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# SUMMARY AND SYNTHESIS OF ADVISORY PANEL DISCUSSION

ON

## ARBORETUM RESEARCH AT THE UNIVERSITY OF WISCONSIN

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### Introduction

This report is my interpretation of the results of an advisory panel meeting held at the University of Wisconsin Arboretum on the morning of October 13, 1984. The panel consisted of Drs. John Aber, Gregory Armstrong, Jeffrey Baylis, Thomas Bonnicksen, Grant Cottam, Gerald Gerloff, William Jordan, Virginia Kline, and Donald Waller from the University of Wisconsin and the following outside consultants: Drs. Anthony Bradshaw, Jared Diamond, John Ewel, Michael Gilpin, Katherine Gross, James MacMahon, Michael Miller, William Platt, and Earl Werner. Dr. Becky Brown of the University of Wisconsin kept detailed notes of the meeting and worked closely with me in preparing this report. Although I have attempted to include a broad sample of the viewpoints that were expressed, I have no doubt overlooked some significant contributions; these are preserved on the recorded transcripts of the meeting. Where a clear consensus was obvious I stated the panel's recommendation. More often than not, however, varied opinions were offered, and these are summarized as options for action.

The meeting, chaired by Dr. Gerloff, was guided by an eleven-point agenda. The panel was charged with the task of advising the University of Wisconsin Arboretum staff on: 1) the types of research that should be developed at the Arboretum, 2) how this research should be carried out, and 3) how the research potential of the Arboretum might be realized.

### **Types of Research to be Developed**

The Arboretum's re-created ecosystems have immeasurable value commensurate with their uniqueness and age. These communities and the research that has been carried out on them during the last five decades are the Arboretum's greatest strengths, and constitute levers that can and should be used to good advantage in whatever new research the Arboretum undertakes.

Most research underway at the Arboretum falls into one of two categories: 1) monitoring community change and the impacts of management activities in the restored communities, or 2) research at the organism, community, and ecosystem level by scientists who might not necessarily be interested in the restored communities but who are attracted to the Arboretum because of the excellent opportunities it affords.

Research of the first type is essential, and must be continued. The outside consultants were favorably impressed with the way ecological research and management are carried out in the Arboretum. The re-created communities seem to be well-maintained and this is especially important as these are the experimental showpieces that distinguish this arboretum from all others. However, monitoring is not the kind of research that will attract

outside funding. This type of research might be enhanced by a better research infrastructure (formalized record-keeping, computerized database, permanently marked gridwork of coordinates), but the panel was not unanimous in assessing the priority that should be assigned to these enhancements.

Research of the second type should continue, and the present policy of encouraging research that is in keeping with the Arboretum's management guidelines need no modification. The levels of both types of research would increase if the Arboretum could offer small grants to University of Wisconsin faculty members; these pilot projects might lead to increased levels of outside funding.

Should the Arboretum get involved in a broader range of restoration ecology investigations than those it is already famous for? Yes. How broad should these new directions be? The answer to this question is less straightforward, but the panel did agree that the first-order strength of the Arboretum is the re-creation of whole communities on lands that might have been severely degraded but had previously supported an ecosystem: the "secondary succession" aspect of restoration. Although the Arboretum might become involved in research on the establishment of communities on virgin substrates (mine tailings, etc.) this should be a second-order priority and is likely to be undertaken on Arboretum lands other than the Madison holdings or on the lands of research clients and collaborators. The Arboretum should take the next logical step in expanding its research efforts, but should guard against immediately trying to solve all the world's restoration ecology problems.

The panel was asked to identify the most interesting questions of the day in restoration ecology, but was not completely successful. (Suggestions included ecology and management of alien species, the use of varying species mixtures to achieve similar functional properties, and testing ecological theory by community construction rather than destruction.) However, the panel members concurred that many such questions had been raised in the symposium of the two previous days and will appear in the book that will be an important, tangible outcome of that meeting. Furthermore, as new research expertise is attracted to the Arboretum, each researcher is likely to come equipped with the questions she or he perceives to be most important, regardless of what this particular panel advises.

#### **Fitting New Research into the Existing Program**

Restoration implies manipulation, yet an atmosphere of preservation pervades the Arboretum. If the Arboretum is serious about undertaking new types of research in restoration, areas must be identified where researchers can manipulate the existing communities. Manipulative-research areas might include appropriate parts of outlying holdings. Nevertheless, the area near the Madison campus is, for logistic reasons, bound to attract the greatest numbers of faculty and students. Therefore, it is imperative that areas within the Arboretum-proper be identified where such research can be conducted. Furthermore, the existence of opportunities for manipulative research must be advertised to local researchers.

The Arboretum committee will have to develop guidelines for assigning areas for this kind of research because manipulation is likely to preclude alternative uses for relatively long periods. Researchers should be encouraged to work together on the same sites. This will maximize research yields from the manipulations and optimize use of available resources.

There are three kinds of areas in the Arboretum-proper that might be made available for manipulative research:

- 1) The extensive holdings that have never been restored.
- 2) Areas where restoration was attempted, but failed.
- 3) Small areas within successfully restored communities. Such areas should be designated only when it is highly probable that they will be of exceptional research, teaching, or demonstration value.

The Arboretum should go into the restoration research business, not the restoration business. Development of a research program in restoration ecology will require judicious opportunism. The panel emphasized that all ventures should be directed at high quality research likely to be of value to ecological theory and applicable beyond the confines of a specific study site. The outstanding ecological research reputation of the University of Wisconsin is one of the Arboretum's most valuable assets. This reputation must not be tarnished or diluted by unimaginative efforts.

This does not mean, however, that the Arboretum should cut itself off from research opportunities offered by prospective supporters who require solutions to site-specific restoration problems. Such short-term projects can yield crucial research

results while paying for the infrastructure needed to maintain a strong, broad-based program.

### **Development of Research Potential**

The panel's strongest recommendation is that the Arboretum seek support to hire an internationally known scholar for a new position as Director of Research. Alternative investments (e.g., stipends for graduate students and postdoctoral research associates) were discussed, but the panel concluded that these would not draw substantial numbers of established scientists to the Arboretum. Also, as one panelist put it, "Agencies fund scientists, not programs." An additional, and important, consideration is that a long-term restoration research program requires continuity.

The panel recognizes the tremendous magnitude of the commitment (salary, support staff, facilities) that this recommendation implies. It is also aware that the administrative relationships between the Arboretum and degree-awarding departments are likely to be complex. My view (but a point not discussed by panelists) is that the scholar, to be an effective magnet, should be physically located at the Arboretum. The individual would, however, hold an adjunct academic appointment in an on-campus unit.

The outside consultants concurred that, in spite of the obstacles involved, the hiring of a first-rank investigator as Arboretum Director of Research is likely to be the single most important action that the University of Wisconsin can take to realize its full potential for research in restoration ecology.

The Arboretum's communications and public relations program seems to be making great strides. The panel recommends that the title of **Restoration and Management Notes** be changed to something that would enhance the journal's image. At least for the time being, its format and intended audience should remain about the same. The Arboretum might cautiously venture into publishing more scientific works, but should be aware that there are many such publication outlets currently available. The book that results from the symposium will link the Arboretum and the science of restoration ecology together in the minds of scholars and resource managers. To maintain this momentum, the Arboretum might sponsor annual conferences, each addressing a different issue related to restoration. (Panelists were reminded of the Tall Timbers Fire Ecology conferences and the scientific proceedings that resulted from each symposium.) Workshops and short courses on restoration are logical activities for the Arboretum to become involved in, either in conjunction with conferences or as separate endeavors. The potential audience -- from universities, government agencies, and the private sector -- is large.

The organizational structure of the Arboretum staff was not clear to the panel. However, it is imperative that researchers attracted to the Arboretum be answerable to a single individual. A logical person would be the Staff Ecologist.



Finally, the panelists suggested several actions that might enhance research activities and visibility. Some of these actions are cheap and some are expensive. None, alas, are free.

- funding and seed money for faculty, graduate students (in addition to currently available support), and postdoctoral associates
- improvements of on-site research facilities such as the laboratory and greenhouse
- computerization of available data
- more signs, and more-informative signs, near research plots: "These inverted Old Milwaukee cans are being used by Becky Badger to measure rates of production of caterpillar dung."
- construction of a living facility (cabin, dormitory, guest room) for visiting scientists.