

**Summary of the Economic Value of the Florida Keys National Marine Sanctuary, USA, by Vernon R. (Bob) Leeworthy, NOAA, December 2003**

*In 2000-01, all uses of the artificial and natural reefs of the Florida Keys National Marine Sanctuary generated over \$504 million in Sales/Output, including multiplier impacts. This generated \$140 million in income in Monroe County, which supported almost 10,000 full and part-time jobs.* Reef use accounted for over 18 percent of the total Monroe County economy, when measured in terms of sales/output or employment.

The above information is what economists call the “market economic use value” or economic contribution to the local economy as measured by sales/output, income and employment. When people consume any good or service they receive what is called “consumer’s surplus” or the amount of value received by the consumer over and above what they pay for the good or service. Consumer surplus is determined by both demand and supply. So a consumer might be willing and able to pay \$10 for a good or service, but suppliers are willing and able to supply it to them for \$8. So a consumer receives a net value of \$2. For most goods traded in markets, economists can get prices and quantities of the goods and services traded and estimate consumer’s surplus. Consumer’s surplus is a non-market value, because it doesn’t appear in any official accounts.

For most natural resources, no one owns the resource, and, therefore, consumers of the goods and services from natural resources are not priced. The provider of a fishing trip pays nothing for the fish. The provider of a scuba diving trip cannot charge a price for the reef. As used here, consumer’s surplus is the amount attributed to the natural resources since they are not figured into the cost of undertaking the activity. We refer to the consumer’s surplus as “non-market economic use value.”

The annual non-market economic use value can be estimated, and with certain assumptions, the “asset value” of the reefs can be calculated. The asset value of the reefs is the same as the asset value of a house or car. Each generates a flow of services over time. If we discount this flow of value over time to present dollars using some interest or discount rate, we can derive the asset value. Asset value is what someone would be willing to pay today for the house, the car or the reefs. For the reefs, no one owns and can charge a price to use the reefs, but if they could charge a price, we estimate what someone would be willing to pay.

Our assumptions for calculating asset value are conservative (lower bound estimates). We assume that use will stay constant into the future and the value per unit of use will also stay constant into the future. Both of these assumptions are obviously wrong, but we have no way of forecasting either of these very far into the future. We use a real interest rate (net of inflation) of three percent (3%) to discount future dollars to present dollars. We also assume the reefs and their use will last into perpetuity (the indefinite future).

In 1995-96, the user value of all uses of the FKNMS was estimated. This would represent the visitor non-market economic use value for all ecosystems. For natural resource-based activities there were 10.4 million person-days of use with an annual user

value of over \$910 million. ***Capitalizing this value at 3 percent yields an estimated asset value of \$30.4 billion for the natural resources of the FKNMS.*** Again, this is what someone would have been willing to pay for all the natural resources of the FKNMS if they could own the resources and charge visitors for their use. The value for resident use was not estimated in the 1995-96 study.

Non-natural resource-based use included activities like swimming in pools, visiting historic areas, and museums and other non-natural resource based outdoor recreation activities.

In the 2000-01, the study included both resident and visitor reef users that accessed the reef by boat. There were a total of 5.46 million person-days of use with an annual user value estimated at \$51.78 million. ***Capitalizing this value at 3 percent yields an estimated asset value for the artificial and natural reefs of the FKNMS of \$1.726 billion.*** Again, this is what someone would have been willing to pay for all the reefs in the FKNMS if they could own them and charge a price for their use.

User value is what economist would use in doing any benefit-cost analyses. Whether the issue was investment in improving water quality or other habitat protection or restoration strategies it is user values that would be appropriate to include in benefit-cost analysis.

User values under estimate the total non-market economic value. The reason is it doesn't include non-use or what has come to called passive economic use value. Non-use or passive use values include people's willingness to pay to know the resources will exist in a certain protected condition, even though they never plan to use them (existence value). Non-use or passive economic use value also includes people's willingness to pay to leave the resource in a certain protected condition so that future generations can enjoy them (bequeath value). In addition, there is another kind of non-use value called "option value". Some people would be willing to pay some amount to ensure that the resource is maintained in a certain condition should they decide to use it sometime in the future. This would be like an insurance policy to ensure future use.

Other economic values not included here include what is called "quasi option value". This term is currently used to describe the value of currently unknown future uses, especially scientific discoveries that might prove useful (e.g., cures for cancer or other diseases). The natural resources may also have scientific and education values as well.

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