

PROPHYLAXES FOR OUR RESEARCH NATURAL AREA SYSTEM

Jerry F. Franklin

ABSTRACT: Three problem areas that could threaten the integrity of the Research Natural Area system are discussed: (1) lack of scientific use; (2) inadequate documentation of the research methods and marking of installations in the field; and (3) inadequate management (stewardship) programs. Suggestions are made to remedy these conditions.

INTRODUCTION

Things are going well in our natural area programs. In most States, we either have or are developing comprehensive plans for natural area systems--plans that coordinate activities of many agencies and organizations. The Nature Conservancy's heritage programs are abetting the work with identification of elements or cells of interest and their locations. Natural areas are being incorporated into Forest Service land-use planning; many new Research Natural Areas will presumably emerge. The Bureau of Land Management has greatly simplified its establishment procedures, releasing a tide of new Research Natural Areas. States and The Nature Conservancy are identifying and protecting endangered habitats as a part of critical-area programs, one of which has just been successfully completed in California.

Some of the problems are obvious. When the National Forest plans are finalized, will all of the identified areas actually get established? Dollars are short for research and monitoring. In some States, including Oregon, State programs are high-centered, unable to get sufficient funds or agency support for establishment of natural areas.

Nonetheless, we could congratulate ourselves on our advances. Progress has been made in identification and establishment of areas, in general recognition of the value of Research Natural Areas, and in acceptance of these programs by managers.

A keynoter--even in absentia--might be expected to deliver a positive statement. I choose not to make such a statement, however, for the dark clouds ahead could create major problems for our Research Natural Area system unless appropriate measures are taken.

Jerry F. Franklin is Chief Plant Ecologist at the Pacific Northwest Forest and Range Experiment Station, USDA Forest Service, Corvallis, Oreg.

Some potential dangers to our Research Natural Area system are: (1) the minimal use by scientists of the existing Research Natural Areas; (2) inadequate documentation of what has been done, including work intended to provide a long-term data base; and (3) insufficient attention to stewardship of reserves. My intention is to characterize these dangers and to propose some remedial actions. Without such prophylactic measures, I question whether our natural area system will persist.

USE IT OR LOSE IT

Establishing a Research Natural Area or reserve does not insure its existence in perpetuity--regulation, law, or ownership, notwithstanding. Federal Research Natural Areas are going to be reviewed periodically by the responsible agency. Land-use planning on the National Forests may mean, for example, a major round of establishing Research Natural Areas after plans are adapted. But it also insures that this designation is going to be reviewed at 10-year intervals--at each planning cycle.

Many questions will be posed at each review. The most critical question may be, "Has anybody used this natural area?" However much we may argue (and believe) that reserves have value even without any use, managers and the public are going to find such arguments unconvincing. Managers already complain constantly of the real or imagined lack of scientific use of existing Research Natural Areas. Each cycle of land-use planning--of reassessment--will be a moment of truth in which concrete evidence of use by the scientific community will be essential. Have we put our energies and our dollars where our mouths are?

The importance of using natural areas is not confined to Forest Service or Bureau of Land Management Research Natural Areas. It will almost certainly come to apply to all lands exempted from normal social uses for scientific purposes. The Nature Conservancy and other private reserves are commonly granted tax exemptions based on scientific and other benefits to the public. We can be sure that this contribution will be periodically examined. Even areas designated as Wilderness or as National Parks are going to be periodically reassessed. Wilderness, in particular, has been justified partially on scientific grounds, but agency attitudes and regulations have relegated research to a minor activity; I expect to see an accounting for the paucity of research in Wilderness locations in the future.

Many factors contribute to low scientific use of existing Research Natural Areas. Scientists often do not know of the existence and variety of ecosystems found in natural areas. Funds and time are short, discouraging use of a more remote site even though it is protected. I have heard scientists offer various rationales as to why they could not use an established Research Natural Area or Experimental Forest; some of these scientists have been very vocal in insisting agencies establish them.

Natural scientists are responsible for seeing that appropriate use is made of natural areas in their own studies and those of others. We need to begin pointing out natural areas to fellow scientists, making the extra commitments of dollars or time necessary to use natural areas in our own work, and criticizing colleagues who fail to use appropriate areas for their research. Managing agencies, as well as the scientific community, must be kept informed of studies.

Funding agencies bear a special responsibility to see that scientists use appropriate Research Natural Areas and other scientific reserves. This burden lies with the panels that provide peer reviews and recommendations, as well as program managers in organizations such as the National Science Foundation. Strong encouragement--even coercion of reluctant peers--may be justified.

The scientific community must begin to put up or shut up; if we do not use our scientific reserves we will almost certainly lose them. We need to take this responsibility seriously.

LEAVING TRACKS

Documentation is the key to any research or monitoring program that purports to be of long-term value. What were the objectives of the research? Where was the sampling conducted--the geographic location within the Research Natural Area? Can the plots be relocated? What methods, instruments, were used? Where are the original data? Have they been duplicated and archived in a safe place? Have the data been entered in electronic form and subsequently verified?

I contend that--with a few notable exceptions--the scientific community has done an abominable job of plot monumenting and field marking, study documentation, and data archiving. How many times have we attempted to revisit old plots, use old data sets, repeat measurements, and so on--and been totally frustrated because we could not tell what had actually been done? Part of this is a consequence of an unwarranted belief in our individual abilities to recall critical information at some far-off date. Some of our failure is a consequence of laziness. Agencies contribute to documentation failures by regulations that unnecessarily limit field

marking. Institutions discourage (directly or through their reward structures) long-term research perspectives. Many circumstances cause failures and few nurture documentation efforts.

We simply must get this area of field marking and documentation under control or little long-term research and monitoring will be worthy of the name--or the dollars invested in it.

Field marking is where the documentation job starts (not counting the initial study plan). Future scientists have to be able to relocate plots which requires detailed maps or carefully marked aerial photographs, detailed instructions, and, often, route markings on the ground. In the rugged topography and dense vegetation of many forested mountain regions, relocating a plot can be difficult and time consuming. Plot markings themselves need to be permanent and often as conspicuous as possible. When it comes to marking plots, metal or plastic stakes are better than wooden, taller stakes typically better than shorter, and more stakes better than fewer. Yellow metal signs, 5 by 8 inches, tacked on trees and facing outward from plot edges have been very helpful in guiding researchers back to plots in the shrub- and tree-infested Neskowin Crest Research Natural Area on the Oregon coast. Metal tree tags are usually the fastest and surest way of identifying individual trees for remeasurement; simply tallying trees on a plot provides information of much more limited value and none on the behavior of individual specimens. And so forth.

I am sure that some of you take exception to some or all of these suggestions. I do not propose scientific license in the use of reserves, however, or use of conspicuous markings in recreationally sensitive areas. I do argue that we should use techniques that will provide for reliable and efficient remeasurement programs consistent with maintenance of natural processes. None of the field markings proposed above are likely to have a significant effect on natural processes, but objections to them are sometimes voiced, based primarily on esthetic considerations and not on concern for altered ecological processes. I think that such concerns are grossly misplaced, especially when activities that significantly alter natural processes--such as trapping, hunting, or grazing by domestic livestock--are allowed to continue in and around our Research Natural Areas.

Data documentation and archiving are the other critical areas. During the first several decades of Forest Service research, establishing long-term plots was emphasized; excellent records were laboriously duplicated and maintained, methodologies were standardized or described in detail, and so on. Few modern researchers appear to take the time to protect and document their data sets adequately for the long term. They know what they did--so they often waste no time describing methods, variables, and so on.

Forest Service and university researchers at Oregon State University have had extensive experience in developing a forest-science data bank during the last decade. Long-term data sets are emphasized. Our experience suggests that: (1) documentation of methodology is typically weak, especially for long-term studies in which methods change over time; (2) accountability to a third party, such as a biometrician, improves documentation; (3) data sets need to be periodically analyzed--use invariably surfaces problems in documentation; and (4) data sets need to be archived in data depositories that offer uniform standards of data maintenance and make data retrieval possible and efficient. Art McKee will have some further observations on the virtues of careful documentation later in this symposium.

To summarize, scientists are going to have to learn to leave better tracks for future generations of scientists if their work is to have any value as a long-term baseline. Permanent and conspicuous, but ecologically neutral field markings are important. Data archiving and documentation need extensive, continuous, and sometimes expensive attention.

ADOPT-A-NATURAL-AREA

Laissez faire management of natural areas is the third danger area. Simply the absence of management plans for most of the Federal Research Natural Areas suggests that we have a serious problem. Such management as occurs is usually based on general agency guidelines (for example, the Forest Service manual), not on a detailed consideration of specific preserve objectives and the various factors affecting achievement of those objectives.

Developing specific objectives for every natural area is important. What are we trying to achieve? A lack of operational objectives often produces disagreements over management. Some individuals interpret the general guidelines as indicating that succession should be allowed to proceed, even when natural processes have been altered. Others interpret guidelines as a mandate for management to maintain a specific community or organism or to try to duplicate natural processes, such as wildfire, with management. Any or all of these approaches are allowable and may be appropriate on a specific Research Natural Area--depending on the objectives of the particular area, however--which is why analysis of objectives is a key part of preparing a management plan. What do you want to achieve and in what part of the natural area?

Forest Service establishment reports are sometimes considered to be functional management plans, but I have yet to see an establishment report that even provides the detailed information base required to prepare a management plan. The Nature Conservancy is far ahead of the Federal agencies; stewardship plans have been developed for the majority of its

preserves and intensive management to achieve specific preservation objectives is characteristic of many of their properties.

We argue that the natural areas are invaluable, yet the management attention they are receiving is not consistent with those purported values. Management plans are a first step and can help clarify our objectives, as well as define management needs. They can also focus the attention of the busy local managers on these unique properties, identify necessary investments, and serve as a basis for budgetary requests.

Finances are an additional issue that I will not dwell on here. Many of us are aware that Research Natural Area programs, whether for management or research, are typically financial stepchildren. What is done is primarily through the good will of interested managers and researchers, not because of any institutionalized financial commitment to Research Natural Areas. A lot of buck passing occurs in the area of financial responsibilities.

At least one aspect of stewardship is amenable to our efforts as individuals and small groups. Many natural areas have suffered simply because no interested or knowledgeable parties looked in upon them periodically. When people like Will Moir, Fred Hall, Chuck Wellner, and I have visited Research Natural Areas in the course of preparing guidebooks, we frequently discovered that we were the first to visit them since establishment. Various activities occur that detract from natural area values--poaching for firewood, perhaps, or development of a hunter's camp. A timber sale may intrude because of incorrectly located boundaries. Overburdened agency management personnel are often unable to give the Research Natural Areas the specific attention they deserve.

We could insure that our Research Natural Areas do get regular and sympathetic attention if each of them was adopted by an interested individual or group. This program would at least provide for regular visits during which management problems and developments would be noted. Problems might include inappropriate use, and a development might be a storm that resulted in substantial tree mortality. The results of these visits could be documented, providing the managing agency with a continuing record of developments in the natural area and flagging developing problems before they become critical. The documents would also become part of the scientific record of the natural area.

As with management planning, The Nature Conservancy is ahead of the Federal agencies in volunteer involvement with management and use of natural areas. Many Nature Conservancy preserves have management committees composed of interested scientists and laypersons. These committees sometimes develop and implement the management plans, although many State and regional offices of The Nature Conservancy have

professional stewardship positions, and larger preserves have full-time directors and management staffs. Sometimes universities have assumed responsibility for management and protection of The Nature Conservancy reserves.

Stewardship is currently inadequate for most of our Federal Research Natural Areas. Objectives are often poorly defined, detailed management plans are generally lacking, and funding is inadequate for dealing with a scientific resource that is truly invaluable. We must continually work to improve this situation, but we can take direct action now with an "adopt-a-natural-area" program. As individual scientists, research work units, university departments, junior colleges, citizen groups, or whatever, we can insure that specific Research Natural Areas receive regular visits and that a record of management activities and natural events is created and maintained.

CONCLUSIONS

My apologies to you for this Cassandraic keynote. What follows should be considerably more upbeat. The symposium will, I hope, help to stimulate baseline monitoring and research in the outstanding system of natural areas that we are creating through cooperative Federal, State, and private programs. We must never forget that creating the system is only the first step: eternal vigilance is, unfortunately, essential for a permanent system. The Research Natural Area system needs to be actively managed and to be used for carefully documented research and monitoring. For each of us, a professional commitment above and beyond the scope of anyone's current job description is required--the future of our natural area system relies on philanthropy in the best sense of the word.