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## Ecology, Economics, and Law in the Conservation and Management of Cetaceans

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ECOLOGY, ECONOMICS, AND LAW  
IN THE  
CONSERVATION AND MANAGEMENT  
OF  
CETACEANS

BY

JOHN DAVID ROANOWICZ

A MAJOR PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE  
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UNIVERSITY OF RHODE ISLAND

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## Ecology, Economics, and Law in the Conservation and Management of Cetaceans

### Abstract

Quite possibly no other form of life has come to epitomize the problems of management of our living resources more than the great whales. Numerous articles have been written offering legal reforms, but often these single-discipline viewpoints overlook the unique and multifaceted problems involved with the conservation and management of cetaceans. On the other hand, an interdisciplinary approach capable of integrating biological, economic, legal, and political knowledge provides an effective alternative approach for an analysis of the problems presented by the international management of cetaceans.

Certain features of present regulatory schemes inhibit their effectiveness. Beyond correcting these deficiencies, more general topics need to be addressed. Under present economic considerations, resource depletion and environmental disruption are, at best, externalities that distort the more immediate goal of production and exchange. However, by putting the needs of the biological world first, an ecological approach addresses the imbalance between economic and environmental considerations in decision-making. The basic intent of this approach is to place resource development and exploitation within the capacity of species and habitats to sustain themselves. Five suggestions to help achieve that end are offered.

Because ecosystem needs are not encompassed by national or economic interests, the proposed approach inevitably will rely upon a legal and political structure for protection and control. This recognizes the essential role played by the law and lawyers in resolving environmental problems. But, if law is to contribute to the future, its function must be transformed from one that largely follows and facilitates economic processes to one that leads and initiates democratic decision-making.

For cetaceans, substantially more protection exists now than at any previous time. But, whales and whaling can be viewed as only one part of a much larger problem--the difficulties presented by the integration of human economic and political systems in a limited global environment. Resource conflicts resulting from the opposing objectives of conservation and exploitation will persist. Only by confronting the basic economic and political causes that generate these conflicts can lasting solutions for the conservation, management, and protection of natural resources be achieved.

John D. Roanowicz

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## I. Introduction

Quite possibly no other form of life has come to epitomize the problems of management of our living resources more than the great whales. The rapid decline of some whale populations within the last several decades not only has evidenced the dramatic effects of the power of human technology to alter the marine environment, but also has been responsible for questioning the capability of international legal regimes to adequately and effectively safeguard the living resources of the seas. Numerous articles have been written offering legal reforms, but often, these single-discipline viewpoints overlook the unique and multi-faceted problems involved with the management and conservation of whales. The biological characteristics of whales, dolphins, and porpoises; the ecological features of the oceans, and the economic and legal conflicts generated by the goals of exploitation and conservation are interwoven in a manner that prevents an effective single-discipline analysis. Therefore, it is necessary to adopt an interdisciplinary approach in order to meaningfully comprehend the conservation and management problems presented by cetaceans -- whales, dolphins, and porpoises. This article, drawing upon biological, economic, legal, and political knowledge analyzes these problems for all cetaceans, including those smaller species not specifically subject to international legal control. In so doing, my purpose is to provide an alternative approach for the analysis of issues in international cetacean management. In order to comprehend the necessary legal and political reforms, one must understand not only international law, but also the precise manner in which biological and economic factors interact with these institutions.

## II. General Description of the Resource

Whales, dolphins, and porpoises from a single mammalian order, the Cetacea. Approximately 78 species of two living orders of Cetacea are currently recognized by the scientific community. Suborders comprise the Mysticeti or baleen whales and the Odontoceti or toothed

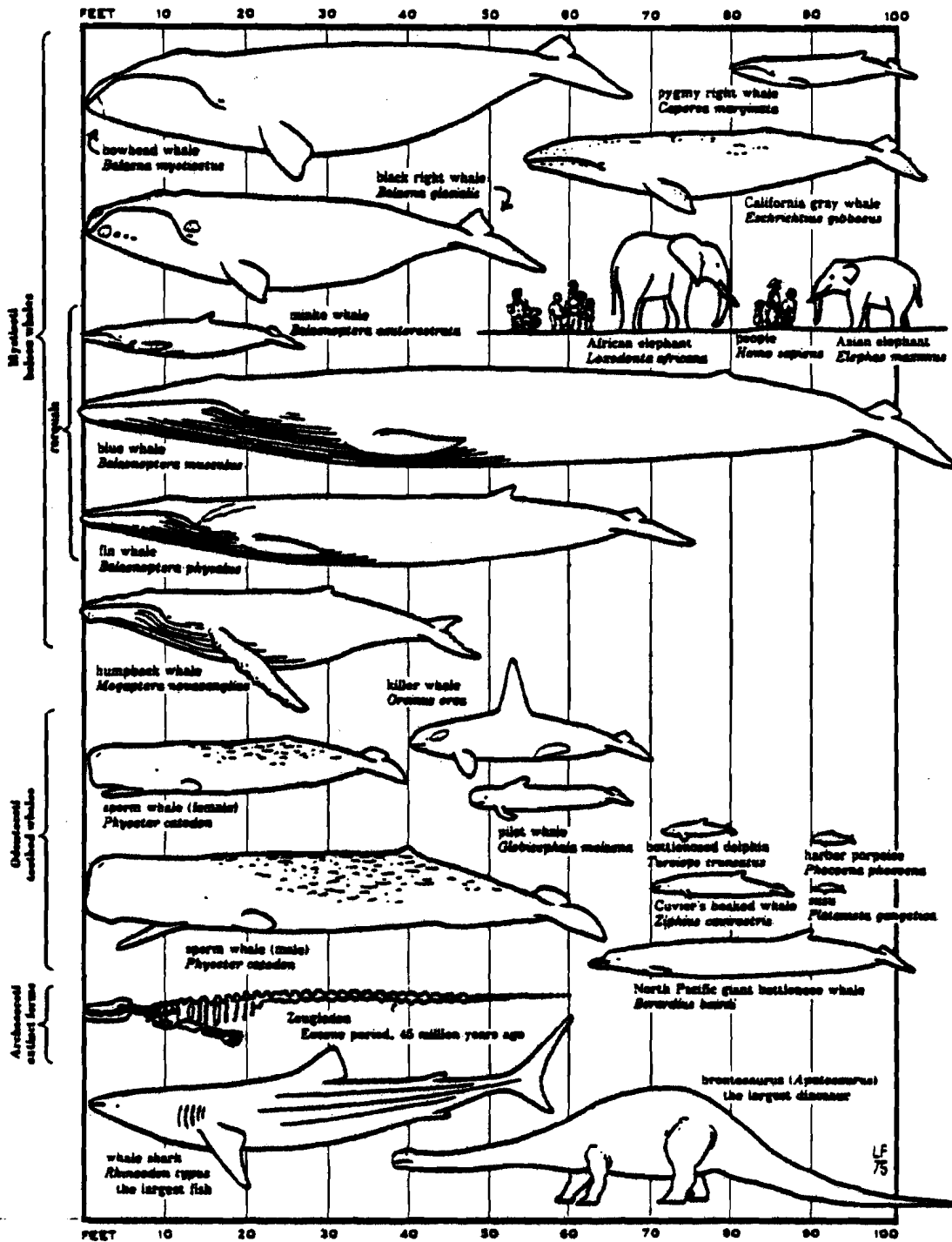
whales (Figure 1). The baleen whales are nearly all large whales whereas, the toothed whales include a single large whale species (sperm whale) and the more numerous species of dolphins and porpoises. All of the above species may be broken down into reproductively isolated populations or "stocks". The whaling industry has traditionally separated cetaceans into two main groups i.e., the commercially valuable large whales and the less valuable small cetaceans, primarily dolphins and porpoises. The history of exploitation and management of each of these two groups has been very different and reflects their direct commercial value. For example, a porpoise may be worth only \$17<sup>1</sup> (in 1975 dollars) in contrast to \$6,700<sup>2</sup> (in 1972 dollars) for a single fin-whale. Individual descriptions of each group, beginning with the large whales, will serve to acquaint the reader not only with the complexity of the resource being managed, but also will provide essential background material for later discussions of existing and proposed international and national agreements regarding jurisdiction over cetaceans.

#### A. Large Whales

Large whales include nine of the ten baleen whale species, and one toothed whale species, the sperm whale. These animals range in size from the minke whale (30') to the blue whale (105'), with most species in this group of cetaceans averaging 40' to 60' in length. Typically, baleen whales are larger than the biggest toothed whales.

Contrasted with the relatively short migrations of toothed whales, all baleen whale species engage in lengthy migrations, often from tropical or sub-tropical regions to polar regions. Each species is believed to exhibit a distinct temporal and geographic migratory pattern; however, for most species, the exact nature and extent of these migrations remains uncertain.

Social behavior and morphology of cetaceans often can profoundly affect the manner in which a species can be managed. Baleen whales generally occur in small groups or pods of mixed sex. Although female baleen whales tend to be slightly larger than males, for all intents and purposes, the sexes are virtually indistinguishable in the water. Consequently, it would be impractical to set harvest quotas for each sex. In contrast, sperm whales are not only gregarious but also



Drawings by Larry Foster, General Whale, 9616 MacArthur Blvd., Oakland, Ca. 94605.

Figure 1. Shapes and Sizes of Selected Cetaceans.

polygynous.<sup>3</sup> They often form large herds, usually between 20 to 40 individuals,<sup>4</sup> composed generally of a large male and numerous females and calves. Bachelor males travel either singly or in separate groups. This behavioral segregation and the generally smaller size of females makes it feasible to set quotas by sex for sperm whales.

The division of the order cetacea into baleen and toothed whales reflects a major difference in feeding behavior, the kind of food taken, and the part each plays in the marine ecosystem.<sup>5</sup> The principal diet component for baleen whale species is zooplankton. It is the abundance of these small, drifting animals in the upper layers of cold ocean waters that attracts whales toward polar regions. Baleen whales have developed sophisticated capture techniques in order to obtain the vast amounts of these animals that they need to survive. These feeding requirements are directly related to the formation of the baleen plates and the further adaptations of the head, mouth, and tongue characteristics of many baleen whale species. In short, baleen whales are atop a very short food chain.

Toothed whales (and here are included the smaller dolphin and porpoise species) have completely different feeding techniques and prefer different foods. These species generally depend on fish and squid. This food preference is responsible for the typically more aggressive capture techniques of these animals. Because their prey is more widely distributed, so to are the distributions of the various toothed whale species. As a result of inherent biological characteristics, the impacts on the marine ecosystem generated by baleen and toothed whales can be quite different.

#### 1. Abundance

It has been estimated that the exploitable (minimum harvest length) population of whales has decreased from about 2.4 million animals to a present (1976) level of about 1.2 million animals since whaling began.<sup>6</sup> This reduction is deceptive because selective depletions (e.g. blue and humpback whales) have reduced some species as much as 96 percent.<sup>7</sup> This occurs because the whaling industry, hunting many species of large whale, is selective of targets based upon either value or quota



level. The unforeseen difficulty is that whales exhibit some of the lowest recruitment rates in the natural world. The maximum net recruitment rate for a whale stock at between 30 to 70 percent of its initial population level has been estimated to be only 5 to 7 percent annually.<sup>8</sup> In general, whales have an elevated age of sexual maturity; usually only bear one calf at a time; and do not bear young more frequently than one every two years. The implications for the enrichment of stocks that have been heavily hunted should be obvious.

## 2. Uses

Historically, the most valuable products derived from whales have been their baleen and oil. This changed during the 1960's when whale meat became the most valuable product. Other whale parts may be found in soaps, leather, linoleum, pharmaceuticals, cosmetics, glue, gelatin, brushes, pet foods, vitamins, thread, and margarine.<sup>9</sup>

The low and non-consumptive uses of whales, as typified by the proliferation of whale-watching cruises and documentaries depicting aspects of cetacean ecology have been on the increase. The magnitude of the economic value of these uses is only beginning to come to light. For example, an inventory of the gross economic values of the low-consumptive uses of cetaceans was prepared for a Food and Agriculture Organization (FAO) sponsored consultation on marine mammals in 1976. At that time, it was reported that "...even this very incomplete survey shows a gross annual value of the low-consumptive industry on the order of hundreds of millions of dollars";<sup>10</sup> and it was "...felt that the estimates made were grossly below the true world value...".<sup>11</sup> By comparison, just four years earlier (1972), the worldwide estimated value of all whale products was on the order of 100 million dollars.<sup>12</sup> Quite obviously, formulations of management objectives and practices must be able to take into account these low and non-consumptive uses.

### B. Small Cetaceans

Small cetaceans share most of the characteristics of large cetaceans mentioned above. There are, however, three noteworthy differences. Their dependence on fish and squid causes them generally to: 1) have a coastal distribution; 2) be distributed in warmer waters; and 3) have less lengthy migrations. Females give birth to a single calf, but

unlike large whales, the interval between successive births may range from under one year to as much as four years. By and large, dolphins and porpoises are believed to be far more social than whales with group sizes ranging from tens of animals towards 1,000 animals or more.

#### 1. Uses

The capture of small cetaceans for food, oil and other products is ancient and widespread.<sup>13</sup> Although the oil derived from small cetaceans is capable of being used as a lubricant, the most common product derived from these animals is meat. Products from small cetaceans do not often enter national markets and rarely are traded internationally.<sup>14</sup>

#### 2. Fisheries

Many species are captured directly or indirectly in one or more fisheries. Direct fisheries, where small cetaceans are the target species, consist of five types: 1) drive fisheries; 2) net fisheries; 3) harpoon and shoulder gun fisheries; 4) catcher boat fisheries, and 5) live capture fisheries. Fisheries where small cetaceans are caught "incidental" to the capture of a different target species, usually fish, fall into two categories: 1) inadvertent, and 2) deliberate.

Direct fisheries are usually localized and small in scale. Minke, pilot, and killer whales, as well as common, bottlenose, and striped dolphins, along with harbor and Dall's porpoise are the major species taken in direct fisheries. Additionally, beluga whales and narwhals are taken by North American eskimos in various aboriginal hunts. The impact and importance of live-capture fisheries should not be overlooked. Areas off the western and southern coasts of North America have been involved in controversy concerning the capture of killer whales and bottlenose dolphins for the purposes of public display and scientific research.

Distinct from the selective depletions of local stocks that can result from direct fisheries, the truly "incidental" fisheries pose a potentially far more serious management problem. The largest incidental catches taken at present are not used at all.<sup>15</sup> These occur principally with respect to the tuna and salmon gillnet fisheries where spotted and spinner dolphins and Dall's porpoise are the major species impacted.

### 3. Current Knowledge

Information concerning population dynamics and abundance of most stocks of small cetaceans remains scarce. This alone can account for the fact that, "(p)ractically all efforts to manage small cetaceans have been limited to national actions," and "...are mostly unenforced."<sup>16</sup> Similarly, estimates concerning the contributions of small cetaceans to food supplies or their effects on fisheries are difficult to predict. However, small cetaceans do constitute "...a significant element in marine ecosystems in all regions."<sup>17</sup> The benefits derivable from uses other than harvesting, while difficult to assess, "...are surely not trivial."<sup>18</sup> For example, since they are at the top of the food chain, small cetaceans are potentially excellent indicators of the presence of pollutants in the seas.

### III. Goals of Conservation and Management

Large and small cetaceans present diverse conservation problems stemming from both inherent biological characteristics and from differing economic and social objectives. A great variety of objectives for the use of cetaceans by man can be accommodated on a continuum between complete protection and exploitation leading to extermination. Since the choice of objectives is capable of not only clearly defining acceptable management practices helping to insure the long-term survival of species, but also for instituting potentially inappropriate or conflicting strategies leading toward potential species extinction, the choice of management and conservation objectives for cetaceans is of the utmost importance.

#### A. Objectives

In 1974, at an FAO sponsored conference in Bergen, Norway, a group of scientists and economists advanced a list of twenty possible objectives (Table 1.) for marine mammal management. While not exhaustive, the list is broken down into socio-economical, ecological, and ethical considerations. In another analysis by a group of economists during the same meeting, eleven economic objectives were identified.<sup>19</sup> (Table 2.) It is worth noting that a great many of the

### Socio-Economically Oriented Objectives

1. Providing commodity yield (including food, industrial products and so on).
  - a) From marine mammals.
  - b) From competitors of marine mammal (e.g. fish at high trophic levels).
  - c) From food species of marine mammal (e.g. krill).
2. Providing recreation and tourism.
  - a) Oriented toward hunting and fishing for sport.
  - b) Oriented toward nature observation (e.g. whale watching).
3. Providing employment.
4. Providing cash income.
5. Providing for cultural diversity (e.g. survival of traditional and subsistence economies).
6. Providing for distribution of benefits to all levels of society.
  - a) Nationally.
  - b) Internationally.
7. Providing for scientific uses and increase of knowledge.
8. Providing education benefits.
9. Providing for human health.
10. Providing for domestication (e.g. as sources of food and other commodities and as work animals).

### Ecologically Oriented Objectives

11. Maintaining ecosystem diversity.
12. Maintaining ecosystem stability.
13. Maintaining gene pools, distribution of species and varied environments.
14. Maintaining ability of population to survive fluctuating environmental conditions.

### Ethically Oriented Objectives

15. Providing minimum stress for marine mammals.
16. Increasing survival chances of marine mammals (including not killing).
17. Particularly respecting the life of cetaceans because of their intelligence, friendliness and lack of aggressive behavior toward man.
18. Avoiding inhumane or cruel practices involving marine mammals.
19. Maintaining the options for future generations of human beings.
20. Not killing animals at all.

Table 1. Objectives of Management of Marine Mammals

**Economic Objectives**

1. Long-term maximization of net economic benefits to society:  
comprehensive form of maximum economic yield
2. Maximum sustainable yield
3. Optimum sustainable yield
4. Maximization of food (or protein production)
5. Maximization of employment
6. Maximization of present value of economic "rent"  
(net economic revenue): high discount rate
7. Maximization of present value of economic rent:  
low (zero or negative) discount rate
8. Maximization of the conservation of marine mammal resources
9. Maintaining free access to exploitation of marine mammal  
resources
10. Maximization of stability of yield
11. Maximization of resilience (latter term not well defined yet)

Table 2. Economic Objectives of Management of Marine Mammals

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objectives which have been identified require the populations to be maintained at a substantial level, and that it is only the most short-term consumptive objectives which can be satisfied by a serious reduction in population sizes.<sup>20</sup> While economical and ecological considerations are important and will be examined in later sections, it is also important to understand the ethical arguments for and against exploitation in order to place the following regulatory and economic sections in proper perspective.

#### B. Ethics and Management

Three main issues are raised concerning the killing of cetaceans: 1) the risk of severe depletion or extinction of a species or stock; 2) the humaneness of hunting techniques; and 3) the morality of exploiting cetaceans. Each issue will be considered in turn.

#### C. Risk of Extinction

Throughout history, man has generally regarded animals as a natural resource capable of providing food and other necessary items. Only within the last several decades have humans recognized their responsibilities to preserve their environment and, in particular, to preserve wildlife. While many species have been protected by this development, controlled exploitation has continued for others. Harvesting of species which are major components of marine ecosystems has caused and will continue to cause major, and only partially predictable, changes in these ecosystems. Our knowledge concerning the complexity, stability, and productivity of marine ecosystems is far from comprehensive. Because the economic, scientific, and ethical needs of future generations are predictable only within extremes, it is reasonable to assume that current management practices should preserve as many options as possible for the future. Therefore, "...the most pressing need...is development of a predictive understanding of the relationship between a population's size and its chances of extinction."<sup>21</sup>

Species of animals that have become extinct in the recent past appear to have had a critical minimum population size, that once gone below, the species could not naturally survive in the wild. Depending on the species, this critical minimum population size may be as high as tens of thousands of individuals, or as low as a few dozen.<sup>22</sup> The case

histories of extinct species suggest that relatively social animals tend to have relatively high critical minimum sizes.<sup>23</sup>

The difficulty is that critical minimum populations can be accurately determined only after a population has dropped below that level. Because it is impossible to maintain sufficient captive reserves of cetaceans, species and stocks must survive in the wild, if at all. On biological grounds alone, it appears that, especially for harvested species, sound management should endeavor to provide a considerable safety margin between stock size and those minimum population sizes that are potentially critical. The degree of uncertainty regarding stock size, critical population size, the effects of cetaceans on marine ecosystems, and the effects of human activities on cetaceans all argue for an increase in that margin of safety.

Beyond biological or ecological reasons for preventing possible extinction, purely ethical considerations may be more persuasive. For many people, human-caused extinction may violate either religious principles or general moral principles concerning the unnecessary destruction of resources otherwise available for future generations. While biological parameters often determine management practices, the risks associated with those practices often have strong and possibly conflicting ethical implications that must be taken into account. In short, all types of values and uses eventually must be taken into account in management decisions.<sup>24</sup>

#### D. Humaneness of Hunting

The humaneness associated with cetacean exploitation is a technological question composed of three factors: 1) the time until death; 2) the amount of pain felt by the animal; and 3) the percentage of animals struck but not landed. Only the last of these factors can be accurately and objectively determined. Additionally, the possible degree of suffering associated with various hunting techniques is largely unknown. While research continues into the humaneness of the various hunting techniques and on the time until death, "(t)he most serious problem in obtaining and comparing such data is the degree of subjectivity involved in deciding the moment of death."<sup>25</sup> Unless new data prove otherwise, the "...explosive harpoon is still the most

reliable and efficient method of killing whales..."<sup>26</sup> However, "...in most cases the present method probably does not approach the requirements of humane slaughter legislation for domestic stock."<sup>27</sup> Needless to say, the question of the humaneness of the techniques used in exploiting cetaceans will continue to be a source of controversy.

#### E. Morality of Killing Cetaceans

The argument has often been advanced that consumptive exploitation of cetaceans is immoral because it destroys intelligent life. Implicit in the argument is the assumption that "intelligent life" is important and should be preserved. In the case of cetaceans, and particularly for dolphins, the reason for this is inextricably tied to the general perceptions of these animals. While precise and factual statements concerning cetacean intelligence are difficult to make, there exists a common and widespread belief that these animals are perceived as exhibiting characteristics humans associate with intelligence. While based more upon emotion than reason, this perception of significant human characteristics in non-human animals has been the basis for an increasing affinity between man and dolphin. As this appreciation of the "...marine brothers of man..."<sup>28</sup> has grown, so, too, has the concern over the morality of killing cetaceans, perhaps reflecting the belief that killing whales and dolphins is akin to the destruction of human life. However, present management schemes simply bypass this ethical question by stating that the socially optimal policy will result from a maximum sustainable harvest of cetaceans. As can be seen from the above statements, their utilitarian approach may be too simplistic, for it ignores non-economic human values. In an attempt to balance utilitarian and non-utilitarian values, it will help to describe the basic ethical costs and benefits associated with harvesting cetaceans.

Due to our present inability to assess the effects of harvesting, it is necessary to consider the potential cost to the harvested populations in the disruption in social behavior, and changes in distribution and abundance. The potential evolutionary effects of these "costs" should, at least, be noted, especially where high consumptive uses occur. Additionally, for many people, it is not easy to overlook the fact that a form of life, perceived to be intelligent, is being destroyed. The presumption is that this destruction inflicts a cost on society.



Benefits that accrue from harvesting must be weighed against these costs. The major use of whale meat is for human food. Anti-whaling groups would argue that this is unnecessary because cetaceans do not provide any product not obtainable from other materials.<sup>29</sup> Furthermore, they argue that whale products are used for trivial purposes. In all fairness, the counterclaim asserts that this consumptive use may be justified if there is no reasonably available alternative source of protein. Additionally, if you are going to take whales for meat, the manufacture of "trivial" products is necessary in order to provide for maximum utilization and economic return.

Realistically then, what appears to be required is a management program capable of balancing ethical costs with particular human benefits resulting from harvesting. Due to the unique characteristics exhibited by whales, dolphins and porpoises and the variability of human perceptions of these animals, it is necessary that this ethical balancing, although difficult, be incorporated into management programs on a species by species and stock by stock basis. This ethical balancing will produce two important effects. First, it will shift the burden of proof from the conserver to the exploiter; and second, it will insure that "needs" and not "preferences" are taken into account. In this way, the question becomes not "why save the whales?", but rather "what justification(s) can there be for destroying them?". Only in this way can human and scientific needs be fulfilled. Additionally, as low and non-consumptive uses of cetaceans increase, these must be recognized as legitimate management objectives and be incorporated in any overall cetacean management scheme.

#### IV. Existing Legal Regimes

##### A. Introduction

The above descriptive material is intended to acquaint the reader with some of the unique characteristics of cetaceans and cetacean fisheries and to introduce some of the necessary considerations that must be taken into account in the selection of objectives for viable cetacean management programs. With this in mind, the remainder of

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this paper will focus primarily on the legal and economic aspects of cetacean management and adopt an interdisciplinary approach in order to answer three critical questions. First, what are the major organizations charged with managing cetaceans and what are their objectives? Second, in light of the above descriptive material, how appropriate are those objectives? Third, what are the needs and opportunities for reform?

## B. The International Whaling Commission

### 1. Structure

Currently, there is only one international organization governing the regulation of whaling -- The International Whaling Commission (IWC). The Commission, established after a series of conferences held between 1944 and 1946, resulted from the 2 December 1946 signing of the International Convention for the Regulation of Whaling.<sup>30</sup> Presently, the IWC consists of nine whaling and fifteen non-whaling states.<sup>31</sup> The nine whaling nations, including the U.S., account for roughly 90 percent of the total world cetacean catch.<sup>32</sup> Additionally, there remain some non-member states and occasional "pirate" operations that also harvest cetaceans.

### 2. Objectives

The Preamble to the Convention establishing the IWC states that the purpose of the Convention (and therefore the IWC) is, "...to provide for the proper conservation of whale stocks, and thus make possible the orderly development of the whaling industry."<sup>33</sup> The Convention was signed at a time when the world faced a serious shortage of raw materials as a result of the recently concluded world war. The fats and oils that a whaling industry could provide were, therefore, much in demand. But the drafters of the Convention were well aware of the pre-war overexploitation of whales that occurred, especially in Antarctic waters. Thus, the Preamble reflects a basic conflict that was consciously written into the Convention -- short-term economic considerations versus long-term regulation and conservation.

### 3. Schedule to the Convention

To accomplish their stated objective, the IWC promulgated regulations that can be amended by a three-fourths majority vote of the

Commission. These regulations constitute the Schedule to the Convention (Schedule, in short). The Schedule is a living document, changing each year.<sup>34</sup> Generally, it provides for: 1) data collection; 2) inspections; 3) efficient treatment of carcasses; 4) size, season, and area quotas; and 5) stock classification and protection.

Article V of the Convention authorizes the Commission to amend provisions of the Schedule for the conservation and utilization of whale resources. Paragraph 3 of this Article allows any IWC member nation to object to a majority decision within 90 days of formal notification of that decision. At this time, any other previously non-objecting member may now file an objection if it desires. Unless objections are withdrawn, the amendment(s) shall not apply to that nation.

#### 4. New Management Procedure

In June of 1974, at the 26th meeting of the IWC, the Commission, in response to continuing pressure of world opinion that considered whale stocks to be inadequately protected, made its strongest and most specific commitment to whale conservation with the adoption of a formal management policy. The New Management Procedure (the Australian Amendment) sought a more ecologically sound basis for the determination of harvest quotas. Each identifiable stock of each species was to be placed into one of three categories: initial, sustained, or protection. The hope was that all stocks would ultimately be managed as sustained stocks. The Commission further sought to replace their old management criterion (that of working toward an optimum level of whale resources) with one that was more scientifically sound. They chose as their new management criterion maximum sustainable yield (MSY). Thus, initial stocks would be those 20 percent or more above MSY; sustained stocks would be those "at or near MSY";<sup>35</sup> and protection stocks would be those more than 10 percent below MSY. Quotas would then be set at 90 percent of MSY for all stocks at or above the level of MSY, and graded linearly from this point towards zero at the boundary with the protection stocks.<sup>36</sup> In other words, commercial whaling would be permitted on both initial and sustained stocks, while no commercial whaling would be permitted on protection stocks. Determinations of the level of allowable commercial whaling will be made,

"...subject to the advice of the Scientific Committee."<sup>37</sup> One of three permanent IWC committees, the Scientific Committee, is charged with reviewing catch and effort data; reviewing and recommending research programs; and recommending to the Commission specific quotas and acceptable rates of stock depletion.<sup>38</sup>

##### 5. Limits to Success

In addition to conflicts of purpose and the potential for member nations to veto IWC regulations, several additional factors apparently limit the success potential of the organization.

First, the IWC has authority only over its members. At present, unregulated whaling by non-IWC nations and various "pirate" operations, even though comprising only 10 percent of the overall catch, threaten particular stocks that are geographically discrete with further depletion and possible extinction.

Second, the IWC is highly species-oriented, primarily confining its activities to large cetaceans. In fact, the IWC's jurisdiction over small cetaceans is unclear. The Convention's Preamble only mentions "whales", not "cetaceans."<sup>39</sup> Only in 1976, at the urging of the Subcommittee on Small Cetaceans, were amendments adopted requiring the collection of catch and effort data on some direct small cetacean fisheries.<sup>40</sup> This collection of information is at a very early stage both inside and outside the IWC. In most cases, little is known about the numbers and distribution of stocks; the identity of discrete stocks; their migratory routes; the intermingling of stocks across national boundaries; their places in their respective ecosystems; and their general biology.<sup>41</sup> Small cetaceans are neither regulated by nor defined within the existing IWC Convention. Therefore, while the IWC may become a reliable and comprehensive source of mortality data, there are not indications that the IWC will assume a more active management role in future dolphin conservation.<sup>42</sup>

The problems associated with a species approach can be seen in the New Management Procedure. The adoption of this policy was a "...deliberate attempt to remove decisions as far as possible from the political arena,"<sup>43</sup> and generally is considered to be one of the strongest and most specific commitments to conservation that the IWC

has undertaken. However, it has substantially increased the number of protected stocks and reduced quotas on many others but, it has, therefore, placed tremendous political pressure directly on the Scientific Committee. For instance, in 1980, the Scientific Committee, under the New Management Procedure, was required to make recommendations to the Commission on the 30 stocks contained in the initial or sustained categories. Even for these stocks, it is possible in only about two-thirds of the cases to make any quantitative statement as to the probable stock size and MSY.<sup>44</sup> Given that stock assessments have been known to differ by as much as 100 percent<sup>45</sup> for some lightly harvested species, and that the Committee has to recommend to the Commission a precise figure for the quota calculation of 90 percent of MSY, at best, quantitative decisions and the resulting management decisions remain uncertain and subject to non-biological considerations. With the present level of knowledge concerning stock assessment and cetacean population dynamics, this required level of accuracy is impossible to obtain. Additionally, the simplistic concept of MSY has been shown to be an inappropriate management goal<sup>46</sup> because it does not take into account the inter-relationships among target species and their relationships to other populations in an ecosystem.

Third, the IWC has only limited powers of monitoring and little or no powers of enforcement. In all fairness, it is difficult to see how international enforcement standards and penalties could have been written into the Convention and still have been acceptable and binding on the states concerned.

Under the present system, each nation's enforcement obligations are of two types: 1) obligations to enforce the Convention and Schedule with respect to its own vessels and citizens; and 2) obligations to make various reports to the IWC to allow international supervision of this enforcement. In addition, since 1972, there has been an international exchange of observers between active whaling nations. These observers have no powers other than to see what goes on and report to the IWC. Overall, the system can best be described as one of international inspection of national enforcement.

### C. The Marine Mammal Protection Act

Having briefly examined the major international regime for the management and conservation of cetaceans, which stresses national enforcement, it is appropriate to review the role played by one of the strongest relevant national pieces of legislation, the Marine Mammal Protection Act.

#### 1. Objectives and Provisions

In the United States, the primary piece of legislation concerned with the conservation and management of cetaceans is the Marine Mammal Protection Act of 1972, 16 USC SS 1361-1407 (hereinafter cited as MMPA). The primary objective of the MMPA is to maintain the health and stability of the marine ecosystem and whenever consistent with this, to obtain and maintain optimum sustainable populations (OSP) of marine mammals.<sup>47</sup> Central to the MMPA are an indefinite moratorium on the taking and importing of marine mammals and their products into the U.S. without permit, and the pre-emption of state management authority over all marine mammals.

Although the MMPA pre-empted state authority, it did establish a mechanism to return that authority as well as federal financial assistance to the states once state programs have received federal approval.<sup>48</sup> The law further provided that: 1) the moratorium could be waived when a population was determined to be at the OSP level; 2) specific native exemptions would be permitted either for subsistence purposes or for the purpose of creating and selling native handicrafts; and 3) permits could be issued during the moratorium for the taking of marine mammals for the purposes of scientific research, public display, and for takings incidental to commercial fishing operations.<sup>49</sup> Furthermore, the impact of the MMPA is felt internationally. Specifically, Section 1371 requires that nations exporting fish products to be the U.S. furnish certification, based upon reasonable proof, that national methods used in taking fish conform to the MMPA standards.<sup>50</sup>

#### 2. Marine Mammal Commission

To carry out the policy and program objectives of the MMPA, the U.S. Congress divided authority for conservation, management, and protection of marine mammals between the Secretaries of Commerce

(National Oceanic and Atmospheric Administration - NOAA) and the Interior (Fish and Wildlife Service) Title II of the Act established the Marine Mammal Commission (MMC) as the agency responsible for reviewing the activities of these two secretariats. The Commission, similar to the Scientific Committee of the IWC, is responsible for:

1) making recommendations to Congress and other Federal agencies to enhance the conservation and protection of marine mammals; 2) reviewing the condition of the stocks; and 3) undertaking or causing to be undertaken specific marine mammal research.<sup>51</sup> Lastly, the MMC has specific national and international policy review and formulation responsibilities.<sup>52</sup>

### 3. Strengths and Limits

Largely as a result of the choice of OSP as a management criterion, the MMPA contributed significantly to the conservation and management of cetaceans. Distinct from the IWC's use of MSY, OSP acknowledges the interactive nature of components in the marine ecosystem. The ecosystem approach attempts to integrate the things that we do with the things that we are learning nature does and tries to get some appreciation of how to make these things compatible. Obviously, the limitations of our knowledge concerning the ecology of the marine ecosystem and the natural history of its inhabitants constrain our ability to conserve and manage all marine mammals. However, the important factor seems to be to place resource exploitation and development within the capacity of species and habitats to sustain themselves. But, the choice of OSP has also led to conflicts with other national and international pieces of legislation.

Nationally, concern with some provisions of the MMPA centers on the question of whether it is, in fact, possible to harvest certain fishery resources at the optimum yield level (as specified under the Fishery Conservation and Management Act of 1976 - FCMA) while, at the same time, allowing the marine mammal populations, which are predators of harvested fish species, to be maintained at or above the OSP level specified in the MMPA. Alaskan officials have argued that if commercial fish species are managed so as to achieve the FCMA goal, the food supply for marine mammals would be reduced so that the goal

of the MMPA could not be achieved. On the other hand, if marine mammal populations were allowed to increase to the OSP goal, the commercial fisheries harvest would be reduced -- arguably conflicting with the goal of the FCMA.<sup>53</sup> This perceived incompatibility may be attributable, in part, to a confusion of scientific and policy questions.<sup>54</sup>

Internationally, the MMPA native exemption provision has meant direct conflict with the IWC over the subsistence taking of bowhead whales by Alaskan Eskimos. While subsequent sections will deal with this problem more fully, the controversy centers around the conflict between preserving an endangered whale species, while at the same time, attempting to satisfy the Eskimo's needs for subsistence and to preserve their culture.

#### D. Politics of Exploitation

It is important to realize that we are still in what can be defined as a pre-agricultural phase in our development of the seas, so that our control over the sea and its resources is mostly limited to the management of human activities. Currently, then, cetacean management consists primarily in managing people, for benefits to cetaceans and humans result only with the abatement of harmful human activities. Therefore, in order to be able to enjoy the benefits cetaceans can provide, increased compliance with regulations must be achieved.

#### E. Compliance Strategies

Attempts to force compliance have been many and varied. One basic strategy has been the threat of imposing trade sanctions to gain agreement on conservation policies. More direct attempts involve the placing of observers aboard vessels actively engaged in harvesting operations. The effectiveness of each method relates directly to a potential offender's attitude toward accepting risk.

##### 1. International Trade Sanctions

In an attempt to place international restrictions on the trade of whale products, the United States, in 1973, hosted an international conference which ultimately drafted the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).<sup>55</sup> The Convention regulates the trade in both live animals and any readily



recognizable part or derivative of a dead animal of species, subspecies, or geographically separate populations listed in three Appendices to the Convention.<sup>56</sup> Administered by the International Union for the Conservation of Nature and Natural Resources (I.U.C.N.), the Convention, as of February, 1981, with the addition of three recent signatories, has 62 member countries.<sup>57</sup> While providing potentially invaluable assistance to the IWC in the enforcement of the Commission's regulations, several problems exist with the administration of CITES-endorsed trade sanctions.

First and foremost, the Convention allows a member country to take a reservation on one or more species.<sup>58</sup> This reservation allows the country to disregard the Convention's listing of the species, thus permitting trade.<sup>59</sup> Japan, one of the three newest signatories, has done just this for nine species.<sup>60</sup>

Second, as a practical matter, in many cases, the detection of whale parts would be practically impossible due to their combination with other compounds. Without accurate catch records, it would also be impossible to determine if the part initially came from an endangered or healthy stock of a particular species. Additionally, whale products from different species, once processed, may look very similar to each other which, for all intents and purposes, makes a determination of whether the product was derived from a listed or non-listed species impossible.

## 2. U.S. Attempts

With the adoption in 1971 of the Pelly Amendment to the Fishermen's Protective Act of 1967,<sup>61</sup> the United States adopted a measure designed to make it economically less attractive for nations to continue depleting living marine resources. The amendment gives the President authority to ban all imports of all fishery products from a foreign country if it is determined that the nationals of that country "...are conducting fishing operations in a manner or under circumstances which diminish the effectiveness of an international fishery conservation program."<sup>62</sup> Furthermore, the amendment does not require that the nation against which the embargo would be imposed be a member of the conservation program it is hindering. The hope was that this would be a means to

exert pressure on non-IWC nations to either join the IWC or at least comply with their regulations. Two instances serve to demonstrate the potential effectiveness of this management tool.

In 1974, the Secretary of Commerce, following a Marine Mammal Commission recommendation, certified to the President that Japanese whaling was diminishing the effectiveness of the IWC.<sup>63</sup> The U.S. threatened to embargo Japanese products (worth over \$100 million a year, or roughly the gross value of Japan's whaling catch)<sup>64</sup> through the invocation of the Pelly Amendment. Although the embargo was never invoked, it was felt that the threat probably increased Japanese cooperation at the 1974 IWC meeting.

A similar situation occurred early in 1977. At that time, the chairman of the Marine Mammal Commission again drafted a letter to the Secretary of Commerce which, in essence, stated that whaling activities of Peru and South Korea, both non-members of the IWC, were diminishing its effectiveness. The chairman recommended that this be certified to the President and consideration be given to the "...potential prohibition of importation of Peruvian and Korean fish products."<sup>65</sup> Subsequently, in 1979, both Peru and Korea joined the IWC. In late 1980, discussions within the State Department were underway concerning the possible certification of Taiwan (non-IWC)<sup>66</sup> and again South Korea (IWC member)<sup>67</sup> for their respective activities diminishing IWC effectiveness. Each situation was politically sensitive and the State Department moved slowly and cautiously. Subsequently, South Korea dropped their objection to an IWC decision and this removed the possibility of imposed trade sanctions, while the People's Republic of China joined the IWC (perhaps so that Taiwan couldn't)<sup>68</sup> thereby further politicizing and delaying an imposition of sanctions against Taiwan. As can be seen from the above examples, the Pelly Amendment can prove an effective deterrent, but political considerations dictate its judicious use.

### 3. Compliance at Sea

Compliance with regulations is often difficult to determine for operations conducted at sea. Similar to fin fisheries, the major enforcement problems occur with respect to specific catch quotas and the protection of particular stocks of species. While the international

observer scheme adopted by the IWC in 1972 has reduced the number of reported infractions from direct fisheries, the detection of violations by the fisheries that incidentally catch cetaceans is far more. In both the tuna and salmon gillnet fisheries, cetaceans caught are discarded at sea, making enforcement difficult. Experience with the placing of observers on tuna boats has not proven completely effective. In fact, in a lawsuit filed on October 20, 1980, (*Balelo v. Klutzinck*), 11 tuna vessel captains challenged the constitutionality of regulations forcing tuna boat operators to accommodate federal observers who later may present evidence against them.<sup>69</sup> Presently on appeal, the case went against the government when the judge found the government's observer program in violation of both the Marine Mammal Protection Act and the Fourth Amendment of the Constitution.<sup>70</sup> In part, the judge's opinion stated that, "...the protection of marine mammals from careless depredation is an important societal value as manifested by the Marine Mammal Protection Act, but it cannot be furthered by the violation of the Fourth Amendment rights of fishermen."<sup>71</sup> Current attempts to reduce incidental losses and simultaneously increase the fishermen's efficiency have centered around the development of new equipment and techniques. Presently, it is not clear that such technological solutions are either possible or economically feasible for many of the fisheries with high incidental catches of cetaceans.

#### F. Legal Alternatives: Law of the Sea

The proposed Law of the Sea treaty has been offered as one potential legal alternative aiding in the compliance with regulations and the conservation of whale stocks. As negotiations move towards a conclusion, it is apparent that actions that emerge from these consultations may significantly affect the IWC. Consequently, it becomes necessary to, at least cursorily, examine some of the relevant provisions.

Article 65 in the most recent text (10<sup>th</sup> session August 29, 1980) of the United Nations Conference on the Law of the Sea is the single article directly dealing with marine mammal management. It states:

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(n)othing in this Part restricts the right of a coastal State or the competence of an international organization, as appropriate to prohibit, limit or regulate the exploitation of marine mammals more strictly than provided for in this Part. States shall co-operate with a view to the conservation of marine mammals and in the case of cetaceans shall in particular work through the appropriate international organizations for their conservation, management and study.<sup>72</sup>

This revision of a previously drafted article apparently ends a debate between coastal states and international authorities over the nature and extent of territorial jurisdiction. At a minimum, Article 65 virtually guarantees that coastal states would have to apply international conservation standards to coastal marine mammal populations. This is important because many populations of cetaceans either reside in or frequently pass through areas under coastal state jurisdiction. Furthermore, the article, with its reference to "cetaceans" and not "whales" could conceivably allow the "appropriate international organization" to, at a minimum, "limit or regulate" the incidental catch of all cetaceans, including dolphins and porpoises, regardless of whether that catch is demonstrably threatening a particular species or stock or not. Additionally, no mention is made of the duty of that organization to provide only for the high-consumptive uses of cetaceans. While on the surface, conservationists seem to have potentially won a significant battle, this may not be the case, because Article 65 may lead to conflicts with Article 64.

Article 64 deals with highly migratory species as defined in Annex I of the treaty. Annex I lists most families of toothed whales (the one familial exception is for river dolphins) and all the families of baleen whales as highly migratory species.<sup>73</sup> Article 64 directs coastal states to engage in direct cooperation towards, "...ensuring conservation and promoting the objective of optimum utilization..."<sup>74</sup> Conservation, in the context of this Treaty, closely relates to management by MSY. This duty applies only to nations that harvest that particular resource "...throughout the region, both within and beyond the exclusive economic zone"<sup>75</sup> (an area beyond and adjacent to the territorial sea, not to exceed 200 nautical miles, granting specific rights and jurisdictions to both coastal states and foreign nations).

Articles 64 and 65, taken together, present several problems. There is no mention of formal sanctions for failure to cooperate or to negotiate in good faith; no specific mention of a duty to reduce the incidental catch of cetaceans; and no clear statement as to whether a coastal state is under a duty to achieve optimum utilization or not. Furthermore, the reference in Article 65 to work through the appropriate international organization, directly places increased pressure on the IWC to achieve positive results, but obviously without any increase in authority. Ultimately, all this may amount to nothing, for nations cannot be bound by a treaty they don't sign or ratify. However, cetaceans are a natural resource that exists at potentially exploitable levels. In order to be able to fully make use of both low and high consumptive uses of a cetacean resource, adequate resource protection must be available, and that entails removing some of the present legal ambiguities.

## V. Economic Evaluation

### A. Introduction

Previous sections in this paper have described the major international and national legal frameworks characterizing present cetacean management practices. But as nations persist in the harvesting of cetaceans and stock sizes decrease, biological and ethical considerations become of secondary importance. Of primary consideration is the economics of the fishery. While the maximization of current net revenue is generally thought to be the dominant economic goal of the whaling industry, there are, in fact, several possible alternative economic goals as seen in Table 2. Each economic goal will have its own biological, legal, or political trade-offs. This section will be concerned with the identification of these trade-offs to be used as a guide to help determine how far a company or nation will deplete a resource in pursuit of economic efficiency.

### B. Goals

Three realistic economic goals of the whaling industry would be:  
1) the maximization of product yield, equaling MSY by weight; 2) the

maximization of net revenue (annual rent); and 3) the maximization of the present value of discounted net revenues (present net worth). Less important considerations could include: 1) employment; 2) management costs; and 3) industry stability.

#### 1. Maximizing Product Yield

Traditionally, MSY for whales has been calculated to yield the maximum "number" of whales that may be harvested. As seen in the first major economic goal, an alternative exists -- that of MSY by "weight." The whaling industry is interested in the volume of whale products. Volume is a function of weight rather than number. As a population is depleted, the average size of the individuals caught also decreases. When this happens, the yield obtainable at an MSY-weight level, "...is inevitably somewhat higher than that giving the maximum by number."<sup>76</sup> Therefore, the whaling industry should prefer quotas set by MSY-weight. But they do not. Their principle objection centers on the fact that the MSY-weight criterion requires stock levels to be higher ( 10%) than the level generating MSY. Thus, the differences in yield...are so small that the most important, practical advantage of a change to using MSY level by weight as a target could well be the additional safety factor against accidental overexploitation given by the higher population level.<sup>77</sup> In other words, the industry appears to be more concerned with maintaining present catch levels than with any anticipated gains from future catches and, consequently, opposes the MSY-weight criterion. However, economists have attacked this criterion for it rarely maximizes revenue due to the fact that the concept of MSY fails to take into account the relationship between stock size and the marginal cost of whaling, which increases as stock size decreases, i.e., it is easier and, therefore, less expensive to harvest a given number of cetaceans from a large population than from a small population.

#### 2. Maximizing Net Revenue

An alternative economic goal -- maximizing net revenue (annual rent) -- takes account of this relationship. But, precisely because it incorporates this relationship, the stock level generated through the use of this approach will also be above the MSY stock level. However,

the most serious criticism of this stock level option concerns its failure to effectively deal with the trade-off between present and future consumption. The most common method used to accomplish this time-independent accrual of benefits is through discounting. This is done by reducing the value of future revenues in consideration of the time value of money. The rate at which this is done is called the annual discount rate. In the annual rent model, this rate is assumed to be zero; meaning that ten whales taken today have the same value as ten whales taken five years from now. However, it is probable that whaling companies use a positive discount rate; meaning that ten whales taken today have a higher value than ten whales taken five years from now. It should be obvious that the choice of a discount rate could directly affect the rate at which a stock is depleted. Since the third realistic economic goal also utilizes discounting, a discussion of the relationship between the choice of a discount rate and stock size will be delayed.

### 3. Maximizing Present Value

The third of the major economic goals -- maximizing present value -- only slightly changes the annual rent option. This goal assumes the use of a positive discount rate with the hope of making a more realistic assessment of industry practices. This use of a positive discount rate means that stock levels calculated for the maximization of present value will be below both MSY and sustainable annual rent stock levels. Dr. Colin Clark contends that high rates of discount have the effect of causing biological overexploitation whenever it is commercially feasible.<sup>78</sup> Thus, the maximized present value stock level is sensitive to changes in the discount rate. This tendency also means that sustainable revenue -- revenue derived from sustainable yield management at the desired stock level -- is also sensitive to changes in the discount rate. In other words, the higher the discount rate, the lower the stock level allowed.

#### C. Areas for Concern

Several sources of concern are inherent in a model maximizing present value. The model apparently assumes that only a single species will be harvested when, in fact, whalers generally hunt several species simultaneously. This complication of the model assumption means that

the marginal cost of harvesting that single species rises more slowly than anticipated and, therefore, allows further depletions in the maximized present value stock level.

Economic models accurately reflecting cetacean biology remain very uncertain. Depending on the choice of a discount rate, this model could allow for rather deep cuts in the stock level. It is precisely at this time of reduced stock levels that accurate biological information is needed. However, due to the potential reduction in revenue while stocks rebuild, it is unlikely that increased research funds would be made available. What the scenario may be then is one where whalers seek to take as much as they can now, for there may not be an economic future to the fishery.

#### D. The Choice of a Discount Rate

The use of discounting is based upon two assumptions. Because the choice of a discount rate can have serious consequences for the whaler and the whale alike, it is necessary to examine these assumptions and their direct applicability to cetaceans.

The first of these assumptions involves the relative value of present versus future consumption. It is assumed that both individual consumers and those involved with whaling companies value present consumption more than future consumption.<sup>79</sup> This derives partly from the perception that regardless of actions that are taken to ensure future benefits, other actions may occur that can prevent the realization of those benefits. If this is true, the discount rate would rise as the perceived risks involved with whaling rise.

It is not necessary to look very far to identify potential risks for whalers. Unregulated whaling, market closures, and uncertain quota levels are typical concerns of the industry. These factors would support the choice of a high discount rate, i.e., a rate greater than the maximum net recruitment rate.

The validity of this present time preference of consumption apparently rests on an irrational preference for immediate goods without accurately reflecting on future value.<sup>80</sup> As the supply of whale products decreases without an equal drop in demand, it is reasonable to assume that prices will increase. The recreational and aesthetic values



derived from cetaceans are also increasing. These low and non-consumptive uses must also be considered, because they will directly affect the potential value of the resource. In such a situation of newly evolving uses directly conflicting with established ones, the use of discounting must be approached cautiously due to the potential undervaluing of these emerging uses.

The second assumption concerning discounting involves the rate of return on investments. Money invested in the whaling industry presumably could be invested elsewhere. Because of this, it can be assumed that investors are seeking at least a normal return on their money. Due to the risks involved with whaling, investors must compare the rate of return from whaling investments with return rates from other high risk enterprises in order to ascertain the appropriateness of their investment. Conservation for future harvests will occur only if the value of these future harvests exceeds the present value of investments in alternative high risk enterprises. The uncertainty of future harvest quotas places a greater emphasis on present consumption creating a bias against present conservation measures designed to insure a sustainable resource. Indeed, uncertainty about whale biology appears to increase, rather than reduce, pressures for exploitation. Discount rates would, therefore, be set to equal the market rate of return to insure appropriate revenue. Because of the level of depletion allowed under this scheme and the observed slow recruitment rates for cetaceans, the applicability of discounting with regard to cetacean management appears risky.

Governments as well as whaling companies may adopt the use of high discount rates as a way to increase whaling revenues. In so doing, political expediency then dictates actions that may not be in the best long-term interest of the people represented. Practically, high discount rates have contributed to continued stock depletion even in the Antarctic where since 1963, the major IWC nations have divided baleen whales quotas into national property rights.<sup>81</sup> Thus, even the imposition of some system of property rights may be subverted by political and economic forces arguing for the use of high discount rates. While it is obvious that further comprehensive and sophisticated economic

analysis is required, the inescapable conclusion is that cetacean conservation must be regarded as the primary management objective, for without conservation, the industry and ultimately the whales will be the losers.

## VI. Cetacean Management in Practice - The Bowhead Whale

Before concluding with a general analysis of cetacean management practices, a brief presentation of the problems created by one endangered species, the bowhead whale, will be presented for it illustrates many of the inherent problems in the management of cetaceans.

The subsistence take of bowhead whales by Eskimos is an action that has been specifically banned by the IWC since 1977. Prior to this date, Eskimo subsistence whaling had occurred for nearly one hundred years. However, new questions concerning the estimated numbers of bowhead whales remaining in the Bering Sea rekindled an old problem. What is at stake is the survival of a once abundant, widely distributed whale species, and of an ancient, highly specialized human civilization.<sup>82</sup>

In 1979, the Carter administration determined that Eskimo nationals should be allowed to continue their subsistence catch of bowhead whales as provided for in the MMPA. This decision was in opposition to the IWC's Scientific Committee's recommendation that, on biological ground, exploitation of this species must cease.<sup>83</sup> Despite the fact that as the Eskimos were modernizing their hunting techniques and there had been a rise in the percent of whales that were struck but subsequently lost, the United States allowed harvesting to continue by distinguishing between subsistence whaling and commercial whaling based upon MMPA provisions.<sup>84</sup> In so doing, the United States not only directly challenged the IWC's authority to regulate whaling but also abandoned its commitment to both a moratorium on whaling and the acceptance of collective scientific judgement. Politics apparently played a substantial role in this decision based on reports that the MMPA was passed by Congress only after the Alaskan lobby had been assured that the native exemption provision would not be dropped.<sup>85</sup> The dilemma the U.S. faced forced them to choose between being the forerunner of whale

conservation and being a champion of human rights. The U.S. hesitated to file an objection to the IWC recommendation because it would have compromised their position on both issues. Instead, the U.S. chose to fight the recommendation. It worked.

The situation has changed greatly in the years since 1977. The IWC, in 1979, backed off from their zero quota and tentatively accepted the U.S. position of establishing bowhead whale catch quotas. This decision may have made political sense, for the IWC badly needed the support of the U.S. to be effective, but the decision made no sense on scientific grounds because the bowhead was and is the single most endangered cetacean species. The U.S., in trying to regain some lost prestige, did not impose quotas on the Eskimos which had not worked previously, but on March 26, 1981, concluded an arrangement with the Alaskan Eskimo Whaling Commission (AEWC) for combined management of the bowhead whale hunts for 1981 and 1982.<sup>86</sup> In an attempt to reduce the percent of animals lost after striking, these hunts will return to the use of traditional hunting techniques. Although painstakingly slow, progress does appear to be being made; but the future of an endangered species -- the bowhead whale -- and an endangered culture -- the Alaskan Eskimo -- remains, at best, uncertain. Certainly, political, cultural, and conservation needs can all be met, but doing so will require the scholarly inputs of scientists in all three areas.

## VII. Discussion

From the preceding material, it is apparent that certain features common to both national and international cetacean conservation and regulatory efforts handicap their effectiveness. Perhaps the most basic question concerns the basis for and the extent of a regulatory body's powers to control certain activities. The current legal status of cetaceans, as a common property resource, is considered to be *res nullius*, i.e., owned by no one but capable of being appropriated by the first taker. As such, the effectiveness of control depends on the extent to which states are willing to yield authority to international controls. Once states have invested in the harvesting of such a

common property resource, it is in each state's economic interest to protect against encroachment by other states. The product of this individual pursuit of wealth is the eventual destruction of the resource producing what Garrett Hardin has called the "tragedy of the commons."<sup>87</sup> Under this scenario, a rational maximizer of utility will exploit to the maximum extent possible unless either unanimous agreement or coercive enforcement are employed to check this exploitation. This "tragedy" results from the predominance of short-term economic objectives that are fundamental to the nature of our society. In this respect, competing nations act simply as spokesmen for domestic economic interests, and hence there are no technical solutions, only political ones.<sup>88</sup> To this end, viewing cetaceans as part of the common heritage of mankind may help. Under this concept, a natural asset is owned by everyone and is not subject to taking except with the permission of a designated authority. By extending this approach to cetaceans, populations would be subject to international control wherever they are found. This approach in combination with the proposed Article 65 of the Law of the Sea conference, would extend jurisdiction and provide, that at a minimum, coastal states must apply international conservation standards even to coastal populations. Since many species of large and small cetaceans that are currently harvested occur within what would ordinarily be considered coastal state jurisdiction (within 200 miles), this extension of international control would significantly contribute toward conservation efforts. Obviously then, the choice of international standards and their enforcement becomes critical.

Many of the nations currently exploiting cetacean populations lack any domestic environmental pressure to counter their interest in short-term economic exploitation. Therefore, any pressure to be responsive to international environmental problems must come from the outside and, naturally, will engender national defensiveness. While the threats of imposed trade sanctions have helped to increase national compliance, they do not attack the heart of the problem -- the lack of domestic support for environmental concerns. It is not sufficient to seek changes only at the international level. Political changes on the

national level that increase accessibility for environmental concerns are required. The significance of this accessibility on international events can be seen from the recent amendment to the Fishery Conservation and Management Act requiring that nations found to be acting against an international fisheries agreement be excluded from fishing within the U.S. exclusive economic zone. Therefore, to be effective, any system of enforcement must recognize that the foundation of cetacean regulation is a combination of economic and political power. In so doing, this also recognizes that non-state participants contribute significantly to the operation of international law, especially those sectors that address environmental concerns.

#### VIII. Desirable Reforms

In addition to the specific considerations mentioned in each of the previous sections, more general topics need to be addressed. Under present economic considerations, resource depletion and environmental disruption are, at best, only externalities that distort the more immediate goal of production and exchange. Defining some desirable state and optimal future use of these "natural" resources requires the application of social as well as biological and economic criteria. What is required is a new approach. What is now proposed is an ecosystem approach considering the long-term conservation of the ecosystem as the primary goal. This ecological approach puts the needs of the biological world first. Since these needs are not encompassed by economic or national interests, this approach relies upon a legal and political structure for protection and control. Thus, present demands are balanced against those of the future and shift the burden of proof from the consumer to the exploiter. The basic intent of the proposed approach is to address the existing imbalance between economic and environmental considerations in decision-making and is aimed at placing resource exploitation and development within the capacity of species and habitats to sustain themselves.

First, the use of ecosystem approach for conservation and management as adopted in the MMPA must be expanded. For cetaceans, this

means that increased research in natural history, ecology, behavior, and economics are just as important as population dynamics and stock assessment. Not only will efforts in these areas help us to understand the numbers we already possess, but it will also help us to better interpret the fishery resource statistics we possess and, therefore, provide a more coordinated approach to the utilization of both resources.

Second, government accessibility to non-economic interests should be increased. Excluding the U.S., many nations seem to have few, if any, opportunities for public access. Legislation facilitating such access for public-interest decisions is one simple remedy to this situation. At a minimum, public access to information should be increased. Aside from increasing bureaucratic accountability, this wider accessibility will allow for new and innovative thinking from a wider constituency to be heard and evaluated. This would include a re-examination of the conflict in interests between long-term conservation and short-term economics gains.

Third, wider national adoption and utilization of sanction-type tools, when combined with an expanded role for non-state organizations, will provide for increased enforcement without relying purely on international compliance. To do this, non-state participants must bridge the economic-ecological gap by not only resolving specific problems but also by doing so in ways that contribute to constructive changes in economic and political systems. This requires that while attempting as much as possible to live lives reflecting their visions, ecologists must also develop the technical and political capabilities to be both creditable and challenging. Additionally, they must relate constructively to decision-makers without becoming absorbed by them. The organizations themselves must develop effective structures to achieve goals on both the governmental and popular levels.

Fourth, conflicting values generated by conservation and consumption for survival must be balanced. This does not require a rigid hierarchy. Rather, simply increasing the weight given to cultural diversity and need in the allocation of sustainable uses should suffice. This would allow for traditional consumption to occur, provided it is sustainable and essential. However, nonconsumptive uses should be

encouraged, even if it requires changing tradition. Priority is then given to sustainable noncommercial subsistence use and nonessential consumption reflecting the exploitative industries' uses are reduced.

Finally, decisions concerning the allowable uses of a cetacean resource should be based upon scientific findings. Increases in exploitation should be allowed only when scientific justification exists. In so doing, both raw data and reports should be submitted by scientists and industry representatives alike with the aim of constructing an independent and authoritative data base. In effect, this system recognizes that scientific certainty lags behind economic pressures, so that the only safe course, for conservation purposes, is to control exploitation in advance.

In specifically advocating an ecological approach to conservation and management of natural resources, there is the recognition that,

(t)he environment is not just one more factor to be considered along with dozens of others in making social and economic decisions. The environment is not a crisis or a problem at all. Rather it is the context in which all crises and problems have to be analyzed and judged.<sup>89</sup>

## IX. Conclusion

The ethical, biological, economic, and legal problems of cetacean management are interconnected in a manner that prevents an effective single discipline analysis. But whales and whaling are only the most visible part of a much larger problem. Aside from demonstrating the imbalance between economic and ecological considerations, the conservation and management problems presented by cetaceans clearly point to the difficulties inherent in integrating human economic and political systems in a limited global environment. These are the more important issues to address, for only by confronting the more basic economic and political causes of these problems will lasting solutions be achieved. To that end, an interdisciplinary approach is mandatory.

The general approach proposed here recognizes the essential role played by the law and lawyers in resolving environmental crises. In so doing, individually and collectively, their responsibilities are unique.

But, if law is to contribute to the future, its function must be transformed from one that largely follows and facilitates economic processes to one that leads and initiates democratic decision-making. Opening the decision-making process is the first step.

Lastly, while the thoughts presented may seem idealistic and abstract, it is only necessary to consider the gains that have occurred within the last decade in all environmental areas to see that these ideas are only extensions of existing philosophies. For cetaceans, substantially more protection exists now than at any previous time. It is important to remember that ideology precedes expertise. Therefore, while conflicts involving cetaceans will continue, only by confronting the basic economic and political causes that generate these conflicts can lasting solutions for the conservation, management and protection of natural resources be achieved.

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