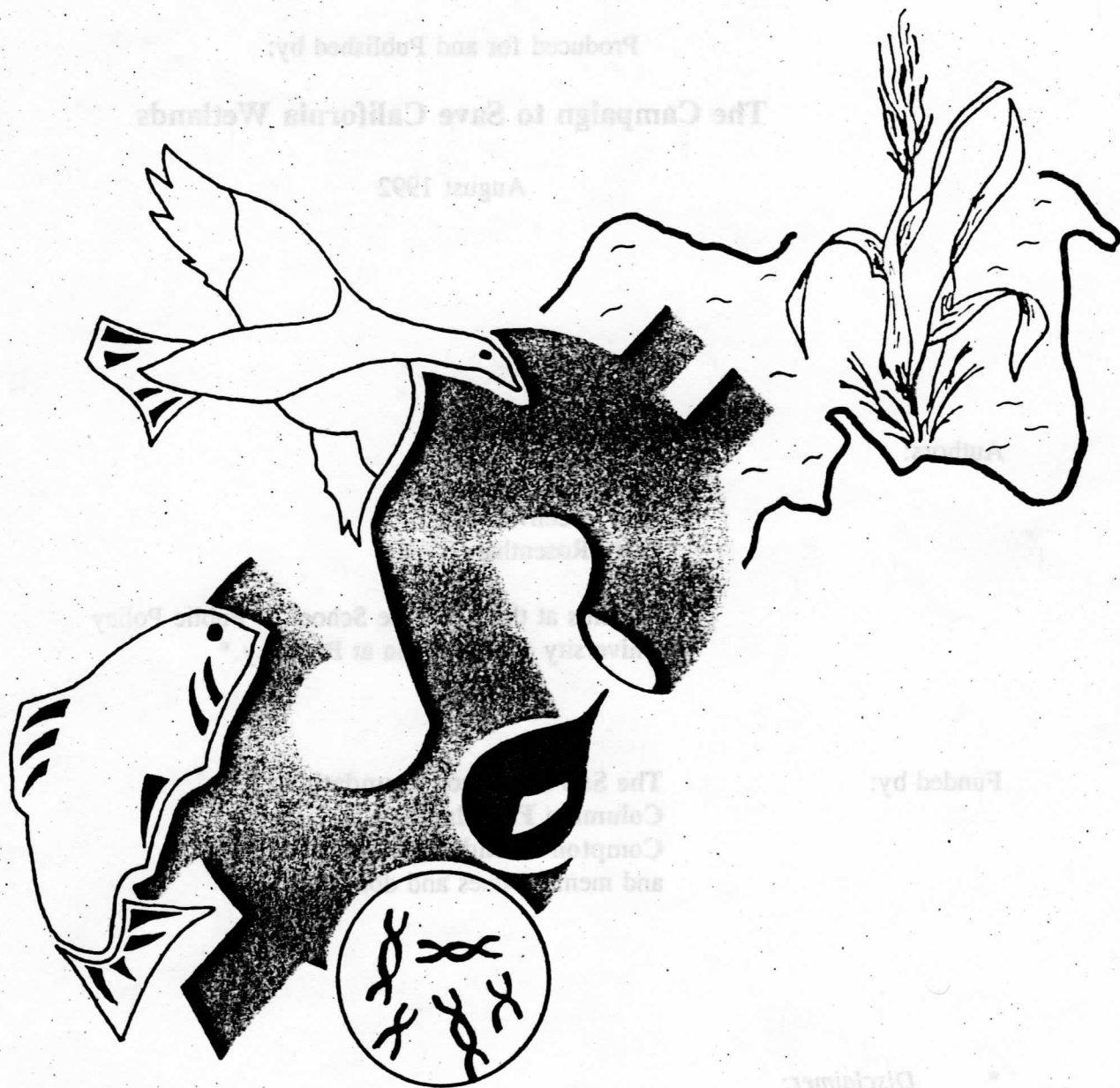


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THE VALUE OF CALIFORNIA WETLANDS

AN ANALYSIS OF THEIR ECONOMIC BENEFITS



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The Campaign To Save California Wetlands

The Value of California Wetlands

An Analysis of Their Economic Benefits

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*** Disclaimer:**

The authors conducted this study as part of the program of professional education at the Graduate School of Public Policy, University of California at Berkeley. This paper is submitted in partial fulfillment of course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the authors, and are not necessarily endorsed by the Graduate School of Public Policy, by the University of California, or any other agency.

Preface

California has the dubious honor of having lost more than 90% of its historic wetlands, the largest percentage of any state in our nation. The United States as a whole has lost over 50%. As if this were not enough, our remaining wetlands are now under an unprecedented attack. The Bush Administration has proposed changes to both the federal regulatory program that protects wetlands and to the very definition of wetlands itself. If enacted, these proposals would result in the loss of over 50% of the remaining wetlands of California and the nation.

Before our society approves of a program that leads to such drastic losses it must first understand and consider just what such losses would mean. To help in such an evaluation, the Campaign to Save California Wetlands commissioned the following study, an economic benefits analysis.

This study shows that in addition to the incalculable value wetlands provide in terms of species preservation and biodiversity, they also bring very real and very large economic values to our society. This study illustrates the enormous value wetlands provide **right now** for the people of California. Wetlands provide pure water to drink, food for the table, flood control, and a recreational industry which includes fishing, hunting and nature enjoyment. Wetlands are essential to California's economic well-being.

The Value of California Wetlands provides a very conservative estimate of the true value of wetlands. Not included are dollar values associated with species extinction and loss of biodiversity, inevitable companions to wetland loss. Furthermore, these values are based on wetlands for the most part already degraded by pollution and drought. This study does not, for example, estimate the increased value a California fishing industry would have if it were based on healthy, restored wetlands rather than on today's degraded wetlands.

A reasoned study of this report must leave one with an awareness that California and our country can not afford to lose any of its remaining wetlands.

This study was commissioned by **The Campaign to Save California Wetlands** and performed by four graduate students under the supervision of two professors, including the Dean, of the Graduate School of Public Policy at the University of California at Berkeley. Special thanks to Bruce Lee Livingston, with a masters degree in public policy from the same school, who conceived and coordinated the study. Besides the individuals listed below, we would like to thank Gary Bobker of the Bay Institute of San Francisco and Totton Heffelfinger of the San Francisco Bay Chapter of the Sierra Club.

Campaign to Save California Wetlands

For more information on this study or the Campaign to Save California Wetlands call:

- Jackie McCort, Sierra Club, (510)654-7847
- Bruce Lee Livingston, Clean Water Action and Clean Water Fund, (415)362-3040
- Arthur Feinstein, Citizens Committee to Complete the Refuge, (510)843-2222
- Marc Holmes, Save San Francisco Bay Association, (510)452-9261

To join, assist or to send donations write to:

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Preface

California has the dubious honor of having lost more than 90% of its historic wetlands, the largest percentage of any state in our nation. The United States as a whole has lost over 30%. As if this were not enough, our remaining wetlands are now under an unprecedented attack. The Bush Administration has proposed changes to both the federal regulatory program that protects wetlands and to the very definition of wetlands itself. If enacted, these proposals would result in the loss of over 50% of the remaining wetlands of California and the nation.

Executive Summary

Before our society approves any such changes, it must first understand and consider just what such losses would mean. To help in such an endeavor, the Campaign to Save California Wetlands commissioned the following study, an economic benefits analysis.

This study analyzes and quantifies the economic value of preserving wetlands in California.

Over 90% of the California's original wetlands have been destroyed by agriculture and economic development. Many of the remaining 454,000 acres are similarly threatened, despite protection under the federal Clean Water Act. Recent initiatives by the Bush Administration would remove some 50% of California's remaining wetlands from federal protection, putting them at risk of permanent loss.

Projects that would eliminate wetlands often have clear economic benefits, but the benefits of preserving wetlands are more difficult to quantify. Often, preserving wetlands is mistakenly seen as "unproductive" or detrimental to economic growth. In reality, wetlands perform a number of valuable economic functions, including:

- *Flood Control* that protects millions of dollars worth of property.
- *Groundwater Storage* that maintains valuable water supplies.
- *Water Purification* for irrigation and drinking.
- *Recreation* for millions of Californians who visit wetlands to fish, hunt, or simply admire their beauty.

In addition, wetlands provide crucial habitat for hundreds of plant and animal species. These species include many fish sold commercially. As wetlands grow increasingly scarce, each acre of wetland becomes increasingly valuable to society.

Several techniques have been developed to estimate the economic value of these wetland benefits. Economists have clearly established that wetlands are an extremely valuable resource. Their destruction should be weighed by society as seriously as the loss of any other real resources. This paper reviews recent economic studies to estimate the value of the benefits provided by all undeveloped wetlands in California.

The following table presents a conservative estimate of the most quantifiable values of California's total wetland acreage:

Economic Values of California Wetlands

| | Annual Statewide Value | Permanent Statewide Value¹ |
|-----------------|-------------------------------|----------------------------------------------|
| UPPER BOUND | \$ 22.9 billion | \$ 286.4 billion |
| MEDIAN ESTIMATE | \$ 10.0 billion | \$ 124.5 billion |
| LOWER BOUND | \$ 6.3 billion | \$ 78.7 billion |

¹This column represents the value of preserving California's wetlands forever at an 8% annual discount rate. However, it does not fully capture benefits considered priceless, such as species preservation.

Our median estimate suggests that the deregulation and development of 50% of California's remaining wetlands would cost residents approximately \$5 billion per year. If these annual benefits were lost forever, the cost to Californians would approach \$62.3 billion (assuming an 8% discount rate).

Most importantly, these estimates do not include some costs, such as the permanent loss of wetland species and the loss of biodiversity. For many people, the value of species and biodiversity are not measurable and worth many times more than the benefits of wetlands measured here.

This analysis was prepared by Jeff Allen, Mike Cunningham, Alex Greenwood, and Larry Rosenthal for the Campaign to Save California Wetlands and Clean Water Fund.

VALUE OF CALIFORNIA WETLANDS

Summary Table

Estimated Annual Values (Per Acre/1990\$)

| <u>Wetland Function</u> | <u>Low</u> | <u>Medium</u> | <u>High</u> |
|--------------------------------------------------------|----------------|----------------|----------------|
| Flood Control | \$260 | \$4,650 | \$4,650 |
| Water Supply | \$6,800 | \$6,800 | \$20,360 |
| Water Quality | \$3,360 | \$6,600 | \$10,400 |
| Recreation | \$67 | \$347 | \$6,060 |
| Commercial Fisheries | \$38 | \$199 | \$877 |
| Habitat | <u>\$3,337</u> | <u>\$3,337</u> | <u>\$8,128</u> |
| Total Annual Benefit Per Acre | \$13,862 | \$21,933 | \$50,475 |
| | | | |
| California Wetland Acreage | 454,000 | 454,000 | 454,000 |
| | | | |
| Total Annual Statewide Benefit (Billions) ¹ | \$6.29 | \$9.96 | \$22.92 |

Permanent Statewide Value (Billions)²
(Comparison of Selected Discount Rates)

Annual Discount Rate

| | | | |
|----|---------|---------|-----------|
| 8% | \$78.7 | \$124.5 | \$286.4 |
| 5% | \$125.9 | \$199.2 | \$458.3 |
| 2% | \$314.7 | \$497.9 | \$1,146.0 |

¹ Total Annual Statewide Benefit is calculated by multiplying the annual per-acre value by the total California wetland acreage, 454,000 (Dahl 1990).

² Permanent Statewide Value is calculated as the present value of a perpetual stream of future benefits. The formula is (Annual Statewide Benefit) ÷ (Discount Rate).