

Long-term Research Symposium Summary

Significance of long-term ecological research in preserving national parks, R. Stottlemeyer, organizer. Symposium held at 72nd National Meeting of the Ecological Society of America (ESA). Columbus, OH, Aug. 9-14, 1987.

The goal of this symposium was to acquaint and encourage the ESA community to see the research potential, public service value, and professional satisfaction possible from the conduct of long-term research in national parks. Symposium objectives were 1) to demonstrate the unique opportunities parks have in the conduct of long-term ecological research; 2) to demonstrate the need to carry out long-term research to meet mandated obligations of ecosystem preservation; 3) to provide examples of where long-term ecological research in parks has led to change in park management and public land use policy, and 4) to explore possibilities for use of Park Service interpretive programs to further public knowledge of ecological research and its role in preserving our natural heritage.

The speakers and topics addressed were: Dr. Rolf Peterson, Mich. Tech U. "The wolves of Isle Royale: 30 years of evolution in understanding;" Dr. Lloyd Loope, Haleakala NP. "The role of long-term research and monitoring in managing biological invasions in national parks of Hawaii;" Drs. William Halvorson and Gary Davis, Channel Islands NP. "Long-term natural resources monitoring in Channel Islands National Park;" Dr. James Kushland, East Tex. State U. "The Everglades, developing ecosystem management goals based on long-term research;" Dr. Robert Dolan, University of Virginia, "Management of coastal and marine areas within the National Park System;" and Dr. Robert Stottlemeyer, "Long-term watershed ecosystem research in national parks." Additional input on long-term fauna/flora research was provided by Dr. Donald Despain, Yellowstone NP.

The predator-prey studies on Isle Royale, conducted by Dr. Peterson, serve to demonstrate the need for long-term research to obtain a proper understanding of the true length of natural population cycles. The interpretation of these research results has shifted considerably over the years as new data became available, and it is clear the early interpretations were in error due to the lack of knowledge involving the length of natural cycles and factors limiting population size at various stages in the cycle.

The primary factor in the success of long-term research is commitment of the principal investigator

(Strayer et al. 1986). The research on Isle Royale and the work of Dr. William Robertson at Everglades are among the best examples of this commitment, against many odds, within the National Park System.

Islands are especially vulnerable to biological invasions, and much long-term research has focused on such ecosystems. Dr. Loope addressed this question for Haleakala and Hawaii Volcanos NPs. While these parks are some of the most intact areas of the Hawaiian Islands, still about half their species are introduced. The most damaging have appeared to be alien (exotic) ungulates. The long-term study of their invasion has also demonstrated how long the adverse influence of alien herbivores can last in an ecosystem. Now additional research is underway examining how alien invertebrates and plants are exerting influence. There remain many local examples of intact ecosystems at high elevations or on specialized substrates, and monitoring should be put into place to quantify both endemic and alien biota responses to change in introduced exotic populations.

The history of research in Everglades NP, addressed by Dr. Kushlan, and the emerging databases developed in selected parks for assessing ecosystem response to atmospheric contaminants point out the need for understanding fundamental ecological processes that drive park ecosystems. Such studies can provide quantitative management goals. These goals, in turn, can provide strategies and performance standards for research and monitoring. Acceptance of such standards, however, usually requires the heavy involvement of scientists external to the Park Service. Process-oriented research is the minimum necessary to carry out the mandates of public resource managing bureaus, but its sophistication and complexity will require a fundamental shift in NPS research strategy and training of personnel.

The Channel Islands research program also focuses on the dynamics of endemic vegetation species subjected to severe grazing pressure. Here also are examples of endemic plant species surviving in local refugia, and now recovering with removal of the exotic herbivore. Dr. Halvorson also outlined the Channel Islands ecosystem monitoring program, which goes far beyond just the monitoring of alien species impact. It is perhaps the most elaborate attempt in the entire NP System to provide a context within which change in individual species or abiotic factors may be followed.

Perhaps no better example exists to demonstrate the significance of systematic long-term, process-oriented, ecosystem-level research than the effect such research has had on barrier island management. Research conducted by Dr. Dolan and Dr. Paul Godfrey (U/Mass) among others, funded in large part by NPS, profoundly changed the management goal of these intrinsically dynamic systems. Further, this research served as a basis for the 1982 Coastal Barrier Island Protection Act, which eliminated many of the federal incentives for the development of private barrier islands. This legislation has the potential to enhance the protection of existing barrier island reserves and to save the U.S. billions of dollars a year. Providing a sound principled basis for national environmental policy is the ultimate service a bureau such as the Park Service can perform.

In a quick review of audience response, the main concern related to the sincerity of the Park Service in pursuing long-term research. For example, there is no research strategy in place for the NP System or, for that matter, for most parks. A symptom of this is no

Request for Proposals relating to such research. Also, there is the near absence of funding for research/resource management, the least for any national resource managing bureau. Also there is the paucity of peer review of much NPS research. All of these suggest a lack of interest in involving the external scientific community.

The potential for national parks to play a larger role in long-term research, involving both external personnel and funding, has been adequately demonstrated in undertakings such as at Sequoia-Kings Canyon NPs. But even this type of cooperation requires steady Park Service funding in amounts far above that traditionally spent on research or monitoring. Also it requires program review by persons reasonably current in their respective disciplines. Nationally, there are fewer than 65 NPS employees on Research Grade Evaluation – hardly the base for program peer review of internally or externally-funded research.

Long-term research/monitoring requires a commitment from both the researcher and the funding agency. Steady funding, principally for baseline inventory and monitoring, is the primary obligation of the funding agency. Long-term study is by its nature complex, and it requires a multi-disciplinary research approach. The number of researchers within Park Service and their array of expertise is not at the threshold for an effective effort. The need for considerably expanded external involvement is both apparent and feasible. It is time the Park Service outgrew its intimidation in dealings with the external scientific community.

Literature Cited:

Strayer, D., J.S. Glitzenstein, C.G. Jones, J. Kolasa, G.E. Likens, M.J. McDonnell, G.G. Parker, and S.T. Pickett. 1986. Long-term ecological studies: an illustrated account of their design, operation, and importance to ecology. Occasional Pub. #2, Institute of Ecosystem Studies, New York Botanical Garden, Millbrook, N.Y., 38 p.

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