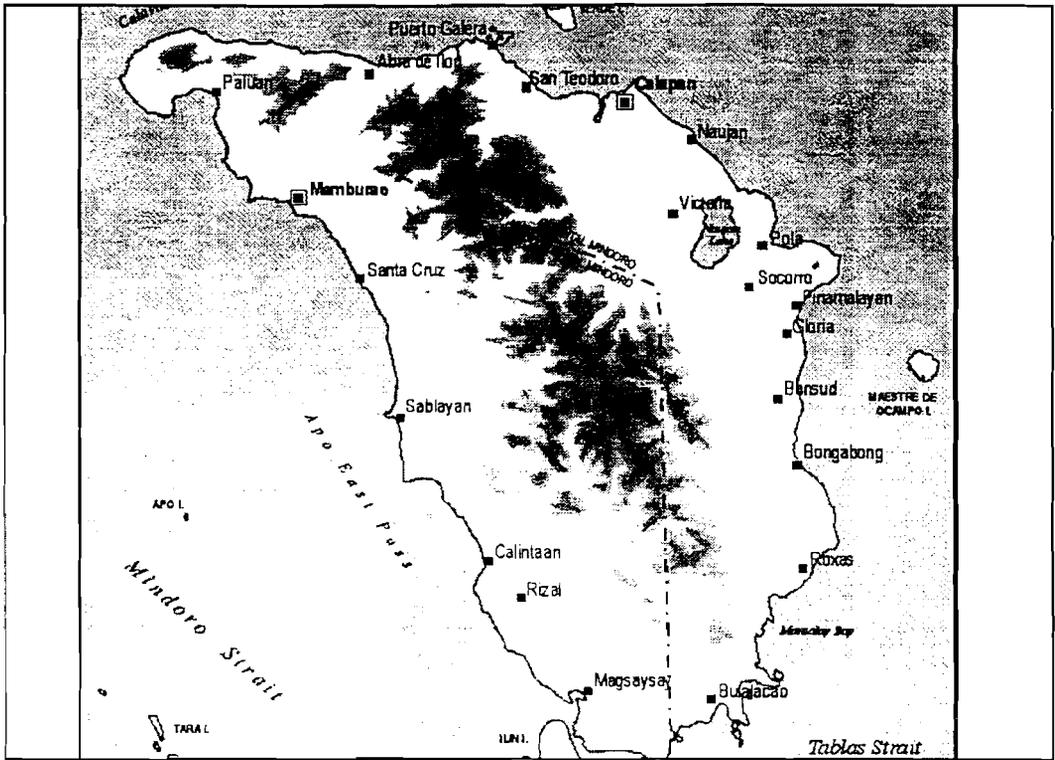
51 Person/Organization: [ ] 52 Type of Action: [ ] 53 Details of campaign: [ ]

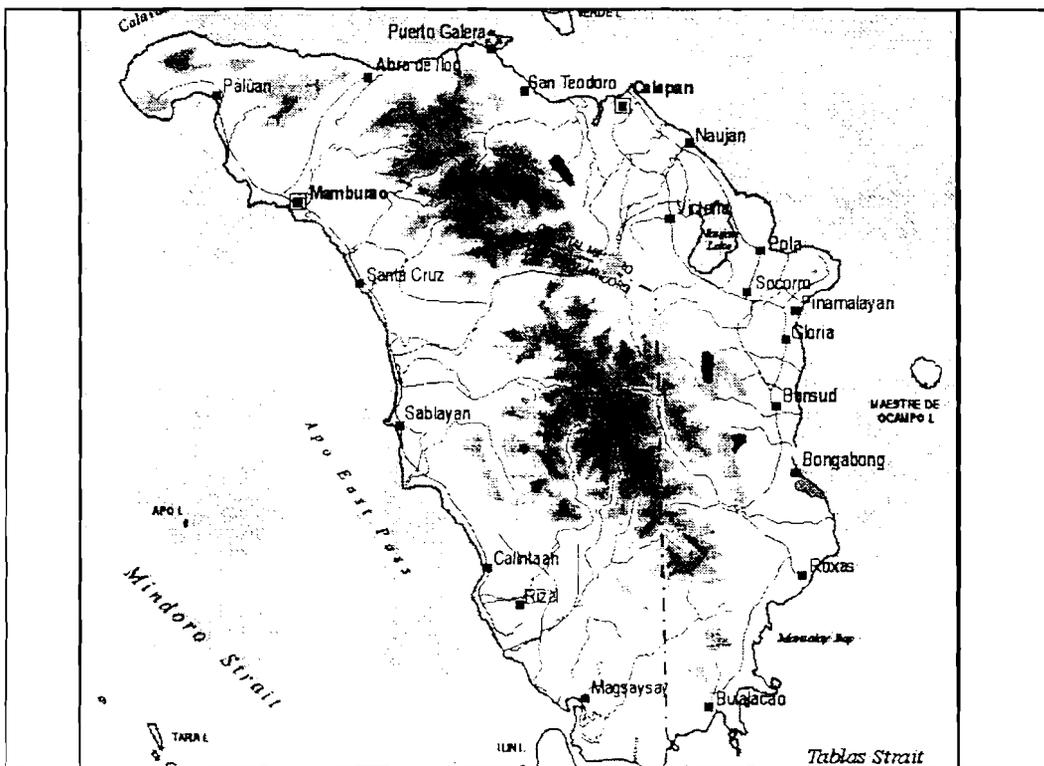
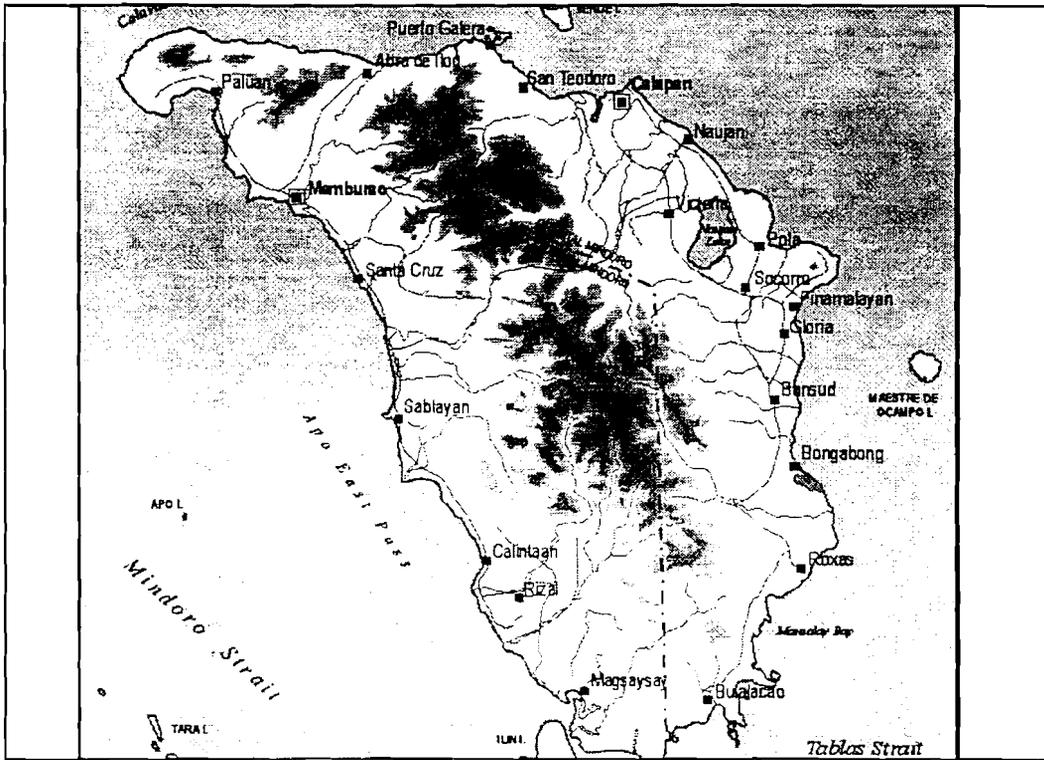
54 Person/Organization: [ ] 55 Date action start: [ ] (dd/mm/yyyy) 56 Date of last information: [ ] (dd/mm/yyyy) 57 Correspondance file: [ ]

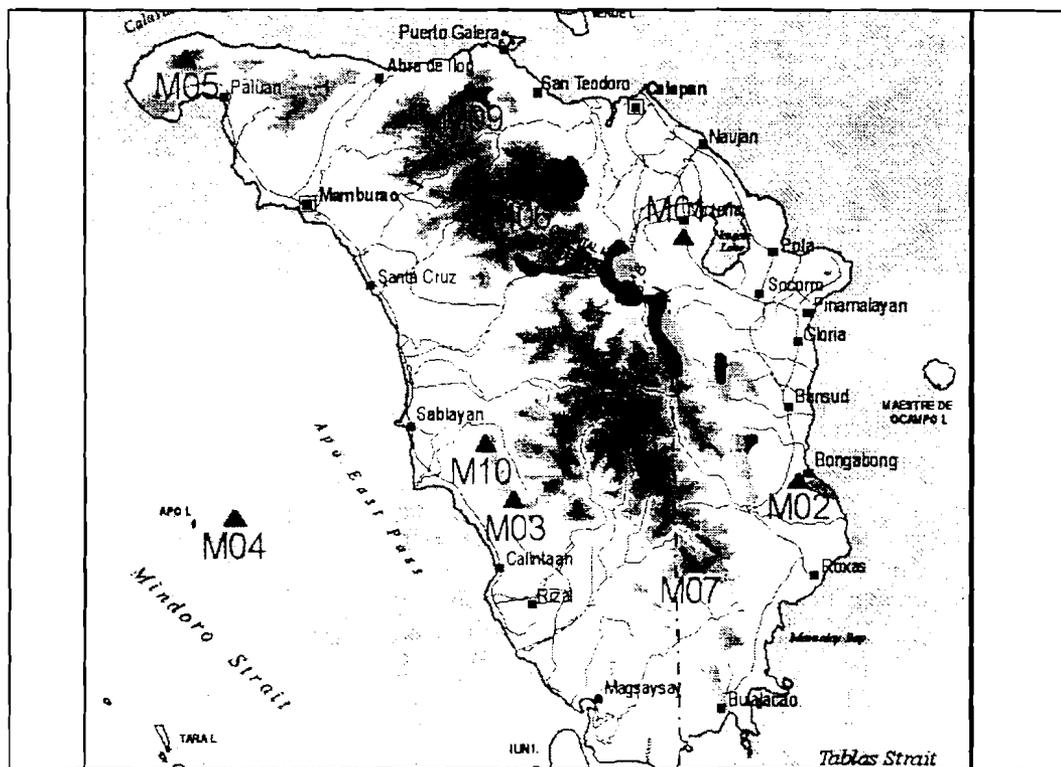
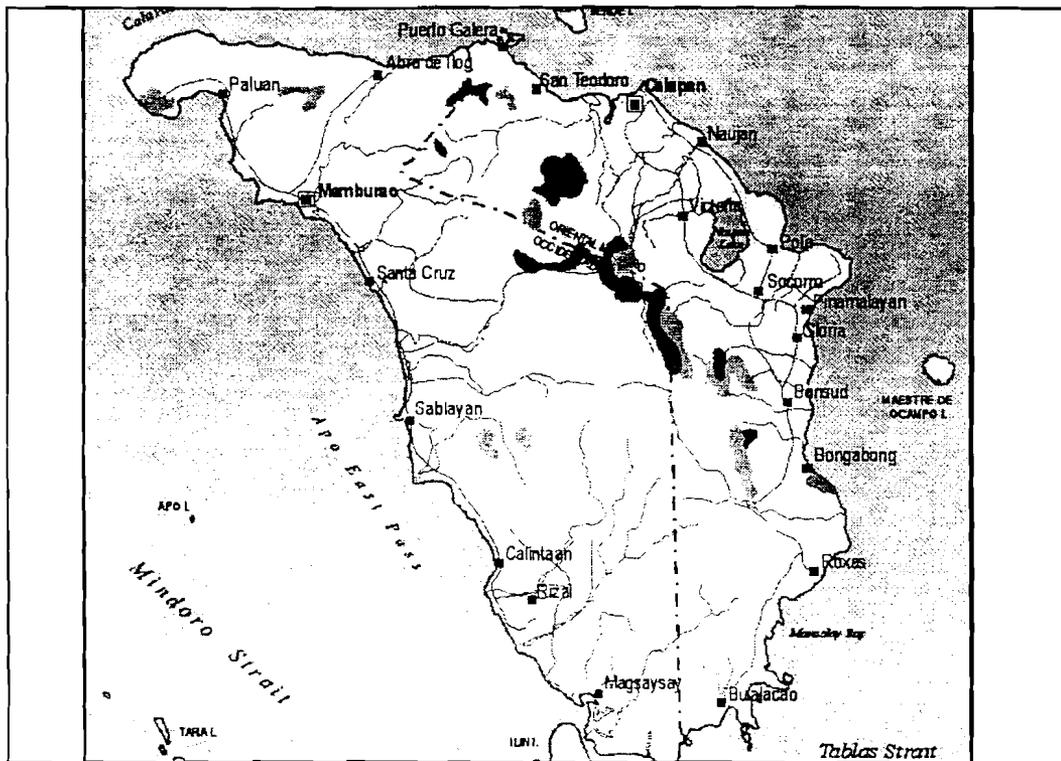
58 Results of lobbying or campe: [ ] 59 Notes: [ ]

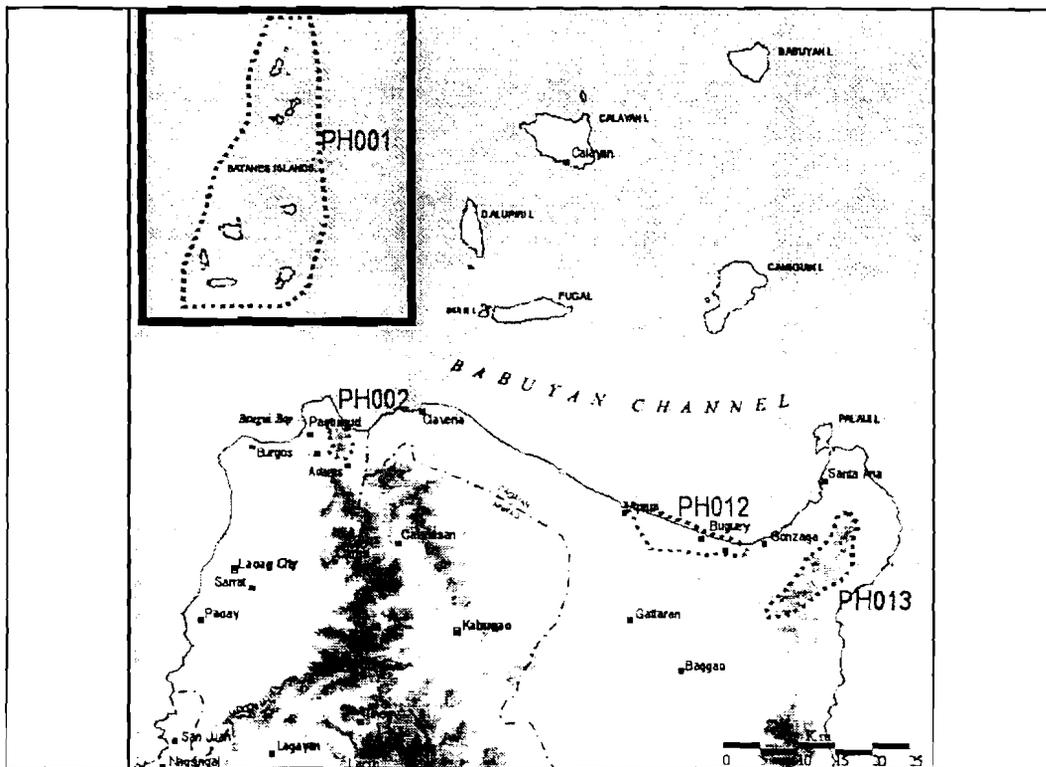
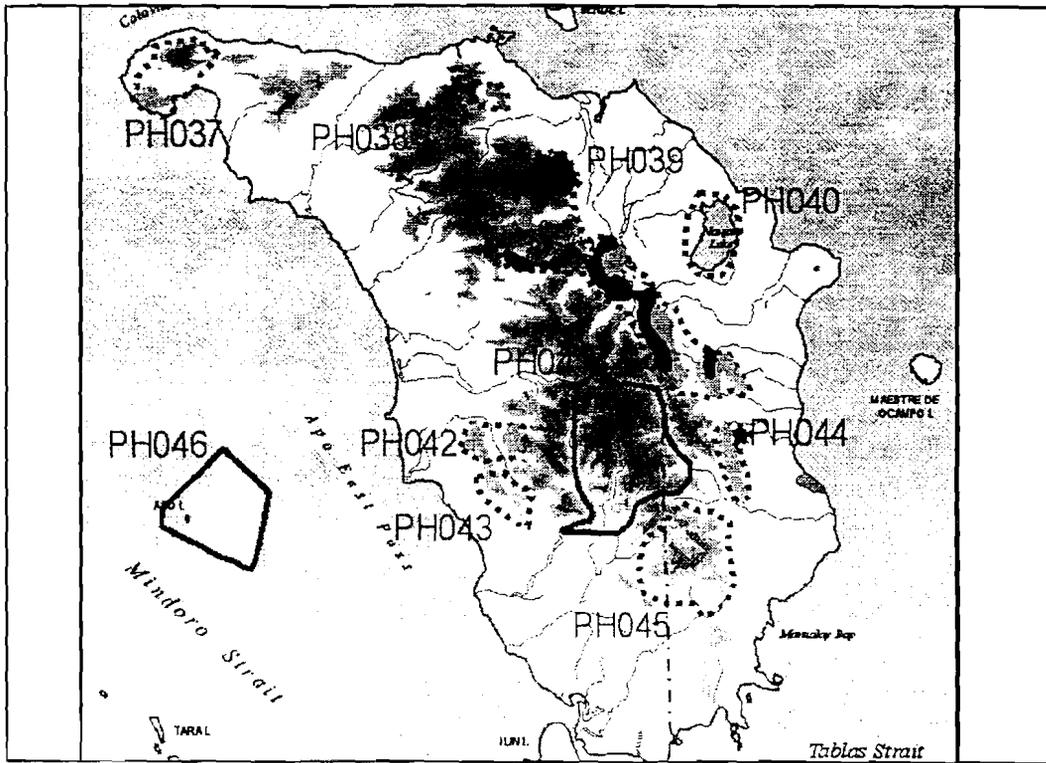




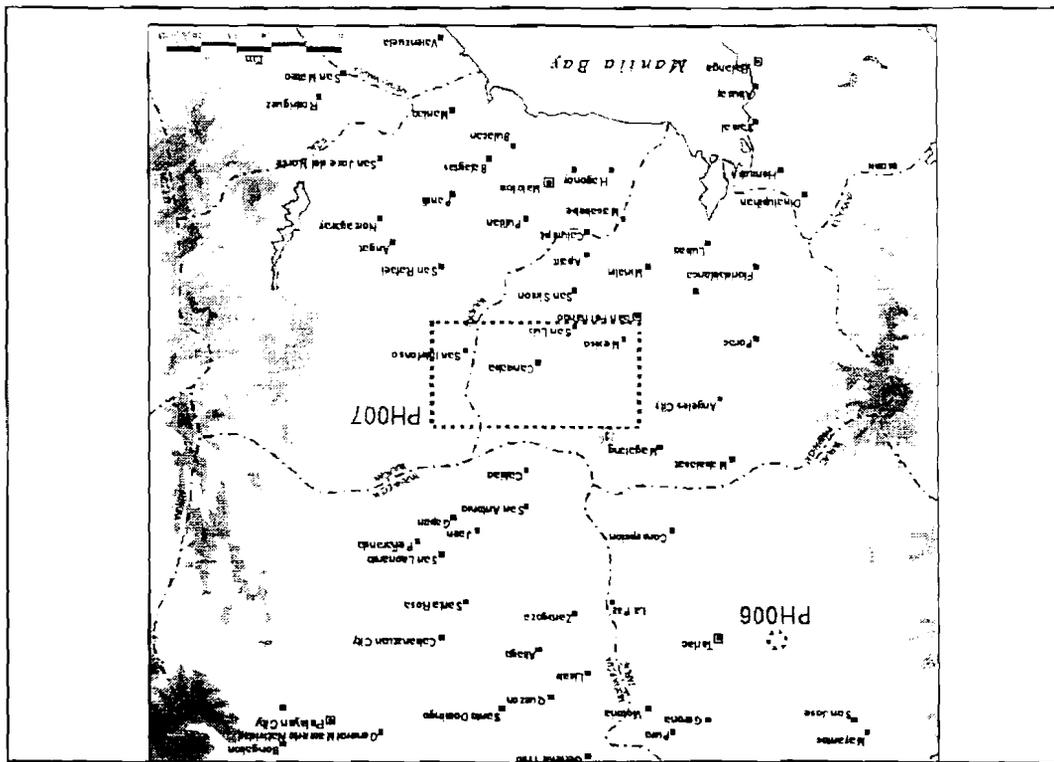


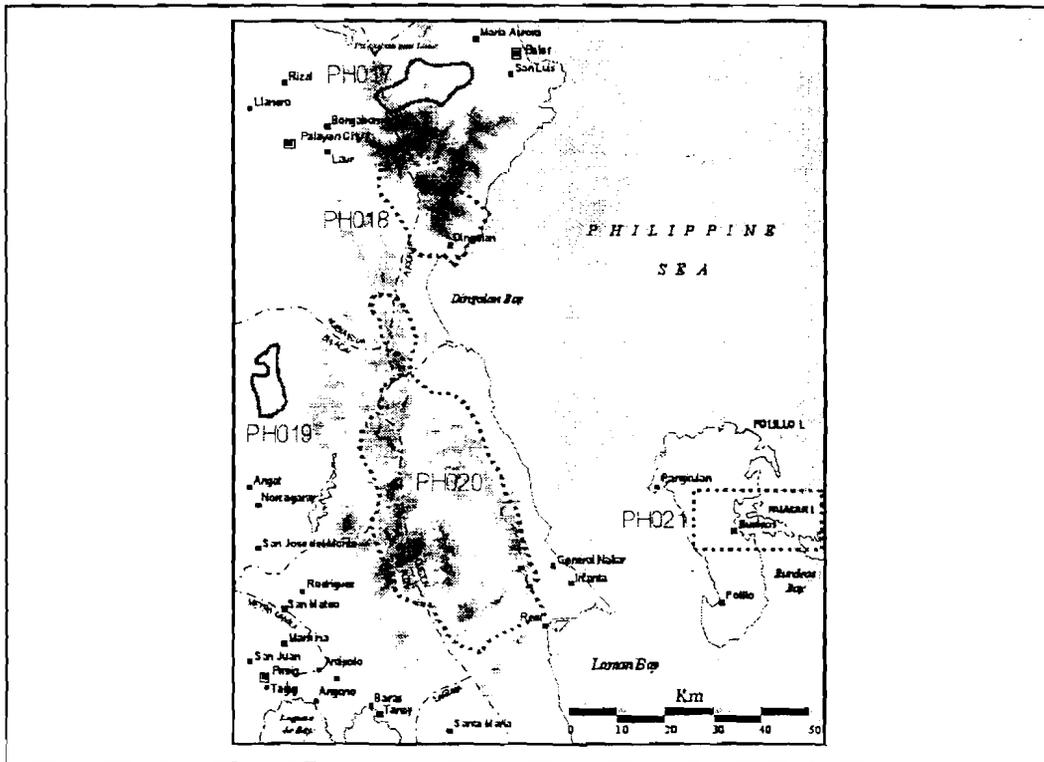
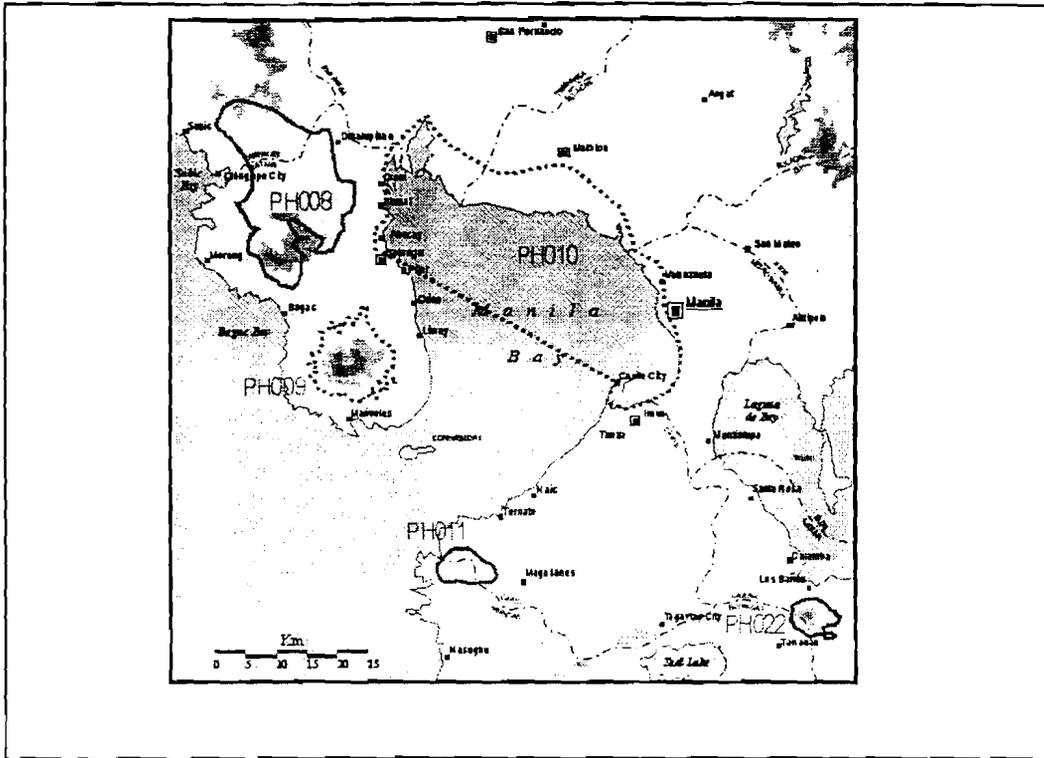


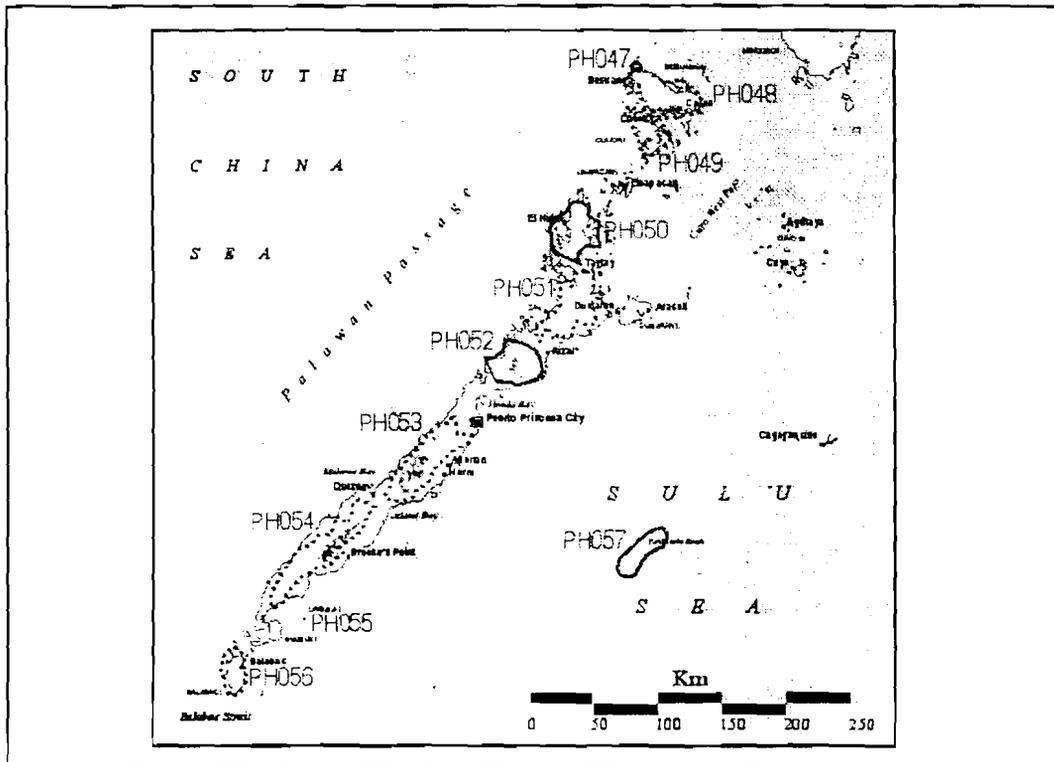
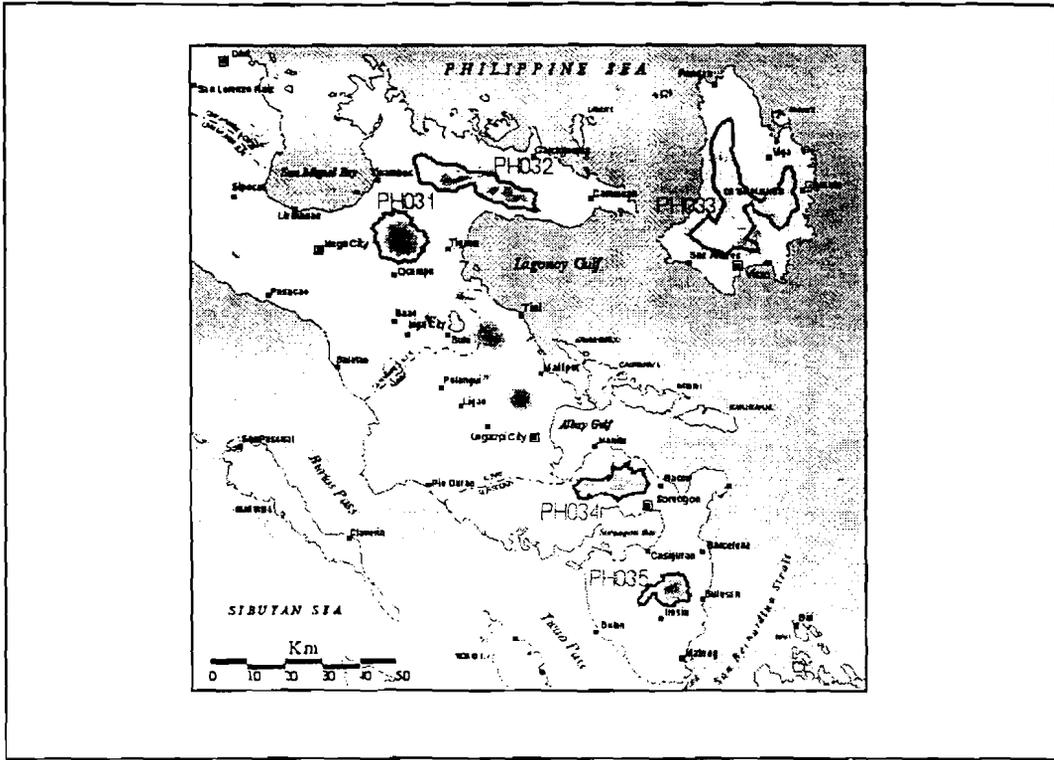


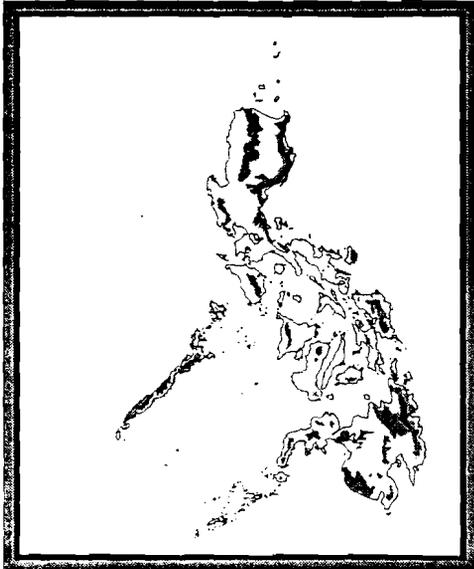




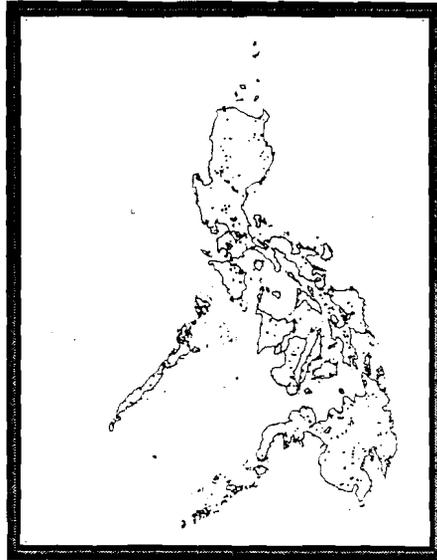








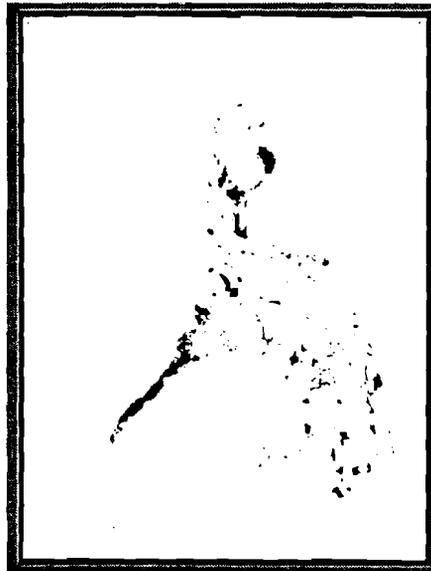
**Vegetation Map**



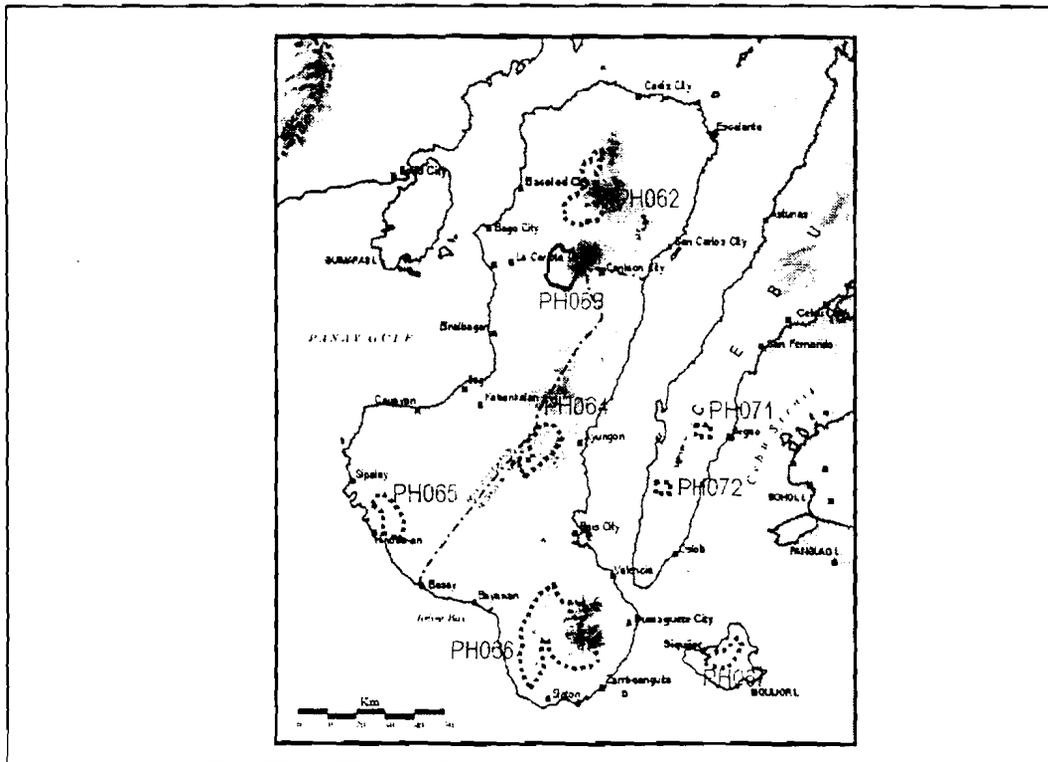
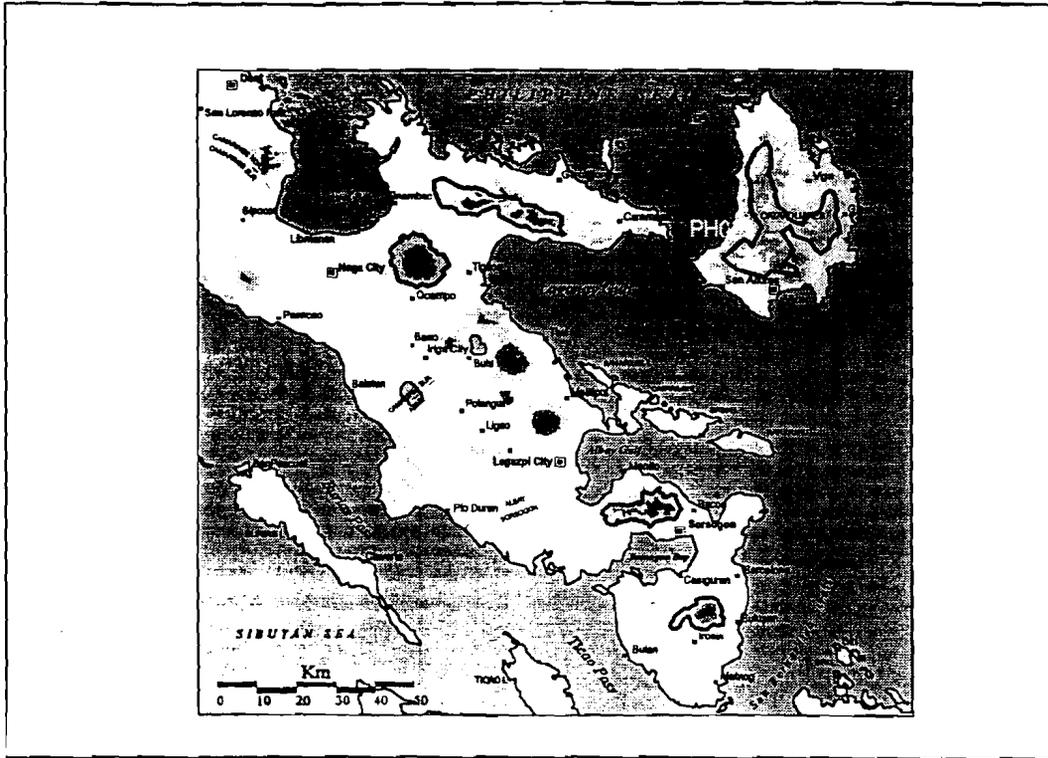
**Threatened Bird  
Localities**

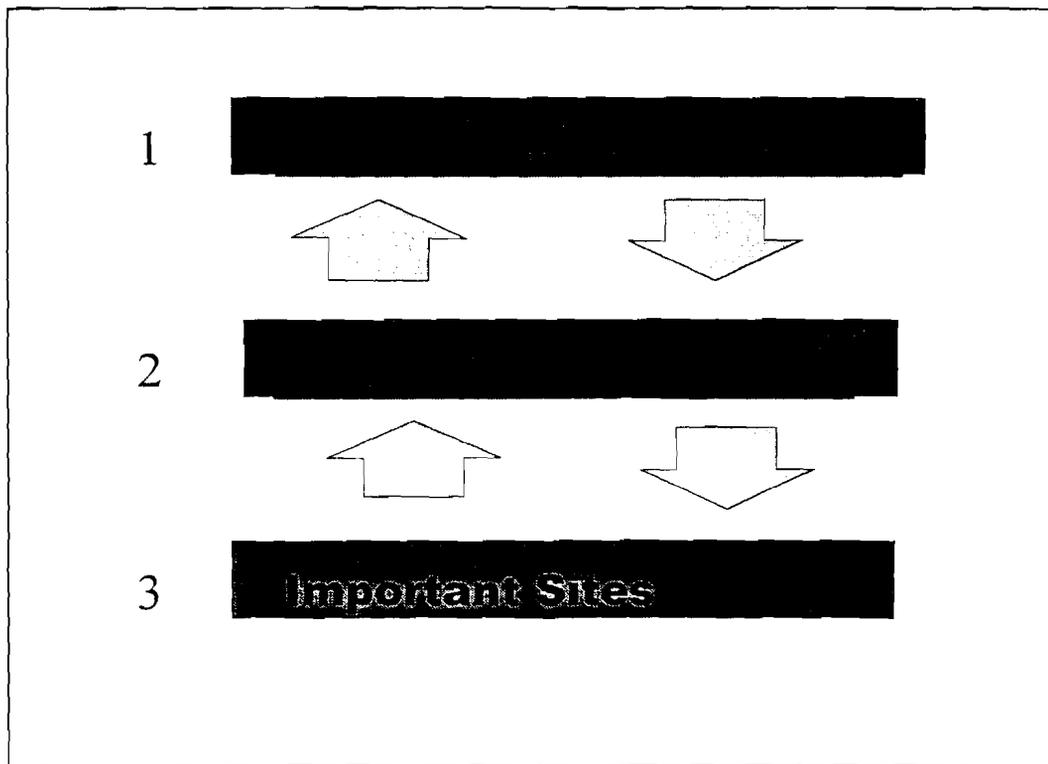
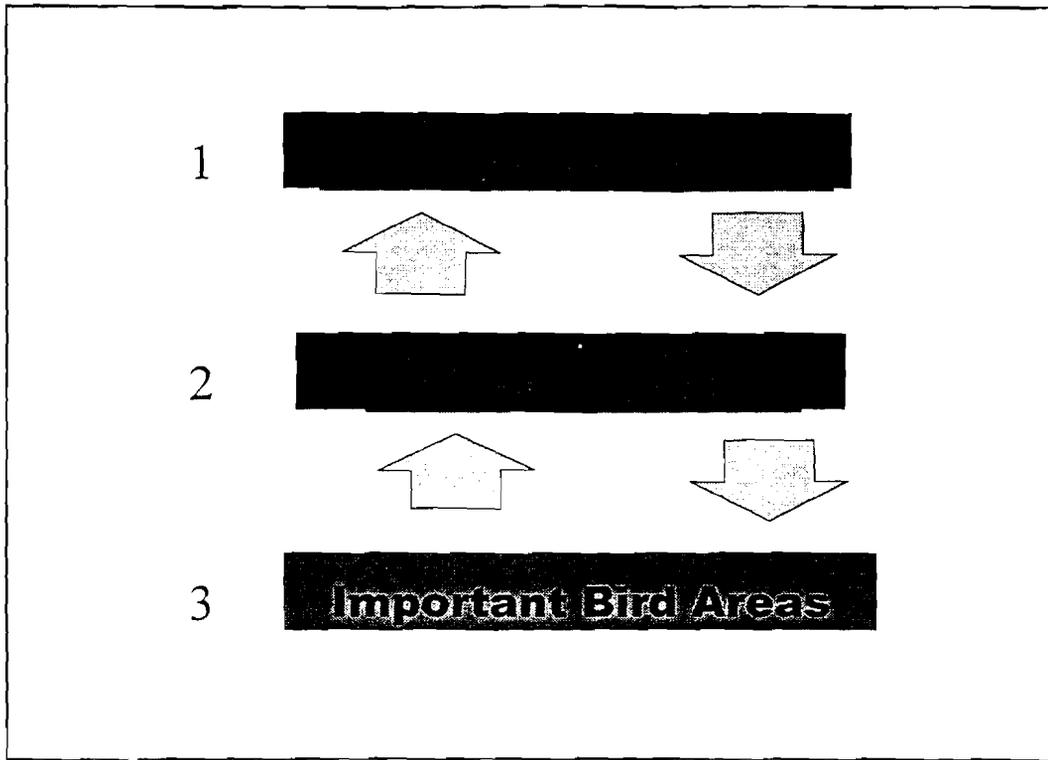


**Mining Applications**

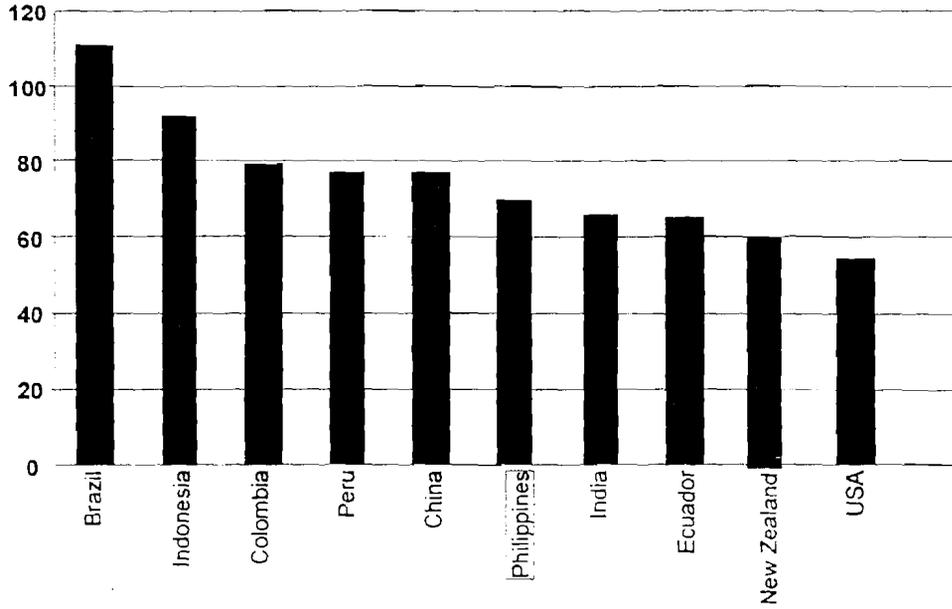


**Protected Areas**





# Threatened species by country



©2000 NADMallari/Haribon Foundation

# Density map of threatened species



©2000 NADMallari/Haribon Foundation

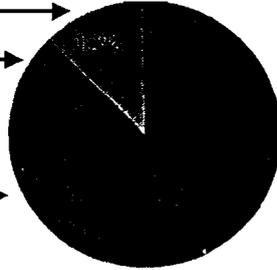
# Key Results

Total Globally Threatened species = 70

9 species vagrant,  
extirpated, introduced

6 species winter visitors

59 species endemic

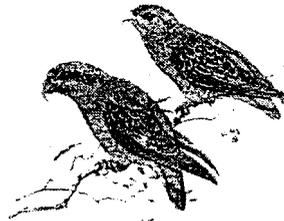


13 species Critical (2 are vagrants)

13 species Endangered (2 vagrants)

44 species Vulnerable

4 species Data Deficient



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## Global conservation issues [1]

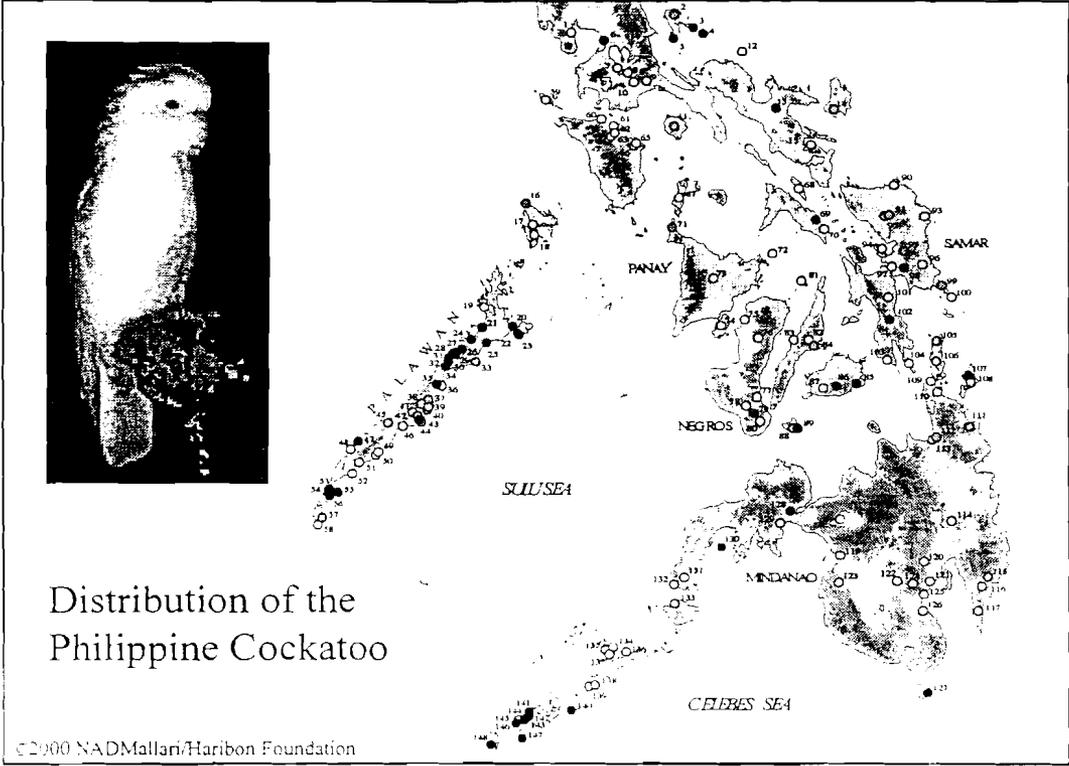




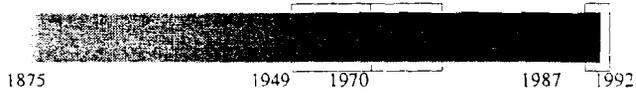
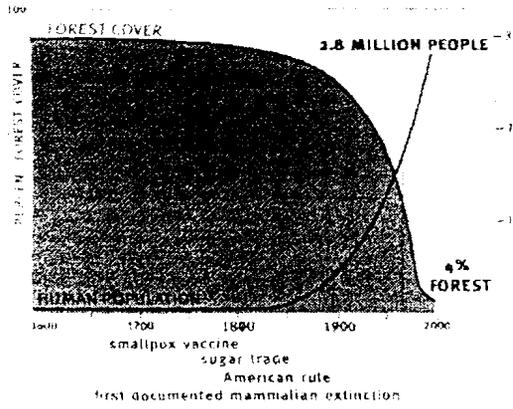
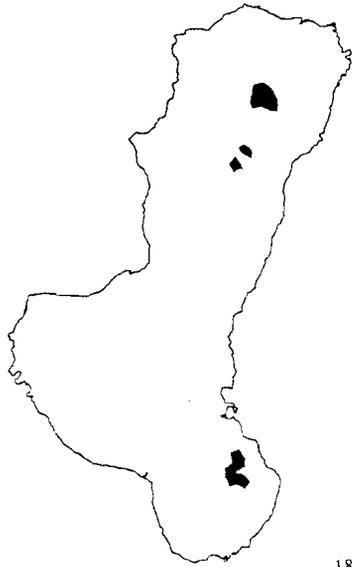
## Importance of habitats



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# Forest loss on Negros



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**STATUS REPORT OF THE HERPS WORKING GROUP**  
by Arvin C. Diesmos

**Species Diversity, Endemicity, Ecology**

- The level of endemicity of Philippine frogs and reptiles is among the highest in Southeast Asia: more than 70% of the known species are found only in the country.
- Herpetofaunal (amphibians and reptiles) diversity is peculiarly high for a country of this size. Using frogs as an example: Borneo, a big island that is 1.4 times the size of the Philippines, has about 140 known species. The country has about 100 species with many more new species that are being discovered each year.
- The herpetofaunal is composed of species with diverse ecological adaptations and requirements. There are arboreal, terrestrial, burrowing, aquatic and gliding species. Discrete patterns in both space and elevation are evident.
- The rainforest is the most important habitat for nearly 80% of the total herpetofauna.

**Field Research and Awareness**

We need increased action in the field. Among Philippine vertebrates, herps lag behind in basic information on ecology, biology and distribution.

Field research needs to be done in unexplored areas of the country. The complete elevational range (from the lowlands to the mountain peaks) needs to be carefully surveyed.

Biologists need to consider forest canopy exploration. A considerable number of species inhabit only the canopy layer of the forest; it is expected that several new species will be discovered in this stratum.

We need information on how herpetofaunal populations respond to habitat fragmentation, in aspect that needs urgent investigations.

As with other themes/fields of study, there is a growing need to influence and train new players/workers in herpetological research and conservation.

**Some Interesting Information**

The Asian Giant Softshell Turtle (*Pelochelys bibroni*), a Threatened and a CITES species, inhabits major rivers in northeastern Luzon. It was first recorded in Bulacan Province in the 1920s. Local people hunt this turtle for subsistence and for other purposes.

The country's largest frogs (more than 150 mm from snout to vent length) occur in unpolluted rivers of Luzon (*Limnonectes macrocephalus*), Mindoro and Palawan (*L. acanthi*). The smallest known frog, *Platymantis pygmaeus* (about 15mm from snout to vent length) occurs in the Cordilleras and the Sierra Madres.

Frogs and snakes figure prominently in folklores and myths in local communities.

A new alien species, the Taiwanese frog (*Hoplobatrachus rugulosus*), occurs in Luzon. It was probably introduced in the early 1990s and is now widespread in the island. The danger it poses to the native species: its tadpoles eat other tadpoles.

STATUS REPORT OF ARTHROPODS WORKING GROUP  
by Dr. Victor P. Gapud

**Status Report on Insects and Allied Arthropods of Luzon, Palawan and Mindoro**

**Dr. Victor P. Gapud**

**List of identified local specialist**

Agency	Specialist	Group(s) of Species Endemic
UPLB	Mario Navasero	Jumping Plant Lice (Homoptera: Psyllidae)
UPLB	Adelina A. Barrion	Spiders (Araneidae)
UPLB	Grace F. Barrion	Leaf beetles (Coleoptera: Chrysomelidae)
UPLB	Venus J. Calilung	Aphids (Homoptera: Aphidoidea)
UPLB	Leonila A. Corpus-Raros	Mites (Acarina)
UPLB	Stephan G. Reyes	Beet and Wasp (Hymenoptera)
UPLB	Victor P. Gapud	Amphipods (Amphipoda), Collembola (Collembola), Blattellid (Blattellidae), Coleoptera (selected spp)
UPLB	Mico Lit Jr.	Mealworms (Lepidoptera: Plutellidae), Coccinellidae
EAG	Cecilia P. Reyes	Beetle (Hymenoptera)
NABT	Clara R. Baltazar	Parasitic Wasps (Hymenoptera): Butterflies & Moths (Lepidoptera)
IRRI	Alberto T. Barrion	Spiders (Araneida)
USC	Juan Jimalon	Butterflies/Skippers (Lepidoptera: Rhopalocera)
USC	Sumayda Jimalon	Butterflies
CLSU	Leah Ruiz-Figueron	Vinegar Flies (Diptera: Drosophilidae)
VISCA	Juliet C. Coziza	Ladybird beetles (Coleoptera: Coccinellidae)
CMU	Myma Batentes	Leaf beetles (Coleoptera: Chrysomelidae)

**Current Inventory of Philippine Insects**

Number of Families — 494  
 Genera — 6122  
 Species — 20462  
 Endemics — 14211  
 Overall % Endemism — 69.45

Order	Family Contributions	Generic Contributions	Species Contributions	Endemic Species Contribution
Coleoptera	87 (17.6%)	1567 (25.6%)	7375 (36.0%)	5840 (41.1%)
Hymenoptera	58 (11.7%)	871 (14.2%)	2999 (14.6%)	2237 (15.7%)
Lepidoptera	52 (10.5%)	1185 (19.3%)	2601 (12.7%)	1806 (12.7%)
Diptera	78 (15.8%)	747 (12.2%)	2864 (14.1%)	1639 (11.5%)
Hemiptera	77 (15.6%)	1000 (16.3%)	2518 (12.3%)	1507 (10.6%)
Total	362 (71.2%)	6378 (87.2%)	18665 (91.2%)	13531 (61.7%)

- Insects and Allied Arthropod Groups Covered**
- PHYLUM ARTHROPODA  
 Class ARACHNIDA (spiders) - A.T. Barrion  
 Class ACARINA - L.C. Raros  
 Class INSECTA  
 Order Hemiptera  
 Psyllioidea - M. Navasero  
 Aphidoidea - V.J. Calilung  
 Coccoidea - J. Lit  
 Aquatic Bugs  
 Family Velidae  
 Family Naucoridae  
 Family Ochiteridae  
 Family Leptopodidae  
 Family Gerridae  
 Family Aphelocheiridae  
 } V. P. Gapud

- Cont.
- Insects and Allied Arthropod Groups Covered**
- Order Hymenoptera - S. G. Reyes  
 Order Odonata (Family Platycnemididae) - V. P. Gapud  
 Order Coleoptera  
 Family Curculionidae (weevils) - V. P. Gapud  
 Family Coccinellidae - J. R. Adorata

- Status of Arthropod Group Database**
- ACARINA - L. C. Raros  
 ARNEIDA - A. A. Barrion/A. T. Barrion (partial)  
 INSECTA  
 Odonata - V. P. Gapud (Platycnemididae, *Risicnemis* only)  
 Orthoptera - V. P. Gapud (Tetrigidae)  
 Phasmatodea - V. P. Gapud (Obriminae only)  
 Thysanoptera - S. P. Reyes/V. P. Gapud (Acolothripidae, Phlaeothripidae)  
 Hemiptera  
 Aphidoidea - V. J. Calilung  
 Psyllioidea - M. Navasero  
 Coccoidea - J. Lit, Jr.  
 Aquatic Bugs - V. P. Gapud (selected groups only)

Cont.

### Status of Arthropod Group Database

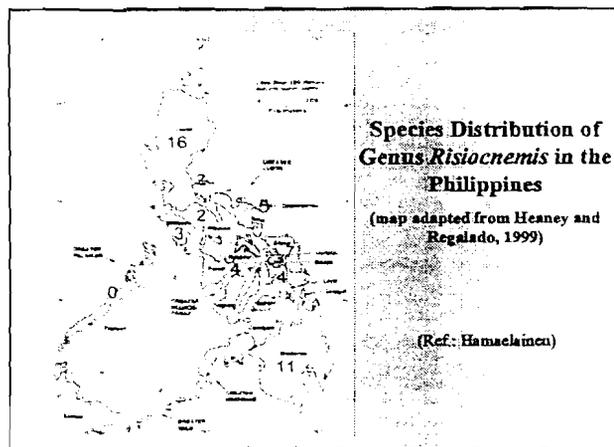
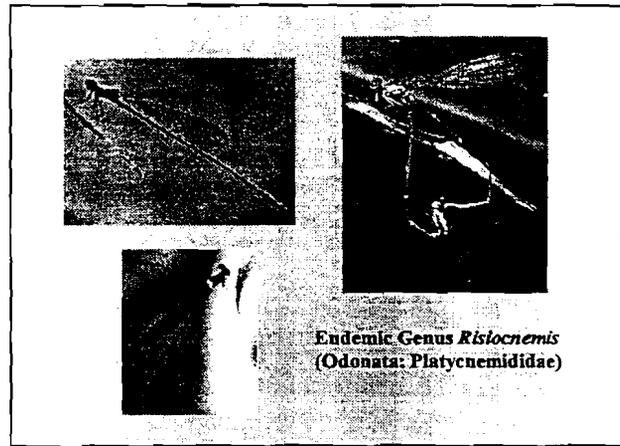
<b>Coleoptera</b>		
Cerambycidae (in process)	V. J. Calilung	
Chrysomelidae (in process)	M. Ballentes/V. P. Gapud	(selected groups only)
<b>Curculionidae</b>		
Brachyderinae, Pachyrhynchini	V. P. Gapud	
Gymnetrinae, Alcidinae	V. P. Gapud	(in process)
Trichoptera	C. R. Baltazar/V. P. Gapud	(in process)
<b>Lepidoptera</b>		
	C. R. Baltazar / CI /	
	A. Mohagan (Rhopalocera,	in process)
<b>Diptera</b>		
Tipulidae	C. R. Baltazar / CI	(in process)

Cont.

### Status of Arthropod Group Database

<b>Hymenoptera</b>		
Braconidae	C. R. Baltazar (Microgasterinae)	
	S. G. Reyes	
Vespidae	S. G. Reyes	(in process)
Ampulicidae	S. G. Reyes	(in process)
Sphecidae	S. G. Reyes	(in process)
Pemphredonidae	S. G. Reyes	(in process)
Larridae	S. G. Reyes	(in process)
Crabronidae	S. G. Reyes	(in process)
Nyssonidae	S. G. Reyes	(in process)
Philanthidae	S. G. Reyes	(in process)
Halictidae	S. G. Reyes	(in process)
Megachilidae	S. G. Reyes	(in process)
Apidae	S. G. Reyes	(in process)

- ### Example Groups for the Philippines
1. Philippine Damselflies (Odonata) (*Risicnemis*, *Drepanosticta*, *Anphicnemis*)
  2. Pygmy locust, *Misythus* (Orthoptera: Tettigidae)
  3. Walking sticks, Oribininae (Phasmatodea: Bacillidae)
  4. Philippine Thrips (Thysanoptera)
  5. Philippine aphids (Hemiptera: Aphidoidea)
  6. Philippine jumping plant lice (Hemiptera: Psylliodes)
  7. Philippine mealybugs and scales (Hemiptera: Coccoidea)
  8. Aquatic Bugs (Hemiptera)
  9. Philippine weevils, Pachyrhynchini (Coleoptera: Curculionidae)
  10. Philippine weevils, Gymnetrinae (Coleoptera: Curculionidae)
  11. Philippine caddisflies (Trichoptera)
  12. Philippine sphecoid wasps (Hymenoptera)



### Odonata of Luzon, Mindoro, and Palawan

Island	Damselflies	Dragonflies
Luzon	71	69
Marinduque	11	17
Catanduanes	14	4
Polillo	8	9
Mindoro	21	56
Palawan	26	52

**Distribution of *Risticnemis* in the Greater Luzon and Mindoro Regions**

Taxon	Island				
	Luzon	Polillo	Catanduanes	Marinduque	Mindoro
<i>R. arator</i>	x				
<i>R. asahinal</i>	x				x
<i>R. confusa</i>	x		x		
<i>R. elegans</i>	x				
<i>R. gracilis</i>	x				
<i>R. laguna</i>	x				
<i>R. pulchra</i>	x				
<i>R. serrata</i>	x	x	x	x	
<i>R. varians</i>	x				
<i>R. sp. (1)</i>	x				
<i>R. atropurpurea</i>	x			x	
<i>R. haematopus</i>	x		x		
<i>R. ignea</i>	x				
<i>R. incisa</i>	x				x
<i>R. oobeni</i>	x		x		x
<i>R. polilloensis</i>		x	x		
<i>R. sp. (2)</i>	x				

**Distribution of *Risticnemis* in the Greater Negros-Panay Region, Siquijor Island and Sibuyan Island**

Taxon	Island					
	Panay	Negros	Cebu	Masbate	Siquijor Island	Sibuyan Island
<i>R. klauti</i>						x
<i>R. plebeja</i>						
<i>R. rivasalmulderi</i>						
<i>R. sp. (1)</i>						

**Distribution of *Risicnemis* in the Greater Mindanao Region**

Taxon	Island										
	Mindanao	Basilan	Davao	Surigao	Comilla	Homonhon	Panama	Sibuan	Leyte	Samar	Sulawesi
<i>R. adoniscoides</i>	x				x	x					
<i>R. albipennis</i>	x						x				
<i>R. calceolaria</i>							x				
<i>R. erythraea</i>	x		x								
<i>R. formicosa</i>	x		x			x		x	x	x	
<i>R. longicornis</i>	x	x	x				x				
<i>R. maculipes</i>	x						x	x	x	x	
<i>R. orbicollis</i>											
<i>R. rubripes</i>	x		x								
<i>R. scutellata</i>	x										
<i>R. setosus</i>								x	x	x	
<i>R. sp. (1)</i>											x
<i>R. sp. (2)</i>	x										
<i>R. sp. (3)</i>	x										
<i>R. sp. (4)</i>											x

*echinatus* (Iligan)      *bolivari* (Mt. Banakaw)

*cristicornis* (Polillo)      *sacrisifer* (Mt. Makiling)      Panay

Pygmy locust genus *Misythus* (Tetrigidae)

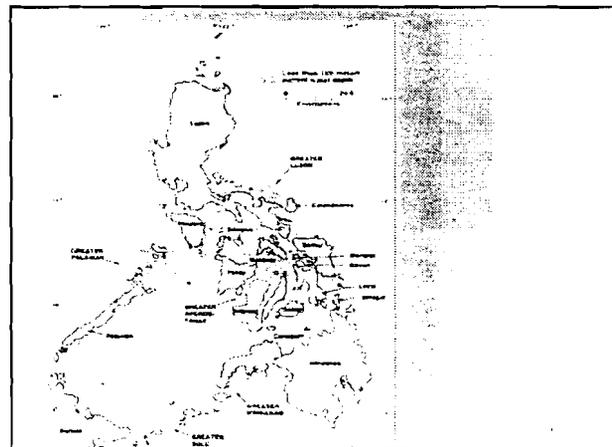
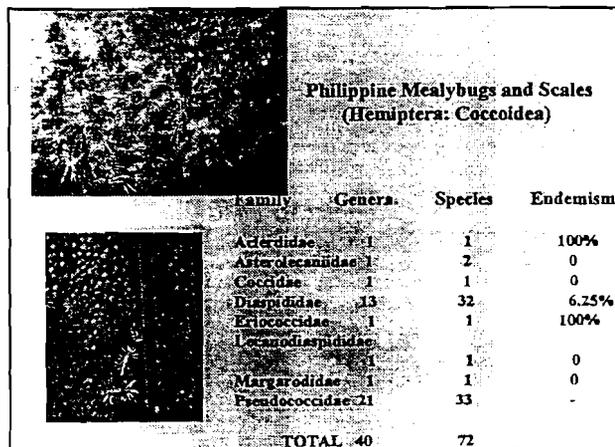
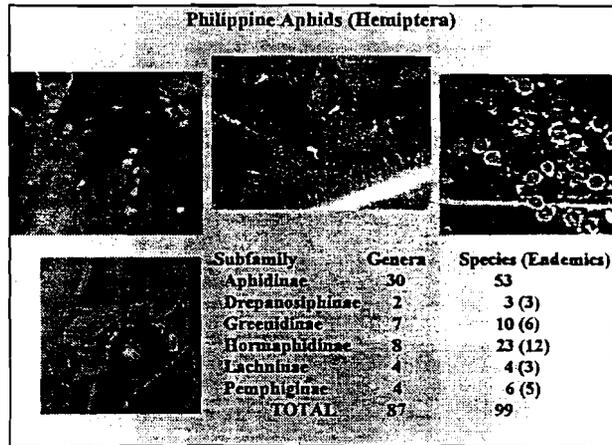
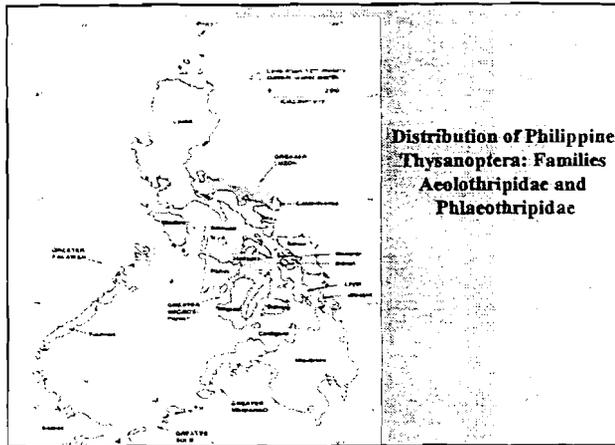
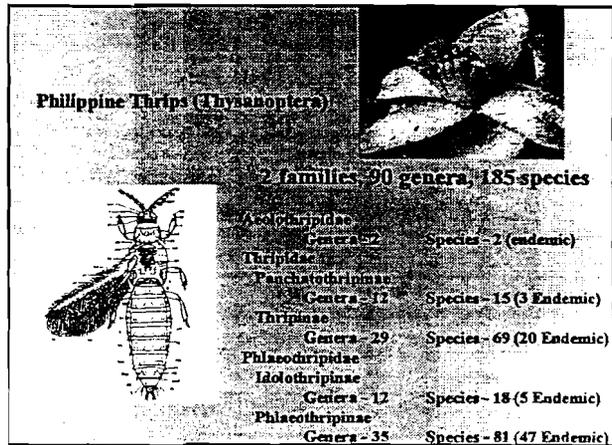
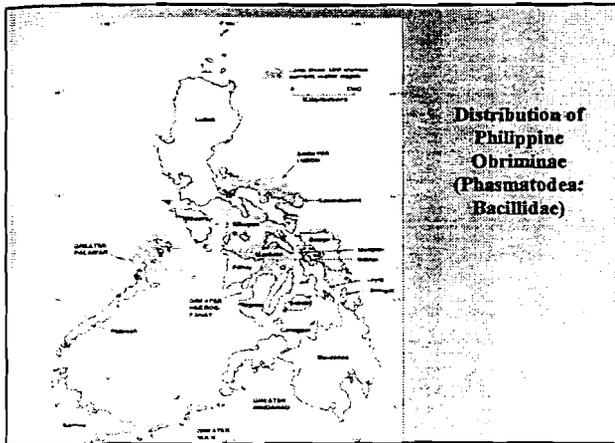
Philippine species - 27 (all endemic)  
Luzon - 22      Visayas - 3  
Mindanao - 3

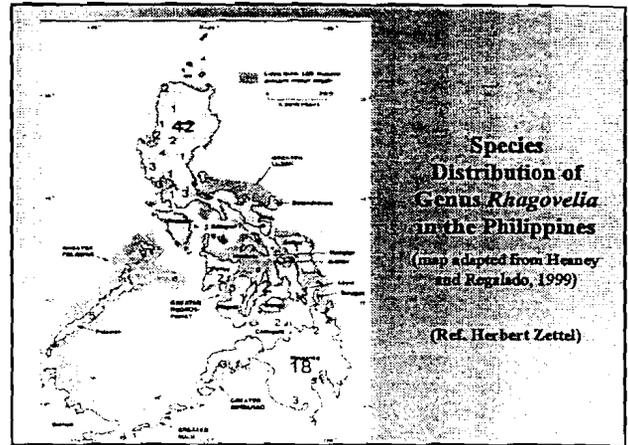
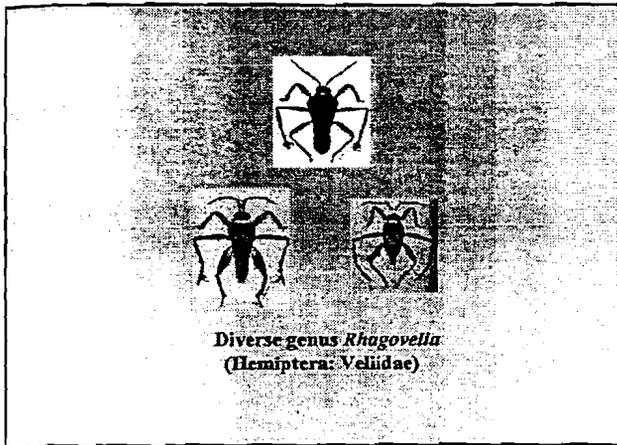
Polillo

**Distribution of Species of Pygmy Locust, *Misythus***  
Orthoptera: Tetrigidae

**Philippine Spiny Walking Sticks**  
Phasmatodea: Bacillidae: Obriminae

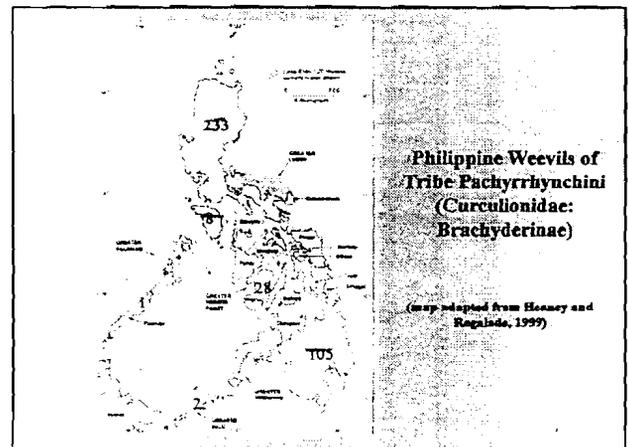
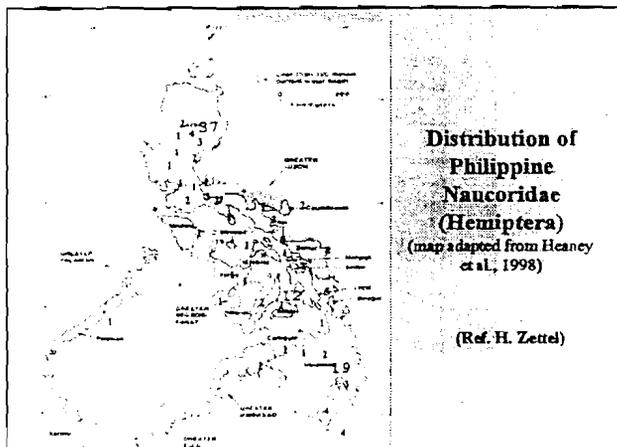
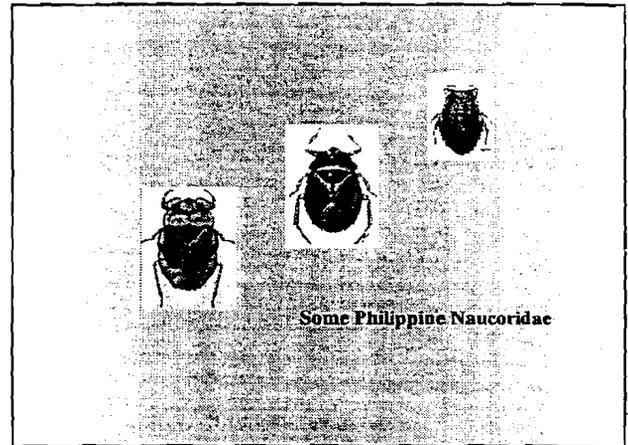
No. of Genera - 10  
Philippine Species - 43  
Endemic Species - 38 (88.4%)

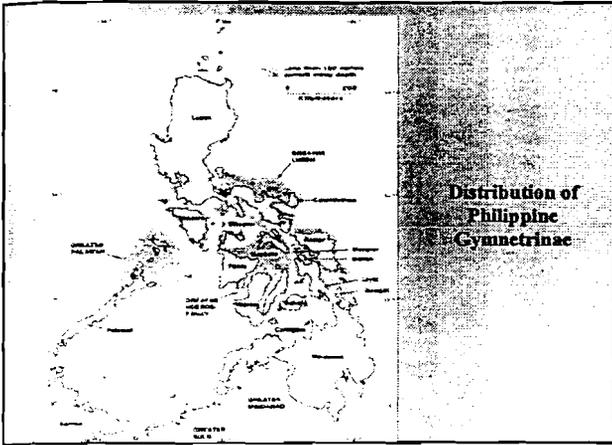




**Distribution by province of genus *Rhagovella***

SPECIES	DISTRIBUTION-PROVINCE
1. <i>Rhagovella aberrans</i>	Zamboanga del Sur
2. <i>Rhagovella camiguinana</i>	Camiguin Island
3. <i>Rhagovella hoogstraali</i>	Davao
4. <i>Rhagovella mindanecensis</i>	Cotabato Davao del Sur South Cotabato Surigao del Norte
5. <i>Rhagovella niesen</i>	Agusan del Norte
6. <i>Rhagovella orientalis</i>	Canao del Norte Zamboanga del Sur
7. <i>Rhagovella orientalisoides</i>	Camiguin Island
8. <i>Rhagovella ridicula</i>	Sarangani Island South Cotabato Davao del Sur
9. <i>Rhagovella usingeri</i>	South Cotabato Davao Surigao del Norte
10. <i>Rhagovella werneri</i>	Zamboanga del Sur Davao del Sur





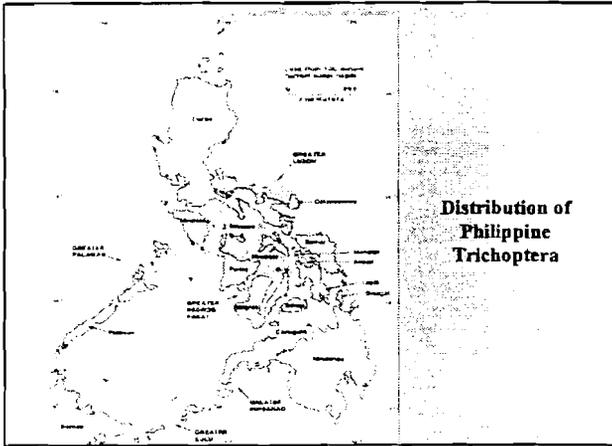
**Philippine Gaddisflies (Trichoptera)**

Families - 16



Genera - 52      Species - 255

Endemics - 240 (94%)



**Philippine Sphecoid Wasps (Hymenoptera)**



FAMILY	Philippine Species	Luzon/ (endemics)	Mindoro/ (endemic)	Palawan/ (endemics)
Ampulicidae	6	2 (2)	-	2 (1)
Sphecidae	18	16 (1)	1	4
Pemphredonidae	67	27 (15)	4 (1)	17 (12)
Larridae	137	73 (19)	20 (2)	51 (18)
Crabronidae	53	23 (9)	10 (1)	18 (12)
Nyssonidae	18	4 (2)	-	7 (3)
Philanthidae	21	13 (4)	-	4
<b>TOTAL</b>	<b>320</b>	<b>158 (52)</b>	<b>35 (4)</b>	<b>155 (46)</b>

DATA UPDATE: PHILIPPINE MITES AND TICKS  
by Dr. Leonila C. Raros

Status Report on Mites and  
Ticks of Luzon, Palawan and  
Mindoro

by  
Dr. Leonila C. Raros

HABITATS OF MITES AND TICKS

- > Terrestrial (mostly)
  - \* aquatic
  - \* freshwater
  - \* marine
- > Forest - primary, secondary, denuded at various degrees
- > Grasslands - some can recolonize areas 1 week after experimental burning
- > Cultivated areas - lowland upland
- > Buildings - on dust, furniture (incl. beds); on stored food and feed of plant or animal origin
  - nests of animals - bees, wasps, birds, rodents, bats
  - dried museum collections - insects, vertebrate skins
- > Soil and overlying litter (decomposing bodies of plants and animals, dung)
  - Fungi (mushrooms), algae, mosses
  - Vascular plants

Cont.

HABITATS OF MITES AND TICKS

- Animals - invertebrates (sponges, molluscs, crustaceans, insects, myriapods, arachnids)
- vertebrates (amphibians, reptiles, birds, mammals including humans)

FEEDING HABITS OF MITES AND TICKS

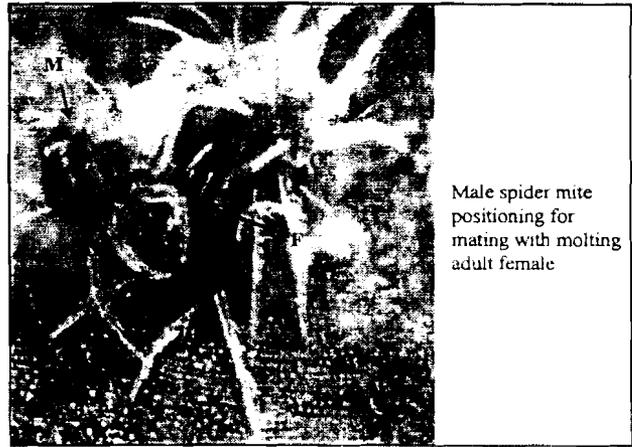
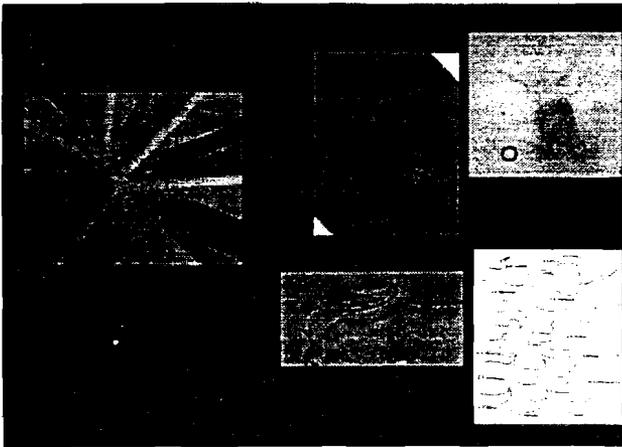
- PREDATORS
  - of other mites or plants, animals and soil
- PARASITES
  - of invertebrates and vertebrates
  - external (mostly)
    - internal esp. nasal passages of vertebrates but also deep in lungs; also on skin, glands in eyelids, hair follicles, quills of feathers, cloaca of amphibians
    - internal in spiracular chamber and main tracheal trunks of insects, tympanum of insects
  - of plants
- DETRITIVORES, FUNGIVORES, also on BACTERIA and ACTINOMYCETES

Number of Acarine taxa, endemic species and % endemism on various islands of the Philippines

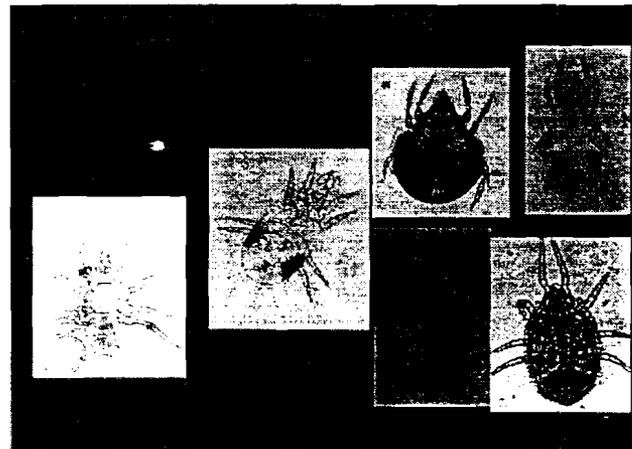
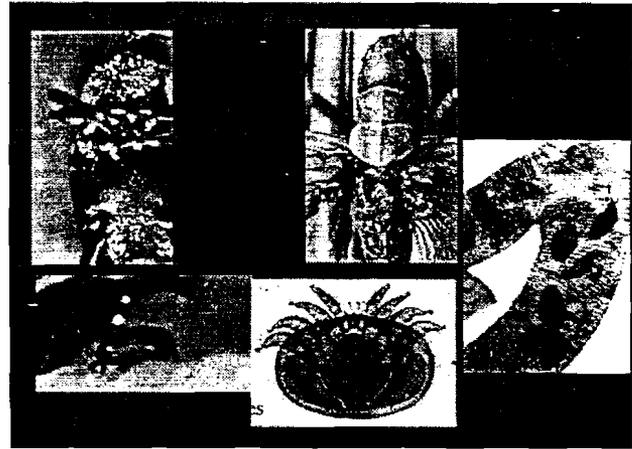
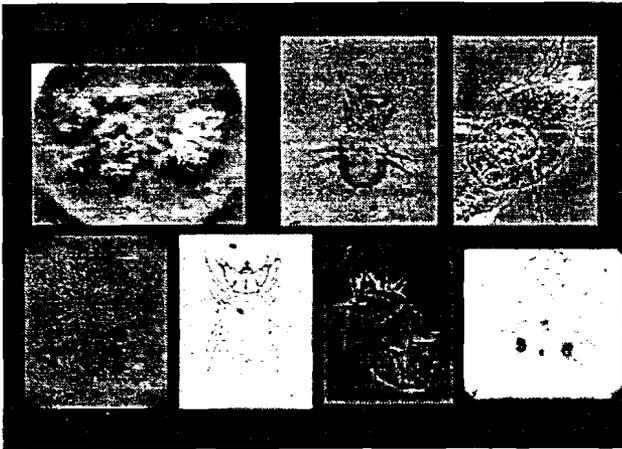
	Formosa	Osorno	Speleu	Endemic	% Endemism
Luzon	111	63	700	600	60.0
Palawan	4	0	0	0	0
Mindoro	4	0	0	0	0
Mindanao	12	21	20	0	0
Palawan Group	0	13	17	0	0
Caraga	0	3	11	0	0
Sulu	20	22	40	7	16.8
Sulu Group	0	0	0	0	0
Palawan	0	14	21	0	0
Luzon	67	160	350	30	10.0
Palawan	13	20	20	0	0
Osorno Group	12	21	20	0	0
Caraga Group	0	0	11	0	0
Palawan	11	17	20	0	0
Palawan	20	22	40	7	16.8
Sulu	1	1	1	0	0
Palawan	10	20	20	0	0
Palawan	1	1	1	0	0
Palawan	1	1	1	0	0
Palawan	73	100	100	0	0
Palawan	1	1	1	0	0
Palawan	1	1	1	0	0
Palawan	4	4	4	0	0
Palawan	1	1	1	0	0
PHILIPPINE PROVINCES	165	441	1000	600	60.0
Palawan Group	20	21	20	7	16.8
TOTAL	185	462	1117	607	60.0

Number of genera, species and % endemism of selected well-studied acarine groups for Luzon Island.

NAME OF GROUPS	GENERA	TOTAL Sp.	ENDEMIC Sp.	% ENDEMIC
Uropodidae	14	33	20	62.0
Phytoseiidae	11	80	20	25.0
Cavendishia	11	24	18	75.0
Chlorididae	26	47	24	51.1
Oribatei	132	247	82	33.2
Dermanyssidae	18	34	22	64.7
Dermanyssidae		26	12	46



Male spider mite  
positioning for  
mating with molting  
adult female



**STATUS REPORT OF THE PLANTS WORKING GROUP  
by Dr. Daniel A. Lagunzad**

Working Group Meeting  
(Plants Working Group)

## Objectives:

- To determine the most effective and efficient approach in generating the data required.
- To organize the group into task force.
- To clarify issues pertaining to Intellectual Property Rights and overlap of research programs.
- To update the group on what has been accomplished.
- To set up a monitoring system by which the objectives are achieved.

Hidden agenda: To organize the plant working group into an organization.

# Updates

## Criteria used.

- Distribution “representativeness”
- Systematic consistency
- Spread and ecological importance
- Economic importance and threat

## Taxa suggested to be covered by the priority setting exercise

Taxon	# Species	# endemics	% endemism
Dipterocarpaceae	46	21	45.65
Meliaceae	75	7	9.33
Mimosaceae	51	10	19.61
Caesalpiniaceae	70	14	20.00
Fagaceae	25	14	56.00
Sapindaceae	63	19	30.16

Moraceae (Ficus)  
Palmae  
Araceae  
Elaeocarpaceae (Elaeocarpus)  
Ericaceae  
Coniferae  
Bamboos

- List of experts, addresses, institutions
- List of known species in the country
- Detailed bibliography
- List of biological collections including description, quality, access, institutions
- Information on collected specimens
- Available distribution maps

Criteria for selection of Priority Sites

1. Biological Values

1.1 Species

- High endemism
- High diversity
- Unexplored
- Economic values
- Endangered species
- Degree of rarity
- Keystone species

1.2 Habitat/Ecological Diversity

High diversity (presence of habitat types per area)

Unexplored/partially explored

Uniqueness (limestone;ultrabasic soil;presence of ecological (human) communities

Economic values (direct values; indirect values-watershed,soil stabilization etc)

2. Threats

Agricultural development/land use changes

Mining/harvesting

Monoculture

Introduction of species

3. Capacity(needs)

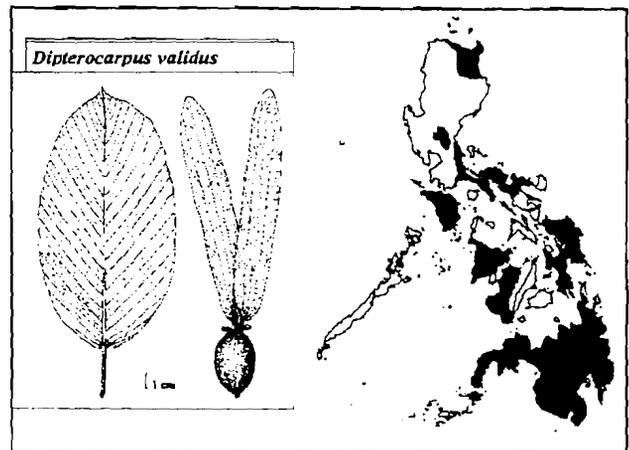
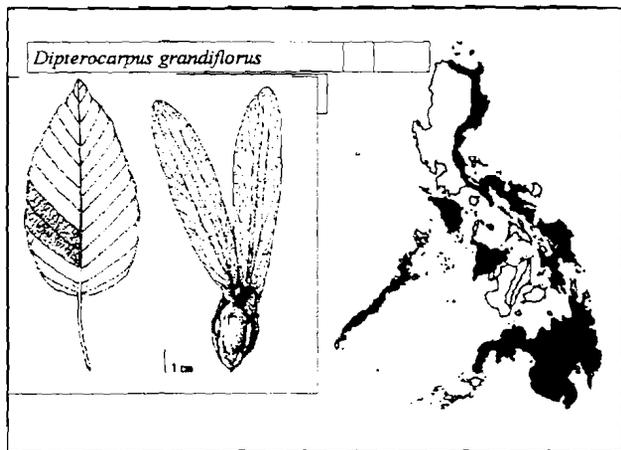
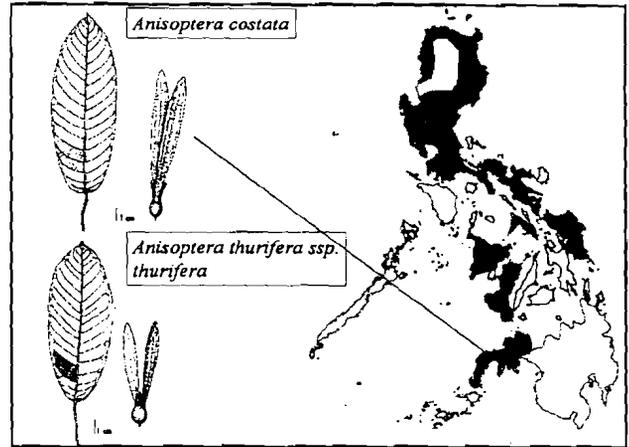
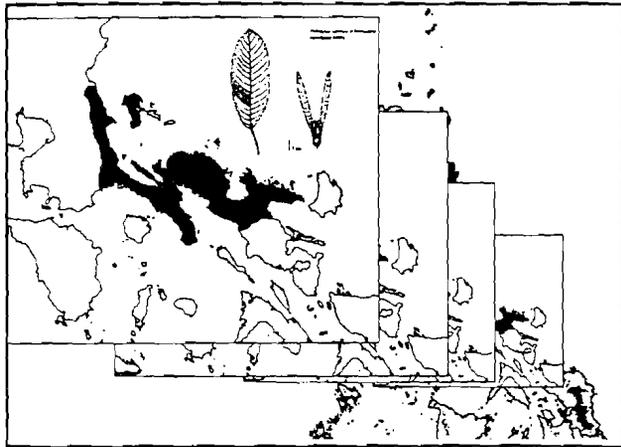
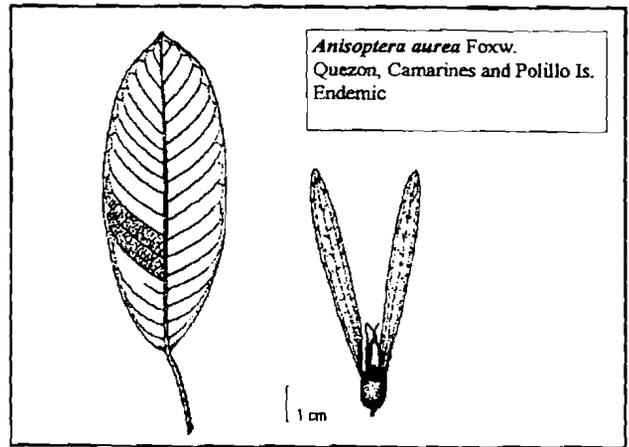
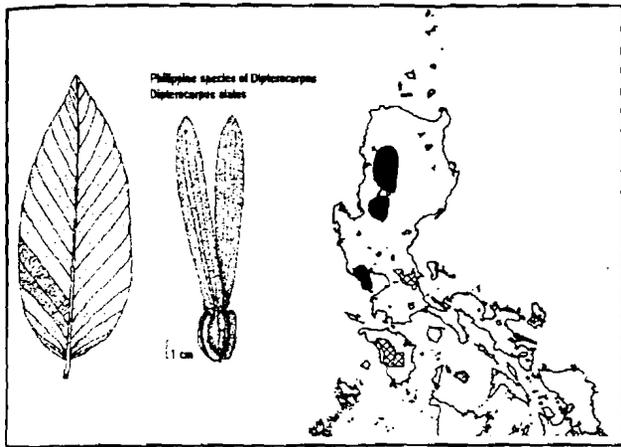
Policy support and political will

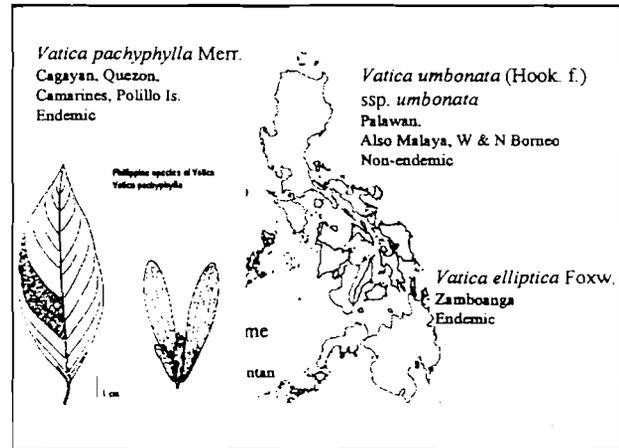
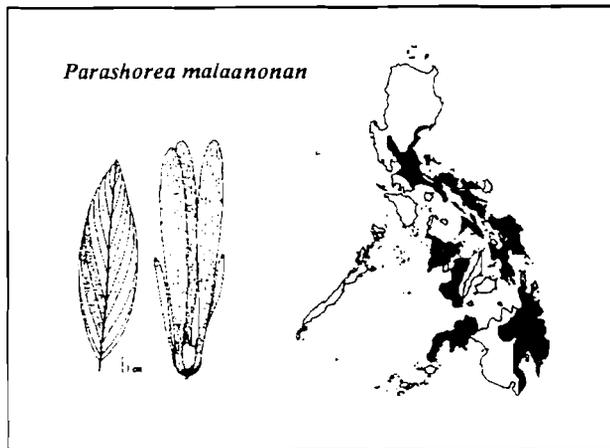
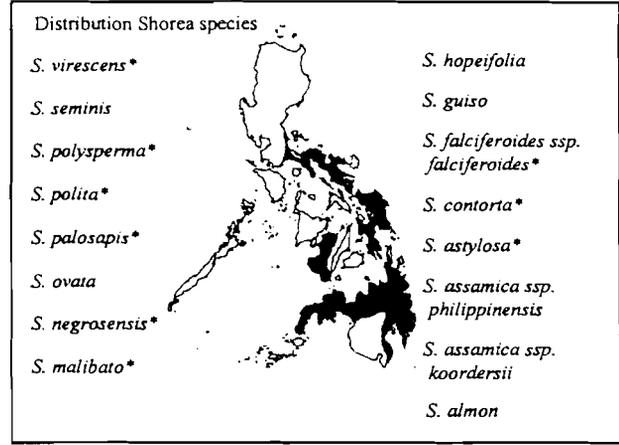
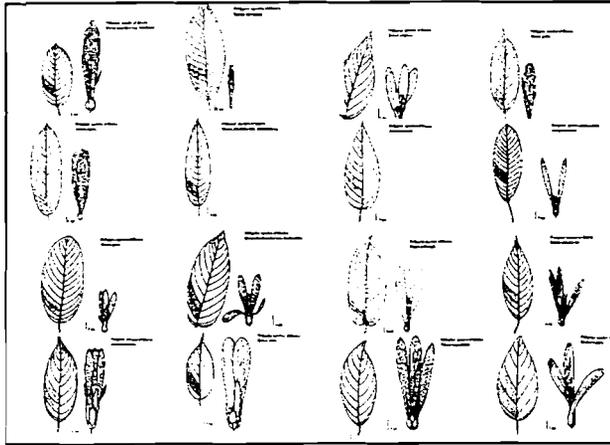
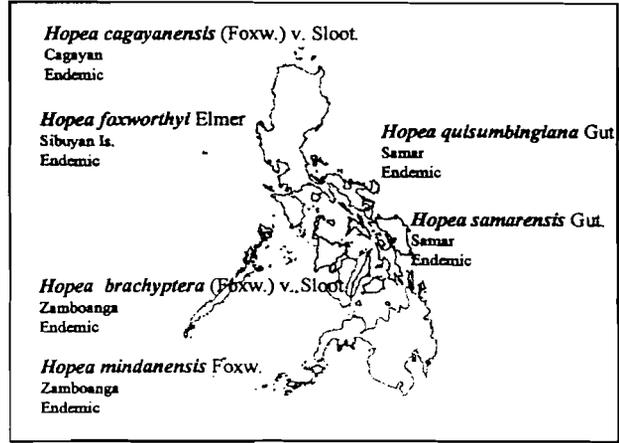
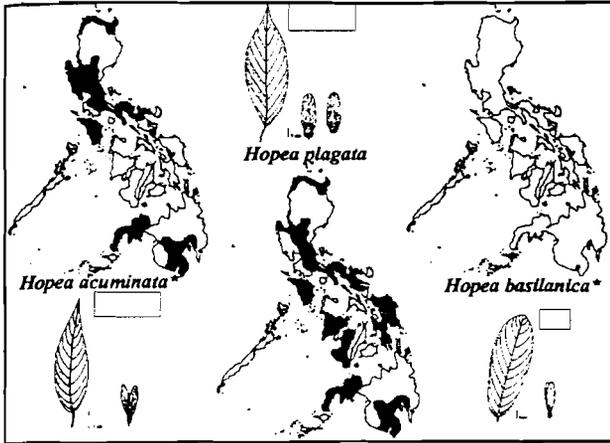
Qualified personnel; (education, training and skills)

Fund availability

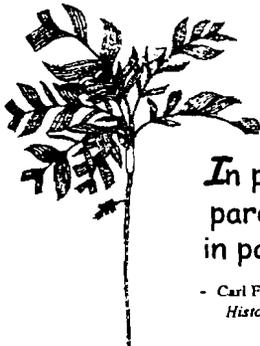
Networking/linkages opportunities and realities

# Philippine Dipterocarps





DATA UPDATE: PHILIPPINE PALMS  
by Dr. Edwino S. Fernando

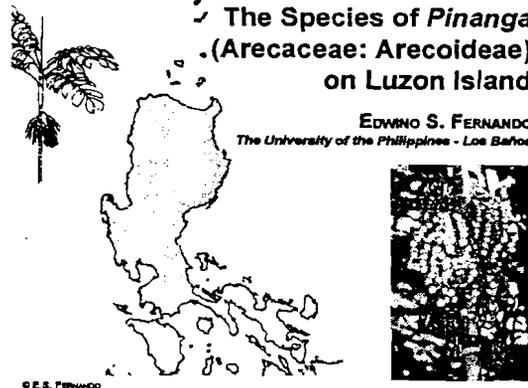


*In palmis semper  
parens juvenus;  
in palmis resurgo.*

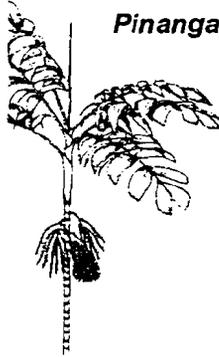
- Carl Friedrich Philipp von Martius  
*Historia Naturalis Palmarum*  
(1823-1850)

The Species of *Pinanga*  
(Arecaceae: Arecoideae)  
on Luzon Island

EDWINO S. FERNANDO  
The University of the Philippines - Los Baños



© E.S. FERNANDO



***Pinanga* (Arecaceae: Arecoideae)**

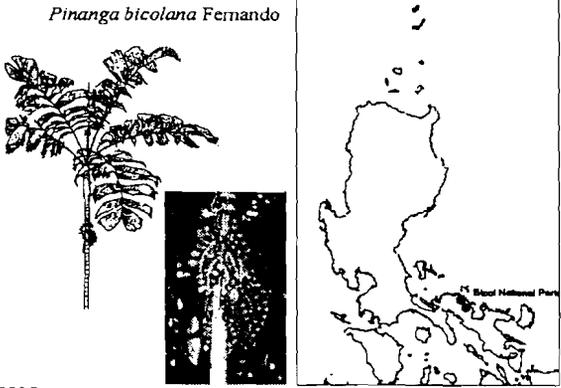
about 120 species, mostly forest  
undergrowth palms

Himalayas to South China,  
S.E. Asia to New Guinea

greatest diversity in wet areas  
of Sunda Shelf

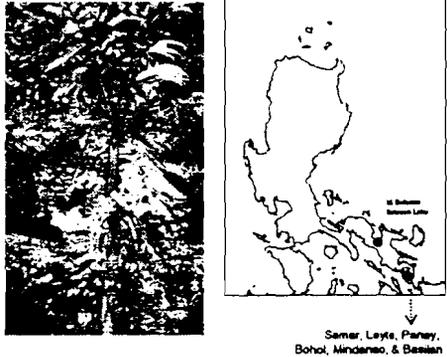
**Philippines: c. 26 species**  
**Luzon Island: c. 15 species**  
all species endemic  
except *Pinanga insignis*

*Pinanga bicolorana* Fernando



© E.S. FERNANDO

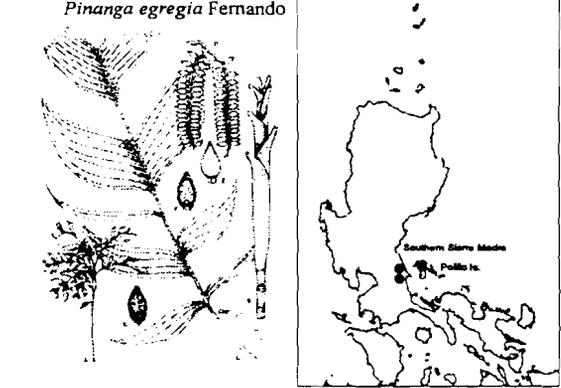
*Pinanga copelandii* Becc.



Samar, Leyte, Pinney,  
Bohol, Mindanao, & Basilan

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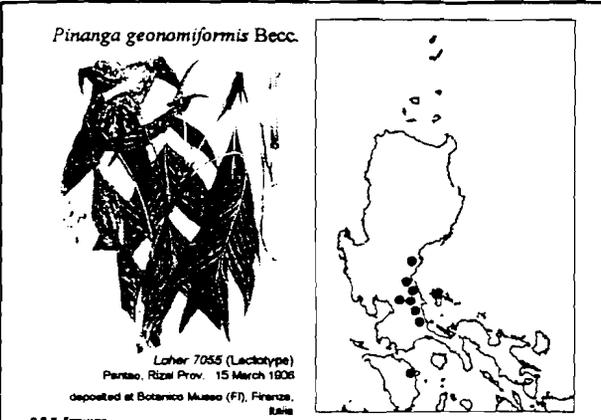
*Pinanga egregia* Fernando



Southern Sierra Madre  
Palilo Is.

© E.S. FERNANDO

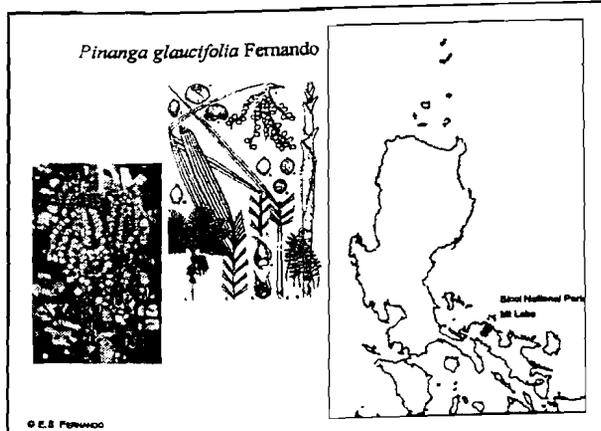
*Pinanga geomiformis* Becc.



Loher 7055 (Lectotype)  
Palau, Rizal Prov. 15 March 1908  
deposited at Botanico Museo (FI), Firenze,  
Italia

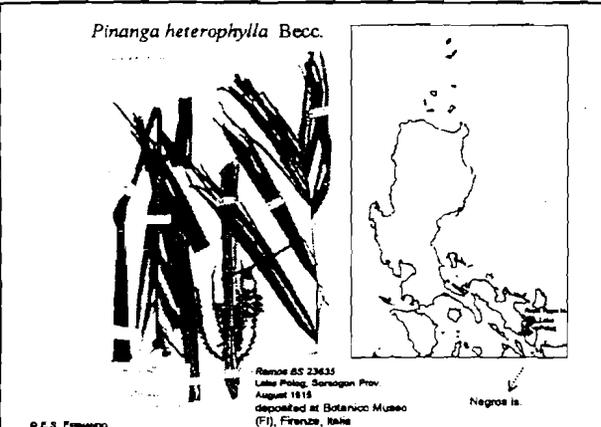
© E.S. Fernando

*Pinanga glaucifolia* Fernando



© E.S. Fernando

*Pinanga heterophylla* Becc.

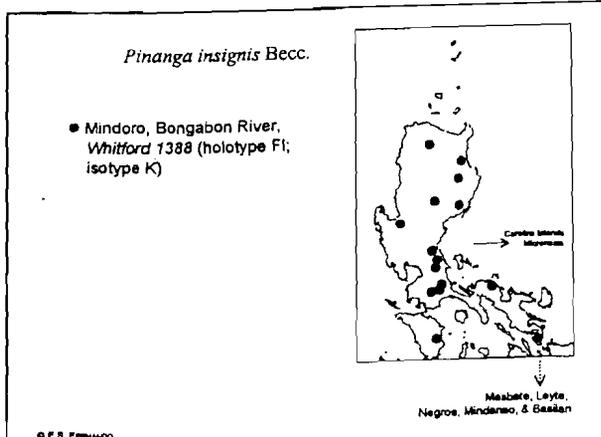


Ramos 85 23435  
Luluha Ping, Sarangani Prov.  
August 1915  
deposited at Botanico Museo  
(FI), Firenze, Italia

Negros is.

© E.S. Fernando

*Pinanga insignis* Becc.



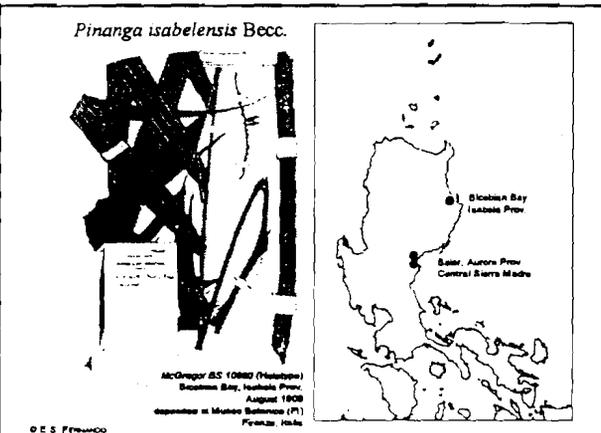
● Mindoro, Bongabon River,  
Whitford 1388 (holotype FI;  
isotype K)

Central Islands  
Mindanao

Masbate, Leyte,  
Negros, Mindanao, & Basilan

© E.S. Fernando

*Pinanga isabelensis* Becc.



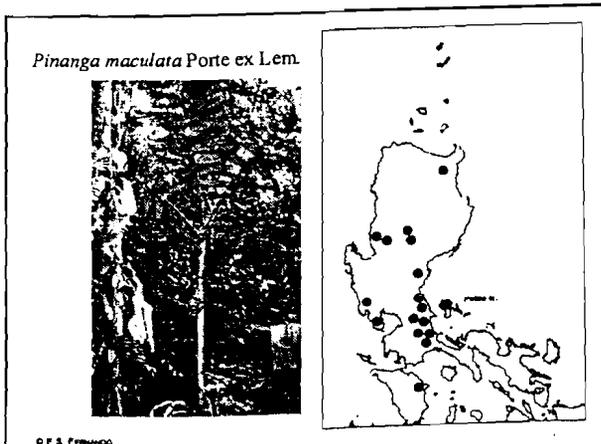
McGregor 85 10880 (Holotype)  
Bosoma Bay, Zamboanga Prov.  
August 1909  
deposited at Museo Botanico (FI),  
Firenze, Italia

Isabel Bay  
Basilan Prov.

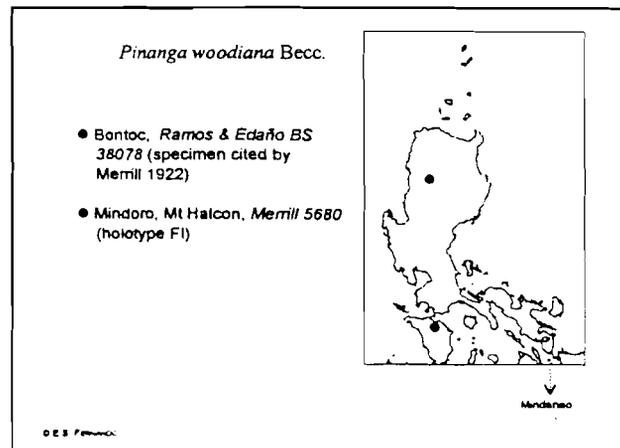
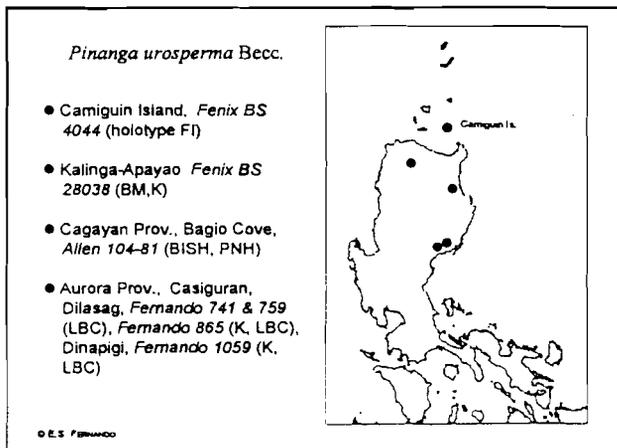
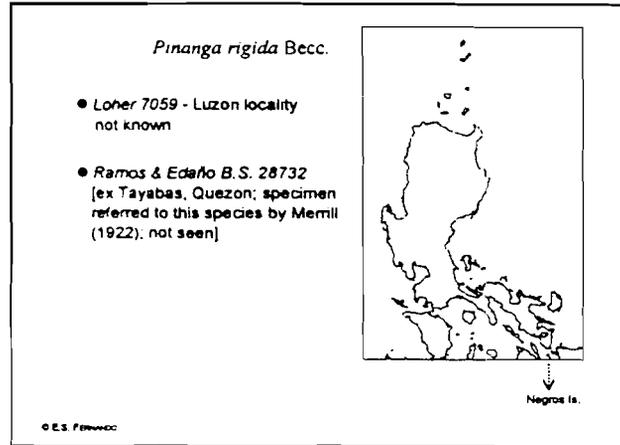
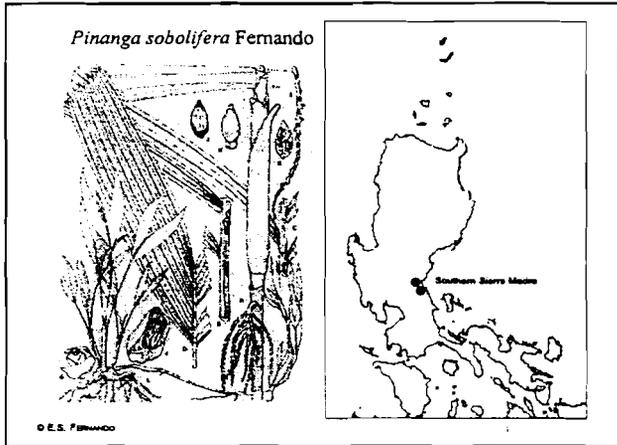
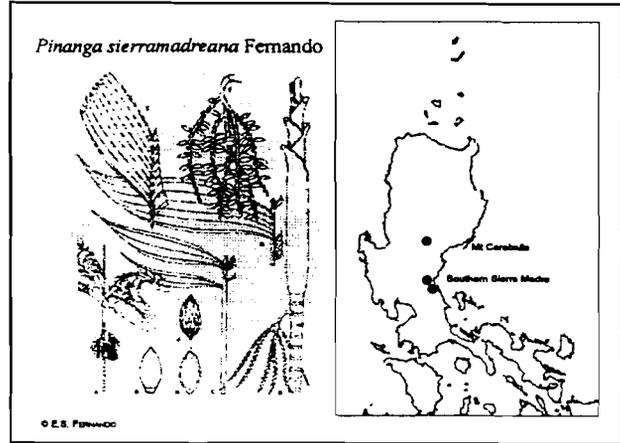
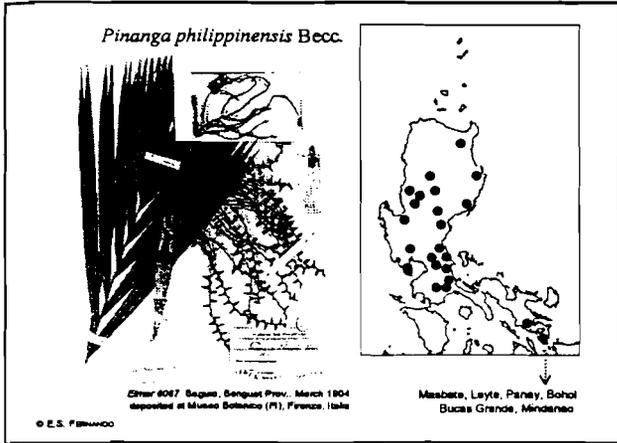
Basilan, Aurora Prov.  
Central Sierra Madre

© E.S. Fernando

*Pinanga maculata* Porte ex Lem.



© E.S. Fernando





© E.S. Fernando Palm hotspots on Luzon Island

**SATANES & BABUYAN ISLANDS**  
*Pinnaculatan* PLM ...  
*Pinnaculatan* *Pinnaculatan sat. philippinensis*  
*Calamus* *calamus*  
*Calamus* *calamus*

**SOUTHERN SIERRA MADRE**  
*Pinnaculatan* PLM ...  
*Pinnaculatan* *Heteropachia agrippinensis*  
*Pinnaculatan* *Heteropachia philippinensis*  
*Pinnaculatan*

**CENTRAL SIERRA MADRE**  
*Pinnaculatan* PLM ...  
*Pinnaculatan* *Heteropachia leucosticta*  
*Pinnaculatan* *Heteropachia leucosticta*  
*Pinnaculatan* *Heteropachia agrippinensis*  
*Pinnaculatan* *Heteropachia philippinensis*  
*Pinnaculatan* *Calamus* *calamus*

**SOUTHERN SIERRA MADRE**  
*Pinnaculatan* PLM ...  
*Pinnaculatan* *Orontium* *religiosum* *Ames* *sp.*  
*Pinnaculatan* *Heteropachia philippinensis*

**MACOL NATIONAL PARK & MT LABO**  
*Pinnaculatan* *Pinnaculatan* PLM ...  
*Pinnaculatan* *Pinnaculatan* *Heteropachia* *arata*  
*Pinnaculatan* *Pinnaculatan* *Ames* *sp.*

**MT IRDIN & LAKE SULUBAN**  
*Pinnaculatan* PLM ...  
*Pinnaculatan* *Heteropachia* *intermedia*  
*Pinnaculatan* *Ames* *sp.* *Calamus* *calamus*



**In palmis semper  
 parens juvenus;  
 in palmis resurgo.**

- Carl Friedrich Philipp von Martius  
*Historia Naturalis Palmarum*  
 (1823-1850)





MPA SURVEY FORM

MEASURES OF EFFECTIVENESS OF THE MPA

- Scope and degree of impact on environmental issues
- Scope and degree of impact on socio-economic issues
- Presence and soundness of conceptual framework and/or management plan
- Degree of participation of stakeholders from different levels (local, national, international)
- Stewardship role of local community
- Effectiveness of networking with other MPA practitioners
- Degree to which results and experiences have been used to improve MPA management
- Others \_\_\_\_\_

MPA SURVEY FORM

TYPES OF ACTIVITIES RESTRICTED INSIDE THE MPA

- Fishing of any kind
- Tourism-related activities (e.g. SCUBA diving, snorkeling, aquasports, etc.)
- Selected fishing gears or tourism-related activities (pls. specify)
- Passage of ships
- Construction & development
- Research
- Industrial activity
- Mariculture
- Logging in adjacent land areas
- Agricultural activities in adjacent land areas
- Others \_\_\_\_\_

MPA SURVEY FORM

FREQUENCY OF MONITORING

(score)

- 2 Regular (i.e. once a year or more)
- 1 Occasional (i.e. less than once a year)
- 0 Survey only; no monitoring
- 0 No survey

Measuring Stresses/Threats

A. Fishing

- #fishing boats w/in 500m
- #fish buyers w/in 500m
- #seaweed growers w/in 500m
- #aquarium fishers w/in 500m
- #blasts heard during the dive
- #invertebrate gatherers w/in 500m
- %area used for mariculture w/in 500m

Measuring Stresses/Threats

B. Pollution

- distance to nearest pop. center (in km)
- pop. of nearest pop. center
- #factories per km of adjacent coast
- distance to nearest river (in km)
- %farmed area of coastline
- %forested area of coastline
- #mines w/in sight
- #items of floating trash
- #items of trash underwater
- #fish nets/traps left as trash

Measuring Stresses/Threats

C. Other stresses & threats

- #boats anchoring w/in 500m
- #divers observed w/in 500m
- #snorkellers observed w/in 500m
- #diveshops w/in 10km
- years since last typhoon (>100kph)
- #large ships w/in sight
- %coast built-up w/ structures
- years since last mass bleaching
- %bleached coral area
- %diseased coral area

STATUS REPORT OF THE FRESHWATER WORKING GROUP  
by Ms. Adelina C. Santos-Borja

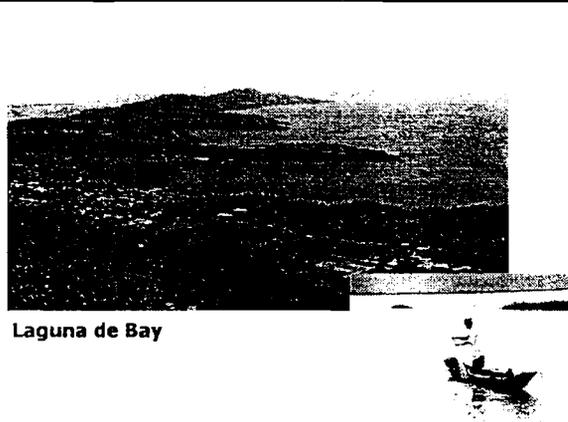
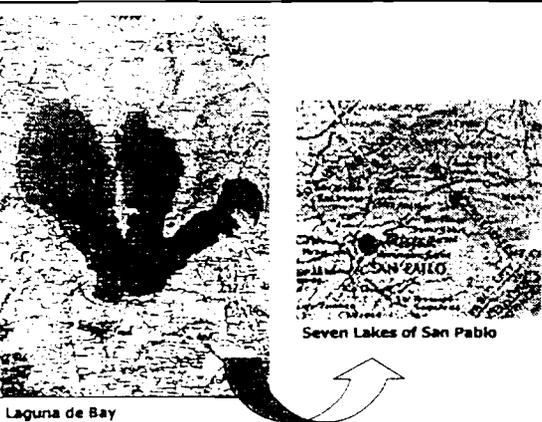
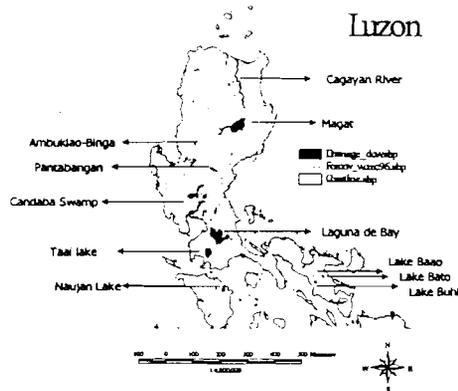
**Freshwater Working Group  
Status Report for Luzon**

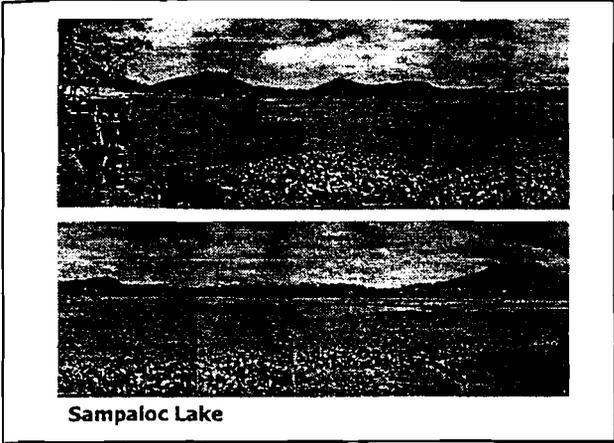
Ms. Adelina C. Santos-Borja  
Working Group Leader

**Freshwater bodies in the Philippines**

- Lakes (71)
- Rivers (18)
- Marshes/swamps (8)
- Reservoirs (6)

**LOCATION MAP OF  
LAKES IN THE PHILIPPINES**



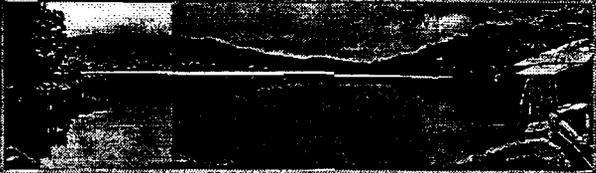


Sampaloc Lake

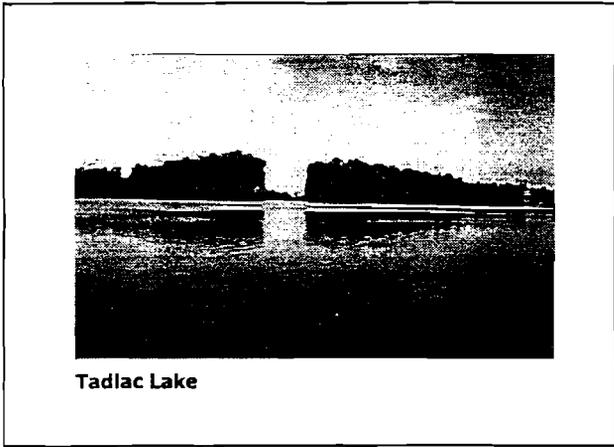



DEPARTMENT OF WATER RESOURCES AND HYDROLOGY  
 DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

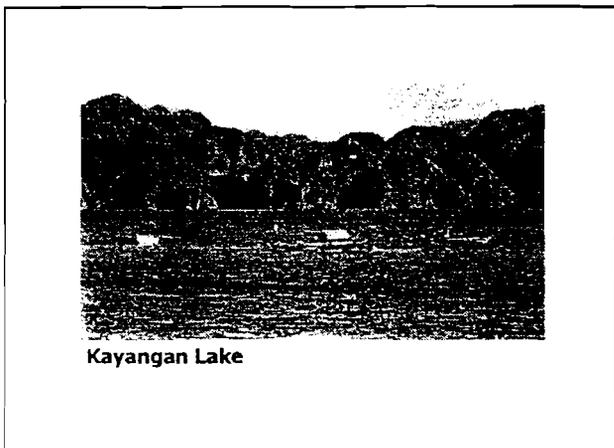
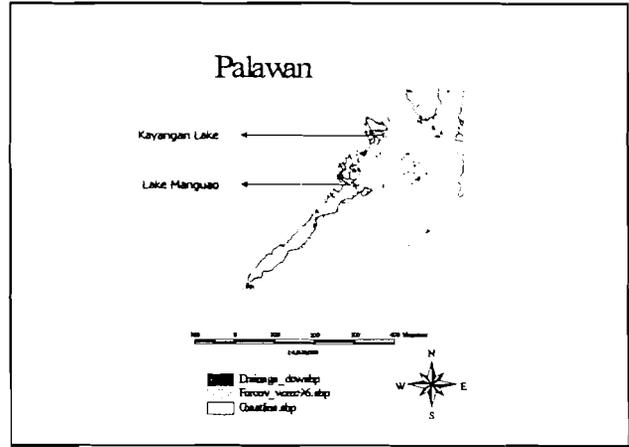
### Physical Characteristics of Tadalac Lake



Surface area: 24.75 has. or 0.248 km<sup>2</sup>  
 Mean depth: 2.7 meters  
 Watershed area: 60 has.  
 Geological origin: volcanic  
 No surface outlet and inlet. Fed by rain and ground water.



Tadalac Lake



Kayangan Lake

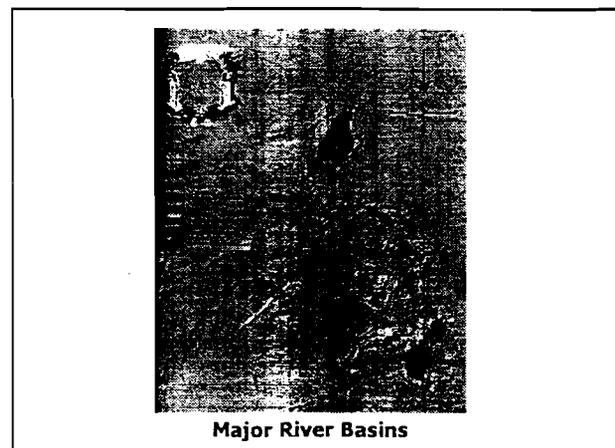
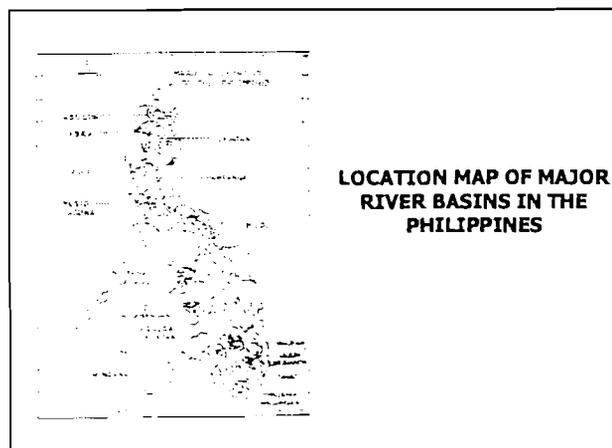
LAKE	Location	Surface Area (has)	Phytoplankton	Macrophytes	Zooplankton	Mollusca	Fish	Endemic Species
Pooy Lake	18°07'30" 120°52'05"	4.02		x			x	
Calig Lake	18°12'34" 121°49'10"	0.027						
Capansarawan lake	18°13'33" 121°46'44"	0.055						
Casuarin Lake	17°54'11" 121°44'50"	0.32						
Mapusao Lake	17°45'04" 121°51'14"	0.35						
Sibip Lake	18°52'16" 121°49'34"	0.027						
Paitan Lake	15°50'39" 120°43'37"	0.418						
Lake Look	14°54'08" 120°09'50"	2.74						
Lake Gogo	14°55'10" 120°17'21"	0.027						

LAKE	Location	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Mollusca	Fish	Endemic Species
Laguna Lake	14°23'00" 121°15'00"	900	x	x	X (with some record)	x	x	
Lake Yambon	14°07'15" 121°21'45"	0.34	x	x	x		X	
Lake Pandia	14°06'55" 121°22'00"	0.19	x	x	x		X	
Lake Busot	14°05'05" 121°20'30"	0.37	x	x	x		X	
Lake Malicamp	14°07'20" 121°19'50"	0.18	x	x	x		X	
Lake Palpaquin	14°07'20" 121°20'20"	0.49	x	x	x		X	
Sampaloc Lake	14°04'45" 121°19'40"	1.01	x	x	x		X	
Lake Calibato	14°04'45" 121°22'30"	0.53	x	x	x		X	
Lake Tisob	13°57'51" 121°18'16"	10.05						

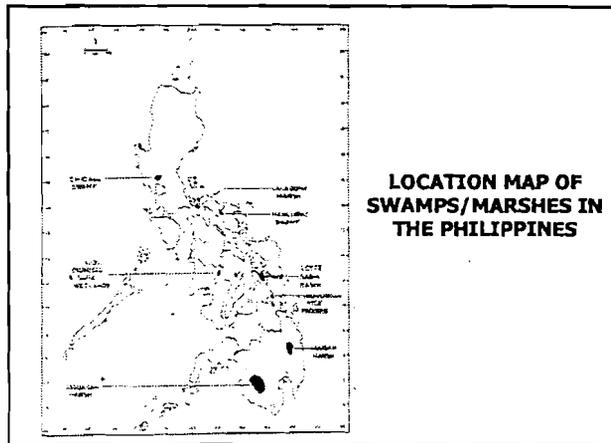
LAKE	Location	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Mollusca	Fish	Endemic Species
Lake Pagasa	13°54'08" 121°18'48"	0.027						
Lake Padas	14°00'35" 122°19'34"	0.25						
Taal Lake	14°00'45" 120°59'45"	234.24	x	x	x	x	X	
Yellow Lake	14°00'45" 12059'45"	2.74						
Maliwago Lake		0.049						
Lacuna Lake	13°12'40" 120°40'21"	0.054						
Lake Nauyas	13°10'20" 121°20'45"	81.74	x	x			x	<i>Puntius breviceps</i> etc.
Buruyan Lake	13°22'34" 121°08'08"	0.6						
Dinagaran	10°42'39" 119°28'00"	0.164						

LAKE	Location	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Mollusca	Fish	Endemic Species
Analogan Lake	10°32'16" 119°15'54"	0.094						
Tagbung Saeng Lake	9°26'45" 118°12'00"	0.722						
Lake Cebuano	11°54'16" 120°14'27"	4						
Lake Bato	13°19'45" 123°21'10"	28.1		x			X	Seserapan
Lake Baso	13°28'00" 123°18'55"	1.77		x			X	
Lake Bato	13°28'10" 123°30'50"	17.07		x			x	Seserapan
Lake Buluan	12°45'19" 124°05'32"	0.22						

LAKE	Location	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Mollusca	Fish	Endemic Species
Tadik Lake	Laguna		x		x		x	
<b>PALAWAN</b>								
Kayangan Lake	Coron, Palawan							
Lake Mangao	10°45'55" 119°32'46"	6.43						



River	Region	Drainage Area (ha <sup>2</sup> )	Phytoplankton / Phytoplankton	Macrophytes	Zooplankton	Mollusca	Fish	Endemic Species
Abra	Ilocos	5125						
Cagayan	Cagayan Valley	25649					x	<i>Catostomus pleurolepis</i>
Agno	Central Luzon	13800						
Pampanga	Central Luzon	9759						
Pasig	Southern Luzon	4678						
Bicol	Bicol	3771						



**Candaba Swamp**  
 Location: near the towns of Candaba, San Miguel and San Ildefonso. Pampanga and Bulacan Provinces  
 No information is available on the aquatic vegetation. This area is an important staging and wintering area for ducks and other species of birds.

**Lalaguna Marsh**  
 Location: near the southwestern tip of Lamon Bay, Quezon Province, Luzon  
 Dominant aquatic species: *Scirpus grossus*, *Eichornia crassipes*, *Ipomoea reptans* and *Phragmites communis*

**Manubas Swamp**  
 Location: Near Guinacutan and Labo 65 km NNW of Naga  
 No information is available on the aquatic vegetation. This is an important breeding area for birds.

**WORKSHOP OUTPUT OF THE SOCIO-ECONOMIC & CULTURAL WORKING GROUP  
by Dr. Rowena R. Boquiren**

**SOCIO-ECON WORKING GROUP**

**WGL: DR. ROWENA REYES-BOQUIREN**

**Members:**

Dr. Rogelio Serrano	Loreto Rodriguez
Rodney Verian	Pedro Velasco
Manuel Romero	Cris Rivero
William Savella	Flora Leocadio
Dr. Roberto Arano	Jeff Parungao
Pia Villapando	Nancy Ibuna

**SOCIO-ECONOMIC AND CULTURAL  
WORKING GROUP**

- I. Correction of Luzon Statistics
- II. Correction of Maps
  - A. Vegetation
    1. NSMNP: re-classify mossy forest into lowland dipterocarp forest, virgin forest and limestone forest
    2. Presence of mossy forest in higher elevations of Mt. Isarog

3. Standardize nomenclature/classification of vegetation with plant group (e.g. ultrabasic forest, peat forest etc.)

4. Consideration of major grasslands/savannahs w/c also have unique biodiversity value

- a. Cagayan Valley
- b. Karanglan, Nueva Ecija
- c. Nueva Vizcaya

5. Palawan

a. Vegetation

- i. Mossy forest at 1,013 masl of Mt. Capoas
- ii. Grassland and secondary forest in Dumarán Island

B. Lakes, rivers and bays

1. Other lakes in Cordillera and N. Vizcaya
2. Pinatubo lake

3. Lake Kaliraya

4. 7 Lakes of San Pablo

5. Sisiran Bay

6. Tayac Lake

7. Bulusan Lake

8. Palawan

- a. Bays: Honda Bay, Ulugan, Pagdanan Bay, Bacuit and Coron
- b. Lakes: Tagbunsaing lake, Kayangan, Awuyuk and Barracuda Lake

9. Indicate also impt. dams

- |                 |              |
|-----------------|--------------|
| a. Magat Dam    | c. Binga Dam |
| b. Ambuklao Dam |              |

C. IP Areas and CADC

1. Tagbanuas in Malampaya Sound

III. Criteria and Scoring

A. Levelling-off of experts' opinion on the definition of variables

\* There is a need to reconcile criteria with available data

**A. Density = area-specific resource use; depending on its relation to population pressures and resource utilization**

▸ **RELATIVE DENSITY**

**B. Per Capita Income/Poverty Incidence**  
 = Scoring should be reversed as a low per capita income should indicate high priority

**C. Cultural Diversity**

= Scoring should be reversed high priority should be given to areas with a high degree of acculturation

**D. Conservation Initiatives and Opportunities**

= Scoring should be reversed to give high priority to areas with low conservation initiatives and opportunities

**PROPOSED CRITERIA & SCORING SCHEME**

**POPULATION PRESSURE**

- |                        |                                     |
|------------------------|-------------------------------------|
| • Density              | • Migration                         |
| 1 <i>critical</i>      | 1 <i>high net in-migration</i>      |
| 2 <i>high</i>          | 2 <i>moderate net in- migration</i> |
| 3 <i>moderate</i>      | 3 <i>stable in-out migration</i>    |
| 4 <i>low</i>           | 4 <i>low net out-migration</i>      |
| 5 <i>insignificant</i> | 5 <i>high net out-migration</i>     |

\* There is a need to determine critical levels according to ecological zone.

- Per capita income    1 *significantly lower*  
                                  2 *slightly lower*
  - Poverty Incidence    3 *approximates national ave.*  
                                  4 *slightly higher*  
                                  5 *significantly higher*
- (indices relative to national standard)

- Tenurial Issues
- 1 *critical*
- 2 *severe*
- 3 *moderate*
- 4 *weak*
- 5 *insignificant*

**RESOURCE UTILIZATION ISSUES**

- Impact of resource utilization practices  
\* *relative to a hierarchy of biodiversity threats*
  - 1 *critical*
  - 2 *severe*
  - 3 *moderate*
  - 4 *weak*
  - 5 *insignificant*
- Economic trends  
\* *relative to a hierarchy of biodiversity threats*

**CULTURAL DIVERSITY**

(uniqueness and degree of non-acculturation/non-integration)

- persistence of customary land rights & arrangements
- 1 *insignificant*
- 2 *weak*
- 3 *moderate*
- NRM practices & beliefs (*Sustainable IKS*)
- 4 *strong*
- 5 *very strong*

**POLICY HARMONIZATION**

- Identification of models in biodiversity-related policy harmonization
- Identification of issues in national and local, intra- & inter-agency conflicts

**CONSERVATION INITIATIVES & OPPORTUNITIES**

- Institutionalization of conservation effort (sustained, supported by LGU & community) 1 *insignificant* 2 *weak* 3 *moderate* 4 *strong*
- Community mgmt. 5 *very strong*

**IV. Test Cases**

**A. Mt. Guiting-guiting**

- 1. Cajidiocan (2)
- 2. Magdiwang (3)
- 3. San Fernando (1)

**B. Mt. Makiling**

- 1. Calamba (1)
- 2. Los Banos (2)
- 3. Bay (3)
- 4. Alaminos (5)
- 5. Sto. Tomas (4)

**C. Mt. Isarog**

- 1. Naga City (7)      5. Goa (2)
- 2. Pili (4)          6. Tinambac (6)
- 3. Ocampo (1)      7. Calabanga (5)
- 4. Tigaon (3)

**D. NSMNP**

- 1. Maconacon (5)    6. Ilagan (2)
- 2. Divilacan (6)    7. Tumauni (4)
- 3. Palanan (1)      8. Cabagan (4)
- 4. Dinapigue (3)    9. San Pablo (4)
- 5. San Mariano (1)

**E. Palawan**

- 1. Busuanga (5)      13. Cagayancillo (6)
- 2. Coron (3)          14. Magsaysay (6)
- 3. Culion (4)          15. PPC (3)
- 4. Linapacan (4)      16. Aborlan (4)
- 5. El Nido (4)          17. Narra (3)
- 6. Taytay (1)          18. Espanola (3)
- 7. Sn Vicente (5)      19. Quezon (3)
- 8. Roxas (2)            20. Rizal (4)
- 9. Dumaran (3)        21. Brooke's Pt (4)
- 10. Aracell (3)        22. Balabac (5)
- 11. Agutaya (5)        23. Bataraza (5)
- 12. Cuyo (6\_)

**V. Remaining Tasks**

**A. Additional Data Sources and Experts**

- 1. Provincial Profiles & Dev. Plans
  - a. Palawan- c/o Flor Leocadio
  - b. Reg. II - c/o Bert Arano and PASu Savella
  - c. Reg. III- c/o PAWB
  - d. Reg. IV- c/o M. Romero
- 2. CRMP profiles- Palawan, c/o Flor
- 3. CBFM; NRMP - c/o Proj. Support Office  
DENR (Noni Tamayo)

**4. 1999 Forestry Statistics - FMB**

- 5. Area Profiles of FPE, PAFFID, PCARRD
- 6. EIA: Ilagan & Abuan- NAPOCOR, c/o EMB

**B. Additional Experts**

- 1. Oscar Balbastro- RED, NEDA Reg. IV
- 2. Perla Vizzoro
- 3. Delbert Rice - IKALAHAN Fd'n
- 4. Dr. Sebastian - Philrice

<b>5. Dr. Ruben Sevilleja - CLSU, VPAA</b>	
<b>6. Jun Redor - Kabanahaw</b>	
<b>C. Validation of Test Sites by Luzon Participants</b>	<b>Oct 9</b>
<b>D. Scoring for other Luzon Sites</b>	<b>End of Oct</b>
<b>E. Luzon-based consult'n workshop at UP-CIDS</b>	<b>Oct 11</b>
<b>F. Map Work</b>	<b>Nov-Dec</b>
<b>G. Nat'l Consultation</b>	<b>Dec 4-8</b>

<b>SOCIO-ECON WORKING GROUP</b>	
<b>WGL:</b>	<b>DR. ROWENA REYES-BOQUIREN</b>
<b>Members:</b>	
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<b>Dr. Roberto Arano</b>	<b>Jeff Parungao</b>
<b>Pia Villapando</b>	<b>Nancy Ibuna</b>

WORKSHOP OUTPUT OF THE ARTHROPOD WORKING GROUP  
by Dr. Victor P. Gapud

ARTHROPOD  
WORKING GROUP

Dr. Victor Gapud  
Dr. Leonila Raros  
Dr. Cecilia Reyes  
Connie Morales, Documentor

WORKSHOP OUTPUT

1. Validation of Luzon Statistics
2. Validation and Ranking of Criteria for Priority Setting
3. Establishment of Coordinates of Collection Sites of Mites and Insects with Records of Endemic Species
  - a) Mountain Areas/Peaks in Luzon, Mindoro, Palawan
  - b) Municipalities/Municipality Districts in Luzon, Mindoro, Palawan
2. List of Freshwater Bodies with Records of Endemic Species of Odonata, Aquatic Bugs, and Caddisflies

Collection Sites with Coordinates

Aborian	Calayan I. Babays Is.	Lubugan, Kalings
Agoo, La Union	Calumpit, Bulacan	Maddela, Quirino
Alabate Is., Quezon	Caraballo Mountains	Makayan, Benguet
Alfonso, Cavite	Castiguran, Aurora	Makipol, Albay
Atok, Benguet	Coron, Busuanga	Mantilo, Albay
Babalain, Kalings	Dait	Mervolas, Saitan
Balete Pass, N. Viscaya	Dagupan, Pangasinan	Makinat, Abra
Baita, N. Viscaya	Davao, Kalings	Maysao, Ifugao
Banaue, Ifugao	Dlad, Nueva Viscaya	Monreal, Ticao Is.
Bangued, Abra	Dimans, Busuanga	Montalban, Rizal
Bangul, Iloos Sur	Duyoc or Suyoc, Benguet	Munoz, Nueva Ecija
Bantay, Iloos Sur	Garu, Isabela	Namatao, Mt. Province
Batan Is., Albay	Go, Camarines Sur	Narra, Palawan
Bato, Catanduanes	Guinobatan	Olongan, Romblon
Bauang, La Union	Gumaca Quezon	Olongapo, Subic Bay
Bayombong, N. Viscaya	Haigh's Place, Benguet	Pagbilao
Bicol National Park	Iribana, Quezon	Pantabangan, Nueva Ecija
Binaluan, Palawan	Iriban, Benguet	Parasale, Camarines Norte
Biosoc, Mindanue	Iwahig, Palawan	Tugbo, Masbate
Bontoc, Mt. Province	Kiangyan, Ifugao	Tuguegarao, Cagayan
Brooks's Point	Laoag, Iloos Norte	Vigan, Iloos Sur
Bungas, Iloos Sur	Limay, Batan	Villarado, Nueva Viscaya
Cabigan, Palawan	Lipata Is., Padre Burgos	Virak, Catanduanes

VALIDATION OF NAMES OF MOUNTAINS

Mt. Alzapoa, N. Viscaya (?)	Mt. Lobo, Camarines Norte
Mt. Arayat, Pampanga	Mt. Lomutan, Rizal
Mt. Arayat, Pampanga	Mt. Luwang, Benguet
Mt. Baco, Occ. Mindoro	Mt. Makiling, Laguna
Mt. Banahaw, Quezon	Mt. Malinao, Albay
Mt. Calavite, Mindoro	Mt. Mayon, Albay
Mt. Davao, Mt. Province	Mt. Miranda, Benguet
Mt. Dibaya, N. Viscaya	Mt. Malinao, Isabela
Mt. Cuking-Cuking	Mt. Nagpartian, I. Norte (?)
Mt. Hales, Or. Mindoro	Mt. Palimlan, Iloos Norte (?)
Mt. Imagan, Nueva Viscaya	Mt. Pulog, Benguet
Mt. Irid, Rizal	Mt. Sta. Teresa, Benguet
Mt. Irip, Camarines Sur	Mt. Tabaka, Zamboanga (?)
Mt. Isarog, Camarines Sur	

ABRA	Abra River (Bangued)
ALBAY	Bicol Falls (Makipol) Cawayan River (Mantilo) Faldal Falls (Malinao)
BENGUET	Azin Hot Springs (Bangued)
CAMARINES SUR	Baki River (Lupi, Alameda) Suki Lake, Tulin Falls Mintal Spring (E. Carabao) Makibay Falls (Mt. Isarog)
CATANDUANES	Esteroang Falls (Bato) Mardani Falls (Bato) Papa River (Sta. Dominga, Virak)
CAVITE	Talong Malagad, Nurayna Creek (Faje) Tupul River (Alfonso)
LAGUNA	Aviguo Creek, Hidden Valley (Alameda) Dampall River/Falls (Los Baños) Malawa Creek, Mt. Makiling
LA UNION	Alipang River (Tubao) Baying River (Bawang)
MT PROVINCE	Sallina River (Bontoc) Chico River (Dagupan)
NUOVA ECIA	

FRESHWATER BODIES WITH RECORDS OF ENDEMIC SPECIES OF SEBRAYANQUATE BUGS

ABRA	Lobon River (Bantoc) Mabang Brook (B.W.P. Alameda)
BENGUET	Bangued River (Bato Malinao)
BUENOS AIRES	Bicol Falls (Tubao, San Agustin) Lumbaga Falls (Bato, Magatung, Benguet) Papa River (Cawayan, Magatung, Benguet) Papa River (Mabang, Cawayan, Benguet)
CAVITE	Chico Spring (San Fernando) Tulin Spring (Makiling Peak, Malinao)
CAMARINES	Bato Brook (Bato, Bantoc) Bontoc River (Bontoc) Mabang River (Bantoc) Mabang River (Bato, Bantoc)

## **WORK ASSIGNMENT**

- 1. List of Endemic Species of Selected Mites and Spiders from Established Coordinates**
- 2. Plotting of Distribution Ranges (using coordinates) of Endemic Species of Selected Arthropods on Maps**
- 3. Extension of the process to cover Visayas and Mindanao**
- 4. Working Papers on the Status of Knowledge on Selected Arthropod Groups for Priority Setting**

**WORKSHOP OUTPUT OF THE VERTEBRATE WORKING GROUP  
by Prof. Blas Tabaranza, Jr.**

**VERTEBRATE WORKING GROUP  
Mammals, Birds, Amphibians and Reptiles  
(Luzon, Palawan and Mindoro Island)**

**Group Members**

<b>Blas Tabaranza</b>	<b>Haribon</b>
<b>Genevieve Gee</b>	<b>Haribon</b>
<b>Arvin Diesmos</b>	<b>DLSU</b>
<b>Aloy Duya</b>	<b>CI-Philippines</b>
<b>James Medoza</b>	<b>PPSRNP</b>
<b>Mike De Guia</b>	<b>CI-Philippines</b>
<b>Joy Hibaya</b>	<b>PSU</b>
<b>Gaudencio Bartolome</b>	<b>DENR Region 2</b>
<b>Daniilo De Sagun</b>	<b>PCSDS</b>
<b>Jimmy Aberin</b>	<b>DENR Region 3</b>
<b>Artem Antolin</b>	<b>CI Philippines</b>
<b>Myrissa Tabao</b>	<b>Haribon</b>

**Vertebrate Working Group: LUZON Island****Protected Areas****Highlights/Source of Info**

1. Batanes PLS	CPPAP
2. Calayan (Babuyan) Island Group (proposed)	Coastal Environmental Program
3. Palau Island PLS	Coastal Environmental Program
4a. Bauan Watershed FR	Hornbill
4b. Wangag Watershed FR	
5. Magapit Protected Area	Caves
6. Mt. Cetaceo	IBA/ Philippine Eagle/Caves
7. Penablanca PL	Caves/bats
8. San Pablo Watershed FR	Caves/Philippine Eagle/Hornbill
9. NSMNP	
10. Tumauini Watershed FR	Phil. Eagle
11. Fuyot Spring NP	Caves
12. Dinapigue, Isabela (outside NSMNP)	
13. Magat Dam	<i>C. mindorensis</i>

14. Dupax Watershed FR (Proposed)	EIA c/o Prof PL Alviola
15. Salinas Natural Monument	Caves
16. Casecan Watershed FR	EIA-EMB
17. Pantabangan-Caranglan Watershed	Philippine Duck (A. luzonica)
18. Bongabong, Nueva Ecija	Philippine Eagle
19. Dona Remedios Trinidad (DRT) (Gen. Tinio Watershed FR)	Philippine Eagle, Changeable Hawk Eagle, Hornbill
20. Angat Watershed FR	PASA-Resource Basic Inventory
21. Pinagrealan Watershed FR (proposed)	PASA-RBI
22. Minalungao NP	Deer
23. Talavera Watershed FR	PASA-RBI
24. Maria Aurora National Park	Philippine Eagle, <i>P. sierramadrensis</i> , <i>R. tipana</i>
25. Arayat NP	PASA-RBI
26. Roosevelt NP	PASA-RBI
27. Bataan-Subic NP	CPPAP/NORDECO/UP Diliman
28. Mariveles Watershed FR (proposed)	<i>P. leucopterus</i> , <i>Padda oryzivora</i>

29. Olongapo Watershed FR	PASA-RBI, Hornbills
30. Masinloc-Oyun Bay Marine Reserve	CEP
31. Candaba Swamp	Wintering area
32. Mt. Tapulao PL (proposed)	Mossy and Pine forest
33. Masinloc Watershed FR (proposed)	RBI
34. Santa Cruz Watershed (proposed)	RBI
35. Amro Watershed FR	UP Diliman, <i>Pitta kochi</i>
36. San Luis-Diteki Watershed FR	<i>P. sierramadrensis</i>
37. Kanan River Watershed FR	EIA-MADECOR
38. Kaliwa River Watershed FR	No info
39. Bird Sanctuary, Gen Nakar	No Info
40. Limay, Bataan	UP Diliman, <i>P. leucopterus</i> <i>Padda oryzivora</i> , <i>C. plicata</i> <i>R. insignis</i>
41. Brgy. Canabuan, Artao, N.V. Mt. Paiton	
42. Minalin, Pampanga	breeding ground of Purple heron
43. Balanga, Bataan	Wintering ground of migratory Birds
44. Santa Praxedes (proposed protected landscape)	<i>Hopea cagayanensis</i>

45. Biak na Bato	Luzon Scops Owl, caves and bats
46. Bicol NP	<i>Varanus olivaceus</i>
47. Libmanan Caves	bats
48. San Miguel Bay, Mangrove Area	BFAR
49. Mt. Isarog NP	Heaney et al, Haribon
50. Caramoan NP	<i>V. olivaceus</i> , Turtles and dugong
51. Mt. Asog or Mt. Iriga	No Info
52. Mayon Volcano NP	
53. Cagraray Island, Albay	Mangrove area (BFAR)
54. Bulusan Volcano NP	Diesmos, Haribon, LIKAS, UP Diliman
55. Prieto Diaz, Sorsogon	CEP

**Vertebrate Working Group: Mindoro Island**

- |                          |   |
|--------------------------|---|
| 1. Naujan Lake           | UPLB, IESAM                                       |
| 2. Mt. Halcon            |   |
| 3. Mt. Iglit Baco NP     | UPLB, <i>Ducula mindorensis</i> , <i>C. steer</i> |
| 4. Sablayan Penal Colony | HARIBON, UPLB, Fauna and Flora Int'l              |
| 5. Apo Reef              | CPPAP   |
| 6. Paloan Area           | Hornbill, Tamaraw, Mindoro Imperial Pigeon        |
| 7. Magsaysay             | Haribon (IBA)                                     |
| 8. Calavite              | Haribon (IBA)                                     |
| 9. Puerto Galera         | Haribon (IBA)                                     |

**Vertebrate Working Group: Palawan Island**

1. Calauit Game Preserve and Wildlife Sanctuary (existing)
2. Coron Island (proposed)
3. El Nido-Taytay Manage Resource PA (existing)
4. Malampaya Sound Protected Land and Seascape (existing)
5. Lake Mangualo Managed Resource Protected Area (proposed)
6. Green Island Bay (proposed)
7. Port Barton Marine Park (existing)
8. Puerto Princesa Subterranean River NP (existing)
9. Ulugan Bay Protected Seascape (proposed)
10. Honda Bay Protected Seascape (proposed)
11. Irawan Watershed (existing)
12. Rasa Island Bird Sanctuary (proposed)
13. Mt. Mantalingahan Range Natural Park (proposed)
14. Ursula Island Bird Sanctuary (existing)
15. Tubbataha Reef National Marine Park (existing)
16. Balabac Group of Islands Protected Land- and Seascape (proposed)

17. Victoria's Peak (Anapalan Range) Natural Park (proposed)
18. Iwahig Penal Colony Wildlife Sanctuary (proposed)
19. Bataraza Crocodile Sanctuary (proposed)
20. Rizal Crocodile Sanctuary (proposed)
21. Mt. Cleopatra Nature Park (proposed)

**SITE**

**HABITAT DIVERSITY**

- Primary lowland TRF 3
- Primary Montane/Mid Mountain (Pine Forest) 2
- Primary Mossy 2
- Secondary Lowland TRF 2
- Primary/Secondary Mangrove 2
- Wetlands/ Grasslands (Original) 2

**FOREST COVER**

- |              |   |
|--------------|---|
| 10,000+-     | 5 |
| 5,000-10,000 | 4 |
| 1000-5,000   | 3 |
| 500-1,000    | 2 |
| 250-500      | 1 |
| <250         | 1 |

**STATUS OF UNEXPLOREDNESS**

- |                    |   |                |                           |
|--------------------|---|----------------|---------------------------|
| Unexplored         | 3 |                |                           |
| partially explored | 2 |                |                           |
| Well-explored      | 1 |                |                           |
| <b>Species</b>     |   | <b>Mammals</b> | <b>Birds</b> <b>Herps</b> |
| Site Specific      | 4 |                |                           |
| Island endemic     | 3 |                |                           |
| National Endemic   | 2 |                |                           |
| Widespread         | 1 |                |                           |
| 21-30=3            |   |                |                           |
| 11-20=2            |   |                |                           |
| 1-10 =1            |   |                |                           |

**SPECIES RICHNESS**

- |        |   |
|--------|---|
| High   | 3 |
| Medium | 2 |
| Low    | 1 |

**THREATENED SPECIES**

- Present 1
- Absent 0

**ECONOMIC IMPORTANCE**

- |                                   |   |
|-----------------------------------|---|
| Timber                            | 1 |
| Other forest products             | 1 |
| Game animals(Food/Trade)          | 1 |
| Watershed (spring, lakes, rivers) | 1 |
| Tourism                           | 1 |

**THREATS**

**Human Population**

High 3  
Medium 2  
Low 1

Logging (illegal and legal) 1  
Mining 1  
Kaingin 1  
Hunting 1

**CONSERVATION EFFORTS**

**National government**

LGUs

NGOs

Academe

POs

Church

Other Government Agencies

• Present 0  
• Absent 1

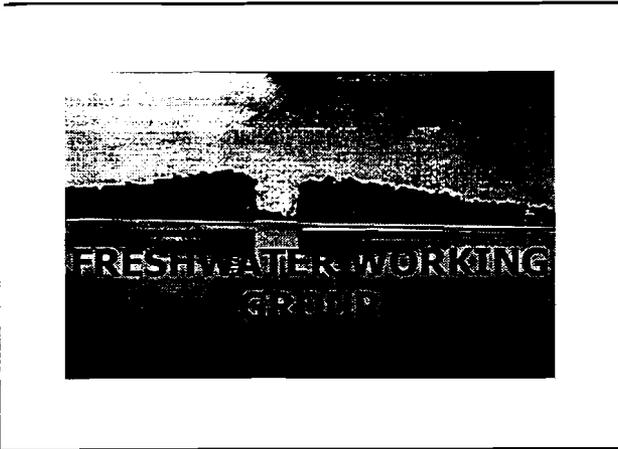
**FUNDING**

High 1  
Medium 2  
Low 3  
None 4

**EXISTING MEASURES OF PROTECTION**

• Present 0  
• Absent 1

WORKSHOP OUTPUT OF THE FRESHWATER WORKING GROUP  
by Dr. Roberto C. Pagulayan

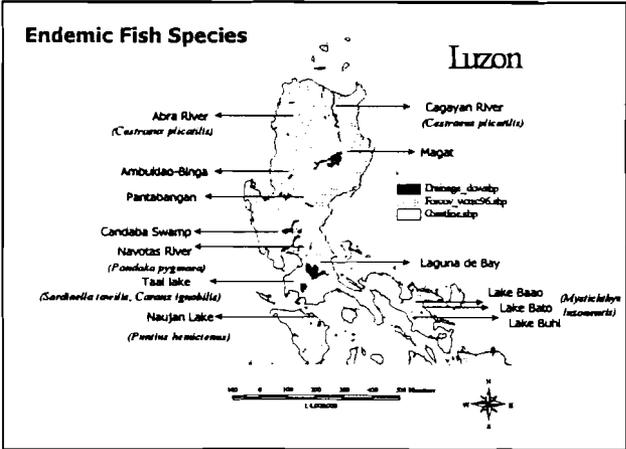


**List of Experts**

<b>Phytoplankton</b>		
Macrina Zafaralla	UP Los Banos	
<b>Zooplankton</b>		
Augustus Mammariil	UP Dilliman	
Angelita Rivera	LLDA	
<b>Mollusc</b>		
Roberto C. Pagulayan	UP Dilliman	
<b>Fish</b>		
Eliadora C. Mercene	BFAR, 4	
Victor S. Solliman	BU	
Evelyn Dangla	BFAR, Region 3	
<b>Contributor:</b>		
Mariynn Mendoza	PAWB	

**Contributors**

Rodney Venan	PASu	Coron, Palawan
Loreto Rodriguez	PASu	El Nido, Palawan
Pedro Velasco	PASu	Malampaya, Palawan
Danilo de Sagun		PCSDS
Jule Hibaya		PSU



**Endemic Phytoplankton**

Taal Lake

- Blue-Green Algae
- Eucapsis philippinensis zafaralla*
- Democarpa velasquezii zafaralla*
- Homeothrix rubrus zafaralla*

**Endemic Zooplankton**

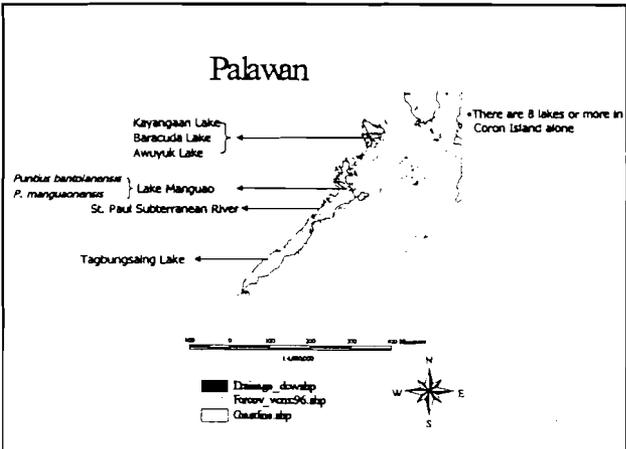
*Filipinodaptomus insularis*

\* Found In Rizal, Laguna, UP Dilliman, Lamesa Dam

**Endemic Mollusc**

Luzon

- Bullastra cumingiana*
- Lymnea philippinensis*
- Pila luzonica*



### List of Lakes in Luzon

LAKE	Location (Municipality, Province)	Geographic Coordinates	Surface Area (has)	Phytoplankton	Macrophytes	Zooplankton	Macro-in v	Fish	Endemic Species
1. Pusey Lake	Pusey, Ilocos Norte	18°07'20" N 120°32'05" E	4.02			x	x	x	x
2. Calig Lake	Buguey, Cagayan	18°12'34" N 121°49'10" E	0.027						
3. Comanservan Lake	Buguey, Cagayan	18°13'33" N 121°46'44" E	0.025						
4. Conarim Lake	Faire, Cagayan	17°54'11" N 121°44'50" E	0.32						
5. Mapaseo Lake	Igung, Cagayan	17°45'04" N 121°31'14" E	0.35						
6. Sialap Lake	Minami, Cagayan	18°52'16" N 121°49'34" E	0.027						
7. Patus Lake	Urdaneta, Pangasinan	15°50'39" N 120°43'37" E	0.438						

LAKE	Location (Municipality, Province)	Geographic Coordinates	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Macro-in v	Fish	Endemic Species
8. Lake Lood	San Marcelino, Zambales	14°54'08" N 120°09'50" E	2.74	x	x	x		x	
9. Lake Gogo	Olongapo, Zambales	14°55'10" N 120°17'21" E	0.027						
10. Mt. Pinatubo Crater Lake	Zambales								
11. Sacobia Lake (Pinatubo Lake)	Zambales			x	x	x		x	
12. Lake Napuape	Zambales			x		x	x	x	
13. Laguna Lake	Laguna	14°23'00" N 121°15'00" E	900	x	x	X (with some spec. n)	x	x	
14. Lake Yuzo	San Pablo, Laguna	14°07'15" N 121°21'45" E	0.34	x	x	x			X

LAKE	Location (Municipality, Province)	Geographic Coordinates	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Macro-in v	Fish	Endemic Species
15. Lake Pardo	San Pablo, Laguna	14°06'55" N 121°22'00" E	0.19	x	x	x		X	
16. Lake Buhon	San Pablo, Laguna	14°05'05" N 121°20'15" E	0.37	x	x	x		X	
17. Lake Molscep	San Pablo, Laguna	14°07'20" N 121°19'50" E	0.18	x	x	x		X	
18. Lake Palpaogan	San Pablo, Laguna	14°07'20" N 121°20'20" E	0.49	x	x	x		X	
19. Semploc Lake	San Pablo, Laguna	14°04'45" N 121°19'40" E	1.01	x	x	x	X	X	
20. Lake Calibomo	San Pablo, Laguna	14°04'45" N 121°22'30" E	0.53	x	x	x		X	
21. Lake Tiocob	Tiaong, Quezon	13°57'51" N 121°18'16" E	10.05						

LAKE	Location (municipality, province)	Geographic coordinates	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Macro-in v	Fish	Endemic Species
22. Lake Pagtan	Tiaong, Quezon	13°54'08" N 121°18'48" E	0.027						
23. Lake Podan	Jomalig Is., Quezon	14°00'35" N 122°19'34" E	0.25						
24. Tsal Lake	Tsal, Batangas	14°00'45" N 120°59'45" E	234.24	x	x	x	x	x	<i>Sardinella lemuru</i>
25. Main Crater Lake	Tsal, Batangas	14°00'45" N 120°59'45" E	2.74	x					
26. Malibago Lake	Occ. Mindoro		0.049						
27. Linao Lake	Occ. Mindoro	13°12'40" N 120°40'21" E	0.054						
28. Lake Nanyan	Mindoro Oriental	13°10'20" N 121°20'45" E	81.74	x	x	x	x	x	(1) <i>Puntius bicinctus</i>
29. Baruyan Lake	Calapan, Or. Mindoro	13°22'34" N 121°08'06" E	0.6						

LAKE	Location (Municipality, Province)	Geographic coordinates	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Macro-in v	Fish	Endemic Species
30. Lake Baso	Comanese Sar	13°19'45" N 123°21'10" E	28.1	x	x	x	x	X	<i>Alysiaichthys lacunosa</i> (Sinareapan)
31. Lake Baso	Comanese Sar	13°28'00" N 123°18'55" E	1.77		x			X	<i>Alysiaichthys lacunosa</i> (Sinareapan)
32. Lake Buh	Comanese Sar	13°28'10" N 123°19'50" E	17.07	x	x	x	X	X	<i>Alysiaichthys lacunosa</i> (Sinareapan)
33. Lake Buhang	Buhang, Sarangani	12°45'19" N 124°05'32" E	0.22		x	x	x	x	

LAKE	Location	Surface Area (km <sup>2</sup> )	Phytoplankton	Macrophytes	Zooplankton	Macro-in v	Fish	Endemic Species	
34. Tandak Lake	Laguna	0.248	x		x		x		
<b>PALAWAN</b>									
35. Tagbungsaing Lake	Quezon, Palawan	9°26'45" N 118°12'00" E	0.722						
36. Lake Amuyuk	Coron Island, Coron, Palawan	11°54'16" N 120°14'27" E	4						
37. Barocuda Lake	Coron Island, Coron, Palawan								
38. Kayangan Lake	Coron Island, Coron, Palawan								
39. Lake Mangso/ Danao	Taytay, Palawan	10°45'55" N 119°32'46" E	6.43					<i>Puntius bicinctus</i> <i>P. mangsoensis</i>	

### List of Major River Basins in Luzon

River	Region	Drainage Area (km <sup>2</sup> )	Phytoplankton / Phytoplankton	Macrophytes	Zooplankton	Macro-invertebrates	Fish	Endemic Species
Abra	Ilocos	5125					X	Continues placards Luning
Cagayan	Cagayan Valley	25649					X	Continues placards Luning
Agno	Central Luzon	13800	x			X	X	
Pampanga	Central Luzon	9759	x					
Paag	Southern Luzon	4678	x	x	x		X	
Bicol	Bicol	3771						

### List of reservoirs and swamps/marshes

Swamp/marsh/reservoirs	Location	Sources of Information
Ambukdao	Benguet Province	Data on macroinv & fishes c/o RCP
Binga	Benguet Province	Data on macroinv c/o RCP
Pantabangan	Nueva Ecija	Napocor, NIA
Magat	Nueva Vizcaya	SESAM Iib, Napocor, NIA
Angat	Bulacan	Napocor
Lamesa Dam	Metro Manila	Data on all taxa c/o ACM
Caliraya	Laguna	Napocor
Candaba	Pampanga	Data on Mollusc c/o RCP & Haribon
Prieto Diaz	Sorsogon	Data from Tambuyog
Manlubas	Naga	----

### CRITERIA

	Weight	Laguna de Bay
<b>SITE</b>		
physical condition	4	3
habitat diversity		
water quality		
status of intertidal zone	3	4
management	3	1
social richness	4	4
<b>FAUNA</b>		
diversity	4	2
# of species/genus	4	3
management (sp. of interest)	4	2
key biological values (including sp. for clean water)	2	1
Economic Value	4	2
<b>THREATS</b>		
Population trends	3	3
Resource utilization activities		
introduction of invasive species	4	3
deforestation	3	3
industrial activities	3	3
agriculture activities	4	3
destructive fishing	4	3
uncontrolled pollution	4	3
Tourism	2	2
discrepancy	2	2

INTERVENTION NEEDS	Weight	Laguna de Bay
introduction	3	2
management efforts (water quality, habitat, security, etc.)	4	4
policy harmonization	4	1
management plans	1	1
resource protection	4	2
<b>POLITICAL STABILITY &amp; O</b>	3	3
<b>ECONOMIC BENEFITS</b>	3	4
	64	64

Criteria	Weight	Weight	Weight	Weight	Weight	Weight	Weight
<b>Criteria</b>							
<b>SITE</b>	60%	20%	0.7	0.8	(subtotal of criteria) x W		
<b>FAUNA</b>	40%	40%	1.4	0.8			
<b>THREATS</b>		15%	0.45	0.65			
<b>INTERVENTION NEEDS</b>		3%	0.18	0.13			
<b>POLITICAL STABILITY &amp; O</b>		3%	0.025	0.025			
<b>ECONOMIC BENEFITS</b>		15%	0.45	0.6			
			2.18	2.61			

WORKSHOP OUTPUT OF THE MARINE WORKING GROUP  
by Mr. Rueben Campos

**MARINE WORKING GROUP**

**Dr. Porfirio M. Allño**  
*Working Group Leader*

*Members:*

Dr. Reynaldo dela Paz	Dr. Edna Fortes
Dr. Lemuel Aragonés	Dr. Benjamin Vallejo
Rhodora R. de Veyra, DVM	May Jean A. Caleda
Priscilla Calimag	Lory Tan
Noel Dumaop	Rudy Reyes
Reuben Campos	Liza Valenzuela

**Outline of Presentation**

- I. Review of framework
- II. Data sources
- III. Strategies
- IV. Updates

**I. REVIEW OF FRAMEWORK**

A. **PSR** Approach

- Pressure - Threats/Risks
- State - State of knowledge(information), condition of habitat
- Response - Management interventions, e.g. MPAs, CRM, etc.

B. Significance of biodiversity conservation areas, e.g. fisheries, ecological, aesthetic values

C. Review of criteria for prioritizing biodiversity conservation areas (previous workshops in Visayas, Mindanao cited/discussed)

**II. DATA SOURCES**

A. Involvement of institutions

- representatives shall send a description of their respective institutions
- metabase - identification of the databases located in the member institutions bibliography
- retrieval of published literature, 'gray' literature such as reports, thesis (e.g. SICEN has a bibliography of marine invertebrates and seaweeds; database of marine biodiversity - some flora and fauna)

B. Identification of experts in specific fields :

- marine mammals
- fishes
- marine turtles
- corals
- mollusks & other invertebrates
- marine plants

C. Specific sources of data

- Survey data (e.g. technical reports, EIS)
- Museum and herbarium records
- Other existing databases (Fishbase, Reefbase, PhilReefs)

**III. STRATEGIES**

A. Taxon-based

- Mapping of marine organisms
- Identification of data gaps - some areas have no information - not accessed or no collection

B. Thematic-based

- review of criteria formulated during the previous workshops
- discussed in detail the threats on the marine ecosystem

### 1. Pressure - Threats/Risks

- Destructive fishing
- Introduction of exotic species (species w/c when introduced to a certain area causes negative influence in the environmental condition - e.g.)
- Human population issue
- Siltation
- Industrial threats/risks (potential vs. actual)
- Agricultural threats
- Aquaculture threats
- Harvest pressure/over-exploitation
- Water-based pollution
- Habitat conversion

\* when effects are known and qualified - High, Medium, & Low classification

\* when unknown - presence or absence

\*Although the threats/risks are encompassing to the various marine taxa/habitats, some sub-groups may define their own specific risk qualification criteria.

e.g. non-destructive fishing method can be a threat to marine mammals  
mariculture as an ambiguous issue

### 2. Status

Determining the status of the habitat:

- Coral reefs - CI, MI, DI, SI, based on benthic cover
- Mangroves - change detection (satellite images); stand characteristics (primary, secondary, etc.)

- # of species trophic groups & biomass change
- Seaweeds - # species, % cover, s &
- Mammals & turtles - feeding, spawning, developmental (calving, nursery) areas

### 3. Response - Interventions made/planned

Marine Protected Areas (MPA)

- reviewed the status of MPAs in Luzon
- listing of Luzon MPAs was distributed for evaluation
- 27 out of 257 were evaluated; others are being scored by PAWB

WORKSHOP OUTPUT OF THE PLANTS WORKING GROUP  
by Dr. William Sm. Gruezo

## Plants Working Group

**NBCPSW Regional  
Consultation for Luzon**

**Workshop Outputs**

***“Nomina si nescis, perit et  
cognitis rerum.”***

[Linnaeus 1739, as cited in Gruezo 1999]

## The Plants Working Group

Dr. Daniel Lagunzad, UPDil (Working Group Leader)  
Ms. Vicenta Añonuevo, DENR-Rgn 4  
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Dr. Edwino Fernando, MCME  
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Dr. Armand Palijon, UPLB  
Dr. Filiberto Pollisco, Jr., PCARRD  
Dr. Justo Rojo, FPRDI  
Dr. Prescillano Zamora, UPDil, BCP-CIDS  
Ms. Joy Navarro, CI Phil (Rapporteur)

## Outline

- I. Definition and Classification of Habitat Types
- II. Review of Criteria
- III. Criteria Prioritization
- IV. Mapping of Data and Sources
  - a. Published Literature
  - b. Unpublished Reports
  - c. Collection Reports
- V. Data Analysis and Validation
- VI. Identification of Data Gaps

## I. Definition of Habitat Types

- Definition of SITE / HABITAT should be standardized for all thematic groups
  - Different classifications were made and used by Vertebrates group and Presentation on Local PAs
  - Adapt global classification but equated to what is on the ground
  - Habitat is a primary concern of the PLANT WORKING GROUP
  - Whitmore's classification to be adapted

## I. Definition of Habitat Types

- References:
  - T. C. Whitmore.** 1978. The Tropical Rainforests of the Far East.
  - E. S. Fernando.** 1988. Vegetation of the Philippine Islands. (Unpublished).

### III. Criteria Prioritization

Habitat	SITE								Subtotal
	Habitat Condition					Status of Information	Uniqueness	Species Richness	
	Habitat Diversity	Habitat Conversion	Vegetative Cover	Watershed Quality					
Lowland Evergreen Rainforest	1	1	3	1	2	1	1	1	10
Semi-Evergreen Rainforest	1	1	4	2	3	1	2		14
Forest on Limestone	3	1	4	5	3	1	2		19
Forest over Ultramafic Rocks	3	2	3	4	5	1	1		19
Lower Montane Forest	2	3	2	3	3	1	3		17
Upper Montane Forest	3	1	1	1	3	1	3		13
Sub-alpine Forest	4	1	1	2	4	1	3		16
Freshwater Swamp Forest	5	5	5	5	4	2	4		30
Peat Swamp Forest	1	5	4	3	5	1	4		23
*Parang/ Savannah/ Grassland	4	1	5	4	2	5	5		26

Habitat	SPECIES										Subtotal	
	Endemic		# of Species per Taxon			Endangerment	Invasive Species	Flagship Species	Economic Value			
	Genus	Species	1	2	3				Timber	Non-Timber		
	1	2	3	4	5	6	7	8				
Lowland Evergreen Rainforest									1	1	1	3
Semi-Evergreen Rainforest									3	1	1	5
Forest on Limestone									3	1	3	7
Forest over Ultramafic Rocks									1	3	3	7
Lower Montane Forest									3	3	3	9
Upper Montane Forest									1	5	3	9
Sub-alpine Forest									3	5	3	11
Freshwater Swamp Forest									5	5	1	11
Peat Swamp Forest									5	5	3	13
*Parang/ Savannah/ Grassland									5	3	3	11

1 - Widespread Phil. Endemic 2 - Endemic to 2 to 3 islands 3 - site / localized endemism

Habitat	THREAT											Subtotal		
	Population			Resource Utilization					Tourism	Biodiversity				
	Density	Migration	Poverty	Industrial Acty	Agric Acty	Logging	Mining	Other ECPs			Kaingin		Monocrop- ping	Land-Use Conversion
	Incidence	Intro of Invasive Sp.	Small-Scale Logging											
Lowland Evergreen Rainforest				1	1	3	1	1	1	1	1	3	1	13
Semi-Evergreen Rainforest				3	1	3	1	1	1	1	3	1		15
Forest on Limestone				1	3	1	1	3	3	3	1	1		17
Forest over Ultramafic Rocks				3	3	1	1	5	5	3	5	1		27
Lower Montane Forest				1	3	3	1	3	3	3	1	1		19
Upper Montane Forest				3	5	5	1	3	3	3	1	1		25
Sub-alpine Forest				3	5	5	1	5	5	5	1	1		31
Freshwater Swamp Forest				1	5	5	3	5	5	1	5	3		33
Peat Swamp Forest				5	5	5	5	5	5	5	5	5		45
*Parang/ Savannah/ Grassland				1	5	5	1	3	1	1	5	5		27

Habitat	OPPORTUNITIES										Subtotal	
	Intervention				Restoration Potentials							
	Scale of Information	Conservation efforts	Presence of Mgt. Plans	Restoration determination	Existing measure of Protection	Reproduction Potential	Incidental Calamities	Tourism	Bioprospecting			
	1	2	3	4	5	6	7	8	9			
Lowland Evergreen Rainforest												0
Semi-Evergreen Rainforest												0
Forest on Limestone												0
Forest over Ultramafic Rocks												0
Lower Montane Forest												0
Upper Montane Forest												0
Sub-alpine Forest												0
Freshwater Swamp Forest												0
Peat Swamp Forest												0
*Parang/ Savannah/ Grassland												0

### Summary Table

Habitat	SITE	SPECIES	THREAT	OPPORTUNITIES	Total	Rank *
Lowland Evergreen Rainforest	10	3	13		26	1
Semi-Evergreen Rainforest	14	5	15		34	2
Forest on Limestone	19	7	17		43	3
Forest over Ultramafic Rocks	19	7	27		53	4
Lower Montane Forest	17	9	19		45	4
Upper Montane Forest	13	9	25		47	5
Sub-alpine Forest	16	11	31		58	7
Freshwater Swamp Forest	30	11	33		74	9
Peat Swamp Forest	23	13	45		81	10
*Parang/ Savannah/ Grassland	26	11	27		64	8

\* Temporary Ranking

### List of Recommended Flagship Species of Plants

- *Dipterocarpus alatus*
- *Agathis philippinensis*
- *Tectona philippinensis*
- *Diospyros philippensis*
- *Medinilla spp.*
- *Rafflesia manillana*
- *Strongylodon sp.*
- *Vanda sanderiana*
- *Salacca clemensiana*
- *Cyathea sp.*
- *Matonia sp.*
- *Papiopedilum sp.*
- *Isoetes sp.*
- *Nepenthes spp.*
- *Pinanga spp.*
- *Phalaeonopsis aphrodite*
- *Platynerium grande*
- *Xanthostemon spp.*
- *Glennia philippinensis*
- *Sararanga philippinensis*
- *Litsea leytensis*
- *Falcatifolium gruezoii*
- *Podocarpus spp.*
- *Cibotium cumingii*
- *Renanthera sp.*
- *Lithocarpus sp.*

## Summary of Habitat Types

- Lowland Evergreen Rainforest - Bicol Natural Park
- Semi-Evergreen Rainforest- Western Palawan, Cebu, Panay
- Semi-Deciduous Rainforest - Zamboanga forest
- Forest on Limestone - St. Paul Natural Park
- Forest over Ultramafic Rocks - Palawan, N. Sierra Madre
- Lower Montane Forest - Mt. Makiling, Mt. Banahaw
- Upper Montane Forest - Mt. Data, Mt. Polla
- Sub-alpine Forest - Mt. Halcon
- Freshwater Swamp Forest - along Cagayan River, Agusan
- Peat Swamp Forest - Agusan Marsh
- "Parang"/ Savannah/ Grassland - Carranglan, Nueva Viscaya

## Collection Site Map Based on:

1. Merrill, E.D. (1914). Present Status of Botanical Exploration in the Philippines. 1902-1914.
2. Quisumbing, E. (1953). Botanical Exploration in the Philippines. 1946 - 1953.
3. Madulid, D.A. & H. Gutierrez. (1982). Summary of Botanical Exploration in the Philippines.

## Collection Site Map

### Legend:

- Red = with intensive collections
- Green = "moderate"
- Black = sporadic
- White = unexplored  
e.g. Cresta, Northern Isabela;  
Anacua, Aurora  
S. Mindoro - Mt. Baco-Iglt  
Palawan - Cleopatra's Needle,  
Mt. Gantung, Mt. Matalingahan

***"Nomina si nescis, perit et  
cognitis rerum."***

**Unless you know the names, your  
knowledge of those matters perishes.**

[Linnaeus 1739, as cited in Gruezo 1999]

## VEGETATION OF THE PHILIPPINE ISLANDS

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**Introduction**

The Philippine Islands lie slightly above the equator on the western edge of the Pacific Ocean. They are spread in a north-south orientation between 21° and 5° N latitude and between 116° and 126°E longitude, stretching some 1839 km between Taiwan to its north, and Borneo and Sulawesi to its south. The islands form part of a phytogeographical region known as Malesia that also includes the Malay Peninsula, Singapore, Sumatra, Borneo, Java, the Lesser Sunda Islands, Sulawesi, Moluccas and New Guinea (Fig. 1).

The Philippine archipelago comprises more than 7000 islands of varying sizes and distance apart. About 460 of these islands have an area of at least 2.5 km<sup>2</sup>. The total land area is nearly 300 000 km<sup>2</sup> just slightly more than one-third of the area of New South Wales. About two-thirds of the Philippine area is represented by the two largest islands, Luzon and Mindanao (Fig. 2; Table ~). The remaining one-third is shared by the other islands. Four of these, viz. Samar, Negros, Panay and Palawan have areas above 11 000 km<sup>2</sup>. Seven islands have areas between 1000 and 10 000 km<sup>2</sup> while some 24 others have areas between 100 and 1000 km<sup>2</sup>.

The topography of the islands can be characterized as generally mountainous. There are at least 11 mountains with summits reaching from 1700 m to more than 2900 m. The highest mountain peak is that of Mt Apo (2929m) on Mindanao, closely followed by Mt Pulog (2924 m) on Luzon. The other islands with mountain peaks above 2000 m are Mindoro, Panay, Negros and Palawan. The great mountain ranges are the Cordillera, Caraballo and the Sierra Madre, all on Luzon.

The tropical climate of the Philippine Islands is largely governed by the southwest and northeast monsoons with two main seasons: the wet (typhoon) season from June to October and the dry season from November to May. The mean monthly temperature at sea levels for the warmer months (March-October) ranges from about 26°C to 28°C and for the cooler months (November-February) from 25°C to 26°C. The mean annual rainfall varies considerably in different parts of the archipelago ranging from 900 mm to 4500 mm. The western parts of the archipelago, which are in the lee of many mountain ranges, are generally drier and seasonal in character. The eastern parts receive much of the rainfall and are perhumid. Greatest precipitation occurs when tropical storms (typhoons) cross the archipelago from the Pacific.

**Palaeogeography and Vegetation History**

The Philippine Islands are regarded as having a complex geological history (McCabe et al. 1982). Indeed, recent palaeogeographic models consider the archipelago to be an assemblage of ophiolite terranes, island-arc, ocean-basin, and continental fragments of different origins and ages (Roeder 1977; Hamilton 1979; Audley-Charles 1981; McCabe et al. 1982, 1987; Wolfe 1983; Karig et al. 1986; Mitchell et al. 1986; Geary et al. 1988). This assemblage is believed to have been formed during the Tertiary (Geary et al. 1988). The western parts of

Panay and Mindoro and the northern section of Palawan and its adjacent small islands constitute the Triassic and Jurassic continental fragments rifted off the margin of South China during the Oligocene and colliding with the central Philippine Islands (Hamilton 1979; Holloway 1982; McCabe et al. 1982). Luzon, the largest island in the archipelago, is known to be composed of accretions of terranes and basement complexes of diverse origins varying in age from Late Jurassic to Early Miocene (Karig et al. 1986; Geary et al. 1988).

Audley-Charles (1981) has suggested that some Philippine volcanic islands may have been above sea level for about 70-140 Ma or since the Cretaceous. The collision of the Gondwanic Australia/New Guinea Plate with the Laurasian Indo-Malaysia in the region of Wallace's Line is estimated to be in the mid-Miocene (about 15 Ma) (Audley-Charles 1981). This collision has given rise to new islands through volcanic activity (Audley-Charles 1987). Some of the resulting collision fragments could have been thrust north towards the Philippine area and formed separate islands or accreted to existing larger islands. Wolfe (1983), for example, has suggested that Catanduanes Island and the Surigao area of Mindanao may represent fragments thrust towards the Philippine area from the southwest Pacific as the Australia/New Guinea Plate rafted northwards from Gondwanaland.

There is recent evidence which indicate that fragments of the Australia/New Guinea Plate that drifted north (what are now parts of Sumatra, Malay Peninsula, Thailand and Burma) much earlier than the mid-Miocene collision at Wallace's Line, may have provided stepping stones of dry land in Late Jurassic (160 Ma) (Audley-Charles 1987).

The Philippine archipelago is today linked by island arcs to its neighboring islands to the north and south. The Babuyan-Batanes-Yami island arc connects to subtropical and warm temperate Taiwan in the north. In the southwest are two island arcs that connect the archipelago to Borneo, viz. the Mindoro-Calamian-Palawan-Balabac island arc and the Basilan-Sulu-Tawi Tawi island arc. Another two island arcs link the archipelago to Sulawesi, Moluccas and farther to New Guinea. One of these arcs, the Sangihe, runs directly south from the Davao Peninsula on Mindanao and nearby Sarangani Islands to the Minahassa Peninsula in Sulawesi. The second arc runs from Cape San Agustin on Mindanao and nearby Miangas Island then to Talaud and towards the Sula Islands and Moluccas.

These island arcs have been postulated as migration routes for flowering plants in both directions. The Taiwan-Luzon path in the north via the Babuyan-Batanes-Yami island arc has been recognized by Steenis (1965) as one of three tracks by which mountain plants have entered Malesia. Lam (1945) also has earlier identified the island arcs south of Mindanao as possible migration tracks between the Philippine archipelago and Sulawesi (Fig. 3). The Palawan-Balabac island arc is closely allied with Borneo being geologically part of the Sunda Shelf.

The vegetation of the Philippine Islands bear the influence of the climatic vicissitudes that occurred in Malesia during the Tertiary and Quaternary (Whitmore 1981; Morley & Flenley 1987). These fluctuations, according to Morley & Flenley (1987), have brought about changes in sea levels, in the degree of seasonality in precipitation and in variations in temperature. The lowering of sea levels provided more linkages with mainland Asia and Australia. Cooler temperatures during the Late Quaternary allowed more area for montane plants to migrate. The extensive seasonal climate in the Malesian Region during the Late Tertiary on the other hand, has permitted migration of monsoon plants. There is, unfortunately, very little published work available on fossil pollen or other palaeobotanical

material from the Philippine Islands from their earliest known geological history. Their vegetation history, thus, remains poorly understood.

## **Vegetation**

The natural vegetation of the Philippine Islands is generally a mosaic of different kinds of forests (often called formations, Whitmore 1984a) which differ from each other in structure, physiognomy and floristic composition. The primary vegetation (both dry land and wetland) may be divided into 13 types following the scheme and nomenclature used by Whitmore (1984a). The forest types described by Whitford (1911) have been adapted here with some modifications. These have also recently been reviewed by Tan & Rojo (1988).

Similar formations can be recognized elsewhere in Southeast Asia on the basis of their structure and physiognomy, but the differences in floristic composition can be substantial.

### **1. Tropical lowland evergreen rain forest**

This is the typical tropical rain forest formation in the Philippine Islands. It includes the dipterocarp and mixed-dipterocarp forests. This formation occurs from coastal flats up to c. 900 m elevation and is best developed in areas where rainfall is more or less uniform throughout the year (as in the eastern parts of the archipelago) or where there is only a short dry season. It is characterized by its richness in arborescent flora (Table 2). The Dipterocarpaceae forms the major component of the forest and its emergents. Whitford (1909) has shown that the relative density of dipterocarps, among trees exceeding 40 cm in diameter, varied from 3% on Mindoro to 89% on Negros.

Variation generally occurs within the tropical lowland evergreen rain forest (Whitmore 1984a). Whitford (1911), indeed, recognized sociological units (also termed subtypes or associations) within this formation in the Philippines. These are, however, often not readily distinguishable because of the large number of species concerned and the difficulty of differentiating them in the field. The change from one subtype to another is also usually gradual. The variation is apparently correlated with elevation, topography, soil-water relations and dominant species composition and perhaps even storm frequency.

This type of formation, dominant along the eastern parts of the archipelago, is battered yearly by storms coming from the Pacific. Their canopy structure is often greatly modified becoming more diffuse and allowing more light to penetrate the understorey. This permits dense growth of tangles of rattans (calamoid palms) and lianas, epiphytes, herbaceous plants on the forest floor, arecoid tree palms, and seedlings and saplings of the emergents.

### **2. Tropical semi-evergreen rain forest**

This formation includes deciduous trees in a mixture but with a tendency towards gregariousness (Whitmore 1984a). It occurs in areas where there is yearly water stress of some duration and perhaps bounds the zone of monsoon climates. There is, as yet, no exact delimitation of this formation in the islands, but the deciduous "Yakal-lauan" and "Lauan-apitong" subtypes described by Whitford (1911) probably belong here as well as the semi-

deciduous forest reported on Palawan Island (Hilleshog 1985). The western side of the archipelago, including Palawan, has a seasonally dry climate characteristic of areas where this formation occurs.

### 3. Forest over limestone

The limestone forest in the Philippines is known as the "Molave" (*Vitex parviflora*) forest owing to the distinct presence of this species. This formation occupies low limestone hills, either coastal or bordering large uplifted river valleys, which are mainly composed of crystalline limestone covered by a shallow or very thin soil.

This formation is generally open. Its large trees are few and scattered. The intervening space are filled with small trees and growth of usually sprawling, climbing and small erect bamboos. With a few exceptions, the dominant trees are short-boled, irregular in form and with wide-spreading crowns. The forest has a deciduous foliage, especially on rough topography in regions where the dry season is pronounced.

A number of leguminous trees are dominant in this formation, viz. *Azelia rhomboidea*, *Sindora supa*, *Intsia bijuqa*, *Albizia acle*, *Wallaceodendron celebicum*, *Pterocarpus indicus* and *Kingiodendron alternifolium*. Other dominant species include *Pterocymbium tinctorium*, *Zizyphus talanai*, *Toona calantas*, *Mimusops elengi*, *Maranthes corymbosa*, *Wrightia pubescens*, *Lagerstroemia piriiformis*, and *Heritiera sylvatica*, and such smaller trees as *Diospyros ferrea*, *Pterospermum diversifolium* and *Mallotus floribundus*.

### 4. Forest over ultramafic rocks

This formation occurs in soil rich in heavy metals and is generally characterized by a sclerophyllous stunted vegetation with sharp boundaries. In the Philippines it is found on Palawan (Hilleshog 1985), eastern Isabela, Luzon (and possibly also in northern Zambales), northeastern Mindanao, and on Dinagat Island.

Some of the ultramafic forests on Palawan are only about 2-5 m tall and contain a unique flora including, among others, *Planchonella* sp. and the heavy metal indicators *Scaevola micrantha*, *Brackenridgea palustris* and *Exocarpus latifolius* (Hilleshog 1985). Other tree species include *Ochrosia glomerata* and species of *Gymnostoma*, *Suregada*, *Archidendron* and *Pouteria*. The Mt Victoria area is the largest region of ultramafic forests on Palawan and is home to the endemic tree *Embolanthera spicata*, one of only two species in the genus (the other being in Indo-China).

On Dinagat Island and also the northeastern tip of Mindanao and northern Leyte the ultramafic forest contains the endemic tree *Xanthostemon verdugonianus*.

This formation in the Philippines needs further investigation particularly of its unique flora.

## 5. Beach forest

This formation forms a narrow strip of woodland along the sandy and gravelly beaches of the seacoast. Its composition is uniform throughout Malesia and most of the representative species are pantropical. Many species have fruits and seeds adapted for water dispersal.

The principal species occurring in the Philippine beach forests are: *Terminalia catappa*, *Erythrina orientalis*, *Barringtonia asiatica*, *Thespesia populnea*, *Thespesia populneoides*, *Hibiscus tiliaceus*, *Calophyllum inophyllum*, *Pongamia pinnata*, *Messerschmidia argentea*, *Casuarina equisetifolia* and *Scaevola frutescens*.

Locally one or other species may become dominant, but a mixed association is more usual. *Terminalia catappa* may occur in small patches of pure stands in rich river bottoms. On sandy flood plains near rivers, *Casuarina equisetifolia* usually forms pure stands.

*Desmodium umbellatum* and *Pandanus tectorius* also occur commonly in the beach forest. On the accreting sand there is usually a narrow strip of herbaceous vegetation dominated by *Ipomoea pes-caprae*.

## 6. Mangrove forest

This formation occurs along clayish seashores and in the tidal zones in river estuaries. It can be bordered at its inland side by old shorelines of low hills, by tidal freshwater swamp or more or less sandy transition forest. Along its borders on the lateral side, it merges gradually into the beach formation.

The number of tree species in a mangrove forest is usually limited in the Philippines and elsewhere in Malesia. By far a total of 39 species have been recorded for the Philippines (Fernando & Pancho 1980). The number includes inland marginal species which are usually not abundant. Only about 13 species (in 5 genera and 3 families), however, contribute significantly to the floristic composition of the forest. The following are the more common and abundant: *Rhizophora apiculata*, *Rhizophora mucronata*, *Bruguiera cylindrica*, *Bruguiera gymnorrhiza*, *Bruguiera parviflora*, *Bruguiera sexangula*, *Ceriops decandra*, *Ceriops tagal*, *Avicennia marina*, *Avicennia officinalis*, *Sonneratia alba* and *Sonneratia caseolaris*.

Species of *Avicennia* and *Sonneratia* occupy the seaward side where the soil is generally mixed with sand or coral limestone. Associated with these species is *Osbornia octodonta*, of Australian affinity, which forms almost pure thickets. *Rhizophora stylosa* also invades sandy shores and coral terraces and does not occur inland.

Species of *Bruguiera* and *Ceriops*, as well as *Lumnitzera littorea*, *Lumnitzera racemosa*, *Aegiceras corniculatum*, *Aegiceras floridum*, *Camptostemon philippinense*, *Scyphiphora hydrophyllacea*, *Excoecaria agallocha*, *Heritiera littoralis* and *Cerbera manghas* are found on the inner edges of the mangrove formation.

The following species may be rare to frequent and occur along the borders: *Glochidion littoralis*, *Dolichandrone spathacea*, *Barringtonia racemosa*, *Xylocarpus granatum* and

*Xylocarpus moluccensis*. In cut-over areas and along the edges, the swamp fern *Acrostichum aureum* and two species of spiny scandent *Acanthus* are prominent.

#### 7. Brackish-water forest

This formation occurs on the inland edge of the mangrove and the upper tidal limit of estuaries. It is dominated by the distinctive acaulescent palm *Nypa fruticans*. This species forms extensive pure stands especially along water courses. The brackish-water formation generally merges with the mangrove of which it is often considered a part.

#### 8. Peat swamp forest

This formation occurs in areas where the water table is higher than the surrounding areas, with the peat often about 50 cm deep, acidic, with a soft-crust over semi-liquid interior with large pieces of wood; the only incoming water is from rain (Whitmore 1984a). The presence of peat swamp forests in southern Philippines has been indicated by Whitmore (1984a). In southern Leyte, I have seen small patches of this formation, and there could still be similar areas on Mindanao. In the Philippines, the flora of this formation has never been documented.

#### 9. Fresh-water swamp forest

This formation is regularly to occasionally inundated with mineral-rich fresh-water from rivers and streams with the water level fluctuating, thus allowing periodic drying of the soil surface. Whitmore (1984b) cited two areas of this formation in the Philippines viz., the middle Agusan valley and west of Pagalungan, both areas on Mindanao. All have now apparently been cleared for rice paddies, human settlements or other uses. I have seen tiny vestiges of this formation near Tungao, Agusan Province, also on Mindanao, in the late 1970s. The floristic composition of this type in the Philippines also has never been studied. The remaining small patches, however, indicate that the palm *Metroxylon sagu* may have been a dominant component and occurred in huge stands. It is likely that this formation was once extensive along the large river systems in the archipelago, particularly in the south.

#### 10. Tropical moist deciduous forest

Water availability in this formation is periodically seriously limiting to plants and the forest, and is thus, manifestly deciduous to a considerable degree and generally of lesser stature than the rain forests. Whitmore (1984a) believes that this formation may have once occurred in the central part of the Philippines adjacent to the rain forests of the eastern coasts. It has been suggested by Whitmore (1984b) that the deciduous dipterocarp forest subtypes described by Whitford (1911) belong to this formation. He also indicated the occurrence of deciduous or monsoon forests in the Zamboanga Peninsula in southwest Mindanao. This

obviously merit further study. Very little is known of the floristic diversity and structure of this formation.

#### 11. Tropical lower montane rain forest

The lower montane rain forest in the Philippines is known as the pine forest. It reaches its best development in the high plateau region of the Cordillera Mountains on Luzon. The greater part of it, although at an altitude ranging from c. 700 to 1800 m elevation, is in a region with a distinct dry season.

*Pinus insularis* is the only pine species in the lower montane rain forests of Luzon. In certain areas, scattered pines are found in the grasslands at lower elevations bordering the upper limits of the dipterocarp forest. Pine forests also occur in Zambales in western Luzon and on Mindoro Island. In Zambales, two species are found: *Pinus insularis* and *Pinus merkusii* with an altitudinal range of usually 500 to 1500 m. On Mindoro, *Pinus merkusii* occurs in pure stands and in open groves scattered throughout the grasslands, often above 900 m.

#### 12. Tropical upper montane rain forest

This formation in the Philippines is commonly called the "mossy" forest. It occurs on mountains above 1000 m elevation with the upper limits varying depending on the locality and height of the mountain. The topography is rough and constantly changing. It consists of steep ridges and canyons. Generally the climatic conditions are exceedingly moist, both as regards rainfall and humidity. Opposed to this is the great exposure to winds. Hence, the mossy condition and dwarfed, crooked trees is characteristic of this formation. Many trees seldom reach 20 m tall. The trunks and branches of trees are generally covered with mosses, liverworts, ferns and other epiphytes. The open places are occupied by ferns and grasses.

The floristic composition is relatively complex but less so than the formations at lower elevations. The typical trees in this formation are conifers of the genera *Dacrydium*, *Dacrycarpus* and *Podocarpus* as well as broadleaf genera such as *Lithocarpus*, *Symplocos*, *Engelhardia*, *Syzygium* and *Myrica*. Species of Ericaceae (*Rhododendron* and *Vaccinium*) and Melastomataceae (*Astronia*, *Medinilla*, and *Melastoma*) are common, as is the tree fern genus *Cyathea*.

#### 13. Subalpine rain forest

In the Philippines this formation is, thus far, known only on the Mt Halcon-Mt Sialdang range (2470-2587 in alt) on Mindoro Island. The vegetation is generally regarded as open shrub heaths, mainly characterized by the dominance of small, woody dicots with microphyllous-sclerophyllous leaves, forming a low, dense canopy. The soil is shallow, acidic, and nutrient poor. Many of the genera are mainly temperate in distribution (microtherms). This formation differs from the summit vegetation of the other high mountains (e.g., Mt Pulog, Luzon) where grasses and sedges dominate with few herbaceous elements.

Some of the more common woody dicots on Mt Sialdang subalpine rain forest include *Styphelia suaveolens*, *Rhododendron quadrassianum*, *Vaccinium myrtoides*, *Myrica javanica*, *Leptospermum flavescens*, and *Eurya coriacea* (Mandia 1994). This assemblage of plants fits well with the subalpine formation on the rocky summits of Mt Kinabalu (4101 m alt., Borneo) and Mt Kerinci (3800 alt., Sumatra).

### Diversity and Endemism

Our knowledge of the flowering plants of the Philippine Islands is still sketchy and the present account is inevitably incomplete. Merrill's work of 1923-1926 remains the most useful, but obviously needs revision and updating.

The Philippine flora is a rich one comparable to those of other areas in the tropics (Fig. 4). This richness is, in part, due to the composite origin of the archipelago with its floristic elements of different sources now mixed together. The archipelagic character and mountainous topography of the islands likewise, could have provided flowering plants with diverse habitats and a broader range of ecological opportunities, thus enhancing adaptive radiation.

The indigenous flowering plants are estimated at about 8000 species belonging to nearly 1500 genera and 200 families. These estimates are based from Merrill (1926). The number of species is roughly 26%-32% of the 25 000-30 000 (Jacobs 1974) estimated for the entire Malesian region, while the number of genera represent more than 60% of the total 2382 (Steenis 1987) for the region.

About 37% of the estimated number of species are trees with a stem diameter of 3 cm or more (Salvosa 1963). Indeed, its tree flora is particularly diverse (Table 2).

Of the genera only 23 are now considered endemic or approximately 1.5% of the total (Table 3). This is about 10.5% of the total number of endemic genera (218) for the whole of Malesia. The Philippine endemic genera include representatives of 12 families. There are four in Rubiaceae; three each in Asclepiadaceae and Orchidaceae; two each in Melastomataceae, Sapindaceae, Zingiberaceae and Loranthaceae; and one each in Urticaceae, Leguminosae, Euphorbiaceae, Rutaceae and Compositae.

Endemism at the species level is relatively high, reaching 70% to 80% in certain families, especially those inhabiting primary forests (Merrill 1926; Dickerson 1928). These include, among others, the following, each with no less than 15 genera: Orchidaceae, Rubiaceae, Euphorbiaceae, Sapindaceae, Asclepiadaceae, Palmae, Annonaceae, Meliaceae, Zingiberaceae, Sterculiaceae, Melastomataceae and Verbenaceae (Mitra 1973). The Orchidaceae, with nearly 900 species and 77 genera, is the largest family of flowering plants in the Philippines. In the Palmae with 135 species and 20 genera, species endemism reaches over 70% (Fernando 1990). In *Symplocos* (Symplocaceae) endemism is 77% (Nooteboom 1977), while in *Rhododendron* (Ericaceae) it is 72% (Sleumer 1966). In other families of mostly woody large trees, endemism is slightly lower, e.g. Dipterocarpaceae, 47% (Ashton 1982), Fagaceae, 31% (Soepadmo 1976), Burseraceae, 33% (Leenhouts 1956) and Anacardiaceae, 44% (Ding Hou 1978). However, on the whole, species endemism is estimated at about 75% (Merrill 1926; Dickerson 1928; Mitra 1973).

Despite its essentially Sundaic or West Malesian affinity the Philippine angiosperm flora is quite distinct at the species level.

### Origin and Geographical Relationships

The angiosperms are generally believed to have begun to evolve during the Lower Cretaceous at about the time Gondwanic fragments started to drift northwards and became isolated.

From what is now known of the complex geological history of the Philippine archipelago and of present plant distribution patterns, it is evident that the angiosperm flora of the islands have originated in a variety of ways and from different sources. They are essentially of composite origin, Laurasian or Asiatic and Gondwanic or Australian/Papuan. Thus, within the archipelago there has been convergent migration and further evolution of the relict flora. The long succession of extraordinary situations in the history of the islands may have contributed to some sort of rapid speciation.

The floristic alliances of the Philippines are with Malesia. It clearly belongs to the area west of Wallace's Line (West Malesia) together with Borneo, Malay Peninsula and Sumatra. At least 181 Asiatic- and West Malesian-centred genera find their eastern limits in the archipelago (Steenis 1950).

The mainland Asiatic elements in the Philippine flora are often associated with vegetation confined to medium and higher elevations. Steenis (1950) noted some 32 Asiatic-type genera occurring in the archipelago. Of these 23 are found only on Luzon and 21 genera are montane plants. At least 13 are not known elsewhere in West Malesia (Table 4). Many of these mainland Asiatic-centred genera may have reached Luzon via the Formosa-Batanes-Babuyan island arc. The continental fragment that rifted off South China and collided with the central Philippines could have also served as a stepping stone for migration of Asiatic plants into the archipelago (Tan et al. 1988).

Within West Malesia, the Philippine flora is closely allied with Borneo. About 66 species (Merrill 1926) and certain genera (e.g. *Ludokia*, *Williamsia*, *Tetralopha*, *Myrmeconuclea* in Rubiaceae, *Hallieracantha* in Acanthaceae, and *Philbornea* in Linaceae) are restricted to Borneo and the Philippines. In the Philippines, these genera mainly occur either in the Calamian-Palawan-Balabac area or the Zamboanga-Basilan-Sulu-Tawi Tawi area; all areas lie more or less geologically within the Sunda Shelf together with Borneo. Some species previously thought to be Philippine endemics are now known to occur in Borneo. On the other hand, many Bornean species have now also been recorded from Palawan (Hilleskog 1985).

The Australian-Papuan or eastern element in the Philippine flora is also well-developed. In fact, in West Malesia only the Philippine Islands have an appreciable eastern floristic element. About 64 genera of Australasian affinity occur in the archipelago (Steenis 1985). Of these 18 are montane genera occurring above 1500 m alt. Some 30 eastern-centred genera occurring in the Philippines are so far not known elsewhere in West Malesia (Table 5).

There is also a very striking Philippine-Sulawesi floristic pattern. This has earlier been noted by Merrill (1926) and has likewise recently been shown by Balgooy (1987) at both the genus and species levels for flowering plants. The Philippine Palmae in particular have, more recently, been recorded to show strongest affinity with those in Sulawesi (Fernando 1990). Balgooy (1987) noted that some 32 species of flowering plants are found only in Sulawesi and the Philippines. This distinct Philippine-Sulawesi pattern shows the importance of the island arcs as migration paths that link the two areas together.

To the north of the archipelago towards Taiwan, the Philippine flora becomes attenuated, with at least 388 genera not occurring beyond the country's northernmost island group of Batanes (Steenis 1950). Although there is a distinct floristic discontinuity at the Bashi Channel, there are some 40 species known only from Taiwan and the Philippines (mainly northern Luzon and the Babuyan and Batanes Islands) (Merrill 1926; Dickerson 1928). At least one genus, *Yushania* (Gramineae), is restricted to northern Luzon and Taiwan.

The distinct Asiatic and Australian/Papuan element in the Philippine flora is only a reflection of the composite geological history of the islands.

### Conservation Status of the Vegetation

Much of the original vegetation in the Philippine Islands has already been altered fundamentally and greatly reduced in area. Even within national parks and reserves, vegetation has not been spared.

It has been estimated that the remaining virgin dipterocarp (including lowland evergreen, semi-evergreen and moist deciduous) forests is just over 9000 km<sup>2</sup> or about 3.3% of the total land area (Table 6). In 1934 there was more than 170 000 km<sup>2</sup>. This meant an annual loss of more than 2800 km<sup>2</sup>. The remaining area is being reduced at the rate of at least 400 to 500 km<sup>2</sup> per year (DENR 1989) by logging, shifting cultivation (*kaingin*), and conversion to single species tree farms or agricultural crops.

The mangrove and brackish-water forests have also been drastically reduced in size to less than 20% of their original area in 1920. Much of the denudation is due to conversion into fishponds, as well as over-exploitation for fuel-wood and charcoal production.

The forests over ultramafic rocks on Palawan are threatened by timber poaching for fuel-wood (Hillebrand 1985). Those over limestone have been rapidly disappearing due to excessive timber extraction as well as mining and quarrying. The beach forests have mostly now been converted into either coconut plantations, human settlements, or tourist resorts. There are no reliable estimates for the extent of the remaining ultramafic, limestone and beach forests. It is likely that only very little are left intact.

The fresh-water and peat swamp forests have rapidly been converted into farmlands and settlements, or otherwise heavily exploited and only a few small patches remain. Both formations have never been floristically documented.

The lower montane (pine) and upper montane (mossy) forests also continue to be threatened by milling and by farming of exotic vegetables, especially on Luzon. These formations, when disturbed and abandoned, are of tell quickly transformed into grasslands.

All the natural vegetation of the Philippines is, therefore, endangered and its degradation continues. The destruction of the natural vegetation and of habitats either by logging, shifting cultivation or conversion to other uses, is the most serious threat to Philippine biological diversity. Over-exploitation of particular plant groups is another. Both are real problems that put the future of the rich and diverse Philippine flowering plants at stake.

### Endangered Plants

Some listings on endangered Philippine plants have appeared in the past (e.g. Quisumbing 1967; Madulid 1982; Tan et al. 1986). The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1976) has earlier included seven species of Philippine flowering plants in its appendices, and more are currently being added.

The present state of our knowledge of the Philippine flowering plants is not such that a thorough analysis can be made of how many and what species are extinct, endangered or threatened. Many plant groups are still poorly known. We still do not know what plants occur on what island and in what sorts of habitats. With the extensive devastation of the natural vegetation and habitats, some species previously occurring in certain areas are, almost certainly, now either rare or completely absent. The situation is even more serious for endemic species that are extremely restricted in their geographical range to one or a few localities. Thus, previous listings of endangered plants are generally incomplete and often conservative in their estimates.

However, there are a number of species that have been identified as immediately endangered. Two of these are *Rafflesia manillana* (Rafflesiaceae) and *Tectona philippinensis* (Verbenaceae), of Asiatic affinity. Both species are endemic. *Rafflesia manillana*, although known from three islands including Luzon, has never been recollected. The small population on Mt Makiling (one of only two sites on Luzon) is probably nearly extinct, and was last seen in 1982 just before the site was bulldozed for geothermal exploration. *Tectona philippinensis* occurs only in a small area near Lobo in Batangas Province in southern Luzon and on Iling Island off southern Mindoro. The small area on Luzon where this tree grows has been converted into an exotic fruit tree plantation and the remaining individual trees are felled for charcoal production.

A great number of species are also very rare occurring only in particular habitats and localities. For example, in the large genus *Medinilla* (Melastomataceae) many of the Philippine endemics are very local in their distribution (Regalado 1989). In the Palmae about a dozen endemic species are known only from one or two adjacent localities (Fernando 1990) and some have no longer been sighted in their known areas in recent visits and are now believed to be extinct.

These examples illustrate the situation for many endemic species of Philippine flowering plants.

## Conclusions

The vegetation of the Philippines is diverse in its habitats and flora. Destruction has been reducing its scope even more rapidly than we have been able to catalogue it.

Although plant collecting activity in the Philippines has been shown to have increased since 1974 compared to other countries in Malesia (Prance 1988; Tan & Rojo 1988), the area or island concentration of the collections is not clear. In fact, the collecting density index for each island or province is still not known. It is almost certain that collecting has been carried out unevenly with greater focus on some, mostly readily accessible, areas or islands. Many of the forest formations in the various islands are still poorly collected, notably those in the Sierra Madre Mountains along the eastern coasts of Luzon, the islands of Samar and Leyte, southern Palawan and certain areas on Mindanao. Some have not even been documented floristically. The majority of the plant groups remain insufficiently known and meagerly represented in herbaria, particularly the difficult-to-collect emergent trees, epiphytes, lianas, palms (including rattans), pandans and aroids.

The inventory of the flowering plants of the Philippines is thus, far from complete. There are yet many inadequacies in our floristic knowledge of many parts of the archipelago, particularly of the different formations and habitats. The current "Flora of the Philippines Project", being undertaken under the auspices of the Botanical Research Institute of Texas and the National Museum in Manila (Madulid 1989; Sohmer 1989) is, undoubtedly, a step in the right direction and should proceed with greater urgency. There is also need to immediately set aside and protect adequate representative areas of the various vegetation types in the archipelago to safeguard biological diversity. Botanic gardens, likewise, can help insure the prevention of total loss of floristic diversity by bringing rare and endangered plants into effective cultivation. Time is of the essence in all these undertakings because the decimation of the flora and their habitats is proceeding unrelentingly.

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E.S. Fernando: *Vegetation of the Philippine Islands* 17

**Table 1. Areas of the largest islands in the Philippine archipelago.**

<b>I s l a n d</b>	<b>Area (km<sup>2</sup>)</b>
Luzon	105 708
Mindanao	95 587
Samar	13 271
Negros	12 699
Palawan	11 655
Panay	11 520
Mindoro	9 826
Leyte	7 249
Cebu	4 390
Bohol	3 973

**Table 2. Species richness among trees with a diameter of 10 cm in a tropical rain forest (modified after Pajmans 1976).**

<b>Source of Data</b>	<b>Plot Size (ha.)</b>	<b>Number of Tree Species</b>
<b>Philippines</b>		
Lamao Forest Reserve (Whitford 1906)	1.02	120 <sup>a</sup>
Makiling Forest (Brown 1919)	0.25 0.25	92 <sup>b</sup> 43
<b>Borneo</b>		
Andulau Forest Reserve (Ashton 1964)	2.0	199
Sepilok Forest Reserve (Nicholson 1965)	1.9	198
<b>Malay Peninsula</b>		
Bukit Lagony Forest Reserve (Wyatt-Smith 1949)	2.0	251
<b>Papua New Guinea</b>		
Hill Forest (Pajmans 1970)	0.8	138
<b>Nigeria</b>		
Okomu Forest Reserve (Richards 1939)	1.5	70
<b>Suriname</b>		
Coesewilne River (Schulz) 1960	1.0	116

<sup>a</sup> Diameter not known; includes trees below 4 m tall.

<sup>b</sup> Diameter not known; includes trees over 2 m tall.

**Table 3. Genera of flowering plants endemic to the Philippine Islands; figures in parentheses denote the number of species in the genus (after Steenis 1987).**

Amesiella (Orchidaceae) (1)	Leptosolena (Zingiberaceae) (1)
Antherostele (Rubiaceae) (4)	Luzonia (Leguminosae) (1)
Astrocalyx (Melastomataceae) (2)	Macropodanthus (Orchidaceae) (1)
Astrothalamus (Urticaceae) (1)	Phragmorchis (Orchidaceae) (1)
Caronia (Melastomataceae) (1)	Quisumbingia (Asclepiadaceae) (1)
Clemensiella (Asclepiadaceae) (1)	Reutealis (Euphorbiaceae) (1)
Cyne (Loranthaceae) (1)	Sulitia (Rubiaceae) (1)
Dolichostegia (Asclepiadaceae) (1)	Swinglea (Rutaceae) (1)
Fenixia (Compositae) (1)	Thaumasianthes (Loranthaceae) (2)
Glococarpus (Sapindaceae) (1)	Vanoverberghia (Zingiberaceae) (1)
Gongrospermum (Sapindaceae) (1)	Villaria (Rubiaceae) (5)
Greeniopsis (Rubiaceae) (6)	

**Table 4. Asiatic-centred genera of flowering plants in the Philippine Islands, not known elsewhere in West Malesia (modified after Merrill 1926).**

Acrocephalus (Labiatae)	Peracarpa (Campanulaceae)
Deutzia (Saxifragaceae)	Photinia (Rosaceae)
Distyliopsis (Hamamelidaceae) (also in Sulawesi and New Guinea)	Saururus (Saururaceae)
Ellisiophyllum (Scrophulariaceae) (also in New Guinea)	Skimmia (Rutaceae)
Lilium (Liliaceae)	Tectona (Verbenaceae)
Melientha (Opiliaceae) (also in Lesser Sunda Is.)	Thesium (Santalaceae)
Ophiopogon (Liliaceae)	Triphasia (Rutaceae)
Pegia (Anacardiaceae)	

**Table 5. Eastern-centred genera of flowering plants in the Philippine Islands, not known elsewhere in West Malesia; includes East Malesiaae)**

Dimorphanthera (Ericaceae)	Myrmephytum (Rubiaceae)
Discocalyx (Myrsinaceae)	Neotrewia (Euphorbiaceae)
Dolicholobium (Rubiaceae)	Neuburgia (Loganiaceae)
Ectrosia (Gramineae)	Papualthia (Annonaceae)
Eucalyptus (Myrtaceae)	Pimelea (Thymelaeaceae)
Euphorianthus (Sapindaceae)	Pothoidium (Araceae)
Geitonoplesium (Liliaceae)	Quintinia (Saxifragaceae)
Heterospathe (Palmae)	Sararanqa (Pandananaceae)
Kania (Myrtaceae)	Scaphiophora (Burinanniaceae)
Legnephora (Menispermaceae)	Wallaceodendron (Leguminosae)
Lepiniopsis (Apocynaceae)	Xanthostemon (Myrtaceae)
Loheria (Myrsinaceae)	

Figure Number of genera plotted against log area (km<sup>2</sup>)

1	Barro Colorado, 445/15
2	Penang, 633/270
3	Jamaica, 810/11400
4	Taiwan, 1080/36000
5	Ceylon, 1047/62500
6	Java, 1320/125000
7	Malaya, 1407/132000
8	Philippines, 1308/290000
9	New Guinea, 1463/990000
10	Malesia, 2178/3000000

Data from van Balgooy (1969), Beintema-Hietbrink (n.d. Ceylon), Keng (Malaya, 1970), Merrill (Philippines, 1926), van Steenis (Malesia, 1950).

#### Primary Vegetation Types (forest formations\*) of the Philippine Islands

1. Tropical lowland evergreen rain forest
2. Tropical semi-evergreen rain forest
3. Forest over limestone
4. Forest over ultramafic rocks
5. Beach forest
6. Mangrove forest
7. Brackish-water forest
8. Peat swamp forest
9. Fresh-water swamp forest
10. Tropical moist deciduous forest
11. Tropical lower montane rain forest
12. Tropical upper montane rain forest
13. Subalpine rain forest

Scheme and nomenclature after Whitmore, T.C. 1984. Tropical Rain Forests of the Far East. 2nd ed. Clarendon Press: Oxford. 352 p.

## ATTACHMENTS

- ATTACHMENT 1. PROGRAM
- ATTACHMENT 2. SAMPLE CRITERIA FORM
- ATTACHMENT 3. EVALUATION RESULTS
- ATTACHMENT 4. SAMPLE CERTIFICATE
- ATTACHMENT 5. DIRECTORY OF PARTICIPANTS

Funding support provided by:



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ICLARM, Bicol Univ., Bookmark, Plan Int'l, PSU, KKP, PCSDS, CFI,  
PPSRNP, CRMP Palawan, PTFPP, PNNI and DENR Project  
Agencies (NIPAP, CPPAP, NORDECO)



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# NATIONAL BIODIVERSITY CONSERVATION PRIORITY-SETTING

*Regional Consultation  
for Luzon*

Sept 27 – 29, 2000  
Punta Baluarte  
Calatagan, Batangas

*"Saving the Hottest of the Hotspots"*

*This serves as an invitation*

Opening Program

Facilitators:  
Ms. Lettola Afuang & Mr. Carlo Custodio

Invocation	
National Anthem	
Welcome Remarks :	RED Vicente Paragas Regional Executive Director DENR Region IV
Message :	Dr. Jerry Blisson Head, Office of Environmental Mgt, USAID
Keynote Address :	Hon. Marlo Roño DENR Undersecretary for International Commitment & Local Gov't Affairs
NBCPSW Backgrounder :	Dr. Theresa Mundita Lim Asst. Director, PAWB NBCPSW Convenor
NBCPSW Process :	Dr. Perry S. Ong Country Director, CI Phil NBCPSW Co-Convenor
Luzon Situattoner :	Ms. Mae Lowe Leonida NBCPSW Luzon Regional Coordinator
Emcee: Dr. Edwino S. Fernando	

*"Welcome guests and observers"*

*Everyone is invited to attend the  
special cocktails and socials at night.*

Hosts:

*Dr. Edwino S. Fernando & Ms. Mae Lowe Leonida*

Time	Sept 27 Wednesday	Sept 28 Thursday	Sept 29 Friday
8 am - 9 am	Registration		Nomination of Representatives for the National Workshop
9 am - 11 am	Opening Program	Workshop: Confirmation of NBCPSW Data Sharing/ Validation	Presentation of Map Results and Criteria Resolutions by WGL  Summary by the Regional Coordinator
11 am - 12 nn	Orientation and Levelling of Expectations		Closing Program
Lunch			
1 pm - 2 pm	Assessment of Protected Areas in the Region	Process/Data Collation for the Region	Special Meeting of Working Group Leaders;
2 pm - 5:30 pm	Data Updates from Working Group Leaders and Presentation of Preliminary Species Database and Maps for Luzon	Paper Mapping	Follow-up Consultations; Pack-up & Check out
5:30 pm - 6 pm	PRISMA Introduction		
6 pm - 7 pm	PRISMA Workshop to allow hands-on experience		
Dinner			
8 pm - ad infinitum	Cocktails and Socials	Group Meeting of Working Group Leaders	

**ATTACHMENT 2. SAMPLE CRITERIA FORM**

**Form 1 : Criteria Definition**

Thematic Group:

Form Author:

Criteria:

Definition:

**Values**

Extremely high (1):

Very High (2):

High (3):

Medium (4):

Low (5):

**ATTACHMENT 3. EVALUATION RESULTS**

<b>NATIONAL BIODIVERSITY CONSERVATION PRIORITY-SETTING WORKSHOP</b> Regional Consultation for Luzon Punta Baluarte, Calatagan Batangas September 27 - 29, 2000	
<b>EVALUATION</b>	
1. The NBCPSW process was well explained.	4.3
2. In general, the regional consultation objectives (as indicated in the program) were successfully met.	
Objective #1	4.2
Objective #2	4.2
3. The workshops in my working group	
a. had sufficient time for discussions (relative to the objective and schedule)	4.4
b. were well-facilitated	4.6
c. enriched my insights	4.7
d. provided opportunities for expanding linkages	4.5
4. The provisions were satisfactory for	
a. meals and snacks	4.7
b. lodging	4.4
c. the venue	4.5
d. workshop support materials	4.4
e. communication	4.3
<b>TOTAL</b>	<b>4.40%</b>
5. What are your suggestions to ensure better planning and preparation for the next regional consultations?	
5.1 Arthropods working group needs some resource persons for forested areas and mountain systems, as well as for river systems and tributaries to allow us to link with habitats of arthropods;	
5.2 Arrange the lodging such that members of a working group are billeted in the same room;	
5.3 Next venue should be in a place where e-mail and internet connection can be easily set up;	
5.4 Use of workshop secretariat and to work on the preparation at least 2 months;	
5.5 Rooms should accommodate only 2-3 persons and 2 tables to work our assignment;	
5.6 Strictness on time;	
5.7 Prepare background materials and distribute sufficient copies to participants;	
5.8 Send official invitations at least two weeks in advance;	
5.9 Make arrangements for special food requirements (e.g. vegetarian meals for non-pork eating participants, etc.)	
5.10 Improve audio-visual materials and presentations;	
5.11 Thematic maps should have the appropriate title and should reflect only the necessary information. For example, small river systems should be excluded and base line info. should be present in all maps for reference;	
5.12 Invitations did not reach the regional office/concerned personnel (but received verbal information from PAWB)	
5.13 Time management in the delivery of activities in the program;	
5.14 More socio-econ experts (given the extensive date needed);	
5.15 As much as possible those who have attended previous meetings should also be invited to attend the subsequent meetings to have continuity of thoughts on whatever decisions are to be integrated in the final report;	
5.16 In case of government agencies the communication should be specific on what data/documents that will be brought to the workshop, specifically to the field officers or personnel;	
5.17 More experts. More background paper;	
5.18 Preparation of available literature - needs more	
5.19 "Ang gagaling nilang lahat" (personal communication of Joks with Noel Dumaup)	



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*present this*

# Certificate of Participation

*to*

## *Mariano Roy M. Duya*

*for actively participating in the Luzon Regional Consultation for the National Biodiversity Conservation Priority-Setting Workshop held on September 27 - 29, 2000 at Punta Baluarte, Calatagan, Batangas.*

*Given this 29th day of September, 2000 at Punta Baluarte, Calatagan, Batangas.*

**Dr. Theresa Mundita S. Lim**  
Assistant Director  
PAWB-DENR  
Convenor, NBCPSW

**Dr. Ferry S. Ong**  
Country Director  
CI Philippines  
Co-Convenor, NBCPSW

**Dr. Prescillano M. Zamora**  
Director, BCP  
UP CIDS-NAST  
Scientific Adviser, NBCPSW

**DIRECTORY FOR THE LUZON REGIONAL CONSULTATION**

Punta Baluarte, Calatagan, Batangas

September 27-29, 2000

Name	Affiliation	Address	Contact Nos.	Email	Specialization
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2 Victor S. Soliman	Bicol University	Tabacco, Albay			Fisheries
3 Jose Ma. Lorenzo Tan	Bookmark	264 Vito Cruz Extn., Makati City	897 0824; 895 8061 to 65	<a href="mailto:bookmark@info.com.ph">bookmark@info.com.ph</a>	Marine Mammals
4 William Savella	CENRO, PASu, NSMNP	DENR, NSMNP, Palanan, Isabela			Socio-Economic
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6 Flora Leocadio	CRMP	Coastal Resource Management Program, Rizal, Puerto, Princesa			
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10 Vicenta Anonuevo	DENR, Reg. IV	1515 L & S Bldg., Roxas Blvd., M	450 1313		Protected Areas and Wildlife Management
11 Emelina Mandia	DLSU	Biology Department, De LaSalle University, Taft Ave., Metro Manila	02 536 0228		Plants
12 Reynaldo dela Paz	DLSU	Biology Department, De LaSalle University, Taft Ave., Metro Manila			Fishes
13 Cecilia P. Reyes	Emilio Aguinaldo College	Emilio Aguinaldo College, Taft Ave., Manila			Arthropods (Thrips)
14 Justo P. Rojo	FPRDI	Forest Products Research and Development Institute, CFNR, UPLB, College, Laguna	049 536 2360		Plants
15 Myrissa Lepiten-Tabao	Haribon	#9 Malingap St., UP Village, Diliman, QC	433 3476		Mammals
16 Rodolfo Reyes	ICLARM	IRRI Cpd., Los Baños, Laguna	845 0563; 891 1292		Fish
17 Noel Dumaup	KKP	#23 Maalindog St., UP Village, Diliman, Q. C.	433 3220 to 22	<a href="mailto:ndumaup@wwf-phil.org.ph">ndumaup@wwf-phil.org.ph</a>	Reef fishes
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**PLATES**



Plate 1. Plant Working Group



Plate 2. Insects and Allied Arthropods Working Group



Plate 3. Vertebrate Working Group.



Plate 4. Marine Working Group.



Plate 5. Freshwater Working Group.



Plate 6. Socio-Economic and Cultural Working Group.

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Plate 7. Information Group and the CPSW Staff.



Plate 8. Luzon Regional Consultation Participants.



Plate 9. Plenary session.



Plate 10. Plenary session.



Plate 11. Insect Working Group during the workshop session.



Plate 12. Vertebrate working group during the workshop.



Plate 13. Freshwater working group during the workshop session.

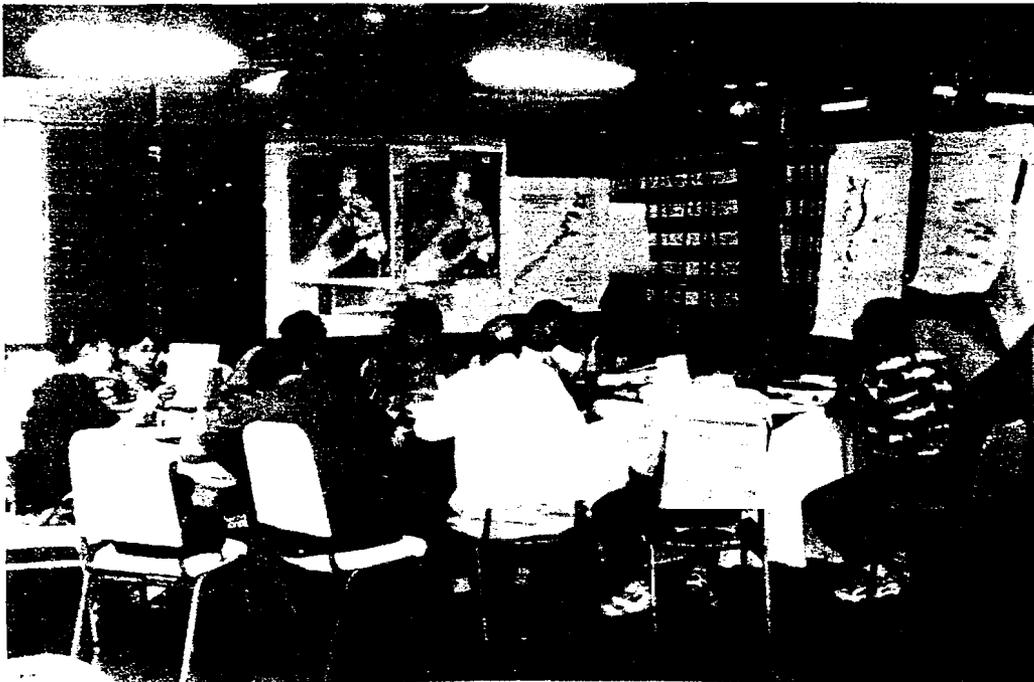


Plate 14. Marine working group during the workshop session.



Plate 15. Plant working group during the workshop session.



Plate 16. Socio-econ working group during the workshop session.

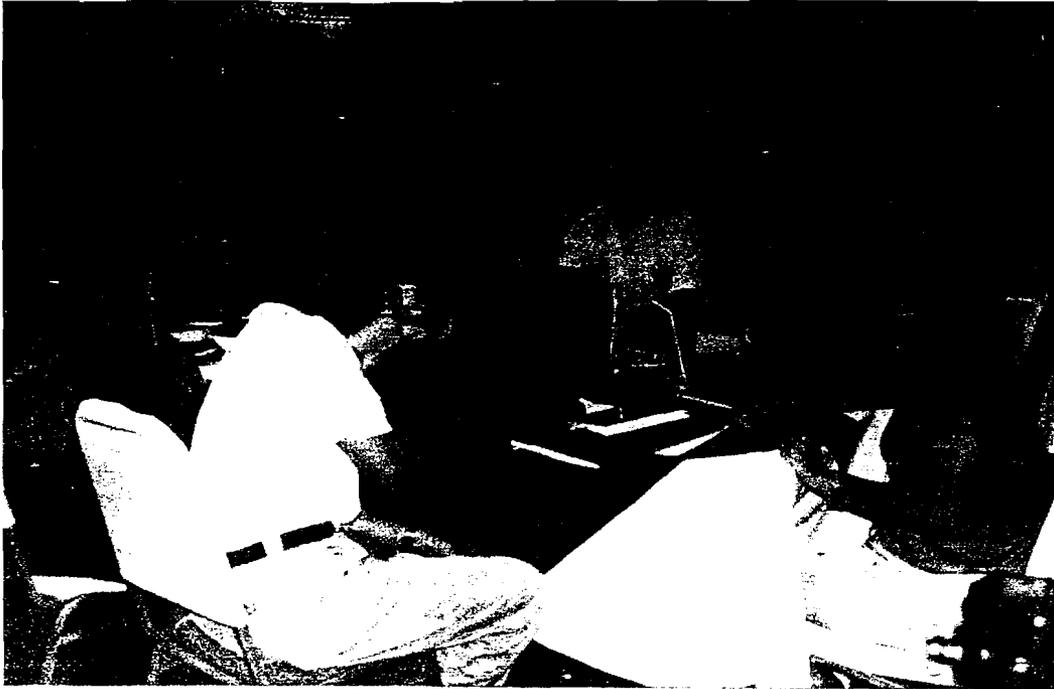


Plate 17. Information working group at the workshop.

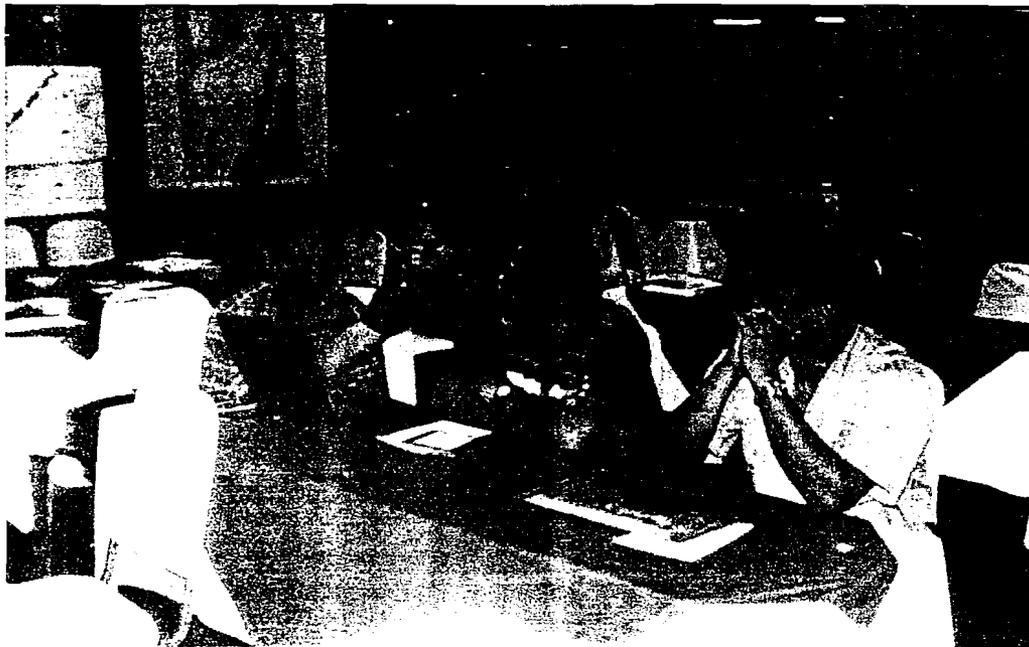


Plate 18. Prisma hands-on training.