A Collaborative Adaptive Management Plan

for the

CLEMSON EXPERIMENTAL FOREST TRAIL SYSTEM

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OVERVIEW

A Collaborative Adaptive Management Plan for the Clemson Experimental Forest Trail System[1]

The 110-mile Clemson Experimental Forest (CEF) Trail System is embedded in a 17,500-acre Upper-Piedmont forest owned and managed by Clemson University, Clemson, South Carolina. The CEF originated in the New Deal programs, principally the Land Purchase Program and the Resettlement Administration, of the 1930s. Today the Forest is managed for natural resource education, research and outreach programs. The management costs are funded from timber sale revenues. The CEF is, and has to be, totally self-supporting.

Except for a few miles of recreational hiking trails established adjacent to Lake Issaqueena during the projects of the 1930s, the entire CEF Trail System development was user-established. Equestrian traffic on these trails began in the 1960s, and increased slightly through the 1970s and 1980s. Around 1990, equestrian traffic began to increase dramatically.

Mountain bike traffic on the CEF did not occur until the mid-1980s. It also began a dramatic increase in the early 1990s. Based on preliminary survey data, The CEF Trail System is getting 25,000 – 30,000 person-hours of use annually. Almost all of this is use is attributable to equestrians and mountain bikers with mountain bike use slightly exceeding that of equestrian use.

While of significant size and importance to users, this trail system has had no design and essentially no regulation of use. It has been the site of substantial natural resource degradation, and it is unsustainable by simple maintenance methods. It requires major re-design, partitioning of use by site capacity to withstand the type and intensity of use anticipated, regulation, and new maintenance technologies and strategies. Possibly above all else, the users need to become aware of the attributes and capacities of the ecosystems in which their trails are embedded. Not only does the trail system need to be renewed, but a renewal of how users, managers, and scientists think about humans as ecosystem components and human activity as ecological process that can be intelligently shaped needs to be accomplished.[2]

Clemson University has made the decision to change the CEF Trail System from a resource liability into a natural resource management asset in the context of the

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[1] Wood, G. W., S. K. Cox, and S. E. Perry. 2000. A collaborative adaptive management plan for the Clemson Experimental Forest Trail System. Clemson Univ., School of Natural Resources, Clemson, S. C., 71 pages plus appendices.

[2] For an excellent treatise on this concept see: Gunderson, L. H., C. S. Holling, and S. S. Light. 1995. Barriers and Bridges to the Renewal of Ecosystems and Institutions. Columbia University Press, New York, N.Y., 593p.

primary purposes of the land grant university system – education, research, and outreach. Our goal is to have the CEF Trail System become a conceptual prototype for experimentation with trail design, maintenance technologies and strategies, and partitioning of types of use and use intensities. The newest dimension to this approach is to bring users directly into the design and evaluation processes.

To accomplish this goal, we are employing a collaborative adaptive management process.[3] The most important product of this process is *knowledge*. Managers, scientists, and users all share information and learn from each other, i.e., *collaboration*. The process begins with the *gathering of the best currently available information* on ecosystem and ecosystem-user attributes. The next step is to develop a *plan* for the management of the system using the best technologies available and affordable. The third step is to *implement the planned management strategy*. The fourth step develops and implements a *monitoring* strategy to monitor ecosystem and user responses including responses to forces outside of the influence of management (e.g. storms, droughts, plant and animal diseases, etc.). The final step is to implement a *research* program that explains change.

Adaptive management accepts that four things are changing inevitably: a) ecosystems, b) knowledge of ecosystems, c) human values for ecosystems, and d) technologies for the use of ecosystems. The old paradigms of "blueprinted" approaches to natural resource management are antiquated, and, in hindsight, were never logical to start with. *The management of trail systems is an emerging art and science.* On the one hand, the CEF Trail System, like most other trail systems, is an artifact of uninformed human behaviors on wild landscapes, and human behavior in such situations is the most challenging part of natural resource management. On the other hand, as a relatively fresh substrate for management art and the development of science, a trail system offers an opportunity for a fresh paradigm in natural resource management.

As mentioned earlier, the most important product of adaptive management is knowledge. While 80 percent of our citizenry lives in an urban environment, that citizenry has an expanding demand for wildland recreation in general, and trail systems in particular. Trail systems are emerging as the preeminent "outdoor classrooms." Here the recreationist can become re-created in both the aesthetic sense and in an increased awareness of ecosystems and the ecosystem dynamic. Trail systems can take trail-users through the landscape equivalents of libraries, museums, art galleries, factories, and farms. Ideally, it will be in the collaborative adaptive management mode that trail systems will provide the opportunities for humans to grow in awareness of the need to harmonize their use of ecosystems with

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[3] For recent discussions of adaptive management in natural resources see: Johnson, N. C., A. J. Malk, R. C. Szaro, and W.T. Sexton (editors). 1999. Ecological Stewardship: A Common Reference for Ecosystem Management. Volumes I-III. Elsevier Science Ltd., Kidlington, Oxford, UK. Within these volumes particularly see: Malk, A. J. Adaptive management. vol. I, pages 207-213; Dallmeier, F. Information and data management – overview. Vol. III, pages 499-503; and Bormann, B. T. et al. Adaptive management. vol. III, pages 505-534.

ecosystem capacities and with other users of those ecosystems who have substantially different values and perspectives.

The CEF Trail System will become a product of a philosophy of dynamic pragmatism. That is, the answers will be found when they are proven to work, but the answers will inevitably change as circumstances change in time and space. Adaptive management accepts that change is a natural phenomenon. Adaptive management is about learning to cope with change. The CEF Trail System will become a resource for learning how to learn to manage in a changing world.

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