



Did indigenous conservation ethics exist?

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Abstract

Despite the common assertion that some indigenous peoples were conservationists, a number of authors have claimed that persuasive evidence for this is lacking. They have, apparently, overlooked such evidence. It is well documented, for example, that centuries ago Pacific Islanders invented and employed all the basic marine conservation measures that Europeans began to use only in the early 1900s. For islanders to have devised and employed deliberate conservation measures, they first had to learn that their natural resources were limited. They could only have done so by depleting them. Evidence that a culture overharvested or otherwise damaged its natural resources at some period in its history is no proof that it was, for all times, non-conservationist. Some Pacific Island cultures learned that their marine resources were limited and introduced marine conservation measures accordingly. Others never learned this lesson because their marine resources always exceeded harvesting pressure. I suggest that a worldwide survey of relevant literature would show that societies that developed conscious conservation practices were usually small and relied on natural resources that were circumscribed and thus easily depleted. Today, in an era of shrinking natural resource frontiers, establishing whether a conservation ethic exists in an indigenous culture is a vital first step in determining how to help its people live within their natural resource limits.

Introduction

The widespread assertion that some societies possessed a conservation ethic — an awareness of their ability to deplete or otherwise damage their renewable natural resources, coupled with a commitment to reduce or eliminate the problem — is being questioned increasingly (Smith and Wishnie 2000). But the evidence used to support this negative view has been selective. Ignored, for example, has been the considerable published historical and anthropological evidence that centuries before the arrival of Europeans, a variety of Pacific Island cultures invented most of the marine resource management measures western countries use today — limited entry, closed seasons, closed areas, size limits, gear restrictions and the protection of spawning aggregations (Johannes 1978, 1981).

To be sure, Pacific Island fishers' actions were not always ecologically wise. Their fishing taboos did not always have conservation as their objective, nor did their explicit conservation measures always work (Johannes 1978). But this does not negate the considerable and widespread evidence that various Pacific Island fishing cultures possessed a marine conservation ethic and put it into practice (Johannes 1978, 1981).

However, Diamond (1986) in an article entitled 'The environmentalist myth' dismissed the notion that pre-industrial societies lived in harmony with nature. Many of his examples concerned Pacific Islanders. And recently, Jackson et al. (2001) published an article in *Science* implicating aboriginal cultures in the near-extinction of marine species, and disparaging the 'supposedly superior ecological wisdom of non-western societies'. How can we reconcile these assertions with the evidence for the existence of traditional marine conservation practices in Oceania?

Jackson et al. (2001) provided only two examples of the environmental excesses of indigenous marine fishers: one where they 'may have' contributed, along with fur traders, to the extinction of one marine mammal, and one where they brought about the severe depletion of another. To extrapolate from a sample size of two to a general dismissal of the ecological wisdom of non-western societies is not persuasive.

In discussing Pacific Islanders' environmental problems, Diamond (1986) focused on the terrestrial environment. His list of extinctions of terrestrial fauna that occurred after human occupation of these islands — but prior to western impact — has since been extended. Not a single paleontolog-

ically explored Pacific Island escaped a recent mass extinction of its larger fauna. In Hawaii alone, over 50 species of birds disappeared after human colonisation (Diamond 1991).

How could Pacific Islanders have developed complex marine conservation practices if their record in conserving terrestrial animals is so bad? The answer lies in both biology and human behaviour.

Birds were by far the most important endemic terrestrial animal food source on most tropical Pacific islands; on most of these islands the only indigenous mammals were bats. In much of Oceania, birds evolved in the absence of mammalian predators and showed no fear of humans. In addition, many were flightless. Coupled with their very low reproductive rate — as few as one egg per clutch — these characteristics suggest that some birds could have been eliminated so fast that some islanders failed to comprehend the need for their conservation until it was too late.

In any event, human harvesting was not the sole cause of these extinctions; there were other major, unintended and irreversible ecological consequences of human activities (Steadman 1997; Kirch 1983). One of the most ecologically devastating of their actions was the introduction of other mammalian predators — dogs, rats and pigs, whose ecological impacts were unlikely to have been anticipated (Kirch 1983). Birds were easy targets for these invaders — especially for the rats. So were bird eggs, especially those of the species of terns, boobies and tropicbirds that were ground-nesters.

The destruction of habitat of the native fauna was also extensive on some islands, due to land clearing for farming. This seriously accelerated erosion from elevated areas and soil deposition in lowland areas, greatly modifying both habitats (Olson and James 1984). In addition, the introduction of alien plants blanketed large areas at the expense of endemic species that had provided local fauna with food and habitat (Kirch 1983).

Once full awareness of the ecological consequences of such problems developed, there was little or nothing that could have been done to reverse them, no matter how concerned about them islanders might have become. Moreover, the depletion of terrestrial sources of animal protein would have posed in itself no great nutritional

threat to islanders living near the sea as long as their reefs, lagoons and nearshore pelagic waters continued to yield plenty of seafood.

Marine fauna harder to deplete

Few of the terrestrial ecological changes brought about by the islanders had any marine counterparts. There were, for example, no known introductions of foreign marine species into Oceania until after European colonisation (Eldredge 1994). Technology, moreover, was unavailable to affect the marine environment nearly so dramatically as the islanders affected their terrestrial environments. There was no underwater equivalent to land clearing through cutting trees or the use of fire.

As human populations increased on many islands, seafood often became a vital source of animal protein.¹ Pressure on marine resources intensified. We can see this reflected in the decline with time in mean sizes of marine species in Pacific Island middens. There are also declines with time in shallow water species easily harvested on foot, along with increases in species requiring greater efforts to harvest in deeper water (Dalzell 1998).

Whereas it was possible to severely *deplete* some nearshore marine species, it was nearly impossible to *exterminate* the great majority of them.² Because of the high fecundity and pelagic larvae characteristic of tropical marine fish and invertebrates, a single spawner can often spread thousands to millions of its progeny over thousands of square kilometres. Thus, even after severe overharvesting, populations of tropical marine fish and invertebrates will often rebound when given adequate protection (McKinney 1998).

So the time available for islanders to develop an awareness of the need for conservation of their seafood stocks would have been far longer than it was for their indigenous land animals. And conserving their marine fauna was not nearly so impeded by the unintended, irreversible consequences of some of their activities as was conserving their terrestrial fauna.

Discovering resource limits

It is sometimes said that island peoples discovered their environmental limits more easily than did continental peoples (Roberts and Hawkins 2000). This seems likely, but it would have almost

1. Dalzell and Adams (1996) have calculated that annual 'finfish yields in the range of 5–20 t/km² are probably sustainable in Pacific Island coral reef fisheries in the long term'.

2. McKinney (1998) reviews data indicating that 'marine taxa tend to have consistently lower extinction rates (than terrestrial taxa) during geological time as well as the current extinction crisis'.

certainly been only because they *exceeded* those limits more easily; it is a maxim among natural resource biologists that, even today, it is not possible to know a renewable natural resource's sustainable yield without first exceeding that yield (Brower 1974; Walters and Hillborn 1976; Ludwig et al. 1993).

When islanders' coastal populations increased to the point where they began to push their marine harvest limits, either they took steps to address the problem or they faced much more serious food shortages than the decline of their terrestrial fauna would have posed. They could not simply move on like many continental dwellers.

Yet some Pacific Island societies never became aware that their seafood supply was limited. Indeed, until about a century ago, Europeans did not foresee the limits of *their* marine fisheries either, because the available supply was so much greater than the demand. This is encapsulated in T.H. Huxley's much-cited statement, made in 1884, that 'all the world's great sea fisheries are inexhaustible'.³

Some islanders, likewise, lived in areas where marine resources always exceeded their needs; they literally could not deplete them (Huxley 1884; Chapman 1985). This is because their marine resource needs were kept low in relation to their supplies by: warfare and disease; living on a large island with plenty of terrestrial animal protein, such as on mainland Papua New Guinea; or possessing a small land area — and thus limited scope for human population growth — but large fishing grounds.

The inhabitants of the tiny islands in Torres Strait, for example — whose population apparently never exceeded about 5000 until very recently — have lived surrounded by 30,000 km² of shallow, productive marine waters. Their marine resources were thus functionally unlimited. Not surprisingly then, these islanders show no evidence of having possessed a traditional marine conservation ethic (Johannes and MacFarlane 1991).

The continuing debate about whether indigenous peoples in general had or did not have a conservation ethic is a waste of time, as well as a descent into stereotyping. Clearly some did, some didn't.⁴

Those who did conserve their natural resources at one stage in their history almost certainly did not at an earlier stage before they learned that their natural resources had practical limits. Yet some authors have been moved to generalise freely on this question based on evidence too limited in time, space and/or in terms of numbers of cultures studied.

The recent example of Jackson et al. (2001) has already been mentioned. Another extreme example is Kay's conclusion that 'Native Americans had no effective conservation practices' based on his studies of their harvesting of ungulates in western North America (Kay 1994). Kirch (1984) stated that 'recent evidence shows this view — that prehistoric Pacific Island peoples practised conservation — to be false'. But he considered only their impacts on terrestrial environments. Yet it was the outer edge of their fishing grounds, not the water's edge, where islanders' food resource frontiers ended.

In short, if a culture never exceeded the sustainable limits of its natural resources then we should not expect it to have developed a conservation ethic. Moreover, those cultures that did possess such an ethic must have overharvested their natural resources earlier in their history. How else could they have learned that their natural resources had limits? This is not knowledge our species is born with.

Thus, evidence for resource depletion during one time period cannot be used in isolation to argue that people were anti-conservationist throughout their history. Some learned their lesson in time to survive and prosper, like many Pacific Island fishing cultures. Others did not and paid the price. The Easter Islanders provide a striking Pacific Island example. They cut down every tree on their once-forested island. Among the penalties they paid was that they no longer had any logs from which to make canoes, and so not only depleted the land but also made their marine resources relatively inaccessible. The society disintegrated, there was starvation, warfare and cannibalism ensued and the population collapsed (Kirch 1984; Diamond 1988). Other cultures never learned the lesson because nature never taught it to them — such as the Torres Strait Island fishers mentioned above.

3. Today this does not always preclude roughly estimating one's natural resource limits using information derived from research done on sustainable yields of similar resources elsewhere, but such information was unavailable until recently.

4. Diamond seems to have changed his emphasis since he wrote 'The conservationist myth' (Diamond 1986). Five years later (Diamond 1991) he wrote, 'It is still true that small, long established egalitarian societies tend to evolve conservation practices, because they have plenty of time to get to know their local environment and to perceive their own self-interest.'

A hypothesis

Kay (1995) stated: 'The question of the conditions under which people conserve their resources, as determined from the historical record, remains a perplexing yet important one for future study. Obviously, we would like to learn from the past to avoid negative environmental impacts.'

The above discussion suggests a hypothesis with which to examine this question. As noted, it was necessary to exceed one's environmental limits before becoming aware of them, and this could only be accomplished if these resources were limited relative to demand. Historically, such conditions were most likely to be found in small, non-nomadic societies whose natural resources were circumscribed either by geography — obvious examples would be societies living around oases or on small oceanic islands or that were heavily dependent upon the resources of small water bodies — or by other hostile surrounding human populations. Conservation ethics were least likely to have evolved among those pre-industrial continental dwellers that had access to what seemed like limitless natural resource frontiers. A systematic survey of the relevant global literature should provide a test of this hypothesis.

Whether or not a culture has a conservation ethic is not just an academic question. Many efforts are being made around the world today to assist indigenous peoples to manage their marine resources better, such as in Southeast Asia and Oceania. And some of the results are promising (Alcala 1998; Adams 1998; Fa'asili and Kelokelo 1999; Johannes and Hickey 2001). How we best help to encourage people to live in better balance with their natural resources today depends on knowing their traditional attitudes towards these resources. Traditional resource management systems were not designed to cope with the stresses that the introduction of modern technologies, money economies and export markets has visited on indigenous cultures. But, where an indigenous conservation ethic exists, government agencies or NGOs that wish to help people live sustainably need to understand this ethic so they can help build on it. People are more likely to be receptive to suggested changes to their resource use patterns if these changes are founded on their own values and customs.

Where a conservation ethic is absent, outside agents of improved natural resource management must begin at the beginning and try to introduce one by means of education. Otherwise their efforts to encourage improved natural resource management are likely to fail. On the other hand, research may well reveal that newly developed conserva-

tion ethics are arising with increasing frequency among indigenous cultures, even without substantial outside encouragement, as awareness that their natural resources are limited is forcing itself increasingly upon them.

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