# Florida State University Journal of Land Use and Environmental Law 

Volume 1
Number 3 Fall 1985

April 2018

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# Journal of Land Use and Environmental Law 

# NATURAL RESOURCE DAMAGES: RESTITUTION AS A MECHANISM TO SLOW DESTRUCTION OF FLORIDA'S NATURAL RESOURCES 

James S. Mattson, Ph.D. $\dagger$ and J. Allison DeFoor, II $\dagger \dagger$

## I. Introduction

The Florida Constitution provides that "[i]t shall be the policy of the state to conserve and protect its natural resources and scenic beauty." ${ }^{1}$ In many ways, the civil and criminal laws of Florida do not go far enough to implement this policy. This article explores ways in which the restitution provision available in criminal prosecutions, as well as civil actions by the state as public trustee, can be utilized to protect and conserve Florida's natural resources. A proposed statute will be examined which would allow the state to collect monetary penalties in criminal and civil proceedings from those who illegally appropriate Florida's natural resources. Monies collected pursuant to the proposed statute would be used to protect and restore natural resources.

## II. Compensating the State for Damages to Natural Resources

## A. The State as Manager of Public Resources

The common law of England recognized two kinds of property,

[^1]"private property" and the "commons." ${ }^{2}$ Common property belonged to everyone, but to no one; its management was a function of government. ${ }^{3}$ Extending beyond mere land, the commons included natural resources such as fish, game, air, and water. ${ }^{4}$ The same basic division of property exists in the United States today, although with countless accretions fashioned by statutes and case law. Little of the old world of the "commons" remains unmanaged today by states and the federal government. ${ }^{\text {b }}$

Governments manage a variety of natural resources, some, such as parks and seashores, by ownership outright; others, such as migratory birds and fish, in sovereign trust because no individual can own them. ${ }^{6}$ A government suing on behalf of its citizens for damage to the commonwealth invokes the parens patriae and public trust doctrines. ${ }^{7}$ Although often used interchangeably in environmental litigation, "public trust" is the more apt theory. Parens patriae implies government representation of incompetents otherwise unrepresented, such as friendless lunatics, orphans, and juveniles. ${ }^{8}$ Public trust implies no such substitute capacity. Instead the government acts directly as the trustee of the corpus (body) of a trust benefiting the public. ${ }^{\text {a }}$

## B. Application of the Florida Victim Rights Act to the Sovereign

In 1984 the Florida Legislature enacted the Victim and Witness Protection Act ("Victim Rights Act"). ${ }^{10}$ The Victim Rights Act makes restitution to victims in all criminal cases a presumptive right. The statute provides: "In addition to any punishment, the court shall order the defendant to make restitution to the victim for damage or loss caused directly or indirectly by the defendant's offense, unless it finds reasons not to order such restitution." ${ }^{11}$ The statute further provides that in cases where the court does not or-

[^2]der restitution or does not order complete restitution, the reasons therefor must be stated on the record. ${ }^{12}$

The Victim Rights Act allows either monetary or nonmonetary restitution and makes restitution a mandatory prerequisite to probation. ${ }^{13}$ While the Act does not specifically include the state as a "victim" under the statute, it defines victims as "aggrieved parties. ${ }^{14}$ There is no reason to believe that restitution in natural resource cases is any less appropriate than in cases involving damage to the property or person of an individual. A defendant who poaches lobster ${ }^{18}$ from state waters should pay restitution just as the defendant who kills an individual's cow.

Though codified as a criminal statute, the Victim Rights Act is functionally a civil statute. The amount of restitution to be paid is determined by the preponderance of the evidence, a standard of proof generally reserved to civil actions. ${ }^{16}$ The State Attorney must prove the amount of the victim's loss, while the burden of demonstrating insufficient financial resources is on the defendant. ${ }^{17}$ One court has required notice and an opportunity to be heard before imposing restitution as part of a sentence. ${ }^{18}$ The Act contains a provision permitting enforcement of the restitution award through any means available for enforcing a civil judgment. ${ }^{19}$

The Victim Rights Act provides that in any subsequent civil action arising from the same incident, the criminal conviction estops the defendant from denying the essential allegations of that offense. ${ }^{20}$ Conceivably, a criminal defendant could avoid a restitution award under the Victim Rights Act by showing inability to pay, yet he could lose a subsequent civil action for damages where inability to pay is not a defense.

With its presumptive mandate and its civil burden of proof and enforcement provisions, the Florida Victim and Witness Protection Act is a powerful tool for victims seeking to be made whole following a criminal act. In natural resource violations, where the of-

[^3]fender is often a corporation or a well-heeled sportsman, a restitution award may well exceed the fine by orders of magnitude, thus making this law a particularly effective tool in the hands of the State Attorney.

Difficulties are anticipated in several areas. First, the criminal justice system is not accustomed to thinking along these lines. Second, how do we calculate the value of a natural resource that is not bought and sold in a commercial fashion, such as coral reefs or mangrove trees? Third, once the award is determined, to whom is it paid, and how can the money be used to restore the injured resource? The following discussion addresses the last two points. Adapting the criminal justice system to a broader range of remedies is an evolutionary process that must take its own course.

## C. Natural Resources as a Subject of Restitution

Many people, including scientists and lawyers, have trouble with the concept that publicly-owned natural resources have a monetary value. Environmentalists, joined by many biologists, often claim that such resources are priceless, and are concerned that placing a dollar value on such assets will ultimately lead to their appropriation and destruction by those who can afford to pay the price. ${ }^{21}$ Economists, on the other hand, believe that publicly-owned resources are no different from any other goods; they are worth only what people will pay for them. ${ }^{22}$

Lawyers have no alternative but to side with the economists. When a defendant has chopped down a cherry tree, destroyed a forest, or poached some lobster, the price the defendant must pay in damages or restitution will be determined by a judge or a jury. Judges and juries cannot play the "priceless" game. Instead, they must ascribe a value based upon their own experiences. Thus society sets values on tangible, and often on intangible, property.

The concern that we will promote the sale of natural resources by putting dollar values on them is dealt with by regulations, laws, and penalties imposed upon those who take them. Whether a Queen conch is really worth ten dollars, the value placed on it by the Department of Environmental Regulation (DER) tables, ${ }^{23}$ or five cents, is something that will be decided by the public when

[^4]imposing penalties on those who illegally take these species. If penalties are set high enough, perhaps well in excess of the economist's "value" of the resource, few people will be willing to run the risk of being fined.

## III. The Law of Natural Resource Damages

One of the earliest federal cases dealing with valuation of natural resources is Feather River Lumber Co. v. United States, ${ }^{24}$ a 1929 forest fire case. In Feather River, the government succeeded in recovering the cost of restoring burned-over forestland, even though a portion of the damaged timber was commercially worthless. ${ }^{25}$ In general, where land with a readily determinable market value is damaged, the plaintiff recovers only the diminution in market value caused by the defendant's acts. ${ }^{28}$ Courts have recognized, however, that some features of property may be so unique that restoration, not damages for diminution in property value, is the proper remedy. ${ }^{27}$ Because the government held lands in trust for its citizens, the court in Feather River concluded that restoration was the better remedy. ${ }^{28}$

The landmark case dealing with a recovery for natural resource damages is Puerto Rico v. S.S. Zoe Colocotroni. ${ }^{28}$ The Zoe case involved damages to twenty acres of mangroves caused by a 1973 oil spill, and the court of appeals axed the diminution theory without pause: "A strict application of the diminution in value rule would deny the state any right to recover meaningful damages for harm to such areas, and would frustrate appropriate measures to restore or rehabilitate the environment." ${ }^{30}$

The Zoe Colocotroni oil spill case predated CERCLA ${ }^{31}$ by seven years, but the court of appeals looked at provisions in the Clean Water Act amendments of $1977^{32}$ and Title III of the Outer Conti-

[^5]nental Shelf Lands Act Amendments of 1978, ${ }^{33}$ and concluded that a "restoration, replacement, or [acquisition of] the equivalent" standard should be the primary standard employed. ${ }^{34}$ The case was remanded to the district court for a new trial on the issue of damages to be decided consistently with the standards for measuring damages as set forth in Zoe. ${ }^{36}$

The Zoe court developed primary and secondary standards for measuring natural resource damage. The primary standard was defined as "the cost reasonably to be incurred by the sovereign or its designated agency to restore or rehabilitate the environment in the affected area to its pre-existing condition, or as close thereto as is feasible without grossly disproportionate expenditures." ${ }^{36}$ The court cautioned that restoration should be "reasonable and prudent" in light of technical feasibility, harmful side effects, compatibility with or duplication of expected regeneration, and the point at which further efforts become redundant or "disproportionately expensive." ${ }^{37}$

There will be instances where the cost of restoring damaged natural resources will be so high as to boggle the imagination. For example, restoring the coral reefs destroyed by the M/V Wellwood off Key Largo in 1984 is impossible, ${ }^{38}$ and dredging the kepone from the James River in Virginia could cost over two billion dollars. ${ }^{39}$ The costs of restoration in many instances could greatly exceed the benefits to society. In these cases, and in the Zoe Colocotroni case itself, the court suggested a variety of acceptable alternatives to actual restoration, including the acquisition of comparable land for use as public parks, or restoration of an alternate site. ${ }^{40}$ The Zoe court cautioned that when applying the secondary standard ". . . damages awarded for such alternative measures should be reasonable and not grossly disproportionate to the harm caused and the ecological values involved. The ultimate purpose

[^6]. . . should be to protect the public interest in a healthy, functioning environment, and not to provide a windfall to the public treasury." 11

Finally, the court acknowledged that " $[t]$ here may indeed be cases where traditional commercial valuation rules will afford the best yardstick" if the damaged resource actually has a market value. ${ }^{42}$ When the case was remanded to the district court, Puerto Rico settled with the Zoe Colocotroni's insurers for $\$ 2$ million $^{43}$ or approximately $\$ 100,000$ per acre of destroyed mangroves!
The State of Florida has dealt with some of these issues by rule. Pursuant to statute, DER maintains a table of values for many marine and some freshwater species. ${ }^{44}$ These values can be used and are presumed correct, absent contrary proof, in any pollution case where listed species are destroyed. ${ }^{45}$

According to the DER table, the following species (among others) have been assigned values: angelfish, $\$ 20.00$; dolphin, $\$ 7.00$; grunts, $\$ 1.00$; African pompano, $\$ 10.00$; king mackerel, $\$ 10.00$; blue marlin, $\$ 200.00$; snook, $\$ 20.00$; tarpon, $\$ 50.00$; largemouth bass (over 8 lbs ), $\$ 10.00 / \mathrm{lb}$; manatee, $\$ 500.00$; porpoise, $\$ 200.00$; blue crab, $\$ 0.50$; stone crab, $\$ 10.00$; spiny lobster, $\$ 10.00$; penaid shrimp, $\$ 0.25$; macrobrachium (freshwater prawn), $\$ 5.00$; and Queen conch, $\$ 10.00$. $^{46}$ The value placed on some of these species is particularly curious. For example, why is a freshwater shrimp worth twenty times the value of a saltwater shrimp? Hatchery values are not necessarily relevant, as no one hatches lobster, porpoise, blue marlin, and the like. Whatever the origin of Florida's species values, they have not been updated since 1971, and many of them are readily subject to challenge on the ground that they are arbitrary. However, a table of values is an excellent mechanism

[^7]for easily assessing damages or restitution amounts, and the DER table should see more use in those settings.

## IV. Determining the Value of Natural Resources

## A. Standards and Standing

Although the common law right to recover for damages to natural resources has long been established, ${ }^{47}$ natural resource damage assessment has become a topic of considerable concern to state governments since the passage of CERCLA, with its strong provision permitting states to recover for natural resource damages resulting from discharges of hazardous substances. ${ }^{48}$

Natural resources can be injured by air and water pollution, mechanical action, sewage effluent and sludge disposal, illegal hunting, and a host of other causes. As a result of these injuries, both market and nonmarket costs are borne by the human population that utilizes the affected natural resource. ${ }^{48}$ Although pollution affects nonhuman organisms as well, our legal compensation scheme is strictly anthropocentric, and it is only for damages to human usage and enjoyment that compensation is likely to be awarded.

As a consequence of the 1978 Amoco Cadiz oil spill, many French lobstermen and oyster farmers lost their entire crop, and their production grounds were irreparably damaged. ${ }^{50}$ They were able to band together and file suit as a class. ${ }^{31}$ When the freighter M/V Wellwood ran aground on Molasses Reef off the Florida Keys in 1984, it plowed a furrow across one of the finest coral reefs in North America. ${ }^{52}$ The Wellwood grounding injured the economy of the neighboring Florida Keys and deprived the world of a natural resource that will not restore itself for three or four hundred years, if it ever recovers. ${ }^{53}$

The classes of individuals damaged by incidents such as the

[^8]Wellwood grounding and the Amoco Cadiz oil spill range from the single individual whose occasional piscatorial pleasure is disrupted, to the entire population of a region. ${ }^{54}$ Entire economies of some regions are dependent upon aquatic resources. ${ }^{55}$ As the affected population base expands, individual injuries become too small to justify protracted litigation, and the state must step in on behalf of its citizens to seek damages either in a civil action, or in the form of restitution in a criminal case. The federal government has taken such action in the Wellwood case. ${ }^{\text {b8 }}$
While American courts have been willing to recognize new causes of action, traditional burdens of proof make it difficult to prove damages to natural resources. ${ }^{57}$ However, the court in the Zoe Colocotroni case stated that "[a] District Court can surely calculate damages under the foregoing standards with as much or more certainty and accuracy as a jury determining damages for pain and suffering or mental anguish." ${ }^{58}$

Because proving damages is not always an easy task, the difficulty of proving actual damage to an ecosystem would drive most plaintiffs' lawyers to despair. The battle of experts that develops in natural resource damage cases can be very expensive. For instance, the Puerto Rico legislature had to appropriate $\$ 750,000$ for attorneys' fees and expert witness costs in the Zoe Colocotroni case, and had to wait eight years to get reimbursed. ${ }^{59}$ The wherewithal to hire experts and outside counsel is frequently unavailable within state agencies and, for lack of such support, the cases are often simply disregarded.

## B. Economic Methodologies

One problem with recent reviews of economic methodologies as applied to natural resource valuation problems is that they ask more questions than they answer. ${ }^{60}$ Thus, the practitioner has been

[^9]given little guidance. Basically there is only one way to tackle these problems, and that is to sit down and figure them out. With the help of a resource economist and appropriate scientific experts, natural resource valuation can be accomplished with a fair degree of accuracy. ${ }^{61}$

Other than in the isolated cases involving a single animal, or a discrete bird or fish kill, the best way to develop values for natural resources is to take an ecosystem approach. ${ }^{62}$ There are twenty to twenty-five coastal ecosystems in the United States. ${ }^{63}$ Coastal marshes and wetlands are common subjects of natural resource economic studies, and the methodologies that have been developed in wetland economics warrant application to other systems. ${ }^{64}$

A natural resource has both market and nonmarket values. ${ }^{65}$ Market values include such obvious "use" values as commercial fisheries production, wood production, and other traditional goods and services for which markets exist. ${ }^{68}$ Nonmarket values can be subdivided into "use," "option," and "existence" values. ${ }^{67}$ Nonmarket "use" values include free functions such as flood protection and bird watching, where the beneficiary does not pay directly to use the ecosystem, as well as functions for which the user pays a fee. ${ }^{68}$ An "option" value is ascribed to a resource by persons who perceive that they can use the resource some time in the future. ${ }^{69}$ "Existence" values derive from persons who value the very existence of a resource, whether or not they ever use it. ${ }^{70}$ Existence and option values are probably too ethereal to be quantified in a court of law, but nonmarket use values are subject to quantification. An ecosystem benefits people in a variety of ways, which may be characterized as "value elements." ${ }^{11}$ For wetland ecosystems,

Scheuerman \& Lombardo, The Valuation of Wetlands, 1 J. Land Use \& Envtl. L. 1 (1985). 61. See, e.g., Leitch, Folk, Nelson, Ogaard \& Scott, Socioeconomic Values of Wetlands: Concepts, Research Methods, and Annotated Bibliography, North Dakota Research Report No. 81, N. Dakota State University (1981) [hereinafter cited as Leitch Report].
62. Id. at 2 .
63. See generally 1 Coastal Ecosystems of the United States, (Odum, Copeland \& McMahon, eds. 1974)
64. Yang, Dower $\&$ Menefee, supra note 60, at 6.
65. Leitch Report, supra note 61, at 4-8.
66. Id. at 5 .
67. Id. at 7 .
68. Id.
69. Id.
70. Id.
71. See generally Gupta \& Foster, Economic Criteria for Freshwater Wetland Policy in Massachusetts, 57 Am. J. Agric. Econ., 40-45 (1975).
economists have developed independent valuations for value elements such as wildlife, water supply, flood control, and visual-cultural attributes, just to name a few. ${ }^{72}$

One problem in natural resource valuation is the way in which the value elements for an ecosystem are aggregated. ${ }^{73}$ One cannot sum the development and wildlife values of a coastal wetland since the two are usually mutually exclusive uses. A problem also arises in the form of "double counting." ${ }^{74}$ Some value elements attributed to an ecosystem may not be completely independent from other elements, resulting in a certain amount of double counting if value elements are aggregated to arrive at an overall value. ${ }^{75}$

Another problem is the need to view the ecosystem's production functions as part of a larger ecological scheme. Some economists have considered one ecosystem as the limiting habitat for the species in question, thereby imputing the entire value of the species to that habitat. ${ }^{78}$ This raises questions regarding the input value of other ecosystems during the species' life cycle. For example, migratory waterfowl require northern wetlands to breed, flyway wetlands to feed on during their migrations, and wintering wetlands for winter survival. If the wintering wetlands are population limiting, does that eliminate any value for "excess" breeding wetlands?

A major consideration is the choice of economic methodology for valuing nonmarket benefits of various natural resources. Nonmarket valuation approaches fall into three categories:

1. Expenditure based methods. These methods attempt to value resources based on the amount of money spent by those using and enjoying the resource or resources in question. ${ }^{77}$ The travel cost method of valuing recreation sites is a primary example of this method. ${ }^{78}$

[^10]2. Hedonic pricing methods. These methods are premised on the relatively simple concept that consumers ultimately derive utility or satisfaction from a particular product. ${ }^{78}$ These methods generally use indirect data for value imputation, although they also have been used with direct data. ${ }^{80}$ The utility function (land value differences) and household production function approaches are examples of these methods. ${ }^{81}$
3. Contingency valuation (bidding game) methods. These methods use direct responses to survey questions that elicit willingness-to-pay or willingness-to-sell for hypothetical (or actual) changes or conditions. ${ }^{82}$

Each method has been tested in different contexts. Although researchers who have compared the methods disagree about the theoretical and empirical relationships among them, there is general agreement that "option" and "existence" values require contingent valuation methods. ${ }^{83}$

One question is whether to use marginal versus average values. ${ }^{84}$ Loss of a single acre out of a 200,000 acre wetland would probably not have a measurable impact on the wildlife population of the wetland, and many economists would value that acre at its marginal value, which would be very small. Yet the entire swamp may have an incredibly high value, and dividing that value by 200,000 acres would yield an average value that far exceeds the marginal value. In seeking damages or restitution from a tortfeasor or criminal defendant, the use of the average value must be justified in terms of the unlawfulness of defendant's activities. The first person to despoil an ecosystem should not be permitted to pay only a small marginal value simply because he arrived first. Each de-

[^11]spoiler should pay the same sum, in other words, the average value.
There may be site-specific distinctions between individual areas of the same ecosystem that must also be considered when ascribing value. One area may be more aesthetically pleasing than the rest, or one area's recreational potential may be higher than average because of its proximity to a major population center. Finally, some areas already may be seriously altered by pollution and thus less valuable than the average. Therefore, an average value may not always be the appropriate measure if the area despoiled has unique and valuable characteristics.

## C. An Example -- The Coral Reefs of the Florida Keys

The coral reef tract off the Florida Keys is usually taken for granted; however, it becomes the subject of heated argument whenever new residential developments are proposed. ${ }^{85}$ Few people have considered calculating a dollar value for this magnificent natural resource, and many readers will take exception to this attempt to do so. Nonetheless, the exercise is worth the aggravation. Because the exercise shows lawyers and judges that such valuation is well within their grasp, it may encourage some to try it. The method used is a crude version of an expenditure method. ${ }^{\text {b6 }}$
A coral reef has both market and nonmarket "use" values. ${ }^{97}$ Market values include uses such as commercial fishing and sponging. Nonmarket uses include snorkeling, sightseeing, and scuba diving. Use values, both market and nonmarket, are quantifiable and can be calculated for many natural resources. Once the use values have been determined, they will be used as the minimum value to be assigned to the resource.
John Pennekamp Coral Reef State Park and the adjoining Key Largo National Marine Sanctuary total over 180 square miles in area off Key Largo, Florida. ${ }^{88}$ Recreational diving, sightseeing, and snorkeling uses are primarily conducted in seven small live coral reef areas in the Park/Sanctuary complex. ${ }^{89}$ Visitors to the Park/

[^12]Sanctuary include both Florida residents and out-of-state visitors. The "travel costs" for these users include:
a. air fare, rental cars, mileage;
b. hotels, motels, meals;
c. dive trip costs, air tank fills; and
d. a portion of their diving gear costs. ${ }^{90}$

For the purpose of this article, it was impossible to accurately determine the transportation, per diem, and equipment costs, but some accurate numbers for the money paid out locally for dive trips, boat rentals, gear rentals, air tank fills, and the like were obtained.

Pennekamp Park, the Coral Reef Park Company (the Park concessionaire), and the Keys Association of Dive Operators (KADO) were contacted to determine the annual number of visitors to the Park/Sanctuary, the annual number of person-trips to the reefs made by KADO dive shops, and the gross annual revenues of the park, the concessionaire, and KADO shops in the Key Largo area. There is no doubt that without the coral reef nearly all of this income would disappear. Therefore it is reasonable to attribute these revenues to the nonmarket use value of the seven major live coral areas in the Park/Sanctuary complex. ${ }^{91}$

For the period July 1, 1984, through June 30, 1985, 644,628 visitors went through the Park gates. ${ }^{92}$ Rangers patrolling the Park/ Sanctuary waters estimated that 467,370 persons were on the water during that same period. ${ }^{93}$ The ten Key Largo area KADO dive shops, together with the Park concessionaire, transported approximately 300,000 users to the reef on their dive boats in 1983-84, or about sixty-four percent of the total estimated water visitors in that period. ${ }^{94}$ Gross revenues of the Park, the Park concessionaire, and the dive shops totalled approximately $\$ 7.5$ million in 1983-84, or about $\$ 25.00$ per person-visit. ${ }^{95}$ The 17.6 per cent increase experienced in 1984-85 should raise this "direct" expenditure total to

[^13]$\$ 8.8$ million in 1984-85.96
The total area of live coral formations in the seven sites, according to estimates from NOAA charts, is about 560,000 square meters (approximately one-fifth of a square mile). ${ }^{97}$ Division of the gross annual revenues by the area used yields a direct annual revenue of $\$ 15.75$ per square meter ( $\$ 1.46$ per square foot) of live coral formations.

If the rest of the users' travel costs were accurately known, they could be included in the estimation of the coral reef's value, even though they are indirect expenditures. ${ }^{98}$ Tourists in the Key Largo area are primarily water or reef oriented as there are no other area attractions aside from warm weather, sunshine, and beautiful sunsets. The manager of a major chain motel in Key Largo estimated that seventy-five percent of his total meal and lodging revenues are derived from tourists there to use the offshore reefs. ${ }^{98}$

For the purpose of this example, the Monroe County Tourist Development Council (TDC) was asked to estimate daily per-tourist expenditures in the Upper Keys. A spokesperson for the TDC estimated that summer visitors average between $\$ 45.00$ and $\$ 50.00$ per person per day, and winter visitors average between $\$ 112.50$ and $\$ 125.00$ per person per day. ${ }^{100}$ The difference is partly due to the higher winter rates for accommodations. Winter visitors to the Florida Keys also tend to be high-spending "snowbirds" from northern states, while summer visitors are dominated by in-state family vacationers taking advantage of lower rates. ${ }^{101}$

The $\$ 112.50$ per day expenditure, the low end of the TDC's figures, was assigned to out-of-state visitors and the $\$ 45.00$ per day figure was assigned to in-state visitors, for the reasons given above. One major dive shop owner estimated that eighty per cent of his

[^14]divers year around are from out of state. ${ }^{102}$ Based on the figures obtained from John Pennekamp Coral Reef State Park, TDC, and area businesses, users of the Park/Sanctuary complex are broken down as follows:

Type of User Person-trips/Yr Travel Dollars

1. Commercial Boat Entry ( $75 \%$ ):
In-state (20\%): 70,107 3,154,815

Out-of-state (80\%): 280,427 31,548,038
2. Private Boat Entry ( $25 \%$ ):

In-state ( $50 \%$ ): $58,422 \quad 2,628,990$
Local residents ( $50 \%$ ): $\quad \underline{58,422} \quad \underline{1,460,550}^{103}$
INDIRECT SUBTOTAL:
DIRECT EXPENSES:
TOTALS:

$\overline{467,378} \quad$| $8,800,000$ |
| ---: |
| $47,592,393$ |

This amounts to an additional $\$ 38.8$ million per year in annual "travel costs" by Park/Sanctuary users and raises estimated total revenue to $\$ 47.6$ million, or $\$ 85.00$ per square meter ( $\$ 7.90$ per square foot) for 1984-85. ${ }^{104}$
Not directly included in the calculations are the values of commercial and recreational fishing associated with the reef. Many species of fish and shellfish (e.g., snook, snapper, and lobster) spend part of their life cycle on the reef. The reef thus contributes to rich fisheries that probably would disappear without the reef. These market use values, if included in the calculations, would push the total valuation of the live coral reefs even higher. ${ }^{105}$

The next step is the comparison of the coral reef resource to the corpus of a trust managed in perpetuity by two trustees, the state and federal governments. The trust beneficiaries are the citizens of Florida and the United States. The gross annual expenditures by all users of the resource are the annual income produced by the trust and paid to the beneficiaries. An individual who destroys part of the corpus of the trust can be sued by the trustee to replace that

[^15]which he has destroyed. ${ }^{108}$ The measure of damages in such a suit depends on whether the resource has been completely destroyed, or whether it will recover naturally in a few years so that only the income stream has been interrupted.

If it is assumed that the resource would recover over time, the damages would be calculated as the loss of income during the recovery period. Using a historical rate of return of three percent, a minimum nonmarket use value of the live coral reef areas in the Park/Sanctuary was calculated at a minimum of $\$ 2,833.00$ per square meter ( $\$ 263.17$ per square foot). ${ }^{107}$ The combined minimum value of all seven areas within the Park/Sanctuary complex, using this method of analysis, is $\$ 1.6$ billion. The minimum value of Molasses Reef alone, using this approach, is about $\$ 400$ million. With numbers of this magnitude, is it any wonder that Colorado sued for $\$ 2$ billion in natural resource damages in the Rocky Mountain Arsenal case? ${ }^{108}$

## V. Even if You Win, the Money Goes Into the General Fund

Natural resource damage litigation is expensive, often requiring the services of outside experts and outside counsel. A single case can cost a litigant hundreds of thousands of dollars, a cost the state is not readily able to pay. Florida's state agencies are illequipped and inadequately funded to support such extraordinary actions within their regular budgets. ${ }^{109}$ Even if the state is successful in such an action, neither the Attorney General's office nor any state agency assisting that office would be able to recover out-ofpocket expenses from the award. In most cases, the damages recovered would not be used to benefit the damaged natural resource unless the legislature made a special appropriation for that specific purpose. ${ }^{110}$

[^16]Generally, money damages recovered by the State of Florida in an action against someone who has injured a natural resource are deposited into the state treasury and are spent according to the General Revenue Fund Appropriations Act. ${ }^{111}$ Florida's existing budget procedure provides no assurance that the damaged natural resource will be restored, even when a responsible party has paid for the damage. ${ }^{112}$ Moreover, the absence of a mechanism for reimbursing the agencies for their out-of-pocket expenses incurred when bringing environmental damage actions creates a disincentive for state agencies to pursue such actions. Under Florida's current system no state agency, including the Attorney General's office, has enough money in its budget to undertake the cost of thoroughly litigating a major environmental damage suit. ${ }^{113}$ As a result, cases go unprosecuted and Florida's natural resources continue to be depleted.

As noted at the outset, it is Florida's constitutional policy to conserve and protect the state's natural resources and scenic beauty. ${ }^{114}$ In response to this constitutional mandate and to public demand, legislation has been enacted to protect, regulate, and conserve Florida's natural resources. This legislation includes the Florida Air and Water Pollution Control Act (FAWPCA), ${ }^{115}$ the Pollution Spill Prevention and Control Act, ${ }^{116}$ the Environmental Land and Water Management Act, ${ }^{117}$ the Resource Recovery and Management Act, ${ }^{118}$ and the Environmental Protection Act of 1971. ${ }^{119}$ The Environmental Protection Act provides injunctive remedies to compel enforcement of the other statutes. ${ }^{120}$ These statutes provide for civil and criminal fines and penalties as well as money damages. In addition to statutory remedies, Florida law recognizes the common law actions of negligence, nuisance, and trespass. ${ }^{121}$ This panoply of remedies can and should be brought to bear against those who injure our natural resources.

[^17]All money damages recovered by the State of Florida, whether under an environmental statute or in a common law action, are initially deposited into the state treasury. ${ }^{122}$ From there they are transferred into either the General Revenue Fund, ${ }^{123}$ the Working Capital Fund, ${ }^{124}$ or a specific trust fund. ${ }^{125}$ Money damages recovered in a common law action go into the General Revenue Fund, from which they are expended pursuant to general revenue appropriations acts or transferred into another fund. ${ }^{126}$ Monies recovered under environmental statutes may be deposited into special trust funds in some cases. ${ }^{127}$ The Florida Air and Water Pollution Control Act establishes a trust fund into which penalties, fines, and money damages are deposited to be used, when feasible, to restore the polluted area involved in the action. ${ }^{128}$ Absent a statutorily created trust fund, monies collected pursuant to state environmental statutes are deposited, like common law damages, into Florida's General Revenue Fund. ${ }^{129}$ It appears clear that the same result would follow if damages were recovered in an action based upon both common law remedies and state statutes. ${ }^{130}$

Although one trust fund currently exists allowing money damages recovered by the state to be used for restoring a polluted area, ${ }^{131}$ no fund exists for reimbursing a state agency's extraordinary costs. The Pollution Recovery Fund, established by the FAWPCA, is the only provision in Florida law that allows monies collected in a civil action to be used to restore damaged natural resources. ${ }^{132}$ The Pollution Recovery Fund is limited in scope and only applies to money damages recovered for violations of the FAWPCA. ${ }^{133}$ This provision would not cover a situation like the coral reef destruction caused by the Wellwood grounding in the Keys because it compensates for natural resources injury or de-

[^18]struction only when pollution is involved. ${ }^{134}$

## Vi. Trust Fund Bill Permits Restoration of Damaged Natural Resources

The Florida Natural Resource Restoration Trust Fund Act was introduced as Senate Bill 1056 in the 1985 Florida legislative session by Senator Larry Plummer. ${ }^{135}$ The proposed bill would have established a trust fund to receive money damages recovered by the State of Florida, in either civil suits or administrative actions, from persons who injure or destroy Florida's natural resources. ${ }^{136}$ Included in the Appendix is a bill similar to the one introduced in the 1985 Legislature. The bill is modified slightly and provides that restitution funds paid to the state under the Florida Victim Rights Act would go to the Natural Resource Restoration Trust Fund. ${ }^{137}$ This modified version of the bill is expected to be introduced by Monroe County's legislators, Joe Allen and Larry Plummer, in the 1986 legislative session.
The bill would require that all money damages recovered by the state for injury to, or destruction of, the state's natural resources be placed in a trust fund. ${ }^{138}$ The fund will be subdivided into nine regional subfunds, based upon the boundaries of the Department of Natural Resources' Division of Recreation and Parks. ${ }^{139}$ Money deposited into the fund would first be used to reimburse state agencies for extraordinary costs incurred in maintaining recovery actions. ${ }^{140}$ There is little danger of generating too much litigation by state agencies, since they would have to front the costs of litigation from their operating budgets and would only be reimbursed if they won. ${ }^{141}$ The balance of the monies recovered would be spent in the area of the state where the damage occurred. ${ }^{142}$ To the extent feasible, the injured natural resource would be replaced or restored. ${ }^{143}$ If that result could not be accomplished, alternative natural resource projects would be funded by the local trustees of the

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134. Id.
135. See Senate Bill 1056 (1985).
136. Id.
137. See Appendix infra.
138. Id. at § 5.
139. Id. at & 6(b).
140. Id. at § 6(e)(1).
141. Id.
142. Id. at § 6(e)(3).
143. Id. at § 6(e)(2).
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fund. ${ }^{144}$ The bill contains reasonable time constraints on the fund trustees to ensure that a vigorous recovery effort is planned and implemented. ${ }^{145}$ In any event, once monies are deposited in the fund they will remain in the appropriate regional account until expended in accordance with the Act. ${ }^{146}$

The Florida Natural Resource Restoration Trust Fund Act would fill a void in existing Florida law. It would provide an incentive for state agencies to pursue instances of natural resource damage with more vigor than is possible under the existing system. This bill follows the trend established at the federal level with the 1977 amendments to the Clean Water Act and the 1980 "Superfund" law (CERCLA), both of which require states to use money damages to "restore, rehabilitate, or acquire the equivalent of" injured natural resources. ${ }^{147}$

## VII. Conclusion

There is a gap between the mandate of Florida's Constitution to protect our natural resources, an obligation of the sovereign that stretches back to the very beginnings of the common law, and the statutory and operational framework that implements this public trust doctrine. This article has suggested, first, that the concept of restitution in criminal cases be expanded to include compensation to the public for injuries to our natural resources. Second, the discussion has demonstrated that there are theoretically sound and quite practicable techniques for valuing natural resources that do not have a conventional "market" value. Finally, a new statutory framework has been proposed that will "capture" restitution and damage awards for the state and return them to the region where the injury occurred for the purpose of repairing or mitigating the damage. If adopted by the legislature in 1986, the Natural Resource Restoration Trust Fund Act would substantially enhance Florida's ability to redress injuries to its declining natural resources.

[^19]
## APPENDIX

## Florida Natural Resource Restoration Trust Fund Act <br> [Italicized words have been added since the bill was first introduced in 1985.]

Section 1-Title. This Act shall be cited as "The Florida Natural Resource Restoration Trust Fund Act."
Section 2-Definitions. (a) "Damages" means money damages or restitution paid by any person, whether voluntarily or as a result of administrative or judicial action, to the State of Florida as compensation or restitution, or as punitive damages, for causing injury to, or destruction of, natural resources of the State of Florida.
(b) "District" means the District of the Division of Recreation and Parks, Florida Department of Natural Resources, or its successor agency, wherein the injury to, or destruction of, natural resources occurred.
(c) "Executive Director" means the Executive Director of the Florida Department of Natural Resources, or the head of any successor agency.
(d) "Fund" means The Natural Resource Restoration Trust Fund established by this Act.
(e) "Natural Resources" means land, air, water, ground water, drinking water supplies, fish, wildlife, biota, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the State of Florida.
(f) "Person" means any and all persons, natural or artificial, foreign or domestic, including any individual, firm, partnership, business, corporation, company, the United States and all political subdivisions, regions, districts, municipalities, and public agencies thereof.
(g) "State agency" means any agency of the government of the State of Florida, including the offices of the State Attorney for each County of the State of Florida.
Section 3-Findings. (a) The Legislature finds that the natural resources of the State of Florida are subject to instantaneous injury or loss from a variety of negligent and willful acts, in ways that cannot be foreseen and provided for in the normal budget process. As a consequence of the unforseeability of such incidents, no funds have been available for reimbursement of extraordinary expenses incurred by State agencies in seeking compensation, on behalf of the citizens of the State, for such injury or destruction of natural resources. As a further consequence of this lack of funds for reim-
bursement, State agencies are reluctant, or cannot spare the personnel and funds from their operating budgets, to seek such compensation either through administrative or judicial action.
(b) Prior to the enactment of this Chapter, any monetary damages or restitution that would be recovered by the State of Florida for injury to, or destruction of, its natural resources were deposited in the general accounts of the state treasury, and were not specifically set aside for restoration or rehabilitation of the injured or destroyed natural resource, or for the acquisition or improvement of comparable natural resources in the region of the State where such injury or loss occurred.
Section 4-Purposes. It is the purpose of this Act to establish a fund for reimbursement of actual costs incurred by any State agency in obtaining payment of damages or restitution for injury to, or destruction of, natural resources of the State of Florida, and to designate that damages or restitution in excess of such reimbursed costs be dedicated to the restoration or rehabilitation of, or substitution for, the natural resources injured or destroyed.
Section 5-Establishment of Trust Fund. All damages or restitution recovered by or on behalf of the State of Florida for injury to, or destruction of, natural resources of the State of Florida shall be deposited in a special account, which shall be established by the State Treasurer, denominated "The Florida Natural Resource Restoration Trust Fund," and shall remain in such account until expended for the purposes of this Act. The State Treasurer shall deposit all funds received for the Fund in a financial institution of this State, in an account, or accounts, which bear interest at the highest rate available, consistent with sound fiscal management policies. All interest earned on Fund deposits shall be credited to, and become part of, the Fund.
Section 6-Trust Fund Expenditures. (a) No moneys credited to the Fund, shall be available for any expenditure other than as set forth in this Act.
(b) Separate subaccounts shall be established within the Fund according to the geographical boundaries of the Districts of the Division of Recreation and Parks, Florida Department of Natural Resources, and moneys deposited into the Fund shall be credited to the subaccount corresponding to the District or Districts where the injury or destruction occurred.
(c) There shall be a three-person Board of Trustees for each Fund subaccount, consisting of: (1) the District Manager, Division of Recreation and Parks, Department of Natural Resources, of the

District corresponding to each subaccount, (2) the Executive Director, or his or her designee, and (3) a private individual who is a resident of said District and is appointed by the Executive Director, on the advice of the District Manager.
(d) Each Board of Trustees shall determine the best use of the Fund for that District, and on receipt of a certification signed by all three trustees, the State Treasurer shall disburse the funds in that subaccount in the manner and to the persons so directed.
(e) The purposes for which moneys in the Fund shall be expended are limited to the following, and shall be expended in order of descending priority as follows:
(1) To reimburse any agency of the State of Florida for its reasonable costs incurred in obtaining payment of the damages or restitution for injury to, or destruction of, natural resources of the State, including administrative costs, attorneys' fees, and fees and costs of experts and consultants.
(2) To pay for restoration or rehabilitation of the injured or destroyed natural resource, either by a State agency or through a contract to any qualified person, except that the sums used to restore or rehabilitate an injured or destroyed natural resource shall not be grossly disproportionate to the benefits likely to be derived from such restored or rehabilitated natural resource.
(3) To pay for the development or restoration of a natural resource similar to that which was injured or destroyed, at a location within the District or Districts where the injury or destruction occurred.
(4) To pay for alternative projects, selected by the trustees after solicitation of proposals by public notice, and after one or more public hearings conducted within the affected District when the amount available within that District's subaccount exceeds $\$ 25,000$, which project or projects shall be selected on the basis of their anticipated benefits to the citizens of the State of Florida who use or used the injured or destroyed natural resource.
Section 7-Miscellaneous Provisions. (a) The trustees of a District need not act unless there is at least $\$ 5,000$ in that District's subaccount, and they may accumulate funds from small incidents and expend them on single projects, where it would not be economical to allocate funds to several small projects. All claims for trust fund reimbursements under Subsection (e)(1) of Section 6 of this Act must be made within 90 days after payment of damages or restitution is made to the State. All projects proposed to be carried out by State agencies under Subsections (e)(2) and (e)(3) of Section 6 of this Act must be presented to the trustees within 180
days after payment of damages or restitution is made to the State, and said projects must be started and funds allocated thereto within one year after payment of damages or restitution is made to the State. Projects which are to be funded under Subsection (e)(4) of Section 6 of this Act must be the subject of public advertisement for bids within 180 days, and of at least one public hearing within an affected District within 20 days, and funds therefore must be allocated and a grant or contract awarded within one year after payment of damages or restitution to the State, and should, to the maximum extent possible, be completed within three years after the grant or contract is awarded. If damage or restitution payments are made periodically, the date of the first payment shall be considered the first day of the deadlines in this Subsection.
(b) The private trustees for all Districts shall be appointed no later than six months after enactment of this Act, with their terms to run for three years beginning on July 1 or January 1, whichever falls within said six months. On the resignation, death, or incapacitation of a private trustee, the Executive Director shall appoint a replacement within 60 days, to serve the remainder of the term of his or her pedecessor.
(c) Private recipients of Fund disbursements shall be required in advance to agree that their accounts and records of expenditures of said moneys are subject to audit at any time by appropriate state officials, and to submit quarterly reports and a final, written report describing such expenditures within 90 days after the funds have been expended.
(d) Notwithstanding any other provision of law, no moneys in the fund shall be available for appropriation by the Legislature for any purpose whatsoever. When payments are made to a State agency from the Fund, for expenses incurred which are compensable under Subsection (e) of Section 6 of this Act, such reimbursements shall be considered as being for extraordinary expenses and no agency appropriation shall be reduced by any amount as a result of such reimbursement.


[^0]:    Recommended Citation
    Matson, Ph.D., James S. and DeFoor, II, J. Allison (2018) "Natural Resource Damages: Restitution as a Mechanism to Slow Destruction of Florida's Natural Resources," Florida State University Journal of Land Use and Environmental Law: Vol. 1 : No. 3 , Article 1.

    Available at: https://ir.law.fsu.edu/jluel/vol1/iss3/1

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    The authors wish to acknowledge the five University of Miami law students who, in the spring of 1985, drafted most of the proposed Natural Resource Restoration Trust Fund Act bill, and the explanatory statement. Our thanks go to Ricardo A. Banciella, Lori A. Hulmes, Jorge Maxion, Juan E. Rodriguez, and Gregory Snell, Esq. for their contributions to this article.

    1. Fla. Const. art. II, § 7.
[^2]:    2. Mattson \& van Emmerik, The Law and Practice of Assessing Damages to Natural Resources, Proc. 1983 Oil Spill Conference, Amer. Petroleum Inst. Pub. 4356, Washington, D.C. 559.
    3. Id.
    4. Id.
    5. Id.
    6. Id. at 560 .
    7. Id.
    8. Id.
    9. Id.
    10. 1984 Fla. Laws, ch. 84-363 (codified at Fla. Stat. § 775.089 (Supp. 1984)).
    11. Fla. Stat. § 775.089(1)(a) (Supp. 1984).
[^3]:    12. Fla. Stat. § 775.089(1)(b) (Supp. 1984).
    13. Fla. Stat. § 775.089(1)(a) (Supp. 1984).
    14. Fla. Stat. § 775.089(1)(c) (Supp. 1984).
    15. Fla. Stat. § 370.14(4) (1983 \& Supp. 1984) (repealed effective July 1, 1986, by § 8 ch. 83-134, which further provides that if the governor and cabinet have not adopted appropriate rules by July 1, 1986, this section shall remain in effect until such rules are adopted).
    16. Fla. Stat. § 775.089(7) (Supp. 1984).
    17. Id.
    18. Harris v. State, 452 So. 2d 1041 (Fla. 2d DCA 1984).
    19. Fla. Stat. § 775.089(8),(10) (Supp. 1984).
    20. Fla. Stat. § 775.089(8) (Supp. 1984).
[^4]:    21. See Book Review 11 Ecology L.Q. 460 (1983) (reviewing T. Schelling, Incentives For Environmental Protection (1983)).
    22. See infra Part IV, section B and accompanying notes.
    23. Fla. Admin. Code R. 17-11.01(3) (1982).
[^5]:    24. 30 F.2d 642 (9th Cir. 1929).
    25. Id. at 644. The court determined that the young timber growth on the land could not be destroyed for free, and that some value should be placed on it despite its conceded lack of market value.
    26. Id.
    27. See, e.g., Pierce v. DeJong, 13 Ill. App. 3d 889, 300 N.E.2d 782 (1973). But see, e.g., Roark v. Musgrave, 41 Ill. App. 3d 1008, 355 N.E.2d 91 (1976).
    28. Feather River, 30 F.2d at 644.
    29. 628 F.2d 652 (1st Cir. 1980), cert. denied, 450 U.S. 912 (1981).
    30. Id. at 673.
    31. Comprehensive Environmental Response, Compensation and Liability Act, Pub.L. No. 96-510, (codified as amended at 42 U.S.C. §§ 9601-9657 (1983)).
    32. Zoe Colocotroni, 628 F.2d at $673,675$.
[^6]:    33. Id. at 673-74.
    34. Id. at 675.
    35. Id. at 678.
    36. Id.
    37. Id.
    38. Florida has recognized the importance and extremely fragile nature of its coral reefs by enacting legislation to protect these natural resources. See Fla Stat §§ 258.083, 370.114 (1983).
    39. Keypone still remains on the bottom of the James River despite the fact that Allied Corp. paid approximately $\$ 25$ million in fines and lawsuit settlements. See Mesdag, Remember Keypone? Fortune Aug. 22, 1983, at 193.
    40. Zoe Colocotroni, 628 F.2d at 676.
[^7]:    41. Id. Defining "disproportionate" is a difficult task. Following enactment of CERCLA, and just before the clock ran out on filing actions for pre-CERCLA damages to natural resources, the State of Colorado filed a $\$ 2$ billion damage claim against the United States and Shell Oil Company, for damages done at the Rocky Mountain Arsenal outside of Denver. See Colorado v. Shell Oil Co. and the United States, No. 83-C-2386 (D.Col. filed Dec. 9, 1983). The district court recently ordered the U.S. government and Shell Oil Co. to pay the estimated $\$ 357$ million to $\$ 1.9$ billion in costs to clean up the Rocky Mountain Arsenal. Tallahassee Democrat, Nov. 17, 1985, at 3A, col. 1. The United States also brought suit against Shell to recover its $\$ 1.8$ billion in clean up costs. See United States v. Shell Oil Co., No. 83-C-2379, 605 F.Supp. 1064 (D.Colo. 1985).
    42. Zoe Colocotroni, 628 F.2d at 676.
    43. Telephone conversation with N. Jimenez, Counsel for Puerto Rico (1981).
    44. Fla. Stat. § 403.141(3) (1983).
    45. State Dep't. of Pollution Control v. International Paper Co., 329 So. 2d 5 (Fla. 1976).
    46. Fla. Admin. Code R. 17-11.01 (1982).
[^8]:    47. See, e.g., Mattson, Compensating States and the Federal Government for Damages to Natural Resources Resulting from Oil Spills, 5 Coastal Zone Mgmt. J. 307 (1979).
    48. See supra note 31 .
    49. See infra notes 66-68 and accompanying text.
    50. In Re Oil Spill by the AMOCO CADIZ off the Coast of France on March 16, 1978, MDL Docket No. 376, N.D.Ill., 1984 A.M.C. 2123-2199 (trial on damages expected in early 1986).
    51. Id.
    52. Coral reefs in John Pennekamp Coral Reef State Park are specifically protected by statute. See Fla. Stat. § 258.083 (1983).
    53. See infra Part IV, section C and accompanying notes.
[^9]:    54. In at least one case, the sport fisherman has been held not to have a right to recover for loss of his opportunity to fish, and the commercial fisherman must meet a fairly stringent burden of proof. See Union Oil Co. v. Oppen, 501 F.2d 558, 570 (9th Cir. 1974) (citing Oppen v. Aetna Insurance Co., 485 F.2d 252 ( 9 th Cir. 1973).
    55. Communities near the Apalachicola River depend almost solely on oyster harvesting and other commercial fisheries for their livelihood.
    56. United States v M/V Wellwood, Case No. 84-1888-CIV-CCA, (S.D. Fla. 1984).
    57. See, e.g., Union Oil, 501 F.2d at 570.
    58. Zoe Colocotroni, 628 F.2d at 675.
    59. See supra note 43.
    60. See generally Yang, Dower, \& Menefee, The Use of Economic Analysis in Valuing Natural Resource Damages, U.S. Dep't of Commerce, Washington, D.C. (1984); Cowdery,
[^10]:    72. Id. For additional information regarding independent valuation for specific value elements see, e.g., Hammack \& Brown, Jr., Waterfowl and Wetlands: Toward Bioeconomic Analysis, (1974) (waterfowl habitat); Gosselink, Odum \& Pope, The Value of the Tidal Marsh, LSU Center for Wetlands Resources Report No. LSUSG7403, Baton Rouge, LA (1974) (waste assimilation); Goldstein, Competition for Wetlands in the Midwest: Economic Analysis, (1971) (agricultural value).
    73. Leitch Report, supra note 61, at 1.
    74. Gupta \& Foster, supra note 71, at 43-44.
    75. Id.
    76. Leitch Report, supra note 61, at 3-4.
    77. Id. at 8 (expenditures usually include travel costs, equipment costs, license costs, and food and lodging expenses).
    78. See generally Gum \& Martin, Problems and Solutions in Estimating the Demand for and Value of Rural Outdoor Recreation, 57 Am. J. Agric. Econ. 558-566 (1975); McConnell, Some Problems in Estimating the Demand for Outdoor Recreation, 57 Am. J. Agric.
[^11]:    Econ. 330-334 (1975).
    79. See Yang, Dower \& Menefee, supra note 60, at 63. See generally Muellbauer, Household Production Theory, "Quality and the Hedonic" Technique, 64 Am. Econ. Rev. 77-94 (1974); Sinden, A Utility Approach to the Valuation of Recreational and Aesthetic Experiences, 56 Am. J. Agric. Econ. 61-72 (1974).
    80. Yang, Dower \& Menefee, supra note 60, at 63.
    81. Id.
    82. Id. See generally Rowe, D'Arge \& Brookshire, An Experiment in the Economic Value of Visibility, 1 J. Envtl. Econ. Mgmt. 1-19 (1980); Randall, Ives \& Eastman, Bidding Games for Valuation of Aesthetic Environmental Improvements, 1 J. Envtl. Econ. Mgmt. 132-49 (1974).
    83. See Yang, Dower \& Menefee, supra note 60, at 62. See also Bishop and Heberlein, Measuring Values of Extra-market Goods: Are Indirect Measures Biased? 61 Am. J. Agric. Econ. 26-30 (1979); Brookshire, Thayer, Schulze \& D’Arge, Valuing Public Goods: A Comparison of Survey and Hedonic Approaches, 72 Am. Econ. Rev. 165-77 (1982).
    84. Leitch Report, supra note 61, at 3.

[^12]:    85. See, e.g., Skinner \& Jaap, Effects of Boat Traffic and Land Development on Key Largo's Coral Reefs and Adjacent Marine Environments, A Report to the Governor and Cabinet, Florida Dep't of Natural Resources (January 1984).
    86. See supra notes 77-78 and accompanying text.
    87. See supra notes 65-68 and accompanying text.
    88. National Oceanic \& Atmospheric Administration Chart No. 11462, Fowey Rocks to Alligator Reef, 18th Ed., June 1982.
    89. Molasses Reef, The Elbow, Carysfort Reef, Grecian Rocks, White Bank Dry Rocks, French Reef, and Key Largo Dry Rocks.
[^13]:    90. See supra notes 77-78 and accompanying text. See also Yang, Dower \& Menefee, supra note 61, at 50-56.
    91. See supra note 89 .
    92. 1984/85 User Attendance Reports, John Pennekamp Coral Reef State Park, Div. of Parks and Recreation, Florida Dep't. of Natural Resources.
    93. Weekly Boat Patrol Logs, 7/1/84-6/30/85, John Pennekamp Coral Reef State Park, Div. of Parks \& Recreation, Florida Dep't of Natural Resources.
    94. A "blind" survey of KADO dive shops was conducted in September, 1984. Members telephoned their annual gross revenues and person-trips to the second author who then reported only the grand totals.
    95. Id.
[^14]:    96. Weekly Boat Patrol Logs 1983/84, John Pennekamp Coral Reef State Park, reported 397,400 on the water.
    97. National Oceanic \& Atmospheric Adminstration Chart No. 11451, Miami to Marathon and Florida Bay, 22nd Ed., October 1984.
    98. Indirect expenditures include things such as meals and lodging, car rentals, amortization of diving gear costs, etc.
    99. Telephone communication with Neil Boyce, Manager of the Key Largo Holiday Inn (September, 1984).
    100. Telephone communication with Ms. Sandy Higgs of the Key West Tourist Development Council (September 10, 1985).
    101. These calculations ignore another fact known to Keys' businesses; scuba divers are notoriously low-spenders. Some attribute this to the fact that they have invested so much money in their gear, cameras, training, and air fare, that they have no money left by the time they arrive in the Keys. We believe that these latter expenditures probably exceed the money they save in the Keys, and one can only do so much with these numbers.
[^15]:    102. Telephone communication with C. Toth, co-owner Diver's World of Key Largo (September, 1984).
    103. For local residents, we estimate $\$ 25.00$ per person per day for gasoline, bait, ice, and depreciation of their boats. We also assume that an insignificant number of out-of-state residents enter the Park/Sanctuary complex by private boat.
    104. See, e.g., McConnel, supra note 78 (for an economic analysis of travel costs and their assessment).
    105. See supra notes 65-66.
[^16]:    106. See Bogart \& Bogart, The Law of Trusts at 612 (1973).
    107. As the damaged coral reef is not expected to recover for at least 200 years, the rate of return should be something which can reasonably be expected for the next 200 years. As followers of the environmentalists' conflicts with the U.S. Army Corps of Engineers over "rates of return" will recall, the value of money, after subtracting inflation, over the past 200 years has been about $3 \%$. Therefore this figure was chosen.
    108. See supra note 41.
    109. The difficulties of anticipating and estimating such extraordinary costs make it nearly impossible for an agency to request these funds in their yearly budget proposals. See Fla. Stat. § 216.031 (Supp. 1984).
    110. See Fla. Stat. § 215.425 (no money shall be appropriated on any claim the subject matter of which has not been provided for by pre-existing laws, unless it is allowed by bill passed by two-thirds of the members elected to each house of the Legislature).
[^17]:    111. Fla. Stat. § 215.32 (1)-(2)(a) (1983).
    112. See generally Fla. Stat. ch. 216 (1983 \& Supp. 1984).
    113. See, e.g., note 109.
    114. See supra note 1 and accompanying text.
    115. Fla. Stat. §§ 403.011-403.4153 (1983 \& Supp. 1984).
    116. Fla. Stat. §§ 376.011-376.317, (1983 \& Supp. 1984).
    117. Fla. Stat. §§ 380.012-380.12 (1983 \& Supp. 1984).
    118. Fla. Stat. §§ 403.701-403.759 (1983 \& Supp. 1984).
    119. Fla. Stat. § 403.412 (1983).
    120. Id.
    121. See, e.g., Alton Box Board Co. v. Pantya, 236 So. 2d 452 (Fla. 1st DCA 1970) (nuisance).
[^18]:    122. Fla. Stat. § 215.32 (1983).
    123. Fla. Stat. § 215.32 (1)(a) (1983).
    124. Fla. Stat. § 215.32 (1)(c) (1983).
    125. Fla. Stat. § 215.32 (1)(b) (1983).
    126. Fla. Stat. § 215.32 (2)(a) (1983).
    127. See e.g., Fla. Stat. §403.165 (1983).
    128. Id.
    129. Fla. Stat. § 215.32 (1983).
    130. Fla. Stat. § 215.32 (2)(a) (1983) (the General Revenue Fund shall consist of all monies received from the state from any source whatsoever).
    131. Fla. Stat. § 403.165 (1983).
    132. See also Florida Coastal Protection Trust Fund, Fla. Stat. § 376.011 (Supp. 1984) (allowing for cleanup and rehabilitation after a pollutant has been discharged, but not specifically mentioning or providing for restoration).
    133. Fla. Stat. § 403.165 (1983).
[^19]:    144. Id. at § 6(e)(4).
    145. Id. at § 7(a).
    146. Id.
    147. See supra notes $32-34$ and accompanying text.
