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ECOLOGICAL RESEARCH IN THE VIRGIN ISLANDS
Historical and Administrative Background

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Historical and Administrative Background

This paper is intended to provide for a general introductory background theme to the topic of "Research Needs in Ecology in the Virgin Islands", one session of the Research Needs Conference, a multi-disciplinary effort, sponsored by the College of the Virgin Islands through it's Caribbean Research Institute, and being held at the College, St. Thomas, Virgin Islands, 24 April 1973.

In this discourse I am restricting my definition of the word "ecology" to the traditional definition used by biologists; that is, a study of the relationships of plants and animals to one another and to their environment. I do not intend to provide background discussion upon those broader, and more lately popular, definitions which in fact would preclude a comprehension of the sum total of environmental influences, thus breaching several of the other topics of this Conference.

This paper is also not an attempt to examine in depth what has already been accomplished in ecological research in the Virgin Islands; such would merely be redundant, for this technical information is already in command and use by those participants at this Conference. For those readers who may not have a background on such research, there is no quick and easy reference; excellent starting points, however, are the

various Reports of the New York Academy of Sciences (1913-et sec); Miss Enid Baa's monograph on dissertations and thesis on Caribbean topics (1969); and, the Reports of the Caribbean Research Institute.

My objective, rather, is to demonstrate in a broad manner the status of ecological research in the Virgin Islands at the present time, with particular regard to those factors of it's historical development, it's perspective within the West Indies, and it's current administrative status, which latter eminently governs it's immediately future development.

Historical and Perspective Background

The Virgin Islands are, today, an anomaly with regard to ecological research in the West Indies. It is important to understand the causative factors behind this situation in projecting the ecological research needs of these islands.

Located geographically in the east-central part of an archipelago of islands extending from Trinidad and South America to Florida and the Yucatan Peninsula, the Virgin Islands are biologically, as well as socially, ethnically, and geographically, West Indian and Neotropical. That their political and economic structure is not a part of this regional scene is rather an artifact of history than a result of natural regional associations.

The biota of the Virgin Islands shares with those other

islands of this archipelago common affinities of origin, systematic relationship, evolution, and adaptation. This relationship parallels, with differing origins, the evolution of the present human population of the West Indies.

Our biota has, as a result of the human influence, been subject to those same changes that have effected plant and animal communities on each of the other West Indian islands. While some of the reasons for these changes are peculiarly West Indian, most are typical of the same changes that have occurred throughout the world tropics, and in particular on tropical islands.

The questions relating to the nature and degree of these changes, and the effect that they have on the present and future inhabitants of these islands, not only with their biota but also with themselves, is the motivating factor behind much of the endemically-originated ecological research in the West Indies.

The anomalous status of the Virgin Islands with regard to ecological research arises from the fact that, with notable exceptions outlined below, little such research has been endemically-generated. In this aspect, the Virgin Islands differ startlingly from their sister islands in the West Indies. They represent, in fact, a situation comparable to that of other West Indian islands a generation or more ago. The Virgin Islands are distinctly behind their other West Indian neighbors in ecological awareness.

This situation appertains only today in the adjacent Commonwealth of Puerto Rico.

The present United States Virgin Islands have, for over 250 years, been under the federal control of two continental governments: The Republic of Denmark and the United States of America. This control, in fact, parallels that which was exercised on other West Indian islands in the past, and today is also the case in Puerto Rico. However, in terms of ecological research if in no other fields, such parallels do in fact end.

The remaining West Indian islands were, for the most part, under the control of external governments that had established a heritage of interest and a precedent for research in natural history; a heritage that was ultimately in greater or lesser degree passed on to the peoples of their islands. Great Britain, The Netherlands, France, and to a lesser degree Spain, were all such nations.

In case any of the participants at this Conference are unaware of the impact which such colonial actions in fact had in the West Indies, I would demonstrate in point the development of such a heritage in the former British possessions. Britains were, and are, by nature naturalists: In their colonies in the New World tropics, as elsewhere, they early established formal clubs promoting the study of natural history; they established botanic and agricultural research sta-

tions; and they not infrequently established viable and often still extant small natural history museums. In the West Indies, such institutions were established on St. Vincent in 1763, Trinidad in 1820, Guyana in 1879, Grenada in 1886, Dominica in 1891; other such institutions existed on Jamaica, St. Lucia, and Antigua by 1907 (Aspinall, 1907). The Royal Victoria Institute Museum and the still eminently viable Trinidad Field Naturalists' Club were both founded in 1892. In 1922 the Imperial College of Tropical Agriculture, now the Faculty of Agriculture of the University of the West Indies, was established at St. Augustine, Trinidad. I.C.T.A. played the most important role in the Caribbean in the training of essentially applied ecologists in agriculture, entomology, botany, silviculture, and soil science.

The Dutch established similar facilities on Curacao, and later a formal research station, as did the French on Guadeloupe.

This background of governmental interest in natural history helped form the basis of a heritage on those islands today for the basic subject matter that now comprises ecology. While it is true that the primary political and professional motivation behind the establishment of most of these facilities was improved agriculture, these organizations in fact served as a regional locus for research in a wide variety of biological topics. A significant part of the functions of such establishments was the attraction to them of visiting biologists, thus infusing the local naturalists

with current concepts and tending to break down insular barriers to new knowledge.

This lack of a heritage for ecological studies in the United States Virgin Islands is clearly due to the absence of such viable research organizations and educational and social institutions until very recent years. The reasons for this would appear to be the post-emancipation emphasis by both the Danish and the United States governments upon non-agricultural economics, commerce, and later tourism. It is in fact the recent emphasis upon tourism that has to no small extent provided the germ of interest in ecological studies in these islands.

Without such a heritage, it is not surprising that most applied as well as basic ecological research in the Virgin Islands prior to the early 1960's was conducted by commuter scientists. In turn, this lack of heritage upon the part of the local community has made it sometimes difficult to press forth the need for endemically originated ecological research. In this regard, the transcription of ecological needs based upon temperate-zone continental concepts, popular during the past decade, into an essentially West Indian social community has been merely confusing.

The Virgin Islands need a regional and a local ecological identity, an identity that will ultimately provide for heritage. The structural basis for the establishment of that identity is now present.

The Basis for Current Ecological Research
in the Virgin Islands

Four primary events mark the basis for current interest in ecological research in the Virgin Islands. Those events were:

- 1) The establishment of the Virgin Islands National Park for the most part on the island of St. John, 1956.
- 2) The opening of the College of the Virgin Islands as a territorial institution of higher learning, 1962.
- 3) The establishment of the Virgin Islands Ecological Research Station, 1965.
- 4) The vitalization of research by the Bureau of Fish and Wildlife, Department of Conservation and Cultural Affairs, 1970.

I shall discuss the role of these units separately. For the moment, however, it is pertinent to point out that the primary impetus for the establishment of the research elements of these organizations was the scientific "crisis" which faced the United States in the late 1950's, and the consequent large amounts of federal funds that became available for such programs. Without that funding, it is exceedingly doubtful if ecological research in the Virgin Islands would have progressed beyond the individual inquiry stage.

The College of the Virgin Islands.

The College of the Virgin Islands was established in

1962 to provide for post-secondary school education in the Virgin Islands. It has progressed through two-year Associate to four-year Baccalaureate programs, and is now a territorial Land Grant institution. To provide for a broad liberal curriculum, a Division of Science and Mathematics was established, including a resident faculty in the biological sciences.

Primarily a teaching institution, the College shortly after founding established a Caribbean Research Institute within its administrative framework, with the object of the Institute acting as the research arm of the College. The Institute is in concept a multi-disciplinary organization, and includes the Virgin Islands Ecological Research Station within its administrative jurisdiction.

Within the field of ecological research, the role of the College should be clear:

- 1) It provides through its faculty in biology and through the Caribbean Research Institute for the educational and experiential training in ecology of regional students on the baccalaureate level. It is on this level, in fact, and not on the graduate level that the greatest paucity of ecological manpower exists today in the Virgin Islands.

- 2) It provides for the training of public school teachers in ecological subject matter, to better fit them, regardless of their academic backgrounds, for the needed interest which will ultimately lead to heritage in local students.

3) As a Land Grant institution, the College is now in a position to fill the local niche that has traditionally provided for the bulk of core research, both basic and applied, in the ecological sciences.

4) With the presence of the administrative (Caribbean Research Institute) and operational (Virgin Islands Ecological Research Station) structures for this research, the College is functionally prepared to undertake a wide variety of research programs.

Virgin Islands Ecological Research Station.

The Ecological Research Station is a unique research facility in the West Indies, in that it: (1) Is administratively authorized to conduct ecological research on both terrestrial and marine habitats, and, (2) Is by right of its location on the island of St. John logistically positioned to conduct such research literally in its own backyard. Further to this, is the fact that those habitats are protected by right of the presence of the Virgin Islands National Park.

This facility is funded by an annual appropriation from the Legislature of the Government of the Virgin Islands, and is administered by the College of the Virgin Islands through its Caribbean Research Institute.

Logically, and by continental precedent, this facility as a part of a Land Grant College should provide for the bulk of ecological research in the Virgin Islands. The history of the Station and its contributions have been clouded by ad-

ministrative and policy problems. One major problem concerns the precise role the Station should play as a regionally funded and directed organization.

The Ecological Research Station has, in the past, supported the following kinds of programs:

- 1) Basic research on marine and terrestrial ecology, with a major emphasis on the former prior to 1971. For the most part, these studies have represented thesis or dissertation problems originated and conducted by visiting investigators, and funded by United States federal granting agencies.

- 2) Support for the Tektite I and II Projects (Collette and Earle, 1972, for technical studies). These were major, federally-funded, short-duration concentrated basic studies conducted almost exclusively by visiting investigators. Although the research conducted under these two programs was basic in motivation, much of the biological results have practical applications in the Virgin Islands.

- 3) Non-thesis graduate studies. The Ecological Research Station has served as a training ground in basic principles of tropical ecology for a limited number of selected graduate students from United States universities. While no specific research is usually conducted by these students, the students do act as a potential pool of future investigators with the advantage of previous Virgin Islands experience.

4) Applied research, which to date has been concerned with marine resources. Two signal projects were a study of the fisheries potential of the Virgin Islands (Dammann, 1969) and a spiny lobster management program (Olsen, 1972). Proposals have been submitted for a program of research on pollination and seed dispersal in Virgin Islands plants of economic and aesthetic importance (Buchanan, MS).

5) Undergraduate field studies. These studies, basically pedagogic and experiential in nature, have been seasonally conducted at the Station by groups from United States colleges and universities. There is great demand for the use of the Station facilities by such external groups, and there is serious contention as to what extent the Station should serve such purposes. There is no question that the Station could, and would be justified in serving such a useful role in undergraduate training at the College of the Virgin Islands; this has not been the case, however, because of course scheduling and the problem of inter-island logistics.

Department of Conservation and Cultural Affairs.

The Department of Conservation and Cultural Affairs is an agency of the Government of the Virgin Islands, headed by an appointed Commissioner, and possessing a Bureau of Fish and Wildlife with a professional biologist as Director.

The staff of the Bureau consists of a number of trained fisheries and wildlife management biologists. The Department

is charged with the authority for the control, use, and management of the natural resources of the Virgin Islands not predisposed by United States federal authority. The Department is also concerned with the development and use of recreational facilities and with the cultural affairs of the island communities.

The Bureau of Fish and Wildlife is, in effect, an administrative and operational duplicate in general aspects of similar agencies in each of the various United States, and it has an authoritative parallel.

In terms of ecological research, the Bureau acts as an interpretive clearing house for the results of basic ecological research conducted in the Virgin Islands, and makes use of the results of such research in devising meaningful applied research programs conducted by its own staff.

Recent examples of applied programs conducted under the direction of the Bureau include food and sport fisheries studies, artificial reef design, mongoose ecology, a study of parasites of St. Croix whitetail deer, and primary support for the compilation of a popular handbook to the natural history of Puerto Rico and the Virgin Islands.

Virgin Islands National Park.

The establishment of the Virgin Islands National Park, administered by the United States National Park Service under the Department of the Interior, had a profound physical,

biological, social, and economic effect upon the island of St. John, and to a lesser extent the other Virgin Islands.

Entirely aside from the very real social and economic changes wrought, the Virgin Islands National Park brought to the West Indies the concept of a major portion of a large island being under almost complete ecological control, with that control having its ultimate authority and administration from without the territory. From a historical standpoint, this represents a reversal of the general trend in the West Indies for greater territorial control, including that of natural resources. It is interesting to note that this same event coincided with the establishment of the Five Year Development Programmes leading to the independence of two major West Indian islands, Jamaica and Trinidad and Tobago, under which programs transference of authority for Crown Forest Lands and Reserves was made to the regional governments.

In terms of its meaning to regional ecological research, the Virgin Islands National Park has provided for the following:

- 1) It has reserved a large mass of lands and waters, comprising some 6,000 acres, where ecological disturbance has been reduced to a minimum. The reserve includes reef and inshore habitats; mangrove swamps; cactus, arid thorn scrub, tropical deciduous, and some regenerating rain forest communities. No single reserve in the West Indies con-

tains so many diverse habitats; it provides for a large natural arena for comparative ecological studies in the West Indies.

2) For the management of the resources of the Park, the National Park Service has devised a Management Resources Plan the bulk of which consists of problems which can only be answered by the application of ecological research. Provision for the funding for the execution of those projects by contract is in process.

In addition to these primary government-funded research organizations, there are three others which play a significant role in ecological thought, education, and research in the Virgin Islands. The Virgin Islands Conservation Society, Inc., a public non-profit society, is concerned primarily with the stimulus of ecological research and with education; it has recently concentrated on the publishing of popular tracts relating to such research. The Environmental Studies Program of the Department of Education is primarily concerned with the development of an ecological awareness upon the part of primary and secondary school students; in this sense, the Program plays a critical role in the initiation of interest leading to heritage in the natural sciences. The Island Resources Foundation, Inc., a private non-profit organization, includes significantly ecological research within the framework of its broader resource programs; it also serves as the headquarters of the Caribbean Conservation Association,

the regional West Indian conservation organization.

I am fully aware that I have not touched upon those several aspects of research that should, rightly, come within the scope of ecological research in the Virgin Islands. These include, for example, research conducted by the Department of Agriculture, the Soil Conservation Service, and possibly other agencies. They also include research conducted at the West Indies Laboratory of Fairleigh Dickinson University, St. Croix. I hope that those officials in these organizations will not feel that such omission is intentional; it is rather simply based upon my lack of information concerning their activities.

Discussion

It should be obvious from the data presented above that the Virgin Islands today have a large and diverse number of organizations within the operational structure of which ecological research is conducted. It is, in fact, a remarkable assemblage for a tri-island community comprising only some 70,000 inhabitants.

A major factor in defining the research needs of the Virgin Islands today lies in the need for a clear definition of the respective roles to be played by these now extant research organizations, and consequently the allocations of research programs.

The roles of the educational and conservation affiliates, the Environmental Studies Program and the Virgin Islands Conservation Society, are already clearly defined. However, the relationships between the College of the Virgin Islands, the Caribbean Research Institute and Virgin Islands Ecological Research Station, the Bureau of Fish and Wildlife of the Department of Conservation and Cultural Affairs, and to a lesser degree, the United States National Park Service are less well-defined.

The need for definition arises out of the very real possibility of duplication of effort with regard to: (1) Overall research objectives; (2) Expenditures for facilities, equipment, and field work; and, (3) Utilization of available scientific manpower. Such overlap and duplication within the governmental structure of a community of islands such as these, with restricted fiscal and human resources, cannot easily be long tolerated. The restrictions of recent years in federal funds available for biological research of the kind needed in these islands makes this point abundantly clear.

With regard to the National Park Service, it is clear that there are policy decisions which to a great extent limit the use of their human, fiscal, and physical research resources to objectives which, in effect, are directly associated with the management of the National Park. To some ex-

tent there is a sharing of these resources between the Park Service and the Ecological Research Station, authorized through a Memorandum of Agreement between the Park Service and the College of the Virgin Islands. It is very doubtful that such a relationship would exist if the Station were located otherwise. This is so because most of the research objectives of the National Park Service lie in the field of resource management, not in strict research which in fact is the reason for the existence of the Ecological Research Station.

It is clear that whatever formal research relationship that may exist between the Station and the National Park Service will, under present policies, be limited to the execution of contract research by the Station for the Park Service. The limit to which this contract relationship exists should be defined. To a very great extent, however, those possibilities are severely limited by the National Park Service since they do not accept unsolicited proposals for research. This is an undesirable situation, considering the unique role played by the National Park within the community. That the National Park Service has made concessions in other aspects of the natural resources of the Virgin Islands National Park should give license for modification of policies which in effect are designed to cover continental Park management, and are not necessarily realistic in this insular community.

The research relationship between the Department of Conservation and Cultural Affairs and the Ecological Research Station is perhaps less well-defined than that between the Station and the National Park Service. This is, in fact, another curious anomaly of Virgin Islands bureaucracy, since the funding for the Ecological Research Station is provided by the Legislature through the Department of Conservation and Cultural Affairs.

As a generality, however, it may be stated that the logical research functions of the Department of Conservation and Cultural Affairs should be those applied studies bearing directly upon natural resource utilization and management. Because of its primary academic affiliation, the Ecological Research Station should be engaged in basic research and in the education and training of regional students in the ecological sciences.

There would appear to be an obvious need for circular allocation of projects, information, and perhaps human resources and facilities in this relationship. The parallel can again be made between Land Grant colleges in the United States and their state game and fish commissions: There exists as a general rule a rapport, if not an actual formal agreement, that facilities, services, and professional expertise will be shared, as needed, between the Land Grant institution and the conservation-oriented departments of the

state government.

The establishment of a realistic working relationship such as this between the College of the Virgin Islands and the Department of Conservation and Cultural Affairs would clear the way for more meaningful coordination of research, avoidance of the possibility of duplication of effort, and possibly fiscal saving with regard to resources.

Each biologist working in the Virgin Islands is intimately familiar with the research needs within his field of study. Because of the relatively small number of scientists concerned, and because of the potential degree of informal communication afforded, there should be a general understanding upon the part of each scientist of the principal ecological research needs.

However, because of the administrative barriers outlined above, and because a not inconsiderable amount of the ecological research conducted in these islands is in fact conducted by visiting investigators often without affiliation with these regional organizations, there is often a communications gap.

It would be in the interests of the various research organizations within the Virgin Islands to establish a regular open-discussion group for the systematic and periodic exchange of ideas and information on ecological research. The structure of such a group need not be formal, and it's

published productivity might be limited to minutes. At the present time, such a group could, in fact, comprise the entire community of scientists engaged in ecological research in the Virgin Islands. The regular sitting of such a group, would allow for quick and easy dissemination of ideas and information; it's funding, limited in scope, could be shared by the various agencies represented.

The features of insularity are the meat of the island ecologist; they are also the major deterrent to the projection of rational research programs endemically generated. Because of the lack of ecological heritage and tradition in the Virgin Islands, it is especially important that those persons charged with the conduct of ecological research communicate with one another.

This Conference is an initial step in attempting to establish that kind of cooperation and exchange of ideas.

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