

Coastwatch UK – a public participation survey

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Abstract. Education and public participation are recognized as important elements of coastal zone management. The current paper describes the UK's largest public participation survey concerned with coastal issues. Coastwatch UK involves thousands of volunteers in an annual survey of the coastline. The project has several aims – primarily to provide an insight into the major problems and threats to the coastline and, through the involvement of volunteers, to raise public awareness and aid environmental education at all levels.

Keywords: Coastal management; Environmental education; Pollution; Volunteer.

Introduction

Public participation is a key element of successful integrated coastal zone management (Camhis & Coccoccis 1982; Gubbay 1994; Waite 1982). Of importance to the issue of public participation is Agenda 21 arising from the Rio Earth Summit, June 1992 (Anon. 1992). Many of the problems addressed by Agenda 21 are local and therefore the involvement of local authorities as the facilitating bodies for Local Agenda 21 becomes obvious as they have a vital role in educating, mobilizing and responding to the public to promote sustainable development. The strength of Local Agenda 21 is that it allows people involved in local action to realize they are part of a much wider effort which has global impact. This in itself helps to motivate them to take their own responsibility in environmental improvement seriously (Harman et al. 1996). Coastal management is an area of environmental action in which the public can play an important part. In particular the public can be an essential part of beach litter management and control. It is an issue which requires specific management given its potential impacts on tourism. Public involvement in coastal management takes two forms: (1) direct action, such as beach clean-ups and monitoring and (2) indirect action, such as education, award schemes and legislation. The current paper describes a large-scale public participation project that involves the public in both direct and indirect action to aid coastal management.

Coastwatch UK is part of a Europe-wide initiative, Coastwatch Europe, currently involving around 20 countries. It was established in 1988 by the Dublin Bay Environment Group with core funding from the European Commission through DGXI. The project was initiated with the following aims in mind:

- To gather a large amount of baseline data in a form which is directly comparable.
 - To identify problems and threats to the coastline of Europe.
 - To raise public awareness.
 - To aid formal and informal environmental education
- In the UK the project has the additional aim of exploring public health issues.

Organization and Methods

The Coastwatch Europe organization receives core funding from the European Commission but individual countries are required to raise national funds to organise their own survey. In the UK funding was received from a commercial sponsor between 1989 and 1994. Since 1994 regional funding has been obtained through a consortium of local authorities and through funding from the education sector. Funding is the major constraint for the project's expansion.

Coastwatch UK is co-ordinated from the Robens Centre for Public and Environmental Health, University of Surrey where the UK national co-ordinator is based. National co-ordinators meet twice a year to refine the questionnaire and to discuss national variations in the survey. The survey is carried out annually during late September / early October in each country.

Surveyor groups and recruitment

Education is an important aim in many of the countries participating and therefore in several countries, such as Denmark, Belgium, Iceland and Spain, over 80% of the groups involved are from schools. In the UK ca. 50% of the surveyors are from schools. In addition, a number of higher education establishments participate in the project as well as local and national environmental and interest

groups. Involvement of such groups experienced in survey work ensures that volunteers are under strict supervision and well organized.

Surveyors are recruited by a variety of methods. At the onset of the project volunteers were invited to participate exclusively through the media. In subsequent years recruitment became less concentrated around the survey period. A publicity brochure was produced and mailed to groups who had previously participated in the survey and in response to general inquiries. Increasingly, a network of core surveyors has been established who are familiar with the format of the survey and their site. Currently, between 60 and 70% of groups have participated in at least one Coastwatch UK survey before.

Site selection

In 1991 the national co-ordinating office classified the entire UK coastline into 5-km blocks using Ordnance Survey maps (scale 1 : 50 000). Each block of coastline is identified by a six-figure map reference of the start and finish of the block, a county and block code. The name of the block describes the starting point. Identical blocks of coastline can therefore be surveyed each year. This method ensures that sites are unbiased in terms of proximity to potential litter sources, the effects of wind or current and allow a truly representative sample of UK coastline to be surveyed.

Allocation of coastal blocks

Where possible, the same sites are allocated as a priority each year. Each volunteer group is designated a 5-km block of coastline in the location of their choice. On allocation the volunteers receive written notification of the name of the block, the map reference of the start and finish of the block, the block code and county code.

Volunteers are asked to confirm in writing that they are able to complete the survey of the allocated block. This ensures, as far as possible, that volunteers are committed to carrying out the survey and allows the block to be re-allocated before the start of the fieldwork period if necessary. All details of the block together with the contact name, address and telephone number of the surveyor group are recorded on a database.

Guidance

The involvement of such large numbers of volunteers to gather data obviously precludes the option of personal training of each individual. Surveyors are therefore provided with as much guidance as possible to ensure that, as far as possible, the questionnaires are completed with the same degree of accuracy by each group.

Where possible regional training events are held, however, due to staffing constraints these are limited. All materials required to complete the survey are mailed to

volunteers approximately three weeks before the start of the survey. Telephone instructions are issued where appropriate. In addition, surveyors are provided with the contact number of a regional co-ordinator whom they can contact during the survey period in case of difficulties.

Completion of the survey

Surveyors are instructed to visit their allocated block of coastline on one day during the fieldwork period as close to low tide as possible. The block is divided into 10 equal units each 0.5 km in length. One Coastwatch Europe questionnaire is provided for each unit and identified by sequential numbering. Surveyors are instructed to walk along the unit at the tide mark and then return via the splash zone and indicate a positive answer using a tick or giving a numerical or written answer where appropriate. This method removes any assumptions made when using transects (Burnham et al. 1980, 1985) or smaller units used in previous studies such as those of Dixon & Dixon (1983), Caulton & Mocogni (1987) and Benton (1995), and the data can be accurately mapped for every 500 m surveyed. Completion of the questionnaires requires a thorough examination of all sections of the coastline in terms of its physical characteristics, ecology, threats and pollution status.

Questionnaire

All participating countries are issued with identical core questionnaires translated as necessary. Detailed instructions on how to complete the questionnaires are issued by each country to ensure consistency in methodology. In the UK this takes the form of a 'resource file' containing all the materials required for completion of the survey and support materials. The instruction sheets are updated as necessary and each volunteer group receives additional information in the form of fact sheets on marine issues and ideas for follow-up activities. The fact sheets are aimed at providing background information to the issues covered by the questionnaires and to aid completion of the survey. The follow-up activities are aimed at encouraging surveyors to investigate the issues further and to continue their involvement in related activities throughout the year. The activities are designed to be adapted to suit various age ranges and, where appropriate, the materials are referenced to the UK National Curriculum to aid formal education and cover a range of cross-curricular subjects.

The questionnaire covers a range of issues relating to the coastal zone:

1. Information on the site, including knowledge of designation and surveyors familiarity of the site.
2. Character of the coastal zone – land use in the area up to 500 m from the splash zone. The activities occurring in the immediate hinterland may have an important

influence on the type of management required for the coastal zone. Inflows into coastal units are a potential source of unregulated pollution. Surveyors are asked to characterise and examine all inflows into the coastal unit and to assess the quality by recording basic characteristics such as 'off smells', discolouration, dead fish, presence of oil, petrol, dumped debris, sewage fungus and scum/froth. Given the international concern with regard to the problems of eutrophication experienced in the North Sea and Mediterranean (Boalch 1987; Anon. 1990a; Pearce 1995) each year surveyors are provided with nitrate test strips to estimate the nitrate concentration of water flowing in the inflows. It is generally considered that nitrogen is the limiting factor in coastal waters (Anon. 1990a). Detailed instructions are provided on how to conduct the test that is a simple colour test.

3. Physical characteristics of the splash and intertidal zone. This section requires surveyors to estimate the width of both zones and indicate the dominant coverage. The section has value on a local scale to assess the scale of erosion over several years or as an indication of the change of land use, both of which would require a change in management. It also has an educational value in determining the total area surveyed (Anon. 1989).

4. Fauna and flora. Identification of the fauna on the coastline primarily provides educational benefits. The UK National Curriculum specifies identification of common animals and plants on the basis of their external appearance and encourages investigation into the adaptation of animals to various habitats and conditions. To assist with this section an identification guide was prepared and issued with the survey materials. A guide was also produced on how to construct a scientific key to classify plants and animals, which is also a requirement of the science curriculum in the UK.

5. Litter and pollution. Marine litter is a worldwide problem. The large quantities of debris present on the coastline raises a number of concerns: risks to wildlife, potential human health hazards and threats to the economy of coastal communities as a result of extensive litter in potential tourist areas. Continual monitoring of the types and quantities of debris found along the coastline is essential in the process of reducing such litter and in assessing the effectiveness of current legislative procedures (Faris & Hart 1995). Classifying the debris into categories can help to identify the origin of the litter and thus may aid in reducing or preventing the problem at source (Faris & Hart 1995). This section of the questionnaire provides both an overall impression of the state of littering along the coastline in all zones and a detailed assessment of the type and quantity of litter items. The questions have been refined in the UK to maximise the quantitative data obtainable, in particular concerning medical and sanitary waste.

6. General observations. The final section of the questionnaire provides an indication of surveyors perception of threats. The perception of the public to the cleanliness and safety of a site has important implications for tourism and such issues are included in the European Blue Flag Awards (Anon. 1993). Surveyors are asked to indicate whether the coastal unit is under threat, whether the appearance of the coastal unit has been changed by recent weather conditions and if there is evidence that the coastal unit has been cleaned in the week before the survey.

Quality assurance

The use of volunteers in data collection has been discussed in detail (Ribic et al. 1992; Dixon 1992; Amos et al. 1994) and to allay concerns of the reliability of the data a number of measures have been incorporated into the survey. The instructions provided to the surveyors form the greater part of the quality assurance programme. The accuracy of the data collection is also assured by the inclusion of a number of measures such as the assessment of reproducibility of results, reliability of sampling between groups, internal cross checks and investigation into seasonal variability.

Network establishment

Following completion of the survey volunteers return the questionnaires to the Coastwatch UK national co-ordinating office where they are checked and analysed. A report is written and distributed to all volunteer groups, central Government and all local authorities with coastal responsibilities. In addition, the data is made available to any other interested parties. The importance of measuring litter in 'real time' has recently been emphasized (Earll in Earll 1995, p. 45). The report of the survey is made available within three months of completion of the fieldwork, providing an accessible source of information relating to marine pollution and maintenance of the network is aided by feedback to the surveyors. This is further assisted by the extensive attention of the media in the release of the results which has the added advantage of raising the profile of the issues surrounding the project and extending the distribution of the results to a greater proportion of people than would have otherwise been achieved.

Sample types of results

The survey aims to provide a snapshot of the condition of the UK coastline. Ca. 2000 km of coastline has been surveyed annually – the largest sample documented in this country and throughout Europe. It is considered that a representative sample of coastline is achieved, both identified and non-identified areas, areas devoted

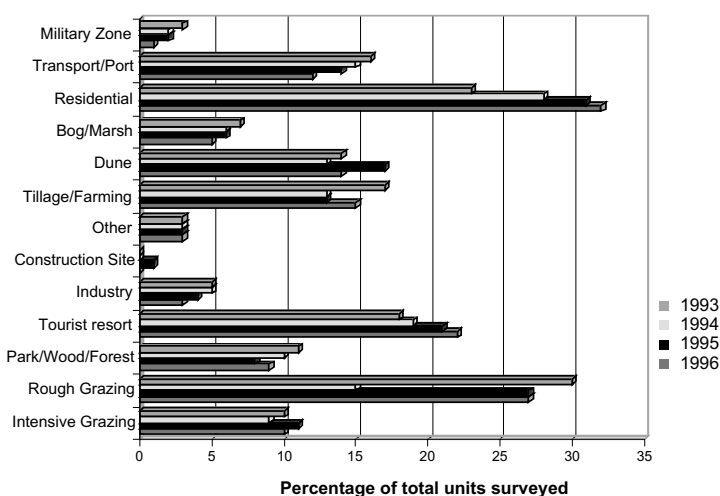


Fig. 1. Main land use in adjoining area (up to 500 m from the shore). Figures are expressed as a percentage of total units surveyed (1996: 2238; 1995: 2921; 1994: 3683; 1993: 4227).

to military use, industrial use and recreation (Fig. 1).

17 general litter categories and seven major litter categories are identified. Country of origin of items, if clearly demonstrated, is also noted. General litter items have been reported at largely consistent frequencies since the early years of the survey – in particular plastic fishing gear, 'other plastics', polystyrene, tar, oil, potentially hazardous containers, textiles and faeces are still at the same level recorded in the 1992 survey (Fig. 2). The study has verified the findings of other studies investigating the types of marine debris on the coastline – it was confirmed that plastics are the most frequently recorded, as found in studies worldwide (Dixon & Hawksley 1980; Caulton & Mocogni 1987; Corbin & Singh 1993; Benton 1995; Pollard 1996). In 1996 over 60% of the units surveyed contained at least one plastic bottle, packing straps were recorded on over a quarter of units surveyed and other forms of plastic on 55% of units. Actual items of litter counted are shown in Table 1. Per km values of these items indicate that marine debris is a consistent blight on the UK coastline.

Accumulations of rubbish in any environment pose potential health threats and the presence of sewage-related debris and medical waste are key indicators of the aesthetic quality and health risk to coastal visitors. Medical waste is considered to be one of the most potentially harmful types of debris encountered on the coastline both in terms of actual and perceived threat

(Anon. 1991; Walker 1991). However, there are very few verified public health risks associated with marine litter, apart from the direct hazards associated with items such as glass, fish hooks, hazardous containers and munitions (Cottingham 1989; Dixon & Dixon 1981; Dixon 1992). Nonetheless, contact with blood or other body fluids in medical equipment could potentially cause disease (Rees & Pond in Earll 1995, pp. 34-35). In response to recommendations made by the World Health Organisation to find alternative health indicators to the conventional microbiological indicators to help assess the aesthetic quality of recreational bathing water and bathing beach quality the Coastwatch UK questionnaire was modified in 1991 to incorporate counts of medical waste items and sanitary items (Philipp et al. 1993, 1995; Anon. 1977; Anon. 1990).

The total number of medical waste items recorded per km surveyed showed a steady, almost fivefold increase between 1991 and 1993; a considerable decrease was recorded in 1994, with a subsequent increase in 1995 and a further doubling in 1996. The results show considerable variation between regions of the UK (no. of km surveyed in brackets):

	1992	1995
England	209 (1357)	575 (979)
Wales	106 (314.5)	53 (165)
Scotland	118 (348)	192 (235.5)
Northern Ireland	12 (81)	14 (35)

	1996	1995	1994	1993	1992
Packing straps	5044 (5)	4470 (3)	7482 (4)	6722 (3)	Not counted
Potentially hazardous containers	952 (1)	2008 (1)	1545 (1)	1475 (1)	1956 (1)
Paper drinks containers	5396 (5)	6704 (5)	8794 (5)	56674 (27)	47588 (22)
Sanitary items	15893 (14)	25582 (18)	35987 (20)	84431 (40)	23454 (11)
Medical waste	1048 (1)	710 (1)	1122 (1)	1248 (1)	466 (<1)
Glass	4279 (4)	6543 (5)	5764 (3)	16684 (8)	Not counted
Drinks cans	19131 (17)	29537 (20)	31116 (17)	87716 (42)	38397 (18)
Plastic can holders	1326 (1)	1431 (1)	Not counted	2402 (1)	Not counted
Plastic bottles	27696 (25)	37243 (26)	41259 (22)	97702 (46)	48997 (22)

Table 1. Total number of litter items recorded on UK coastline during Coastwatch UK 1992-1996. Values in parentheses indicate the average no. per km surveyed.

The reasons for this are not apparent and are not readily explained by differences in residential population density, urbanization or industrial activity (Philipp et al. 1997).

Conclusions

Coastwatch UK provides the opportunity for thousands of volunteers to participate in coastal management issues and has raised public awareness of the condition of the coastline. The establishment of local monitoring and evaluation programmes using volunteers has been supported by a number of local authorities and the Environment Agency in the UK and it has a number of advantages (Everard in Earll 1995, pp. 34-35). The use of volunteers is the only way of conducting such a large scale survey and by involving as many people of varying ages, occupations and interests as possible it has the added advantage of raising public awareness of the condition of the coastline. Such volunteers have no political, economic or personal motives for influencing the data which is therefore completely impartial. In particular, the use of school and college groups, which are large, well organized groups, with practical involvement in survey work promotes environmental education. Indeed, where education features as an objective of the project it is considered essential to use volunteers. Coastwatch UK provides an activity which supports and facilitates the objectives of Local Agenda 21 - education and public participation being identified as key components in achieving sustainable development (Anon. 1992).

The method used by Coastwatch UK has acknowledged limitations but is considered the most appropriate to achieve the aims of the study. The involvement of local communities and users has been recognized as one of the most critical factors in the success of CZM programmes (Gubbay 1996). The interest of the public in the present survey has confirmed their concern with coastal issues. The survey promotes a responsible attitude towards the coast and by working with all interest groups and by targeting public understanding provides a means of aiding local authorities in their role in coastal protection.

The subsequent dissemination of the information collected in the form of an annual reports aids the process of raising public awareness by involving groups, organizations and individuals who do not directly participate in the survey. The development of the 'resource file' aids formal and informal education. Coastwatch UK asks people to consider their own conduct in terms of responsibility for the coast, in terms of waste management processes and in terms of

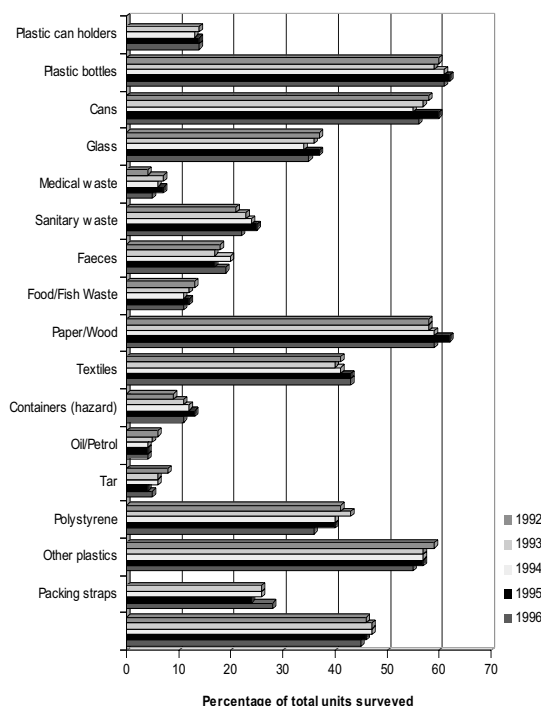


Fig. 2. General litter items recorded. Figures are expressed as a percentage of total units surveyed (1996 = 2238; 1995 = 2921; 1994 = 3683; 1993 = 4227; 1992 = 4370).

partnerships to address these issues. The liaison achieved with local authorities, commercial organizations, public bodies and hundreds of schools nationally demonstrates this.

The survey has identified the baseline levels of pollution around the coastline of the UK. The items of debris which may have been considered to have originated largely, but not exclusively, from visitors to the coast – for example cans, plastic can holders and plastic drinks bottles show no evidence of any real decrease – implying that the need for education and public awareness campaigns are still very strong. It may also be argued that anti-litter campaigns mounted over the last 20 years or so by various organizations have had little or no effect.

The Coastwatch UK project addresses the recommendations made by the World Tourism Organisation 'to provide for participation by all sectors of society' (Shackleford 1996). Education, public awareness and integrated management are all key factors in producing long-term reductions in the quantities of marine debris. Coastwatch UK provides a tool to achieve this.

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