

THE UEA ECUADOR CLOUDFOREST EXPEDITION 1991/2. c/o Fundación Ecclogica Mazan, Casilla 844, Cuenca, S W M MRY I. Ecuador. 2-2-92.

Dear Sir

Enclosed is the first preliminary report of the UEA Ecuador Cloudforest Expedition 1991/2, to inform you of our progress to date. As we are still midway, we haven't yet analysed our results fully, so this report is mainly a compendium of ideas and impressions.

We have had some logistic problems working in this dite and were concerned about our inability to work to our original objectives. Consequently, we have adapted the project's aims to suit the possibilities and requirements of the area.

There is a strong possibility that the status of the region will be raised from Protected Forest to National Park with, for the first time in Ecuador, settlements included within the Park's boundaries. Potentially, a large barrier to the success of this proposal, will be the conflict of interests between the Park and its inhabitants. The main direction of our work has, therefore, been to assess the impact of human activities on the forest and the ecological value of disturbed and secondary areas. From this, it has been possible to draw tentative ideas on how to resolve this conflict.

It was our intention to return to this area to continue this study but lack of funds, and logistical problems, have made this impossible in the time available to us. However, we shall be submitting a proposal for further research and feasibility studies for the Park, and would like to encourage further expeditions here.

Since we cannot work there now ourselves, we shall be continuing a similar study in the forests of Inga Pucara on the east slope of the western cordillera. This forest is important in the protection of water supplies to - the downstream town of Santa Isabel. The work of the expedition will assist the people of the neighbouring community of Huasipamba, in their search for an appropriate management strategy.

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Borrero 7-84 y Sucre Casilla 844 Tell 821 347 Cuenca, Ecuador

We hope the changes to our original objectives meet with the approval of the institutions supporting us and will not affect our position here.

In line with the expedition's commitment to full integration of Ecuadoreans in the project, we shall be bringing one of cur counterparts back to England with us. S/he will assist in the writing of the reports and the planning of future research. This will also provide an opportunity for her/him to take advantage of the greater resources available for further education in conservation and ecosystems management in Britain. The flight will be paid by the British Council and we are looking for further funding to help with maintenance costs.

We will be returning to England at the end of April. Until that time, further information/inquiries can be directed to us via the Fundación Ecologica Mazan.

Yours Sincerely,

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Nikki Dayton, Expedition Coordinator.

UEA ECUADOR CLOUDFOREST EXPEDITION PRELIMINARY REPORT

DECEMBER 1991.

INTRODUCTION.

This expedition had the original aim of making comparisons between primary, secondary and plantation cloudforest, in Asuay Province, Ecuador. These comparisons would be made through five related projects; on the bird life, pollination by hummingbirds, trees and forest structure, epiphytes and water retention, and the social interactions between local communities and the forests studied.

Our first study site has been Pulpito; the steep-sided valley of the Rio Pulpito which is part of the drainage catchment running into the Paute Hydroelectric Dam. It also forms part of the large forested area called the Bosque Protector 15. This site was chosen because of the interest of the local authorities (through its relevance to the dam), because of its protected status, and to follow the work of the Bristol Rio Paute Headwaters expedition 1991. The camp was made on the west side of the valley, about 5km from the dam.

Limitations.

The first major difficulty encountered was the loss of one of the Expedition members, Andy Mitchell, who was to have worked on the bird project, and had to return to England due to personal problems at home. It was possible to carry cut a less extensive bird survey without him, and we have now managed to replace him with an experienced Ecuadorian ornithologist for the rest of the Expedition.

Access to Pulpito was very difficult. All supplies for six weeks in the field had to be taken with us, which meant getting 40 sacks across the reservoir on a wire, and making five trips from there to the final camp as there were not enough horses.

The primary forest was almost completely inaccessible, plantations were non-existant and the secondary forest was a mixture of primary and pioneer species, due to the traditional methods of pasture clearance; by leaving stands of socially and economically useful species.

This meant that the comparisons originally intended could not be made. Instead, as much information as possible was gathered about the nature of the forest, its diversity and the threats to its existance. This information is being used to strengthen the case, currently being made, to gain National Park status for this area, and to press for changes to existing protection laws, presently found unworkeable by the campesino community.

Counterparts.

Five Ecuadorean graduates, previously involved with the Rio Mazan Project, have been working with us for this period (and are now being joined by a sixth). The time in Pulpito has been an opportunity to introduce our counterparts to the techniques we are using and to get them used to doing this type of fieldwork. They have been invaluable in forging relationships with the campesinos and have integrated well into the expedition group.

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PROJECT RESULTS.

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Social Survey.

To assess present land-uses in the valley, investigate changes in this land-use and their underlying causes.

Methods:

Semi-structured, open-ended interviews were conducted; the interviewees being selected through casual encounters. Information was also gathered through direct and participant observation.

Preliminary Results:

The Pulpito valley has a relatively extensive cloudforest cover in comparison to others in this area. This seems to be more significantly due to its isolated position than to its status as a protected forest, having no direct access to a road.

Approximately 40 years ago, a large proportion of the valley was cleared, used for pasture, and later abandoned. In the past five to ten years the area, since overgrown into scrub (monte), is being cleared and the number of holdings being actively worked is on the increase again. The protected status of the forest is undermined by the legal tangles surrounding land rights issues. The previous colonisation has increased the confusion surrounding the beaurceracy of land tenure, since titles to the land already exist. Also deforested land has greater value on the market.

The majority of the holdings are owned by members of a cooperative from the village of Santa Rita, five hours away. They cultivate crops in Santa Rita, and use their holdings in Fulpito to raise cattle; coming up to check them, and clear more pasture, only a couple of times a year. A system of "cambiomano", or mutual labour exchange, is used for land-

The predominant land-use is cattle raising; thus, the clearance. main activities on the land are deforestation and weeding of regrowth. When the area was first cleared, socially and economically useful trees were left standing; the rest out and burnt. This, when abandoned, quickly regenerated to monte and then secondary forest, retaining some of the original forest structure; for example, a high canopy. Now, this practice is waning, since the trees are considered a danger to cattle from falling branches, and also reducing sunlight reaching the pasture.

The level of wood extraction is low and purely for local use; for example, building of refugios and fencing. Cutting firewood is not an issue here, as deadwood is plentiful. Hunting is low-intensity. Although there are still large animals abroad, such as mountain tapirs and spectacled bears, they occur only in the more inaccessible parts and are sufficiently scarce to prevent hunting being cost-effective. Fishing for trout is considered merely recreational. Honey is extracted when encountered. Milk and cheese are made from the cows' milk on a small scale and horses are occasionally hired out to carry stores.

The life-strategy of the campesinos in this area is typical of local subsistence farming practices; that is, for personal consumption and, where possible, diversifying their interests to generate cash. The land and cattle in Pulpito are a form of security as can be transformed into hard currency when needed, as well as generating some, low-level, income.

Tree Survey.

Aim:

To investigate the tree species composition and structure of the disturbed primary forest.

Methods:

Assessment was made in 10m2 quadrats at 20m intervals along a 250m transect. Within each quadrat, each tree greater than 10cm dbh and 3m in height was described using a standard form, and samples were taken for identification purposes.

The structural characteristics of the vegetation of each quadrat were described using a "pro forma" based on that devised by Webb *et al*, [1976].

The main difficulty encountered was the extraction of samples, since the foliage and flowers were often only present in the upper reaches of the canopy, and many species were too fragile to climb.

Preliminary Results:

In total 60 individual trees were surveyed, making an average of six per quadrat. Identification pending. The area of forest studied would appear to be disturbed primary forest, or secondary regrowth with primary standards. The high abundance of epiphytes, mosses and vines thriving on the trees, and the maturity of the trees themselves, indicate primary forest. There is evidence of foraging and trampling by cattle. This, with the occasionally very dense ground cover comprised mainly of the bamboo 'suro' (a key indicator of disturbance), suggests the forest has been put to greater use in the past.

Bird Survey.

Aims:

A comparison of the disturbed primary forest with the more recently cleared monte habitat in terms of bird diversity and relative abundance, in order to investigate some of the effects of man's encroachment up the valley on the avifauna.

To teach Gustavo comparative survey techniques and the use of mist-nets.

Methods:

The main survey method used was point-counts along a 1km transect, with tape recordings made at each site to correct for the distance of sound-carriage in each habitat. Nets were also set in both habitat types.

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Preliminary Results:

105 species have so far been positively identified, including 4 near-threatened species [Collar *et al*, 1988) and an unconfirmed sighting of the Violet-Throated Metaltail (*Metallura baroni*); a species with full Red-Data Book status. Two new height records have also been found for Andean Cockof-the-Rock and Yellow-Throated Bush Tanager. A complete list is attached in Appendix 1.

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Prelimimary analyses suggests that monte habitat is used by many forest dwelling species, utilising the primary standards left. It seems that this mixture of patches of disturbed primary forest, secondary forest with primary standards and monte with primary standards, is capable of supporting populations of primary forest species, and has high diversity.

The catch rate in the nets was approximately one individual per 30ft net per two hours. This catch rate is very similar to that experienced in the Mazan reserve (Robinson, 1987).

Epiphyte and Water Retention Study.

Aims:

To describe the density and distribution of epiphyte species between the different tree species of the forest. To estimate the quantity of water held in the canopy.

Methods:

The same quadrats were used as for the tree survey, corrected for overhanging branches. Each tree was divided into four zones: trunk, primary, secondary and tertiary branches. In each zone, % cover of mosses and ferns and the number of individuals of the vascular plant species encountered were noted. The trees were also indexed according to their climbability and ease of visibility.

The size of all bromeliads was measured, and an experimentally based index made of their average water holding capacity. This was also measured for mosses.

Preliminary Results:

Identification pending. The most noticeable taxonomic feature was the high diversity and abundance of orchids, including Nanoides medusa, especially on the more mature tree. There seemed to be several plant species limited to one or two tree species and others more generalist. Also, some trees were festooned with diverse species whereas others were almost bare, including some of the larger, older trees. There was a definate concentration of epiphytes in the central part of the canopy (zone 2).

The amount of water held in the epiphyte mass has not yet been calculated, but preliminary results suggest that it is very large. Hummingbird Pollination Study.

To study the relationships between hummingbirds and flowering plants, in terms of nectar production and foraging efficiency.

The study was carried out using the same quadrats as the other botanical studies, in each of which records were made of the flowering plant species present, Observation hummingbird relative abundance was made by point-counts and individual flowers were observed to determine frequency of hummingbird visits. Nectar concentrations were measured using micropipettes and a refractometer.

Preliminary results:

Of the twelve species of flowering plants regularly visited along the transect, most were of the form generally associated with hummingbird pollination: long, fused corolias, often red or orange, with protruding anthers and stamens. Other flowers visited were small, flat compositae in dense inflorescences. For six plant species, observation of regular visits was made; by the thirteen species of hummingbird observed around the study site.

The main problem for this project was the lack of flowering plants within the area studied, preventing the yeild of sufficient data for the nectar production and pollen flow experiments. Although data collection was limited by time, it shows at least some potentially interesting relationships within the diverse community of hummingbirds encountered in Pulpito valley.

CONCLUSIONS

results, only tentative full analysis of suggestions can be made, but several things seem to stand out from this study.

The forest here, in the lower and middle parts of the valley, is not pure primary, even high on the slopes. That remaining is either very disturbed, or is secondary regrowth with primary standards. The woodland is distributed along the ridge between the Pulpito and Juval valleys, and in large irregular patches between areas of monte and cattle pasture. On the other side of the valley, the forest seems to be more continuous.

In the forest areas studied, and from observation, there seems to be a high plant species diversity, with many primary forest tree species forming a high canopy. The epiphyte community in particular seems to be rich, with a large number of orchid species. 108 bird species were identified by the project, and with the lists made in neighbouring valleys by Ridgeley and Handcock in previous years, a possible count for the area could be higher than 180.

The people working in the valley are mainly there, parttime, to diversify their interests and to generate cash. The forests themselves hold little value for them, other than to be cut for more cattle pasture.

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It appears that the old form of pasture clearance allows forest regeneration to a stage where a high diversity of primary bird and epiphyte species can be supported, whereas the modern, more thorough, clearance prevents this. It would seem adviseable to encourage the leaving of standards in this area, to improve the structure and interest of regeneration.

This is a supremely beautiful area which, although having the status of a protected forest, is still being cut down at a rate which threatens its existance. The Ministry of Agriculture is currently seriously considering a proposal to make the whole area (Mazar, Juval and Pulpito valleys) a National Park, including the people living there. This would be a new type of Fark for Ecuador, more on the lines of the English idea of working landscapes. The problem in Pulpito is how to give the forests value to the campesino community.

One possible solution could be ecotourism, on a small and sensitive scale. This could provide an influx of money to the area in exchange for forest protection, either by hiring local 'people as guides and labourers, or by renting forest areas from them. This would have to be discussed with the community. The Pulpito valley seems to lend itself to this, both from its ecological and aesthetic interest, the organised structure of the cooperative, and diversification being the major reason for their interest in the valley.

REFERENCES

Robinson F. (1987) The Rio Mazan Project Report. Rio Mazan Project, Norwich.

Webb L.J., J.G.Tracey and W.T.Williams (1976) The value of structural features in tropical forest typology. Australian Journal of Ecology, 1, 17-28.

APPENDIX 1.

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List of bird species encountered in (Whittingham and Jiménez)

Black Vulture Turkey Vulture Osprey Black-and-Chestnut Eagle Roadside Hawk Broad-winged Hawk American Kestrel Torrent Duck Andean Guan Band-tailed Pigeon Maroon-Chested Ground Dove White-Throated Quail Dove Barred Parakeet White-Capped Parrot Scaly-Naped Parrot White-Throated Screech Owl Andean Pygmy Owl White-Collared Swift Chestnut-Collared Swift Speckled Hummingbird Collared Inca Sword-Billed Hummingbird Chestnut-Breasted Coronet Gorgeted Sunangel Amethyst-Throated Sunangel Booted Racket-Tail Green-Tailed Train-Bearer Purple-Backed Thornbill Tyrian Metaltail Long-Tailed Sylph White-Bellied Woodstar Gorgeted Woodstar Golden-Headed Quetzal Grey-Breasted Mountain Toucan Andigena hypoglauca Black-Billed Mountain Toucan Andigena nigrirostris Bar-Bellied Woodpecker Crimson-Mantled Woodpecker Powerful Woodpecker Strong-Billed Woodcreeper Spot-Crowned Woodcreeper Elegant Spinetail Pearled Treerunner Streaked Tuftedcheek Chestnut-Crowned Antpitta Andean Cock-of-the-Rock Red-Crested Cotinga Dusky Piha Black-Capped Tyrannulet Mountain Elaenia White-Tailed Tyrannulet White-Banded Tyrannulet Torrent Tyrannulet

Coragyps atratus Cathartes aura Pandion haliaetus Oroaetus isidori Buteo magnirostris Buteo platypterus Falco sparverius Merganetta armata Penelope montagnii Columba fasciata Claravis mondetoura Geotrygon frenata Bolborhynchus lineda *Fionus senibides* Amazona mercenaria Otus albogularis Glaucidium jardinii Streptoprocne zonaris Cypseloides rutilus Adelomyia melanogenys Coeligena toguata Ensifera ensifera Boissonneaua matthewsii Heliangelus strophianus Heliangelus amethysticollis Ocreatus underwoodii *Lestia nuna* Ramphomicron microrhynchum Metallura tyrianthina Aglaiocercus kingi Acestrura mulsaut Acestrura heliodor Fharomachrus auriceps Veniliornis nigriceps *Piculus rivolii* Lampephilus pollens Xiphocolaptes promeropirhynchus Lepidocolaptes affinis Synallaxis elegantior Margarornis squamiger Pseudocolaptes boissonneautii Grallaria ruficapilla Rupicola peruviana Ampelian rubrocristatus Lipaugus fuscocinereus Phyllomyias nigrocapillus Elaenia frantzii Mecocerculus poecilocercus Mecocerculus stictopterus Serpophaga cinera

the Pulpito valley

Rufous-Crowned Tody-Tyrant Black-Throated Tody-Tyrant Cinnamon Flycatcher Greater Pewee Black Phoebe Slaty-Backed Chat-Tyrant Yellow-Bellied Chat-Tyrant Rufous-Breasted Chat-Tyrant Smoky Bush-Tyrant Streak-Throated Bush-Tyrant Tropical Kingbird Barred Becard Brown-Bellied Swallow Blue-and-White Swallow Turquoise Jay White-Capped Dipper Plain-Tailed Wren Mountain Wren Grey-Breasted Wood-Wren Swainson's Thrush Grey-Cheeked Thrush Great Thrush Glossy-Black Thrush Mountain Cacique Blackburnian Warbler Spectacled Whitestart Black-Crested Warbler Capped Conebill Bluish Flowerpiercer Masked Flowerpiercer Rusty Flowerpiercer Black Flowerpiercer White-sided Flowerpiercer Fawn-Breasted Tanager Saffron-Crowned Tanager Flame-Faced Tanager Blue-and-Black Tanager Lacrimose Mountain Tanager Hooded Mountain Tanager Blue-Grey Tanager Palm Tanager Summer Tanager Red-Hooded Tanager Rufous-Chested Tanager White-Capped Tanager Common Bush-Tanager Yellow-Throated Bush-Tanager Superciliared Hemispingus Grass-Green Tanager Yellow Grosbeak Pale-Naped Brush-Finch Slaty Brush-Finch Stripe-Headed Brush-Finch Rufous-Collared Sparrow Hooded Siskin

Poecilotriccus ruficeps Hemitriccus granaden**s**is Pyrrhomyias cinnomomea Contopus fumigatus Sayornis nigicans Octhoeca cinnamomeiventris Octhoeca diadema Octhoeca rufipectoralis Myiotheretes fumiga**tu**s Myiotheretes_striatocollis Tyrannus melancholius Pachyramphus versicolor Notiochelidon murina Noticchelidon cyanoleuca _ Cyanolyca turcosa Cinclus leucocephalus Thryothorus euophrys Troglodytes soltitialis Henicorhina leucophrys Catharus ustalatus Catharus minimus *Turdus fuscater* Turdus serranus Lacius leucorhamphus Dendroica fusca Myisitorus melanoce**ph**alus Basileuterus nigrocristatis Conirostrum albifrons Diglossopis cearule**sc**ens Diglossopis cyanea Diglossa sittiodes Diglossa humeralis Diglossa albilatera Pipraidea melanota Tangara xanthaephala Tangara parzudakii Tangara vassorii Anisognathus lacrymosis Buthraupis montana Thraupis episcopus Thraupis palmarum Piranga ruba Firanga rubiceps Thlypopsis ornata Sericossypha alboc**ris**tata Chlorospingus opthalmicus Chlorospingus flav**igu**lans Hemispingus supercilians Chlorornis rieffeni Pheucticus chrysopeplus Atlapetes pallidin**uch**a Atlapetes schistaceus Atlapetes torguatus Zonatrichia capensis Clarduelis magellauica

Additional species seen by Ridgeley (1991) and Hancock (1984).