



## Ethnobotanical Leaflets



## NSF EXTENDS INVITATION FOR ETHNOBOTANICAL WORKSHOP PROPOSAL

By Miriam Kritzer Van Zant

### An Opportunity

A letter from Joann Roskoski, Deputy Division Director for Environmental Biology at the National Science Foundation (NSF), was sent in response to the editorial in the Winter 2000 issue of Ethnobotanical Leaflets (EBL) entitled, "A Call for an Economic Botany/Ethnobotany Cluster at NSF (<http://www.siu.edu/~ebl/nsf.htm>). The letter from Dr. Roskoski was addressed to this writer as Associate Editor of EBL and includes the following invitation, "I would encourage you and others in the ethnobotanical community to consider submitting a proposal to NSF to hold a workshop. Topically it might explore the current state of research, articulate a conceptually based research agenda, and explore interest in this area by a spectrum of public agencies and private foundations."

The concept of calling for a cluster within NSF had developed in part from, "'Teaming with life: Investing in science to understand and use America's living capital' An Interview with Meredith Lane (<http://www.siu.edu/~ebl/lane.htm>)," first appearing in the Spring 1999 issue of EBL, concerning the PCAST (Presidents Committee of Advisors on Science and Technology) Biodiversity and Ecosystem Panel report to the White House, chaired by Peter Raven, and concerning the future of funding in biological research at all Executive Branch agencies including NSF, USDA, NOAA, NASA, funding for military research, etc. It is also an outgrowth of ideas developed when this writer worked on the Institute for Sustainable and Renewable resources within the Committee for the National Institutes for the Environment (CNIE) in 1990-91.

The PCAST report had been well received in Washington. It is clear that though PCAST contains much lip service concerning the type of research and concerns which generally characterize those who might consider themselves to be working in the fields of ethnobotany and economic botany, neither discipline had been named anywhere in the report. Though much was included about the need for scientific surveys of the natural biota, the only plants for which actual dollar recommendations had been mentioned were wheat, corn and rice. It was also clear from the Lane interview that the agencies named

were already in the process of writing their budgets to Congress, incorporating many of the ideas found in the report, including improving their cooperative efforts. Though this can become a boon for biologists, it also has the potential of making it even more difficult for funding to be found for small scale projects by independent researchers.

This writer became very concerned about what this might mean for those who are working toward academic careers in the fields of ethno and economic botany. As professional academics in these disciplines retire, they are rarely replaced. Few universities are acknowledging the growing pressure from incoming students to have courses in these subjects as well as graduate opportunities. This is ironic, as biology departments are under so much pressure to increase their enrollments. Part of what the last editorial explored was the impact of the current research funding situation on academic hirings. Until there is money available that brings in overhead to universities and does not require the researcher to surrender intellectual property rights of those whom they study to corporations, it is unlikely that most biology departments will move to hire in these disciplines. It also means less money will be available to work on the vital human/plant interface in the interest of conservation and environmental protection, especially on the local scale.

### **History of the effort to increase funding for ethno and economic botany at NSF**

The Society for Economic Botany (SEB) made its foray into policy at the UW- Madison meeting in 1991, by being the first of many scientific societies to support the CNIE effort and the original bill to investigate the need for more research dollars, with an eye to better understanding and protecting the environment, helping to make the original CNIE bill the fastest environmental bill to pass Congress as of that time. The SEB council gave this writer permission to talk about CNIE (then called NIE), the first time a policy talk was allowed as part of the SEB agenda. Walter Lewis, then incoming SEB President, produced a letter of support on behalf of SEB with the council's blessing and approval from the membership through a show of hands. SEB Presidential nominee Brian Boom, also became of great help in the CNIE effort. Hugh H. Iltis 1998 Distinguished Economic Botanist (DEB) had been involved since the first NIE meeting, invited by the founding co-chairs, ecologists Henry (Hank) F. Howe and Stephen P. Hubbell.

As executive assistant to Dr. Howe, this writer was fortunate to be in a position to assist with aiding Sustainable and Renewable resources within NIE by assisting in researching and writing the policy statement for that Institute and inviting groups and persons interested in ethno and economic botany, pharmacognosy, restoration ecology, conservation, systematics and taxonomy, mycorrhizae, sustainable agriculture, bio-controls, etc. to participate. Soon a number of other societies, many with members also in SEB, added personal and institutional support for CNIE as did a number of other individuals including 1979 DEB Richard E. Schultes, 1983 DEB Norman R. Farnsworth, 1994 Past President Paul Cox and 1991 Past President Douglas Kinghorn. Support and testimony from then SEB members Brent Berlin and Miguel Altieri, were also critical in gaining congressional support. A slew of SEB past and present members lent their names and often more to CNIE including Greg Anderson, Thomas M. Antonio, David M. Bates, Mark Blumenthal, Peter Bretting, Cesar Compadre, Ed Croom, Memory Elvin-Lewis, Hardy Eshbaugh, Paul Fryxell, Charlotte Gyllenhaal, Lawrence Kaplan, Lucille Kaplan, Stephan

Kresovich, James D. McChesney, Sidney McDaniel, Jerry L. McLaughlin, Eugene B. Shultz, Jr., Doel Soejarto, and David M. Spooner, as did many others. In the process Sustainable and Renewable Resources was converted from a perceived liability to a known asset within CNIE and became household words to Congressional aides.

The CNIE effort had begun as an attempt to develop a new agency targeting environmental problem solving research. As changes in the political balance within Congress and problems in the economy made the concept of an entire new agency an increasingly difficult sell, the effort changed to develop more funding for such research within existing agencies. Even the U.S. military, which had become interested in environmental defense in the face of reduced support for weapons development, supported CNIE, which continued making headway in Congress, until it was pushed into the background by the Gulf War.

A few years ago a group of SEB Past Presidents met with NSF leaders and got a promise for increased consideration for interdisciplinary research. Most of the small amount of resultant funding has actually been made available to support graduate students for ethnobotanical training with most of their time devoted to sequencing.

At about the same time that the Winter 2000 editorial was written, the American Institute for Biological Sciences (AIBS) held a meeting to which the Presidents of all of its member organizations were invited, to discuss the reinventing of AIBS, in keeping with how umbrella societies for engineering, physics and mathematics had already reorganized. Instead of making yearly interdisciplinary meetings its main focus, AIBS guided by SEB Past President (1986) Gregory J. Anderson, is beginning to plan funding for initiatives for biologists, on the scale of the human genome project for medical researchers.

SEB Past President Jan Salick (1997) officially represented SEB at the AIBS meeting. Paul Cox (1994) and Brian Boom were also present. Dr. Salick was notable in using that opportunity to talk face-to-face with NSF Director Rita R. Colwell and Joann Roskoski about the funding situation for ethno and economic botanists. This writer had also briefly discussed this situation with Dr. Colwell and separately with Dr. Salick in the first days of the XVI Botanical Congress in St. Louis, prior to the SEB meeting there. In fact it was Dr. Salick who was first to respond with encouragement and an offer to look into this writer's concerns and attempts to activate SEB to do something to head off the threat of a further dry spell for academic funding in these areas. After the St. Louis meeting, notes of support were exchanged with Dr. Salick, to not give up on mutual attempts to bring about change at NSF especially through the AIBS meeting and the EBL editorials.

SEB Past President (1992) Dr. Michael Balick, recommended to this writer that workshops be the next step in approaching NSF and suggested making a request to current SEB President Beryl Simpson, to write NSF to consider workshops to discuss changes in funding for ethnobotany and economic botany. She did, but when no direct response had come after a couple of months, the editorial requesting the workshops and explaining why they were needed was written and placed in EBL Winter 2000. Soon after, the URL for the editorial, which asked that NSF and the ethno and economic botany communities

work together to change the funding situation, beginning with workshops, was sent to nearly the entire Biology directorate at NSF. The first response developed into a brief set of E-mail exchanges between Mary E. Clutter, Assistant Director of the Directorate for Biological Sciences at NSF, and this writer, concerning these needs with assurance that the request would be considered. Two months later, in March 1999, the letter came from Roskoski with the invitation to apply for workshop funding.

## **What is needed**

It must be kept in mind that NSF funds basic research and does not consider applied research as part of their mandate. The line between basic and applied are becoming increasingly blurred but the need to protect theoretical research, which is born of the curiosity of the individual researcher, continues to be that which NSF's leadership claims to cherish and protect above all else. There are a number of areas in basic research, subservient to success at the applied level, which are in desperate need of funding.

For example, there is a need for funding for production of reliable field and herbarium keys and an understanding of the origin of ancient cultivars, their relationships to each other and to wild species and determination of which are the closest ancestors. This example is discussed in the previous EBL editorial. Work on ancient crop plants would also give much insight into diversity from a different angle than does status quo methodology in systematics, but is not always well suited to or does not clearly benefit from standardized molecular sampling or may not be best served by a world wide monograph approach. Yet, without promising to deliver a world wide monograph and including a promise to do molecular work, there appears to be virtually no chance to get NSF funding for the morphological/taxonomic/systematics work most often needed to solve local identification problems. An examination of abstracts for grants from the systematics cluster over the last two years, posted on the NSF website gives testimony to this fact. This is sad, not only for ethno and economic botanists and their constituent cultures and ecosystems, but for those trying to grasp the underlying genetic systems which control expression and their role in speciation.

It is unrealistic for single graduate students working on individual projects to promise to deliver so much to complete a degree, and often independent, established researchers with good ideas and skills are not in a position to participate in every aspect of investigation as currently required for most NSF funding. These groups need pockets within the larger funding umbrellas now in existence and those being assembled. Taxonomic work needs doing now and has at times been requested by foreign scientists working with their own indigenous cultures and plants. It is a waste of time to pursue grants that do not fit what granting agencies intend to fund. USDA is not able to assist with plants not currently cultivated in the United States. NIH is not interested in writing keys except in a few cases where a case can be made for direct application to human medicine, requiring pharmacognosy work as well.

Production of a thorough database of herbarium specimens and their characters for a single species complex can take one to two years. To include field work, especially abroad, requires support and additional time, without molecular or pharmacognosy work. This is an example of how independent projects in ethnobotany are frequently squelched for lack of funding or may not be as good as they could

be with support. Many ethnobotanical projects require underlying basic research including population biology studies and development of taxonomic keys, often in several unrelated taxa, tied by culture and locale.

Private agencies are funding more ethnobotany today than in the past, but their emphasis is on the applied end. Most won't fund the basic/academic underlying research which results in good management decisions which affect people, economies and ecosystems.

### **What should NSF fund in ethnobotany and economic botany?**

Dr. Roskoski stated in her letter that ethnobotany and economic botany are broadly interwoven throughout NSF and thus initiatives tying these areas together would be better than a cluster. Though that is true in theory, it has not actually worked in practice, especially for biologists who work in these disciplines. Anthropology funds a small amount of work with persons of live cultures but rarely more than rudimentary surveys of plant use if that. Archeobotanists fair only slightly better. A cluster in ethno and economic botany would not require erasure of these interests in other places as Roskoski warned. Any multidisciplinary science can potentially be found in more than one place and still have one or more central clusters and initiatives. For example ecology and biodiversity overlap with each other and each is interwoven with a number of clusters and initiatives. Molecular biology which has several areas of concentration and additionally seems to be in nearly every cluster in biology, is a target for research in physics and engineering and also a multi-agency concern. No one has suggested that because some clusters emphasize molecular biology that it should be removed from any consideration elsewhere.

Roskoski states that an initiative is a better goal than a cluster. Perhaps for the short term this is the best bet, not so much because these disciplines exist throughout the agency, but because it is more attainable initially. She also suggested that all disciplines potentially doing ethnobiology be included in the workshop. Though that sounds good, it is the areas with the least funding and most immediate need which should be targeted.

Ethnobotany and economic botany can be considered as a glue which connect all areas of speciality in the plant sciences in much the same manner as do evolution, biodiversity, conservation and genetics. This is not only historical. Nearly every justification for grants concerning plants, written today, includes mention of something that falls within these disciplines.

It is important to distinguish what the definitions are of economic and ethnobotany from what a cluster and/or initiative concerning them should focus on at NSF. This writer accept the broadest definitions of these disciplines. Any example of a relationship between economics and plants is arguably economic botany. Within this definition, any scientist who makes a living studying any aspect of plants could be considered involved in economic botany. Any example of plant/human relationships which considers culture is ethnobotany. This can include modern cultures as well as traditional ones. Ethnobiology follows this definition but expands to include, as Roskoski mentions, animals and microorganisms.

The problem is that certain areas within ethnobotany and economic botany fall through the cracks regularly and are too important to both science and society (taxpayers) to continue shunting aside. There are currently more opportunities to do zoology and microbiology and thus to do related ethnobiology than there are for botany. Also, the way trained ethnobotanists work, few would ignore an opportunity to record use of any species that those they interview choose to talk about. Thus a cluster and initiatives for at least the next few years need to center around these areas in relation to botany and long term protection for these interests should be set up so this doesn't happen again.

The push right now is for big science in biology. That's fine, but included under such a network is the need to enable small local scale studies of ecosystem and human interaction including agro- ecosystems and economies which use combinations of wild, semi-cultivated and cultivated systems. SEB council member Will McClatchey is correct in pointing out that all work considered for funding by this effort should pivot around the cultural/plant interface.

Which plants are utilized? How do they propagate, what are their taxonomic and systematic relationships? This is particularly needed at the local scale. To determine what should be prioritized, questions may include, what is most endangered? Not only in terms of individual plants and ecosystems, but human knowledge of them. How can modern culture apply what ancient cultures knew and know, to improve nutrition, availability of food, medicines, protection for food production and sources for renewable materials, and still maximize protection for ecosystems and all they contain? How can people in economic need produce what they must without destroying the source of their raw materials?

In answering some of these questions, ethnobotanists continue to contribute insight into genetics and evolution and assist in the process of cataloging the world's biodiversity, but they must be allowed to take this broader approach to tie these areas to the broader good. This is what drives their individual interest. They should not be constrained by what have become standard approaches to studying evolution and systematics.

Researchers who work on many organisms and become familiar with their morphological variation under changing conditions may contribute insights which those limited to narrower approaches often miss. Ethnobotanists sometimes develop this potential while pursuing ethnobotanical agendas. Edgar Anderson was one of the greatest ethnobotanists to do so. His work on the origin of crop plants included separating ancestors from escapes and contributed a great deal to genetic and evolutionary theory. Crop plants and ancient crop plants in particular are living examples of what Amy Trojnar, editorial assistant for the *Journal of Economic Botany*, has referred to as "accelerated evolution," and should be studied for that reason as well as for their economic application. But not all ethnobotanical efforts will or should be expected to yield significant evolutionary insight, it is the icing, not the cake.

What is NOT needed at NSF, is replication of what USDA does on major crops (wheat, soy, rice, corn) at the expense of taking the opportunity to study multiple taxa. If ethnobiology is to be considered as a whole, new funding lines should not reduce the opportunity to meet that which is so in need within botany.

Roskoski also recommends targeting interagency initiatives. This is a good idea, but only if it does not take the pressure off of NSF to put biology money directly into the effort in the near future and for the long term. USDA should expand their direction to consider local plants for use in local economies with an eye to localized protection of ecosystems, economies and what is unique and beneficial to human cultures at both the local and global scale. This may include small scale agriculture, tissue culturing and vat production of products, with the intent to maximize economic gain and reduce the cost of living for a wide spectrum of people, while minimizing environmental damage. NIH should increase the availability of money to study extraction processes and improve the ability to understand, standardize and utilize plant extracts to benefit people and not strictly for the sake of producing profitable products for the pharmaceutical industry.

It is hoped that graduate students will be given an opportunity at the workshops to testify as to their current experiences within academia and hopes for their careers in science, along with prominent and established ethnobotanists at the workshops. Within the framework of big biological projects there needs to be opportunities not only for students but for senior researchers at smaller institutions, who have good ideas, but may not be employed where all of the components are available for larger scale efforts. Collaboration is important but so is independent work. This would both assure that the best ideas come forward, and provide future opportunities for research and thus also for teaching positions for ethnobotanists and economic botanists when they move past the student stage of their careers.

### **What should SEB members and other interested researchers do?**

Donald Ugent has suggested that SEB set up a committee to discuss these interests and work on a proposal which carefully considers what Dr. Roskoski has recommended both in her letter and in conversations with those already working on this issue. Careful consideration must also be given to what NSF is willing to fund not only for workshops, but more significantly, to make sure something worthwhile happens after the final recommendations emerge. Though other agencies should be considered, the focus needs to remain on NSF so the buck is not passed until it drops.

Essential to the success of the workshop is the need to use it as an opportunity to decide which scientific questions will define ethno and economic botany, relevant to agency funding. Dr. Roskoski made this exceedingly clear in conversation since the letter came.

It is critical to build strong coalitions of support for this concept within and outside NSF and that resources and insight be pooled to avoid pitfalls and keep problems from starting. Intelligent use should continue to be made of and expanded to include all appropriate media outlets. A realistic timetable and recognition of what is available, will lead to success in opening up this type of funding for economic and ethnobotany.

For more information on the AIBS reorganization go to their website at: <http://www.aibs.org/core/index.html>

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URL: <http://www.siu.edu/~eb1/invite.htm>

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