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## CONTRIBUTIONS

### **Cannibalism**

**(By Quan Dong)**

Cannibalism is a widespread phenomenon. It occurs among species that are diverse taxonomically and in their life histories, from unicellular ciliates to highly social chimpanzees. It also occurs in a variety of forms: simple heterocannibalism of conspecifics, sexual cannibalism of mates, filial cannibalism of offspring, and sibling cannibalism of sisters and brothers. Why does cannibalism occur and how does cannibalism affect dynamic patterns of individual life history traits, population distributions, and community structures?

These are major questions in many recent studies of cannibalism. Why eat creatures of one's own kind; this does not make sense for people carrying a strong moralistic mind. Why not? some others may simply ask, who hold a traditional Darwinian belief. For them, the answer is simple: everyone competes for live, the fittest survive. Cannibals are the fittest. However, consuming one's own offspring is not an obvious mechanism for enhancing fitness, although filial cannibalism widely occurs. One concept seems pivotal for us to clarify our discussion--kin selection. If kin selection operated in forming cannibalistic traits, cannibals might have to pay a cost in terms of inclusive fitness when they prey on an encountered conspecific. Such cost can slow down gene propagation and reduce relative frequencies of the gene in populations. It is this cost that prevents animals from eating own close or far relatives in favorable conditions but allows them to do so in adverse circumstances.

Cannibalism can produce high mortality, even when their frequency is low. The change in mortality not only leads to a varying selective pressure but produces various consequent population or community dynamics as well.







**Sino-ECO Members' ESA-Get-Together**

If you are going to the Annual ESA and AIBS Meeting, 7-11 August 1994, at Knoxville, Tennessee, you are welcome to the Sino-ECO members' ESA-Get-Together. Please bring your friend(s) also. The detail information will be announced in next issue of Sino-ECO Newsletter or look for

announcement on Information Desk at the meeting. The local host will be Shen JianMing, (volunteer of course, the state of the Volunteers). If you have any suggestions, please contact Jianming or Quan Dong. Dr. Baohua Gu at the Oak Ridge National Laboratory will be the associate host:-) See u there!

**Membership Updates**

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## Job Opportunities

### GRADUATE RESEARCH ASSISTANTSHIP. (Ph.D.) : ECOLOGY

University of Washington (Seattle) / Dept of Botany. This is a position beginning in the spring of 1994 to study aspects of nutrient cycling through a soil-cryptogamic crust-vascular plant system within a polar desert landscape (Devon Island, Canada). Emphasis on nitrogen and phosphorus. The field work is in a beautiful, exciting and remote High Arctic location (76 degrees North). This work will build upon preliminary investigations using N-15 tracers and nutrient additions. Student will be member of multidisciplinary team studying ecosystem development of polar deserts. Research experience with nitrogen and phosphorus cycling and an M.S. degree are desirable.

#### Options For More Information:

1. E-Mail to Warren Gold at warreng@u.washington.edu
2. Telephone (206) 543-8917 to Larry Bliss, Warren Gold, or Leal Dickson
3. Send letter of inquiry to Dr. Lawrence Bliss, Department of Botany, University of Washington, Seattle, WA 98195.

### GRADUATE RESEARCH ASSISTANTSHIP (Ph.D.),

Division of Ecosystem Science and Conservation, College of Forest Resources, University of Washington. A 3-yr assistantship is available to conduct research in an interdisciplinary study of forest ecosystem response to alternative silvicultural systems in western Oregon and Washington. Student will develop dissertation research on a problem related to forest understory and/or overstory response to varying levels and patterns of "green-tree" retention. M.S. required. Background in plant community ecology, forest ecology, conservation biology, and/or multivariate statistics (community analysis) desired. 12 month stipend ca. \$13,000-14,500/yr plus tuition and some benefits.

Contact Dr. Charles B. Halpern, College of Forest Resources, AR-10, University of Washington, Seattle, WA 98195; Tel: 206-543-2789; FAX 206-543-3254; E-mail: chalpern@u.washington.edu.

### ASSISTANT PROFESSOR OF BIOLOGY: POPULATION GENETICIST

The University of Maine at Machias invites applications for a full-time, tenure track position beginning September, 1994. We seek a population geneticist committed to undergraduate teaching, with field biology and conservation/environmental interests. The successful applicant will teach genetics, evolution, a course in an organismal group of her/his speciality, and other courses supporting the university's biology and environmental studies degree programs. This person will also be expected to work with students on undergraduate research projects. An earned doctorate in biology, willingness to contribute to our rapidly growing Division of Science and Mathematics, and sensitivity to the needs of students with a variety of skill levels, ages, and backgrounds are required. The University seeks an individual with a commitment to interdisciplinary teaching and collegiality, interest in issues of pluralism and gender, and applications of technology in teaching and education in a rural setting.

The University of Maine at Machias is a 1000-student, independently accredited undergraduate campus of the University of Maine System Located in an unspoiled portion of the spectacular Maine coast, UMM strives to take best education advantage of these natural resources. Send letter of application, detailed curriculum vitae, transcripts, three letters of reference, and an e-mail address (if available) to: Richard Paul, Chairman Division of Science and Mathematics University of Maine at Machias 9 O'Brien Avenue Machias, Maine 04654 TEL: (207) 255-3313, Ext. 288  
 rpaul@torrey.UMM.Maine.edu

### VISITING ASSISTANT PROFESSOR OF FOREST ECOLOGY

Department of Forestry  
 University of Illinois at Urbana-Champaign Position: Temporary, one-year appointment, with possible re-appointment for a second year. Teach a combined upper-level undergraduate and graduate course in forest ecology. Conduct innovative research in one or more of the

following areas: landscape, systems, or quantitative ecology. Collaboration with on-going research programs is encouraged. Research laboratories and GIS equipment, along with growth chamber, greenhouse, and field experimental facilities are available. Qualifications: Ph.D. is required with at least one degree in forestry or a related natural resources field. Expertise in using information systems such as GIS in an interdisciplinary approach to forest and natural resource management. Aptitude for research and teaching in a challenging academic environment is necessary. Application: The position is available June 21, 1994, with

the search committee reviewing completed applications beginning March 25, 1994. Salary will be negotiated and will be commensurate with qualifications and experience. Applications should include a letter of intent including a statement of professional interests, a curriculum vitae, and names, addresses and telephone numbers of at least three references. Applications from women and minority candidates are encouraged. Send applications to: Dr. Mark B. David, Chair Search Committee, Department of Forestry, University of Illinois, W-503 Turner Hall, 1102 South Goodwin Avenue, Urbana, IL 61801. Phone: 217-333-4308, 217-244-3219 (fax) m-david@uiuc.edu

### WATER RESOURCE EDUCATOR

Vacancy for water resource educator. Washington State University Cooperative Extension faculty position. community based education and volunteer training in water quality, groundwater, wetlands or stream stewardship. Position is funded through the Puget Sound Water Quality Authority and agent will work in Port Townsend Washington on the the northeast corner of the Olympic Peninsula ( hiking, seashores, kayaking, read this as the good life!). . . Masters degree required. Position closes end of January For information call WSU Extension at (206) 840-4526 Bob Butler or (206) 385-9393 Katherine Baril

### GRADUATE RESEARCH ASSISTANTSHIP: BIODIVERSITY/COMMUNITY ECOLOGY/PLANT ECOLOGY

Graduate Research Assistantship available beginning summer 1994



to participate in a study of mechanisms maintaining biodiversity, using desert annual plants as a study system. Overall project includes field experiments, lab experiments, monitoring, and modelling to estimate the size and relative importance of various mechanisms involved in the long-term persistence and coexistence of desert annual plants. GRA will be responsible for lab and field studies of seed bank dynamics and will be expected to develop a dissertation dealing with this project. GRA includes 12-month stipend and tuition/fees waivers. For more information or to apply, contact Dr. Nancy Huntly, Department of Biological Sciences, Idaho State University, Pocatello ID 83209-8007. (huntnanc@ux1.isu.edu; 208-236-4570 (FAX)) For graduate school information and application forms, contact Ms. Sandra Mitchell at the same address.

#### PROJECT MANAGER

The position will run fixed term till December 31st 1995. The position is based in the Budapest headquarters of the REC, but will require extensive travelling. Responsibilities include, but are not limited to: assistance to the Hungarian EMTC in planning, budgeting and self-sustainability plan; researching sources (literature and experts) for training materials; assistance in adapting of foreign training curricula to the Hungarian situation; maintaining contact between existing EMTCs and related institutions; monitoring and reporting on the performance of the EMTCs, with special responsibility for the Hungarian center. Requested qualifications are: good spoken and written English; other CEE languages appreciated; excellent planning, organizational and project management skills; experience in management, ability to work independently; environmental or training related university degree appreciated; experience in environmental and/or training related projects appreciated; Compensation will be based on the applicant's experience and qualifications. Please send your application with a CV including the names of two persons who are willing to serve as references for you to the following address: Mr. Mozes Kiss, The Regional Environmental Center, Fax: 36/1/2503403, 1035 Budapest, Miklos ter 1., Hungary

#### POST-DOCTORAL RESEARCH ASSOCIATE

Position: Post-Doctoral Research Associate, Insect ecologist/community ecologist. Availability: Immediately. This position has been re-opened and will remain open until filled. We would like to have this person on-board by Feb. 15 1994.

Salary: approximately \$26,000 plus benefits Duration: Currently, we can guarantee a minimum of slightly more than 1 year of support. This project is funded year-to-year and is anticipated to be of a 5 year duration. We are actively continuing to seek funding for subsequent years of support. Project objective: We will evaluate and compare areas of habitat with respect to territory quality for several species of endangered vertebrate insectivores found within coastal sage scrub habitat in southern California. These endangered species include California gnatcatcher, cactus wren, and orange-throated whiptail lizards. This work will involve not only traditional habitat quality estimates and comparisons, but will focus upon comparisons of the food resource bases (i.e. insect communities) found on and off actual and potential territories of the vertebrate insectivores. The position includes supervision of 2 full time technicians and will require travel to and long-term field-work (several weeks) at sites located throughout southern California. This project is multidisciplinary in nature and will involve components of insect and avian ecology, community ecology, and conservation biology. The principal investigators include Rick Redak (insect ecology), John Rotenberry (avian community ecology) and Tom Scott (conservation biology and biogeography). Qualifications: Ph.D. in Entomology, Biology, Ecology or related life science discipline. Experience and familiarity with some of the following is desirable: insect identification, insect sampling techniques, community analysis and comparison techniques, multivariate statistical techniques, and vertebrate habitat evaluation techniques. A knowledge of southern California flora, insect and avian fauna, and some experience supervising technicians would be useful.

To apply: Please send a curriculum vitae including a statement of research interests and the names, addresses, and phones of 3 references to Dr. Rick Redak, Department of Entomology, University of California, Riverside, CA 92521. phone 909-787-7250, fax 909-787-3086, e-mail REDAK@UCRAC1.UCR.EDU

#### ASSISTANT PROFESSOR, FOREST BIOLOGY

Department of Forestry Virginia Polytechnic Institute and State University Blacksburg, VA 24061-0324 Position: Assistant Professor, Forest Biology Location: Blacksburg, Virginia Type of Appointment: Twelve-month, tenure-track Responsibilities: Teaching and research in

landscape ecology or conservation biology, with a forest or woody plant emphasis; Teach at least one undergraduate and one graduate course in area of specialization; Advise undergraduates and supervise graduate students; Conduct research in specialization area and work in conjunction with existing faculty in forest biology and wildlife/conservation biology; and Provide public service outputs when and where appropriate. Qualifications: Ph.D., with at least one degree in forestry desirable. Salary: Commensurate with education and experience Application Deadline: April 1, 1994, or until a suitable candidate is selected. Application Procedure: Send written letter of interest, vita, transcripts, and names and addresses of three references to: Chair, Forest Biology Search, Department of Forestry, College of Forestry and Wildlife Resources Virginia Polytechnic Institute and State University, 307 Cheatham Hall Blacksburg, Virginia 24061-0324, Telephone: 703-231-5483 FAX: 703-231-3698

#### RESEARCH FELLOW / RESEARCH ASSOCIATE

Stream Ecosystems and Landscape Ecology The Natural Resources Research Institute at the University of Minnesota-Duluth has an opening for a Research Fellow/Research Associate to work on a continuing project to assess relationships between watershed characteristics and stream ecosystems for the purposes of developing ecological criteria. Research includes emphases on landscape characterization, physical and chemical analysis of streams, and distribution and abundance patterns of stream biota in a large Midwestern watershed. Minimum qualifications: M.S. in ecology or related field, Ph.D. preferred. Experience sampling stream fish and macroinvertebrate assemblages. Strong verbal, communication and analytical skills. Experience with Geographical Information Systems (GIS) or hydrologic modeling. Responsibilities: Participate in an interdisciplinary research group. Coordinate and participate in project planning, extended field work, data analysis, and report writing. Participate in developing a landscape model of stream responses to watershed characteristics including geomorphic, biotic, and land use elements. The position is available in spring 1994. Appointment is for up to two years depending on funding and starting date. To apply send an application letter, resume, and the names and addresses of three references to Research Fellow/Research Associate Search Committee, Natural Resources Research Institute, 5013 Miller Trunk Hwy, Duluth, MN, 55811.



Applications must be postmarked by March 11, 1994. For further information contact Dr. Carl Richards at: crichard@sage.nrri.umn.edu or (218) 720-4332.

#### **ENVIRONMENTAL AND NATURAL RESOURCE SPECIALISTS**

Immediate openings for specialists in ecology, forestry, environmental and natural resource management with experience in conducting environmental impact assessments for existing and proposed long and short term assignments. Previous work experience in developing countries and fluency in French is required. Fax or e-mail resume to Recruiting Dept. (904) 331-3284 Tropical Research and Development, 7001 SW 24th Ave., Gainesville, Florida 32605. E-mail: lj%gnv%0006402222@mcimail.com.

#### **POSTDOCTORAL POSITION -- KBS LTER Landscape Ecology**

The Kellogg Biological Station (KBS) Long Term Ecological Research (LTER) project seeks a post-doctoral associate to join the LTER to examine patterns and consequences of biological diversity on ecosystem-processes in an agricultural landscape. The focus will be on linking, through GIS and modeling, ecosystem process and community-level studies at the site to local, landscape and regional patterns of biological diversity through GIS and modeling. Applicants should hold a Ph.D. in ecology, soils science, forestry or related field. Experience with GIS and ecosystem models is desirable. This position will be funded by the KBS LTER, though the candidate will be encouraged to develop additional collaborative projects. Send curriculum vitae, statement of research interests, names, addresses and phone numbers of three references by March 15, 1994 to: Dr. Katherine L. Gross, Acting PI, KBS LTER, Kellogg Biological Station, Michigan State University, Hickory Corners, MI 49060; (616) 671-2235, (616) 671-2104 (fax), KGross@kbs.msu.edu

#### **POSTDOCTORAL RESEARCHER IN TROPICAL ECOLOGY**

Position available starting May/June 1994 for ecologist/biologist/entomologist to work at La Selva Biological Station near Puerto Viejo de Sarapiquí, Costa Rica on trophic cascades research program involving \_Piper\_ ant-plants. This research uses "common garden" experiments to (1)

assess the effects of the fourth trophic level on the dynamics of secondary consumers, primary consumers, and producers (top-down), and to (2) quantify effects of nutrient and light enhancement (resources available to the first trophic level) on successive consumer levels (bottom-up). NSF funding for this research program pays \$12,000 per year salary, plus health benefits, plus a \$14,000 stipend for room, board and bench fees at La Selva for 12 months per year. One round-trip per year to USA will be provided, and partial travel funds to national meetings. Responsibilities include running manipulative field experiments, shadehouse experiments, supervising a half-time field assistant (12 mo) and a half-time graduate student (6 mo), data analysis, writing, occasional talks to school groups visiting La Selva, and seminars at the University of Costa Rica. Please send cv and 2 letters of recommendation to Dr. Deborah K. Letourneau, Rm 214 College Eight, University of California, Santa Cruz, CA 95064 fax (408)459-3518; email dletour@cats.ucsc.edu

#### **ECOLOGIST**

Northern Michigan University invites applications for an anticipated opening in the Department of Biology. This continuing position begins August 22, 1994. The successful candidate for this tenure-earning position must possess a Ph.D. in Ecology or in an immediately related field, have experience in directing research, and have undergraduate teaching experience. This person will be responsible for teaching undergraduate and graduate courses in ecology and computer applications to biology, and for directing research for undergraduate and master's degree students. Other teaching assignments may include introductory and specialty courses in biology. All applications received by March 1 will receive full consideration. However, the application period will remain open until the position is filled. Send letter of application, curriculum vitae, transcripts, and names, addresses and telephone numbers of three references, and a statement of professional goals to: Dr. Thomas G. Froiland, Department of Biology, Northern Michigan University, Marquette, MI 49855-5341. Telephone: 906-227-2310.

#### **ASSISTANT PROFESSOR: CONSERVATION GENETICS**

The Department of Fisheries and Wildlife and the Biotechnology Center at

Utah State University seek to fill a tenure-track assistant professorship in Conservation Genetics beginning July 1, 1994. We seek an individual with expertise in population or quantitative genetics and molecular genetic techniques, capable of applying biotechnological methods to animal conservation problems. An active research program with extramural funding and graduate student training is expected. Teaching will entail three courses per year (Genetics in Conservation and Management, Biotechnology in Natural Resources, and a graduate seminar). Ph.D. required, Postdoctoral experience preferred. Applicants should send a curriculum vitae, a statement of teaching interests, and a summary of proposed research interests, and should arrange to have letters sent by three scientists who can evaluate the candidate's accomplishments and potential. Review of applications will begin on March 14 and continue until position is filled. Conservation Genetics Search, Department of Fisheries and Wildlife, College of Natural Resources, Utah State University, Logan, UT 84322-5210.

#### **Ecologist, GS-0408-11**

Duties: Provide scientific support to the EMAP Center Director for developing a regional ecosystem analysis program for the Bay City Center for Ecological Research and Training. Ranking Factors include: knowledge of GIS, remote sensing technologies, and or landscape ecology; knowledge of spatial evr. statistics; skill in writing tech. reports. Contact: Shirley Bowens, EPA, 919/541-4381

#### **Ecologist, GS-0408-13**

Duties: Serve as senior ecologist and provide scientific expertise to the EMAP Center Director for developing a regional ecosystem analysis program for the Bay City Center for Ecological Research and Training. Ranking Factors include: ability to plan and coordinate administrative and programmatic activities; ability to develop a regional ecosystem analysis program; skilled in written and oral communication; ability to provide scientific expertise for the conduct of research on multi-resource assessments. Contact: Shirley Bowens, EPA, 919/541-4381

