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SMITHSONIAN INSTITUTION

Washington, D.C. 20560
U.S.A.

May 20, 1988

Dr. John O. Wilson
Project Officer
Bureau of Latin America and the Caribbean
Agency for International Development
Washington D. C. 20523

Subject: Final report grant No. LAC-0506-G-SS-7021-00

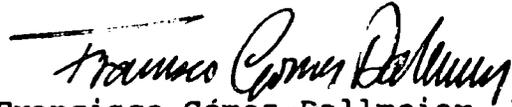
Dear. Dr. Wilson:

I am happy to provide five copies of the final report of the workshop activities co-sponsored by the Smithsonian/Man and the Biosphere Biological Diversity Program and the U. S. Agency for International Development. As you will see, four field training workshops, two in the Beni Biosphere Reserve of Bolivia, and two at the Manu Biosphere Reserve of Peru, and two Museum workshops at the Smithsonian Institution in Washington were conducted in 1987 and 1988. In the field, 53 in-country participants were trained in the newly developed methodology of conducting biological inventories, and research techniques. In the National Museum of Natural History in Washington, 21 Latin Americans participated in Museum Workshops during which they learned skills that were complementary to the field activities and had the opportunity to work on a one to one basis with Smithsonian scientists.

As you will see from reading this final report, we not only provided basic scientific training for our Latin American Colleagues, but also the opportunity to start their individual research, the interaction with other fellow scientists from their countries and abroad, and the institutional linking among the Smithsonian and national institutions. The consequences of these long term links is what I believe will provide the basis for conservation and sustainable development of natural resources in developing countries.

Please enjoy reading the report and if you have any question do not hesitate to contact me.

Yours sincerely,



Francisco Gómez-Dallmeier, Ph.D.
Assistant Director, SI/MAB
Biological Diversity Program
1100 Jefferson Drive, S.W. I.C. 3123

cc. Clark, Erwin, Hoffmann, Shealy, Victurine

**WORKSHOPS IN BIOLOGICAL DIVERSITY INVENTORY METHODOLOGY
CONDUCTED UNDER THE SMITHSONIAN INSTITUTION/MAN AND THE BIOSPHERE
BIOLOGICAL DIVERSITY PROGRAM**

FINAL REPORT

Introduction

Biological diversity of the tropics is at great risk as developing countries destroy their natural resources. This misguided exploitation reduces the alternatives to which we can turn for new bioresources. Worse yet is the fact that very few of the species on earth has been screened for their economic potentials, and many are rapidly heading toward extinction. The Biological Diversity Programs BIOLAT and SI/MAB of the Smithsonian Institution are addressing needs arising from loss of biological diversity in developing countries. Under the program an integrated approach, or master protocol for consistent modern biotic inventories has been developed (Figs. 1-4). This methodology was developed based on the followings needs: 1) better research data bases for scientific synthesis of phylogeny, biogeography evolution and conservation of species of plants and animals, especially in the tropics, 2) more precise data than is presently available for management of protected areas and bioresources use, and 3) integrated training workshops in the field and museum for young people from developing nations who are, and/or will be, the leaders of their countries. They ultimately will promote a better science, conservation, and sustainable use tropical bioresources.

The co-occurrence inventory protocol developed is being taught to, and used by, biologists, conservationists and protected areas managers of host countries. The information gathered is shared with other international organizational databases, enhancing international data sharing for biological information for protected areas around the world. Parallel to the training in the computer methodology, the Biodiversity Programs are providing training in systematic, natural history, ecology, conservation and management of protected areas. During 1987-88, four field training workshops in Beni Biosphere Reserve of Bolivia and Manu Biosphere reserve of Peru, and two museum workshops in Washington were conducted. A total of 66 Latin Americans participated in these workshops. The two biosphere reserves chosen have become long term research sites and the model for other protected areas world wide.

Programs definition

Biological inventories in tropical Latin America Program (BIOLAT) is designed to conduct species research in the ecosystems of the species rich area west and north of the Amazon

Basin, from Bolivia in the south to the French Guyana in the northeast. The program will eventually expand to all Latin America and the Caribbean. Funds from this program come from the National Museum of Natural History of the Smithsonian Institution.

Smithsonian Institution/Man and the Biosphere Biological Diversity Program (SI/MAB) provides training in the bioinventory methodology protocol, ecology, natural history of natural environments, and protected areas conservation and management. This is a joint program between the Smithsonian Institution and the UNESCO Man and the Biosphere Program. The scope of this program is worldwide. Funds come from the International Center of the Smithsonian Institution, UNESCO Man and the Biosphere Program, and other private and government organizations.

Field workshops (Bolivia, Peru)

Two field workshops were conducted at the Beni, Biosphere Reserve of Bolivia. The first one between August 22 and September 4, and the second one between September 4 and October 17 of 1987. From over 60 applicants, ten Bolivian participants were selected by a Bolivian Steering committee formed by individuals from the National Academy of Science, National Museum of Natural History, Ecology Institute, National Universities and others.

In Peru, two field workshops were conducted in the Manu Biosphere Reserve. The first one was held from September 26 to October 1, and the second one from October 15 to October 30 of 1987. Sixteen Peruvian participants were selected for each workshop out of over 100 applicants by a Peruvian steering committee formed by individuals from the San Marcos University, San Marcos Museum of Natural History, La Molina University, APECO, and others.

In La Paz and Cuzco respectively, the participants were given a welcome, orientation, and introduction to the program. The daily activities were organized in such a way that each participant had the opportunity to learn the basic methodology of the bio-inventory process: surveying that consisted of habitats selection, trail mapping, and delimitation of permanent plots; tree identification and tagging by tropical botanists sharing the information first hand in the field with the workshop participants; tree mapping that consisted of measuring the location of the tree species within the plot and the elaboration of the species map with the computer. Individual research activities were conducted daily by each researcher, and workshop participants learned research methods and techniques. A detailed participants booklet is included in appendix 1.

During the field workshops, three plant zones were selected for inventory and long-term monitoring in Bolivia and six in Peru. These zones were island forest, dissected terrace forest, inundation forest, high terrace forest, ancient cocha successional forest, aguajal forest, and the upper primary

floodplain forest. Seven of these (four in Peru and three in Bolivia) had all of the trees identified at least to family level, and mostly to genus and species by tropical botanists. Over 3,000 trees species were identified and many botany samples were collected for herbarium identification and research. Research was coordinated by individual scientists in mammals, birds, fishes, invertebrates, mollusca and archaeology.

During the evenings, lectures were given by professors and trainees on a wide variety of subjects, covering research specialties, techniques such as the inventory methodology based on co-occurrence, specimens preparation, scientific illustration and photography. Trainees presented lectures on their own research as well as describing their institutions.

Museum workshops

Two museum workshops have been held at the National Museum of Natural History at the Smithsonian Institution in Washington (Appendix 2). The first between February 9 and 28 of 1987 and the second between April 18 and May 6 of 1988. A combined total of twenty one Latin Americans participated in these workshops. The workshops were organized to provide the participants with a complete overview of all the aspects related to museum research, management and conservation. The participants had also the opportunity to interact individually with Smithsonian researchers in their different areas of expertise, and conduct their own research with their Smithsonian counterpart. The seven participants in the second workshop began long term research projects with Smithsonian counterparts, and three of them extended their stay in Washington to conduct research at the institution.

Other workshops

Co-sponsored by the U.S. Man and the Biosphere Program a workshop in biological diversity protocol techniques was conducted in the Biosphere Reserve of Luquillo Puerto Rico, between May 22 and 28 of 1988. Eighteen participants attended to this workshop that was held in collaboration with the University of Puerto Rico, the Institute of Tropical Forestry, the Department of Natural Resources, and the Center for Energy and Environmental Research (Appendix 3). Three week workshops are scheduled in Beni Biosphere Reserve of Bolivia in July and Manu Biosphere Reserve of Peru in September where the program began last year and long term research sites were established.

Summary of activities

Analysis of the trainees' evaluation forms for the field and museum and feedback from trainers and in-country scientists indicated that the training and scientific activities of the program went exceedingly well, and much of the original objectives were accomplished. Specific feedback has resulted in redesigning portions of SI/MAB'88. For this purpose, a broader and more intense training curriculum will be offered including tropical ecology, systematic, management of protected areas, and

research and conservation (Appendix 4). Also, several experts will be invited to cover specific areas and a curriculum consultant with experience in education will be helping in the development of the curriculum program.

Figure 1

SMITHSONIAN INSTITUTION AND MAN AND THE BIOSPHERE BIOLOGICAL DIVERSITY PROGRAM [BIOLAT — SI/MAB]

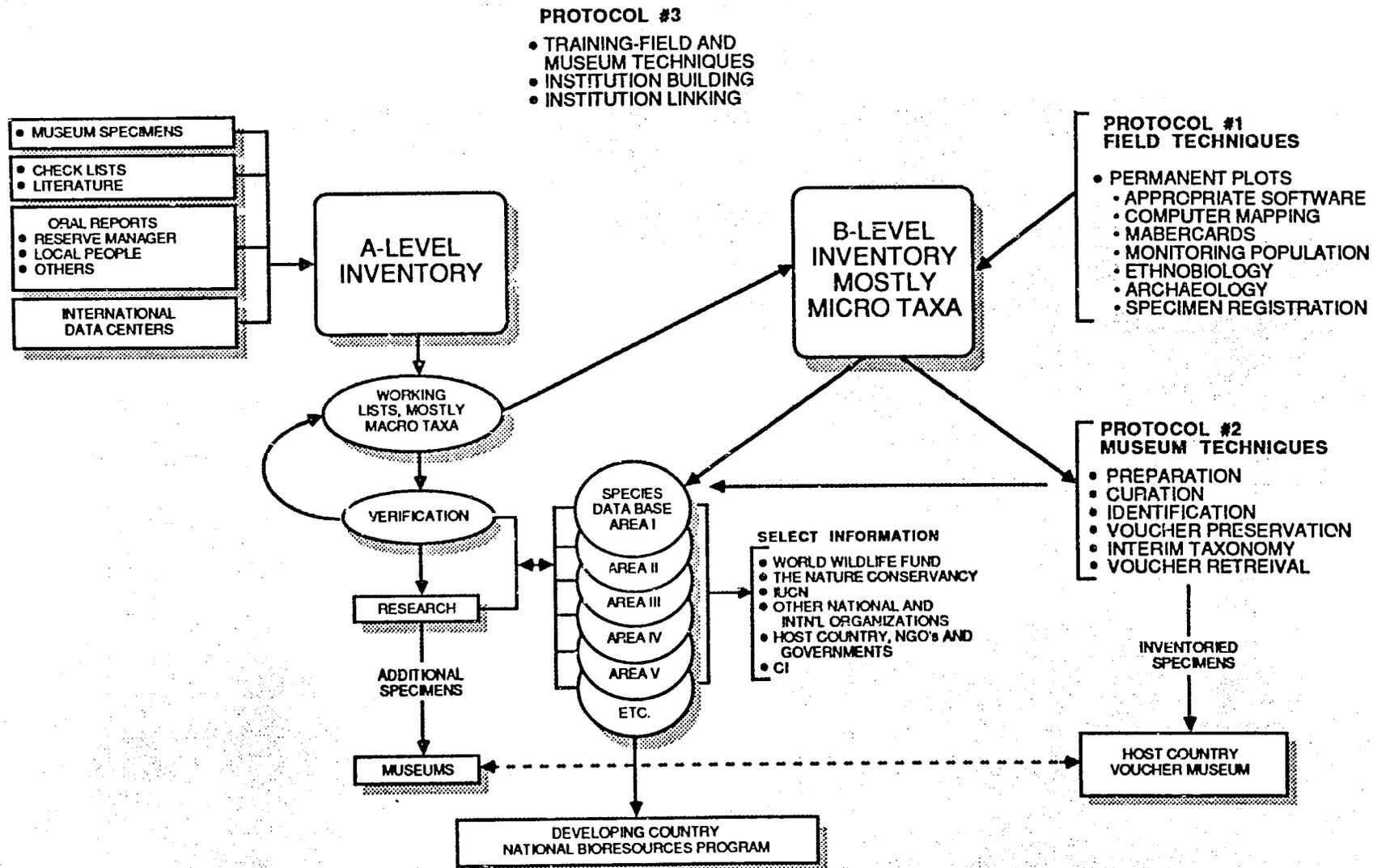


Figure 2

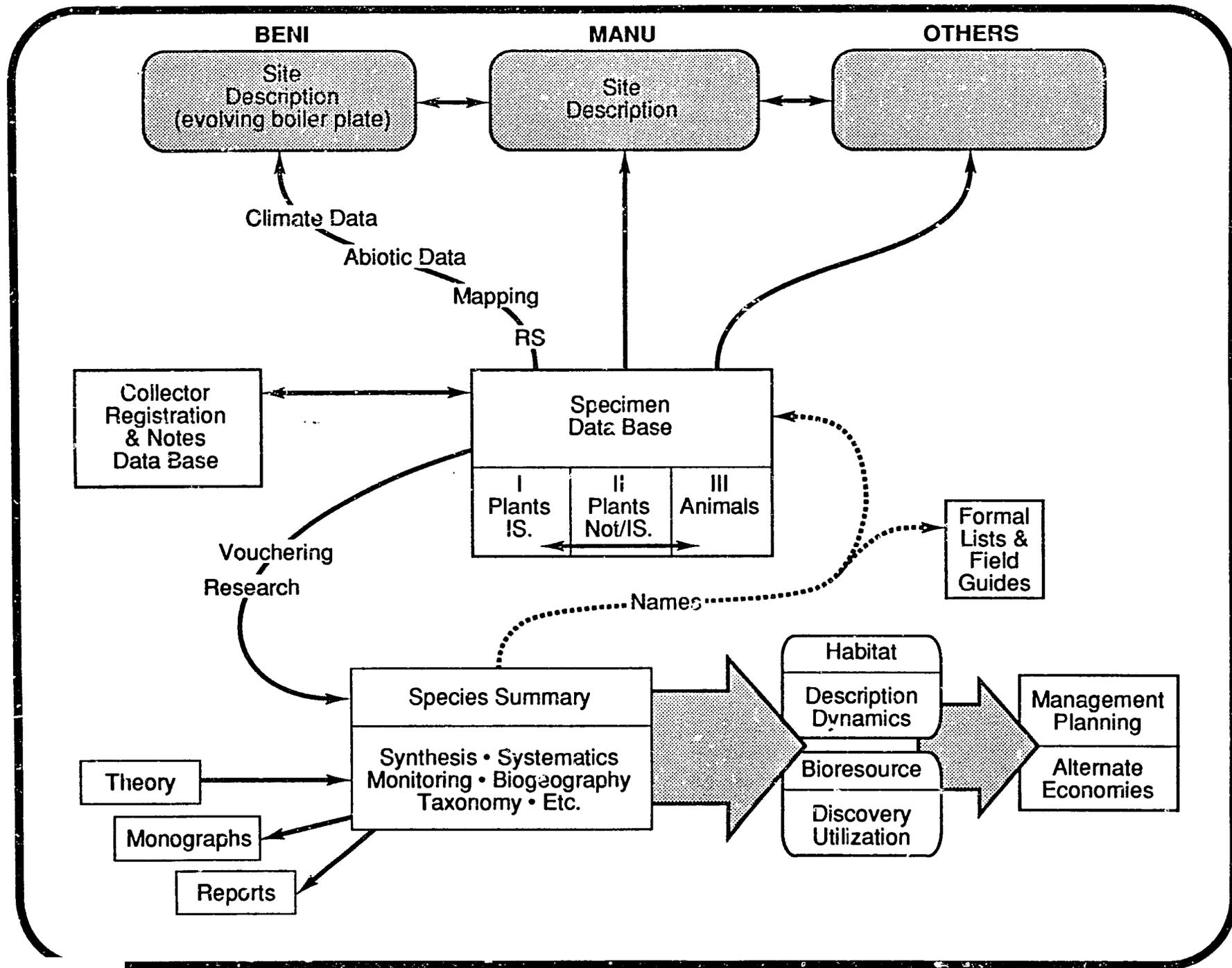
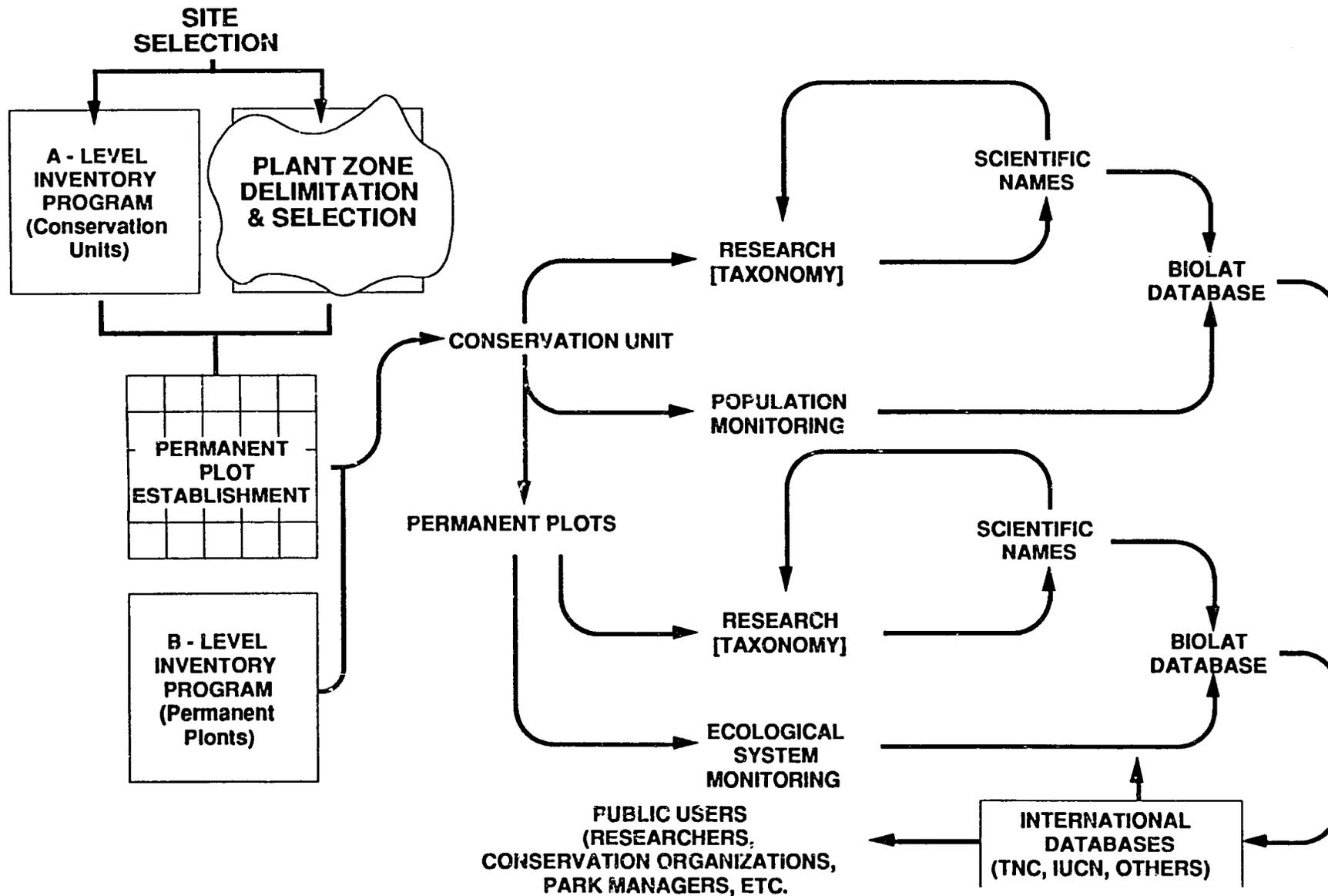


Figure 3

BIOLAT — SI/MAB PLOT MAPPING AND RESEARCH PROGRAM



BIODIVERSITY RESEARCH

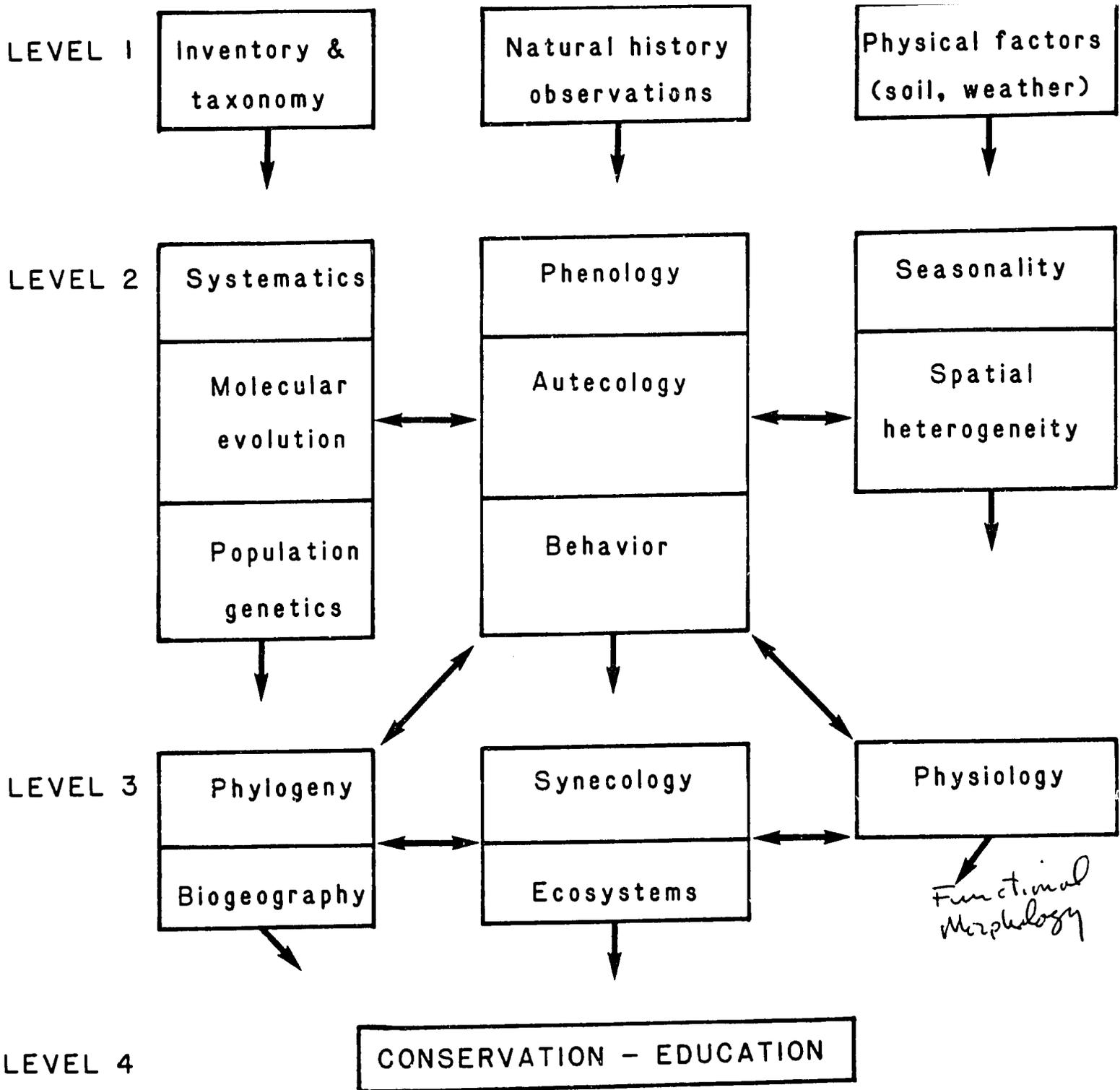
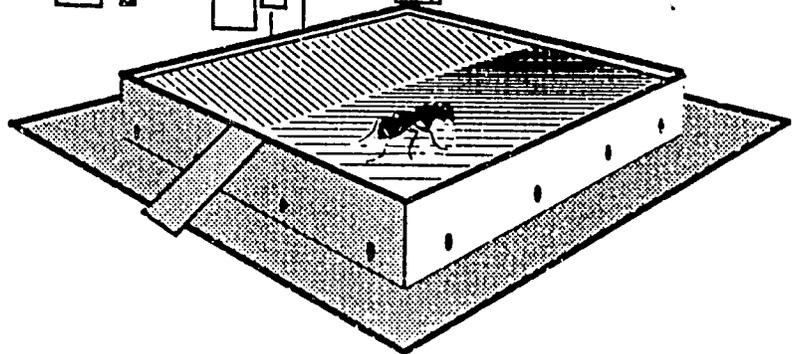
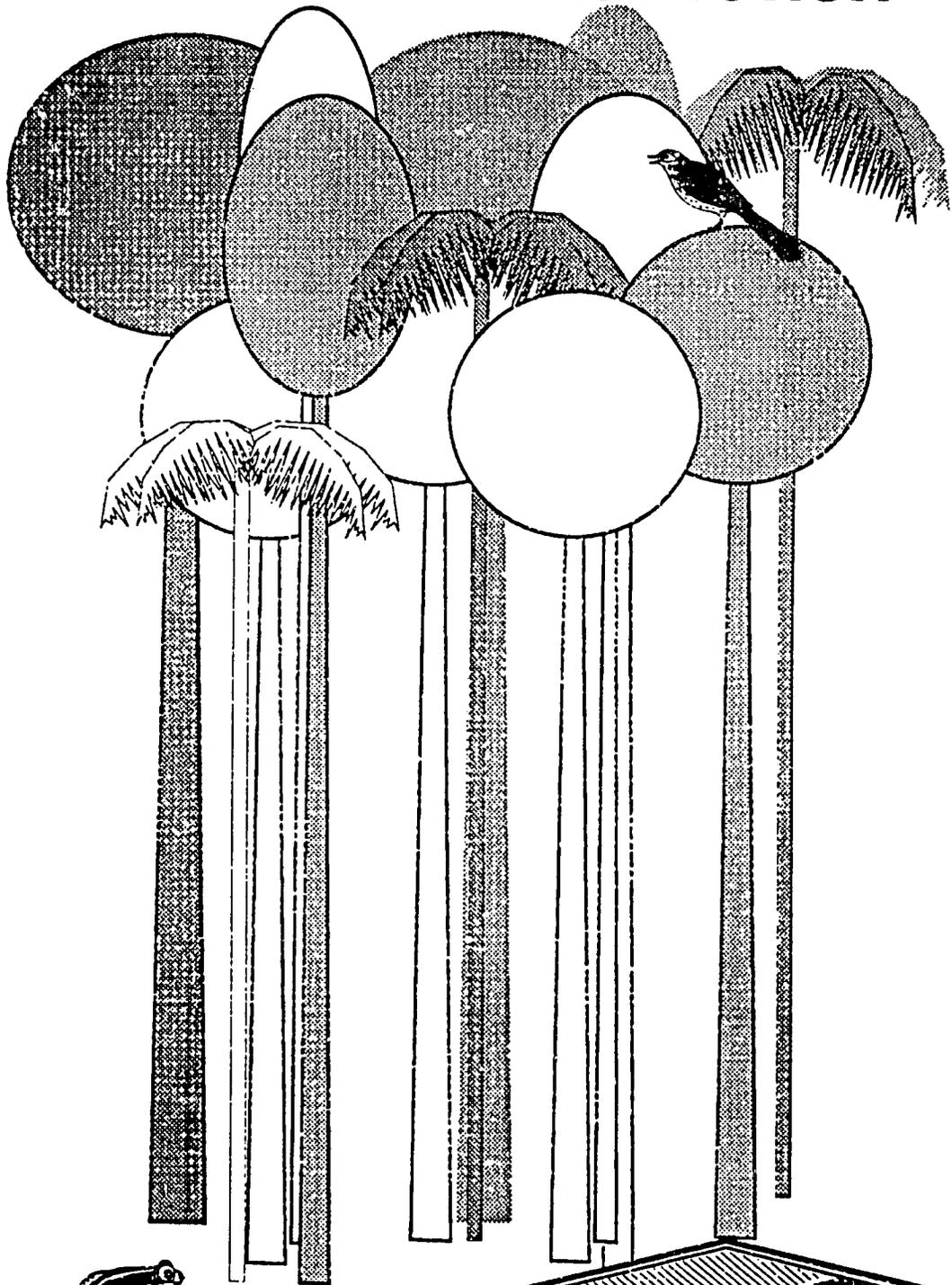


Figure 4

Appendix 1

Participant's Booklet (Bolivia & Peru)

SMITHSONIAN INSTITUTION





National Museum of Natural History · Smithsonian Institution

WASHINGTON, D.C. 20560 • TEL. 202-

July 24, 1987

Dear "student's name",

On behalf of the Smithsonian Institution/Man and the Biosphere Biological Diversity Training Course and the BIOLAT Program of the United States National Museum of Natural History, I welcome you on this expedition to Beni Biological Station and the Biosphere Reserve. You have been selected from among numerous other candidates for the first of the Program's training courses; you will be a pioneer in what we expect to be a long-term activity in your country. Congratulations on your selection.

The attached program and schedules, lists of participants, as well as other important information, will give you a general overview of this joint Bolivia-U.S. program. I strongly encourage you to read it in detail before arriving at the Station.

Particularly, I want to point out the Evaluation Form (item IX). It is crucial to the success of the program for you take the time and put some thought into this and return it to me by the end of your stay at the Station. The program is young and your careful evaluation and critique on this form will help the program grow in the right directions. Thank you.

My colleagues and I look forward to meeting you and working with you in your highly diverse and interesting subtropical forests and savannas.

Sincerely yours,

Terry L. Erwin
Director, BIOLAT-SI/MAB
Biological Diversity Program

encl: Program Orientation materials

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I



National Museum of Natural History · Smithsonian Institution

WASHINGTON, D.C. 20560 • TEL. 202-

BIOLOGICAL DIVERSITY IN LATIN AMERICA INVENTORY PROGRAM (BIOLAT)

Program Statement, Objectives and Goals, Participant Requirements

OBJECTIVE: This Program was defined to develop inventories of species in terrestrial ecosystems in the rich crescent of biodiversity of western and northern Amazonia from Bolivia in the south to French Guyana in the northeast.

ELIGIBILITY: All members of the NMNH scientific staff, their assistants and students, and co-investigators from other Smithsonian Bureaux, and invited non-Smithsonian colleagues and graduate students collaborating directly and in a complementary manner with NMNH scientists.

GOALS:

- To inventory elements of the biota in tropical Latin America at protected sites in the western and northern Amazon Basin to the crest of the Andes, and along the tepui transect onto the Guiana Shield using co-occurrence methodology.
- To generate a relational electronic database for the inventoried flora and fauna which will serve a variety of users in a variety of ways.
- To produce reports and publications of a descriptive nature about the elements of the biota.
- To develop synthesis statements about tropical biology, systematics, and biogeography from the database and report on these periodically.
- Every few years as appropriate sponsor a conference or symposium and publish the proceedings.
- To permanently store voucher material for all appropriate biotic elements in the inventory system and make these available to users.

Augmenting the above is a Program of training of nationals, in each country in which inventories are carried out, sponsored by UNESCO/MAB and other agencies such as USAID and World Heritage Program for the following:

- To use SI inventory and vouchering co-occurrence methodology as a basis for training host-country biologists and conservationists in systematics, biogeography, ethnobiology, conservation, park management, or sustained resource utilization.
- To assist in development of voucher museums and national biotic databases in each country in which inventories are carried out.

Participant requirements

NMNH and other U.S. co-investigators:

- All participants will be expected to interact in a multidisciplinary team approach toward the inventories and general goals of the Program.
- All participants will need to identify, with the assistance of the Program Director if necessary, host-country counterparts or students for the purposes of joint research or training.
- All participants will file a report upon completion of their field season. Reports at the basic level will depend upon the role of the participant, whether taxonomic, technical, etc.
- All scientific participants will be expected to keep their portion of the central database current and accurate as additional material is gathered or identified; the central database will then transmit the information to the regional or country databases.
- All participants can expect to be called upon periodically to produce contributory material for periodic publications resulting from the Program's conference and symposium series
- All participants will be expected to work within the convenios or other arrangements set between the SI and host-country governments, particularly with regard to collected materials.

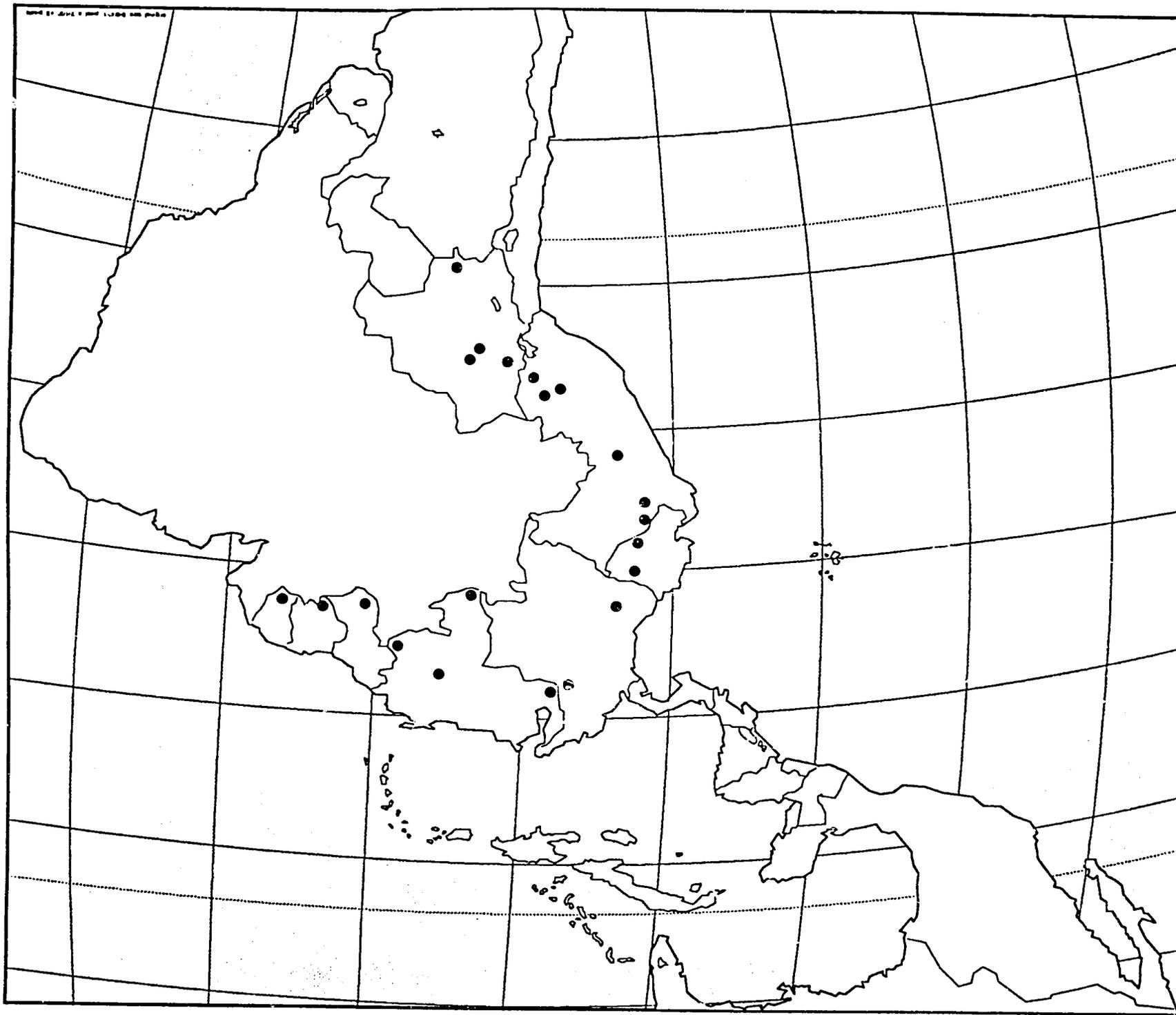
CONTACT:

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Species Database. Inventories of taxa of the selected areas will reside in host country databases as will the voucher specimens; however, since these databases are electronic they may also reside at other localities. Databases from all areas will be collected at the Smithsonian Institution which will serve as a Data Center and clearinghouse. Because other groups, especially those concerned with conservation, will need access to certain parts of the database, the design will allow them to do so via modem or diskette transfer.

PURPOSE OF PROJECT.

To provide 1) a standardized system for recording, storing, retrieving, and sharing information regarding biological diversity; 2) training in all aspects of the system for biologists and conservationists in developing countries; 3) on-site inventories of core areas and buffer zones of Biosphere Reserves and other species-rich areas of mutual interest to the Smithsonian Institution and host countries; 4) means and rationale for establishment of voucher museums in developing countries around which a biodiversity infrastructure could be based; 5) coordination and facilitation of research projects on biological diversity in Biosphere Reserves and other species-rich areas of interest to the Smithsonian Institution scientists and their host country counterparts; 6) diffusion of information about the project on an international basis through various appropriate means.

LOCATIONS OF PROJECT.

Training aspects of the project will take place in the field in core areas and buffer zones of Biosphere Reserves and other species-rich areas of mutual interest to the Smithsonian Institution and host country, and in museums in host countries and in the United States, wherever most appropriate. Museum workshops in the United States will be primarily at the National Museum of Natural History, but are not so restricted. The field training workshops will be held in association with on-going inventories. Selection of areas will depend upon funding sources; for example this proposal will focus on USAID countries. Funding from UNESCO will be tied to countries in which UNESCO is most interested. Funding from the Smithsonian Institution for inventories will be dependent upon the interests of scientists and their counterparts in developing countries. The whole project will have a tropical and subtropical focus, however, and will be oriented toward species-rich protected areas because of the need for permanent plots which can be monitored over long periods of time.

TIMING OF PROJECT.

The in-country phase of the project will begin in April of 1987 with six workshops. Once the project is completely moving, late in 1988, we expect to have biologists in the field throughout the year in numerous countries and to hold museum training workshops monthly. This potential is dependent to a large extent on available funding. In the short term, we have designated 1987 as the year to test all aspects of the system with biologists from developing countries. Four workshops will be held in the field under USAID auspices (this proposal): 2 in Peru, 1 in Ecuador, and 1 in Bolivia. Each pair of these will be followed by a museum workshop in Washington, D. C. Possibly one more will be held in Puerto Rico using separate funding sources. These workshops will be spread over the year to take advantage of seasonality of flora and fauna.

TRAINING ASPECTS DESIGN

Nomination of trainees from developing countries will be made by systematic biologists and conservationists in those countries. Selection will be made by a task force of scientists from those countries and from the Smithsonian Institution. Those selected will be trained as a team at selected field sites in parts of the master protocol (Appendix C) related to field work, including setting up of permanent plots, mapping trees in these plots, using these trees as loci of inventory of microtaxa associated with them, recording all data on laptop portable computers in the field, collecting voucher specimens associated with the data, and transporting these specimens back to museum research facilities in the host country. Following the field work, workshop participants and their selected voucher material will travel to the Smithsonian Institution for the museum workshop phase which will utilize the material they bring with them. This material will become the core of the developing voucher museum in the host country with eventual counterpart vouchers deposited in the Smithsonian and other cooperating institutions.

PROJECT EVALUATION.

At present the Program is run by its director and program manager with the assistance of one half-time secretary. Two advisory bodies, one of Smithsonian biologists from four bureaux, and another international board with members from NGO's, Universities, museums, and herbaria, provide advice concerning project design. In the third year of the Program, a blue-ribbon panel of experts will review all program accomplishments and recommend future directions. Day-to-day oversight is provided by administrators in the National Museum of Natural History and the Directorate of International Activities.

Master Protocol flow diagram (with annotations).

PROJECT DESCRIPTION

This figure outlines the master protocol of the project, showing how all its aspects will be transferred through training workshops to biologists of developing countries. Appendix C shows an example of a Mabercard.

A-Level Inventory. Many protected areas of the world have some sort of listing for major or dominant flora and fauna. Several of these areas have been studied by at least a few biologists which have published their findings and/or deposited specimens collected in national museums. Information associated with these specimens and that gleaned from local peoples and reserve managers will provide a working list of species for selected sites. A database protocol and software have been developed to accept these kinds of records which will produce working lists of species and which can be shared with other interested organizations.

Verification. Species on the working list must be verified through voucher specimens housed in a museum, or in the case of endangered species by sightings of qualified specialists. Such verifications make the record of occurrence available for the Area's Species Database.

B-Level Inventory. Based on national and international priorities in science and conservation, and with participation of appropriate host country agencies, sites will be selected for detailed inventory and as training sites for host country biologists and conservationists. Through the use of Protocol #1, selected areas will be inventoried in-depth by establishing permanent plots in all of the habitats occurring in the at the site selected. These permanent plots consist of surveyed and grided terrain with permanently staked 20 sq. meters quadrats. All trees, 10 cm dbh or greater, are permanently tagged and mapped using software and laptop computers in the field. Habitats without trees are mapped according to whatever dominant plant life is available. Computer-generated maps are duplicated and laminated into Mabercards which are used subsequently for survey purposes. Mapped and permanently tagged trees or other dominant plant life become the focus and reference points for inventory of the microtaxa in the area. These permanent plots also provide the loci of species monitoring in assessing changes in the environment through time and loci for Research. Protocol #2 is applied to all inventoried species through vouchering techniques, that is, standard museum preparation and storage methods appropriate to whatever taxa is in hand.

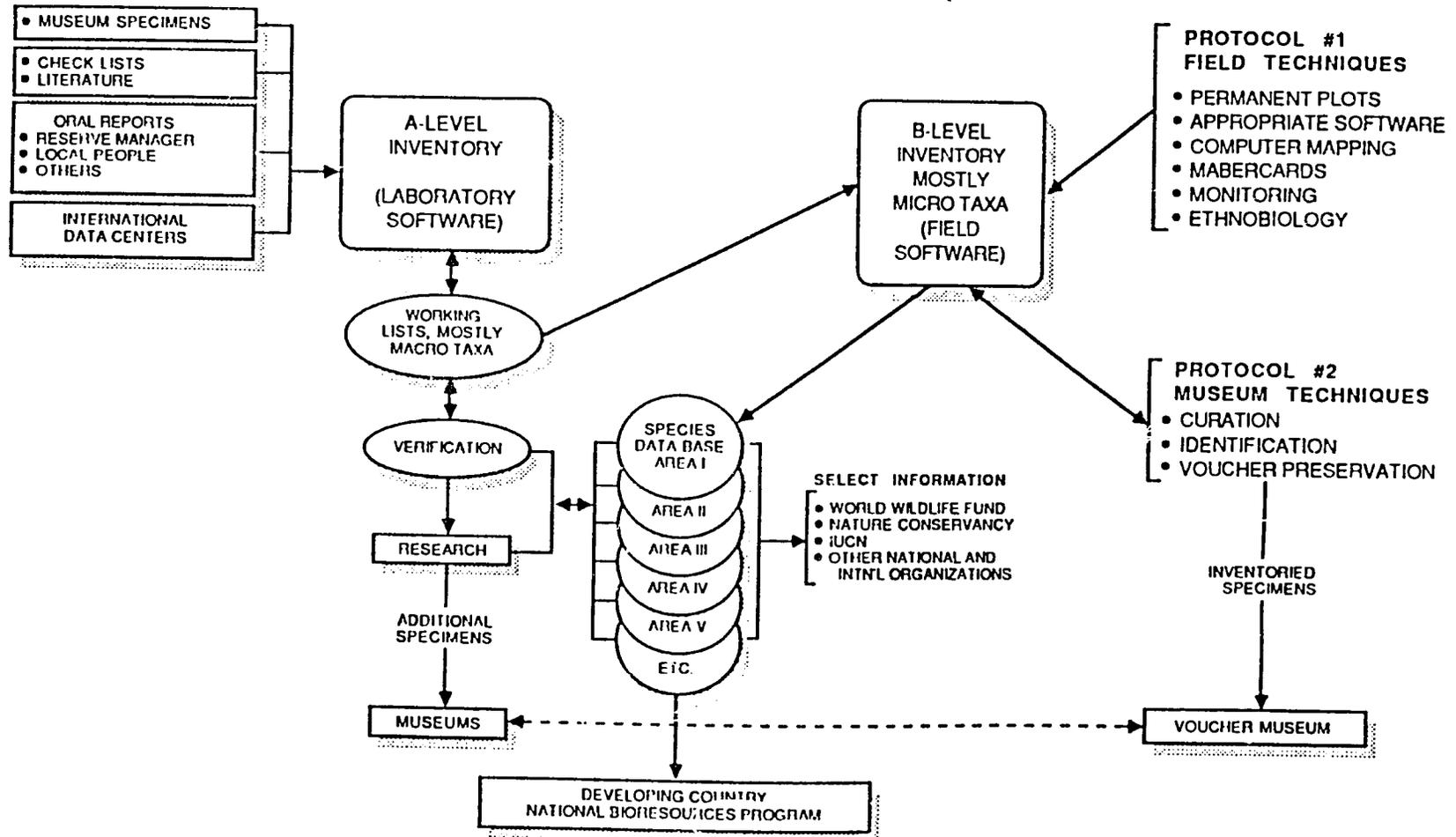
All taxa inventoried are represented by vouchers and these have permanent code numbers referenced in the database. Identification using classical latin names can be applied at any time a specialist is available but the Master Protocol does not depend upon it. The code number and voucher backup provide reference points for both inventory procedures and research so that future comparisons between samples and areas can take place.

Research. Basic and applied research in an inventoried area will undoubtedly turn up new taxa. This information is easily transferred to the Species Database and specimens generated by this research can be transferred, in part, to the voucher museum.

SMITHSONIAN INSTITUTION AND MAN AND THE BIOSPHERE BIOLOGICAL DIVERSITY PROGRAM

PROTOCOL #3

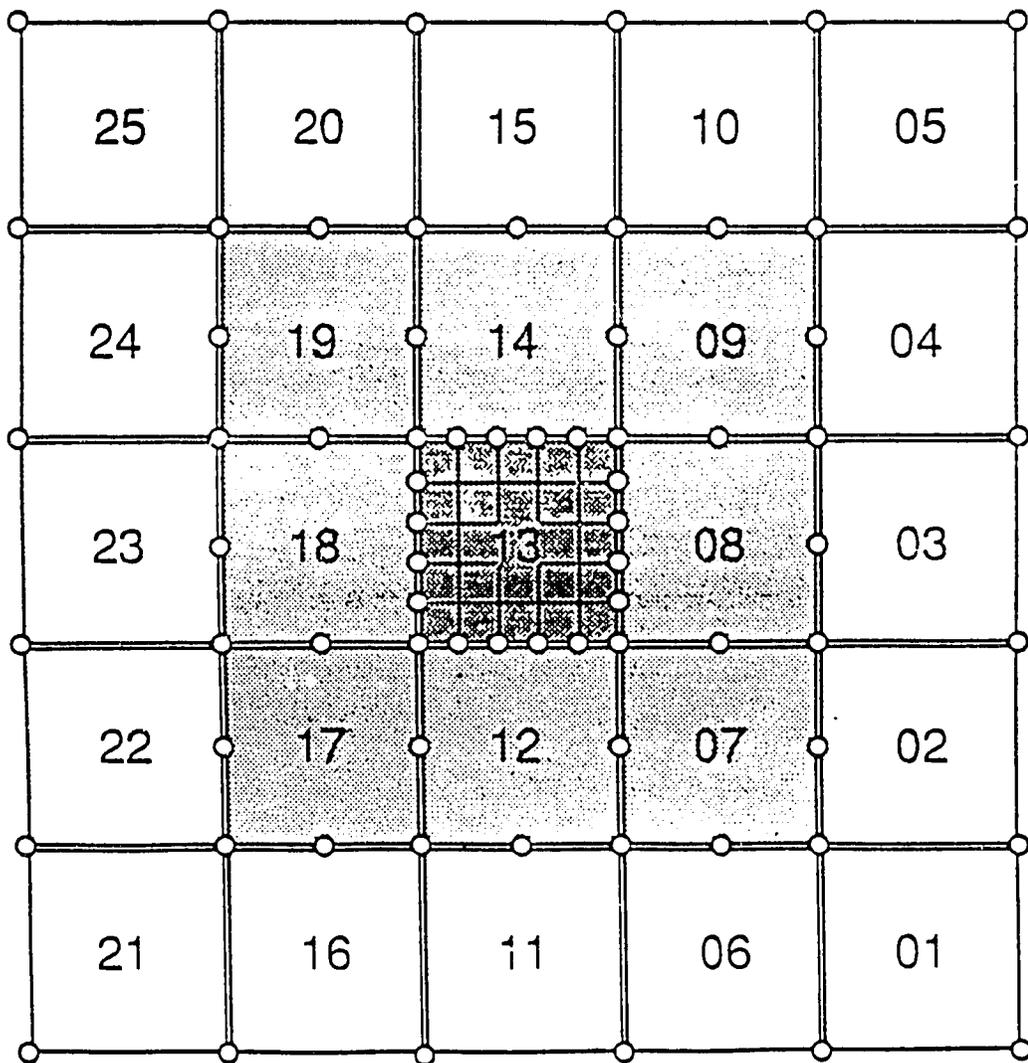
- TRAINING FIELD AND MUSEUM TECHNIQUES
- INSTITUTION BUILDING
- INSTITUTION LINKING



Executive Summary

Biological diversity of the tropics, the mainstay of the natural world upon which mankind has depended for many foods, fibers, medicines, and building materials, is at great risk as developing countries destroy their untapped resources. With misguided exploitation comes reduced numbers of alternatives to which we can turn for new bioresources. Worse yet is the fact that very few of the species on earth have been screened for their economic potentials, and many are rapidly heading toward extinction. The Smithsonian Institution and Man and the Biosphere (MAB-UNESCO) have jointly developed a program to address needs arising from loss of biological diversity in developing tropical countries. Under the Program, a standardized inventory protocol has been developed which can be easily taught to, and used by, biologists and protected area managers of developing countries. The master protocol will lead to national and international cooperation through a biological resource information network. The information gathered also will be shared with other international organizational databases such as The Nature Conservancy, the International Union for Conservation of Natural Resources, the World Wildlife Fund, and others. In order to do this efficiently, the Program will coordinate its site-specific information management system with the more regionally-based system of The Nature Conservancy (TNC) in order to route appropriate conservation-oriented data to TNC conservation data centers and elsewhere. A standardized inventory protocol used throughout the tropics based on cooccurrence of species will markedly enhance developing country connections to other countries under mutual sharing of biological information and management-planning for protected areas. By also focusing on discovery of new bioresources as a goal of the inventories, developing countries will have incentive to invest human and financial resources toward better protection and sustained utilization of their natural resources.

UPPER FLOODPLAIN FOREST PLOT 4



This Diagram was done on a
512 Macintosh Computer using
SuperPaint Software, and printed
on a QMS PS-800 Laser Printer.

The total time from startup to
final printout of four copies
was 25 minutes.

UPPER FLOODPLAIN FOREST

SMITHSONIAN
INSTITUTION

PLOT 4

MABERCARD
4/A

UPPER FLOODPLAIN FOREST TAMBOPATA, PERU

THE MABERCARD SYSTEM
T.L. ERWIN, S. MABER

G.L. VENABLE, GRAPHICS

FRONT

Upper Floodplain Forest - Tambopata, Peru

Long-term climatic cycles in which very heavy rains occur years or even decades apart cause tremendous flooding periodically in the upper reaches of the Amazon drainage system. These very high flood waters create a secondary floodplain above the primary one especially outside sharp bends of the river. Alluvium is periodically deposited making the soils richer as well. However, the plant life which occupies this upper floodplain must be able to withstand periodic inundation of rapidly moving water, as this hectare did in February, 1986, when the Rio La Torre went over its banks. The medium-height (25-35m) forest of the upper floodplain has about 540 trees and vines per hectare, 10cm dbh or more in diameter, and the average diameter is 22.6cm; there are more palms (28%) in this type of forest than in any other in the Reserved Zone. The dominant genera here are *Iriartea* (Family Palmae; local name "pona") and *Rinorea* (Family Violaceae; local name "sowga").

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PLOT 4

MABERCARD
4/B

UPPER FLOODPLAIN FOREST

BACK

UPPER FLOODPLAIN FOREST

SMITHSONIAN
INSTITUTION

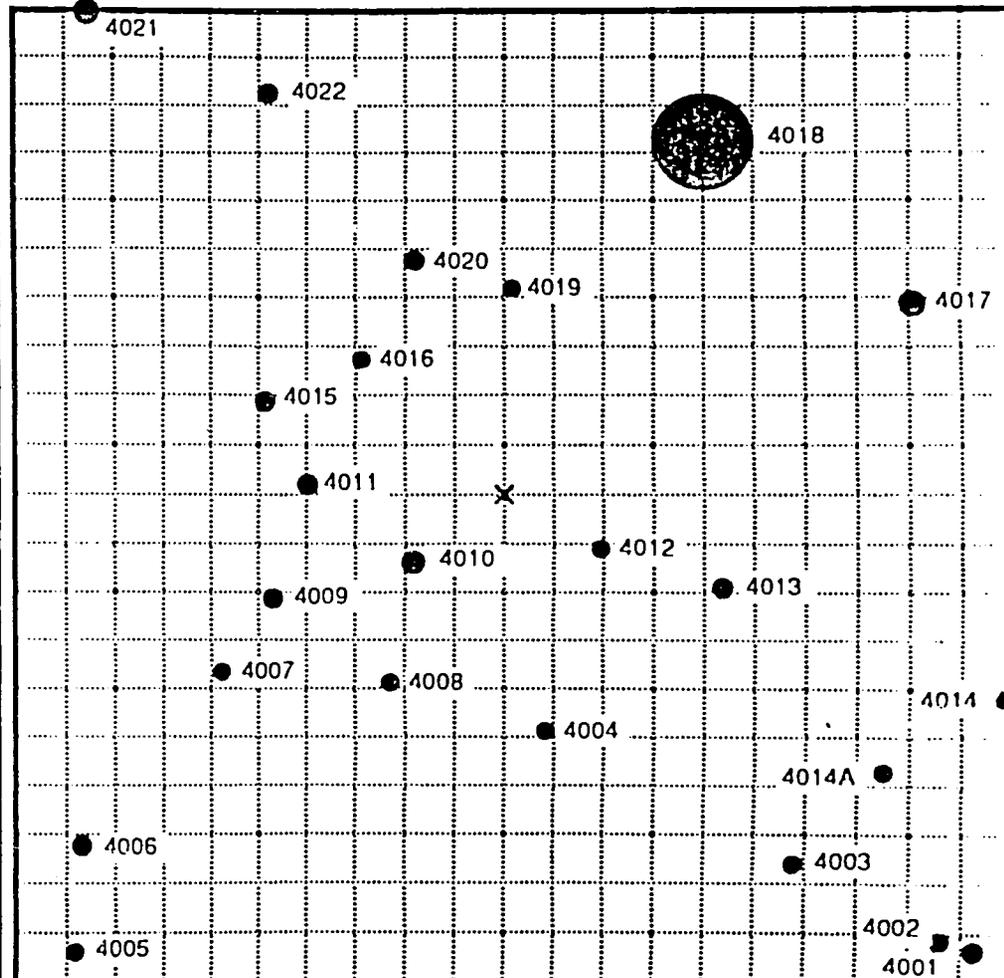
4 QUAD A

MABERCARD
4/1

Y	T	O	J	E	GENUS/SPECIES	FAMILY
X	S	N	I	D	001 <i>Swartzia</i> ?	Leguminosae
W	R	M	H	C	002 <i>Guarea</i> <i>rubicrophylla</i>	Meliaceae
V	Q	L	G	B	003 <i>Iriartea</i> <i>deltoides</i>	Palmae
U	P	K	F	A	004 <i>Socratea</i> <i>exhoriza</i>	Palmae
					005 ?	Myrtaceae
					006 <i>Rinorea</i> <i>viridifolia</i>	Violaceae
					007 <i>Sterculia</i> ?	Sterculiaceae
					008 <i>Pouteria</i> <i>tota</i>	Sapotaceae
					009 <i>Iriartea</i> <i>deltoides</i>	Palmae
					010 <i>Licania</i> ?	Chrysobalanaceae
					011 <i>Oenocarpus</i> ?	Palmae
					012 <i>Leonia</i> <i>glyycarpa</i>	Violaceae
					013 <i>Iriartea</i> <i>deltoides</i>	Palmae
					014 <i>Spurtea</i> <i>schippii</i>	Ulmaceae
					014A <i>Socratea</i> <i>exhoriza</i>	Palmae
					015 <i>Iriartea</i> <i>deltoides</i>	Palmae
					016 <i>Pourouma</i> <i>folleata</i>	Moraceae
					017 ?	Lauraceae
					018 <i>Bertholletia</i> <i>excelsa</i>	Lecythidaceae
					019 ?	Euphorbiaceae
					020 <i>Iriartea</i> <i>deltoides</i>	Palmae
					021 <i>Tipirica</i> <i>guanensis</i>	Anacardiaceae
					022 <i>Leonia</i> <i>glyycarpa</i>	Violaceae

NOTES

FRONT



SMITHSONIAN
INSTITUTION

4 QUAD A

MABERCARD
4/1

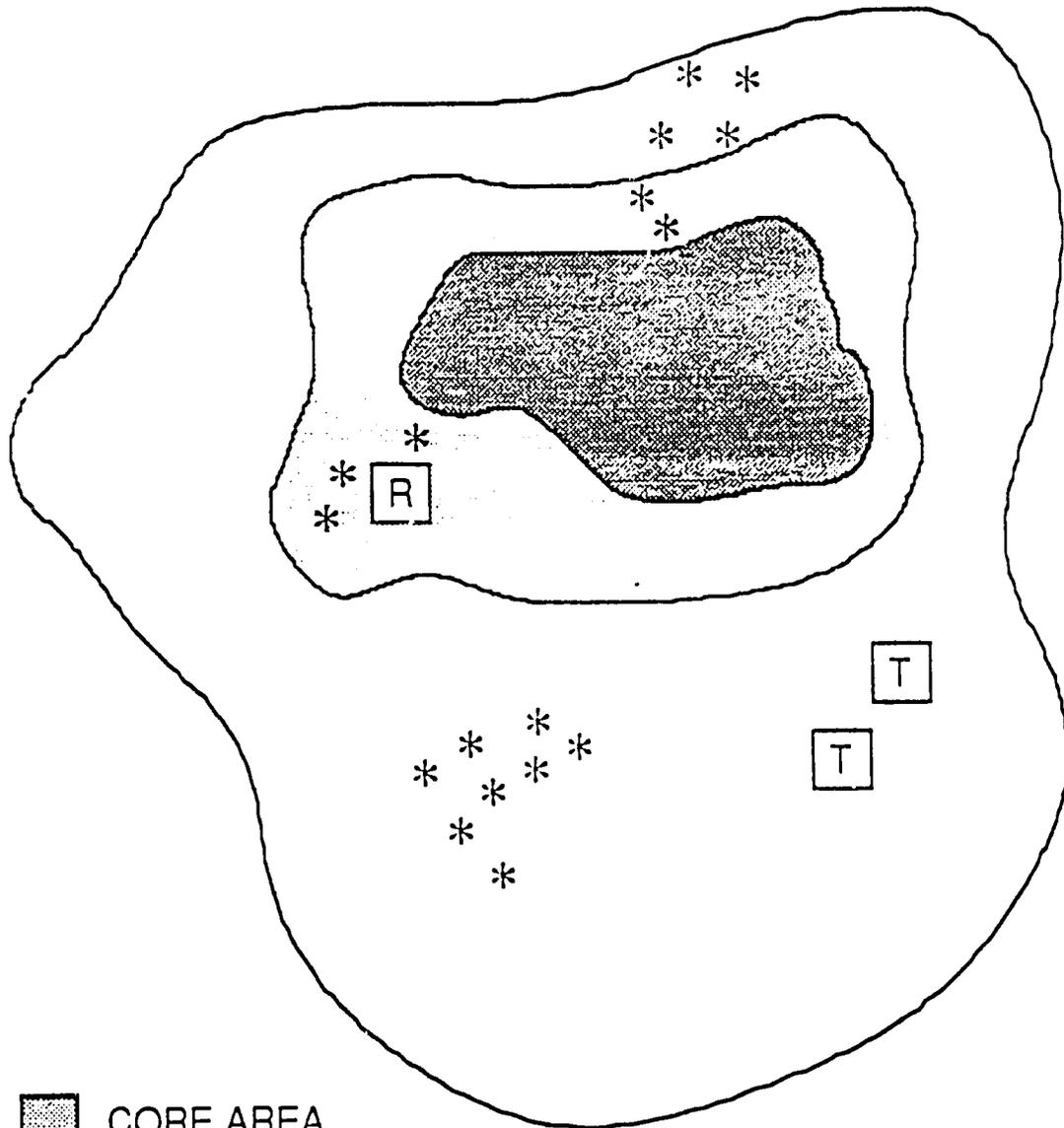
UPPER FLOODPLAIN FOREST

BACK

Appendix C

Example of a Mabercard, a detailed map of quadrats of selected habitats which serves as the basis of coordinating and computerization of all biotic data from the area.

A TYPICAL BIOSPHERE RESERVE



-  CORE AREA
-  BUFFER ZONE 1
-  BUFFER ZONE 2
-  TOURISM
-  RESEARCH STATION
-  HUMAN SETTLEMENTS

Source: Man and the Biosphere Program, UNESCO

fig 2.

28

II

MEMORANDUM

Date: July 9, 1987

To: Participants of the Beni and Manu Bioinventory teams

From: Terry L. Erwin, Director, BIOLAT-SI/MAB
Biological Diversity Program

Subject: Specimens and artifacts collected at Beni and Manu; handling and interim deposition.

Final deposition of specimens is subject to agreements in a 'convenio' with each country; these have not been finalized, therefore an interim arrangement is necessary. Obviously, NMNH is interested in having deposited a good series of each species and set of numbers of plants found in the protected areas which are inventoried, while host-countries need voucher material deposited in-country.

Thus, all participants in the BIOLAT-SI/MAB program are required to obey host-country laws concerning biota and artifacts. Endangered or threatened species will not be collected under the interim plan or the general convenio; rather, if this becomes necessary, a separate application through appropriate host-country channels will be made. Artifacts are often more strictly regulated than biological material and a separate agreement for them is necessary.

With regard to handling the collected material in the short term, the following guidelines will be followed:

Research specimens of expedition members.

1.) Direct taxon research materials collected by host-country counterparts and students associated with BIOLAT are theirs to decide handling and deposition subject to laws and norms under which apply in the country. It is recommended that this material become part of the voucher collection for the host-country and made available for the museum's exchange and loan program under the formula below.

2). An NMNH researcher's material, that which is in the direct study plan of the scientist, will accompany the researcher back to Washington, or be shipped as appropriate. Researchers will be responsible for handling their own material upon leaving the field. Named material from the researchers project will be returned to the host-country according to the formula below on a regular yearly basis until such time as all collected species are represented in the country's voucher collections. Guest or contract scientists working with the BIOLAT program will be required to follow the same procedure except the research material will go to their own institution for preparation; they will be also required to voucher all species in the NMNH as well as host-country.

Miscellaneous inventory material of protected area

3). Miscellaneous specimens in the taxonomic area of NMNH and of guest researchers will be returned to Washington and treated the same as direct research materials unless there is a host-country counterpart or institution that is capable of handling this material in an appropriate and timely fashion. Modest in-country support will be provided to appropriate institutions for this purpose to encourage timely preparation and vouchering of the material. Deposition of materials will be according to the formula below.

4). In permanent plot surveys and mapping, collections of mapped trees or dominant vegetation will be handled by host-country herbaria for preparation and distribution according to the formula below; Reynel in Peru and Beck in Bolivia. Modest in-country support will be provided to their institutions for this purpose to encourage timely preparation, identification, and vouchering of the material.

5). Shipments of specimens returning to NMNH will be sent in care of BIOLAT-SI/MAB Biological Diversity Program, and will be clearly marked as to curator-in-charge of taxa or taxonomic unit. These shipments will be unpacked, fumigated if required, and delivered to appropriate centers in a timely manner. This provides continuous logging of all materials and completes the program's incoming materials registration process.

6). Through the SI/MAB training courses offered to host-country students and young professionals, and BIOLAT institutional support, an infrastructure will be established that will increasingly be able to handle more and more material. All training staff are encouraged to ensure that good preparation techniques are taught and that the Smithsonian philosophy of specimen distribution is transferred to the students, thus ensuring and establishing good counterpart cooperation. Excellently prepared and named material for future study is a goal of this program.

SPECIMEN DISTRIBUTION FORMULA:

Host country: Primary type.

Plants: Sets--1st, 5th, 9th, 11th, 15th*

Animals: 1st, 5th, 7th, 9th, 11th, 15th*

Smithsonian Institution: 1st secondary type.

Plants: Sets--2nd, 4th, 6th, 10th, 12th, 14th

Animals: 2nd, 4th, 6th, 10th, 12th, 14th

Collector's designated institution: 2nd Secondary type.

Plants: Sets--3rd, 7th, 13th

Animals Sets--3rd, 9th, 13th

*Series with more than 15 specimens: 16th to Smithsonian, 17th to host-country, and alternating thereafter to end of series.

NOTE: Traces of species collected or recorded shall be maintained by host-country voucher collections, e.g. casts of tracks, photos. Duplicate material will be in the Smithsonian Institution.

III

INDIVIDUAL EQUIPMENT FOR BENI AND MANU EXPEDITIONS

The following items are REQUIRED by Smithsonian participants!

Lantern. 6 D-cell combo flashlight and small florescent tube.

Swiss Army Knife.

Cantine or water bottle.

Rainware.

Rubber boots, short.

Sleeping bag.

Dinner plate, cup, utensils.

Towels.

Toilet articles.

Repellant.

Boots.

Sandels.

Long sleeve cotton shirts.

Long cotton pants.

Lots of long cotton socks.

Sweater or light jacket.

Winter warm-up clothes (can go as low as 42 degrees F.).

Hat.

Trail food of your choice (enough to live on four days without anything else).

Personal medicines.

 Malaria tablets.

 Iodine tablets for water.

 Foot powder, anti-fungal.

 Aspirin, etc.

 Personal first-aid (anti-diarrhea, laxative, anit-inflamatories,
 anithystimines, eye-drops w/ antibiotics, ace bandages, bandages.

NOTE: We have been asked not to do laundry in the forest camp. Please bring enough clothes to be in camp for six days at a stretch before returning to the Station where laundry can be done.

IV

GENERAL ACTIVITIES

TRAINING SCHEDULE 1987: BENI BIOSPHERE RESERVE, BOLIVIA

- August 22 Arrival, welcome, and evening orientation lecture
 (Miranda and Erwin)
 Techniques (Maber, Reynel, Kabel)
 Team assignments (Pogue and Gomez)
 Teams A, B, C organize for departure next day
- August 23 Departure for Forest encampment (Teams A, B, C)
 Trail and habitat orientation
 Afternoon field demonstrations
 Selected habitats (Teams D-1, D-2, D-3, etc.)
 Evening lectures
- August 24 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)
 Evening lectures
- August 25 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)
 Evening lectures
- August 26 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)
- Team D departs for forest camp in a.m.
 Trail and habitat orientation
 Afternoon field demonstrations
 Team A departs for Beni Station in p.m.
- August 27 Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)
 Evening lectures
- August 28 Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)
 Evening lectures
- August 29 Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)
- Team A departs for forest camp in a.m.
 Team B departs for Beni Station in p.m.

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August 30 Survey, tagging, mapping (Teams C, D, A)
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)
 Evening lectures

August 31 Survey, tagging, mapping (Teams C, D, A)
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)
 Evening lectures

September 1 Survey, tagging, mapping (Teams C, D, A)
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)

Team B departs for forest camp in a.m.
 Team C departs for Beni Station in p.m.

September 2 Survey, tagging, mapping (Teams D, A, B)
 In afternoon, selected habitats or preparation
 Selected habitats (Team C)

September 3 Survey, tagging, mapping (Teams D, A, B)
 In afternoon, selected habitats or preparation
 Selected habitats (Team C)

Teams D, A, B depart for Beni Station
 Evening organization for return to La Paz
 Core staff/researchers return to Beni Station-R&R

September 4 Group I departure
 R&R for everyone remaining

September 5 Arrival, welcome, and evening orientation lecture
 (Miranda, Pogue, and Gomez)
 Techniques (Maber, Sobrevila, Kabel)
 Team assignments (Pogue and Gomez)
 Teams A, B, C organize for departure next day

September 6 Departure for Forest encampment (Teams A, B, C)
 Trail and habitat orientation
 Afternoon field demonstrations
 Selected habitats (Teams D-1, D-2, D-3, etc.)

September 7 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)

September 8 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)

September 9 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)

Team D departs for forest camp in a.m.
 Trail and habitat orientation
 Afternoon field demonstrations
 Team A departs for Beni Station in p.m.

September 10 Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)

September 11 Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)

September 12 Survey, tagging, mapping (Teams B, C, D)
 Selected habitats (Team A)

Team A departs for forest camp in a.m.
 Team B departs for Beni Station in p.m.

September 13 Survey, tagging, mapping (Teams C, D, A)
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)

September 14 Survey, tagging, mapping (Teams C, D, A)
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)

September 15 Survey, tagging, mapping (Teams C, D, A)
 Selected habitats (Team B)

Team B departs for forest camp in a.m.
 Team C departs for Beni Station in p.m.

September 16 Survey, tagging, mapping (Teams D, A, B)
 In afternoon, selected habitats or preparation
 Selected habitats (Team C)

September 17 Survey, tagging, mapping (Teams D, A, B)
 Selected habitats (Team C)
 Break camp, pack all gear
 Teams D, A, B depart for Beni Station
 Evening organization for return to La Paz
 Core trainers return to Beni Station to
 Store and secure all supplies and equipment

September 18 Return to La Paz for everyone

SCHEDULE FOR PERSONNEL

Teams A,B,C,D: Students
 Curators: Coddington, McGinley, Wilson
 Fellows: Munroe, Sobrevila
 Associates: Collins
 Insect Zoo: Van Creveld
 Research Assistants: Larcher, Starnes
 BIOLAT core staff: Kabel, Maber, Pogue, Reynel
 SI/MAB Program Manager: Gomez
 Director BIOLAT-SI/MAB: Erwin

Inventory Team Time Blocks

Dates	Camp	Station
Aug 23--26	others	Munroe Starnes Team D
Aug 27--29	others	Pogue Van Creveld Team A
Aug 30--Sept 1	others	Munroe Starnes Team B
Sept 2--Sept 3	others	Kabel Team C
Sept 4--Sept 6	-----	All personnel
Sept 7--Sept 9	others	Coddington Collins Larcher McGinley Team D
Sept 10--Sept 12	others	Gomez Wilson Team A
Sept 13--Sept 15	others	Coddington Kabel Larcher McGinley Team B
Sept 16--Sept 17	others	Collins Pogue McGinley Team C

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Sept 18

All personnel

V

Smithsonian Institution
Beni, Bolivia
Lectures by Smithsonian Participants

Dr. Jonathan A. Coddington
Lecture: Biology, Behavior and Evolution of Spiders
Documents: 2 sets of papers relevant to the topic

Dr. Margaret S. Collins
Lecture: To be announced
Documents: To be announced

Dr. Terry L. Erwin
Lecture: Bioresources and the Inventory
Documents: summary and reprints

Dr. Francisco Gómez-Dallmeier
Lecture: Management of Wildlife Populations in the
Neotropic
Documents: summary and books in traveling library

Ms. Margo L. Kabel
Lecture: Computer Applications in Bioinventories
Documents: To be announced

Dr. Ronald J. McGinley
Lecture: To be announced
Documents: To be announced

Mr. Thomas Allan Munroe
Lecture: Collecting Methods in Fishes
Documents: handouts

Dr. Michael Gene Pogue
Lecture: Collecting and Preparing Lepidoptera
Documents: summary book in traveling library

Ing. Carlos Augusto Reynel Rodriguez
Lecture: To be announced
Documents: To be announced

Dr. Claudia Sobrevila
Lecture: Reproductive Biology of Tropical Plants:
Questions and Methods
Documents: 3-page summary

Dr. Wayne C. Starnes
Lecture: Collection Methods in Fishes
Documents: handouts

Ms. Barbara Van Creveld
Lecture: Keeping Live Specimens: Arthropods
Documents: 1-page summary

Dr. Don E. Wilson
Lecture: Bats of the World
Documents: handouts

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VI

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43

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VII

BIOLAT Follow-up Projects
Description and application

Upon completion of permanent plot establishment in selected plant zones of BIOLAT inventory sites in the 1988 field season, there will be an opportunity for small projects to be carried out by host-country students who have demonstrated interests and skills during the field courses.

These small projects are in the scope of degree projects acceptable at the student's University, or localized additions to on-going broad research projects by the student. These projects should be designed to further the objectives of BIOLAT, as taught in the field courses, for example, completing the inventory process in the permanent plots for a selected group of organisms or studying microdistribution within the plots.

In order to compete for funding support for these projects, the student must fill out the attached application (see VIII) and have completed in a satisfactory manner at least one field training course with SI/MAB. Final selection will be made by the in-country Steering Committee in concert with the Director, BIOLAT-SI/MAB.

Selections will be made in January, 1988, for work during the 1988 field season which will be May through October.

VIII

APPLICATION

NAME: _____

INSTITUTION: _____

Home Address: _____

Telephone: home _____ office _____

Project title:

Project description: Include methods, timing and duration of project, equipment and supplies necessary, Principal Advisor and department.

Budget: (provide details)
Travel.

Supplies.

Subsistence.

IX

BENI EXPEDITION 1987

EVALUATION FORM BIOLAT—SI / MAB BIOLOGICAL DIVERSITY PROGRAM

*Your comments and suggestions are very important for the future of this program. Please take some time and help us improve different aspects of the training where you feel it is necessary. Thank You.

ORIENTATION:	Very Good	Good	Average	Poor
To Facilities				
To trails				
To habitats				
To the program				
Time for self orientation				

*Comments and suggestions:

ACTIVITIES:

Inventory Techniques

Code 001— Surveying

Methods				
Transfer of information				
Team efficiency				

Code 002—Tree Tagging and collections

Methods				
Transfer of information				
Team efficiency				

Code 003— Computer mapping

Methods				
Transfer of information				
Team efficiency				

*Comments and Suggestions:

001

002

003

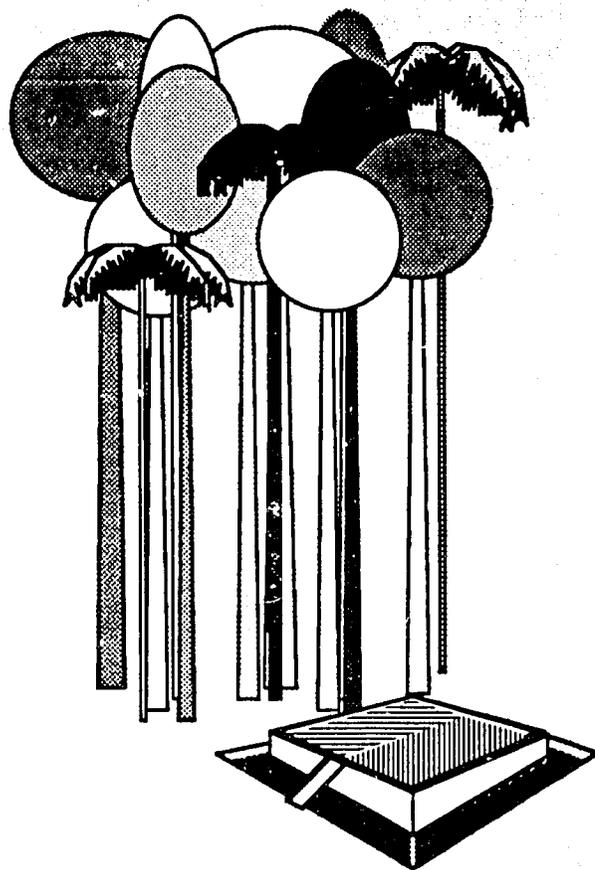
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ACTIVITIES - Cont.:	Very Good	Good	Average	Poor
Scientific Research				
Code 004— Science				
Methods				
Transfer of information				
Code 005— Collecting				
Collecting techniques				
Preparation techniques				
Data with collections				
Transfer of information				
*Comments and Suggestions:				
004				
005				

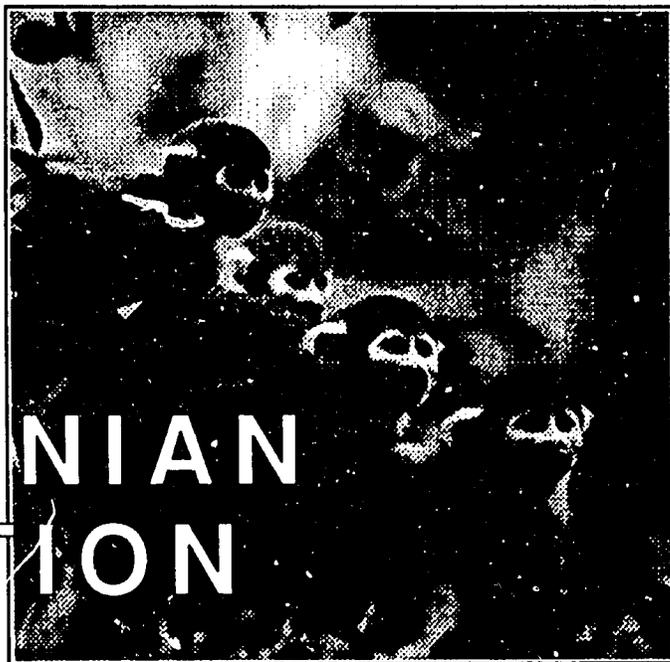
MATERIALS AND EQUIPMENT:				
Laboratory				
Field				
Library				
Handouts				
First Aid				
*Comments and Suggestions:				

LECTURES AND DISCUSSIONS:				
Organization				
Level of Information				
Visual Aids				
Practical Information				
*Comments and Suggestions:				

FACULTY:	Very Good	Good	Average	Poor
Level of contact				
Helpfulness				
Transfer of information				
Group awareness				
*Comments and Suggestions:				
SUPPORT SERVICES:				
Rooms				
Food				
Transportation				
Emergency service				
Station personnel				
*Comments and Suggestions:				
GENERAL ORGANIZATION:				
Timing and schedules				
Scientific activities				
Field techniques				
Support facilities				
*Comments and Suggestions:				
*Any Additional Comments or Suggestions:				



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National Museum of Natural History · Smithsonian Institution

WASHINGTON, D.C. 20560 • TEL. 202-

July 24, 1987

Dear "student's name",

On behalf of the Smithsonian Institution/Man and the Biosphere Biological Diversity Training Course and the BIOLAT Program of the United States National Museum of Natural History, I welcome you on this expedition to Beni Biological Station and the Biosphere Reserve. You have been selected from among numerous other candidates for the first of the Program's training courses; you will be a pioneer in what we expect to be a long-term activity in your country. Congratulations on your selection.

The attached program and schedules, lists of participants, as well as other important information, will give you a general overview of this joint Bolivia-U.S. program. I strongly encourage you to read it in detail before arriving at the Station.

Particularly, I want to point out the Evaluation Form (item IX). It is crucial to the success of the program for you take the time and put some thought into this and return it to me by the end of your stay at the Station. The program is young and your careful evaluation and critique on this form will help the program grow in the right directions. Thank you.

My colleagues and I look forward to meeting you and working with you in your highly diverse and interesting subtropical forests and savannas.

Sincerely yours,

Terry L. Erwin
Director, BIOLAT-SI/MAB
Biological Diversity Program

encl: Program Orientation materials

ITINERARY: MANU EXPEDITION, 1987

TEAM ONE: Coddington, Reynel, Middendorf, Sobrevila

USA-----LIMA (or La Paz---Lima, or La Paz---Cusco)	21 September
LIMA-----CUSCO (+ students) 1 hour, jet	22 September
Rendezvous: place and time to be announced later	
CUSCO-----SHINTUYA 1 day, van	23 September
SHINTUYA----BOCA MANU 1 day, boat	24 September
BOCA MANU---PAKITZA 3/4 day, boat	25 September

(15 days at camp)

PAKITZA----BOCA MANU	11 October
BOCA MANU--SHINTUYA	12 October
SHINTUYA---CUSCO	13 October
CUSCO-----LIMA	14 October
LIMA-----USA	15 October

TEAM TWO: Gomez, Ortega, Guevara, Sarmiento

USA-----LIMA	10 October
LIMA-----CUSCO (+ students) 1 hour, jet	11 October
Rendezvous: place and time to be announced later	
CUSCO-----SHINTUYA 1 day, van	12 October
SHINTUYA----BOCA MANU 1 day, boat	13 October
BOCA MANU---PAKITZA 3/4 day, boat	14 October

(15 days at camp)

PAKITZA----BOCA MANU	30 October
BOCA MANU--SHINTUYA	31 October
SHINTUYA---CUSCO	1 November
CUSCO-----LIMA	2 November
LIMA-----USA	3 November

TEAM THREE: Clark, Erwin, Foster, Louton, Mazer, Pogue, Sandoval, Venable, and a civil engineer and archaeologist counterpart

USA-----LIMA (or La Paz---Lima, or La Paz---Cusco)	21 September
LIMA-----CUSCO (+ students) 1 hour, jet	22 September
Rendezvous: place and time to be announced later	
CUSCO-----SHINTUYA 1 day, van	23 September
SHINTUYA----BOCA MANU 1 day, boat	24 September
BOCA MANU---PAKITZA 3/4 day, boat	25 September

(30 days at camp)

PAKITZA----BOCA MANU*	30 October
BOCA MANU--SHINTUYA	31 October
SHINTUYA---CUSCO	1 November
CUSCO-----LIMA	2 November
LIMA-----USA	3 November

* Three guests will arrive during the third week of October from FPCN and the Ministerio de Agricultura y Forestales. These guests will depart with teams 2 and three on October 30, 1987.

GRUPO 1

- | | | |
|-----|-------------------------------|------------|
| 1. | Joaquina Albán Castillo | UNMSM |
| 2. | Isabel Bohórquez Meza | UNMSM |
| 3. | Rina Ramírez Mesías | UNMSM |
| 4. | Benjamín Kroll Saldaña | UNA-Molina |
| 5. | Grace Servat Valenzuela | UNMSM |
| 6. | Víctor Morales Mondoñedo | UPRP |
| 7. | Julio Arenas Valer | RNP |
| 8. | José Santistéban Castillo | UNT |
| 9. | Benedicto Baca Rosado | UNSAAC |
| 10. | Glicerio Jaime Campos | UNC |
| 11. | Alejandro de la Cruz Melgar | PNM |
| 12. | Gloria Berrocal Tito | UNSAM |
| 13. | Rosario Acero Liñan | DGFF |
| 14. | Arqueólogo (contraparte) | |
| 15. | Ingeniero Civil (contraparte) | |

GRUPO 2

1. César Ascorra Guanira UNMSM
- ✓ 2. José Campos de la Cruz UNMSM
3. Diana Silva Dávila UNMSM
4. Michael Valqui Haase UNA-Molina
5. Enriqueta Olascoaga Mouchard UNA-Molina
6. Antonio Tóvar Narváez UNA-Molina
7. Rolando Gutiérrez González UNA-Molina
8. Rodrigo Arce Rojas UNA-Molina
9. Alfredo Tupayachi Rojas UNSAAC
10. Rafael Chávez Zavaleta UNAS
11. Nila Gamarra Rivera PNM
12. Luis Segovia Juárez UPCH
13. Rosa María Parró Donayre CDC
14. Arqueólogo (contraparte)
15. Ingeniero Civil (contraparte)

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I



National Museum of Natural History • Smithsonian Institution

WASHINGTON, D.C. 20560 • TEL. 202-

BIOLOGICAL DIVERSITY IN LATIN AMERICA INVENTORY PROGRAM (BIOLAT)

Program Statement, Objectives and Goals, Participant Requirements

OBJECTIVE: This Program was defined to develop inventories of species in terrestrial ecosystems in the rich crescent of biodiversity of western and northern Amazonia from Bolivia in the south to French Guyana in the northeast.

ELIGIBILITY: All members of the NMNH scientific staff, their assistants and students, and co-investigators from other Smithsonian Bureaux, and invited non-Smithsonian colleagues and graduate students collaborating directly and in a complementary manner with NMNH scientists.

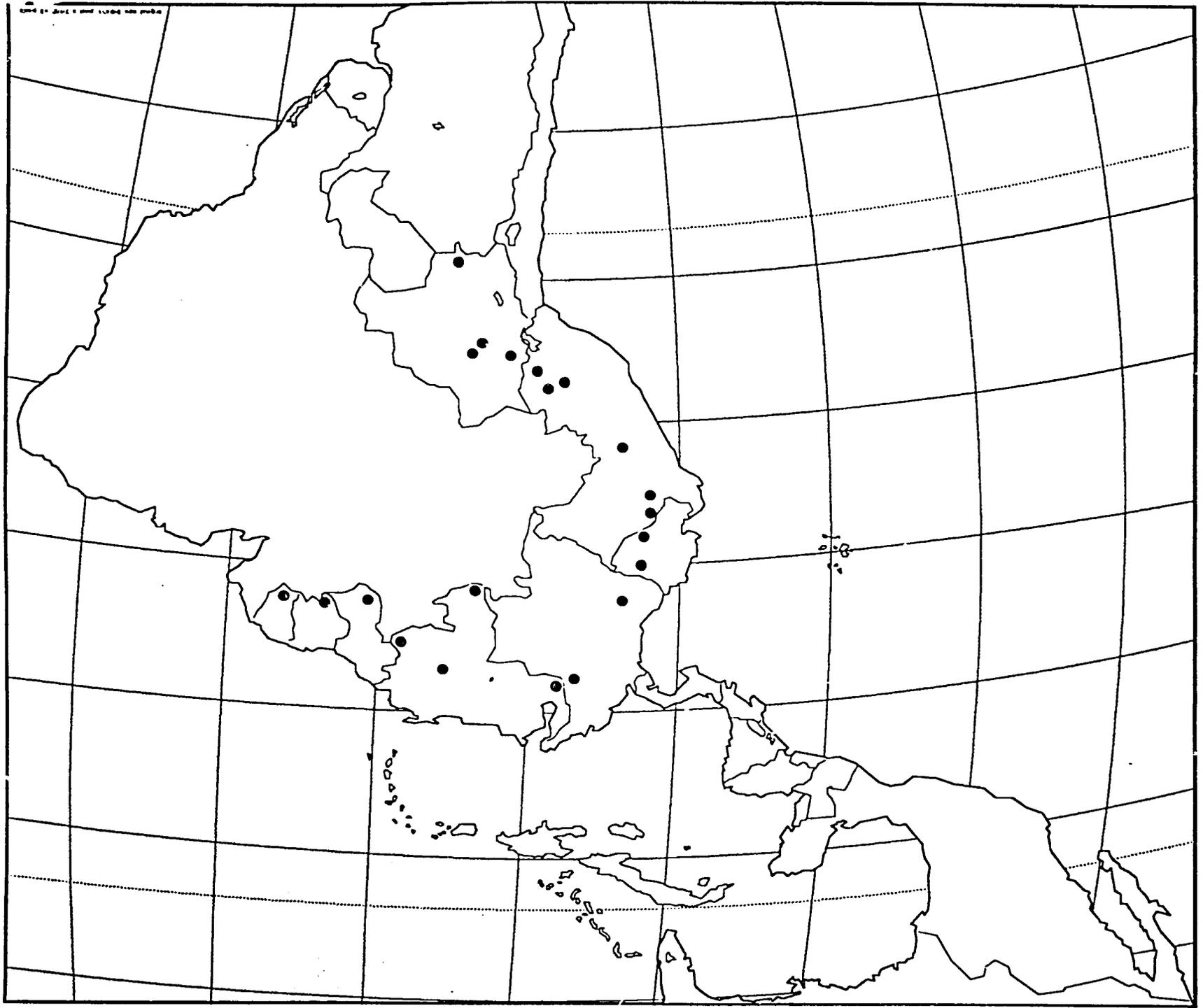
GOALS:

- To inventory elements of the biota in tropical Latin America at protected sites in the western and northern Amazon Basin to the crest of the Andes, and along the tepui transect onto the Guiana Shield using co-occurrence methodology.
- To generate a relational electronic database for the inventoried flora and fauna which will serve a variety of users in a variety of ways.
- To produce reports and publications of a descriptive nature about the elements of the biota.
- To develop synthesis statements about tropical biology, systematics, and biogeography from the database and report on these periodically.
- Every few years as appropriate sponsor a conference or symposium and publish the proceedings.
- To permanently store voucher material for all appropriate biotic elements in the inventory system and make these available to users.

Augmenting the above is a Program of training of nationals, in each country in which inventories are carried out, sponsored by UNESCO/MAB and other agencies such as USAID and World Heritage Program for the following:

- To use SI inventory and vouchering co-occurrence methodology as a basis for training host-country biologists and conservationists in systematics, biogeography, ethnobiology, conservation, park management, or sustained resource utilization.
- To assist in development of voucher museums and national biotic databases in each country in which inventories are carried out.

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Scale 1:100,000

Executive Summary

Biological diversity of the tropics, the mainstay of the natural world upon which mankind has depended for many foods, fibers, medicines, and building materials, is at great risk as developing countries destroy their untapped resources. With misguided exploitation comes reduced numbers of alternatives to which we can turn for new bioresources. Worse yet is the fact that very few of the species on earth have been screened for their economic potentials, and many are rapidly heading toward extinction. The Smithsonian Institution and Man and the Biosphere (MAB-UNESCO) have jointly developed a program to address needs arising from loss of biological diversity in developing tropical countries. Under the Program, a standardized inventory protocol has been developed which can be easily taught to, and used by, biologists and protected area managers of developing countries. The master protocol will lead to national and international cooperation through a biological resource information network. The information gathered also will be shared with other international organizational databases such as The Nature Conservancy, the International Union for Conservation of Natural Resources, the World Wildlife Fund, and others. In order to do this efficiently, the Program will coordinate its site-specific information management system with the more regionally-based system of The Nature Conservancy (TNC) in order to route appropriate conservation-oriented data to TNC conservation data centers and elsewhere. A standardized inventory protocol used throughout the tropics based on cooccurrence of species will markedly enhance developing country connections to other countries under mutual sharing of biological information and management-planning for protected areas. By also focusing on discovery of new bioresources as a goal of the inventories, developing countries will have incentive to invest human and financial resources toward better protection and sustained utilization of their natural resources.

Appendix B

Master Protocol flow diagram (with annotations).

PROJECT DESCRIPTION

This figure outlines the master protocol of the project, showing how all its aspects will be transferred through training workshops to biologists of developing countries. Appendix C shows an example of a Mabercard.

A-Level Inventory. Many protected areas of the world have some sort of listing for major or dominant flora and fauna. Several of these areas have been studied by at least a few biologists which have published their findings and/or deposited specimens collected in national museums. Information associated with these specimens and that gleaned from local peoples and reserve managers will provide a working list of species for selected sites. A database protocol and software have been developed to accept these kinds of records which will produce working lists of species and which can be shared with other interested organizations.

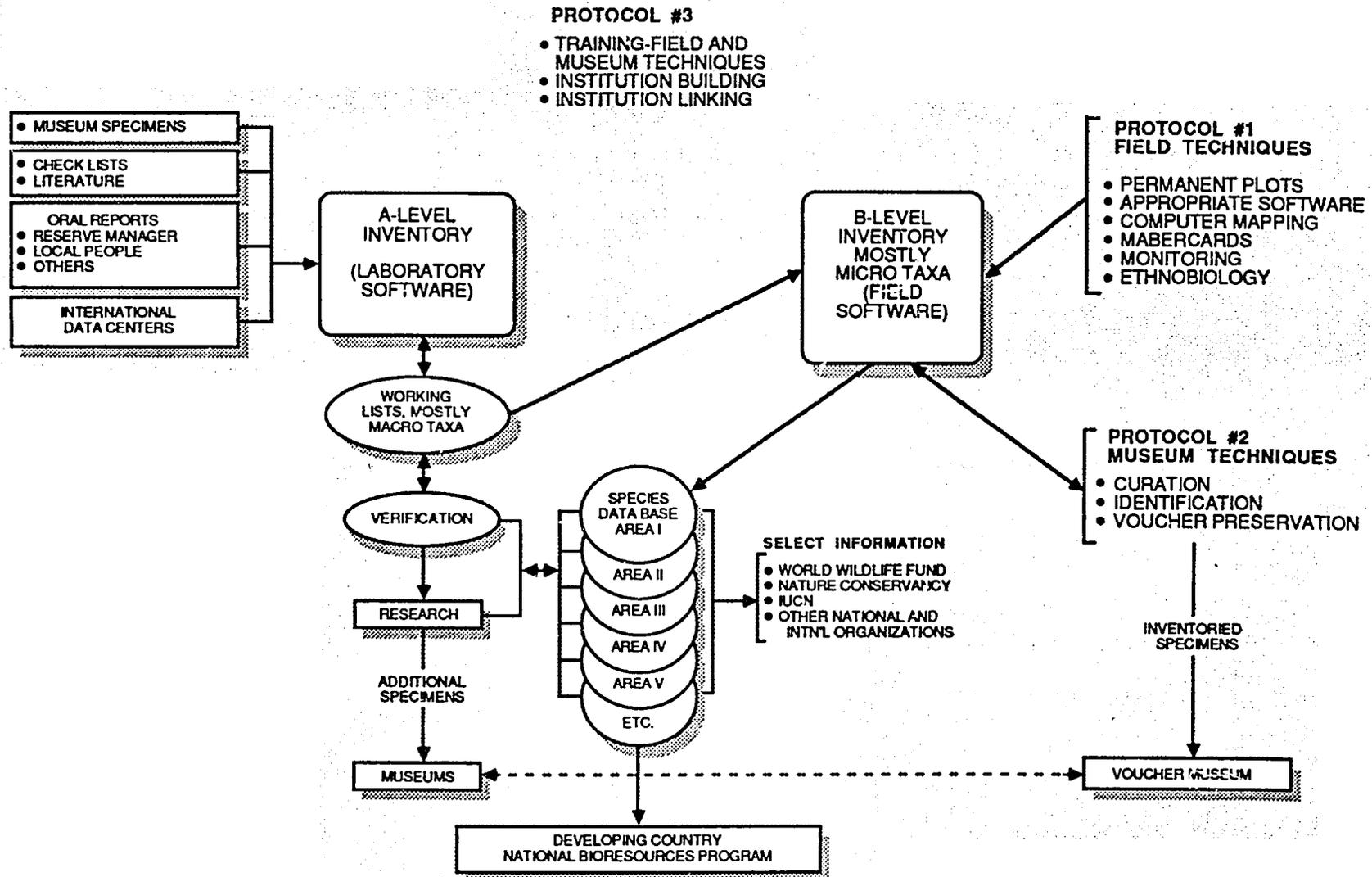
Verification. Species on the working list must be verified through voucher specimens housed in a museum, or in the case of endangered species by sightings of qualified specialists. Such verifications make the record of occurrence available for the Area's Species Database.

B-Level Inventory. Based on national and international priorities in science and conservation, and with participation of appropriate host country agencies, sites will be selected for detailed inventory and as training sites for host country biologists and conservationists. Through the use of Protocol #1, selected areas will be inventoried in-depth by establishing permanent plots in all of the habitats occurring in the at the site selected. These permanent plots consist of surveyed and grided terrain with permanently staked 20 sq. meters quadrats. All trees, 10 cm dbh or greater, are permanently tagged and mapped using software and laptop computers in the field. Habitats without trees are mapped according to whatever dominant plant life is available. Computer-generated maps are duplicated and laminated into Mabercards which are used subsequently for survey purposes. Mapped and permanently tagged trees or other dominant plant life become the focus and reference points for inventory of the microtaxa in the area. These permanent plots also provide the loci of species monitoring in assessing changes in the environment through time and loci for Research. Protocol #2 is applied to all inventoried species through vouchering techniques, that is, standard museum preparation and storage methods appropriate to whatever taxa is in hand.

All taxa inventoried are represented by vouchers and these have permanent code numbers referenced in the database. Identification using classical latin names can be applied at any time a specialist is available but the Master Protocol does not depend upon it. The code number and voucher backup provide reference points for both inventory procedures and research so that future comparisons between samples and areas can take place.

Research. Basic and applied research in an inventoried area will undoubtedly turn up new taxa. This information is easily transferred to the Species Database and specimens generated by this research can be transferred, in part, to the voucher museum.

SMITHSONIAN INSTITUTION AND MAN AND THE BIOSPHERE BIOLOGICAL DIVERSITY PROGRAM [BIOLAT — SI/MAB]



Species Database. Inventories of taxa of the selected areas will reside in host country databases as will the voucher specimens; however, since these databases are electronic they may also reside at other localities. Databases from all areas will be collected at the Smithsonian Institution which will serve as a Data Center and clearinghouse. Because other groups, especially those concerned with conservation, will need access to certain parts of the database, the design will allow them to do so via modem or diskette transfer.

PURPOSE OF PROJECT.

To provide 1) a standardized system for recording, storing, retrieving, and sharing information regarding biological diversity; 2) training in all aspects of the system for biologists and conservationists in developing countries; 3) on-site inventories of core areas and buffer zones of Biosphere Reserves and other species-rich areas of mutual interest to the Smithsonian Institution and host countries; 4) means and rationale for establishment of voucher museums in developing countries around which a biodiversity infrastructure could be based; 5) coordination and facilitation of research projects on biological diversity in Biosphere Reserves and other species-rich areas of interest to the Smithsonian Institution scientists and their host country counterparts; 6) diffusion of information about the project on an international basis through various appropriate means.

LOCATIONS OF PROJECT.

Training aspects of the project will take place in the field in core areas and buffer zones of Biosphere Reserves and other species-rich areas of mutual interest to the Smithsonian Institution and host country, and in museums in host countries and in the United States, wherever most appropriate. Museum workshops in the United States will be primarily at the National Museum of Natural History, but are not so restricted. The field training workshops will be held in association with on-going inventories. Selection of areas will depend upon funding sources; for example this proposal will focus on USAID countries. Funding from UNESCO will be tied to countries in which UNESCO is most interested. Funding from the Smithsonian Institution for inventories will be dependent upon the interests of scientists and their counterparts in developing countries. The whole project will have a tropical and subtropical focus, however, and will be oriented toward species-rich protected areas because of the need for permanent plots which can be monitored over long periods of time.

TIMING OF PROJECT.

The in-country phase of the project will begin in April of 1987 with six workshops. Once the project is completely moving, late in 1988, we expect to have biologists in the field throughout the year in numerous countries and to hold museum training workshops monthly. This potential is dependent to a large extent on available funding. In the short term, we have designated 1987 as the year to test all aspects of the system with biologists from developing countries. Four workshops will be held in the field under USAID auspices (this proposal): 2 in Peru, 1 in Ecuador, and 1 in Bolivia. Each pair of these will be followed by a museum workshop in Washington, D. C. Possibly one more will be held in Puerto Rico using separate funding sources. These workshops will be spread over the year to take advantage of seasonality of flora and fauna.

TRAINING ASPECTS DESIGN.

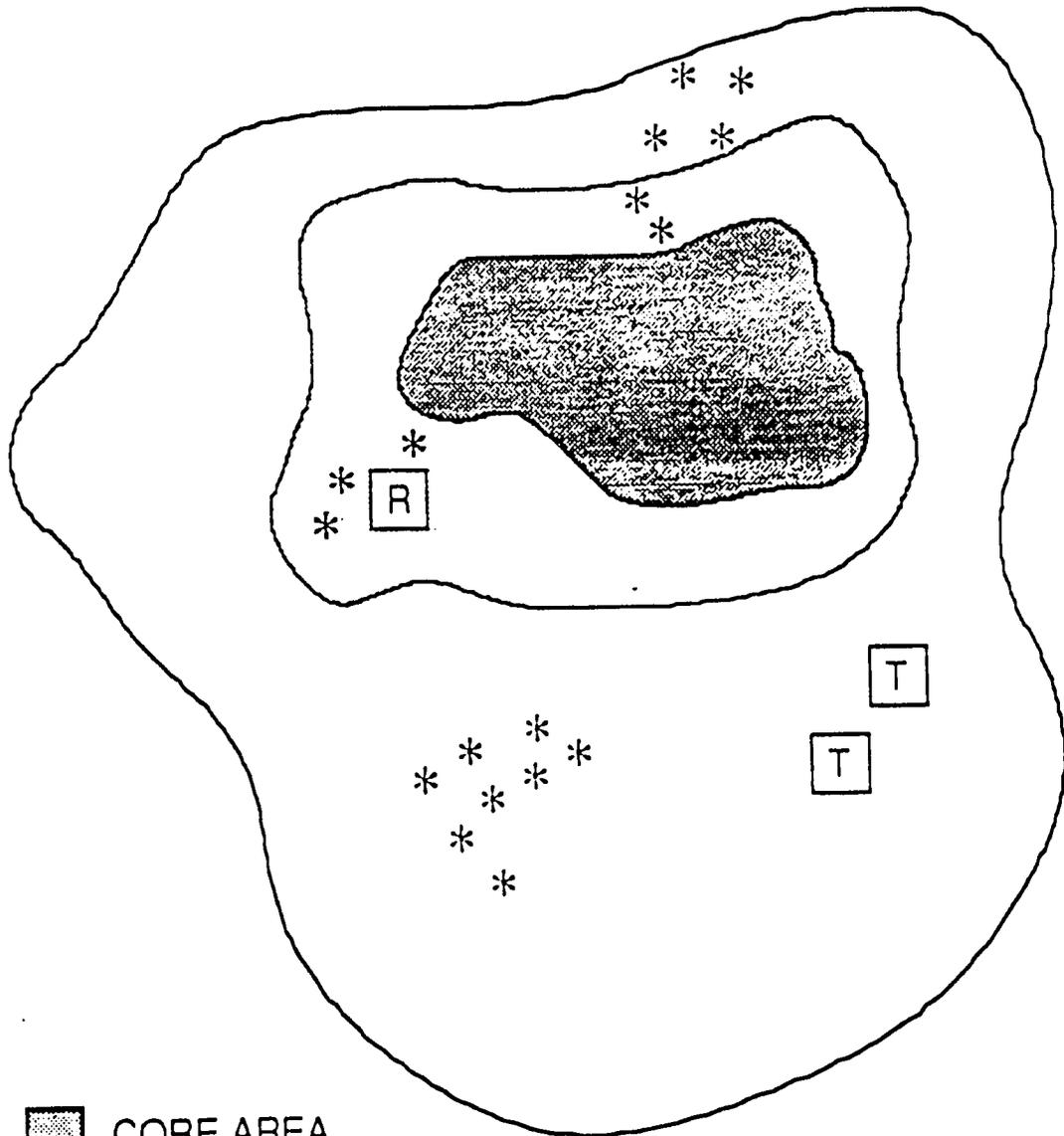
Nomination of trainees from developing countries will be made by systematic biologists and conservationists in those countries. Selection will be made by a task force of scientists from those countries and from the Smithsonian Institution. Those selected will be trained as a team at selected field sites in parts of the master protocol (Appendix C) related to field work, including setting up of permanent plots, mapping trees in these plots, using these trees as loci of inventory of microtaxa associated with them, recording all data on laptop portable computers in the field, collecting voucher specimens associated with the data, and transporting these specimens back to museum research facilities in the host country. Following the field work, workshop participants and their selected voucher material will travel to the Smithsonian Institution for the museum workshop phase which will utilize the material they bring with them. This material will become the core of the developing voucher museum in the host country with eventual counterpart vouchers deposited in the Smithsonian and other cooperating institutions.

PROJECT EVALUATION.

At present the Program is run by its director and program manager with the assistance of one half-time secretary. Two advisory bodies, one of Smithsonian biologists from four bureaux, and another international board with members from NGO's, Universities, museums, and herbaria, provide advice concerning project design. In the third year of the Program, a blue-ribbon panel of experts will review all program accomplishments and recommend future directions. Day-to-day oversight is provided by administrators in the National Museum of Natural History and the Directorate of International Activities.

11

A TYPICAL BIOSPHERE RESERVE



-  CORE AREA
-  BUFFER ZONE 1
-  BUFFER ZONE 2
-  TOURISM
-  RESEARCH STATION
-  HUMAN SETTLEMENTS

Source: Man and the Biosphere Program, UNESCO

fig 2. *AV*

Appendix C

Example of a Mabercard, a detailed map of quadrats of selected habitats which serves as the basis of coordinating and computerization of all biotic data from the area.

INUNDATION FOREST

SMITHSONIAN
INSTITUTION

SITE 01 - ZONE 01
PLOT 13

MABERCARD
01/A

BENI BIOSPHERE RESERVE BOLIVIA

The BIOLAT MaberCard System
(Mapping and Bioinventorying
Earth's Realms)

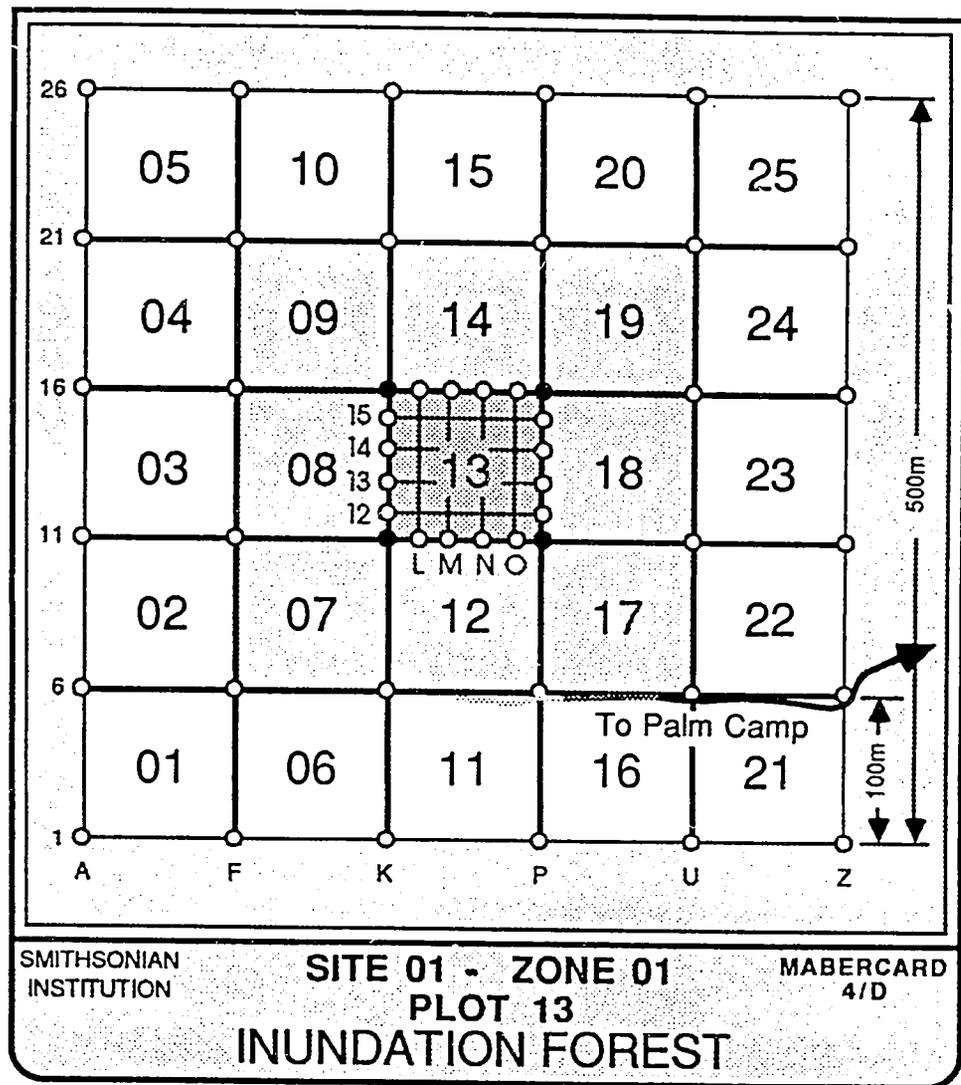
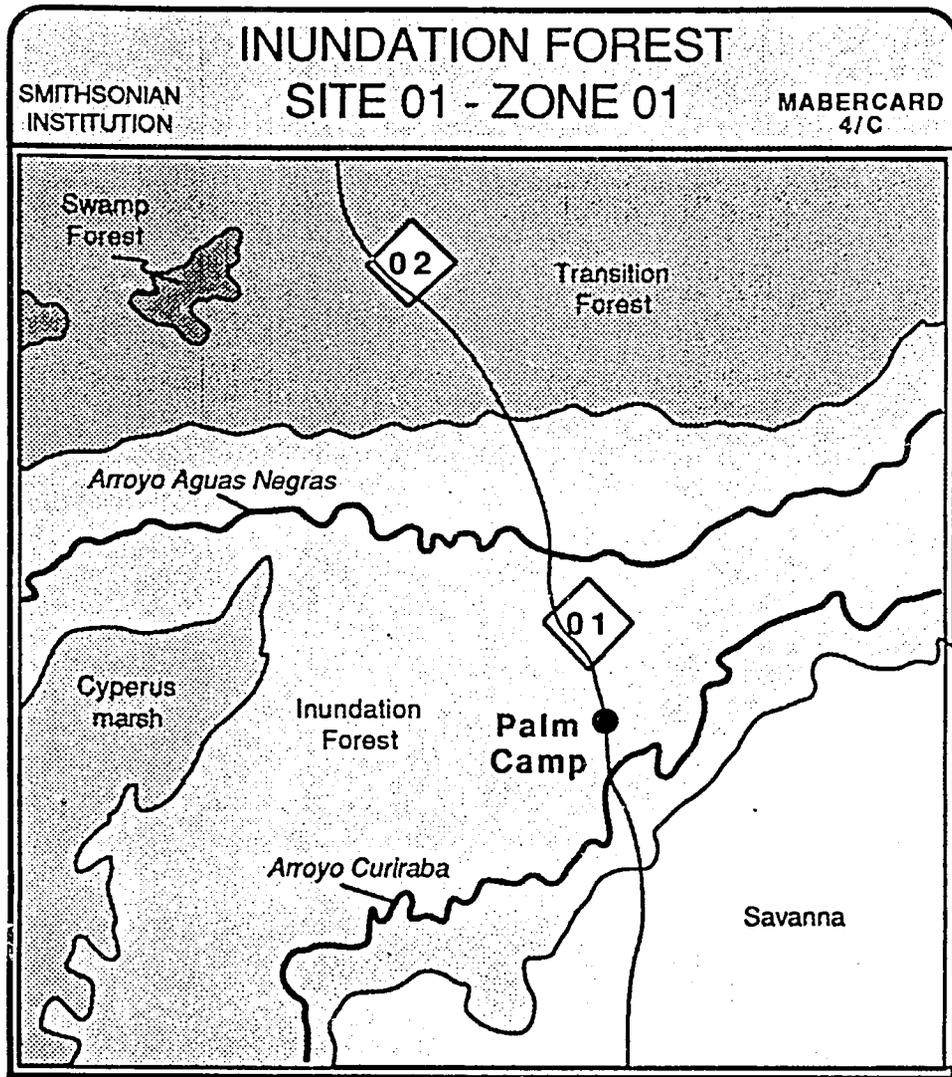
Site 01 lies between the Arroyos Aguas Negras and Curiraba. These streams flood during the rainy season, inundating the surrounding forest with 'black water' from the Aguas Negras and silt-laden 'white water' from the Curiraba. The forest floor is shallowly undulated; water stands for 4-5 months and is many centimeters deep during flood stage. Most trees are of small diameter and average about 20m in height, with no true emergents. Plot 13 has 634 trees of 8cm dbh or more in diameter. The dominant genera are *Brosimum* (Family Moraceae) and *Scheelea* (Family Palmae).

SMITHSONIAN
INSTITUTION

SITE 01 - ZONE 01
PLOT 13

MABERCARD
01/B

INUNDATION FOREST



1/2

INUNDATION FOREST

SMITHSONIAN
INSTITUTION

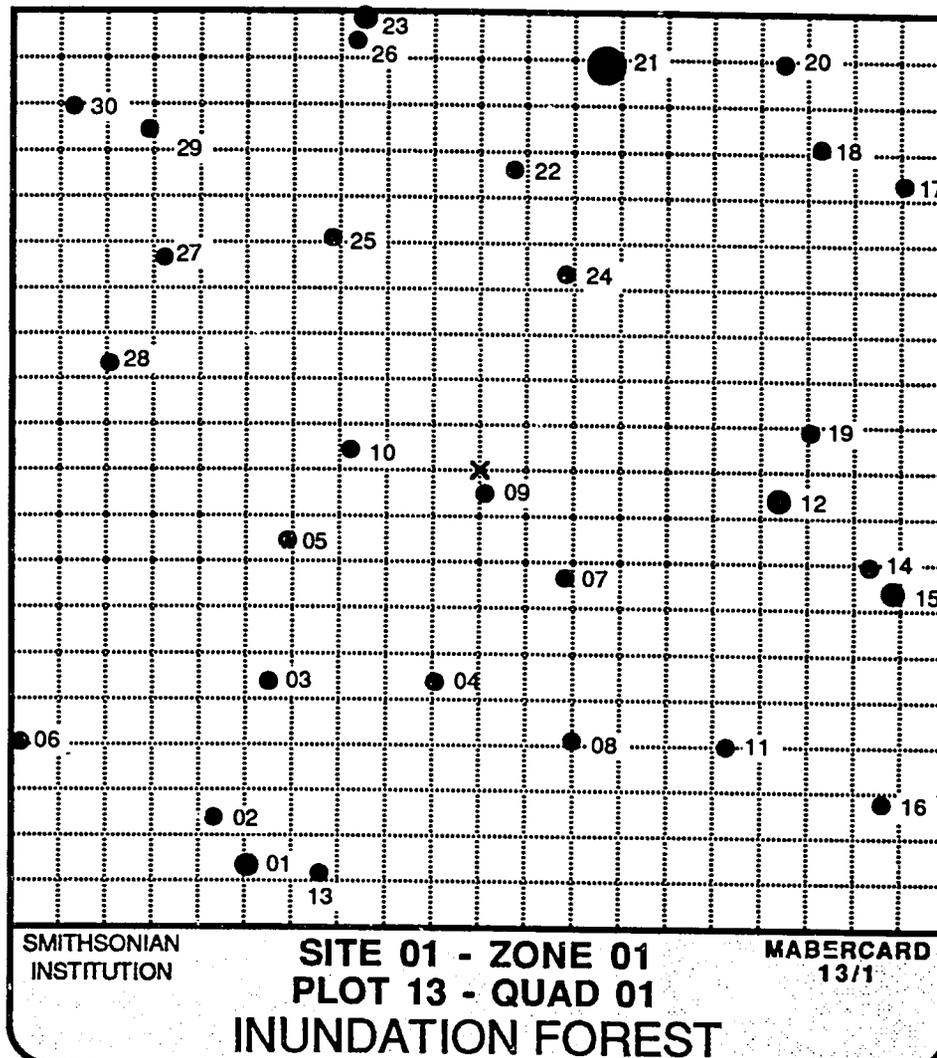
SITE 01 - ZONE 01
PLOT 13 - QUAD 01

MABERCARD
13/1

05	10	15	20	25	GENUS/SPECIES	FAMILY
					01 <i>Xyloia ligustrifolia</i>	
					02 <i>Salacia sp.</i>	HIPPOCRATEACEAE
04	09	14	19	24	03 <i>Heisteria cyanocarpa</i>	OLACEACEAE
					04 <i>Heisteria cyanocarpa</i>	OLACEACEAE
					05 <i>Inga sp.</i>	MIMOSACEAE
03	08	13	18	23	06 <i>Inga sp.</i>	MIMOSACEAE
					07 <i>Brosimum lactescens</i>	MORACEAE
					08 ?	MYRTACEAE
02	07	12	17	22	09 <i>Maytenus ebenifolia</i>	EBENACEAE
					10 <i>Brosimum lactescens</i>	MORACEAE
					11 <i>Brosimum lactescens</i>	MORACEAE
01	06	11	16	21	12 <i>Brosimum lactescens</i>	MORACEAE
					13 <i>Brosimum lactescens</i>	MORACEAE
					14 <i>Brosimum lactescens</i>	MORACEAE
					15 <i>Pouteria sp. I</i>	SAPOTACEAE
					16 <i>Brosimum lactescens</i>	MORACEAE
					17 <i>Brosimum lactescens</i>	MORACEAE
					18 <i>Brosimum lactescens</i>	MORACEAE
					19 <i>Brosimum lactescens</i>	MORACEAE
					20 <i>Heisteria cyanocarpa</i>	OLACEACEAE
					21 <i>Scheelea*</i>	PALMACEAE
					22 <i>Brosimum lactescens</i>	MORACEAE
					23 ?	
					24 <i>Brosimum lactescens</i>	MORACEAE
					25 <i>Brosimum lactescens</i>	MORACEAE
					26 <i>Xyloia ligustrifolia</i>	ANNONACEAE
					27 <i>Brosimum lactescens</i>	MORACEAE
					28 <i>Cupania sp.</i>	SAPINDACEAE
					29 <i>Cupania sp.</i>	SAPINDACEAE
					30 <i>Brosimum lactescens</i>	MORACEAE
					31 ?	

NOTES

*21. estrangulada por ficus



II

M E M O R A N D U M

Date: July 9, 1987

To: Participants of the Beni and Manu Bioinventory teams

From: Terry L. Erwin, Director, BIOLAT-SI/MAB
Biological Diversity Program

Subject: Specimens and artifacts collected at Beni and Manu; handling and interim deposition.

Final deposition of specimens is subject to agreements in a 'convenio' with each country; these have not been finalized, therefore an interim arrangement is necessary. Obviously, NMNH is interested in having deposited a good series of each species and set of numbers of plants found in the protected areas which are inventoried, while host-countries need voucher material deposited in-country.

Thus, all participants in the BIOLAT-SI/MAB program are required to obey host-country laws concerning biota and artifacts. Endangered or threatened species will not be collected under the interim plan or the general convenio; rather, if this becomes necessary, a separate application through appropriate host-country channels will be made. Artifacts are often more strictly regulated than biological material and a separate agreement for them is necessary.

With regard to handling the collected material in the short term, the following guidelines will be followed:

Research specimens of expedition members.

1.) Direct taxon research materials collected by host-country counterparts and students associated with BIOLAT are theirs to decide handling and deposition subject to laws and norms under which apply in the country. It is recommended that this material become part of the voucher collection for the host-country and made available for the museum's exchange and loan program under the formula below.

2). An NMNH researcher's material, that which is in the direct study plan of the scientist, will accompany the researcher back to Washington, or be shipped as appropriate. Researchers will be responsible for handling their own material upon leaving the field. Named material from the researchers project will be returned to the host-country according to the formula below on a regular yearly basis until such time as all collected species are represented in the country's voucher collections. Guest or contract scientists working with the BIOLAT program will be required to follow the same procedure except the research material will go to their own institution for preparation; they will be also required to voucher all species in the NMNH as well as host-country.

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Miscellaneous inventory material of protected area

3). Miscellaneous specimens in the taxonomic area of NMNH and of guest researchers will be returned to Washington and treated the same as direct research materials unless there is a host-country counterpart or institution that is capable of handling this material in an appropriate and timely fashion. Modest in-country support will be provided to appropriate institutions for this purpose to encourage timely preparation and vouchering of the material. Deposition of materials will be according to the formula below.

4). In permanent plot surveys and mapping, collections of mapped trees or dominant vegetation will be handled by host-country herbaria for preparation and distribution according to the formula below; Reynel in Peru and Beck in Bolivia. Modest in-country support will be provided to their institutions for this purpose to encourage timely preparation, identification, and vouchering of the material.

5). Shipments of specimens returning to NMNH will be sent in care of BIOLAT-SI/MAB Biological Diversity Program, and will be clearly marked as to curator-in-charge of taxa or taxonomic unit. These shipments will be unpacked, fumigated if required, and delivered to appropriate centers in a timely manner. This provides continuous logging of all materials and completes the program's incoming materials registration process.

6). Through the SI/MAB training courses offered to host-country students and young professionals, and BIOLAT institutional support, an infrastructure will be established that will increasingly be able to handle more and more material. All training staff are encouraged to ensure that good preparation techniques are taught and that the Smithsonian philosophy of specimen distribution is transferred to the students, thus ensuring and establishing good counterpart cooperation. Excellently prepared and named material for future study is a goal of this program.

SPECIMEN DISTRIBUTION FORMULA:

Host country: Primary type.

Plants: Sets--1st, 5th, 9th, 11th, 13th, 15th*

Animals: 1st, 5th, 9th, 11th, 13th, 15th*

Smithsonian Institution: 1st secondary type.

Plants: Sets--2nd, 4th, 6th, 8th, 12th, 14th

Animals: 2nd, 4th, 6th, 8th, 12th, 14th

Collector's designated institution: 2nd Secondary type.

Plants: Sets--3rd, 7th, 10th

Animals Sets--3rd, 7th, 10th

*Series with more than 15 specimens: 16th to Smithsonian, 17th to host -country, and alternating thereafter to end of series.

NOTE: Traces of species collected or recorded shall be maintained by host-country voucher collections, e.g. casts of tracks, photos, recording. Duplicate material will be housed in the Smithsonian Institution.

Schedule for personnel

Groups A, B, C, D: Students
Curator: Coddington
Fellows: Mazer, Sobrevila
Associates: Foster, Guevara, Middendorf, Ortega, Sandoval, Sarmiento
Technical staff: Clark, Venable
BIOLAT core staff: Louton, Pogue, Reynel
SI/MAB Program Manager: Gomez
Director BIOLAT-SI/MAB: Erwin

Inventory Team Time Block

Dates	Selected Habitates	Plots
Sept. 26-29	others	Sobrevila (B) Mazer (A) Foster (B) Venable (A) Core staff Groups A,B,C
Sept. 30-Oct. 2	others	Sobrevila (C) Mazer (C) Foster (C) Clark (D) Sandoval (D) Core staff Groups B,C,D
Oct. 3-6	others	Coddington (C) Ortega (A) Foster (D) Venable (D) Core staff Groups C,D,A
Oct. 7-10	others	Middendorf (B) Foster (A) Sobrevila (A) Clark (D) Core staff Groups D,A,B
Oct. 11-14	R&R	All personnel

Oct. 15-18	others	Gomez (B) Mazer (A) Foster (B) Venable (A) Core staff Groups A,B,C
Oct. 19-21	others	Gomez (C) Mazer (C) Foster (C) Clark (D) Sandoval (D) Core staff Groups B,C,D
Oct. 22-24	others	Gomez (C) Ortega (A) Guevara (A) Foster (D) Venable (D) Core staff Groups C,D,A
Oct. 25-28	others	Gomez (B) Sarmiento (B) Foster (A) Venable (A) Clark (D) Core staff Groups D,A,B
Oct. 29-30	Break camp/depart	All personnel

III

INDIVIDUAL EQUIPMENT FOR BENI AND MANU EXPEDITIONS

The following items are REQUIRED by Smithsonian participants!

Lantern. 6 D-cell combo flashlight and small florescent tube.
Swiss Army Knife.
Cantine or water bottle.
Rainware.
Rubber boots, short.
Sleeping bag.
Dinner plate, cup, utensils.
Towels.
Toilet articles.
Repellant.
Boots.
Sandels.
Long sleeve cotton shirts.
Long cotton pants.
Lots of long cotton socks.
Sweater or light jacket.
Winter warm-up clothes (can go a low as 42 degrees F.).
Hat.
Trail food of your choice (enough to live on four days without anything else).
Personal medicines.
 Malaria tablets.
 Iodine tablets for water.
 Foot powder, anti-fungal.
 Aspirin, etc.
 Personal first-aid (anti-diarrhea, laxative, anit-inflamatories,
 anithystimines, eye-drops w/ antibiotics, ace bandages, bandages.

NOTE: We have been asked not to do laundry in the forest camp. Please bring enough clothes to be in camp for six days at a stretch before returning to the Station where laundry can be done.

IV

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GENERAL ACTIVITIES

TRAINING SCHEDULE (1987): MANU RESERVED ZONE

- September 25 Arrival, welcome, and evening orientation lecture
 (Reynel and Erwin)
 Techniques (Louton, Sobrevila)
 Trail and habitat orientation
 Team assignments (Pogue)
 Teams A, B, C organize for departure next day
- September 26 Departure for Forest #1 (Teams A, B, C)
 Field demonstrations
 Selected habitats (Teams D-1, D-2, D-3, etc.)
 Evening lectures
- September 27 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)
 Evening lectures
- September 28 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)
 Evening lectures
- September 29 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams D)
- September 30 Survey, tagging, mapping (Teams B, C, D)
 Field demonstrations
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)
 Evening lectures
- October 1 Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)
 Evening lectures
- October 2. Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)
- October 3 Survey, tagging, mapping (Teams C, D, A)
 Field demonstrations
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)
 Evening lectures

October 16 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Team D)

October 17 Survey, tagging, mapping (Teams A, B, C)
 In afternoon, selected habitats or preparation
 Selected habitats (Team D)

October 18 Survey, tagging, mapping (Teams A, B, C)
 Selected habitats (Team D)

October 19 Survey, tagging, mapping (Teams B, C, D)
 Field demonstrations
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)
 Evening lectures

October 20 Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)
 Evening lectures

October 21 Survey, tagging, mapping (Teams B, C, D)
 In afternoon, selected habitats or preparation
 Selected habitats (Team A)

October 22 Survey, tagging, mapping (Teams C, D, A)
 Field demonstrations
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)
 Evening lectures

October 23 Survey, tagging, mapping (Teams C, D, A)
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)
 Evening lectures

October 24 Survey, tagging, mapping (Teams C, D, A)
 In afternoon, selected habitats or preparation
 Selected habitats (Team B)

October 25 Survey, tagging, mapping (Teams D, A, B)
 Field demonstrations
 In afternoon, selected habitats or preparation
 Selected habitats (Team C)

October 26 Survey, tagging, mapping (Teams D, A, B)
 In afternoon, selected habitats or preparation
 Selected habitats (Team C)

October 27 Survey, tagging, mapping (Teams D, A, B)
 In afternoon, selected habitats or preparation
 Selected habitats (Team C)

October 28 Survey, tagging, mapping (Teams D, A, B)
 In afternoon, selected habitats or preparation
 Selected habitats (Teams C)

October 29 Organization for return to Lima
 Core staff/researchers prepare for storage of
 materials

October 30. Group II departure from Pakitza

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V

Smithsonian Institution
Rio Manu, Peru
LECTURES

Mr. Roy E. "Chip" Clark

Lecture: Scientific photography in natural history

Dr. Jonathan A. Coddington

Lecture: Biology, behavior, and evolution of spiders

Documents: 2 sets of papers

Dr. Terry L. Erwin

Lecture: The BIOLAT inventory and bioresources

Documents: Summary and reprints

Blgo. Renato Guevara

Lecture: To be announced

Dr. Francisco Gomez

Lecture: Management of wildlife populations in the Neotropics

Documents: Summary and reprints, books in library

Dr. Robin Foster

Lecture: Tropical Botany

Dr. Jerry A. Louton

Lecture: Computer applications in bioinventories

Dr. Susan J. Mazer

Lecture: An introduction to demography and plant survival

Documents: Summary

Dr. George Middendorf

Lecture: To be announced

Blgo. Hernan Ortega

Lecture: To be announced

Dr. Micheal G. Pogue

Lecture: Collecting and preparing lepidoptera and an overview of the methodology of cladistics

Documents: Summary and books in library

Ing. Carlos Reynel

Lecture: The family Moraceae in the Neotropics

Documents: Illustrations of the plants

Mr. Abelardo Sandoval

Lecture: Archaeology methods

Document: Summary

Dr. Claudia Sobrevila

Lecture: Reproductive biology of tropical plants: Questions and methods

Documents: Summary

Mr. George L. Venable

Lecture: Fundamentals of Scientific Illustration and their preparation for publication

Documents: 2 handouts, art materials packet

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VI

Smithsonian Institution
Manu, Peru
Estudiantes Participantes

Blga. Rosario Acero
Ministerio de Agricultura
Direccion General de Flora y Fauna
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Gabinete de Arqueologia
Colegio Real U.N.M.S.M.
Jr. Andahuaylas 348
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Sr. Julio Arenas

Sr. Rodrigo Arce
Bachiller en Ciencias Forestales
Jr. Coronel Suarez 158
Urb. Chacra Cerro, Comas
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s/d
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92

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Bachiller en Ciencias Forestales
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Apartado 1057
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Ciencias forestales

Sr. Rolando Gutierrez

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Ing. Benjamin Kroll
Director de investigacion Proyecto Dantas
Convenio UNA/COTESU
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Salamanca de Monterrico
Lima
Taxonomia forestal

Blgo. Victor Morales

Srta. Enriqueta Olascoaga
Titulo de Biologa en tramite
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San Borja, Lima
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Srta. Rosa Parro

Blga. Rina Ramirez
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Vinatea Reynoso 532
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Trujillo
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Sr. Luis Segovia
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Ornitologia

Blga. Diana Silva
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Lima 14
Tel.
Arachnida y miriapoda

Sr. Antonio Tovar
s/d
Produccion forestal

Blgo. Alfredo Tupayachi
Sub-Director Herbario de UNSAAC
s/d
Cusco Peru
Botanica, lepidoptera

Sr. Michael Valqui
Estudiante Ciencias Forestales
UNA, La Molina
s/d
Manejo forestal

Contraparte Ing. Civil

ab

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Illustration - anatomy, physiology

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VII

Field studies and museum workshop for Peruvian Students

In spanish version of booklet only.

VIII

APPLICATIONS

Field studies and museum workshop for Peruvian Students

In spanish version of booklet only.

IX

MANU EXPEDITION 1987

EVALUATION FORM BIOLAT—SI / MAB BIOLOGICAL DIVERSITY PROGRAM

*Your comments and suggestions are very important for the future of this program. Please take some time and help us improve different aspects of the training where you feel it is necessary. Thank You.

ORIENTATION:	Very Good	Good	Average	Poor
To Facilities				
To trails				
To habitats				
To the program				
Time for self orientation				

*Comments and suggestions:

ACTIVITIES:

Inventory Techniques

Code 001— Surveying

Methods				
Transfer of information				
Team efficiency				

Code 002—Tree Tagging and collections

Methods				
Transfer of information				
Team efficiency				

Code 003— Computer mapping

Methods				
Transfer of information				
Team efficiency				

*Comments and Suggestions:

001

002

003

ACTIVITIES - Cont.:	Very Good	Good	Average	Poor
Scientific Research				
Code 004— Science				
Methods				
Transfer of information				
Code 005— Collecting				
Collecting techniques				
Preparation techniques				
Data with collections				
Transfer of information				
*Comments and Suggestions:				
004				
005				
MATERIALS AND EQUIPMENT:				
Laboratory				
Field				
Library				
Handouts				
First Aid				
*Comments and Suggestions:				
LECTURES AND DISCUSSIONS:				
Organization				
Level of Information				
Visual Aids				
Practical Information				
*Comments and Suggestions:				

FACULTY:	Very Good	Good	Average	Poor
Level of contact				
Helpfulness				
Transfer of information				
Group awareness				
*Comments and Suggestions:				
SUPPORT SERVICES:				
Rooms				
Food				
Transportation				
Emergency service				
Station personnel				
*Comments and Suggestions:				
GENERAL ORGANIZATION:				
Timing and schedules				
Scientific activities				
Field techniques				
Support facilities				
*Comments and Suggestions:				
*Any Additional Comments or Suggestions:				

Appendix 2

Museum Workshops

- List of participants**
- Program Outline**

**LIST OF PARTICIPANTS
FOR
MUSEUM WORKSHOP
NATIONAL MUSEUM OF NATURAL HISTORY - FEBRUARY 1987**

Ms. Olga Beatriz Vaccaro (Argentina)
Gustavo Scrocchi (Argentina)
Teresa Christina Sauer de Avila-Pires (Brazil)
Ana María Malva Ramos-Costa (Brazil)
Ricardo Castro (Brazil)
Pedro Miguel Ruiz Carranza (Colombia)
Juan Carlo Matheus Pozo (Ecuador)
Ramiro Barriga S. (Ecuador)
Eduardo Antonio Argumedo (El Salvador)
María de Jesús Guillermina Urbano Vidales (Mexico)
Adolfo G. Navarro (Mexico)
Octavio A. Saldaña T. (Nicaragua)
Irma Franke (Peru)
Hernán Castellanos (Venezuela)
José Luis Altuve (Venezuela)

**PROGRAM OUTLINE
FOR
MUSEUM WORKSHOP
NATIONAL MUSEUM OF NATURAL HISTORY - FEBRUARY 1987**

February

- Saturday 7** Participants arrive
- Monday 9** Introduction to Washington
9:00 Greeting
10:00 - 6:30 Orientation to bus/subway, etc; visit to mall museums, etc.
6:30 Get acquainted pot luck dinner for museum participants and trainees
- Monday 9** Introduction to Workshop
8:30 - 9:00 Overview of the workshop
10:00 - 12:00 Presentations by trainees describing their museums, programs, etc.
12:00 - 1:30 Lunch
1:30 - 5:00 Presentations by trainees, cont'd.
- Tuesday 10** Methods of Collecting Specimens: discussion and demonstration of use of nets, traps, poisons, killing agents, etc., and discussion of methods of collecting associated data, field notes, etc.
8:30 - 10:30 Lecture on philosophy of scientific collecting: collecting permits; type specimens; value of series; rare and endangered species
10:30 - 12:30 Fishes
12:30 - 1:30 Lunch
1:30 - 5:00 Amphibians; Reptiles
- Wednesday 11** Methods of Collecting specimens, cont'd.
8:30 - 11:30 Mammals
11:30 - 12:30 Lunch
12:30 - 3:00 Birds
3:00 - 5:00 Sound Recording
- Thursday 12** Field Preparation Techniques: discussion of data collection from specimens, label preparation, types of preservatives, etc; demonstration and hands on practice of specimen preparation
8:30 - 9:30 Lecture: use and value of standard techniques, formats, records
9:30 - 12:30 Demonstration and hands on practice in preparation of fish specimens, fluid and skeletal
12:30 - 1:30 Lunch
1:30 - 5:00 Demonstration and hands on practice in preparation of fish specimens, fluid and skeletal

Friday 13

8:30 - 12:30 Demonstration and hands on practice in preparation of mammal skins

12:30 - 1:30 Lunch

1:30 - 5:00 Mammal skin prep cont'd; preparation of skulls, skeletons, and fluids; handling of large mammals including tanning, etc.

Saturday 14 Field Preparation Techniques, cont'd.

8:30 - 12:30 Demonstration and hands on practice in preparation of bird skins

12:30 - 1:30 Lunch

1:30 - 5:00 Bird skin prep cont'd; preparation of fluids, skeletons, eggs, and nests

Sunday 15 Free**Monday 16** Museum Preparation of Skeletons

8:30 - 12:30 Demonstration and hands on practice of skeleton cleaning and bone numbering, all groups' visit to skeleton prep lab.

12:30 - 2:00 Lunch

2:00 - 5:00 Skeletal prep, cont'd.

Tuesday 17

Cataloguing, Installation, and Arrangement of Specimens: discussion of systems of arrangement (taxonomic, geographical, by date, by sex,; fluid, skeletal, skin, etc.); explanation of methods used systems of labelling drawers, cases etc.

8:00 - 9:00 Lecture on catalogue systems: kinds (e.g. accession, specimen, geographic, type), functions

9:00 - 12:00 Visit to fishes for demonstration of catalogue systems, files, specimen arrangement, etc.

12:00 - 1:00 Lunch

1:00 - 5:00 Visit to herpetology for demonstration of specimen catalogue systems, files, and arrangement; visit to sound laboratory and discussion of catalogue systems, storage and maintenance of tapes, etc.

Thursday 19

Storage and Pest Control: discussion of bottles, tanks, cases, boxes, vials; and of fumigants, sunlight, dust, temperature, and humidity control, etc.

8:30 - 12:30 Lecture, demonstration and visits to departments as necessary.

12:30 - 2:00 Lunch

2:00 - 5:00 cont'd.

Friday 20

Loan Invoicing and Packing of Specimens; lecture, demonstration, and hands on practice

8:30 - 10:30 Invoicing and record procedures

10:30 - 12:00 Wrapping and packing skeletons, eggs, nests.

12:00 - 1:00 Lunch
 1:00 - 3:00 Packing fluid specimens
 3:00 - 5:00 Packing bird and mammal skins

Saturday 21 Specimen Identification: explanation of measurements and characteristics used with different organisms; use of keys; comparison of specimens in the collection
 8:00 - 11:00 Fishes
 11:00 - 12:00 Lunch
 12:00 - 5:30 Amphibians and Reptiles

Sunday 22 Free

Monday 23 Specimen Identification, cont'd.
 8:30 - 11:30 Birds
 11:30 - 1:00 Lunch
 1:00 - 5:00 Mammals

Tuesday 24 Introduction to and Use of Library Materials: catalogues, abstracting services (e.g. Zoo Record, Biological Abstracts, computer search programs), etc.
 8:30 - 11:30 Lecture, demonstration
 11:30 - 1:30 Lunch
 1:00 - 5:00 cont'd.

Wednesday 25 Functions of Natural History Museums
 8:30 - 11:30 Research, educational, and public functions: presentations and round table discussion
 11:30 - 1:00 Lunch
 1:00 - 5:00 Research activities: discussion and demonstrations of projects using museum collections (e.g. systematic, distributional, ecological)

Thursday 26 Functions of Natural History Museums cont'd.
 8:00 - 12:00 Educational activities: discussion and demonstrations; visits to the Naturalist' Center and Insect Zoo
 12:00 - 1:00 Lunch
 1:00 - 5:00 Public exhibits and programs: discussion and demonstrations

Friday 27 Individual Work by Trainees
 8:30 - 5:00 Department of Special Interest: arranged with individual curators

Saturday 28 Individual Work by Trainees cont'd.
 8:30 - 5:00 Department of Special Interest: arranged with individual curators
 7:30 Farewell get-together

Sunday 1 March Trainees Depart

**LIST OF PARTICIPANTS
FOR
MUSEUM WORKSHOP
SMITHSONIAN INSTITUTION APRIL/MAY 1988**

Eduardo Rafael Forno Gisbert (Bolivia)

Mónica Moraes Ramirez (Bolivia)

René Vasquez (Bolivia)

Joaquina Alban (Peru)

Victor Morales (Peru)

José Santisteban (Peru)

Grace Servat (Peru)

**PROGRAM OUTLINE
FOR
MUSEUM WORKSHOP
SMITHSONIAN INSTITUTION - APRIL/MAY 1988**

Saturday 16 Bolivian participants arrive
Sunday 17 Peruvian participants arrive
17 General orientation to bus/subway,
Smithsonian Museums

Monday 18
8:30 - 12:00 ID cards, Bank,
Greeting (Gómez)
Orientation within the Smithsonian
Overview of next two weeks activities and
responsibilities (Gómez)

12:30 - 1:30 Welcome by Dr. Hoffmann, Dr. Erwin.
Welcome by BIOLAT and curators counterpart.
Assignment of working teams.
(I.C. 3113)

1:30 - 4:00 Research, proposal planning, processing of
specimens

4:00 - 6:00 General Reception (I.C. 3113)

Tuesday 19
8:30 - 12:00 Research, proposal planning, processing of
specimens
12:00 - 1:00 Seminar by René Vasquez (I.C.3109)
2:00 Visit to World Wildlife Fund - U.S.
3:00 - 5:30 Research, proposal planning, processing of
specimens

Wednesday 20
8:30 - 10:00 Research, proposal planning, processing of
specimens
10:00 - 12:00 Seminar - U.S. Fish & Wildlife Service and ICBP
12:00 - 1:00 Seminar by Grace Servat (I.C. 3112)
1:00 - 5:30 Research, proposal planning, processing of
specimens

Thursday 21
8:30 - 12:00 Research, proposal planning, processing of
specimens
12:00 - 1:00 Seminar by Victor Morales (NMNH Waldo Schmitt
Room)
1:00 - 5:30 Research, proposal planning, processing of
specimens

5:30 - 8:00 Senate of Scientists Dinner Forum

Friday 22

8:30 - 12:00 Research, proposal planning, processing of specimens
12:00 - 1:00 Seminar by Mónica Moraes (NMNH Waldo Schmitt Rm.)
1:00 - 2:00 IUCN Latin American Program (NMNH Waldo Schmitt Rm.)
2:00 - 5:30 Research, proposal planning, processing of specimens

Monday 25

9:00 - 10:00 Seminar by Eduardo Forno (I.C. 3112)
10:00 - 2:00 Research, proposal planning, processing of specimens
2:00 - 4:00 Visit to Conservation International
4:00 - 5:30 Research, proposal planning, processing of specimens

Tuesday 26

8:30 - 12:00 Research, proposal planning, processing of specimens
12:00 - 1:00 Seminar by José Santisteban (I.C. 3109)
1:00 - 2:00 Seminar by Roy McDiarmid (I.C. 3109)
2:00 - 5:30 Research, proposal planning, processing of specimens

Wednesday 27

8:30 - 12:30 Twenty minute presentation by each participant on their small projects with BIOLAT
12:30 - 2:00 Seminar by Joaquina Alban (I.C. 3109)
2:00 - 3:00 Visit to the Nature Conservancy
3:00 - 5:30 Research, proposal planning, processing of specimens

Thursday 28

8:30 - 5:30 Research, proposal planning, processing of specimens

Friday 29

8:30 - 5:00 Research, proposal planning, processing of specimens
Meeting with Sharol Nishizaki of Office of Fellowships and Grants

5:00 Deadline to submit 1) final proposals for small BIOLAT project, 2) three-page written report of the activities conducted within the last two weeks, and 3) list of specimens collected in your area of interest during last year's BIOLAT expedition.

5:30 Informal reception

Sunday 1 Departure of Peruvian participants
Monday 2 Departure of Bolivian participants

Week of May 2 - 7

Some participants stay to complete individual
research with Smithsonian Counterpart(s)

NOTE: I.C. = International Center (located on the 3rd floor of
the Quadrangle).
The Waldo Schmitt Room is located on the 2nd floor of the
Natural History Museum.

**SEMINARS TO BE GIVEN BY
PERUVIAN AND BOLIVIAN VISITING SCIENTISTS**

Tuesday 19

René Vasquez
Universidad Técnica del Beni - Bolivia
"Convenio de investigación Piscícola U.T.B. - CORDEBENI en la
Amazonia Boliviana"
Time: 12:00 - 1:00
Room: I.C 3109 (Quadrangle)

Wednesday 20

Grace Servat
Museo de Historia Natural de Lima - Peru
"Actividades que realiza el Departamento de Ornitología del
Museo de Historia Natural de Lima"
Time: 12:00 - 1:00
Room: I.C. 3112 (Quadrangle)

Thursday 21

Victor Morales
Coordinador del Grupo Herpetológico (ECCO)
Museo de Historia Natural de Lima - Peru
"Sonogramas: Un método para la identificación de Anfibios
Tropicales"
Time: 12:00 - 1:00
Room: Waldo Schmitt Room (NMNH)

Friday 22

Mónica Moraes
Herbario Nacional de Bolivia, La Paz - Bolivia
"Herbario Nacional de Bolivia: Proyecto Palmae Bolivianas"
Time: 12:00 - 1:00
Room: Waldo Schmitt Room (NMNH)

Monday 25

Eduardo Forno
Instituto de Ecología, Carrera de Biología, Universidad Mayor
de San Andrés - Bolivia
"Programa de Investigación Entomológica en el Instituto de
Ecología"
Time: 9:00 - 10:00
Room: I.C. 3112 (Quadrangle)

Tuesday 26

José Santisteban
Lima - Peru

"Systematic Entomologist in a developing country: a personal view"

Time: 12:00 - 1:00

Room: I.C. 3109 (Quadrangle)

Wednesday 27

Joaquina Albán

Museo de Historia Natural, Oficina Nacional de Evaluación de Recursos Naturales (ONERN) Lima - Peru

"Vigilancia Ecológica de los Procesos de degradación y desertificación en el Perú: Estudio de la Vegetación"

Time: 12:00 - 1:00

Room: I.C. 3109 (Quadrangle)

**SEMINARS ON RESEARCH
TO BE CONDUCTED BY BOLIVIAN AND PERUVIAN VISITING SCIENTISTS**

René Vasquez: 8:30 - 9:00
Organization: Universidad Técnica del Beni - Bolivia
Research Proposal:
"Determinación de biomas de reproducción de las especies piscícolas en la Estación Biológica del Beni"

Victor Morales: 9:00 - 9:30
Organization: Museo de Historia Natural de Lima - Peru
Research Proposal:
"Diversidad Herpetológica en la Reserva del Manu"

Joaquina Albán: 9:30 - 10:00
Organization: Museo de Historia Natural, Oficina Nacional de Evaluación de Recursos Naturales (ONERN)
Research Proposal:
"Estudio Florístico y ecológico de la familia Rubiaceae en Pakitza - Zona Reservada del Manu, Peru"

Eduardo Forno: 10:00 - 10:30
Organization: Instituto de Ecología, Universidad Mayor de San Andrés - Bolivia
Research Proposal:
"Aspectos de la Ecología y Microdistribución de las Mariposas de la Estación Biológica del Beni"

Grace Servat: 10:30 - 11:00
Organization: Museo de Historia Natural de Lima - Peru
Research Proposal:
"Inventario Ornitológico y estudio preliminar de los Manakin (Pipridae) en el bosque tropical - Pakitza Zona Reservada, Parque Nacional del Manu"

José Santisteban: 11:00 - 11:30
Organization: Trujillo - Peru
Research Proposal:
"Herbivorous beetles and its microdistribution on the understory of permanent plots at Pakitza, Manu Reserved Zone, Peru"

Mónica Moraes: 11:30 - 12:00
Organization: Herbario Nacional de Bolivia, La Paz - Bolivia
Research Proposal:
"Biología reproductiva de Chamaedorea leonis H. E. Moore (Palmae) en la Estación Biológica del Beni: Densidad poblacional, floración y polinización".

DATE: Wednesday, April 27, 1988
LOCATION: I.C. 3113, located on the 3rd floor of the Quadrangle

Appendix 3

**-List of participants in workshop conducted at the Luquillo
Biosphere Reserve, Puerto Rico**

- Schedule of Activities

**LIST OF PARTICIPANTS
FOR
FIELD WORKSHOP
LUQUILLO BIOSPHERE RESERVE, PUERTO RICO - MAY 1988**

I. Coordinators in Puerto Rico

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Dr. Fred Scatena
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Yolanda Salvá
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III. Volunteers & Collaborators

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122

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Dr. Janice Voltzow
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IV. Biological Station Manager

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**LUQUILLO BIOSPHERE RESERVE PUERTO RICO
SCHEDULE OF WORKSHOP ACTIVITIES (MAY 22-28, 1988)**

May 22 Arrival of the participants from Washington
5:00 pm Welcome, presentation of the program and
 description of the field workshop, general
 discussion and organization (Gómez, Velez)
7:00 pm dinner
8:00 pm Departure to El Verde Research Station

May 23 - 27 6:30 am breakfast
7:00 am departure to the research site
7:30 am - 5:00 pm field work at the research site
5:00 pm dinner and return to station 7:00 pm
7:00 pm -12:00 participants' lectures and data
 processing

May 28 6:30 am breakfast
7:30 am - 10:30 am final data processing and
 packing of equipment
9:30 am return to San Juan
11:30 am final lecture (Erwin) and lunch with the
 entire group, and others.
Departure of the participants from Washington

Appendix 4

Draft of revised field training workshop for Peru 1988

BIOLAT-SI/MAB 88
PAKITZA, PERU

Proposed workshop schedule:

- 31 Aug.- Orientation talks, Cusco
14:00 Welcome and introduction (Peruvian administrator)
14:15 Overview and broad goals of program (T. L. Erwin)
15:30 Slide presentation and preview of site, logistics,
etc. (F. Gomez)
16:30 Introduction of Smithsonian, Peruvian and Bolivian
participants and opportunity for questions and
answers.
- 01 Sept.- Bus to Erica
- 02-03 Sept.- Boat to Pakitza (overnight camp on river)
20:00 Division of participants into three teams and
discussion of next days schedule
- 04 Sept.-
07:00 Orientation walks (one team to each of the major
habitats and then switch so that all participants have
had a general introduction to each habitat and some of
the dominant plants, animals, soil types, and other
pertinent aspects found in each)
14:00 Lecture- ERWIN "Natural diversity of the biota"
17:00 Lecture- PONCE "Management of protected areas"
- 05 Sept.-
07:00 Field work and small groups
19:00 Lecture- PONCE "Management of protected areas"
20:00 Lecture- PEARSON "Biodiversity: Education,
conservation and research"
- 06 Sept.- (arrival of aquatics group)
08:00 Lecture- GOMEZ "Value and current state of
biodiversity"
09:00 Lecture- PONCE "Management of protected areas"
10:00 Lecture- PONCE "Management of protected areas"
14:00 Field work and small groups
18:00 Field work and small groups

07 Sept.-

08:00 Lecture- FARRELL "Field identification and ecology of herbivorous beetles"

09:00 Lecture- R. FOSTER "Field identification and natural history of Amazonian tree families"

10:00 Lecture- PONCE "Management of protected areas"

14:00 Field work and small groups

18:00 Field work and small groups

08 Sept.-

07:00 Field work and small groups

14:00 Lecture- MATHIS "Identification and natural history of aquatic diptera"

15:00 Lecture- PONCE "Management of protected areas"

17:00 Field work

09 Sept.-

07:00 Field work and small groups

14:00 Lecture- GOMEZ "Principles & techniques of wildlife management for sustainable development"

15:00 Lecture- PONCE "Management of protected areas"

17:00 Field work

10 Sept.-

07:00 Field work and small groups

14:00 Lecture- PONCE "Management of protected areas"

* 17:00 Lecture- LOUTON "Odonate identification & natural history"

11 Sept.-

(Independent studies)

- 12 Sept.-
08:00 Lecture- TERBORGH (Guest lecture on Amazonian ecology)
09:00 Lecture- DAVIDSON (Guest lecture on Amazonian ecology)
10:00 Lecture- TERBORGH (Guest lecture on Amazonian ecology)
14:00 Field work and small groups
18:00 Field work and small groups
- 13 Sept.-
08:00 Lecture- R. FOSTER "Amazonian forest phenology"
09:00 Lecture- PEARSON "Plant/herbivore co-evolution"
10:00 Lecture- FARRELL "Phylogenetics of insect/plant interactions"
14:00 Field work and small groups
18:00 Field work and small groups
- 14 Sept.-
07:00 Field work and small groups
14:00 Lecture- McDIARMID "Composition and structure of Neotropical herpetofauna"
15:00 Lecture- NICKLE "Biology of Peruvian termites"
18:00 Field work and small groups
- 15 Sept.-
07:00 Field work and small groups
14:00 Lecture- ORTEGA "Identification and natural history of Amazonian fishes"
15:00 Lecture- PEREIRA "Biology of Amazonian crustaceans"
17:00 Field work
- 16 Sept.-
07:00 Field work and small groups
19:00 Lecture- SANDOVAL "Rise and fall of Andean civilizations"
20:00 Lecture- McDIARMID "Reproductive biology of Neotropical amphibians"

- 17 Sept.-
07:00 Field work and small groups
19:00 Lecture- MAZER "Paleoecological reconstruction of fossil plant assemblages"
* 20:00 Lecture- FLINT "Caddis fly identification and natural history"
- 18 Sept.-
(Independent studies)
19:00 Lecture- PEARSON "Historical factors and bird species diversity in tropical forests"
20:00 Lecture- MAZER "Ecological evolution of seeds and succession"
- 19 Sept.-
* 08:00 Lecture- POGUE "Character analysis in systematics research"
09:00 Lecture- REYNEL "Amazonian botany"
10:00 Lecture- SANDOVAL "Archeology of the eastern Andes"
14:00 Field work and small groups
18:00 Field work and small groups
- 20 Sept.-
07:00 Field work and small group
14:00 Lecture- ROBINSON (Guest lecture on Amazonian ecology)
15:00 Lecture- M.FOSTER (Guest lecture on Amazonian ecology)
18:00 Field work and small groups
- 21 Sept.-
07:00 Field work and small group
19:00 Lecture- WILSON "Biology of Amazonian mammals"
20:00 Lecture- PEARSON "The importance of manipulations in field experiments: tiger beetle community structure"

- 22 Sept.-
 08:00 Student oral presentation of individual projects (15 min) 3 hrs.
 14:00 Field work
 18:00 Field work and small groups
- 23 Sept.-
 08:00 Student oral presentations (3 hrs.)
 14:00 Field work
 18:00 Field work and small groups
- 24 Sept.-
 07:00 Field work
 14:00 Student oral presentations (2 hrs.)
 17:00 Packing and finishing projects
- 25 Sept.-
 07:00 Boat to Limonal (overnight camp on river)
- 26 Sept.-
 Boat to Erica
- 27 Sept.-
 Bus to Cusco
- 28 Sept.-
 Flight to Lima
- * Lecture in English

Total time scheduled:

39 lectures

allotted field work time:

80 hrs between 07:00-12:00
 32 hrs between 14:00-18:00
 >18 hrs after 17:00 (6 days
 for night work)
 8 hrs of student presentations

SCHEDULE FOR FIELD PARTICIPATION OF SMALL GROUPS

Group leaders:

- ERWIN - permanent plot survey and protocol
- FLINT - caddisfly collecting and preparation techniques
- LOUTON - odonate collecting and preparation techniques
- MATHIS - dipteran collecting and preparation techniques
- MAZER - paleoecology and seed biology
- McDIARMID - lizard and amphibian collecting and preparation techniques
- NICKLE - termite and katydid collecting and preparation techniques
- ORTEGA - fish collecting and preparation techniques
- PEARSON - bird and insect natural history and ecology
- PEREIRA - crustacean collecting and preparation techniques
- POGUE - lepidopteran collecting and preservation techniques
- REYNEL - plant collecting and preparation techniques
- SANDOVAL - archeological techniques
- WILSON - mammal collecting and preparation techniques

The goal of these small field groups is to expose all workshop participants to as broad a range of taxa and techniques as possible. The groups will each have six participants and be composed of as diverse a background of interests as possible. Each group will stay intact throughout the workshop and rotate through all the scientific leaders during the course. The small groups will spend a minimum of four hours with each scientist as per the following schedule. Additional time on an individual basis can be arranged with the scientists.

05 Sept., 07:00-12:00 - ERWIN (Group 1)
LOUTON (Group 2)
MAZER (Group 3)
ORTEGA (Group 4)
REYNEL (Group 5)

06 Sept., 14:00-19:00 - FLINT (Group 1)
MATHIS (Group 2)
PEREIRA (Group 3)

18:00-23:00 - McDIARMID (Group 4)
NICKLE (Group 5)

07 Sept., 14:00-19:00 - SANDOVAL (Group 1)
LOUTON (Group 3)
MAZER (Group 2)

18:00-23:00 - POGUE (Group 4)
WILSON (Group 5)

08 Sept., 07:00-12:00 - ERWIN (Group 2)
FLINT (Group 3)
PEARSON (Group 1)

09 Sept., 07:00-12:00 - ERWIN (Group 3)
MAZER (Group 1)
ORTEGA (Group 2)
PEARSON (Group 4)
SANDOVAL (Group 5)

10 Sept., 07:00-12:00 - ERWIN (Group 4)
MATHIS (Group 5)
PEARSON (Group 3)
PEREIRA (Group 2)
REYNEL (Group 1)

12 Sept., 14:00-19:00 - FLINT (Group 2)
LOUTON (Group 1)
ORTEGA (Group 3)

18:00-23:00 - McDIARMID (Group 5)
NICKLE (Group 4)

13 Sept., 14:00-19:00 - MAZER (Group 3)
PERIERA (Group 4)
SANDOVAL (Group 2)

18:00-23:00 - POGUE (Group 5)
WILSON (Group 1)

14 Sept.,	07:00-12:00	- FLINT	(Group 4)
		PEARSON	(Group 2)
		REYNEL	(Group 3)

	18:00-23:00	- McDIARMID	(Group 1)
		WILSON	(Group 2)
15 Sept.,	07:00-12:00	- LOUTON	(Group 5)
		MAZER	(Group 4)
		MATHIS	(Group 3)
16 Sept.,	07:00-12:00	- LOUTON	(Group 4)
		PEARSON	(Group 5)
		PEREIRA	(Group 1)
		REYNEL	(Group 2)
17 Sept.,	07:00-12:00	- EWRIN	(Group 5)
		MATHIS	(Group 1)
		SANDOVAL	(Group 4)
19 Sept.,	14:00-19:00	- ORTEGA	(Group 1)
		REYNEL	(Group 4)

	18:00-23:00	- McDIARMID	(Group 2)
		NICKLE	(Group 3)
20 Sept.,	07:00-12:00	- ORTEGA	(Group 5)

	18:00-23:00	- McDIARMID	(Group 3)
		NICKLE	(Group 2)
		POGUE	(Group 1)
21 Sept.,	07:00-12:00	- MATHIS	(Group 4)
22 Sept.,	18:00-23:00	- NICKLE	(Group 1)
		POGUE	(Group 2)
		WILSON	(Group 3)
23 Sept.,	18:00-23:00	- POGUE	(Group 3)
		WILSON	(Group 4)