

Gap Analysis: Another Look

By Kathy Jope

The winter 1994 issue of *Park Science* carried a thought-provoking article by Machlis et al., which extends the concept of gap analysis described by Scott et al. (1991, 1993) to its social dimension.

Gap analysis has been advanced as a means of identifying "unprotected yet critical areas of biodiversity." Through gap analysis, it is posited, we will be able to protect areas that are crucial to the conservation of biodiversity.

Such an approach is attractive, since it presents an objective means of identifying areas to be protected. However, it is based on two fundamental assumptions, which need to be critically examined. In discussing them, my intent is not to undermine the concept of gap analysis, but to encourage critical thought about it.

The first assumption of gap analysis is that a viable population of each rare species can be contained within the delineated reserve. This may be possible for resident species, but it is more problematic for species that require widely separate summer and winter range, not to mention highly migratory species such as many shorebirds and songbirds. For species to persist over the long run, provision must also be made for changing landscapes and recolonization following disturbance.

Ecosystem Linkages

This leads to the important point that gap analysis focuses not on ecosystems but on aggregations of individual species. An ecosystem is far more than simply an aggregation of species. The essence of an ecosystem is the flows and processes, and the *interrelationships* among the myriad species. It is critical to recognize that gap analysis is not a method that will necessarily conserve ecosystems. There is no guarantee that a reserve designed through gap analysis will conserve the vital linkages and interrelationships of the intact ecosystem.

The second assumption in gap analysis is that species and, presumably, the ecosystems of which they are part, can be effectively protected in a reserve. One has only to look at the results of our efforts to conserve the integrity of park ecosystems to see that the validity of this assumption is debatable. Reserves designed through gap analysis are a valuable part of the conservation agenda, serving valid roles as biological insurance policies and in their contribution to diversity of management. However, reserves alone are not sufficient to conserve biodiversity if they are surrounded by a landscape that is hostile to life.

In delineating reserves to conserve biodiversity, gap analysis accepts a paradigm of dualism, a paradigm that considers people as separate from the natural world, and human-use areas as separate from reserves. Human use of resources and land are seen as incompatible with nature and the conservation of biodiversity. At its extreme, such a dualistic approach does not recognize any substantive link between the well-being of people and the well-being of the environment. In its more moderate version, it focuses conservation efforts on delineating preserves that will be protected from human activities that will continue unabated beyond the preserve boundaries.

Impact or Interaction?

We have too easily accepted the premise that human activities are inherently destructive. This is even reflected in our "Environmental Impact Statements." In striving to minimize the impact of human activities, we imply there will inevitably be some level of impact. Need this be so?

As Scott et al. (1993) noted briefly, there is an alternative paradigm, one that rejects the dualistic approach and instead views people as inextricably linked with the earth. According to this paradigm, wherever we go we are part of an ecosystem. In the air we breathe, in the water we drink, in our interactions with plants, animals, insects, even soil microorganisms, we are linked with the ecosystem around us. We take responsibility for the direct and indirect effects of our activities, not just in a few reserves, but everywhere, in everything we do.

This alternative to dualism might be considered an "ecosystem" approach. Its focus is on interrelationships, flows, and processes. Consider how our approach would be different if we consciously recognized our connectedness—the interrelationships between ourselves and the ecosystem in which we live and work.

In discussing the social dimensions of gap analysis, Machlis et al. (1994) cited "demographic change" and "monetary wealth and capital" as two factors that contribute to impacts on biodiversity. However, these two factors do not inherently lead to impacts. Rather, the impacts stem from the level of resource consumption that we have considered acceptable in our society and which varies with demography and wealth. Similarly, industrial activities and land use do not inherently lead to ecosystem impacts. It is the *way* of living and doing business that needs to be redesigned.

What Goes Around Comes Around

Viewing people as connected with the ecosystem, we would look differently at the effects of our activities on the ecosystem. We would not be so accepting of their destructiveness. **It is true that life and death are**

fundamental ecosystem processes. But what other species in an ecosystem destroys not only life, but the very life-giving potential of the system? Humans do, through release of toxic materials, extinction of species, destruction of fertile soil, and many other actions. Seeing ourselves as members of the community of life, we would be more likely to recognize that when we harm the ecosystem, we harm ourselves. We need to become more responsible members of our community.

One way we can do this is to work with, rather than against, ecosystem processes—to strive to nurture the ecosystem around us, its diversity of life, and its life-giving capability. In business there is a growing field known as industrial ecology. Industrial ecology explores ways in which industrial processes can be designed using ecosystems as a model. Processes in ecosystems tend to occur as loops and cycles rather than the linear path from the source to the dump that characterizes so many of our industrial processes. In an ecosystem, the by-products of one process are the raw materials for another, and there is no such thing as effluent.

How would our operations in national parks differ if we were to adopt an approach such as this—if we use ecosystems as our model, worked with, rather than against, ecosystem processes, and fostered a sense of connection between people and the earth? Consider how we would design visitor centers, roads, and housing areas if we viewed people and our infrastructure as a nurturing component of the ecosystem. Consider how we would design a facility if, for example, we saw ourselves not as using water, but only borrowing it. Consider how we would design the visitor experience if a common thread running through it was to foster our sense of connection with the world around us.

A Society in Transition?

Adopting such a paradigm is not as unrealistic as it may seem. Things change. Society's values and behavior change. Our old way of doing business and the way we related to the environment simply is not working anymore, and the results are becoming less and less acceptable. More and more people, and more and more communities, are recognizing that there is a different way. There is a perception that society is entering a transition, with increased recognition of the difference between needs and wants, and greater willingness to forego immediate gratification in the interest of long-term well-being.

The NPS has a choice: We can either follow along behind society in these changes, or we can move to the forefront as leaders in environmental stewardship. We can support a dualistic paradigm that has not been re-

Continued on page 25

Gap Analysis continued from page 24

soundingly successful in the past and whose prognosis for long-term success is dim, or we can embrace our role as responsible and respectful members of our diverse ecosystem.

There is no difference between you and the Earth. When you learn to read the Earth, you learn to read yourself. When you heal the Earth, you heal yourself.

Doreen Mahoney

Skagit Systems Cooperative

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