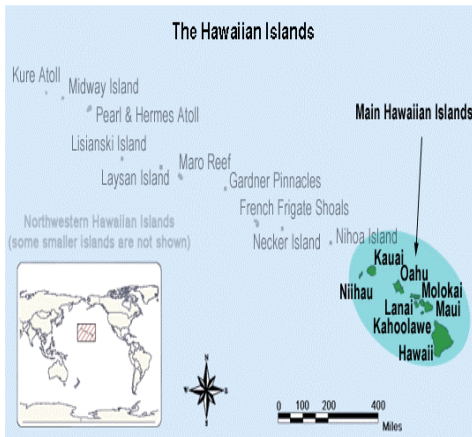




The Total Economic Value for Protecting and Restoring Hawaiian Coral Reef Ecosystems

Summary of Estimated Values



Main Hawaiian Islands



J.E. Smith

Schools of fish live near reefs



James Watt, Ocean Stock, Inc.

A variety of shallow coral

Introduction

This is the second fact sheet summarizing the results from a study funded by NOAA's Coral Reef Conservation Program through the National Ocean Service's Office of Response and Restoration and Office of National Marine Sanctuaries. The study was implemented through a contract with Stratus Consulting, Inc.

What is included in "Total Economic Value"?

For economists, the term "Total Economic Value" or TEV includes the net economic values generally referred to as consumer's surplus or the value received by a consumer of a good or service over and above what the consumer is required to actually pay to receive the good or service. So it is referred to as a net value or surplus value.

In our survey on Hawaii's coral reef ecosystem, TEV includes both some **direct use values** (e.g. recreation-tourist uses, seafood products, and products harvested for the aquarium trade) and **passive use values** (e.g. the willingness to pay to leave a legacy by protecting the coral reef ecosystem in a certain condition for future generations to enjoy—bequest value or the willingness to pay to simply know that the coral reef ecosystem will exist in a certain protected condition—existence value).

What is not included in Total Economic Value?

What is not included in TEV is the dollars that people actually spend while undertaking activities directly using the coral reef ecosystems. So what is not included are what economists call the economic impact on the local, regional or national economy usually stated in terms of expenditures and associated sales/output, income and employment in the economy. This would include the dollars spent by either residents or visitors of Hawaii recreating on the reefs. The actual spending on seafood and aquarium trade products harvested from the coral reef ecosystems would not be counted in TEV. Similarly, any amounts spent on pharmaceutical items developed from things harvested on the coral reefs or educational or scientific projects directly using the coral reef ecosystems would not be counted in TEV.

Although TEV should include other direct use values (consumer's surplus) such as any pharmaceuticals being made from things harvested from the coral reefs, education and scientific activities related to coral reef ecosystems, and storm or erosion protections provided by reefs, our survey did not specifically address these issues with survey respondents, so they might not be included in our estimates of TEV.

What are the appropriate uses of "Total Economic Value"?

TEV can generally be used for the following:
a. Benefit-Cost Analyses of investments to protect and/or restore coral reef ecosystems.

b. Damage Assessment Cases where the State and/or Federal governments sue responsible parties for damages to the coral reef ecosystems.

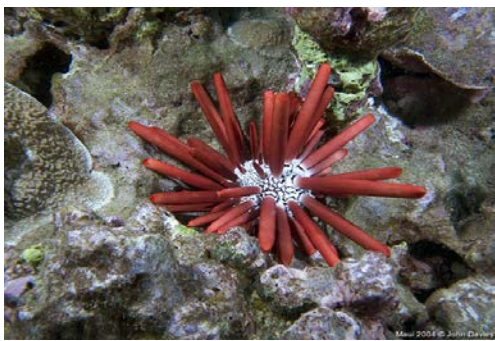
The results can also be used specifically for evaluating the benefits of protection & restoration for all the coral reef ecosystems around the Main Hawaiian Islands and for restoration of five acres per year after localized injuries:

a. Resource protection & restoration included management strategies that would yield within 10 years an increase in fish abundance and size from 10% to 50% of historic values. This would support increases in seals, sea birds and other marine mammals and support improving the health of the coral reef ecosystems throughout the Main Hawaiian Islands, improve the quality of recreation and religious and cultural uses by native Hawaiians.

b. Restoration of 5 acres per year of coral reef ecosystems damaged by ship/vessel groundings. The benefit of restoration activity would be the full recovery from damage in 10 years versus 50 years for natural recovery.

Annual Value Per Household

It was estimated that resource protection is worth about \$224.81 per year to the average U.S. household, and repairing 5 acres of reef per year is worth about \$62.82 per year for a total value per household of **\$287.62** (Table 1).



John Davies

Sea urchins are common in Hawaii

Value of	Estimated WTP	Standard Error	95% confidence interval
Ecosystem-wide Protection & Restoration	\$224.81	\$32.19	\$161.72 to \$287.89
Restoration after Localized Injuries	\$62.82	\$21.73	\$20.23 to \$105.40
Total	\$287.62	\$48.04	\$193.46 to \$381.78

Value of	Estimated WTP (Billions \$)	95% confidence interval (Billions \$)
Ecosystem-wide Protection & Restoration	\$26.24	\$18.88 to \$33.60
Restoration after Localized Injuries	\$7.33	\$2.36 to \$12.30
Total	\$33.57	\$22.58 to \$44.56

Annual Value All U.S Households

The 2010 U.S. Census estimates there were 116,716,292 households in the U.S. Multiplying the average values per household times the number of households yields an estimate of \$26.24 billion per year for resource protection and \$7.33 billion per year for reef restoration for a total value per year of **\$33.57 billion** (Table 2).

To access other facts sheets, executive summary or the full report go to

<http://coralreef.noaa.gov/hicoraleconval/> or contact

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