

## THE ECONOMIC BENEFITS OF WILDERNESS

Pete Morton, Ph.D.  
The Wilderness Society  
Denver, Colorado

### Introduction

The 1964 Wilderness Act (Section 4b) recognizes the multiple benefits of wilderness areas: "wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical uses." While the act provides a basic framework of wilderness uses, it does not begin to enumerate all of the uses and benefits of wilderness areas (Driver and others 1987; Rolston 1986; Reed 1989). This paper attempts to summarize these benefits and uses based on a total economic valuation framework.

### Wilderness Economic Theory

Wildland ecosystems represent natural capital capable of producing a wide range of goods and services for society. Some of these outputs, such as timber, are freely exchanged in formal markets. Value is determined in these markets through exchange and quantified in terms of price. However, many other outputs -- watershed protection, carbon storage, scenic beauty, trophy caliber wildlife and native fish, for example -- contribute to our quality of life and support our market economy, but are without formal markets and therefore without prices.

The fact that wilderness benefits are not priced does not mean they lack value, only that market indicators of the value do not exist. Economists must estimate the nonmarket benefits of the goods and services jointly produced by wildlands when consumers are unable to express their preferences and willingness to pay via the marketplace. Nonmarket benefits should be included in the economic analysis used to inform public land management decisions. An economic analysis must account for nonpriced benefits and costs, as well as those more readily observed and measured in market prices (Pearse 1990; Loomis and Walsh 1992). An economic analysis is conducted from the viewpoint of society, which should also be the viewpoint of managers of the public estate. In contrast, a financial analysis only examines costs and benefits as measured by market price; it is the viewpoint of private industry and is more concerned with profits or losses.

### A Total Economic Valuation Framework

To account for the full array of goods and services generated by wildlands, economists have derived the total economic valuation framework (Randall and Stoll 1983; Peterson and Sorg

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Pete Morton is Resource Economist with The Wilderness Society, 7475 Dakin St., Suite 410, Denver, CO 80221, [pete\\_morton@twc.org](mailto:pete_morton@twc.org)

1987; Loomis and Walsh 1992). A total economic valuation framework is the appropriate measure when comparing wilderness benefits to its opportunity costs (Loomis and Walsh 1992). The total economic benefits generated by wildlands are conceptually summarized in figure 1, based mostly on research by Krutilla (1967), Rolston (1986), Driver and others (1987), Walsh and Loomis (1989), and McCloskey (1990). The seven categories of wildland benefits include direct use, community, scientific, off-site, biodiversity conservation, ecological services and passive use benefits (Morton 1999).

Wildland recreation results in a variety of individual and social benefits including: personal development (spiritual growth, improved physical fitness, self-esteem, self-confidence and leadership abilities); social bonding (greater family cohesiveness and higher quality of family life); therapeutic and healing benefits (stress reduction helping to increase worker productivity and reduce illness and absenteeism at work); and social benefits (increased national pride) (Driver 1976; Haas and others 1980; West 1986; Driver and Brown 1986; Williams and others 1989). Wilderness is a place for spiritual experiences and has inspired the creation of art, photography, literature, poetry and music. Wilderness is also a place to restore mental and physical health, stimulate creativity, achieve self-realization and improve group leadership skills (McCloskey 1990). Wildlands provide current and future generations of Americans with a frontier-like environment to reclaim their cultural identity and feed their soul (McCloskey 1989; Reed 1989).

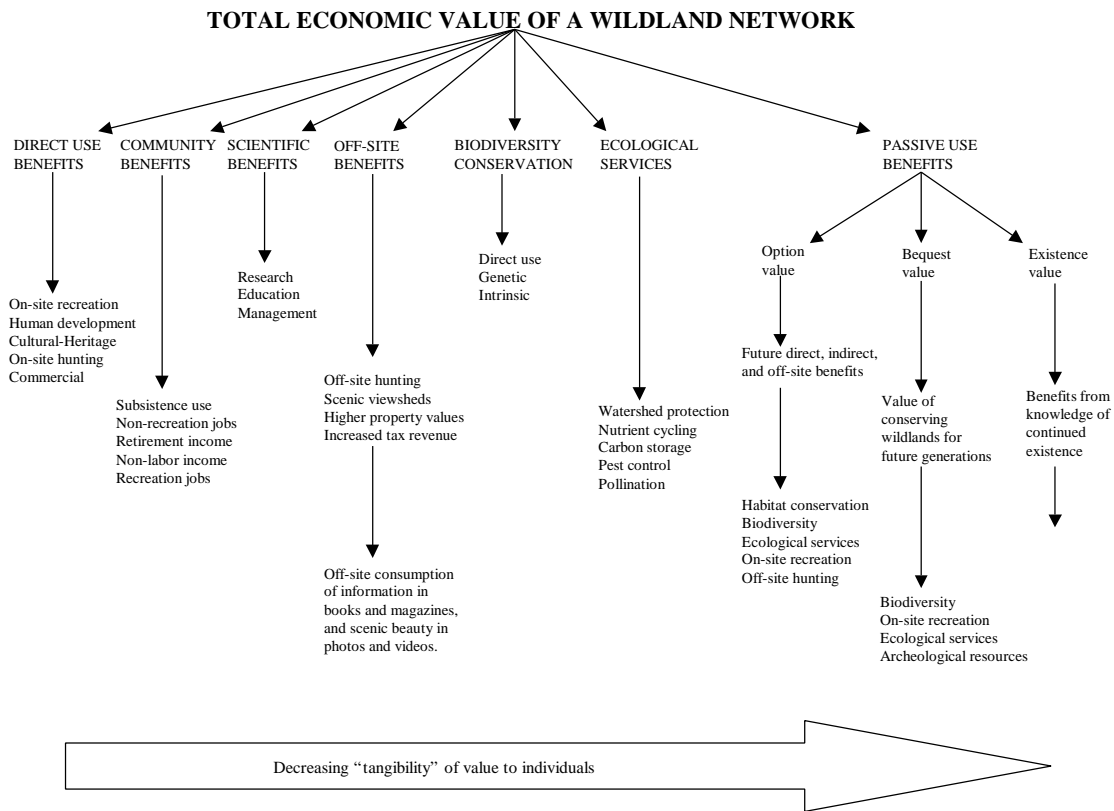


Figure 1. Total economic framework for evaluating wilderness benefits.

The amenity-based development occurring throughout the American West is partially based on the environmental, recreational and scenic amenity resources generated by public wildlands (Rudzitis and Johansen 1989,1991; Whitelaw and Niemi 1989; Rasker 1994, 1995; Power 1996). Wildlands enhance the quality of life for local residents and indirectly benefit rural communities by attracting and retaining nonrecreation businesses and retirees (Decker and Crompton 1990; Johnson and Rasker 1995; Lorah in press). Hunting and fishing outfitters gain commercial benefits from wildlands by providing a primitive environment for their clients. Wildlands also directly create jobs for wilderness rangers, agency planners and administrators, as well as agency and university researchers (Rudzitis and Johnson in press).

There is also growing recognition of the scientific and management value of a network of wildlands (Stankey 1987). By limiting motorized access, wildlands provide valuable protection of archeological and paleontological resources for future scholars. Wildland vegetation is rich in historical information on disturbance regimes, composition, structure and function of natural communities -- information that is prerequisite for successful ecosystem management. Wildlands generate off-site benefits by providing habitat for mountain lion, black bear and other charismatic megafauna that may be hunted or viewed outside wildlands (Loomis 1992). Wildlands also serve as valuable scenic backdrops for resorts and residences on adjacent lands – enhancing property values and tax revenues (Phillips in press).

Wildlands help conserve biological diversity, which includes the full array of native species, the genetic information they contain, the communities they form and the landscapes they inhabit. Genetic diversity allows increases in the productivity and disease resistance of crops and the generation of new medicinal products. Wild plant and animal species are estimated to account for 4.5 percent of the nation's gross domestic product (Prescott-Allen and Prescott-Allen 1986).

Wildlands generate ecological services, including climate moderation, pollination, seed dispersal, watershed protection, natural pest control services and carbon sequestration (Ecological Society of America 1997). Watershed protection protects private property from floods and lowers water treatment and reservoir maintenance costs for downstream communities. Watershed protection is an important role for public lands because wildlands contain the headwaters of many of America's rivers, and controlling development, road construction and hence erosion on private lands is more difficult due to concerns over private property rights.

Sustaining public wildlands with habitat for natural predators is economically rational (Morton and others 1994) as natural predation plays an important role in ending and lengthening the time between pest outbreaks (Ecological Society of America 1997), and natural predation contributes \$17 billion per year to the United States economy (Pimental and others 1997). Scientific concerns over atmospheric carbon dioxide levels suggest that the economic benefits of storing carbon in a wildland network could play a significant role in protecting the temperate rain forests -- on the Tongass National Forest, for example, where up to 75 percent of forest carbon is stored in the soils (Joyce 1995). Protected by the forest canopy, soil carbon can be stored indefinitely (subject to fluctuations caused by natural disturbances) if these forests are reserved

in a wildland network. If the forests are logged, however, the soils can quickly decompose and lose their carbon through exposure to increased sunlight, temperature and wind.

Economists and the courts have also recognized that wildlands generate substantial passive use benefits, including option, existence and bequest values (Clawson and Knetsch 1966; Walsh and Loomis 1989). Option value is like an insurance premium that people are willing to pay over and above their expected recreation benefits to maintain the option, for themselves or for their children, of visiting wildlands in the future (Weisbrod 1964; Krutilla 1967). Existence value is the psychic value a person enjoys from just knowing that a wildlands exist -- regardless of whether the person will ever visit an area (Krutilla and Fisher 1985). Bequest value represents what the current generation might be willing to pay to bequest wildlands to future generations. Researchers have found that the passive use benefits of wilderness are typically greater than the other benefits included in the total economic valuation framework (Walsh and others 1984; Walsh and Loomis 1989; Walsh and others 1996).

### **Conclusion**

Opponents of wilderness argue that protecting public lands as wilderness locks up resources, locks out people, and is bad for the economy. However, the facts do not bear out this tired rhetoric. Since passage of the Wilderness Act, economists have expanded and refined their methods for estimating the total economic benefits of wilderness. The total economic valuation framework presented in this paper illustrates that wilderness is a multiple-use resource that provides a multitude of benefits to the current generation as well as future ones.

### **References**

Available upon request.