Marine Turtle Management in Seychelles: A Case-study

by

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INTRODUCTION

Marine turtle conservation and management in Seychelles has attracted considerable attention, involving *inter alia* the sending of a joint IUCN/WWF cable a few years ago to the then Chief Minister of Seychelles. These organizations appealed to the Seychelles Government 'not to yield to pressure to relax protection of the endangered Green Turtle (*Chelonia mydas*)'; they pointed out that 'an extensive survey was needed before any such steps were taken and accordingly promised their aid' (Jackson, 1976). However, Salm (1976) has warned that such appeals and promises are rather late in coming to Seychelles, and he has asked that the policies of these organizations be made more realistic, at least to the extent that responses to appeals for aid be prompt and consistent. As I have been studying marine turtles in Seychelles for the last decade, and in fact was hired by the Government to initiate surveys and to assist in acquiring supporting funds from organizations such as IUCN/WWF, I may be able to add some relevant points that were missed by these two authors. Furthermore, there have been a number of important recent developments in this interesting, though complex, case-history.

Having already reviewed elsewhere the marine turtle situation in Seychelles (Frazier, 1970; 1971; 1974*a*; 1974*b*; 1975*a*; 1975*b*), I will deal here with these two recent notes and any other recent developments. The IUCN/WWF communiqué is undeniably correct in reporting that an extensive survey of Seychelles turtles is needed, and also in implying that there is no evidence for the recuperation of turtle stocks in Seychelles. Hence, there is no good *biological* reason for rescinding protective legislation.

Salm, however, is no less correct in relating that the Seychelles Government has been frustrated by the lack of international interest and support in this matter, despite concrete signs that they are sincerely committed to marine turtle conservation. Two major actions warranted recognition and some form of support: first, in August 1968, while the islands were under the British Colonial Government, a law was passed affording complete protection to the Green Turtle. This took place after a series of reports had been issued on marine turtles in Seychelles, most proximately one commissioned by FAO/UNDP (FAO, 1968).

Although complete protection of the Green Turtle has long been needed, the marine turtle issue is an exceptionally delicate one in Seychelles, and it is to the Islands' credit that they had some of the most comprehensive turtle legislation in existence. Secondly, in 1972 the Government submitted a detailed proposal to IUCN/WWF for a marine turtle survey; this was in response to advice from Morges to file a formal application. Although there were subsequent indications that funds were likely to be made available, nothing developed, and correspondence even stopped. However, valued support was given by the Fauna Preservation Society for a Hawksbill (*Eretmochelys imbricata*) nesting project on Cousin Island, Seychelles—a reserve run by the International Council for Bird Preservation (ICBP) (cf. Anon., 1976*a*; Diamond, 1976).*

It is no mean goal for a small and young country to rectify the mistakes of centuries past, often made under different governments, and all such efforts should receive international recognition and support. The credibility of conservation organizations, to say nothing of effective conservation, cannot be helped by long waiting for responses to appeals for support. It is much to be hoped that Salm's criticism will be heeded, for this problem is basic to the general policy of international involvement in conservation efforts.

COMPLICATED BACKGROUND

The situation is, however, complicated, and I must take issue with several comments that detract from the main points which each of the above two Authors has made. Salm (1976) claims, early in his paper, that 'Since the protection of the Green Turtle (*Chelonia mydas*) in 1968, the people of Seychelles have waited patiently for an indication that stocks were recovering. Now, disillusioned with the apparent lack of international interest in their turtles, they argue that stocks are stable and they want to resume the Green Turtle harvest.' First, although he later states that 'The Green Turtle is wholly protected under the Turtles Ordinance of 1925 by a law passed in Seychelles during August 1968', it is important to realize that protective legislation for turtles in Seychelles has existed since the early part of this Century and not simply since 1968. The 1925 Ordinance provided protection for both of the two common species of marine turtles in Seychelles, the Green Turtle and the Hawksbill (*Eretmochelys imbricata*). Since then there

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*A referee notes that Cousin Island (to which we paid a memorably enjoyable visit some years ago) 'was purchased for ICBP with very substantial assistance from WWF... the wardening ...was provided for some time by an IUCN/WWF project'.—Ed.

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have been various changes in the law (in 1929, 1957, 1964, 1968, 1976, and 1977), with additional restrictions. It was in 1968 that the Green Turtle was, for the first time, completely protected by law in Seychelles (Seychelles Government, 1972). (*See* Stoddart [1971] for an account of the history of turtle legislation in Seychelles.)

As a second point, I know of no time in their history when the people of Seychelles have 'waited patiently' for turtle meat. Whether during the colonial periods (French or British), when turtles provided valuable export products, or more recently, when remote islanders on subsistence incomes have longed for the delicious meat of their traditional dish, the turtle has always been something of a fetish in Seychelles. The emotions excited by the thought of turtle flesh are intense; I was once told that if I ever stopped a person from eating turtle he would kill me—evidently a 'joke', but difficult to discern at the time! The complete ban of 1968 has been under fire ever since it was enacted. In 1970, the year of a Seychelles General Election, it was very nearly rescinded. So it is hardly surprising that, during the General Election prior to independence (which was obtained on 28 June 1976), turtles were in the political limelight.

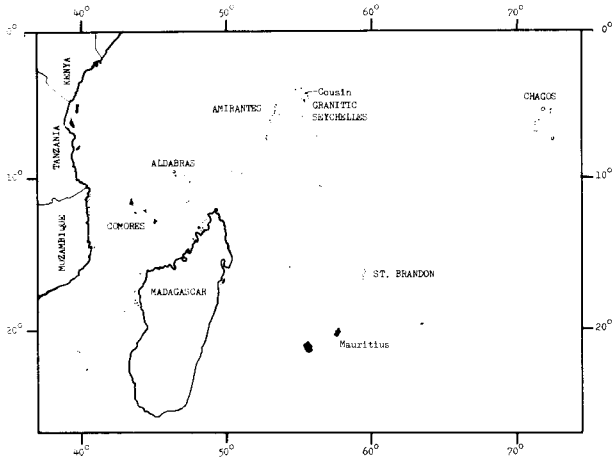

Fig. 1. *The western Indian Ocean, showing major island groups referred to in the text. (Scale* ca *600 km to 1 cm.)*

Discontent with the protective legislation is not merely exhibited verbally. Salm records (1976) a 'considerable amount of poaching around the Amirante Islands' (Fig. 1); I have previously (Frazier, 1974*a*; 1975*a*) reported that poaching occurs virtually everywhere there are turtles—regardless of whether or not there are permanent settlements.* Assumption Island, which may have been the most important Green Turtle rookery in the western Indian Ocean, north of Madagascar, serves as a sad example of how 'patiently' some Seychellois have been 'waiting to harvest' Green Turtles. In 1973 I estimated that about 100 females nested annually (by comparison, Hornell (1927) reported that at the beginning of this century, 200 to 300 could be captured in a *single* night during the main nesting season). At the same time, I also estimated that 100 females were poached in a year, by inhabitants of the Island. Hence, the chances of a female surviving to nest several times in a season, as is usual in this species, are minimal; evidently close to 100% of the females that nest on Assumption are killed. This is not 'waiting patiently' but outright rape of a resource.

Granted that the total number of people involved in poaching on the remote 'outer' islands of the Seychelles archipelago is a tiny percentage of the total population, which is concentrated on the granitic Islands of Mahé, Praslin, and La Digue. However, those who inhabit or frequent the remote islands are custodians of their resources; and the actions of these people, no matter how few, effect all Seychellois. If the majority of the population are not in favour of poaching, they will have to appeal to their Government to take more active measures in protecting natural resources. Unfortunately, the number of people who voice such a sentiment are very much fewer than the number who poach or condone poaching.

As a third point, numerous arguments have been used by the populace for resuming turtle slaughter, but the most usual and persistent reason in my experience is based on a sense of nationalism. Since the inception of the 1968 ban, there have been frequent misgivings that it is unfair for Seychellois to be prevented from eating turtles when people of neighbouring territories are quite free to poach in Seychelles waters or to catch turtles when they migrate elsewhere. The President of the Republic of Seychelles even reverted to this argument in a fairly recent press release (Anon., 1976*b*; 1976*c*). But this argument is clearly irrational, for poaching by Seychellois is by far the most intense form of exploitation of Seychellois turtles—and this is never mentioned.

Other arguments, such as lack of international interest, are no more solid, and all of these arguments provide poor cover to the basic reasoning—to resume catching turtles as soon as possible. Indeed, lack of international interest does not constitute a valid reason for mismanaging a natural resource; the conservation of Seychelles turtles is first and foremost for the benefit of the people of Seychelles. No amount of outside support can effect a realistic conservation programme without the collaboration of the people and Government of Seychelles; the poaching problem is a case in point.

As a fourth point, the criterion for determining when Seychelles turtles can again be culled on a long-term practical basis is dependent on the *recovery* of the population to something approaching its former level of abundance. If the turtle stocks, in their present decimated state, are stable, regardless of whether or not they have partially recovered, there is no hope of restarting a viable turtle fishery. Sad evidence of this is in a recent press release from the President (*see* below). In Seychelles, with the main producing islands (the Aldabra Group)

**See,* for example, the short illustrated paper entitled 'Sea-turtle faces extinction in India', by Professor T. Antony Davis, Rajesh Bedi & Dr G. M. Oza, which we published recently in *Environmental Conservation* (Vol. 5, No. 3, pp. 211–2, Autumn 1978).—Ed.

hundreds of kilometres from the *human* population centres, this requires larger numbers of turtles than might otherwise be exploitable. Not only must the turtle population be large enough to support a percentage cull, but the crop thus obtained must be large enough to make the venture economically sound—notably in view of the considerable transport and handling costs involved. However, the populace is not generally concerned with such problems, although the Government clearly is.

Another small point is that export of tortoise-shell (epidermal scutes of the Hawksbill Turtle) is allowed *under licence*. The legislation is commonly interpreted as banning the export of rough or unworked tortoise-shell (e.g., Salm, 1976), but parts that are not used by local curio-dealers ('hooves' and 'bellies') are exported (S. Savy, pers. comm.), as is evidenced by recent trade statistics (e.g. from Japan).

There are several biological points made by Salm (1976) that also warrant comment. He mentions only three species of marine turtles as occurring in Seychelles waters, *viz.* Green, Hawksbill, and Leathery (*Dermochelys coriacea*) Turtles, whereas in fact the Loggerhead (*Caretta caretta*) has also been recorded (Frazier, 1971). While Salm is correct in stating that Green Turtles rarely nest on the Granitic Seychelles, it is important to emphasize that the major nesting beaches for this species are on the Aldabra Group of Islands (Aldabra, Astove, Assumption, and Cosmoledo—in that order of importance), and these islands are raised reef-atolls, not coral cays. Nesting elsewhere, in the Amirantes and other 'outer' Seychelles Islands, and in the British Indian Ocean Territory (B.I.O.T.),* is secondary to that on the Aldabras (Frazier, 1974*a*; 1975*a*).†

Salm (1976) states that Hawksbills nest during December and January, but nesting is recorded in every month except April, May, and June, and the main peak in nesting activity occurs from November through January (Diamond, 1976; Frazier, pers. observ.). My research does not indicate that 'most (Hawksbills) are found nesting' on the Amirantes, but the greatest nesting activity of this turtle in the Western Indian Ocean is on Cousin Island in the Grantitic Seychelles (Frazier, 1974*a*; 1975*a*). Finally, Salm states that Hawksbill flesh is poisonous in Seychelles; certainly this is the usual claim, but a small number of people (including myself) have eaten it and suffered no ill-effects. It seems that careful butchery is essential.

RECENT DEVELOPMENTS

The IUCN/WWF communiqué cited above reported that there was strong pressure on the Government of Seychelles, prior to independence, to drop protective legislation, and it indicated that such a change would be to the detriment of marine turtle conservation. This was certainly a valid concern, but whatever news reached IUCN/WWF at Morges, the ruling that finally resulted from the relaxation of the August 1968 legislation is perhaps more realistic than was the complete ban.

The revised legislation—Green Turtle Protection Regulations, 1976‡—offers an open season on adult males from 1 March to 1 November; the remaining four months are a closed season. It is not legal to take females or animals of less than 30 inches (76 cm) in carapace length at any time. This allows legal access to adult males which evidently outnumber females considerably (cf. Frazier, 1971) and are also of less importance for maintenance of the population, as one male may fertilize several females. In theory, this is a reasonable compromise, considering both biological and sociological conditions. (However, two points in the ruling would be better changed: The minimum size-limit is ecologically unsound, as the major reproductive investment of the population is in the adults, or large animals. The timing of the open season coincides with the peak in Green Turtle nesting activity—June to August—and it is best to avoid disturbance, even to males, during the main reproductive period.) In addition, the 1976 Regulations ban the salting and drying of turtle meat, and ban the sale of turtle meat to hotels and restaurants. In the past there was a large trade in salted or dried turtle meat from the outer islands; the Government did not want to revive this trade for fear of encouraging large-scale killing of turtles for processing and then shipping to the Granitic Islands. The ban on sale to hotels and restaurants is an attempt to keep turtle meat available to the ordinary Seychellois and avoid having it become a luxury food, too expensive for the common man.

These regulations were proposed by the National Parks Committee in January 1976 and later presented to Government. Evidently the situation relative to the Green Turtle remained unchanged after the *coup* and change in government that occurred on 5 June 1977 (*see* editorial footnote [by Nicholas Polunin] to Jackson, 1977).

Another recent development bodes well of the new Government's position relative to turtle conservation. On 17 October 1977 it was made illegal to buy, sell, or export, stuffed or preserved Hawksbill Turtle or any part of such turtle without a permit from the Ministry of Agriculture and Land Use (Anon., 1977; Seychelles Government, 1977). This came about after a Cousin Island Local Advisory Committee of the ICBP met on 6 April 1977, expressed concern over the level of Hawksbill

*The history of B.I.O.T. is also involved; established in 1965, the Territory originally included the whole of Chagos Archipelago together with Aldabra, Descroches, and Farquhar, Atolls. These last three were returned to Seychelles before independence in 1976.

†Salm (pers. comm.) feels that nesting in the Amirantes (Etoile, Boudeuses, and African Banks) is of great importance, but as yet this is unconfirmed. Given their small sizes, these cays seem unlikely to support nesting populations anywhere near as large as those in the Aldabras.

‡The Author writes (*in litt.* 8 June 1978, from Argentina): 'There is confusion as to whether or not the Green Turtles Protection Regulations, 1976, are in fact law. Conflicting information has been received from Government Officers and National Parks Commission members, but no copy of the Regulations has been seen [by me].' Attempts by the Author and Mr Christopher Cadbury, of the National Parks Committee, to have a clarification by the Government, had been unsuccessful, as of November 1978.

exploitation, and made recommendations to the National Parks Committee that the sale of stuffed turtles be banned. The National Parks Committee then appealed to the Government (M. Garnett, pers. comm.).

Unfortunately, there have been no other recent developments relevant to the Hawksbill—a species which is much more seriously endangered than the Green Turtle.

I understand that, as ever, law enforcement is still a major problem, and it would be most surprising if the regulations were observed in practice—particularly on the remote outer islands where the vast majority of Green Turtles occur. Whatever regulations exist, the real problem is enforcement; without it, legislations are practically meaningless.

Discussions of the finer points of legislation, of the biology and sociology of the turtle situation, and indeed of plans for harvesting turtles, are all academic if there are no turtles to be had. The gravity of the problem is driven home by a fairly recent press-release. The then President James Mancham reported (Anon., 1976*b*; 1976*c*) that, even after the ban on Green Turtle hunting was lifted, no turtles had been landed by fisherman for sale in Victoria, the capital. Eight years of complete protection had seen no apparent improvement in turtle stocks. (However, where *real* protection has been given to breeding turtles, e.g. Cousin Island's Hawksbills, there *has* been a marked increase in numbers of turtles in a relatively short period of time (cf. Frazier, 1974*b*).) Turtle populations are now so low that fishermen are eating the few they catch—the conclusion is inescapable and bears on my fourth point (above).

Unfortunately, the President also claimed that 'The Seychelles sacrifice has been to the advantage of turtle fishermen off the coast of East Africa and around the Indian Ocean island of Mauritius, where the markets were flooded with turtle meat' (this bears on my third point, above). The Green Turtle is known for its transoceanic movements (cf. Hirth, 1971), but it is not known where the Seychelles turtles range and what seas they may pass through. Most territories in the western Indian Ocean have their own nesting populations of Green Turtles, although few are as large as the Seychelles population (Frazier, 1975*b*). Certainly few, if any, markets in the western Indian Ocean have been 'flooded with turtle meat' in recent years. During lengthy surveys in East Africa, I have observed virtually no turtles being marketed. Indeed, Green Turtles have been totally protected by legislation in Kenya since 1962, and Hawksbills since 1971 (Kenya Government, 1962, 1971); and license fees in Tanzania are high enough to be prohibitive to most legal exploitation (Tanzania Government, 1970, 1975).

From reports on the Mauritius Green Turtle fishery, which is restricted to St Brandon Islands, it is clear that the average crop is merely a few hundreds a year (Hughes, 1976; Ardill, pers. comm.)—hardly enough to flood the market on Mauritius, with its human population of nearly a million. Anyway, the St Brandon Islands population is a breeding population and is almost certainly distinct from the Seychelles population.

Despite these allegations, the aforementioned press-release clearly shows that Seychelles politicians are well aware of a critical problem; in calling for 'an urgent conference of all Indian Ocean nations', it has emphasized that successful conservation of marine turtles must be accomplished through international cooperation. However, accusations by one government are not likely to facilitate cooperation—particularly when citizens of the accuser are responsible for a major amount of illicit and destructive exploitation.

Seychelles' eagerness to cooperate on an international level was shown on 8 February 1977, with its accession to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (P. H. Sand, pers. com.). However, it is not known how this will affect turtle exploitation.

Seychelles has had a long history of turtle-rearing projects. Usually gradiose and unrealistic, these schemes have regularly ignored the most basic and critical problems such as poaching, habitat degradation, information gathering, and conservation education. They have also typically disregarded feeding requirements of growing turtles: under optimum conditions, a captive Green Turtle may reach a body weight of 40 kg in three years; during this time it will consume nearly 900 kg of food, which scarcely makes ecological and economic sense when it is considered that less than half the turtle is edible and nearly all of what it eats is high-quality protein (cf. Frazier, 1977). In addition, projected costs for these schemes have been enormous and out of all proportion with what is needed for prudent and methodical solving of the critical problems.

A Hawksbill restocking project, initiated on Cousin Island, may prove a successful exception. There is now talk also of a commercial project for rearing Green Turtles in Seychelles, and IUCN specialists are evidently involved (G. R. Hughes, pers. comm.) though details are unknown to the Author.

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CONCLUSIONS AND SUMMARY

Successful management of marine turtles in Seychelles will depend on the solution of a variety of general problems as follows:

1 Availability of information—basic biological data, particularly on the status and distribution of the two common species, must be gathered, so that up-to-date information is available for decision-makers and Government. It is essential that the information

gathering programme be *recurrent,* in order to *monitor* changes in the populations and their habitats. The Republic of Seychelles has neither the finances nor the expertise to execute such programmes, so that international support is essential.

2 Legislative responsibility of Government—while both biological and sociological factors have to be considered, the Government must legislate for long-term resource management, and not merely for short-term political gain. An enlightened government will revise or modify regulations in the light of the most recent information, to manage best the resource in its current status. Legislation must provide for: (a) reserves to guarantee that requisite feeding and breeding habits are *always* available; (b) protective measures to ensure rational exploitation of the resource; and (c) regulatory measures to ensure rational utilization of that portion of the resource which is exploited.

3 Responsibility of citizens—laws protecting national resources apply to all citizens and must be respected by one and all. Conservation education is needed to instruct the public on the importance of resource management and to enlist their cooperation. Here also, international support is important to enable Government to carry out educational programmes.

4 Enforcement responsibility of Government—enforcement of protective legislation is essential, especially in remote areas that are centres of resource availability. With this issue in particular, it is enforcement that will make the legislation work; and Government will have to provide for adequate enforcement in areas of both high and low population-density.

5 International cooperation—it is essential that neighbouring nations cooperate in the exploitation of these common resources, which demands responsible actions by all parties. Those nations whose territory includes breeding grounds have the greatest responsibility. Arbitration by international organizations would be invaluable.

6 International support—outside aid is needed to finance and man data-gathering and educational programmes; enforcement on remote islands could likewise be much more effective, given material assistance.*

In terms of priorities, enforcement of the legislation is perhaps the highest. Conservation education is also urgently needed and international cooperation is, of course, imperative. The Government's responsiveness in recent legislative measures is laudable, although the existing turtle laws would be improved by certain modifications and additons (detailed recommendations are in Frazier (1974*a*), some of which were used in drafting the 1976 regulations). Basic surveys were completed in 1973, although severely hampered by lack of support (Frazier, 1974*a*; 1975*a*). Recent and more detailed information is needed and monitoring programmes must be initiated. International support is urgently required to realize these goals, and to make the whole programme work.

The marine turtle problem in Seychelles also serves as an example to several points in international conservation:

A. Effective conservation measures must be legislated, carried out, and enforced, from within a country; outside support only complements these measures.

B. Actions of local governments, sound in terms of conservation and management policies, should be rewarded post-haste:

(i) This applies especially to small, young countries that do not have the expertise or financial means to carry out the necessary programmes;

(ii) Clearly, the most effective support is material assistance, but it is imperative that international agencies maintain a consistency in policy and do not respond only to potential crises (cf. Salm, 1976).

C. International cooperation in managing common resources is essential, and involved parties must take reponsible positions in respect of mutual goals affecting all.

*WWF has recently approved a grant of $12,000 towards a sea turtle project (No. 1465) in Seychelles, but details of this project are not known to the present Author.

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Author adds in proof: The Green Turtles Protection (Amendment) Regulations, 1977 (S.I. No. 51 of 1977), *Supplement to Official Gazette,* Government Printer, Port Victoria, Mahé, pp. 123–4 has finally been seen by me, and this refers to The Green Turtles Protection Regulations, 1976 (S.I. No. 43 of 1976).

Oil-spills in the Mediterranean and Contingency Planning

For years the use of chemical dispersants in combating oil-spills dismayed many environmentalists as they feared that the toxic products did more harm to marine life than did the spilled petroleum. Research has now led to the use of less dangerous chemicals. Nonetheless, the French held down the use of chemical dispersants in handling the *Amoco Cadiz* disaster last year, and those they did employ were far less toxic than the chemicals used in the *Torrey Canyon* disaster 11 years earlier. Even considering the state of pertinent scientific knowledge at that time, the advice followed soon emerged as faulty.

The controversial subject of chemical dispersants was discussed by 34 oil-spill experts from 14 Mediterranean countries and the European Economic Community at a recent Workshop in Malta that was jointly sponsored by the United Nations Environment Programme (UNEP) and the Inter-Governmental Maritime Consultative Organization (IMCO). The Workshop was held at the Regional Oil-Combating Centre on Manoel Island near Valletta, capital of Malta, and there was general agreement among the participants that more studies were needed on the various methods of applying chemical dispersants and on their effects on marine resources.

Although the name of the Centre conjures up images of oil-fighters waiting to rush off in boats with barrels and brooms to a spill anywhere in the Mediterranean, this is not its role. Rather, it is intended to serve as a communications coordination centre in the event of a major spill. Under IMCO's technical guidance, the Malta Centre also gathers information on the national oil-combating capabilities of the 17 states participating in UNEP's Mediterranean Action Plan. In this connection it has compiled a useful inventory of their oil-spill experts and equipment.

The regional Centre encourages Mediterranean countries to draw up national oil-spill contingency plans, disseminates the latest technological information, and helps to arrange for the training of technicians. While it is not considered an operational headquarters, the Centre could, if requested by a country or countries endangered by a major spill, coordinate clean-up action. In this connection it is interesting to note that the Director of the Centre, Philippe Le Lourd, reported to the Workshop on a communications exercise involving the exchange of messages between the Centre and 17 Mediterranean countries between 28 June and 7 July of last year. It was made clear in the initial message that the intention was to test communications in case of an oil-spill. Six answers were received within three hours, three more within 24 hours, and three further ones after 24 hours, while five countries did not reply at all. Participants were accordingly asked to find ways of improving communications.

The risk of a major oil-spill is high in the Mediterranean owing particularly to the density of tanker traffic. No individual Mediterranean country could well cope with the consequences of a really catastrophic oil-spill. On the other hand, it would not be economically feasible to tie up substantial resources to combat a disaster that might not occur for 10 or even 20 years. Consequently, joint contingency planning by Mediterranean countries seems to be the best method available to deal with any accidental major pollution of the sea by oil.

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