

**An assessment of the framework, legislation and monitoring required
to develop genuinely sustainable pelagic whalewatching**

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1. Introduction

Whalewatching¹ is one of fastest growing tourism products in the world. Already estimated in 1998 to be worth €1.12 billion worldwide the industry is still growing at 12.1% per annum (Hoyt, 2000). Whalewatching in Europe is relatively new but expanding rapidly (Table 1). Average rates of 8.8% growth per annum between 1991 and 1994 have increased to 19.6% between 1994 and 1998 (Hoyt 2000). Whalewatching is becoming economically important in many EU countries (Table 2) but the potential is still very under-developed. However, tourism activities can have a detrimental effect on the behaviour of whales (IFAW et al. 1995) and the long term sustainability of whalewatching has not been assessed. If whalewatching, along with other forms of marine ecotourism, are to be viable long-term economic alternatives for coastal communities in Europe, it is essential that activities are sustainable. Planning and management frameworks developed for whalewatching can act as a model for other forms of marine ecotourism e.g. seal and basking shark watching, angling and nature tours (Young, 1998; <http://www.isle-of-man.com/interests/shark/holiday.html>).

Table 1. The increase in the number of whalewatchers and their expenditure (€) in Europe (from Hoyt, 2000).

Year	No. of whalewatchers	Direct expenditures	Total expenditures
1991	158,763	2,532,000	6,373,000
1994	204,627	4,618,000	24,623,000
1998	418,332	12,373,000	51,552,000

Note: Tourist expenditures for whalewatch tickets (direct expenditures) and associated expenses incurred by tourists during as well as immediately before or after whale watching (indirect expenditures). A conservative estimate of the total expenditures from whalewatching near urban centers with day (or less) trips is 3.5x the direct expenditures (Kelly 1983, Hoyt, 2000). In remote centers, which require more spending on travel, food and accommodation, total expenditures are usually at least 7.67x the direct expenditures (Duffus, 1988, Hoyt 2000). For the most part, the 3.5 and 7.67 factors stand up to inflation as the ticket prices increase at approximately the same rate as the other expenses.

- (i) The scientific management of whalewatching and tourism is extremely limited. There are few published studies of whalewatching operations (e.g. Corkeron, 1995; Findlay, 1997; Leaper et al. 1997; Berrow & Holmes, 1999) and, despite the economic importance of whalewatching, there have been few socio-economic studies on this industry. Although there are many other associated benefits such as conservation and education, whalewatching is an economic activity, whose principal objectives are financial and require a return on investment. To be genuinely sustainable, whalewatching should be both economically and ecologically sustainable.

The present study is part of a broad, transnational research project called Marine Ecotourism for the Atlantic Area (META-) with the aim of promoting genuinely sustainable marine ecotourism as a tool of regeneration of peripheral coastal communities (see http://www.tourism-research.org/project_introduction.html). META- is based on the belief that certain areas within the EU Atlantic periphery can be made more competitive, by building on opportunities associated with the use of the natural marine environment in a sustainable manner.

META- considered sustainable marine ecotourism to be that kind of nature-based tourism which:

- (ii) interprets marine wildlife and its environment and provides a better quality experience for tourists;
- (iii) decrease/minimise the impact of tourism on the marine environment;
- (iv) increases appreciation of the marine environment and raises the overall conservation ethic, in particular for the marine resource and contributes to environmental conservation;
- (v) provides appropriate benefits to the local community;
- (vi) interprets local marine/coastal culture and heritage; and is managed to be sustainable.

The regions involved in META- include: a coastal resort with the potential for the further promotion of multi-species ecotourism (Torbay, England); a subtropical seaside resort island with an international market (Gran Canaria); and a rural region with a relatively well-developed set of ecotourism products (West Clare, Ireland), which reflects the wide spectrum of coastal communities which may benefit from marine ecotourism. However META- identified a need to assess marine ecotourism in an offshore area to determine whether the spatial planning structures, policies and frameworks that will be needed to develop the potential of marine ecotourism, without prejudicing the natural environment on which it depends, existed. Thus this study was initiated.

The objectives of this study were to:

- i) review whalewatching off Tenerife, Gran Canaria and La Gomera and around the Azores,
- ii) identify impact indices which could be used to assess the sustainability of whalewatching
- iii) to explore potentially useful frameworks for sustainable management
- iv) assess the impact of proposed tighter regulations on visitor attitudes in Tenerife
- v) to propose further work, including localised field work.

¹ defined by the International Whaling Commission as any commercial enterprise which provides for

2. Review of Whalewatching

2.1. Europe

Whalewatching in Europe is presently carried out in 19 countries (see Table 2). Although the extent is minimal in some areas, whalewatching is economically significant (Direct revenues of > € 0.5 million) in nine countries including the Azores (Portugal), Canary Islands (Spain), Gibraltar, Greenland, Iceland, Ireland, Norway, Spain and the UK. The biggest potential economic impact is in those remote locations where people have to travel in order to go whalewatching and these include the Azores, Greenland, Iceland and the Lofoten Islands, Norway. At these locations the multipliers for every pound spent on a whalewatching trip are likely to be significantly larger due to the high cost of travel, food and accommodation. However the environment in some of these regions is fragile and sensitive to increased anthropogenic pressures, including the impact of transportation. Economic impact associated with developing whalewatching in locations such as the Canary Islands or Gibraltar are less as there is already a huge tourism infrastructure in place.

For this study two offshore, deep sea locations were chosen in order to assess the existing and potential planning and management frameworks necessary for sustainable ecotourism. The two locations, Canary Islands and the Azores are both relatively remote island archipelagos in the Northeast Atlantic. Both locations have a rich diversity and abundance of cetaceans (whales, dolphins and porpoises) with at least 23 species recorded at each site.

The Canary Islands are a popular holiday destination for Europeans and whalewatching is well developed with over 1 million whalewatchers per annum, making the Canary Islands, along with the USA and Canada one of only three countries with over 1 million whalewatchers. Whales have long been associated with the Azores, as they were hunted commercially as recently as 1987. Since then whalewatching has replaced whaling and although the number of whalewatchers is still small the economic impact is significant as tourism is a relatively new industry and products and infrastructure limited. Both locations are attempting to manage whalewatching and have recently passed new legislation to increase the protection afforded to cetaceans in the area.

2.2. Canary Islands

Whalewatching began in the Canary Islands in the late 1980s and is now available in five locations: three on the south or southwest coast of Tenerife, and one each from La Gomera and Gran Canaria.

the public to see cetaceans in their natural habitat (IWC, 1994).

Although some visitors go to the Canary Islands especially for whalewatching, the vast majority are there on a sun and sand holiday and go whalewatching as a local attraction (Hoyt 2000).

The majority of whalewatchers leave ports Los Cristianos and Las Americas in southwest Tenerife. In La Gomera there is only one operator offering dedicated whalewatching and this operator co-operates with research and monitoring projects. In addition two operators offer wildlife and scenic cruises around the island which may include opportunistic whalewatching. Operators in Gran Canaria are restricted to Puerto Rico in the south of the island.

Table 3. Increase in the number of whalewatchers and their expenditure (€)in the Canary Islands (from Hoyt 2000)

Year	No. of whalewatchers	Direct expenditures	Total expenditures
1991	40,000	1,281,000	4,484,000
1994	250,000-600,000	8,008,000	28,028,000
1998	1,000,000	19,902,000	69,658,000

The main species watched is the short-finned pilot whale *Globicephalus macrorhynchus*, although up to 24 species have been observed around the islands. Initial interest in whales and whalewatching was stimulated by ongoing research projects on the whales (e.g. Heimlich-Boran & Heimlich-Boran, 1990; 1992) which started in 1988. Whalewatching on bottlenose dolphins *Tursiops truncatus* has recently started up from La Gomera and a variety of other whale and dolphin species can be seen offshore from the islands, but these have been little visited due to the close presence of pilot whales and bottlenose dolphins. Weather conditions are favourable for whalewatching on 315 days of the year.

2.2.1 Legislation and control

The number of whalewatching boats has grown from 10 in the early 1990s, to 48 licensed in 1996 and 50 in 1998. In the region of 15-20,000 trips are carried out each year.

Whalewatching regulations first came into force in 1995 (see Appendix II) which requires operators to obtain a permit. This seems to have controlled the number of whalewatching vessels, however since 1995 10% of the vessels have been replaced by new ones. Catamarans, with their much higher passenger capacity, now carry 50% of all whalewatchers. However, according to Hoyt (2000) the limit to whalewatching operators and boats has been based more on the availability of dockings for boats in the marinas than on best policy.

Swimming with whales, which was very popular in the early 1990s has now been restricted and now requires specific permission. The number (maximum 3) and distance (60m) boats can approach cetaceans is also limited.

In 1996 the authorities launched a patrol boat to ensure compliance with the whalewatching regulations. This vessel operated daily throughout 1996-1998 but due to funding restrictions the vessel could only run for 2-3 days per week during 1999 and 2000. At present (March 2001) the patrol vessel operates for 2 days per week but it is hoped a second vessel will operate from May 2001 and at least one of the vessels will work each day.

Under the amended 2000 regulations each vessel is now required to carry a "Sectarian Monitor Guide" as part of the licencing agreement. These guides are employed by the operators but must be certified by the Tourism Authority. At present these guides are not specific whalewatching guides but have general knowledge of the Canary Islands. It is hoped a specialist marine course will be available in the future to inform about marine and cetacean ecology and conservation and legislation.

2.2.2. Education and Research

Most operators in the Canary Islands offer non-educational whalewatching (Hoyt 2000). Several, however, have enhanced the value of the trips considerably by adding naturalists and also hydrophones for listening to whales. The scientific community in the Canary Islands has also benefited with extensive opportunities for carrying out research (e.g. Heimlich-Boran, 1993, Ritter & Ladner, 1996; Urquiola et al. 1997).

In 1993, the Society for the Study of Cetaceans in the Canary Archipelago (SECAC) was founded as a nonprofit organization to focus on research, conservation and dissemination of knowledge on the cetaceans of the Canary Islands. A new non-profit making organisation called MEER (Mammals. Encounters. Education. Research) has been collecting data on the abundance, distribution and behaviour of cetaceans off La Gomera since 1995. Although data are collected from whalewatching vessels they have been used for research and education and not monitoring purposes (Ritter 2001).

2.2.3. Management potential

Since the new whalewatching legislation in 1995 outside or unscrupulous operators have been largely eliminated, so most of the revenues from whalewatching now accrue to those operators resident in the Canary Islands (Hoyt 2000).

Under new legislation monitoring will be required but the details and protocol has not yet been determined. There are few economic studies available of the demography of the whalewatching industry and no information on visitor satisfaction, especially since swimming with whales was restricted (see Section 2.4 for Visitor Survey).

Partly as a result of reaction to the intense whalewatching activity, there have been moves to recommend a marine protected area for the waters frequented by the pilot whales and bottlenose dolphins.

2.3. Azores Islands

Whales are an important part of the Azorean culture. The tradition of whaling in the archipelago dates back to the 19th century when American whaling vessels on crossing the Atlantic, would collect provisions in the Azores and take on crew. The Azoreans were highly valued on whaling boats and after the US whaling fleet declined in the 1950s, many Azoreans returned home to continue the tradition. Sperm whales *Physeter macrocephalus* were the main species hunted, killed by hand-held harpoons, launched from open vessels and powered by sail.

The last whale was captured in 1987 near the island of Pico and whalewatching has been encouraged as an alternative since 1989, largely by the International Fund for Animal Welfare (IFAW). At present two of the five main island in the Azorean archipelago are involved in the whalewatching, namely Pico and Faial, although limited opportunities exist on Flores and San Miguel. Some ex-whalers as well as young Azoreans are now employed in the whalewatching industry as skippers, crew or land-based spotters. The old vigia huts, originally used for spotting whales for whaling, have been renovated and are used to spot whales for whalewatching vessels. Old attitudes are slow to change and dolphins are still thought to be harpooned by some fishermen and used as bait or for food.

Table 4. Increase in the number of whalewatchers and their expenditure (€) in the Azores (from Hoyt 2000).

Year	No. of whalewatchers	Direct expenditures	Total expenditures
1991	Minimal	Minimal	Minimal
1994	1,000	35,000	745,000
1998	9,500	652,000	3,774,000

The main target species for whalewatching operators are sperm whales *Physeter macrocephalus* but many other species including beaked whale species (family: Ziiphidae) can also be seen from the Azores. According to Hoyt (2000) there is outstanding potential providing the problems of managing whalewatching can be fully solved.

In 1998, based on operator statistics, 88% of whalewatchers were international and came to the Azores mainly or only to go whalewatching. Whalewatching is becoming a key attraction for the islands, with the images of whales proliferating in tourist material.

2.3.1. Legislation and control

The whalewatching industry began in 1992, with 100 tourists, and since then has been growing steadily, with around 8,500 whalewatchers reported in 2000. In 1998, 6 companies and 12 boats offered whale watching while at least 3 unlicensed vessels operated mainly with underwater film crews (Hoyt 2000). By 1999, there were ten companies, most using rigid-hulled inflatable boats and 1,400 trips were taken to see whales in the five-month season. The main fleet comprises small inflatable boats but sailing yachts are also frequently used. In 2000 there were at least 15 vessels operating but as the permits are not whalewatching specific and apply to all marine tourism, including fishing, it is not possible to know exactly how many are dedicated whalewatching vessels. Most trips are up to 3 hours in duration and their success is greatly dependent on a network of vigians who are in contact with vessels via VHF, although weather conditions are also an important constraint.

New whalewatch regulations came into force in March 1999. These new regulations are more complex and detailed (see Appendix II for edited version) but a full English translation is not yet available. This legislation covers several aspects of the licensing of whalewatching activities, observation, filming and photographing whales and research. Swimming with whales and international film crews, taking advantage of the diversity of cetacean species occurring in the Azores and the excellent underwater visibility, were an important component of whalewatching in the Azores. This activity has now been restricted but the impact of this on whalewatching has not been assessed.

At present operators are obliged to complete a form for each encounter at sea which includes information on species present, number of animals, behaviour and the occurrence of typical avoidance behaviour. However the forms are thought to be too complex at present for operators to complete in-situ and are completed retrospectively. A monitoring protocol for all whalewatching operators will be designed and management plans will be produced as part of an ongoing EU LIFE funded project (NAME AND NO). These plans should include adjustments to the recently imposed regulations.

2.3.2. Education and Research

Scientific research on sperm whales in the Azores has been carried out for many years as this is one of the most accessible sites for the study of sperm whales in the world. The first studies on whalewatching began in 1996. In 1998 a study was commissioned by the Regional Tourism Directorate and contributed to the new whalewatching regulations. A second study is assessing the feasibility of the new rules proposed in the regulations. During 2000, land-based observations were

carried out to validate the proposed minimum distances vessels should approach whales. As part of this second study the growth of the industry is being characterised and it is hoped an annual education course for operators will be developed.

Education and interpretative facilities at some locations are well developed. At Lajes on Pico, the Base for the Observation of Cetaceans in the Azores (BOCA) was opened in 1995 and provides high quality education and research materials. A significant proportion of the whalewatchers to the Azores would visit the BOCA.

2.3.3. Management potential

Hoyt (2000) reports that there is still a need for better regulation of boat numbers, licensing, and enforcement, as well as a need for a cooperative operators' association. A precautionary approach is strongly advised, and educational and scientific programs need to be expanded to add value to whale watching, without adding more boats.

2.4. Visitor Survey in La Gomera and Tenerife

2.4.1 Introduction

As part of the present contract a survey of whalewatchers was carried out on La Gomera and Tenerife in the Canary Islands to provide information on the demographic profile of whalewatchers and to assess their expectations and satisfaction while whalewatching.

The objective was to record the views of those people on whalewatching vessels from two different islands as well as understanding the perceptions of those people who may not go whalewatching.

2.4.2 Methodology

Face to face interviews were carried out on whalewatching boats operating from Las Americas in Tenerife and the whalewatching vessel (Triana) owned by Club de Mer operating from La Gomera between 15-30 May, 2001. Interviews were also carried out in the port of Los Cristianos in Tenerife and in La Gomera. The questions asked are shown in Table 5. Some questions were not relevant and not asked, depending on the response to the previous question.

2.4.3. Results

Tenerife

A total of 104 people were interviewed in the ports of Los Cristianos (n=54) and Las Americas (n=50) in and 105 on whalewatching vessel *Tropical Delfin* operating out of Las Americas. The full results from the survey are shown in Appendix I with the results from the whalewatching boats in Table 1 and the land-based interviews in Tables 2a and 2b.

In Tenerife, whalewatchers were generally 20-40 years of age, British people, on holiday for a week with their partners or family and chose Tenerife for the good weather (Table 6). The majority (84%) had never been whalewatching before and had traveled locally (50% <5km) or less than 100km (82.7%). Although over one half had heard of whalewatching on the island before arriving in Tenerife, only 24% said it had influenced their decision to come to Tenerife and 2.8 % to the Canaries.

Table 5. Visitor questionnaire completed during face-to-face interviews in La Gomera and Tenerife.

META Visitor Attitude Survey La Gomera, Canaries							
1. Male		Female					
2. Age Group:	16-19	19-29	30-39	40-49	50-59	60-69	70+
3. Nationality ?	In which country do you live ?						
4. Travelling alone ?	with partner ?			family ?		in a group ?	
5. What brings you to La Gomera;	holiday ?			resident of La Gomera ?			
6. Why La Gomera ?							
7. How long are you on La Gomera ?							
8. How far did you travel to go whalewatching ? (km)							
9. Are you diverting to La Gomera from another holiday ?							
10. Had you heard of whalewatching before arriving in La Gomera ?							
11. Where did you hear about whalewatching ?							
12. Was whalewatching a factor in you holidaying in La Gomera ?							Canaries ?
13. Have you been whalewatching before ?							where ?
14. Did you see cetaceans ?							(Observer Assessment*)
15. Did the experience exceed expectations	meet			or disappoint			
16. What did you particularly like ?							dislike ?
17. Why did you choose a particular whalewatching boat ?							
18. Would you liked to have swam with whales ?							or got closer ?
19. Are you aware of regulations/codes of conduct/intrusion on cetaceans ?							
20. How could whalewatching have been more enjoyable ?							
21. Would you go whalewatching again / recommend to others ?							

La Gomera

The island of La Gomera attracts a different kind of tourist. Although 81% of those interviewed were German which may have influenced the results, La Gomera attracts an older age profile (30-49 years of age) with a greater interest in walking and nature. Unlike on Tenerife, most had been whalewatching before (41.6%) and nearly one-half reported that the availability of whalewatching had influenced their decision to holiday on La Gomera.

Table 6 provides a summary of the answers most relevant to managing whalewatching. Interestingly, that although whalewatchers in La Gomera had often been whalewatching before, the experience exceeded their expectations on more occasions than in Tenerife. A similar proportion to Tenerife (>70.0%) still wanted to swim with whales, despite being more aware of the regulations/codes of conduct etc. The number from La Gomera, who wanted to get closer to whales, was lower; 21.7% compared to 68.8%. The latter is likely to be strongly influenced by the proximity of whales and dolphins to the boat during whalewatching trips which in turn will be strongly influenced by the cetacean species being watched; dolphins being more likely to bow-ride etc than whales.

Table 6. Summary of the answers to the most relevant whalewatching questions during visitor surveys.

Question	La Gomera		Tenerife	
	WW Vessel	Land	WW Vessel	Land
Had you heard of WW before arriving ? Answered - Yes	73.9%	68.1%	48.6%	40.4%
Was WW a factor in you holidaying in Canaries ?	64.6%	15.7%	24.0%	10.6%
Have you been WW before ? Answered - No	41.6%	38.6%	84.0%	83.3%
Did the experience exceed expectations /meet/ or disappoint ?	62/57/14	10/8/2	22/71/1	3/8/0
Would you liked to have swam with whales ? Answer - Yes	73.9%	50%	70.0%	58.3%
or got closer ? Answer - Yes	21.7%	78.9%	68.4%	45.5%
Are you aware of regulations/codes of conduct etc ? Answer - No	36.7%	70.2%	68.8%	55.5%

2.4.4. Discussion

Similar to Orams (2000) this survey has shown a very high level of satisfaction with expectations often exceeded. Most of the answers to the question how could whalewatching be more enjoyable related not to the actual whales but the operation (e.g. boat, food, more information, binoculars, etc, see Appendix I). As expected the level of awareness of regulations on whalewatching boats was much higher than those people interviewed on land.

A similar question relating to the effect of recent restrictions concerning swimming with whales will be included as part of the planned visitor survey in the Azores (Sara Magahales, pers. comm).

3. Monitoring indices to assess the sustainability of whalewatching

A review was carried out of international whalewatching locations and operations to identify any monitoring schemes that may have developed indices with which to monitor and assess impact. As well as a literature search, a request for information was posted on two marine mammal list-servers (MARMAM and European Cetacean Society). The studies referred to here are not meant to be exhaustive but indicative of the type of work and results available.

Despite the economic importance and longevity of whalewatching in many parts of the world there is surprisingly no long term monitoring of the whalewatching industry and its effects on cetaceans at any whalewatching location. There have been a number of short-term studies to assess the effect of tour boats and other activities (e.g. swim-with-dolphin operations, Samuels et al. 2000) on cetacean behaviour but no ongoing monitoring. There are data being collected as part of other studies, which could be used to address tourism related issues, but they are not designed to assess impact.

3.1. Biological monitoring

In order to develop genuinely sustainable whalewatching the effect of tourism activity on the species and habitat being exploited must be quantified and the impact assessed. This information is essential to determine carrying capacity, which is the amount of activity a species or habitat can be subjected to without affecting its long-term viability, and is the biological framework within which whalewatching is constrained. In practice it is extremely difficult to quantify carrying capacity and this has not been achieved at any whalewatching location in the world though some locations are attempting to address this issue (e.g. Shark Bay, Australia).

3.1.1 Short-term studies

The reactions of whales to whalewatching may be negative, neutral or occasionally positive. One of the first studies to assess the reaction of whales to whalewatching vessels was carried out by Gordon et al. (1992) who studied sperm whales in Kaikoura, New Zealand. Indeed there has probably been more work carried out on the effects of whalewatching on sperm whales than any other species (IFAW, 1996). This work showed that although there was some effect of whalewatching vessels, it was considered minimal and additional whalewatching licenses were issued by the licensing authority, the New Zealand Department of Conservation. Blane and Jaakson (1994) recorded avoidance responses by belugas (*Delphinapterus leucas*) to tour boats in the St. Lawrence River, Quebec, Canada. These included bunching together, longer dives and shorter surfacing time. Similar avoidance reactions were reported by Janik and Thompson (1996) for bottlenose dolphins in the Moray Firth, Scotland. Indeed dolphins avoided whalewatching vessels but there was no change in behaviour when ships, yachts or fishing boats were in the area. Corkeron (1995) showed whalewatching vessels affected the behaviour of humpback whales migrating through Hervey Bay, Australia especially whales with calves.

A more favourable response was reported by Ransom (1998) who analysed encounter duration of whalewatching vessels around spotted (*Stenella frontalis*) and bottlenose dolphins on Little Bahama Bank, Bahamas. Between 1996 and 97 observations of boat interactions within 1.2 km of the tour vessel and of swimmer interactions in water found significant increase in encounter duration. Possible explanations included dolphin habituation to swimmers, dolphin tolerance of humans, increased operator experience. More recently Bejder (1999) showed hectors dolphins (*Cephalorhynchus hectorii*) readily approached dolphin boats but their behaviour changed, with less frequent approaches, when encounters exceeded 70 minutes. Whalewatching vessels have been used successfully to assess relative abundance and distribution of minke whales (Leaper et al. 1997).

Monitoring studies have also been carried out from land. For example Yin (1999) studied dusky dolphins (*Lagenorhynchus obscurus*) in Kaikoura, New Zealand from land and reported statistical differences in their behaviour depending on vessel distance from the dolphin group. There was a tendency for more course changes by dolphins when vessels were within 300m and 100m of groups. Briggs (1991) described 24-hr observations conducted from blinds on shore at 2 main rubbing beaches for killer whales (*Orcinus orca*). He reported a 50% decrease in time at rubbing beaches from 1987-89. There was a near constant presence of fishing vessels during season and gun shots were heard on 35% of days that fishing vessels were moored (directed at shore and in water). Recreational boats following whales in straits were usually stopped from entering reserve by a ranger. Rubbing beaches are considered such an important part of the whales' habitat that a reserve was established to protect them.

Impacts of whalewatching are likely to be cumulative rather than catastrophic which emphasises a need for long term studies and for cautious interpretation when evaluating disturbance from short term studies (Bejder et al. 1999). In addition present information on baseline parameters is considered insufficient to measure subtle changes in behaviour that may be caused by whalewatching.

3.1.2. Long-term studies

Studies using long term data sets are scarce. Watkins (1986) reviewed research cruise logbooks from whalewatching vessels in Cape Cod, Massachusetts, USA over 30 years to evaluate responses of whales to research vessels in vicinity of Cape Cod. He compared whale behaviour before and after initiation of whalewatching and found whales primarily responded to underwater sound, light reflectivity and unexpected tactile sensation. The rate of habituation was often rapid but varied with individuals and stimulus and different species had different responses to vessels. He suggested that changes in whale behaviour have been gradual and therefore emphasized the need for long term monitoring. Interestingly although he recommended that skippers of whalewatch vessels used quiet, cautious approaches to whales, skippers have felt it was not necessary as whales have apparently began to accept the presence of whalewatch vessels. There are a number of long term population studies using photo-identification from whalewatching vessels (IWC 1990) and these data could be used to address the long term impact of whalewatching however to date no published review is available.

One novel attempt to monitor the effects of whalewatching involves Rhythm Based Communication (<http://www.whalecontact.com/research>) which attempts to determine the biological stress of the relevant individual(s).

The deficiencies in long term monitoring have been recognised by both the scientific community and the industry and there are a number of initiatives attempting to develop ongoing monitoring programmes (e.g. <http://www.planeta.com/planeta/01/0103whales.html>; Berrow & Holmes, 1999).

3.2. Monitoring Visitor Satisfaction

Managing whalewatching is as much about managing people as managing whales (Orams 2000). In order to develop sustainable ecotourism, monitoring people and product satisfaction is also essential, but despite the economic importance of whalewatching there have been few surveys to determine whether or not whalewatching operations are sustainable and even fewer to assess whether the needs of those who will pay to see whales are being met (Orams 2000).

The presence of whales and their proximity to the boat influences the whalewatchers satisfaction but Orams (2000) also showed a high degree of customer satisfaction can also be achieved in the absence of whales. It is important to note that there are a number of factors other than whales for successful whalewatching and identifying and providing these elements are as important as watching the whales.

Tour operators are becoming increasingly aware of the necessity to adopt good practices and ensure that their impact both environmentally and culturally is minimised (see <http://www.toinitiative.org/home.htm>). Sustainable management of whalewatching in many countries is being driven by tourism agencies and organisations as well as by conservation bodies and a partnership between both is essential for successful implementation.

3.3. Requirements of monitoring programme

A clear indication of the objectives of a monitoring programme is essential as different indices will monitor different aspects of the life-history or habitat of a species. For example; the EU Habitats Directive requires a "favourable conservation status" to be maintained in designated marine protected areas and monitoring programmes should be designed to determine compliance with this objective.

A long-term ongoing monitoring scheme should measure parameters that are sensitive enough to detect change at the appropriate scale. Analysis of these data may act as an early warning that something is changing, which may be an indication that the target species are receiving too much attention, and this should trigger a dedicated study. IFAW (1995) provide a list of potential biological and operational parameters that could be used to monitor impact (see Box 3.3.1). Some parameters will be more useful than others and are species or location specific.

Long term monitoring must also be financially sustainable and thus attempting to monitor population changes through recruitment, mortality or immigration/emmigration is likely to be financially unsustainable (Wilson et al. 1999). Monitoring will be more effective if a regular commitment is maintained over a long period providing extensive reporting, rather than short-term, intensive studies.

3.3.1. *Whalewatching platforms*

Parameters that may be useful for monitoring have to be easy to record, objective and feasible to measure consistently and accurately. Indices recorded may include the behaviour and movements of vessels using GPS loggers, revealing the time taken to find animals and the main areas of boat activity. Potential demographic indices, e.g. % calves, defecation rates as an index of feeding success, could also be used (see IFAW, 1995 and Box 3.3.1).

Box 3.3.1. Outline of parameters for research into whalewatching impacts (from IFAW, 1995)

1. ANIMAL PARAMETERS	3.3. Intensity of influence
1.1 Species - mysticete, odontocete, etc	3.3.1 Number of effectors
1.2 Population type	3.3.2
1.3 Previous experience of individual/group (level of habituation)	3.3.2 Proximity to cetaceans
	3.3.3 Duration of encounter
	3.3.4 Frequency of encounters
1.4 Age/sex demographics	4. MEASUREMENT PARAMETERS
1.5 Individual/group activity (e.g., feeding, resting)	4.1 Short-term reactions
1.6 Time of day (diurnal variation in activity/behaviour)	
1.7 Season (response type and extent can vary over year)	4.1.1 Behavioural
	- surfacing, ventilation and dive pattern
2. ENVIRONMENTAL PARAMETERS	- swimming speed, course and orientation relative to disturbance
2.1 Physical variables	spacing and cohesion of animals
2.1.1 Water depth and temperature	communicative displays (aerial, in-air)
vocalisations,	underwater signals; also suites of behaviour, ranges of intensity and rate of signalling to categorise severity of the action)
2.1.2 Bottom type and topography	manoeuvres of animals relative to disturbance
2.1.3 Thermal profile (CTD)	
2.1.4 light transmission (CTD)	
2.1.5 Current velocity and direction (drogue, Doppler profiler)	
defecation rate	
2.1.7 Wave height and direction (estimation)	4.1.2 Physiological
2.1.8 Natural ambient noise	heart/pulse rate
2.1.9 Sound propagation characteristics	stomach peristalsis
2.1.10 Ice cover	blood chemistry
2.2 Biological variables	
2.2.1 Prey availability (sampling)	4.1.3 Acoustic (vocal activity, type, intensity)
timing	modification of vocalisation rate
species composition	silence (and avoidance)
available bio-mass	modification of vocal frequency
partitioning	modification of vocal intensity
prey condition	modification of repertoire
	potential for masking
2.2.2 Predators (survey)	
specfes	4.2 Long-term impacts
density	
activity	4.2.1 Productivity (individual, group, population)
	calving rates, intervals and calf survival age at first reproduction
2.2.3 Biological pollutants (sampling)	
	4.2.2 Physical condition of individuals
3. INFLUENCE PARAMETERS	injuries and death from boat strikes
3.1 Platform (effector) characteristics	teeth (abnormalities in structure)
3.1.1 Boat	urine/blood chemistry, blubber thickness,
* type (e.g. outboard, inboard, sail, kayak)	pathological indicators, testosterone, progesterone
* size	and other enzymes
* noise characteristics	
3.1.2 Aircraft	4.2.3 Distribution (individual, group, population)
type (eg. helicopter, plane, balloon, etc.)	
size	4.2.4 Behaviour (habituation/tolerance)
noise characteristics	
3.1.3 Shore-based (by type according to landscape)	
3.1.4 Swimmers (swim and scuba)	
3.2 Platform (effector) behaviour	
3.2.1 Variations in speed	
3.2.2	

Current monitoring programmes tend to primarily consider whalewatching vessels as "platforms of opportunity" but increasingly aircraft are also being used for whalewatching and could also be useful platforms. There have been few attempts to assess the usefulness of these platforms of opportunity for long term monitoring (Bejder et al. 1999)

3.3.2. Land-based

Land-based monitoring programmes have advantages over boat based studies as the effect of the observer on the animals being monitored is very minimal. Monitoring may include tracking whales and boat movements with a remote theodolite station (Bejder et al. 1999). Land-based observations have also been used to provide minimum number estimates of dolphins in an area (Hammond & Thompson, 1991).

3.3.3. Visitors satisfaction and requirements

Comprehensive surveys of operator's views and also visitor satisfaction should be part of a monitoring programme.

4. Potential frameworks for sustainable management

4.1. Regulations and legislation

A variety of voluntary and legislative measures have been used to manage whalewatching throughout the world. All countries in Europe have national wildlife legislation which tends to address issues of harassment, disturbance and direct killing. However amendments are necessary in most countries to manage tourism activities such as whalewatching. In 1994 the International Whaling Commission (IWC), established a Whalewatching Working Group and considered that there was a general view on the need for regulations to provide adequate safeguards for the whales as voluntary guidelines or codes of conduct may not always be strong enough controls (IWC, 1995).

The conservation management of cetaceans is covered by a number of international conventions ratified in Europe including the BERNE and BONN Conventions and CITES. Conventions which traditionally have not been investigated with regards resource management but could have potential include OSPAR. Within Europe the Habitats Directive is increasingly identified as being most relevant, as it provides provision for designation for marine protected areas and thus the regulation of

whalewatching. However outside of Marine Protected Areas (MPA), additional legislation may have to be considered in order to provide a legal framework for tourism management.

Although restrictions may be imposed the most successful management potential exists where the number of operators and vessels are licensed.

4.2. Marine Protected Areas

Marine Protected Areas can play a strategic role in the management of marine environments and may be designated for a variety of reasons (see Kelleher & Kenchington, 1992). They are increasingly being considered as a framework for managing whalewatching. For example Stellwagen Bank off NE USA is one of the most important whalewatching sites in the world with at least 10 million whalewatchers between 1975 and 1993. The Stellwagen Bank National Marine Sanctuary (<http://www.sbnms.nos.org>) was established in 1993 in recognition of its importance for whales, largely determined from work carried out on whalewatching vessels, and the threat of excessive disturbance from the whalewatching industry.

No go zones are often a feature of MPA and can aid management by providing areas for whales to be free from disturbance by whalewatching. Critical habitats such as calving areas, rubbing beaches (for orcas) are often those areas designated no go zones.

In Europe the Habitats Directive offers the best opportunities for managing whalewatching. This Directive requires member states to designate sites for the conservation of specific species and habitats (Annex II), under the Natura 2000 network. All cetaceans are listed under Annex IV and two species, bottlenose dolphin and harbour porpoise *Phocoena phocoena*, are listed under Annex II, species whose conservation requires the designation of Special Area of Conservation (SAC). Bottlenose dolphins are frequently the target of whalewatching as they are coastal and readily approach boats. Whalewatching on this species occurs in the Azores, Canary Islands, Croatia, France, Greece, Ireland, Italy, Portugal and the UK.

MPA have also been established in Europe outside the framework of the Habitats Directive. The Ligurian Sea Sanctuary was established by France, Italy and Monaco in 1999. Although mainly concerned with industrial and fisheries impacts, the MPA will also attempt to regulate whalewatching operations.

MPA require adaptive management, that is a form of management based on solid scientific grounds and on performance of studies allowing a systematic evaluation to be made of the degree to which management objectives have been attained. In such a context, scientific research plays a strategic role.

4.3. Codes of Conduct/Guidelines

Models of best practice including codes of conduct and accreditation schemes are increasingly being promoted for the management of whalewatching. Most countries and communities involved in whalewatching have some regulations including codes of conduct with which whalewatching operators are asked to comply. Often these are voluntary but have legal enforcement in some areas, which may be through local by-laws or within the wider legislation of marine protected areas.

A recent review of international whalewatching guidelines (Carlson 2000) included those from six countries in Europe (Azores, Canaries, France, Ireland, Norway, UK) and these are presented in Appendix I. There are a wide range of Codes of Conduct (see Appendix for some examples). These include restrictions on the number of boats close to cetaceans, a minimum approach distance and sometimes a maximum time allowance during each encounter. However the International Whaling Commission Whalewatching Working Group suggest voluntary guidelines or codes of conduct may not always be strong enough to control whalewatching activities especially if there are management conflicts (IWC, 1995).

Both Portugal (Azores) and Spain (Canaries) have recently approved new regulations especially for the management of whalewatching. In the Azores and Canaries companies dedicated to whalewatching must apply for a permit and in the Canary Islands all vessels must carry a monitor-guide to ensure codes of conduction are respected. In the UK and Ireland guidelines for whalewatching operators have been published but no specific regulations have been passed. In an MPA such as the Shannon estuary, Ireland (a Special Area of Conservation for bottlenose dolphins) whalewatching is a notifiable activity and operators, as well as recreational craft, are legally obliged to adhere to the codes of conduct.

Voluntary guidelines, often developed by operators, can be more restrictive and comprehensive than those included in a legislative framework. For example the boater guidelines promoted by the Northwest Whalewatching Operators Association in the Pacific Northwest which is a favoured area for orcas (<http://www.nwwhalewatchers.org/whalewatchguidelines.htm>) are promoted beyond the boundaries of the San Juan Islands National Wildlife Refuge and Wilderness Area.

Essential for the scientific management of whalewatching is hypothesis testing. IFAW (1995) have produced a framework for assessing the effectiveness of each parameter used to determine impact (Box 4.3.1). However IFAW (1996) warn "it is very difficult to provide more specific recommendations, a priori, as to what would constitute biologically significant impacts warranting changes to the regulations or guidelines. Particular care needs to be taken to design studies so that they may have the

best possible chance of detecting any changes in behaviour. However, the participants emphasised that a failure to detect changes in behaviour would not necessarily mean that such changes were absent".

4.4. Research

Due to the lack of basic information on the ecology of cetaceans and the impact of tourism, research should be an essential element in the sustainable management of whalewatching. Research should not

Box 4.3.1. Making Decisions about Whalewatching Rules (from IFAW, 1995).

potential to harm the individual or the population". Traditional wildlife management agencies may not be equipped to incorporate social science research (Duffus & Dearden, 1990).

Ideally baseline research on the distribution and relative abundance of cetaceans should be carried out prior to the start of whalewatching. In reality this has rarely been possible (Berrow et al. 1996) and often it is the availability of whalewatching vessels that facilitate research projects which would not be generally possible without this facility.

4.4.1. Carrying capacity

The carrying capacity of whales to whalewatching is the ultimate constraint to sustainable whalewatching and all activities should be carried out within it. Unfortunately there is little or no information on the carrying capacity of whales to whalewatching. IFAW (1995, Box 3.3.1) list some biological and population parameters that may be impacted by whalewatching. To assess carrying capacity the most sensitive parameter must be determined and its limits assessed and whalewatching managed to within these constraints.

If carrying capacity exceeds demand then whalewatching could be sustainable if on the other hand demand exceeds carrying capacity then management will be necessary.

If, for example, the amount of time vessels are within 100m of cetaceans is the most sensitive variable, then whalewatch operation must work within these limits. This does not necessarily mean that the industry is limited, but must restrict this element of the operation to within sustainable limits. This could mean limiting the amount of time vessels are within 100m on each trip.

4.4.2. Education

Similar to ongoing research, education should be an integral part of developing sustainable whalewatching. Information on the species and habitat being exploited should be available to whalewatchers and operators alike.

Information on the legislation and codes of conduct etc should be promoted at all opportunities together with the sensitivity and conservation value of the site.

4.4.3. Stakeholder involvement

Increasingly the involvement of stakeholders in resource management is critical to the success of sustainable development. Stakeholders, both state bodies, local authorities and local community groups

and private companies should be identified and invited to contribute to the process. Responsibilities and aspirations should be agreed upon and a development plan together with timescales and the resources required to implement plan.

At sites where there are significant numbers of whalewatch operators they have formed associations or organisations. There are 36 operators from Washington State and British Columbia who are members of the Whalewatching Operators Association NW (<http://www.nwwhalewatchers.org>).

4.4.4. Funding

Sustainable development of whalewatching requires long-term funding commitment. State agencies are unlikely to, and should not necessarily, be expected to fund monitoring of whalewatching activities in the long-term. The “polluter pays principal” has been applied to industrial development throughout Europe and may be appropriate for the whalewatching industry.

The whalewatching industry could generate the funds necessary for monitoring of their activities through membership fees of Operators Associations or a trip levy. Some organisations such as the Whale Watching Operators Association NW fund research which provides them with the information they can use to educate passengers and the public and themselves. Swim-with-dolphin operators in the Bay of Isles in New Zealand also pay a levy which is used to fund research and monitoring. The funds are administered by a Committee comprising operators, scientists and New Zealand Department of Conservation staff and although though this levy is not legally binding the operators freely contribute as they can dictate what research is funded.

A number of studies have shown that willingness to pay (WTP) when based on levies is much higher if the funds are demonstrably used for research and monitoring (Tilt 1985, Orams 2000).

Research, education and monitoring should not be seen as a luxury but a necessary part of the sustainable management of whalewatching. It should be considered an operating overhead, similar to boat fuel and insurance. Unless funding is built into the operating costs of the whalewatching industry then it is unlikely that whalewatching can become genuinely sustainable.

5. Impact of proposed tighter regulations on visitor attitudes

Although many aspects of cetacean conservation was covered in national legislation both Portugal (Azores) and Spain (Canaries) have recently approved new regulations especially for the management of whalewatching.

Results of the survey in Tenerife and La Gomera showed that 31.2% and 63.3% of those people on whalewatching vessels were aware there were regulations or codes of conduct that sought to control the behaviour of boats around whales. This compares with 45% and 30% of those people interviewed on the street, suggesting whalewatchers learnt about regulations on the vessels or whalewatchers were more aware than the general person on the street. Visitor satisfaction was high with 75.5-41.0% reporting the experience met with their expectation and 23.4-44.6% exceeding expectations. There

was one disappointed customer on whalewatching boats in Tenerife and 14 in La Gomera. The latter was due to some trips not locating cetaceans while in Tenerife they were 100% successful.

Although the desire to swim with whales is high, not being able to swim with whales did not reduce visitor satisfaction and if more information was available as to why swimming has been restricted (i.e. for the welfare of the whales) the impact of restrictions on swimming would likely to be even less.

Although expectations were met 70% of whalewatchers expressed a desire to swim with whales and 68% would have liked to have got closer. This was reinforced by the suggestions on improving the trip when swimming (6 people), feeding (4), and touching (2) whales were made.

Of those people interviewed on the streets at Los Cristianos, four (8%), all were residents of Tenerife, reported that they would not want to go whalewatching as they considered it was bad for the whales and wished it would stop. This survey suggests that although many people would have liked to swim with whales the restrictions did not impact on their enjoyment of the trip.

6. Recommendations and future work

This study has identified deficiencies in the management of whalewatching if it is to be genuinely sustainable. Specific areas for further work include:

- i) identify potential species and sites for marine ecotourism in Europe,
- ii) encourage long-term monitoring to be established at whalewatching locations,
- iii) produce methodology for determining carrying capacity of species and habitats to tourism,
- iv) assess the effectiveness of recent legislation in reducing impact of whalewatching on whales,
- v) explore options for financing long-term monitoring of whalewatching,
- vi) quantify multipliers and leakages at a sample of whalewatching locations in Europe,
- vii) review national legislation and determine effectiveness at managing whalewatching
- viii) host conference on whalewatching in Europe as part of International Year of Ecotourism

7. Summary and Conclusions

Whalewatching, and other forms of marine ecotourism, is becoming an important economic activity in many parts of Europe, especially in peripheral regions, and is likely to continue to expand. Appropriate frameworks are necessary if these activities are to be sustainable and thus viable for coastal communities throughout the Atlantic region.

Although there are a wide range of legislative and voluntary frameworks throughout Europe for managing whalewatching, there is little continuity between countries and standards may vary significantly. Monitoring of the impact of ecotourism on affected species and habitats is limited, especially long-term programmes. Although ecotourism is largely an economic activity there are few studies of economic impact or visitor satisfaction.

Within the EU, the Habitats Directive is the most useful legislative framework for whalewatching as it provides for the designation of protected sites, but only for Annex II species (bottlenose dolphin and harbour porpoise). Codes of Conduct and best practice are widespread and promoted at most ecotourism sites. Legal enforcement of these guidelines have rarely been tested and mainly rely on voluntary compliance. There are few examples of using market forces to promote or ensure codes of best practice are adhered to, through for example, eco-labelling.

Whalewatching is providing many opportunities for research and education and there are increasingly sophisticated research programmes and innovative educational resources being produced. However long-term funding is required and, where possible, should be integrated into the industry through the payment of levies or donations. This will ensure long-term continuity and scale with an expanding industry.

The expansion of whalewatching as an ecotourism product in Europe is to be welcomed as it provides huge potential for research and education as well as economic benefits to coastal communities. As reliance on traditional sources of income such as fishing are increasingly under pressure, marine ecotourism does provide a viable alternative at some locations. In order to ensure sustainable development of this industry frameworks such as those discussed in this study should be considered and promoted through fiscal incentives, e.g. EU structural funds.

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Appendix I. Results of Visitor Survey of Whalewatchers in La Gomera and Tenerife.

Table 1. Results of Visitor Survey on Whalewatching Vessels operating from Las Americas, Tenerife (n = 105).

Question	Answers
1	55 Male, 60 Female
2	4 = 16-19, 29 = 19-29, 28 = 30-39, 12 = 40-49, 12 = 50-59, 6 = 60-69, 1 = 70+
3a	50 = British, 24 = Spanish, 5 = Argentinian, Dutch, Italian, 3 = German, 2 = Belgian, Irish, 1 = Norwegian, Indian, Swiss
3b	As above
4	54 = partner, 25 = family, 24 = group, 1 = alone
5	102 = holiday, 2 = resident, 1 = work
6	32 = Weather, 18 = Never been before, 16 = Recommended, 4 = Don't know, 3 = Change, Gift, nice, 2 = Friends, like Spain, Exotic, 1 = Cheap, Work, friendly, Clean, Honeymoon
7	58 = 7 days, 27 = 14 days, 6 = 10 and 11 days, 4 = 8 days, 2 = 5 days
8	29 = 1-10km, 8 = 11-20km, 5 = 21-50km, 6 = 51-100km, 3 = 100-150km, 7 = 150km+
9	89 = No, 13 = Yes
10	54 = No, 51 = Yes
11	16 = Abroad, 15 = rep, 12 = Hotel, TV, Adverts = 4, 3 = Family/Friend, 1 = Book, Internet, Previous holiday
12a	73 = No, 23 = Yes, 1 = a little
12b	12 = No, 3 = Yes
13a	84 = No, 19 = Yes
13b	5 = Tenerife, 2 = Israel, Aquarium, 1 = Canada, Canaries, Central America, Greece, Mediterranean
14	105 = Yes
15	71 = Meet, 22 = Exceed, 1 = Disappoint
16a	30 = Everything, 29 = Whales, 13 = Cliffs, 9 = Swimming, 4 = Boat, 3 = Dolphins, Proximity to whales, Food, Sun, 2 = Close contact, 1 = Waves, , Commentary, Family, Relaxing
16b	20 = Nothing, 6 = Choppy Seas, 4 = Food, Bus trip, 2 = waiting, 1 = Music, Not hear commentary, Swimming
17	50 = Recommended, 8 = no particular reason, 4 = glass bottom, 3 = safe, big, value for money
18a	70 = Yes, 30 = No
18b	52 = Yes, 24 = No
19	62 = No, 28 = Yes
20	36 = nothing, 7 = not seasick, 6 = Swimming with whales, 4 = Feeding whales, 3 = Binoculars, 2 = Longer with whales, Touching whales, Less people, 1 = getting closer, not chasing whales, leaving whales in peace, seeing dolphins, less warm, more time
21	97 = Yes, 1 = No

Table 2a. Results of Visitor Survey on the streets of Las Americas, Tenerife (n = 50).

Question	Answers
1	24 Male, 26 Female
2	4 = 16-19, 19 = 20-29, 15 = 30-39, 5 = 40-49, 4 = 50-59, 0 = 60-69, 1 = 70+
3a	26 = Spanish, 13 = British, 2 = German, 1 = Belgian, Dutch, Sweden, Italian, South African, French
3b	1 Belgian lived in Spain, all the rest as above
4	16 = partner, 5 = family, 4 = group, 3 = alone
5	25 = resident, 22 = holiday
6	12 = Weather, 3 = Friends, Beaches, 2 = Recommended, Brochure, Study, 1 = Try it, love, kids,
7	14 = 7 days, 4 = 14 days, 1 = 3, 6, 12, 21 days and 1 year
8	1 = 8km, 100km
9	All no
10	27 = Yes, 16 = No,
11	6 = Friends, 5 = TV, 2 = Newspaper, from Spain, 1 = from Germany, Italy and California
12a	16 = No
12b	12 = No, 3 = Yes
13a	22 = No, 6 = Yes
13b	1 = Gran Canaria, Tenerife, Portugal, USA
14	6 = Yes
15	5 = Meet, 1 = Exceed,
16a	1 = Everything, Whales, Dolphins, Scenery
16b	1 = Voice of commentary,
17	1 = Recommended, Personal contact, chance
18a	7 = Yes, 2 = No
18b	2 = Yes, 2 = No
19	17 = No, 14 = Yes
20	2 = more information, 1 = cheaper, closer to whales, closer but without disturbing them
21	6 = Yes

Table 2b. Results of Visitor Survey on the streets of Los Cristianos, Tenerife (n = 54).

Question	Answers
1	22 Male, 31 Female
2	2 = 16-19, 13 = 20-29, 17 = 30-39, 5 = 40-49, 7 = 50-59, 7 = 60-69, 1 = 70+
3a	20 = British, 16 = Spanish, 5 = Sweden, 2 = Belgian, Dutch, 1 = French, German, Moldovian
3b	1 Moldovian living in Spain, all the rest as above
4	20 = partner, 6 = family, 5 = group
5	33 = holiday, 16 = resident,
6	16 = Weather, 9 = Like it, 5 = Friends, 2 = Why not, Change, 1 = Work
7	16 = 14 days, 7 = 7 days, 3 = 10 days, 1 = 3 days, and 1 year
8	
9	All no
10	25 = No, 17 = Yes,
11	3 = Publicity material, TV, 1 = from boats, in Tenerife
12	26 = No, 3 = Yes
13a	30 = No, 6 = Yes
13b	5 = Tenerife, 1 = Mexico, Canada
14	2 = Yes, 1 = No
15	8 = Meet, 3 = Exceed,
16a	5 = Dolphins, 2 = Whales, 1 = Sea
16b	4 = Weather, 2 = Boat
17	4 = Cost, 3 = Recommended, Personal contact,
18a	7 = Yes, 5 = No
18b	6 = No, 5 = Yes
19	20 = No, 16 = Yes
20	2 = Better boat, 1 = Swimming with whales, more whales, closer to the whales
21	17 = Yes

Table 3a. Results of Visitor Survey on a Whalewatching Vessel operating from La Gomera (n = 139).

Question	Answers
1	88 Male, 48 Female
2	1 = 16-19, 21 = 19-29, 50 = 30-39, 39 = 40-49, 17 = 50-59, 9 = 60-69, 0 = 70+
3a	113 = German, 9 = British, 6 = Dutch, 3 = Swiss, 2 = Austrian, 1 = Belgium, Finland, Italian, Polish, Swedish
3b	As above except 7 (5 German, 1 Polish and 1 Dutch, living on La Gomera)
4	54 = partner, 34 = family, 30 = group, 18 = alone
5	124 = holiday, 12 = resident, 1 = work
6	32 = Weather, 18 = Never been before, 16 = Recommended, 4 = Don't know, 3 = Change, Gift, nice, 2 = Friends, like Spain, Exotic, 1 = Cheap, Work, friendly, Clean, Honeymoon
7	9 = 7 days, 5 = 11 days, 2 = 12 days, 2 = 13 days, 77 = 14 days, 1 = 15 days, 2 = 17 days, 23 = 21 days, 4 = 30 days, 2 = 45 days, 5 = 6 months
8	56 = <1km, 63 = 1-5km, 1 = 5-10km, 15 = 10-50km
9	82 = No, 7 = Yes
10	102 = Yes, 36 = No
11	26 = Family/Friend, 22 = Been before, Internet, 13 = Recommended, 11 = Books, 5 = TV, 4 = Newspapers
12a	59 = No, 56 = Yes,
12b	73 = No, 40 = Yes
13	80 = No, 57 = Yes
14	116 = Yes, 9 = No
15	62 = Exceed, 57 = Meet, 14 = Disappoint
16	2 = Crew, small group, to see dolphins, whole trip, 1 = pilot whales
17	5 = recommended, 3 = small boat, 1 = operator is serious, ecologically sensitive, by chance
18a	102 = Yes, 36 = No
18b	83 = No, 23 = Yes
19	88 = Yes, 51 = No
20	6 = Big whale, More information 5 = to see whales, timing of trip, temperature, food/drink, boat, swell, 3 = equipment/engines, 2 = longer trip, to see dolphins, 1 = swimming with whales, music, cost, lighting, whalewatchers should stay on low-level
21	131 = Yes, 3 = No

Table 3b. Results of Visitor Survey on the streets of La Gomera (n = 47).

Question	Answers
1	23 Male, 24 Female
2	1 = 16-19, 2 = 19-29, 13 = 30-39, 13 = 40-49, 13 = 50-59, 4 = 60-69, 0 = 70+
3a	39 = German, 3 = Dutch, 2 = British, 1 = Austrian, Swedish
3b	As above
4	21 = partner, 11 = family, 9 = group, 5 = alone
5	44 = holiday, 3 = resident, 1 = work
6	18 = Walking, 10 = Nice island, 7 = Been before, 5 = Recommended, 2 = Friends, 1 = Work
7	6 = 7 days, 1 = 11 days, 33 = 14 days, 1 = 17 days, 5 = 21 days,
8	17 = <1km, 25 = 1-5km, 3 = 5-10km, 3 = 10-50km
9	40 = No, 2 = Yes
10	32 = Yes, 15 = No
11	6 = Family/Friend, 5 = Been before, Recommended, Books, 3 = Adverts
12a	28 = No, 9 = Yes,
12b	31 = No, 6 = Yes
13	27 = No, 17 = Yes
14	21 = Yes, 9 = No
15	10 = Exceed, 8 = Meet, 2 = Disappoint
18a	27 = Yes, 17 = No
18b	15 = Yes, 4 = No,
19	33 = No, 14 = Yes
20	2 = more information, 1 = temperature, cost, food, trip length, big whale, swimming with whales
21	22 = Yes

Appendix II. Whalewatching guidelines in Europe (from Carlson, 2000).

INTERNATIONAL WHALING COMMISSION

A major new development in the IWC's involvement in whale watching as a sustainable use of cetacean resources. In 1993 the IWC invited Contracting Governments to undertake a preliminary assessment of the extent, and economic and scientific value of whale watching activities. These reports on the value and potential of whale watching were consolidated by the Secretariat and considered by a Working group at the 1994 meeting. As a result, the IWC has reaffirmed its interest in the subject, encouraged some scientific work and adopted a series of objectives and principles for managing whale watching proposed by the Scientific Committee. In 1996 it adopted a resolution that underlined the IWC's future role in monitoring and advising on the subject. The IWC Scientific Committee has agreed the following general guidelines for whale watching:

General Principles for Whale Watching

- (1) Manage the development of whale watching to minimise the risk of adverse impacts:**
 - (i) implement as appropriate measures to regulate platform numbers and size, activity, frequency and length of exposures in encounters with individuals and groups of whales;
 - management measures may include closed seasons or areas where required to provide additional protection;
 - ideally, undertake an early assessment of the numbers, distribution and other characteristics of the target population/s in the area;
 - (ii) monitor the effectiveness of management provisions and modify them as required to accommodate new information
 - (iii) where new whale watching operations are evolving, start cautiously, moderating activity until sufficient information is available on which to base any further development.
 - (iv) implement scientific research and population monitoring and collection of information on operations, target cetaceans and possible impacts, including those on the acoustic environment, as an early and integral component of management;
 - (v) develop training programs for operators and crew on the biology and behavior of target species, whale watching operations, and the management provisions in effect;
 - (vi) encourage the provision of accurate and informative material to whale watchers, to develop an informed and supportive public and encourage development of realistic expectations of encounters and avoid disappointment and pressure for increasingly risky behavior.

- (2) Design, maintain and operate platforms to minimize the risk of adverse effects on cetaceans, including disturbance from noise:**
 - (i) vessels, engines and other equipment should be designed, maintained, and operated during whale watching to reduce as far as practicable adverse impacts on the target species and their environment;
 - (ii) cetacean species may respond differently to low and high frequency sounds, relative sound intensity or rapid changes in sound; vessel operators should be aware of the acoustic characteristics of the target species and of their vessel under operating conditions; particularly of the need to reduce as far as possible production of potentially disturbing sound;
 - (iii) vessel design and operation should minimize the risk of injury to cetaceans should contact occur, for example, shrouding of propellers can reduce both noise and risk of injury;
 - (iv) operators should be able to keep track of whales during an encounter.

- (3) Allow the cetaceans to control the nature and duration of 'interactions':**

- (i) operators should have a sound understanding of the behavior of the cetaceans and be aware of behavioral changes which may indicate disturbance;
- (ii) in approaching or accompanying cetaceans, maximum platform speeds should be determined relative to that of the cetacean, and should not exceed it once on station;
- (iii) use appropriate angles and distances of approach; species may react differently, and most existing guidelines preclude head-on approaches;
- (iv) friendly whale behavior should be welcomed, but not cultivated; do not instigate direct contact with a platform;
- (v) avoid sudden changes in speed, direction or noise;
- (vi) do not alter platform speed or direction to counteract avoidance behavior by cetaceans;
- (vii) do not pursue, head off, or encircle cetaceans or cause groups to separate;
- (viii) approaches to mother/calf pairs and solitary calves and juveniles should be undertaken with special care there may be an increased risk of disturbance to these animals, or risk of injury if vessels are approached by calves;
- (ix) cetaceans should be able to detect a platform at all times, while quiet operations are desirable, attempts to eliminate all noise may result in cetaceans being startled by a platform which has approached undetected; rough seas may elevate background noise to levels at which vessels are less detectable.

AZORES Regulations

On January 28, the Regional Government of the Azores approved new legislation to regulate the whale watching activities and any other activities involving the observation of cetaceans. This was designated "Decreto Legislativo Regional No. 9/99/A, 22 de Março (Regional Legislative Decree 9/99/A, March 22).

An official translation of the new regulations for whale watching in the Azores is not yet available. Following is a summary of the approved regulations.

The general rules took in account the results of the Montecastelo-di-Vibio and Martinique Workshops (see bibliography below), and a long discussion phase with whale watching operators, scientific specialists, the population and Government.

The law now approved covers several aspects of the licensing of activities, observation, filming and photographing, research and other cases.

In summary, the approach of cetaceans must obey some rules, either regarding the distance as well as the direction, speed and time spent near the animals. The distances vary with situation but, as a general rule, it must not be less than 50 m in any case. The approach must be done from behind, leaving a free zone in front of the animals of at least 180°, by only one boat at time. Other boats may be in the vicinity, but not closer than 200m. Each boat must stay no longer than 30 min. with the same animal/group. Aircraft must not fly under 300 m above the cetaceans for observation.

Whales with calves and calves alone must not be approached closer than 100 m.

Boats must not exceed 30 minutes with the cetaceans.

No scuba diving is allowed with any cetacean, and snorkelling is allowed only with a list of delphiniids. Observation with submersibles, sub aquatic-scooters, kayaks, boards, Jet-skis and similar platforms is not permitted, as well as during the night.

Companies dedicating to whale watching must apply for a permit stating, amongst other things, the characteristics of the boats to be used. Recreational observation has to give priority to commercial tour operators, researchers and licensed photo/filming crews.

The natural photographers and researchers must apply for a special permit if their work needs exceptions to the rules. No harassing, behavioural manipulation or feeding is allowed in any case, except under special license, only for research purposes.

References:

IFAW, 1995. Report of the Workshop on the Scientific Aspects of Managing Whale-Watching, Montecastelo di Vibio, Italy. 40 pages.

IFAW, 1996. Report of the Workshop on the Special Aspects of Watching Sperm Whales, Roseau, Commonwealth of Dominica. 36 pages.

CANARY ISLANDS **1995 Regulation**

2249 Decree 320/1995 of the 10th of November, by which cetacean observation activities are regulated.

Preamble

The observation of cetaceans constitutes an important economic, recreational and educational activity for many people. For the great majority of people this experience is their first contact with marine mammals and their habitat. The observation of cetaceans in their environment is not a negative activity in and of itself, as it can play an important part in conservation work and for environmental education. Nevertheless, problems begin to arise when there is a large growth in the number of vessels involved in these activities. The question is not the activity in itself, but rather in how it is undertaken.

The cetaceans referred to are included in Annex IV of Directive 92/43/CEE of the Council of 21 May, relating to the conservation and natural habitats and of wildlife (The Habitats Directive of the EU) as a strictly protected taxon. Said animals are threatened by degradation of habitat, contamination by heavy META-ls, organochlorides, etc., acoustic pollution, incidental takes in various fishing methods, overexploitation of fisheries resources, and, significantly in this case, by badly managed observation of the same. All of this provokes stress in the animals, as they are approached by numerous vessels that disperse their social groups or even box them in, not to mention the fact that bold approaches by the boats can even hit the animals or injure them.

The tourism development that certain areas of the islands have suffered in recent years has produced an increase in demand for recreational activities. This has led to the growth of numerous companies offering maritime excursions, which include the observation of whales (in particular pilot whales) and dolphins. From the economic point of view, this new market has run into two important problems in just a few years: on one hand, the companies that have legally constituted themselves as a business entity suffer competition from several boats that realize whale watching activities furtively, and on the other hand, the environmental impact question that arises as a result of harassing cetaceans.

For this reason, the adoption of measures of prevention and protection regulating the uses of these animals to which we have referred was mentioned in article 26 of Law 7/1995, of the 6th of April, under the Jurisdiction of the Tourism Department of the Canaries, which made reference to the placing of tourism activities under the laws on environment and conservation of nature, in particular to those affecting protection of flora and fauna, under Law 4/1989 of the 27 of March, which basically refers to, among other things, measures necessary to guarantee the conservation of species.

With this present Decree, rules of behaviour are established in order to resolve the questions put forth above, making them applicable not only to tourist activities but also to any other type of activities, whether scientific, recreational, educational, etc. which has as its objective the observation of cetaceans within the jurisdiction of the Autonomous Community of the Canaries.

In its virtue, by proposal of the Counselor of the Political Territory, and with previous deliberation of the Government in session, celebrated this day, the 10th of November 1995,

Article 1: Objectives

It is the objective of the present Decree to regulate activities that are realized by people or entities in the observation of cetaceans, with a goal of establishing the conservation means necessary to protect the same.

Article 2: The present Decree will be applied equally to all those who organise excursions for touristic reasons, recreational reasons, educational reasons, scientific reasons etc. in order to observe cetaceans in the jurisdiction of the Autonomous Community of the Canaries.

Article 3: Legal guidelines of observation activities.

1. Persons cited in the above article must solicit in advance the pertinent authorizations and to carry on board the vessels used a monitor-guide who specializes in cetaceans, whose characteristics and means of accreditation will be determined by law.
2. During the observation of cetaceans, and in order to not injure, harass or distress the same, the Code of Conduct in Annex 1 of the present decree must be observed. Failure to comply with the Code of Conduct will be considered as an administrative offense, and as such will be punished by application of the sanctions contained in Title VI of Law 4/1989 of the 27th of March on the Conservation of Natural Spaces and of Wild Flora and Fauna. In any case, failure to comply with the Code of Conduct will lead to immediate loss of license, without prejudice to the sanction that might correspond to the infraction.
3. In those cases where the observation of cetaceans is for scientific or research purposes, certain elements of the obligations listed above may be waived as long as such an exemption has been asked for and is fully justifiable.
4. The authorization cited in part 1 of the present article will be issued by the Vice Counsel of Environment within 15 days of receipt of such a request, which will be understood to be denied if the time limit is passed with no express resolution of the authorization. The requests for permits shall be presented to the same Vice Counsel of Environment following the model in Annex 2, and to be referred to as:
 - a) request for a set trip
 - b) request for a set period of time
5. As a requirement of permission, the Counselor of the Political Territory may ask for the deposit of a bond in order to guarantee compliance with the responsibilities that must be followed.

Additional Dispositions

The permit referred to in article 3.1 is understood to be without prejudice to any other administrative measures that arise out of current laws.

Temporary Dispositions

Until such time as the characteristics and means of accreditation have been determined by law for the monitor-guide referred to in Article 3.1 of this Decree, vessels must take on board a monitor responsible for the excursion.

Final Dispositions

First: The present Decree will enter into force on the day following its publication in the Official Bulletin of the Canaries.

Second: The Counselor of the Political Territory is empowered to determine the precise dispositions that will be necessary for the development and application of the present Decree.

As given in Las Palmas of Grand Canary Island, this 10th of November 1995 The President of the Government, Manuel Hermoso Rojas

ANNEX I: Code of Conduct

A) Basic obligations:

- do not intercept the trajectory of the animals.
- do not separate or disperse the groups of animals being observed, especially when a mother and calf are involved
- avoid the simultaneous presence of more than 3 vessels at a distance less than 200 meters from a cetacean or group of cetaceans
- maintain a distance of at least 60 meters from the animals except in situations of emergency or under express authorization
- do not swim or dive deliberately in the proximity of the animals, without express permission
- do not throw food or waste in the proximity of the animals

B) Methods of approach:

- When a vessel is within 300 meters of cetaceans it must move at a slow speed, not more rapidly than the slowest moving animal of the group.
- Approaches to cetaceans must be made gently, converging in the direction that the animals themselves are following.
- Approaches must never be made head on, always allowing for the movement of the cetaceans in any direction.
- During the observation a parallel trajectory to the animal, must always be attempted to be maintained.
- Avoid in all cases abrupt changes in direction or velocity.
- Put the motor on idle, at least one minute before turning it off if the vessels stops in order to observe cetaceans. The same is to be done if an animal approaches the vessel.
- Do not start the motor, or increase speed, if an animal is found within 60 meters of the boat.

C) Behaviour with Cetaceans:

- Abandon the zone if any sign of alarm, change or stress such as abrupt changes in direction or speed, successive dives or exhaling air under water is shown by the animals.
- Avoid noises that could bother the animals, as well as emitting sounds to attract them.
- Advise authorities of your location in the case of an accidental injury to a cetacean. Do the same in the event of observing a dead floating cetacean.
- If two or more vessels approach the same individual or groups, they must communicate amongst themselves in order to coordinate the approaches and maneuvers in a way to minimise repercussions to the animals.

Annex II: Permit Request Model

Asks such things as the accreditation as a tourism company (if applicable), certify that a monitor-guide will be on board, attach the accreditations of the monitor-guide, attach the navigation permits, identify species of cetaceans expected to encounter, description of the vessels(s), name and title of crew and professional experience, location proposed for the activity, duration, frequency and dates of excursions, and, in the case of educational tours, asks that copies of material provided to passengers be attached.

2000 Regulations (still waiting English translation)

FRANCE

There are no guidelines or regulation on a national level

In Normandy, the GMN created a respectful code of conduct towards bottlenose dolphins which includes no pursuing. There is no limit of time when following a group (maximum 7 hours). There should not be more than 2 boats on the same group of dolphins. Approach distance is between 10 and 50m unless the dolphins do not come to “play”.

UNITED KINGDOM

DETR Guidelines For Whale Watching in UK Waters

It is a rare privilege to be able to watch cetaceans (whales, dolphins and porpoises) in their natural environment. The most rewarding encounters occur when they are undisturbed. The following guidelines are designed to minimise stress to individual animals and adverse effects on populations. Where local guidelines are in place, tour operators should follow them. Where these are not in place, it is recommended that you follow these.

- * Maintain slow steady forward progress throughout the trip. Deviation towards cetaceans should only occur when they are sighted in open waters with little other boat traffic. Any approach should be slow and at an oblique angle and should not aim closer than 100m.
- * If cetaceans are sighted you should slow down gradually to no wake speed (or less than 5 knots) and maintain this speed until well clear.
- * Let cetaceans approach you. If cetaceans do choose to approach the vessel or bow-ride, you should maintain a steady speed without changing course. Refrain from altering course to approach them and remember that they may choose not to bow-ride.
- * You should move away slowly if you notice signs of disturbance, such as erratic changes in speed and direction or lengthy periods underwater.
- * Refrain from driving through, or between, groups of cetaceans.
- * You should avoid cetaceans with young.
- * You should try to allow a clear escape route for cetaceans.
- * Try to plan routes and times so there are no more than two boats within 1km of cetaceans. In areas of heavy traffic or in enclosed waters the duration and number of trips should be limited.
- * You should consider fitting propeller guards to minimise the risk of injury to cetaceans. Maintain propellers to avoid unnecessary noise disturbance. Where possible, use boats with low engine noise. Be aware of, and attempt to minimise, other possible sources of noise disturbance.
- * For the sake of their safety and the health of the cetaceans, passengers and crew should refrain from swimming with, touching or feeding cetaceans.
- * Where possible, the crew of a vessel should include a person who is able to inform the public about the natural history and conservation requirements of cetaceans.
- * Remember that it is an offence to dispose of sewage, fuel, oil or litter at sea.

Boat User's Code of Conduct

Whale and Dolphin Conservation Society (Non-governmental Organisation)

February 2000

If dolphins approach the boat and/or bow-ride, maintain a slow, steady speed. Do not change course or turn back to them. Dolphins should never be chased or harassed in an attempt to make them bow-ride. When dolphin watching, please follow these simple guidelines:

* Please keep your distance and never get closer than 100m (200m if another boat is present). The golden rule when watching dolphins is always to let them decide what happens.

* Never drive head-on to, or move between, scatter or separate dolphins. If unsure of their direction, simply stop and put the engine into neutral.

* Please spend no longer than 15 minutes near the dolphins.

* Take special care with mothers and their young.

* Avoid repeated changes in direction or speed - maintain a slow, no wake speed. If dolphins keep heading away, or any of your activity appears to be distressing or harassing them, slowly leave.

* Do not dispose of any rubbish, litter or contaminants at sea.

Sea Watch Foundation (Non-governmental Organisation)

There is no reason why boats and dolphins should not be able to co-exist if care is taken to observe the following rules:

1. **Do not** chase dolphins or drive a boat directly towards them; whenever possible, let them approach you.

2. **Do not** respond to them by changing course or speed in a sudden erratic manner; slowing down or stopping suddenly can confuse and alarm dolphins as much as sudden acceleration.

3. **Avoid** dolphins with young.

4. Do not swim with, touch or feed dolphins, for your safety and theirs.

5. **Ensure that** no more than one boat is within 100 meters, or three boats within one kilo-meter of dolphins at any one time.

SCOTLAND

Codes of Conduct for watching Minke Whales

1. Do not alter course to steer directly at a whale or circle around a whale. (Avoid appearing as a threat to the animal).

2. Do not suddenly change course or speed in reaction to a sighting or in the presence of a whale. Never go into reverse.

3. Avoid getting close to whales with small young. (calves are more naive than older animals and may not perceive a boat and its propeller as a physical threat. Whales with when they have young.)

4. Ensure that no more than 3 boats are within 1km. (More boats are likely to harass an animal. The whale is less likely to avoid them all.)

5. After first sighting a whale, limit your speed to a wake speed no more than 5 knots. (Lower speeds generate less noise disturbance; boats get particularly noisy when you push them towards their hull speed. Lower speeds give more time for a whale to avoid the boat.

6. Remain more than 200m from the whale unless the whale chooses to approach you. (A whale may be feeding in a very specific area and your approach may disrupt its feeding.)

7. Do not repeatedly approach whales, which are obviously shy of boats. (Individual whales react differently to boats. You are unlikely to be able to approach a whale, which is shy.

Codes of Conduct for watching dolphins

If you are a boat user or jet skier (personal watercraft user), please follow these guidelines when you see dolphins or porpoises:

1. Avoid sudden changes in speed or direction. Slowing down suddenly will confuse and scare dolphins and porpoises as much as speeding up.
2. Avoid traveling at high speed.
3. Look out for groups of dolphins or porpoise and avoid heading straight for them-they may not know you are there.
4. Avoid swimming with, touching or feeding the dolphins- for your safety and theirs. Remember, they are wild animals.

WALES

Codes of Conduct for watching dolphins

Cardigan Bay Forum

1. **Do not** chase dolphins or drive a boat directly towards them. Whenever possible, let them approach you.
2. **Do not** change course or speed in a sudden or erratic manner; slowing down or stopping suddenly can confuse or alarm dolphins as much as sudden acceleration.
3. **Avoid** dolphins with young.
4. **Do not** swim with, touch or feed dolphins, for your safety and theirs.
5. **Ensure** that no more than one boat is within 100m or three boats within one kilometer of dolphins at any one time.

The bottle-nosed dolphin and the harbor porpoise are protected by law under the Wildlife and Countryside Act (1981). If you see anyone deliberately harassing them, please report it to the police.

Commercial passenger boat code for the Ceredigion Marine Heritage Coast (MHC) and Cardigan Bay Special Area of Conservation (SAC), West Wales.

General (not entire text):

- * Speed limit within the MHC of 8 knot
- * Speed limit of 8 kts within 300m from high tide line along other stretches of coast
- * Outside these areas, be aware of wildlife and adopt suitable behaviours when coming into contact

Specific to cetaceans:

- * Any individual should not be approached head on
- * Throttle back from 300m when approaching
- * Remain stationery or cruise by at 100m from any individual or group - let them come to you
- * Do not circle around individuals or group
- * Avoid "bunching" around animals
- * Avoid deviating from agreed routes to see animals

IRELAND

These Codes of Conduct are accepted by the operators in the Shannon estuary and part of the new Accreditation Scheme for operators in the Shannon Estuary SAC (Special Area of Conservation under the EU Habitats Directive). As of April 2000 the Shannon estuary is a candidate SAC and dolphin-watching is listed as a notifiable activity. Operators must seek permission from the Minister of Arts, Culture and the Gaeltacht, to be allowed to commercially dolphin-watch in the SAC. To receive permission operators must

- comply by the Codes of Conduct
- abide by the Management Plan

- provide monitoring data
- demonstrate competence in environmental interpretation and species ID

If they do this they will be accredited Operators. Under the SAC Conservation Plan (still in draft March 2001) the total time commercial tour boats are in the vicinity of dolphins will be controlled. Adopting the precautionary principle this will be fixed at the 1999 level, with allowance for present expansion rate, and will not be increased unless monitoring shows that no detrimental effect of the dolphins will result. The Conservation Plan will also limit the time tour boats are in the vicinity (<300m) on a single dolphin or group of dolphins. Monitoring protocols, trialled during the 1999 season, combined with photo-identification, will enable the location, group and identity of dolphins watched to be assessed which is essential to determine the impact of commercial dolphin-watching.

Codes of Conduct (applies to all craft, commercial and recreational)

1. A maximum speed restriction of 7 knots applies to an area south of a line joining the cardinal buoys Doonaha - Tail of Beal to Kilconnelly Point, as this is an important habitat for dolphins.
2. When vessels first see dolphins they should maintain a steady course, reduce speed (<7kts) and monitor the dolphins heading. Attempts should be made to steer a parallel course to the dolphins. DO NOT PERSUE DOLPHINS, allow the dolphins to come to the vessel not you to them.
3. maintain a minimum distance between vessels of 200m.
4. No more than 3 vessels on the same group of dolphins at any one time.
5. vessels on the same group of dolphins should maintain a serial course to each other if at all possible. DO NOT CORRAL BETWEEN VESSELS.
6. successive boats should follow the same course and come astern.
7. maximum time in the proximity of any one group of dolphins should be 30 minutes per vessel, per trip.
8. new vessels into dolphin encounter zones should make VHF contact with existing vessels on Channel 8.
9. there is to be no swimming with dolphins from commercial tour boats.

ICELAND

The Húsavík Whale Centre

Approaching the whales:

When a boat approaches a whale, the main engines should be cut back and let idle.

If a whale-watching boat is already near the whale or whales, the approaching boat should not come closer than 2-300 meters until the first boat leaves or indicates that it is safe to approach.

Do not approach a whale head on or from directly behind.

The best approach to a whale is slowly from the side and slightly behind.

When a boat approaches a whale it should not go closer to it than 50 meters.

If the whale approaches the boat, the propeller should be stopped while the whale is near the boat.

Cause as little noise and disturbance for the animals as possible.

A good idea is to let the engines idle and let the boat drift when approaching the whale. It might be good to turn the engines completely off if the whale wishes to approach the boat. (Passengers can appreciate the quietude better and listen to the whale blowing)

Do not run the engine and propeller at full power in the vicinity of whales nor make sudden directional changes.

Avoid chasing the whales. If a whale shies away from the boat, then cease (following this whale) and look elsewhere.

If dolphins come under the boat and in front of the bow, it is alright to maintain speed 4-6 mph (miles per hour) to let the dolphins play in the wave from the bow. Point out to the passengers to look under the bow when dolphins are in front of the boat.

Do not throw trash to the whales or into the sea.

Avoid sudden changes in direction when the animals are close to the boat.

Memorise landmarks or locations on land to pinpoint the whales better.

Do not stay too long near the whales, it may be good to seek other grounds to find other animals.

Table 2. Numbers of whalewatchers and their expenditure (€) in Europe (adapted from Hoyt, 2000).

Country	No. of whalewatchers	Year began	No. communities	Value Direct	Value Indirect	Monitoring
Azores	9,500	1989	2	652,000	3,774,000	√√
Canaries	1,000,000	Late 80s	5	19,902,000	69,658,000	√
Croatia	21	1991	1	16,800	20,000	√√
Cyprus	minimal	Late 90s	0	-	-	√√√
Denmark	minimal	mid 90s	1	-	-	-
Faroe Islands	minimal	1996	0	-	-	-
France	750	1983	6	460,000	573,000	-
Germany	minimal	early 90s	1	-	-	-
Gibraltar	18,750	1980	2	504,000	3,024,000	√√
Greece	3,678	Late 80s	3	157,000	292,000	√√√
Greenland	2,500	early 90s	6	932,000	3,080,000	-
Iceland	30,330	1991	8	3,313,000	7,246,000	√
Italy	5,300	1988	2	270,000	608,000	√
Ireland	177,600	1986	3	1,480,000	7,973,000	√
Monaco	minimal	Early 90s	1	-	-	-
Norway	22,380	1988	2	1,828,000	13,488,000	√
Portugal	1,398	Early 80s	1	35,000	97,000	√
Spain	25-38,000	Late 80s	11	616,000	2,156,000	√
UK	121,125+	mid 80s	>10	2,110,000	9,219,000	√√

√ = small, √√ = developing, √√√ = significant