ECONOMIC VALUE OF HAWAII'S NEARSHORE REEFS

Physical Value (Jeremiah Christiansen). *Reefs protect the shoreline by dispersing wave energy, which lessens storm damage. Reefs are also the source of Hawaii's famous sandy beaches.*

Economic Value

OF HAWAII'S NEARSHORE REEFS

The Hawaii Coral Reef Initiative Research Program (HCRI-RP) was established as a joint venture of the state's Department of Land and Natural Resources and the University of Hawaii to increase the capacity of resource managers in caring for reef ecosystems. One of HCRI-RP's goals is to provide decision-makers with quantitative information on the value of Hawaii's coastal reefs.

HCRI-RP has sponsored studies that measure the economic value for coastal ecosystems in the main Hawaiian Islands. One such project reports that Hawaii's nearshore reefs annually generate about $800 million in gross revenues (or, $364 million in added value), a figure based solely on economic factors.

Hawaii's nearshore reefs annually generate about $800 million in gross revenues.

Aside from economic, there are many other values that Hawaii's people place on nearshore reefs. Broadly speaking, these include: educational, social, recreational, cultural,

physical, biological, and ecological, as well as assurances that reefs will be there for future generations.

Although limited, economic valuation offers a better understanding of importance of coral reefs to the state's economy and their contribution to the nation. This valuation also assists in answering questions such as:

- How do we assess damages and restoration costs? Cases involving coral reef damage in Florida show restoration costs alone can range from $550 to $10,000 per square meter.
- How much should local, state, and federal governments spend on reef management?

Costs of Degradation

Each year, reefs along Maui's Kihei coast contribute $34 million in gross sales, leading to $28 million in added value (profit plus willingness to pay) to the economy. Over $20 million, however, is lost each year from the impacts of algal blooms in Kihei alone. Annually, these blooms decrease hotel and rental income by an estimated

Over $20 million is lost each year from the impacts of algal blooms in Kihei alone.

Economic Value (Lisa Huynh). *Most visitors to Hawaii play in the nearshore waters during their stay. The island's coastal reefs generate $800 million in gross revenues each year – nearly 10% of the total revenues contributed by tourism to the state's economy.*

Future Generations (Jeremiah Christiansen). *Hawaii's people place many values on the state's coastal reefs, including economic, educational, social, recreational, cultural, physical, and biological – as well as assurances that reefs will be there for future generations.*

$10.8 million and depress property value by $9.4 million (2002 dollars). Moreover, Maui County and the area's condominiums pay $200,000 to clean their beaches each year.

Effective management, however, can stop – and possibly reverse – degradation.

Benefits of Effective Management

The aquarium fish industry, although small in terms of added value, is one of the most economically valuable nearshore fisheries in Hawaii. In the main islands, the industry's gross annual sales are an estimated $3.2 million.

Fish replenishment areas (FRAs) established along the Kona coast by the state government have decreased conflicts between aquarium collectors and other reef users over the past few years.

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Results of HCRI-RP-sponsored research show a recent increase in the abundance of aquarium fishes in both FRAs and unprotected sites.

Since 2000 (when the FRAs were closed to aquarium fish collection), the overall price per fish collected has steadily grown. Projections for FY2003 indicate the total sales price

of collected aquarium fish from West Hawaii will likely be the highest ever recorded. In addition, the increase in aquarium fish benefits the recreational snorkel and dive industry, as there are more fish for their clients to see in select regions.

As a first step, active management is needed to specifically address the cause of reef decline and to implement solutions. Over the long term, however, coastal reef management will have limited success without an informed public. For this reason, education and awareness activities are critical. Monies spent to raise awareness pays dividends across the state as more people experience Hawaii's reefs and live their lives with less impact on the state's environment.

Benefits of Education

With over 1 million visitors each year, Hanauma Bay is one of the most heavily used marine preserves in the world. To mitigate their impact, a $13.5 million visitor center opened in 2002 that includes exhibits and an educational video shown to visitors before they enter the park.

Education efforts at Hanauma Bay each year results in 10.4 acres of reef not being damaged statewide.

Recreational Value (© Edward Watamura). *Along with winds and tides, reefs generate waves that make Hawaii world renowned as a destination for surfing.*

Educational Value (Bryce Minato). *It is critical to provide adequate funding to support management of and education about Hawaii's reefs so that our children's grandchildren will be able to enjoy their benefits.*

Visitors generally go to two to three additional sites in Hawaii during their stay. Residents snorkel or dive at over 10 sites a year. The cumulative annual effect of educating visitors and residents about coral reefs has resulted in improved behavior by snorkelers and divers at sites across the state. This translates to an estimated 10.4 acres of reef not being damaged statewide each year.

Hanauma Bay has been protected as a marine reserve for over 35 years. The gain from environmental awareness through the efforts of the visitor center will generate about $100 million in added value over the next 50 years.

Funding Effective Management Benefits Hawaii's Economy

Funding coral reef management benefits Hawaii's economy and quality of life.

Increasingly, people understand the inherent value of the nation's coral reef ecosystems. We can no longer rely on the intuitive need to protect these natural resources, but must implement proven management measures to sustain these resources. Funding coral reef management benefits Hawaii's economy and quality of life.

publication notes

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It is based on research sponsored by HCRI-RP in 2001-2002 and led by Dr. Herman Cesar (Cesar Environmental Economics Consulting) with Dr. Pieter van Beukering, Mr. Sam Pintz, and Mr. Jan Dierking. The full technical report *(Economic Valuation of the Coral Reefs of Hawaii)* can be downloaded from the HCRI-RP website (www.hawaii.edu/ssri/hcri).

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This Page: ***Biological Value*** (Marc Hughes). *Coastal and deepwater reefs are the cornerstone for a diverse range of species. "Orange Mop" nudibranches (Phestilla melanobrachia) feast on cup coral (Tubastraea coccinea). They are well camouflaged when the coral extends its tentacles at night.*

Front Cover: ***Cultural Value*** (© Bishop Museum). *Reef ecosystems have provided sustenance and medicine to the native people of Hawaii for more than 1600 years. Alga on cover is limu kohu (Asparagopsis taxiformis), a highly prized and edible limu common on Hawaiian reefs* (Kintaro Okamura).

Back Cover: ***Rainforests of the Sea*** (Marc Hughes). *Coastal reefs host a spectacular number of marine plants and animals and are home to the greatest diversity of ocean life. This study only valued nearshore reefs and did not take into account extractive industries in deeper waters, such as black coral mining for jewelry.*

Hawaii Coral Reef Initiative Research Program

University of Hawai'i Mānoa

A Living Reef Gives Our Islands Life

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