ADAPTIVE MANAGEMENT OF MARINE MAMMALS: ACCENTUATING THE POSITIVE

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Introduction

The recent history of marine mammal management includes examples where conflict rather than cooperation characterizes the discourse. One cause of the conflict appears to be the tendency toward globalizing (or progressively de-localizing) the management regimes, with a result that many actors peripheral to resource users' concerns come to play a role in management decision-making. This has the result of greatly increasing the politicization of the management process without increasing the sustainability of the resource user - resource stock interdependency that has come to be seen as an important conservation principle.

Today it is increasingly recognized that community-based fishery and wildlife users in many areas of the world have developed systems of using these local resources on a sustainable basis (e.g. NRC 1986; Berkes *et al.* 1989; Ostrom 1990; Ruddle and Johannes 1990). In many cases this sustainable use takes place despite the introduction of, e.g., modern technology and the community's commercial integration with the world economy (e.g. Dyer and McGoodwin 1994).

This paper will examine the management and use of certain marine mammals in the coastal zone or nearshore areas in the northern regions, where for many years the traditional use and commercial trade of marine mammals has sustained the health and vitality of both aboriginal and non-aboriginal communities and their distinctive cultures. In these regions there exist successful management and conservation programs operating with and without government (or other outside) involvement.

In the discussion that follows, two intergovernmental marine mammal management regimes will be briefly described and their performance analyzed. These two management bodies are the International Whaling Commission (IWC) and the International Agreement on the Conservation of Polar Bears (abbreviated to the Polar Bear Agreement, or PBA).

In marked contrast to the highly polarized and conflict-generating nature of debates that characterizes the IWC management style, the PBA operates with a high degree of consensus and an almost total absence of conflict between governments and user groups. One very important difference between these two management regimes is the different understanding of the role of people in wildlife and fisheries management, in which the reactionary position exemplifying the whaling regime is strongly contrasted with the progressive view represented in the polar bear regime.

New Directions in Wildlife Management

The role of people. It appears to be increasingly understood that people are indeed part of natural ecosystems. One result of the increasing support for a 'man in the biosphere' orientation to the environment is the growing recognition that people, indeed resource users, may play a *positive* role in environmental affairs: that among the various stakeholders with concern and useful knowledge about wildlife, people *using* the wildlife are an indispensable part of rational conservation strategies (e.g. McNeely and Pitt 1985; Gadgil *et al*. 1993; Freeman and Kreuter 1994). The term conservation does imply wise [sustainable] use, and within many traditional societies the means to ensure this wise use is encoded within the cultural norms and social institutions that have evolved over time.

Indeed, the long term persistence of human populations and the biological resources to sustain them (even where available technology is capable of exhausting the resource pool) provides empirical support for the notion that people dependent upon their local resources are generally knowledgable about and responsible toward the limits of sustainability (Dyer and McGoodwin 1994; Young *et al*. 1994).

Though such understanding is commonplace among scientists and managers familiar with non-industrial societies around the world, it may be unknown and contrary to the experience of those scientists and managers in the western industrial world who work and remain intellectually within their own cultural milieu (Gadgil, in Berkes 1989). It is especially unfamiliar to those who utilize orthodox management models developed in ignorance of alternative adaptive systems, a common failing that results from the narrow scientific and professional training still provided to many wildlife and fisheries managers today.

Ethical concerns. A more humanistic dimension has begun to be introduced into living resources' management decisions as a result of both the general public and the local users of these resources becoming increasingly involved in management discussions.

The urban public, which appreciates wildlife due to its emotional and mediagenic appeal coupled with a greater generalized concern about "the environment", expresses these concerns through support of campaigns mounted by various environmental and animal protection organizations. In the case of various charismatic or mediagenic species that include, more especially, seals and whales, such campaigns generally enjoy widespread support. As a consequence of the often negative impacts such urban-based activism has upon the livelihood and health of wildlife users in rural areas, these user-groups themselves have come to assume a more politically-aware role in

order to safeguard their vital interests in the resources and in related environmental affairs.

Among wildlife users, professional hunters also have ethical concerns about the animals they hunt. In the case of whalers and sealers for example, these concerns range from the purely pragmatic, viz., that the kill be clean and the meat handled properly, to deeper concerns about respect for animal life and maintenance of traditional relationships between, e.g., Inuit hunters and the animals they hunt (Freeman *et al*. 1992; Lynge 1992) or various religious practices to insure the peaceful repose of the dead animal's soul, as practised, e.g., by whalers in Japan today (Akimichi *et al*. 1988:53-65; Higuchi 1992).

Further related to these widespread ethical concerns among users, it can be noted that considerable research has been carried out by governments and whalers' organizations during the past decade to develop more humane killing methods in both commercial (e.g. IWC 1992a; IWC 1993a) and aboriginal whale fisheries (IWC 1992b; IWC 1993b). Ethical issues certainly do have a place in wildlife management (e.g. Causey 1989; Jonsson 1992), but it is important to stress that harvesters as well as those who oppose the hunts, are aware of, and seek to address, these concerns in their various ways.

The issue of equity. The importance of equity has been recognized in recent discussions about rational wildlife management. For example, the World Conservation Union recognizing that the social and economic benefits from sustainable wildlife use may provide powerful incentives to conserve wildlife, recommends that the people most directly involved should receive a fair share of the benefits derived from utilizing wildlife resources. Indeed, to further these conservation-enhancing tendencies it is also recommended that wildlife users should enjoy enhanced economic returns and profit from this use (IUCN 1993).

In the past it was common for wildlife users to be largely excluded from any meaningful role in management. More recently however, where problems have arisen over questions of conservation and equitable allocation, many user groups have sought to become partners in wildlife management. This is particularly the case in the northern regions, where marine mammals continue to have significant cultural, socio-economic and nutritional importance, and where the activities of animal protection organizations have been so socially destructive (e.g., Young 1989; Wenzel 1992; Lynge 1993).

For indigenous wildlife users in particular, recent goals include an insistence that users' traditional knowledge about local ecological systems and a more culturally-appropriate management system should be in operation (Freeman and Carbyn

1988; IUCN/UNEP/WWF 1991; Inglis 1993; Keith and Saunders 1989; Williams and Baines 1993).

New partnerships. One method that northern wildlife users have embraced in their attempts to achieve a more significant role in management has been by entering into co-management agreements whereby the state and the user-groups jointly assume responsibility for research and monitoring, and for developing and implementing management plans. There are now many successful examples of co-management in northern North America that involve joint management of e.g., whales, bears, caribou, wildfowl, and various economically-important fish species (e.g., Osherenko 1988; Pinkerton 1989; Usher 1987, 1993).

In the Canadian Arctic where, as a result of negotiated land claim settlements, Inuit-controlled public governments exist, local users are now legally and constitutionally empowered to assume co-equal responsibilities in the management of wildlife resources (see e.g., Binder and Hanbige 1993 for a discussion of co-management in the Western Canadian Arctic). In some cases, sole management (rather than co-management) become the responsibility of a local community alone (e.g. McDonald and Fleming 1993). As a reflection of the progressive nature of these management arrangements, in all of these Canadian examples, the commercial sale of wildlife products is a legal and constitutional right, and indeed is promoted by government as a beneficial and necessary component of regional economic development programmes (Freeman 1993).

Primary environmental care. A recent human-centred view of how to manage the environment, is captured in the term "Primary Environmental Care" (PEC) and advanced in the IUCN/WWF/UNEP *World Conservation Strategy*. For PEC to take place three basic goal-oriented principles require to be satisfied:

1. Ensure that basic human needs are satisfied;

2. Protect the local environment to insure future production;

3. Empower local communities and community-based institutions.

Resource use or management arrangements that satisfying these three principles tend to be community-based, small in nature and impact, and utilize local communities' knowledge and dependence upon local environmental resources; importantly such arrangements may provide the best assurance that resources will be used sustainably (Young *et al.* 1994).

Dated Doctrines and Intellectual Inertia

Despite the advances being made in instituting co-management of marine mammals, science-based state managers continue to play a role in the management process. However, many managers and policy makers today learned from texts and teachers proclaiming such 1960's paradigms as, e.g. "the limits to growth", "the tragedy of the commons", and the idea of prehistoric or protohistoric human over-exploitation of the early megafauna ("the Pleistocene overkill" hypothesis). These ideas, either implicitly or explicitly emphasizing the inherent imprudence and stupidity of *Homo sapiens,* are now generally understood to be variously flawed in their formulation, predictive value and hence policy implications. The widespread acceptance of one of these questionable formulations, namely, "The tragedy of the commons" essay (Hardin 1968), is particularly relevant to discussions about marine mammals.

The "tragedy of the commons". Hardin's thesis was deficient on four main counts: (1) he misunderstood the nature of the historic commons upon which the thesis is based; (2) he confused common property with open access to resources; (3) he ignored the existence of, or lessons to be learned from, successful communal management practices; and (4), he failed to consider the importance of kinship and co-residence in effecting sustainable resource use.

Unfortunately none of these deficiencies have prevented Hardin's model from continuing to be uncritically accepted today by many scientists and managers trained within a narrowly informed scientific tradition, even though inadequacies of the tragedy of the commons model were documented more than a decade ago (e.g., Stillman 1975; Klee 1980; Smith 1981; Cox 1985). Furthermore, for the lay public and politicians, where even less incentive exists to possess current knowledge of scientific matters, the errors contained in the tragedy of the commons parable will remain undetected and uncorrected, yet likely influential, for many years to come.

Hardin believed that the solution to the commons dilemma was either private ownership or state/government control over resource use. However, it is now known that many sustainable resource management systems can exist in the absence of state management and private ownership. In such adaptive systems "ownership" of the resource and responsibility for controlling its use resides in local-level systems of community (communal) management (e.g. Berkes 1989; Berkes *et al.* 1989; Feeny *et al.* 1990; Freeman *et al.* 1991; Dyer and McGoodwin 1994). Where such customary systems fail to maintain sustainable use, the cause is often traceable to a breakdown in the local-level social and cultural institutions that formerly insured sustainability, and which, from a policy perspective, should be recognized as

providing the most pragmatic (i.e. cost-effective and enforceable) means for re-establishing sustainable and equitable resource use.

Glorifying the pristine. A common perspective among those concerned about current marine mammal use is one that appears to believe that returning depleted stocks to levels thought to approximate their pre-exploitation, or pristine, level is highly desireable. In fact, such historic population levels are unknown and unknowable with any degree of certainty; even if they were known, the environmental circumstances that favoured such community composition in the past likely no longer exists today.

It is therefore highly questionable whether, in reality, it would be possible to recreate the "pristine". Policies and actions directed to saving a remnant population of a particular species likely causes no ecological harm (apart from the effects that diverting resources from some more pressing environmental issue may occasion; see Brownell *et al.* 1988). However, to argue that a regional population of non-endangered whales say, numbering in the tens or hundreds of thousands would, if allowed to increase to several times that number, somehow create a "better" state of the environment, cannot be justified on scientific grounds.

The International Whaling Regime.

Thirty-eight countries have signed the 1946 International Convention for the Regulation of Whaling (ICRW) which gives them membership in the International Whaling Commission (IWC). The purpose of the IWC, as laid down in its founding charter, is to conserve whales in order to allow "the orderly development of the whaling industry" (ICRW, Preamble); decisions taken to accomplish this goal are to be informed "by the best scientific advice" (ICRW, Article V, para. 2) and are "to take into account the needs and concerns of the users and producers of whale products" (ICRW, Article V, para 2(b)). These articles in the ICRW remain in force today, despite various protective measures having been adopted over the years (see Note 1).

Equity and non-equity in the whaling regime. Under the existing IWC financial arrangements, whaling countries are assessed higher annual membership dues than are non-whaling countries. Thus the six whaling nations remaining in the IWC constituted 16% of the organization's membership, yet contributed 35% of operating revenues in 1992-3.

Moreover, as a basic membership in IWC [in 1993] costs £12,400 [$18,500], membership dues can constitute a small part of the financial contribution a country may provide to the organization if any serious research on whales is being carried

out. For example, the bowhead whale programme in Alaska costs about $1 million per year, and more costly programmes (in absolute financial terms or as a proportion of national science budgets or GNP for example) are carried out in the North Atlantic region by the Faroe Islands, Greenland, Iceland and Norway. In the Antarctic, where it costs about $1.2 million to operate a single sighting vessel during the summer survey season, the logistical costs for research are obviously considerable.

The IWC Antarctic whale research programme (the so-called International Decade of Cetacean Research, or IDCR) is now approaching the end of its second decade, during which time the ships, crews and logistic costs have been overwhelmingly borne by one country [Japan] on behalf of the IWC. In addition to this particular cost, a far more comprehensive Japanese research programme on Antarctic minke whales (which recovers much of its $23 million cost from the sale of edible by-product) requires more than $2 million each year as a subsidy from the government of Japan (Ward 1993). These two single-nation research programmes constitute virtually the entire "IWC" programme on whales in the Southern Oceans' region.

The question of inequity however, does not merely relate to the unequal financial contributions made by different members to the IWC. Inequities also exist in regard to the very different returns received from such expenditures. As mentioned above, the United States makes a serious contribution to scientific knowledge about the bowhead whale; it also regularly receives approval from IWC to take the number of bowhead required to satisfy U.S. whaling communities' needs (assessed as 43 bowheads per year in 1992 and 1993, rising to 51 per year from 1995-98).

Greenland also contributes to the scientific study of minke and fin whales taken in its own community-based whaling operations. However, in Greenland's case the whale quotas remain below the number needed to satisfy their communities' needs (Caulfield 1993).

In the case of Norway, Iceland and Japan however, where even larger economic expenditures are made on whale research of direct relevance to the work of the IWC, recent requests for conservative quotas from non-endangered whale stocks have been refused. It would be safe to conclude that among its other shortcomings (see e.g., Andresen 1993), the IWC wholly ignores the issue of equity in its management deliberations.

Prolonging the whaling ban. In 1982 a pause in commercial whaling (the so-called "moratorium") was adopted by the IWC. This decision prohibited all whaling by non-aboriginal people by imposing zero quotas upon such non-endangered species as minke, Bryde's and sperm whales. This decision [viz. a blanket moratorium imposed irrespective of the numerical status of the

various stocks] represents a quite unusual management edict, and was passed against the recommendations of the IWC Scientific Committee. Nevertheless, once imposed, the pause in whaling was observed by all nations, on the understanding that the decision would be subject to review by 1990 at the latest.

Those parties affected by the decision (i.e., the whaling nations) have continued to actively contribute to the IWC research effort, in the belief that a 1990 review would to be carried out once adequate scientific information was obtained. For why else would whaling countries accede to such an extreme prohibitory decision (viz., a blanket moratorium on abundant as well as scarce whales), and why would they launch expensive research programmes (providing comprehensive scientific information on whales) unless the pause in commercial whaling was to be subject to review on completion of management-related research the IWC charged its own Scientific Committee to complete by 1990?

However, what followed was not in accord with such expectations. By 1990, new census data indicated that minke whales (a non-endangered and wide-ranging whale of interest to some whaling nations) was at considerably higher stock levels than was thought to be the case at the time the pause in whaling came into effect.

Furthermore, the IWC Scientific Committee unanimously recommended adoption of a newly completed and highly risk-averse quota-setting procedure (the Revised Management Procedure, or RMP) in 1992. This recommendation for adoption was repeated by the Scientific Committee again in 1993, at which time the scientists stated unequivocally that conservative quotas could be established for certain stocks of minke whales of interest to Iceland, Japan and Norway.

The rigorously tested RMP satisfies stringent scientific criteria as well as the objectives and requirements called for earlier by the IWC. It is also in accord with the World Conservation Union's guidelines for the sustainable use of wildlife (IUCN 1993). Thus the quotas to be established under the RMP were not only conservative and safe, thus safeguarding the stock against extinction, but are designed to insure continued growth of these stocks and to satisfy long-tern concerns about sustainability of use. In addition, given the dependence these community-based fisheries have upon whales, this sustainable use is likely to strengthen social and economic incentives to conserve the wildlife resource and supporting ecosystems.

Indeed, none of the species of whales of interest to commercial or community-based whalers are considered endangered by the World Conservation Union (Klinowska 1991; see also Aron 1988), and the stocks of interest are not likely to be adversely

affected by the small catch quotas needed to support viable fisheries (e.g., Conrad and Bjorndal 1993). In view of the expansiveness, contiguity and relatively unchanging nature of the marine environment, marine mammals as a group are among the least threatened of all biological groups (Clark 1989). Recent fears about the possible effect of increased UV radiation upon marine production now appear to be exaggerated (e.g. Holm-Hansen *et al. 1993;* McMinn *et al.* 1994; see also Bothwell *et al. 1995*) and in addition, the RMP is able to factor in to its sustainable-catch calculations whatever environmental changes that may occur and affect marine productivity.

The Commercial Exploitation of Wildlife

There exists a widespread belief that wildlife cannot be used sustainably when it is commercially exploited. Evidence for this statement is part of "conventional wisdom", and is confirmed in many peoples' mind by what they know about the generally poor history of commercial fisheries (including whale fisheries). However, it is such conventional wisdom that allowed Hardin's (1968) "tragedy of the commons" essay to be uncritically accepted by so many people working as professionals in the resource management field, and which continues to lead to pessimistic prognoses about resource utilization in the future (e.g. Ludwig *et al.* 1993).

The large amount of scholarship that now supports the view that common property can be used sustainably when appropriate management institutions are in place, does not draw invidious distinction between commercial and non-commercial users and end uses of the resource (e.g. Dyer and McGoodwin 1994).

Where use of common property becomes unsustainable, it may be because either an inappropriate management regime is in place, or because the customary management institutions no longer work well (for any number of reasons). However, this breakdown may occur in the presence or absence of commercial exploitation. More to the point, many commercialized harvesting operations are carried out in a sustainable manner (e.g. McCay and Acheson 1989), or they provide good evidence that adaptive conservation measures may be instituted by the local users once harvest levels are found to exceed sustainable levels, information which tends to be ignored by those opposed to commercial use of wildlife resources.

Though historical whaling is often taken as a prime example of the inevitable exhaustion following commercial use of a common pool (property) resource, this severe stock depletion more accurately reflects the dangers of not effectively controlling access to a resource and the associated dangers of following quite inappropriate management measures (e.g. Schweder, in

press). Clearly, there are sustainable whale fisheries and these may be found anywhere along the continuum from non-monetized aboriginal fisheries (that likely no longer exist as a general category), through the mixed subsistence-commercial fisheries (that widely existing today) to predominantly commercial fisheries.

The importance of scale. Reasons given for believing that commercial whaling will result in unsustainable harvesting include the notion of profit-maximization (or human greed) and a belief that such operations are necessarily large scale and technologically sophisticated (in contrast to aboriginal-subsistence whaling which is believed to be small scale and technologically simple).

The errors and dangers of such over-simplifications have been addressed elsewhere (Freeman 1993); here it is sufficient to observe that many whale fisheries, whether "subsistence" or "commercial", are family-owned and community-based enterprises which realize important social, as well as narrowly economic, benefits to the local population. Furthermore, all subsistence societies today are monetized and engage in both commercial and non-commercial economic transactions. Indeed, without commercial sale of surplus products it is most unlikely that such societies could continue to exist on their own terms in the modern (and highly monetized) world.

Community-based whaling operations are relatively small scale wherever they occur (IWC 1992d), with the socio-economic benefits derived from the hunt mostly retained in the home community of the boat owner-operator and crew members. In Greenland, Iceland and Norway the boats used in whale hunts are also used for fishing and sealing purposes, whaling being a seasonal activity.

In Japan, where fisheries policy does not allow coastal whaling boats to engage in other forms of fishing, whalers are specialized hunters exclusively licensed to catch specified smaller whale species. Despite this focus upon whaling only, each boat owner and crew of 4-6 men managed to make a living on an annual catch of between 30 and 40 minke whales and a half-dozen toothed whales per boat.

Harvest data supports the notion that this limited-scale operation was eminently sustainable (Braund *et al.* 1989); the allocation of the quota among the nine boats by the boat owners' association ensured it was equitable, and the beneficiaries of this closed-entry fishery were the hundred or so whalers, flensers and village processors and retailers, and the few thousand villagers whose customary diet for generations was based upon the meat, blubber and organ meat of locally-caught whales (Braund *et al.* 1989; Kalland and Moeran 1992; Iwasaki-Goodman and

Freeman 1994). The same socio-economic and dietary rationality exists in the Icelandic and Norwegian community-based whale fisheries (Kalland 1990; Palsson 1992; IWC 1992d).

Nevertheless, the belief continues to exist in the IWC that because these community-based whaling operations involve the sale of whale products they must necessarily represent a threat to the stock. This is an uncritical conclusion based upon a now-discredited Marxian notion that resource over-exploitation has historically resulted from capitalist destruction of pre-industrial societies (Freeman 1993).

Indeed, many non-industrial foraging and fishing peoples around the world (including the aboriginal peoples Marx based his ideas upon) have economies intimately involved with commercial operations, in many cases for centuries. However, despite these outside commercial involvements, their resources are generally exploited sustainably. There are no "subsistence societies" existing in the world today that function without linkages to market economies, a longstanding economic relationship that has led to hunter-gatherers being labelled "commercial foragers" by some anthropologists (e.g., Headland and Reid 1989; Wilmsen 1989; Peterson 1991; Stiles 1992).

The Polar Bear Regime

Polar bears are one of many subsistence resources having had commercial importance since Arctic residents first encountered visitors wishing to engage in trade. In the 1960's there was concern in some countries that hunting of polar bears was taking place at unsustainable levels. Annual takes were believed to range between 1,300 - 1,500 bears annually, likely unsustainable given a world population variously estimated at the time to range between 5,000 to 19,000 animals (Fikkan *et al.* 1993).

As a consequence of these estimates, many U.S. and Russian scientists and conservationists believed that bear sanctuaries or a total ban on hunting should be instituted in order to save the bears from extinction. However, countries, such as Canada and Greenland, with apparently still healthy bear populations and large annual kills, did not share the view that all hunting should be banned, arguing that such a prohibition would create hardship for people responsibly utilizing the resource, as well as impeding research necessary for improved management.

Discussion on these matters among polar bear specialists commenced in 1965, and by 1973 the Agreement on the Conservation of Polar Bears was signed in Oslo. In order to satisfy the concerns of the parties to the agreement who believed that bears required total protection, the treaty sets out a general prohibition on the hunting, capture, and killing of the animals. However, to accommodate the needs of other parties to the treaty

who favour continuing consumptive use, a number of exemptions to this general principle are specified.

The reason that this particular approach is important, is that it allows parties to the agreement wishing to prohibit hunting for conservation, political or aesthetic reasons to do so, whilst not restricting the sovereign right of other parties to the treaty to legislate and enforce quite different conservation regimes that may be equally appropriate in their own national contexts.

In the Canadian Arctic, where selling polar bear hides and guiding trophy hunters are economically significant activities, a state-sanctioned community quota limits the number of bears that can be taken. This necessary limitation inevitably results in some hunters each year being unable to hunt even a single bear. Despite the negative cultural and economic impacts resulting from these restrictions, recognition of impacts being occasioned and the respect shown by the management authorities toward local hunters ensures that the high traditional value Inuit place on wildlife conservation is not severely compromised by this outside imposition. Thus, even where, from time to time, it may be necessary to reduce polar bear quotas, full cooperation can be expected from local hunters (Freeman 1986).

Contrasting the Polar Bear and Whale Management Regimes.

Features of the polar bear agreement contrast in several ways with the international whaling convention, most notably perhaps, by only those five states where polar bears are found (Canada, Denmark/Greenland, Norway, Russia and the U.S.) being signatories to the treaty. In contrast, any nation (including those with no historic or scientific involvement with whaling issues, can become a party to discussions and decisions affecting whaling societies. Also, in contrast to the whaling convention, the polar bear agreement also places responsibility on signatories to protect the bears' habitat, rather than almost exclusively focusing attention upon the directed take of animals and the manner in which this is accomplished.

What appear to allow the polar bear treaty to operate effectively are management decisions based upon credible research in which resource users are meaningfully involved, and a willingness among parties to the treaty to negotiate in good faith. In contrast, the international whaling regime often ignores research-based information in its decision-making, only exceptionally involves resource users in its research or management deliberations, and displays no willingness to engage in goodwill negotiations to resolve disputes.

Thus, despite an international agreement on whaling, there exists an unlawful and uncompromising unwillingness by one group

of nations seeking a permanent end to whaling, to accommodate another smaller group of nations having quite different needs and national policies in regard to whale fisheries. The resulting series of confrontations has led to a breakdown in the trust and goodwill needed to make management work, and has caused a strong desire on the part of whalers to create alternative management regimes (Anon 1993; Hoel 1993). It seems likely that when these alternate management regimes become established, the relevance and legitimacy of the IWC will be further undermined (see note 5).

The contrasts between these two management regimes are marked. In the case of polar bears, despite the continuing taking of polar bears (for important commercial, as well as subsistence, reasons), the estimated world population has increased significantly (to between 25,000 to 40,000) since the treaty came into effect. The bears in question range over (and beyond) the remotest territories of five countries, and a sustainable take of about 700-800 bears occurs on an annual basis.

The level of take in each country is determined and regulated by that nation alone, based on the research carried out nationally but subject to international review. Use of the bears and research justifying the levels of use are consistent with the provisions of an international management regime whose formulations accept the legitimacy of each nation's different needs and circumstances, and which is designed to accommodate and respect such differences.

Thus, in conformity with this international agreement, bears may be totally protected from any use, or they may be used for viewing or research purposes, or killed for scientific, subsistence, recreational, public safety or commercial purposes. These objectives are entirely rational when judged in an appropriate (i.e., national) context whilst remaining consistent with international treaty obligations.

Importantly, under this international treaty, no non-hunting nation, no non-range state and no non-government animal rights organization can claim that its own opposition to the consumptive use of wildlife endows it with the right to interfere with others' lawful use of this international and highly migratory resource.

This pragmatic, effective and co-operative approach to managing a global population of only several thousand polar bears stands in marked contrast to the approach being taken by the international whaling regime to manage a global population of about 1 million minke whales (to take a single example) that consumes the time, energy, and money of several nations each year. In the case of the minke whale, the IWC Scientific Committee has now completed several years work that enables it to

recommend conservative and sustainable quotas for those minke whale stocks of interest to some community-based commercial whalers. However, the majority of IWC decision-makers ignore this advice and the continuing needs and appeals of the resource users requiring to use these renewable resources.

Conclusions

Polar bears today are conserved through the actions of an effective international management regime, under whose authority polar bears continue to be hunted for a variety of commercial and non-commercial reasons, and in ways that do not challenge the authority and legitimacy of the management regime nor the sovereignty of the signatory nations. This desirable state of affairs doubtless owes much to the recognition of, and the accommodation made to, the variable cultural and political realities existing among the five circumarctic nations that are party to the treaty.

In contrast, the international whaling regime acts in ways that continually question the legitimacy of cultural diversity and seek to impose an inappropriate uniformity among a considerably larger number of highly diverse nations (including, e.g. Chile, India, Japan, New Zealand, Oman, and Switzerland). Furthermore, the majority of these diverse member nations have adopted a rigid position opposing the killing of whales by any non-aboriginal people. By basing management on racial criteria, responsible, and hence credible, sustainable and equitable whale management, will assuredly remain an unattainable goal.

Whilst the international polar bear management agreement provides an informative window onto an effective marine mammal management regime, the international whaling regime instructs us only on what to avoid when seeking rational wildlife and fisheries management arrangements.

The continued opposition in the IWC to resumption of science-informed whaling under international control has nothing to do with rational resource management, and it may be safely concluded that apart from the work undertaken by its Scientific Committee, the work of the International Whaling Commission contributes nothing useful to rational wildlife management praxis. Furthermore, such intransigence seriously undermines the whaling regime's moral legitimacy and, arguably, its legal (and hence moral) standing, and provides reason enough to ask the time has arrived to establish a new, equitable, and rational whale management regimes consistent with international human rights law and accepted principles of sustainable use of natural resources.

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