Polar Research

Environmental change as a threat to the pilot whale hunt in the Faroe Islands

Russell Fielding

Department of Geography and Anthropology, Louisiana State University, 227 Howe-Russell-Kniffen Geosciences Complex, Baton Rouge, LA 70803, USA. E-mail rfield2@lsu.edu

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Correspondence
Russell Fielding, Department of Geography and Anthropology, Louisiana State University, 227 Howe-Russell-Kniffen Geosciences Complex, Baton Rouge, LA 70803, USA.
E-mail: rfield2@lsu.edu

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Abstract

The Faroese pilot whale hunt—the *grindadráp*—has provided meat and blubber for human consumption since at least the late 16th century. This paper briefly discusses the history of the *grindadráp* in the context of its culture and broader human–environmental interactions. It then describes threats to the continuance of the *grindadráp*, including the possibility of over-extraction through poor management, international protests and boycotts, and the current issue of marine pollutants found in the tissues of the whales. Next, it examines the outcomes, or anticipated outcomes, of each of these threats. The coordination of science and policy has arguably ensured a sustainable take level, whereas the redirection of many protest efforts to other, more commercialized whaling operations has reduced international pressure on the Faroese to give up whaling. However, the issue of environmental pollutants remains, and has become the leading threat to the *grindadráp*. It concludes with a look to the future and at what changes the Faroese would have to make in their current food and cultural systems were the *grindadráp* to cease, and what the environmental, economic and cultural effects of those changes might be. The major options examined are: increasing the importation of foodstuffs, increasing local food production and redirecting part of the fisheries' catch from exports to the local market. Each option carries its own environmental, economic and cultural impact. A careful combination of the three will most likely prove to be best, if indeed the *grindadráp* is to be reduced or abandoned.

The meat and blubber of the long-finned pilot whale (*Globicephala melas*) have long been an important part of the diet in the Faroe Islands, a semi-independent archipelagic nation in the North Atlantic (Fig. 1). Several times each year, large family groups—known as schools or pods—of these relatively small, toothed whales are driven ashore in a collective effort by dozens of Faroese boats, and are killed with small hand-held knives when the pod has become beached on the shore or stranded in shallow water. The quick exsanguination of dozens of whales turns the harbour waters red: a shocking sight for the uninitiated observer. After the kill, local authorities distribute the meat and blubber free of charge among the hunt's participants, and then among the residents of the district in which the landing took place.

This activity—known in Faroese as the *grindadráp*—is governed by strict regulations under Faroese law and is not subject to the jurisdiction of the International Whaling Commission (IWC). The IWC regulates the take of the "great whales" (i.e., all baleen whales and the sperm whale [*Physeter macrocephalus*]), but does not regulate the take of "small cetaceans" such as pilot whales. IWC member countries regulate their own take or non-take of small cetaceans.

The Faroe Islands are an autonomous province of Denmark, and were granted home rule in 1948. Since that time, the topic of full independence has been discussed within Faroese public and political discourse (Ackrén 2006). Denmark supplies the Faroes with an annual subsidy, police and military forces, and handles some international representation, though the Faroese Home Rule government handles most domestic affairs, including regulation of the *grindadráp*, and an increasing number of foreign affairs. The Danish delegation to the

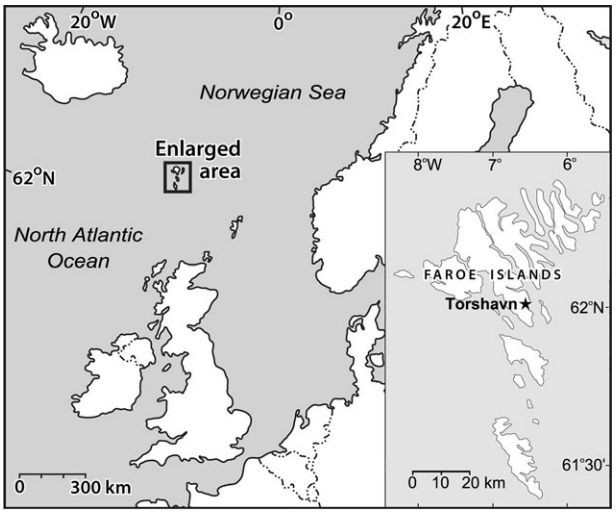

Fig. 1 Map of the Faroe Islands showing its location between Iceland, Norway and Scotland. Map by C. Duplechin, Louisiana State University.

IWC is made up of representatives from Denmark and the Faroes, as well as representatives from Greenland, which has also been granted home rule by the Danish government.

Challenges

Grindadráp have occurred throughout the Norse history of the Faroes, with written descriptions from as early as 1632 (Sanderson 1992), locally-kept statistical records from 1584 (van Ginkel 2005), and archaeological evidence for the presence of pilot whales in the early Faroese diet dating to the "Viking Age" (Sanderson 1992), which is generally defined in the Faroes as lasting from AD 800 to AD 1035 (Edwards 2005). Throughout the history of the Faroe Islands, various cultural and environmental forces have challenged the continuation of the *grindadráp*. Of these, three have dominated academic discourse about the persistence of whaling in modern societies in recent decades.

One is over-extraction, that is, the possibility that whaling takes place at an unsustainable level, exhausting the stocks of pilot whales or decreasing their genetic diversity to the point that they are no longer able to maintain a viable population. In this scenario, Faroese whaling would cease simply because there would not be enough whales to make the activity worthwhile, or the activity would become illegal (either by Faroese law or international treaty) before the stocks got too low in order to facilitate a revival of the pilot whale population. Over-extraction in the Faroes would echo the situation that Newfoundland experienced with its own pilot whaling industry in the mid-20th century (Dickinson & Sanger 2005).

Another force is protest and boycott, in the form of anti-whaling organizations successfully lobbying other nations, corporations or individuals to stop trade with the Faroes unless they cease whaling activities, thus decreasing the market for Faroese fish, which is by far the main export of the islands. In this scenario, the Faroese would voluntarily give up whaling (a non-commercial activity) in order to save their fisheries (their leading source of income) from international boycott. The peak of the protest against Faroese whaling occurred during the 1980s and 1990s, and was well documented by Sanderson (1990, 1994) who was a key player in the discourse, owing to her role with the Faroese Office of the Prime Minister, which required her to provide official answers to many of the protest letters written to the Faroese government.

A third challenge to whaling in the Faroes is pollution in the form of methyl-mercury (MeHg) and other toxins that accumulate in the tissues of the pilot whales and cause adverse health effects in consumers. This threat is the subject of ongoing research by Faroese scientists and researchers from abroad. Leading the research efforts are two medical doctors, Philippe Grandjean of the Harvard School of Public Health and the University of Southern Denmark's Institute of Public Health, and Pál Weihe, chief physician in the Department of Occupational and Public Health in the Faroese Hospital System. If this threat were to lead to the termination of whaling in the Faroe Islands it would be the result of a government ruling or recommendation in the interest of public health, and would most likely originate from the office of Dr Weihe.

In recent decades, each of these scenarios has taken its turn as the leading threat to the continuance of the *grindadráp*, at least in the realm of public perception. I will discuss below each threat as well as its likely outcome.

Over-extraction

The Faroese take on average 900–1000 pilot whales each year, although there is much variance from this mean. In some years—notably around WWII—many more whales than average were taken; in other years—most recently, 2008—no whales were taken at all (Statistics Faroe Islands 2008).

Over-extraction has the potential to become a threat to any wild animal harvest. Without good management to keep technological advances and human population increases in check, there is the potential for the hunters or fishermen to simply catch too many of their prey, reducing the population to a point from which it cannot

return. When this happens the species, at least as a resource, is extinct.

We can compare the *grindadráp* to a similar North Atlantic pilot whale drive that occurred in Newfoundland during the 20th century (Dickinson & Sanger 2005; Fielding 2007a). Newspapers from the mid-1800s in Newfoundland archives show that the occasional pilot whale drive was an important source of supplemental income for residents of the island's south-eastern peninsula, who earned a share of the proceeds from producing and selling whale oil (Cranford & Hillier 1995). In 1951 the Newfoundland pilot whale drive was organized commercially, and 3100 whales were taken that year. Whaling records in Newfoundland show that landings increased with the demand for oil and meat, to a peak of 9794 in 1956 (Pinhorn 1976). A lucrative market was found in the production of whale-based feed for the province's new mink and fox fur farms, encouraging more whale drives. By contrast, the *grindadráp* is forbidden to become commercial by Faroese law. Rather, a centuries-old process of free distribution is mandated, ensuring that the meat and blubber are given first to the participants in the drive and slaughter, and second to the residents of the district in which the kill took place. This system is designed to provide food for the Faroese people while not depleting the resource through unnecessary extraction.

Conducting an accurate count of the eastern North Atlantic pilot whale population has been an ongoing project for Faroese and international biologists. There are approximately 778 000 pilot whales in the eastern North Atlantic stock (Buckland et al. 1993). The Faroese Ministry of Fisheries regulates the number of pilot whales killed annually. The Minister's office can forbid future *grindadráp* if it is known that enough meat and blubber have already been stored (Bjørn Kalsø, Minister of Fisheries, pers. comm.). After 425 years of recorded *grindadráp* occurring in the Faroe Islands, over-extraction does not seem to be a threat and will probably not lead to the abandonment of the *grindadráp*, as it did with the pilot whale drive industry in Newfoundland.

Protest and boycott

Although the *grindadráp* has been well documented in travellers' accounts and cultural studies of the Faroe Islands for centuries (Joensen 1976; Wylie 1981; Sanderson 1992), it remained relatively obscure to the public outside of Scandinavia until the mid-1980s. Sanderson (1990) described the quick shift that the g*rindadráp* made from a relatively unknown method of food procurement and source of national distinctiveness and pride, to an alleged crime against nature and target of international protest. I will summarize and expand upon Sanderson's detailed chronology here, beginning in 1981 when the activity was "discovered" by international environmental organizations.

- 1981. Greenpeace representatives visit the Faroes to document the (now ceased) fin whale (*Balaenoptera physalus*) catch. Their visit coincides with three large *grindadráp*. The representatives' final report to Greenpeace (Glover 1981) focuses primarily (and critically) upon the *grindadráp*.
- 1984. A Danish television company produces a documentary film about the *grindadráp* that increased its visibility within Europe.
- 1985. At the annual meeting of the IWC in Bournemouth, UK, the topic of the *grindadráp* is brought up, although the IWC maintains its stance that it would not regulate the take of small cetaceans. Campaign letters from environmental organizations and journalistic pieces critical of the *grindadráp* are published this year. As a result of these campaigns, letters and preprinted postcards begin to arrive at the Office of the Prime Minister in Tórshavn.
- 1986. Paul Watson, founder of the environmental organization Sea Shepherd, makes a highly publicized visit to the Faroes with the intention of stopping the *grindadráp*. Faroese regulations regarding the *grindadráp* are changed dramatically with the goal of ensuring a more humane death for the whales.
- 1991. The High North Alliance is formed, to "protect the rights of whalers, sealers and fishermen to harvest renewable resources in accordance with the principle of sustainable management" (High North Alliance 2008).
- 1993. Grindamannafelagið (the Faroese Pilot Whalers' Association) is formed to establish regulations for more humane killing methods in the *grindadráp*. Also this year environmental organizations begin calling for a boycott of Faroese products, especially seafood, which makes up over 96% of the country's exports (Statistics Faroe Islands 2005).
- 1995. The IWC commends the improvements in killing methods that were instituted on the recommendation of the Grindamannafelagið.
- 2000. Paul Watson returns to the Faroes with more international press coverage than on the previous visit, and patrols the coastline with the goal of driving pods of whales away from the islands, thereby preventing the *grindadráp*.
- Present. The occasional chain e-mail is circulated, showing photographs of bloodstained Faroese harbours or pilot whale carcasses in various states of being processed. However, no major boycott or protest is currently promoted. The environmental organizations Greenpeace, Sea Shepherd and the Whaleman Foundation maintain their positions against the *grindadráp*.

The World Wildlife Fund Denmark (WWF) has prepared a standard response to enquiries that refers to the sustainability of the *grindadráp*, its long history in Faroese culture, and the efforts made by the Faroese authorities to reduce the suffering of the whales that are killed. The statement concludes by noting that "WWF is a conservation organization and the question of cruelty of the pilot whale hunt is not a conservation issue" (Christina Sabinsky, pers. comm.).

In the recent past, and especially during the late 1980s and early 1990s, it seemed to some Faroese that the international protests and threatened boycott might require the cessation of the *grindadráp*. In August 2005, Ólavur Sjurðarberg, president of Grindamannafelagið, remarked that the protest was the biggest threat to the continuance of the *grindadráp*. This opinion was echoed as recently as March 2008 by Rolf Guttesen, a Faroese geographer at the University of Copenhagen (pers. comm.). As a direct result of the protest, the Grindamannafelagið was created and led efforts to implement changes that improved killing methods and further ensured sustainability. In this regard, the protest had a positive effect in the Faroe Islands, and Faroese writers have credited the anti-whaling organizations with instigating these changes (e.g., Guttesen 1996). Today, most anti-whaling organizations, especially American and Australian ones, direct their efforts against the so-called scientific whaling conducted by Japan in the Southern Ocean, and, to a lesser degree, the commercial whaling conducted by Norway and Iceland. The Faroes have not been subject to much direct protest recently, nor have the proposed boycotts had any noticeable impact on the Faroese economy. It seems then that the protest has not ended—or even lessened—the occurrence of the *grindadráp* in the Faroe Islands. Rather, its effect was to call attention to some areas in which the *grindadráp* could be improved, and to instigate the necessary improvements.

Pollution

As high trophic-level predators, pilot whales accumulate high levels of MeHg, persistent organic pollutants (POPs) and other toxins in their muscle and blubber tissue (Dam & Bloch 2000). Many whale species, both baleen and toothed whales, in a variety of geographical areas have been found to have elevated levels of marine contaminants in their tissues (Hansen et al. 1990; Frodello et al. 2000; Ross et al. 2000; Hoekstra et al. 2002).

Some of these contaminants occur naturally. MeHg, for example, results when elemental mercury—either occurring naturally as it degasses from the Earth's crust, or anthropogenically in the form of air pollution—is deposited into the ocean and is methylated in the marine sediment environment by sulfate-reducing bacteria (Morel et al. 1998). Industry, especially coal-fired electricity generation, is a major contributing source of anthropogenic mercury in the atmosphere. As such, industrialized nations often experience localized deposition of mercury in their waterways (Joensuu 1971; Morel et al. 1998). However, mercury is commonly found far from any source of industrial pollution (Morel et al. 1998; Boening 2000). Faroese scientists and laypeople alike often make the point that their nation is "without responsibility with regard to the marine pollution" (Weihe & Joensen 2008: 3), placing the blame on other, more industrialized countries for the problems that have affected them and the whales upon which they rely as a food source.

Beginning with unicellular organisms living in marine sediments, MeHg is biomagnified as it is transported up the food chain, becoming most concentrated in seabirds and marine mammals (Morel et al. 1998; Gray 2002). The concentration of mercury in an organism's tissue varies with lipid content; whales, of course, are most susceptible, having a thick layer of blubber covering most of their bodies. Humans who eat meat and other tissue from high trophic-level marine animals are exposed to levels of MeHg far in excess of the recommended maximum of 0.5–1 ppm (Morel et al. 1998). Many Northern peoples have been found to have a high rate of exposure to marine toxins as a result of food-borne contamination (Weiss 2008). The problem of mercury and other contaminants is an issue throughout the circumpolar world. In 2006 the Arctic Council, of which the Faroe Islands are a part, formed a working group called the Arctic Contaminants Action Program from an existing steering committee that had already been investigating the problem of contaminated traditional food sources of the Northern peoples (Arctic Council 2008). This working group calls mercury "a priority pollutant". Likewise, the Arctic Monitoring and Assessment Programme emphasizes the risk of increased exposure to MeHg and POPs, associated with a diet that includes high quantities of meat and blubber from marine mammals (AMAP 2009).

The Faroe Islands have led the circumpolar world in research into the problem of mercury contamination and human health (Grandjean et al. 2007). Since 1985, the Faroese Hospital System has chosen 1751 children at or before birth in three cohorts to take part in a long-term study, known as the Children's Health and Environment in the Faroes (CHEF) Project, to determine the effects of MeHg and other marine contaminants (Grandjean & Weihe 2008). Children in the first cohort are now turning 25 years old. Through their participation they have provided the medical researchers with much important information.

In contrast to POPs, MeHg levels in the human body decrease with time and reduced exposure (Weihe & Joensen 2008). When humans eat pilot whale blubber they absorb the POPs stored there, and these toxins stay in their systems for many years. Women who were exposed to POPs as young girls can still pass on the contaminants to their own children. For this reason, Dr Weihe's 1998 dietary recommendations stated that it was best for females not to eat blubber at all until they have reached an age at which they no longer plan to have children (Weihe 1998). This was a radical departure from the long-standing nutritional orthodoxy in the Faroe Islands—among both the public and the community of medical professionals—that pilot whale meat and blubber were essential parts of the diet for healthy Faroese people (Weihe & Joensen 2008).

Ten years after issuing the first dietary recommendations, Dr Weihe and the Faroe Islands' Chief Medical Officer, Dr Høgni Joensen, went one step further. Whereas the 1998 recommendations allowed for one or two meals of pilot whale meat and blubber per month for healthy adults who are not going to become pregnant, the 2008 recommendations stated that:

> Pilot whales today contain contaminants to a degree that neither meat nor blubber would comply with current limits for acceptable concentrations of toxic contaminants . . . From the latest research results, the undersigned consider that the conclusion from a human health perspective must now be as follows: *It is recommended that pilot whale is no longer used for human consumption*. (Weihe & Joensen 2008: 3, emphasis from the original)

It seems, then, that pollution may be the obstacle that the *grindadráp* cannot overcome. Despite environmentalist efforts, as more developing nations industrialize, marine pollution is likely to increase. As the meat and blubber become more contaminated, their risk will increasingly outweigh their benefits.

This is not to say that the Faroese will give up their "national dish" easily. As has been shown in a variety of contexts, food is a powerful reminder of a culture's distinctiveness and national identity (e.g., Wilk 1999; Cusack 2000; Raento 2006). Just as in other Northern maritime communities (e.g., O'Neil et al. 1997), the cultural connection to traditional local food in the Faroes is strong. Initial analysis of data obtained through interviews with Faroese youth as recently as September 2009 indicate that the meat and blubber of the pilot whale are still valued for their healthful qualities, and are still consumed, albeit at reduced quantities since the 1998 and 2008 recommendations were released. The *grindadráp* is still seen by many as a valuable part of Faroese culture. One possible outcome that could balance the cultural connection to pilot whale meat and blubber with the health risks of its consumption would be to retain the food as something of a ceremonial meal, eaten only (or primarily) at special occasions such as weddings, birthdays and the Faroese national holiday, *Ólavsøka*. Initial results from ongoing research indicate that this shift from pilot whale meat and blubber as an ordinary meal to a ceremonial meal is occurring to some degree, especially among the young urban population in Tórshavn.

The Faroese cling tightly to their culture, but they also take seriously the advice of their public health professionals. The third cohort of children in the CHEF Project, born between 1998 and 2000, showed lower concentrations of MeHg than the first cohort, born in 1986 and 1987. The directors of the project attribute this decrease to the obedience of the children's mothers in following the dietary recommendations (Grandjean & Weihe 2008). Similar reductions have been measured in human populations throughout the circumpolar North—a trend that experts attribute to three factors: changes in diet, changing levels of contamination in the environment and increasing availability of public health information in traditional communities (AMAP 2009). Levels of environmental contamination are not declining quickly enough to change the direction of advice given by Faroese health authorities, however.

Dr Weihe believes that the results of his study and the revised dietary recommendations will lead to a cessation of the *grindadráp*, although he does not press for legislation outlawing the practice.

> The reduction in the consumption of whale meat and blubber should be based on an understanding for the toxicological risks. Not a decision from the politicians. I think what will happen is that the women first will stop eating it and . . . the men will follow. However, my best prediction is that sporadic killings will take place over the next decade and [then] it will be a forgotten culture. (Pál Weihe, pers. comm.)

It appears that the pollution may accomplish something that protest and the threat of over-extraction were unable to do in the Faroe Islands—it could lead to the end of the *grindadráp*.

Alternatives

The conflict involved when the same food has both beneficial and detrimental qualities has been studied with regard to the Faroese diet, with the conclusion that one can exercise good judgment in choosing foods that are high in benefits such as fatty acids, but low in contaminants (Budtz-Jørgensen et al. 2007). The fatty acids, antioxidants, vitamins and protein found in the pilot whale meat and blubber must be replaced with nutrients found elsewhere.

In 2002, the *grindadráp* was found to supply 30% of the meat produced locally in the Faroe Islands (Anonymous 2002). Although the *grindadráp* is a non-commercial activity—that is, no money changes hands throughout the process of killing and butchering the whales, or distributing and preparing the meat and blubber—its economic value can be "measured against the economic and environmental costs of importing the same amount of food" (Anonymous 2002: 13). When one considers the possible cessation of the *grindadráp* and the gap that its absence would leave in the Faroese meat supply, one must consider the environmental as well as the economic costs of filling that gap.

Three alternative methods of food acquisition are currently being discussed in the Faroe Islands: an increase of meat imports, an intensification of local livestock production, and the shifting of some of the fish that is currently exported to being made available for local consumption.

Increased imports

The major country of origin for imports to the Faroe Islands is Denmark, with which it shares a crown and a currency (DKK), although the national statistics bureau of the Faroe Islands treats trade with Denmark as it does trade with any other foreign country. In 2005, the Faroes imported over DKK 1 billion (USD 216 million) worth of goods from Denmark. Compare this with the countries of origin for the next-highest levels of imports: Spain at DKK 298 million (USD 56.6 million), Germany at DKK 264 million (USD 50.2 million) and Sweden at DKK 229 million (USD 43.6 million). Put another way, the Faroe Islands receives 26.7% of their total value of imports from Denmark, compared with 7% from Spain, 6.2% from Germany and 5.4% from Sweden (Statistics Faroe Islands 2006). The Faroe Islands also have long-distance trade partners, often importing meat—especially lamb—from as far away as New Zealand (Guttesen 1996). As the costs of food and fuel increase, these import costs will certainly increase as well, even if the amount of food imported remains constant. If the Faroe Islands were to increase their imports to fill the gap left by the cessation of the *grindadráp*, they would also incur higher cost for transportation and would be contributing, through the increased use of fossil fuels, to the same sources of marine pollution that would have led them to abandon the *grindadráp* in the first place.

Intensification of local livestock production

Livestock has been an important part of the Faroese food economy since the islands were first settled. When the Norse arrived in the Faroe Islands during the 9th century, they brought primarily sheep, but also cattle, and established European grazing management practices (Thomson et al. 2005). Their activities transformed the pristine landscape to which they had arrived, but their limited numbers and experience working in Northern settings led to a sustainable use of the local resources (Edwards 2005).

The population has increased dramatically since the time of Norse settlement. The land area of the Faroes, of course, has not increased, and remains 1399 km^2 today, just as it was in the 9th century. As the population increased, so did the intensity of farming, well into the 19th century. In 1865 farming (including livestock raising) was the main occupation in the Faroes, employing some 68% of the workforce. In 1996, farming employed only 2% of the workforce, with commercial trades and services making up the largest sector of the economy (Guttesen 1996).

Livestock management is still an important industry in the Faroe Islands. Through extensive government programmes, the Faroese dairy industry has made the Faroe Islands self-sufficient in milk production, although the dairies are supported through the importation of hay and supplemental fodder from Iceland and other European countries (Guttesen 1996). Government programmes encourage the consolidation of dairy farms into fewer, larger holdings to maximize milk production. Though the number of dairy farmers has decreased from 111 to 51 since 1990, the number of dairy cattle has basically remained constant, from 2070 in 1990 to 2093 in 2007 (Statistics Faroe Islands 2008).

Although sheep still greatly outnumber the human inhabitants, their importance to the economy of the Faroe Islands is in decline. Mutton and lamb imported from Iceland and New Zealand supplement local production, but cultural preferences allow locally raised meat to sell for a much higher price. Guttesen suggested that the Faroe Islands could support a larger sheep industry, but that cultural acceptance of a shift from traditionally pastoral to industrial sheep rearing would need to happen first (Guttesen 1996).

If the Faroese are to use their land resources to replace the meat lost by a potential closure of the *grindadráp*, they will have to reassert livestock as a major industry while maintaining the sustainable practices with which Faroese farming was begun by the original Norse settlers. Guttesen has suggested that the current pattern of land tenure, which has led to a scattering of tiny, irregularly shaped parcels that are incompatible with modern farm machinery, needs to be reformed (Guttesen 1996). Whether society will accept these changes, and the associated modifications that they would produce in the Faroese landscape, is yet to be seen.

Increased consumption of local fish

Some fish and sea mammals show much higher levels of MeHg and other contaminants than do other species. Dr Weihe states that the concentration of mercury is so high in pilot whale meat that, "for every portion of whale you could eat 100 portions of cod" (Pál Weihe, pers. comm.). He advocates replacing whale meat in the Faroese diet with locally caught fish. In 2004 the Faroe Islands exported over DKK 3.4 billion (USD 659 million) of fish, which comprised over 94.3% of their total exports (Statistics Faroe Islands 2005). Perhaps some of these exports could be kept at home for local consumption.

A shift from foreign to local markets for a portion of the Faroese fish catch would provide locally produced food that is high in protein and fatty acids (as are pilot whale meat and blubber), but low in MeHg and other contaminants, and would not incur the environmental or economic cost of transporting the products from Europe or beyond. Nor would the limited area of available land be taxed by higher usage in the farming and livestock industries. The Faroese economy would be affected by the loss of a portion of foreign trade and export power, but if the fish were sold in Faroese markets, the local economy would also be stimulated by the addition of a cash commodity in place of a non-commercial meat source. The economic impact would then be transferred to the individuals who buy the fish in place of the whale meat that they had formerly received at no cost. The loss of any natural resource must be accompanied by increased cost as systems adjust to fill the gap left by its absence.

Conclusion

The world should be watching the reaction of the Faroe Islands to the problem of marine pollution. As pioneers in the cross-disciplinary field of island studies point out, small islands are often at the frontline of environmental change (Royle 2001; Rapaport 2006). The Faroes specifically, and the insular North more broadly, are in a position to inform the world through their own experiences of the potential risks of our increasingly polluted marine environment. Ólafur Ragnar Grímsson, the President of Iceland, recently pointed out that the North is positioned to be an advance indicator of global environmental change to the world (Grímsson 2008). A point often overlooked by the media and science alike, however, is that environmental change is not restricted to global warming alone. The build-up of marine contaminants is one of many environmental changes that shares causal elements with global warming, and could potentially affect Northern—and eventually, worldwide—ways of life just as severely. Reire (2008) showed that the

Fig. 2 Painting by Faroese artist Sámal Joensen-Mikines depicting the frenzied action as a pod of whales is driven and killed at the water's edge. (Courtesy of Listasavn Føroya, Tórshavn, Faroe Islands, and Kári J. Mikines, son of the artist.)

public is eager for more information about environmental change and is willing, to some degree, to make behavioural changes that will decrease the negative effects of human activity on the environment. Environmental forces, often in human-modified forms, engender adaptive changes in human behaviour—which in turn affect the environment. Only with a truly systematic approach to our analysis will we be able to make sense of the interactive cycles of human society and the environment.

The Faroese are proud of the *grindadráp*. For centuries it has been a national symbol of Faroese identity, only briefly losing this status during the protests of the 1980s and 1990s. Jóan Pauli Joensen, in one of the earliest academic treatments of the *grindadráp* in English, calls it "a distinctive cultural characteristic for the Faroe Islands" (Joensen 1976: 5). Sanderson, in her textual history of the *grindadráp*, found evidence that it had long been singled out as a "characteristic feature of Faroese culture" and "an established symbol of Faroese national identity" (Sanderson 1992: 1). As with other whaling cultures, the *grindadráp* has inspired the production of an extensive material culture (Hough 1933; Lantis 1938; Erikson 1999; Arno 2005; Figs. 2–3). Whaling equipment is often displayed in houses as décor, taking it beyond its mere utilitarian purpose. In addition to the objects of material culture it has produced, the *grindadráp* has inspired authors, poets and songwriters in the Faroe Islands for centuries (see Sanderson 1992).

The *grindadráp* has existed for centuries and has overcome the threats of closure from over-extraction and international protest. However, it appears that the problem of environmental pollution leading to marine contaminants in pilot whale meat and blubber may be too great for the *grindadráp* to withstand. If the public abides

Fig. 3 The *grindaknívur*—pilot whaling knife —is "the pilot whale hunt's most distinguished piece of equipment and . . . one of the foremost Faroese contributions to Nordic artistic craftsmanship" (Joensen 1976: 15). Even the most ornately decorated knife is built strong enough to cut through a pilot whale's blubber and muscle, and to break its spinal cord (Fielding 2007b).

by the new dietary recommendations it is likely that the Faroe Islands will witness an ending of the *grindadráp*, as Dr Weihe predicted, within just a few years. Along with the loss of a locally valued national tradition, the cessation of the *grindadráp* will lead to a loss of an important free food source.

Faroese culture will survive, for although a culture may produce a rich variety of materials, traditions and practices, its existence is not dependent upon any one of these artefacts. Faroese national identity can endure without the *grindadráp*, but attention must be given to identifying a sustainable source of food to replace the meat and blubber lost in its closure. The solution will likely not lie in any one of the proposed replacements alone—increased imports, intensified local agriculture and livestock industries, or increased consumption of local fish—but rather in a combination of all three. And although a dinner of wind-dried pilot whale meat, salted blubber and boiled potatoes has long been considered the Faroese national dish, another meal will rise to take its place, will be embraced by the culture, and will be enjoyed for years to come. Flexibility and diversification will be key attributes of an economically successful and nutritionally balanced future for the Faroe Islands.

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