Seminar for School for Field Studies interview, 6 July 1989

I. Introduction -- give a bit of my background in biology, research and teaching I've done; illustrate the breadth of my interests and the training I've had; many seminars about the research here, I will mention projects only briefly and illustrate with slides

A. As a grad student in California, studied elephants seals (3 slides: boat on beach, males, female/pups), with Burney Le Boeuf and Leo Ortiz

1. Feeding habits at sea, energetics in the lab (3 slides: map of distribution, two of seals feeding)
2. Population dynamics, sex ratio (2 slides: me reading tag, population graph)
3. Was in charge of students, directing data collection in the field -- describe exact relationship (2 slides: Mark, normal harem)

B. Shift to (slide of dolphin) Australia (slide of kangaroo) -- as a research associate for a single season, studying satin bowerbirds with Gerald Borgia (1 slide of bird)

1. Research in bower decorations (2 slides of decorated bower)
2. Also directed students here -- describe exact relationship (3 slides: Mark, group at falls)

C. A big shift in direction for me (slide of me) -- bacterial research in population dynamics of gene exchange (cartoon slide), transposable elements (slide of population graph), work that has led me to be advisor for EPA and Audubon Society, and to write 2 book chapters, on genetically engineered organisms

II. Current work on rainforests, work which is most relevant to my interests in the field site in Australia (slide of BCI)

A. Basic interest in population dynamics and community ecology of tropical forests, very interested in conservation and how basic information about forests can contribute to conservation of forests; fortunate to work with Steve Hubbell, a high profile tropical forest ecologist (list plots)

B. Describe BCI (slide of the canal), an important research site of primary tropical forest, protected for 65 years, with remarkable animal populations, like Yellowstone Park in the tropics (8 slides of animals, quick identifications)

C. BCI has 4000 plant species in 1500 ha (7 plant slides), and was chosen by HF for a 50 ha permanent site -- 300,000 tagged trees censused every 5 years with help of large number of people

D. Why so large an area? -- rare species, scattered, many species, a study site could not be big enough; in 1-2 hectares, much missing; e.g. *Anaxogorea*

E. Some of the interesting results that have accumulated

1. 306 species in 50 ha, 21 appear only once
2. One abundant species, 40,000 individuals (16%)
3. Most species show no obvious tendency to grow in certain sites, or "division of niches" (slide of *Virola*)
4. Rare species suffering heavy mortality and not replacing (slide of data) -- apparently forest is not at "climax"; it seems unlikely that forests ever are; mention El Nino, successional theories

F. Major focus of plot has been testing theories about diversity, maintenance of so many species

1. Specialized niches -- evidence seems contrary
2. Frequency dependence -- some evidence (slide of survival), I am working on recruitment rate as a function of distance from adults, but we can't yet examine importance of parent on own offspring
3. Historical -- many species in competition, long time until many disappear

G. Genetic studies -- using DNA fingerprinting to determine parents of seedlings (slide of human fingerprint)

1. I'm trying on trees, so far results are not available, it is a time consuming and expensive procedure, and leaves are difficult sources of DNA
2. Show map of *Ocotea*, describe experiment, importance of rarity for reproducing

III. Prospects in Australia

A. I want to do more field work and am moving in that direction at Princeton -- I have been more interested in census data, recruitment rates and population dynamics; DNA fingerprinting in trees is frustrating

B. Describe how interested I am in being at a site in tropical forest permanently, setting up long-term research projects; how important this is for conservation, and how useful for teaching -- mesh teaching and research

Plans for a field teaching site in Australian rainforest

5 July 1989

I. Developing curriculum

A. I must oversee details of course presentation, and teachers must meet to organize classes -- avoid duplication, cover all areas

B. All classes should emphasize local organisms and put students outside, but I won't dictate teaching style, except as advice

C. Areas that should be covered in a four class format

1. Population dynamics, theoretical ecology, community ecology
2. Animal behavior, behavioral ecology
3. Population genetics and evolutionary theory
4. Conservation biology, including tropical forestry, development schemes for tropical lands, theories and practices for maintaining species diversity, importance or lack of importance of natural lands, economic values of natural lands

II. Teaching theoretical and community ecology, population biology, the areas I would be strongest teaching:

A. Strongly emphasize local systems and get students in field, e.g., begin the class with the problem of maintaining speacies diversity in tropical forest; use this as illustration of basic principles:

1. Niche concept
2. Frequency dependent recruitment
3. Equilibrium vs. non-equilibrium communities

B. Think ecologically -- get students into the field weekly, asking population-level questions about organisms they see; applying concepts to what they see in the forest

C. Best text -- Begon et al.

III. Student projects

A. Students should be required to do a semester project involving data collection, analysis, and writing

B. I along with other faculty should have considerable input in devising the projects; most students should work on a project established by the faculty as useful and likely to be fruitful, although students can choose the general subject matter and class of organism; particular students may be able to develop their own project

C. I will develop a list of projects for students to choose from, based on background data collected at site and carefully catalogued; e.g.:

1. Forest plots (see below) will lead to analyses of plant distribution (uniform or clumped, juveniles near adults or far, correlates with physical parameters), species diversity (species area curve, correlates with

physical environment); available to students who work on censusing -- some of these come out of existing data sets
2. Extension of forest censuses by looking at fruit production of individual trees, seedling germination success at different densities, in different areas, predation on seeds or seedlings; these can be related to known distribution of adults and juveniles
3. Impact of herbivores on plants -- exclusion studies
4. Fruit dispersal by animals -- observations of animal movement, studies of captive animals fed fruit?
5. Modeling studies of communities or populations
6. Studies of aboriginal peoples or colonists -- use of forests, perception of forests, for those with more social or economical interests
7. Animals . . . .

IV. Forest plots
A. As my main interest in studying tropical forests, useful for all sorts of basic and applied reasons
1. Maintenance of diversity
2. Reproductive patterns
3. Distribution and abundance of poorly known species
4. Growth rates
5. Impact of logging or fragmentation on forest dynamics
B. Will need to organize with whoever owns forest
C. A rough plan would be to set up 1 ha sites in logged, unlogged, clearcut, fragmented, and unfragmented forest
1. Survey, put out permanent stakes marking 5x5m quadrats; students helping with this part can do projects mapping obvious features -- slopes, soils, vegetation types, gaps in canopya
2. Tag each free-standing stem >1cm diameter; students participating in this early phase can do projects mapping tag numbers, distribution of different stem sizes; density of different stem sizes
3. Collecting and identifying; students doing collecting can map individual species which they can recognize
D. Will quickly (after a couple of years) provide very large backdrop of information from which students, faculty, and others could glean projects

V. Building a library -- collections of papers on tropical ecology, Australian flora and fauna, and basic ecology texts should be available for students

VI. Surveys and collections of local flora and fauna, other long-term records
A. A main theme of mine is building up information in diverse areas of interest:
1. Lists of birds, mammals, other vertebrates, and their distribution and habits should be catalogued and gradually developed into a handbook, possibly published
2. Insect collections

3. Plant collections
4. Drawings of plants, information about their distribution, flowering period, collected into a handbook as for the major vertebrate groups?
5. Meteorological records?

B. I want this to be a center of information, long-term changes in populations, human effects, an area about which I would be an expert; this would provide an excellent background for teaching

VII. Cooperating, collaberating with local people -- what do they do, and what are their interests in the forests

A. Could we do research projects that address problems important to local people?
B. Do they have knowledge useful to us?
C. Suggestions for interacting
1. Meet with people, ask what they do, tell them what we do
2. Student projects on interactions between humans and forests
3. Aboriginal peoples as well as Europeans
D. Logging interests -- could we develop projects with logging companies, reaching agreements on which sections might be logged and how
1. Impact of logging
2. Recovery following logging
3. Studies of various practices -- selective logging, clearcutting, different sized areas

VIII. Collaboration with Australian ecologists and other scientists

A. Invite people to advise on projects, give lectures, do collections, or send our collections off to experts (e.g., esp., insects); experts in areas in which we lack expertise
B. Advertise the location to scientists who might want to start projects on which students might participate
C. Develop the background of information which makes a research setting attractive for long-term studies
D. Build more and bigger laboratory space?

Schedule of Meetings for Dr. Richard Condit, candidate for Field Director of Center for Rainforest Studies, 7/6/89

10:30AM	Meet with Shaun Bennett, Dean
11:30AM	Meet with Creighton Peet, Assistant Dean
12noon	Presentation to SFS Staff
1PM	Lunch with Joe Madison, Vice President
2PM	Meet with Barry Canner, Director of Finance & Administration
2:30PM	Meet with Andi Walgren, Director of Marketing & Development
3:30PM	Meet with Bob Singer, Director of Center for Marine Ecosystem Studies
4:30PM	Meet with Noah Fleischman, Operations Assistant
6PM	Train leaves Beverly for Boston arriving 6:43PM
8:30PM	Departure from Logan Airport for Newark Airport