



**Charlotte Harbor National
Estuary Program**

Estimated Economic Value of Resources

**Report
March 5, 1998**

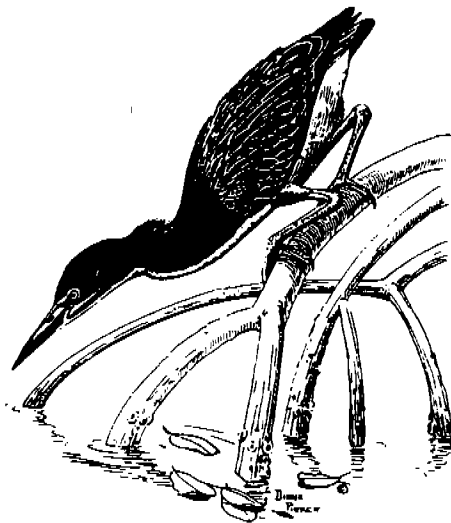




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Artwork by Diane Pierce
"Edge of the Wild", Lake Wales, Florida

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EXECUTIVE SUMMARY

Purpose of Study

The purpose of this study is to provide measures of economic value associated with the current activities, amenities and non-use satisfaction levels dependent on the natural resources of the Greater Charlotte Harbor watershed. These natural resources include wildlife ecosystems, water, minerals, fisheries and agricultural land. The significant activities and amenities dependent on these natural resources include:

- Tourism and recreation industries
- Commercial fishing
- Recreational fishing
- Swimming, boating and other water sports
- Nature observation
- Non-use values of important wetland areas
- Flood control
- Mining
- Agriculture

Given the available data, this study provides estimates of consumer surplus and total income associated with these activities and amenities dependent on the natural resources of the Greater Charlotte Harbor watershed. Estimation of the value of the estuary's contribution to flood control could not be estimated during this study due to lack of data and information.

Study Area

The study area is the Greater Charlotte Harbor watershed which has been designated as the Charlotte Harbor National Estuary Program area (Charlotte Harbor NEP). This watershed, as shown in Figure 1-1, is located on the southwest coast of Florida. It covers about 4,468 square miles and includes the second largest open water estuary in Florida. Freshwater flows into the estuary from three rivers: the Myakka River, the Peace River and the Caloosahatchee River. The area is divided into the following subdivisions: Myakka River, Peace River, Caloosahatchee River, coastal watersheds, Lemon Bay, San Carlos Bay, Estero Bay, Gasparilla Sound, Pine Island Sound and Matlacha Pass.

The Charlotte Harbor NEP encompasses all or portions of eight counties in southwest Florida including: Polk, Manatee, Hardee, Desoto, Charlotte, Sarasota, Lee and Highlands. It includes the cities of Lakeland, Winter Haven, Bartow, Ft. Meade, Bowling Green, Wauchula, Zolfo Springs, Arcadia, North Port, Venice, Englewood, Punta Gorda, Port Charlotte, Cape Coral, Ft. Myers, Sanibel, Estero Bay, and Ft. Myers Beach.

Total Economic Value

Total economic value is the sum of producer surplus and consumer surplus received from the production of the goods and services provided by the natural resources of the Charlotte Harbor National Estuary.

Producer surplus is total revenue minus the opportunity costs of production, including the cost of labor and capital¹, and the value of the entrepreneurial skills and natural resources when placed in their best alternative use. These values are usually reflected in salaries paid to managers and company leaders, and rents paid to owners of the natural resources².

Consumer surplus is the maximum amount of money a consumer would be willing to pay for the benefit above the price actually paid. Consumer surplus is analogous to producer surplus, or "profit". However, unlike producer surplus, consumer surplus does not represent real money changing hands. Instead, it represents the value, in monetary terms, of the human well-being associated with current use of the resource.

Because data and information constraints prevented the estimation of producer surplus for some important industries, total income generated by the tourism, recreation, mining and agricultural industries were estimated. Total income provides an alternative measure of value which communicates the economic importance of the watershed. The two measures of value estimated during this study are described as follows.

Consumer surplus - Estimates of consumer surplus associated with recreational fishing, other recreational activities, and the non-use value of wetland areas are provided. Consumer surplus estimates for other benefits cannot be provided due to information constraints. These other benefits include the value of flood control and the products provided by the commercial fishing, agriculture and phosphate mining industries. Thus, the estimated consumer surplus associated with the Greater Charlotte Harbor watershed will be underestimated.

However, the estimate of consumer surplus reported in this study will represent the value of the estuary to those who live in or near the watershed and those who visit the watershed. While, consumer surplus is a monetary estimate of consumer wellbeing and much of it does not directly

1 *The actual cost of labor and capital paid by the producer is a proxy for the opportunity cost of labor and capital. Sometimes it is a close approximation of the opportunity cost and other times it is not.*

2 *Examples of rents paid to owners of natural resources include land rent and fishing license fees. When the natural resource is owned by the producer or consumer so that no rent is paid, then the value of that resource in its next best alternative use (opportunity cost) should be used. Sometimes, when the owner of the natural resource is the government, the rent charged for its use is much lower than its opportunity cost. The entity renting the resource receives a "windfall" and the calculated producer surplus overestimates total economic value.*

translate into real money changing hands, some of this surplus is reflected in property values. The missing estimates of consumer surplus for commercial fishing, agriculture and phosphate mining are realized by those who live throughout the United States and the world.

Total income - Estimates of total income from tourism and recreation industries, commercial fishing, agriculture and mining are also provided. Total income and consumer surplus are not additive. However, each reflects value. Total income includes direct, indirect and induced wages, salaries, proprietor's income and profit. Total income was estimated for the following industries.

- **Tourism and Recreation Businesses** - hotels, motels, restaurants and drinking places, amusements, gas stations, fishing supply stores, gift stores and the like
- **Commercial Fishing** - finfish, shellfish, saltwater and freshwater
- **Agricultural Production and Processing** - citrus, dairy, beef cattle, winter vegetables, ornamentals, aquaculture, honey
- **Phosphate rock mining**

Direct income is that generated from the types of businesses listed above. Indirect income is that generated from the businesses that provide goods and services to the direct businesses. Induced income is that generated from the businesses that provide goods and services to the employees of the direct and indirect businesses.

Estimates of Consumer Surplus and Total Income

The estimates of consumer surplus and total income are provided in Table ES-1. These value estimates provide a one-year snapshot of the current uses of the watershed resources. Due to data availability, these value estimates are based on 1994, 1995 and 1996 data. Consumer surplus and total income are itemized so that value estimates for individual activities and subsets of activities can be determined. These value estimates provide a snapshot of the recreational, non-use and income values associated with the natural resources of the Greater Charlotte Harbor watershed.

Total consumer surplus associated with the current uses of the natural resources of the Greater Charlotte Harbor watershed is estimated to be \$1.8 billion per year. This value is comprised of \$107 million per year in consumer surplus associated with recreational fishing, \$810 million per year in consumer surplus associated with other recreational activities and \$884 million per year in consumer surplus associated with the non-use value of wetlands. The other recreational activities include:

- saltwater and freshwater beach activities
- picnicking
- saltwater and freshwater boating

- camping
- hiking
- nature study
- canoeing
- hunting

The non-use value of wetlands includes existence, option and bequest values. They are defined as follows.

- Existence value: Value to an individual from knowing the resource is protected even though the individual does not intend to use it in the future.
- Option value: Value to an individual from knowing that a resource of a certain quality is available for use by the individual at a later date.
- Bequest value: Value to an individual from knowing the resource is protected for use by future generations.

Total income associated with tourism, recreation, fishing, agriculture and mining industries is estimated to be \$3.2 billion per year. The \$3.2 billion in total income from these industries is consistent with the county payroll data. This total income estimate is comprised of \$2.2 billion per year of income from tourism and recreation, \$22 million per year of income from commercial fishing, \$672 million per year from agriculture and \$270 million per year from phosphate mining.

When using these numbers, it is appropriate to refer to them in the following manner.

The Charlotte Harbor National Estuary is a unique land and water resource which provides about \$1.8 billion per year in net value to recreators and Florida households, and is used to produce about \$3.2 billion per year in income to the area.

Total direct, indirect and induced sales and employment generated by the tourism and recreation, commercial fishing, agriculture and mining industries located within the Charlotte Harbor NEP boundary are provided in Table ES-2. In 1995, total sales estimated to be \$6.8 billion supported 124,000 full-time and part-time jobs.

Table ES-1

Current Estimated Annual Consumer Surplus and Annual Total Income Associated with the Current Uses of the Natural Resources in the Charlotte Harbor National Estuary

Activity/Amenity Dependent on CHNEP	Consumer Surplus	Total Direct, Indirect and Induced Income
Tourism & Recreation Industries	included under recreation	\$2,196,941,059
Commercial Fishing	not available	\$22,635,667
Recreational Fishing	\$107,228,991	included under tourism
Other Recreational Activities (e.g. boating; swimming and other water sports; nature observation)	\$809,448,482	included under tourism
Agriculture	not available	\$671,580,307
Mining	not available	\$270,250,299
Non-use value of wetlands areas in CHNEP	\$884,028,344	not applicable
Total	\$1,800,705,816	\$3,161,407,332

Table ES-2

Current Estimated Annual Total Sales and Employment Associated with the Current Uses of the Natural Resources in the Charlotte Harbor National Estuary

Activity/Amenity Dependent on CHNEP	Total Sales (1)	Total Employment (2)
Tourism & Recreation Industries	\$4,431,614,602	89,741
Commercial Fishing	\$38,469,605	1,281
Agriculture	\$1,852,186,655	29,683
Phosphate Mining	\$519,288,882	3,344
Total	\$6,841,559,744	124,049

(1) Total sales is direct, indirect and induced.

(2) Total employment is number of direct, indirect and induced full-time and part-time jobs.