

These sea-dwellers didn't get the chance

The Seas Must Live



Caribbean
monk seal

With the launch phase of a \$10 million programme for World Wildlife Fund now ready, and the main phase being developed; the groundwork begun for a global marine conservation strategy (of which the WWF programme is an integral part); and an initiative won to protect sea turtles from international trade: IUCN's marine programme is well and truly on its way.

This issue is entirely devoted to IUCN's strategy to achieve a more rational, sustainable relationship between the peoples and governments of the world and the rich yet vulnerable life of the seas.

At the heart of this strategy is World Wildlife Fund's Marine Programme, prepared by IUCN for WWF's Marine Campaign 1977/1978, "The Seas Must Live" (see below). The strategy itself is described below and on page 66.

Planet Earth is strictly speaking Planet Sea. The seas cover 70% of the earth's surface, governing its climate and sustaining much of its life.

The seas belong to no nation, but all nations are linked by them, and all depend on them—for their major contribution to planetary health, for the quantities of food they yield, and for the living schools, playgrounds and laboratories they provide for humanity's cultural, educational and scientific advancement.

A test of the seas' ability to maintain this vital role is the state of the larger animals that depend on them. They are in a bad way. The Caribbean monk seal, illustrated above, is almost certainly extinct (see back page). Some 12 species of whales, dolphins and porpoises, 9 seal species, all dugongs and manatees, all coastal crocodiles, all marine turtles, and 30 sea and

coastal birds, are threatened with extinction. An additional 44 species of whales, dolphins and porpoises may also be threatened.

These animals face the degradation or even the outright loss of habitats critical for their survival. In the places where they breed, feed and rest, as well as on their journeyings, they run the gauntlets of excessive exploitation, pollution, competition by humans for their food, and persecution.

The loss of a species or even of a few populations does not mean the sacrifice of a biological luxury. Most if not all are likely to be essential participants in the productive processes of the seas. Their endangerment is a sign that the processes are being misused and may become less dependable; a warning that human beings

have yet to come to terms with the beauty and variety of which they are a part.

Many coral reefs, seagrass beds, mangroves, saltmarshes and estuaries—rich environments that directly support important fisheries—are also being damaged or destroyed: by dredging, dumping, "reclamation", quarrying, and intoxication by industrial wastes. Even the deepest, most remote parts of the seas—the unique ocean trenches—are not immune from degradation.

No single programme can redress the plight of the seas. But a strategy of safeguarding the most vulnerable animals, conserving the most precious habitats, stimulating governments and intergovernmental bodies to act on a wider scale, and generating public support for such action, is entirely possible and appropriate. This is IUCN's strategy; and these are the objectives of the WWF Marine Programme.



World Wildlife Fund's Marine Programme: full details of launch phase inside.

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A global strategy for marine conservation

Species and their habitats do not exist in isolation but are involved in biological processes which are often extensive and of long duration. This needs to be borne in mind when planning for the conservation of any species or habitat, but especially those of the sea which cannot be fenced or otherwise compartmentalized.

Mangroves and other coastal wetlands, for example, are parts of biological continua extending from the watershed to the open sea. Their conservation requires not only protecting the wetlands themselves in parks, reserves or management areas, but also maintaining through sound management the rest of the processes to which they belong.

Similarly, it is not sufficient to protect the calving areas of whales or the nesting areas of turtles if elsewhere their populations are overexploited or other areas on which they depend are disrupted. Integrated management systems are needed to conserve each process as a whole.

Accordingly, the aim of a global marine conservation strategy should be the conservation of major marine processes, by (a) protecting habitats critical for such processes; and (b) maintaining the linkages between those habitats and the rest of the processes of which they are parts. Major marine processes are here taken to mean dynamic systems of linked feeding, resting, breeding and nursery areas, and the areas that supply them with nutrients and other essentials.

Under four contracts* with the United Nations Environment Programme (UNEP), IUCN has already taken action to achieve part of this aim. It has undertaken two appraisals of the Mediterranean Sea (one of potential marine parks and

reserves; the other of coastal wetlands of international importance); surveyed parts of the Red Sea, Persian Gulf and northern Indian Ocean; and surveyed parts of the South Pacific.

All of these surveys and appraisals are being followed up. In January 1977, UNEP is holding an expert consultation on Mediterranean marine parks and wetlands, at Hammamet, Tunisia. Other important meetings have been held at Wellington, New Zealand (South Pacific Conference on National Parks and Reserves, February 1975); Tehran, Iran (Regional Meeting on the Promotion of the Establishment of Marine Parks and Reserves in the Northern Indian Ocean including the Red Sea and Persian Gulf, March 1975); Tokyo, Japan (International Conference on Marine Parks and Reserves, May 1975); and Apia, Western Samoa (Second Regional Symposium on Conservation of Nature in the South Pacific, June 1976).

IUCN has responded to the recommendations of these meetings by: initiating surveys in the South Pacific; forming a survey and advice team to help governments (particularly those of developing countries) establish marine parks and reserves; and preparing guidelines for the establishment of marine parks and reserves.

In addition, IUCN is following up all survey recommendations with the governments concerned, especially its surveys in the northern Indian Ocean (at least 13 priority critical marine habitats have been identified) and the South Pacific. IUCN also hopes to promote a Convention for the Protection of Threatened Marine Animals of the Mediterranean Sea.

These are only beginnings, however. As well as continuing its work on the develop-

ment and implementation of the WWF Marine Programme, IUCN will attempt to extend its surveys and other conservation activities to cover a still wider area than at present. The ultimate objective is to establish both a global network of marine parks and reserves and a complementary series of regional management systems.

This requires the full participation of many national and international bodies, especially the Ecosystems Conservation Group (UNEP-FAO-UNESCO-IUCN). In this way, the nongovernmental efforts of IUCN, WWF and others can be allied with the intergovernmental efforts of the UN system, to their mutual benefit.

The conservation of marine processes is as difficult a task as it is urgent and important. An enormous increase in public understanding and support is therefore needed. This is likely to be one of the most valuable products of the WWF Programme and Campaign. The other will be the tangible contribution the Programme should make to the global network of marine parks and reserves and to the development of more enlightened management.

Governments and UN bodies are of course in a position to invest much greater sums of money in marine conservation than is WWF or the nongovernmental community at large. It is hoped they will take advantage of the public interest and support the WWF Campaign is sure to generate, to tackle some of the more obdurate and expensive problems facing the life of the seas—such as pollution and overfishing. It is an opportunity not to be missed.

* RA 1105-73-04, FP 0503-75-03, FP 1103-75-01, FP 1103-75-03

A programme within a programme

The World Wildlife Fund's Marine Programme, the description of which beings opposite, is the centrepiece of IUCN's marine programme.

The IUCN programme consists of three sectors of complementary and closely related activities. The two biggest sectors involve formulating action priorities for funding by respectively WWF and the UN system. The third consists of IUCN activities that do not call for special funding: policy formulation; provision of scientific advice; development of guidelines for management; and interventions on key issues. A successful intervention, on behalf of sea turtles, is described on the back page.

The sector involving World Wildlife Fund is fully described on pages 67-78. That involving the UN system has yet to be developed, although it is hoped that IUCN will be able to build on the substantial work already undertaken with the help of, and in cooperation with, UNEP. This work has already generated projects and action priorities for funding by WWF,

and it is expected that further follow-up will stimulate additional projects for the main phase of the WWF Marine Programme.

IUCN's marine programme is created jointly by its Commissions, IUCN Members and the IUCN Secretariat. To ensure that Commission advice is both quick and coordinated, a Marine Steering Committee has been set up. This is formed by representatives of the Commissions or of an appropriate committee of a Commission, together with three marine scientists acting in their individual capacities.

It is likely that the Ecosystems Conservation Group (UNEP-FAO-UNESCO-IUCN) will form, or itself act as, a steering committee for the larger activities involving the UN bodies.

The members of the IUCN Marine Steering Committee are:

Dr S. J. Holt, Dr C. P. McRoy, Professor J. D. Ovington (Chairman, Commission on Ecology), Dr J. W. Porter (for Commission on National Parks and Protected Areas), Dr G. C. Ray, Dr M. Rémond-

Gouilloud (for Committee on Environmental Law), Mr V. C. Robertson (Acting Chairman, Commission on Environmental Planning), Sir Peter Scott (Chairman, Survival Service Commission), and a nominee of the Commission on Education.

The terms of reference of the MSC are given on page 75, and full details of how IUCN will develop the WWF Marine Programme are given on pages 74 and 75.

The programme description opposite is laid out as follows:

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Sub-programme 1: Conservation of critical habitats	page 67
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Completion of launch phase and development of main phase	page 74
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THE SEAS MUST LIVE

The World Wildlife Fund Marine Programme

World Wildlife Fund's 1977/1978 Campaign *The Seas Must Live* will raise funds for the WWF Marine Programme described below.

The programme has been prepared for WWF by IUCN, and IUCN is responsible for its further development.

The Marine Programme is divided into three phases:

1. Launch phase (January-June 1977);
2. Main phase (July 1977-December 1978);
3. Follow-up phase (January 1979→).

The launch phase and development of the main phase are described here.

The launch phase consists of three sub-programmes, each devoted to tackling one of the three main groups of threats to the life of the seas:

1. Conservation of critical habitats;
2. Regulation of use;
3. Regulation of competing and other destructive activities.

The sub-programmes consist of action plans—for the conservation of cetaceans (whales, dolphins and porpoises), seals and otters, sirenians (dugongs and manatees), sea and coastal birds, turtles, molluscs and corals, seagrasses and mangroves; for the establishment of international agreements; and for the development of new methods of management. Table 1 shows the relationship between the sub-programmes and the action plans.

Each action plan consists of projects, action priorities, and a statement of further action. A project is an activity for which full details are available of the means by which it will be carried out, the cost and the timetable. An action priority is simply a brief statement of a conservation problem and of the action recommended to alleviate it. The cost of an action priority is given wherever possible, but action priority costs are less reliable than project costs.

This procedure has been adopted in recognition of the great complexity and variability of modern conservation problems and of the ways they can be tackled. The speed with which different action priorities can be converted into one or more projects varies considerably, yet the more complicated and more slowly developed projects often require implementation as urgently as the more straightforward ones. Hence the need for a procedure that offers flexibility of response while retaining a reasonable degree of precision.

This too is the reason for developing the programme in three phases. The Marine Programme is a rolling one, and new editions of this description will be published as it progresses. The launch phase itself will be updated between now and the end of this year. The procedure for developing the programme is described on page 74.

The target value of all three phases put together is \$10m. This is divided by action plan as follows:

	US\$ (x million)
Cetaceans	2.0
Seals and otters	1.0
Sirenians	0.5
Birds	1.0
Crocodyles	0.4
Turtles	1.0
Molluscs, corals, seagrasses, mangroves	3.0
International agreements	} 0.5
Development of new methods of management	
Programme development	0.6
TOTAL:	US\$ 10.0 million

Tables 2 and 3 list the projects and action priorities so far included in the programme by species and by oceanic region respectively.

Sub-programme 1: Conservation of critical habitats

Critical habitats are: the feeding, resting, breeding or nursery areas of marine animals; or major sources of nutrients for feeding areas elsewhere (for example, seagrass beds and mangroves); or areas that are particularly rich in species (such as coral reefs) or highly productive (such as estuaries) or of special scientific interest (such as ocean trenches). Their conservation is essential for the survival and productivity of food and commercial species as well as of rare and threatened ones. They are also important for research and monitoring—for example, as controls against which changes to similar areas may be measured.

1.1. Global action plan for the conservation of cetaceans

The breeding and feeding areas of whales, dolphins and porpoises need to be identified and protected. Often, however, so little is known about even the most threatened cetacean species that investigations of their behaviour and requirements are needed first—and for these, study methods that do not involve killing whales must be devised and tested.

The following projects and action priorities to achieve these objectives have been identified so far:



1.1.1. International system of cetacean sanctuaries. Because whales, dolphins and porpoises are more fully sea-dwelling than any other group of marine mammals, protection of their critical habitats (though no less vital) is more difficult. Critical cetacean habitats in coastal waters are of course easier to safeguard than those offshore (especially those in international waters). IUCN proposed a system of international marine reserves at the latest session of the UN Conference on the Law of the Sea, and will follow this up at the next session in May 1977.

The following actions will also be taken: (a) a workshop to review legal and other problems and opportunities concerning the creation of reserves in international waters, with particular reference to cetaceans (if possible before May 1977), and to draft regulations for the management of cetacean sanctuaries, both coastal and oceanic; (b) a special effort to identify potential sanctuaries (coastal and oceanic), in addition to those proposed for the grey whale in Mexico (below) and that for the right whale off the Valdez Peninsula (Argentina).

Action priority. Cost: \$23,000 to \$1m.
1405 *

Note: The lower cost covers only the workshop and preliminary studies (including drawing up an inventory of known potential sanctuaries). Establishing such sanctuaries, and creating a more representative inventory, will of course be much more expensive. The budgetary allocation is \$1m to improve the inventory and to assist in establishing sanctuaries.

1.1.2. Grey whale sanctuaries, Mexico. The grey whale, *Eschrichtius gibbosus*, is confined to the North Pacific. There are two separate populations: one (believed to be much reduced) with calving grounds off the southern shores of the Republic of Korea and feeding grounds in the Sea of Okhotsk; the other with calving grounds in the lagoons of Baja California, Sonora and Sinaloa (Mexico) and feeding grounds in the Bering Sea. The latter population is more numerous but is under pressure: Soviet fisheries on behalf of Siberian aborigines take 80% of the supposed maximum sustainable yield; during the calving season the calving lagoons in Mexico are seriously disturbed by tourists; and present and future industrial development near the lagoons could result in the loss of critical habitat. Only one of the five main lagoons is given any protection. All should be protected as reserves, and visits to them regulated. The Government of Mexico will be offered assistance to establish and manage reserves.

Action priority. Cost: \$105,000. 1406

* These numbers are for internal reference only

Note: It is intended that conservation of the grey whale's feeding grounds in the Bering Sea will be provided for by the Bering Sea regional management scheme (see page 73).

1.1.3. Blue whale, Gulf of St. Lawrence, Canada. The blue whale, *Balaenoptera musculus*, is the largest animal ever to have lived on earth. It is also one of the most abused, having been fished by humans to a small fraction of its former abundance. Furthermore, it is among the least known mammals, in part because it was depleted before serious studies were undertaken, and in part because its large size and high seas distribution make it difficult to study. The blue whale is scarce in northwest Atlantic waters, except for a small concentration in the Gulf of St. Lawrence—a unique spot, because nowhere else in the world can a similar concentration of this species be observed, consistently and predictably, so close to shore.

A study of the history, status and biology of this population is proposed, with the object of gaining knowledge of how to conserve it. In addition, research on techniques of study will be carried out, so that research methods that do not involve killing animals can be developed—to the ultimate benefit not only of blue whales, but also of fin, sei, Bryde's and minke whales. This project will help a number of other whale conservation projects, including that concerning krill and Southern Ocean management options.

Project. Cost: \$27,840. 1407

1.1.4. Humpback whale, Hawaii. A population of the endangered humpback whale, *Megaptera novaeangliae*, is known to congregate in several places close to the shores of Hawaii for singing, mating and giving birth to their young. A study of their remarkable songs and of their underwater behaviour will be made. This should yield considerable information of value for humpback whale conservation throughout the world, as well as provide the basic data required for establishing a sanctuary in Hawaii.

Project. Cost: \$28,500. 1408

1.1.5. Development of an externally visible tag for marking large whales. A tag has been developed and is now being tested off the coast of South Africa. The purpose is to develop a tool to aid studies of the growth, movements, behaviour and population dynamics of currently protected species which does not require killing the animals to be effective. The present "Discovery" mark is an internal tag which requires that the whale be killed before the mark can be recovered. This limits its use to exploited species, and means that information is obtained only from dead whales.

Project. Cost: \$9,240. 1217

1.1.6. Indus susu. The endangered Indus susu, *Platanista indi*, is confined to a sector of the Indus river and parts of some of its tributaries. Total numbers were estimated in 1974 to be 450-600. Decline of populations, which may be continuing,

has been attributed to impoundment of river water and its withdrawal for irrigation, and illegal exploitation by local fishermen. A detailed eco-ethological study of this dolphin over a continuous period of at least 18 months is planned. The objective is to provide the basis for a realistic and effective conservation effort, including conservation of critical habitat.

The Indus susu is a freshwater species, but its study and conservation is expected to be helpful for the conservation of its marine relatives.

Project. Cost: \$22,000. 1221

1.2. Action plans for the conservation of seals and marine otters, Atlantic and Pacific

Seals are generally better off than cetaceans or sirenians. Hence the need for a global action plan is less pressing. Less comprehensive action plans, restricted to the Atlantic and Pacific Oceans, are therefore being created. Seal populations in industrial areas such as the North Sea are under growing pressure, and one seal species in particular—the Mediterranean monk seal—is seriously endangered, so the action plans are concentrated on them.

1.2.1. Mediterranean monk seal, Mediterranean and eastern Atlantic. The total population of the Mediterranean monk seal, *Monachus monachus*, is estimated to be only 500. It is apparently still declining as a result of incidental take, persecution by fishermen, disturbance by visitors, and possibly pollution. Despite great interest, conservation progress is slow, and a more substantial investment of effort and funds is needed. Reserves protecting known breeding areas should be set up; public awareness campaigns directed at fishermen and the general public should be launched; and legal protection by all nations where the species occurs should be sought.

The largest concentrations occur in Greece (150), Algeria (100), Turkey (50-60) and on the Atlantic Sahara coast (55-100). Smaller groups—ranging from 30 to a few pairs—are found in Madeira, Morocco, Libya, Italy, the Balearic Islands (Spain), Tunisia, Lebanon, Yugoslavia, Cyprus, Bulgaria, the Canary Islands, Cape Verde Islands and the Azores. A major effort will be launched to establish reserves in those parts of the Mediterranean where the monk seal is strongest and/or where the conservation climate is most favourable, and in the Atlantic where pollution problems are not so acute.

Action priority. Cost: \$20,000-\$420,000.

Note: The bottom end of the cost range pays for preliminary action to identify the most effective procedure for establishing a network of reserves; the top end pays for the provision of management plans and equipment for about 16 reserves. The latter figure is tentative. 1118

1.2.2. Mediterranean monk seal, Turkey. At present the monk seal is not protected in Turkey. A preliminary survey of the Turkish coast has been made, and this will be extended so that its habitats can be

identified. Seals in the study area will be observed and photographed, and basic biological information collected, to try to determine why populations have plummeted. An effort will be made to protect the seal in two coastal parks, and a public awareness campaign directed at fishermen and the general public will be started.

Project. Cost: \$3,780. 1403

1.2.3. Seals, Baltic Sea. The Baltic populations of the grey seal, *Halichoerus grypus*, ringed seal, *Phoca hispida*, and harbour seal, *Phoca vitulina*, have declined markedly. This project will assist in the establishment of a number of reserves, and in population, breeding and pollution studies, to safeguard these species.

Project. Cost: \$100,000. 1447

1.2.4. Harbour seal, Wadden Sea. Harbour seals, *Phoca vitulina*, in the Wadden Sea have been found containing high concentrations of pollutants (mercury, organochlorines); and land "reclamation" is destroying habitat. Urgent steps to protect habitat will be taken, and attempts will be made to link this effort with action to reduce pollution.

Action priority. Cost: \$150,000. 1448

1.2.5. Marine otter, Chile and Peru. The marine otter, *Lutra felina*, is an endangered species, now restricted to parts of the Chilean and Peruvian coasts. The US Fish and Wildlife Service is surveying its distribution and movements. On the basis of this survey, reserves should be proposed and assistance given to establish them.

Action priority. 1446

1.2.6. Juan Fernandez fur seal. The Juan Fernandez fur seal, *Arctocephalus philippi*, is confined to three islands of the Juan Fernandez group (Chile). The species is vulnerable, and on one island is suffering from poaching and other disturbance. The area is already a national park and other disturbance. The area is already a national park and assistance will be given to strengthen protection.

Action priority. 1410

1.3. Global action plan for the conservation of sirenians

All sirenians—dugongs and manatees—are threatened with extinction: the dugong, the Caribbean manatee and the West African manatee are vulnerable (being overexploited and suffering habitat destruction) and the Amazonian manatee is actually endangered. Yet these creatures are not only intrinsically interesting; they are also a potentially sustainable source of high quality protein. Unfortunately, very little is known about them, and until their distribution and biology are better understood it will be difficult to devise adequate conservation measures. To begin with, a global action plan must consist of surveys. These are furthest advanced in the Caribbean, and it is hoped that potential reserves will be identified soon in Costa Rica, Jamaica, Mexico and Venezuela. Additional surveys are needed of: the Caribbean manatee in Cuba,

Belize, Honduras, Nicaragua, Panama and Colombia (these are being planned as part of the development of the Caribbean sector of the programme, see page 75); the Amazonian manatee; the West African manatee; and the dugong in Somalia, Indonesia, Solomon Islands, New Hebrides and Caroline Islands. In some of these areas, surveys will be extremely difficult to mount. Preliminary estimates of cost (excluding Caribbean surveys costed on page 75) are: \$100,000.

Project identification awaits the results of surveys, but one action priority is already being developed:

1.3.1. Dugong management areas, Papua New Guinea. The dugong, *Dugong dugon*, is an important source of food in Papua New Guinea, but changing economic circumstances threaten to deplete its numbers. Management areas will be set up so that traditional uses may continue. In addition, a public education effort is required to reinforce traditional attitudes in the face of technological innovation. Studies of dugong movements and reproductive capacity—and of the effects of mining pollution on the seagrasses on which dugong feed—are also required.

Action priority. 1449

1.4. Action plans for the conservation of sea and coastal birds, Atlantic and Pacific

Projects and action priorities are being identified to protect the habitats of all the most threatened sea and coastal birds, but these action plans will focus particularly on migratory species—especially those depending on coastal wetlands. Coastal waders, for example, cover vast distances (such as from the Arctic to south of the equator) and coastal wetlands are essential as moulting, resting and wintering grounds. Although coastal wetlands also act as the nurseries and nutrient suppliers of valuable fisheries, they are often the first coastal environments to be destroyed. The action plan for the eastern Atlantic is reasonably well advanced; that for the Pacific is still in the early stages.

1.4.1. Coastal waders, Europe and North-west Africa. The need to establish "green routes" of effective refuges for waterfowl has been acknowledged at every international meeting organized by the IWRB since its foundation, and was reiterated at the International Conference on Conservation of Wetlands and Waterfowl, Ramsar, Iran, January-February 1971. It is proposed that a green route be promoted for coastal waders on the Atlantic run from Scotland to Mauritania. There are 30 estuaries on the Atlantic coasts of Europe and northwest Africa that regularly support more than 20,000 waders. Their conservation would also help protect other waterfowl, as well as safeguard the nurseries and nutrient supplies of important fisheries. A campaign will be initiated to protect those estuaries not already protected. The two most important are already the subject of projects (see below).

Action priority. Cost: \$300,000. 1412



1.4.2. Banc d'Arguin, Mauritania. A remote and remarkable coastal wetland reserve of the greatest importance to waders (it supports more than 750,000) and waterfowl, due to be created a National Park. This project provides for the proper launching of the Park, the establishment of a surveillance system, and the gathering of the information needed for good management. Great care will be taken to allow the Imraguen fishermen—who incidentally use delphinids in fish drives—to continue their traditional way of life on the Banc d'Arguin.

Project. Cost: \$128,000-\$178,000 1333

1.4.3. Wadden Sea, Netherlands, Federal Republic of Germany, and Denmark. The Wadden Sea is of very great importance to waders (supporting more than 400,000) and waterfowl, as well as being the major support of important fisheries in the North Sea. It is under enormous pressure from industrial development. This project provides for the improvement of the Wadden Sea's legal status; research on the threats to animal and plant communities and on ways of protecting them; purchase and protection of certain key areas; the employment of a general inspector; and a public awareness campaign.

Project. Cost: \$500,000. 1411

1.4.4. Coastal wetlands in industrial areas. Coastal wetlands in industrial areas are under especially severe pressure. Although many wetlands make important contributions to fisheries (as nurseries and nutrient suppliers), most nations have different management authorities for fisheries and for wetland conservation, so that the unfortunate economic consequences of such pressure are insufficiently appreciated. It is proposed that such information as is available on the relationship between the 30 wetlands mentioned above (1.4.1.) and fisheries be collated and publicized as part of a campaign to link in the public's mind the aesthetic value of waders and other waterfowl with the economic value of fisheries.

Action priority. Cost: \$10,000. 1444

1.4.5. Directory of Western Palaearctic Wetlands. A directory of western palaearctic wetlands of international importance is being prepared, which will help to emphasize the important link between inland and coastal wetlands.

Project. Cost: \$10,000. 1445

1.4.6. Sea eagle, northern Europe and Greenland. The European and Greenland populations of the sea eagle, *Haliaeetus albicilla*, have declined rapidly, due to persecution, habitat destruction, and pollution. A wide range of activities is being carried out in Finland, the Federal Republic of Germany, Greenland and Sweden—including protection of nesting



sites, research on the effects of pesticides, population studies, and public awareness work.

Project. Cost: \$57,000. 972

1.4.7. Audouin's gull, Mediterranean.

Europe's (and North Africa's) rarest gull, is Audouin's gull, *Larus audouinii*, with breeding colonies restricted to only a few sites. It is proposed that reserves be established on: Islas Chafarinas (off Morocco); Cabrera (Balearics); Palmier, Sanani and Ramkine Islands (Lebanon); Ile Cerbicale, Corsica; and probably other sites.

Action priority. 1413

1.4.8. Filfla, Malta. Filfla, an uninhabited island, contains probably the largest breeding colony of storm-petrels in the Mediterranean and a significant colony of Cory's shearwater. There is a proposal to protect the island and its contiguous sea, possibly as a biosphere reserve.

Action priority. 1417

1.4.9. Conservation of the Finnish archipelago. The archipelago of Finland is a unique habitat and rich in marine species. It is extremely important for birds migrating to and from the Arctic. This project will assist in the establishment of a national park and associated conservation measures.

Project. Cost: \$25,000. 1467

1.4.50. Conservation of seabirds, Line Islands (Gilbert Islands). The Line Islands are among the finest seabird habitats in the South Pacific, containing rare and endangered species such as the Christmas Island frigate bird, Abbott's booby and the Christmas Island silvereye. However, the seabirds are being over-harvested and urgently need protection. A wildlife warden will be provided. He will draw up a management plan, enforce the protection laws, promote awareness of conservation needs and train a Gilbertese replacement.

Project. Cost: \$25,450. 1401

1.5. Action plan for the conservation of coastal crocodiles

Two crocodile species—the American crocodile, *Crocodylus acutus*, and the estuarine crocodile, *Crocodylus porosus*—are largely coastal. A number of predominantly freshwater species (the spectacled caiman, *Caiman crocodilus*, the Nile crocodile, *Crocodylus niloticus*, the African slender-snouted crocodile, *C. cataphractus*, and the New Guinea freshwater crocodile *C. novaeguinae*) also live in estuaries. All these species are threatened, because of excessive exploitation for their skins, habitat destruction and persecution. An action plan will be developed that probably will focus on the areas where the American and the estuarine crocodiles occur: the

Greater Antilles (Hispaniola, Jamaica and Cuba), the Atlantic coast from Florida to Colombia, and the Pacific coast from Mexico to Ecuador (American crocodile); and the Indo-Pacific from southwest India to the Philippines, New Guinea, the Solomons and New Hebrides (estuarine crocodile). The action plan will be developed as part of the main phase of the programme.

1.6. Global action plan for the conservation of marine turtles

All seven marine turtle species are threatened: because of habitat destruction, over-collecting of eggs, accidental drownings in fishing nets, and over exploitation for meat, hides and shell. These threats will be tackled under the appropriate sub-programme. The aim of the critical habitats section of the global action plan is the establishment of a world-wide network of reserves to protect turtle nesting beaches. In certain areas, surveys will be needed beforehand. The following projects and action priorities are examples of what is intended.

1.6.1. Leathery turtle nesting sanctuary, Malaysia. The leathery turtle, *Dermochelys coriacea*, is an endangered species. Its eggs are greatly relished, and—if the species is adequately protected—are a potentially sustainable source of food for tropical peoples. This project will establish a sanctuary to protect 8 km of nesting beach in Trengganu, Malaysia—where the second largest population of the species nests.

Project. Cost: \$16,800. 1348

1.6.2. Survey of turtle nesting beaches, Brazil. There is little doubt that important nesting sites occur along the Brazilian coast, but a survey is needed before attempts to establish reserves can be made.

Action priority. Cost: \$20,000. 1414

1.6.3. Survey of turtle nesting beaches, India. The west coast of India has been surveyed for critical habitats, and proposals for their conservation are being followed up (see page 66). There are likely to be important nesting sites along the east coast, and a survey is needed so that additional reserves may be proposed.

Action priority. Cost: \$20,000. 1415

1.7. Global action plan for the conservation of molluscs, corals, and other invertebrates, and mangroves and sea-grasses

With the exception of molluscs, individual species of marine invertebrates and plants are probably not threatened. However, some of the rich habitats formed by associations of these species are undoubtedly being misused, and it is essential that they be conserved. Some of these associations are extremely rich in species and others are highly productive. They are often economically valuable, and invariably beautiful. The aim of this section of the global action plan is to safeguard a network of representative and

unique associations of invertebrates and plants. The projects and action priorities described below are numbered in regional order, and in such a way as to allow for the addition of further projects and action priorities as they are prepared. Accordingly, the series 1.7.1-1.7.19 is allocated to the Gulf of Mexico and the Caribbean; 1.7.20-1.7.29 to the Mediterranean; 1.7.30-1.7.49 to the western Indian Ocean, including the Red Sea and the Gulf; 1.7.50-1.7.69 to the eastern Indian Ocean and the Indo-Malay archipelago; 1.7.70-1.7.89 to the South Pacific; and 1.7.90-1.7.99 to other areas and to global projects.

1.7.1. Salamanca Island National Park, Colombia. This park covers 21,000 ha of lagoons, mangroves and other coastal habitat, and extends 1 km into the sea. It is an important wintering ground for migratory birds. Easy access to the park makes it prone to illegal grazing, hunting and fishing. This project will provide equipment to make the guard-system more effective.

Project. Cost: \$21,000. 1201

1.7.2. Coral reefs, Caribbean coast of Colombia. Information on coral reefs along this coast is scant, yet they are likely to be important and in need of conservation. An aerial survey to photograph different types of reef and map their location and size will be followed by underwater photography of the reefs, their flora and fauna, and an evaluation of their present condition.

Project. Cost: \$2000. 1416

1.7.30. Coral reefs, Sudan. The coral reefs of the Sudanese Red Sea are rich and spectacular. The reefs along approximately 350 km of coast have remained in almost their natural state. The area is both inhospitable and remote. Industrial development has been slow, and there is almost no rainfall to carry terrestrial pollution into the sea. Increasingly large numbers of divers and other tourists are being attracted to the area. Spear fishing, coral and shell collecting, and so on, are already affecting the life of the reefs. A major effort to expand the marine fishery and the reopening of the Suez Canal pose additional threats. This project provides for the securing of effective conservation legislation, the establishment of marine parks and equivalent reserves, the creation of a nucleus of local persons to ensure the continuation of effective conservation action, and the creation of public awareness among local people and tourists.

Project. Cost: \$20,000. 1163

1.7.31. Coastal survey, Sudan. The coast of Sudan is not only rich in coral reefs, it also boasts significant turtle and seabird nesting areas, and important mangroves. A survey is needed to extend the conservation activities described in the project above.

Project. Cost: \$20,000. 1470

1.7.32. Coastal survey, Saudi Arabia. Saudi Arabia's long coastline is scarcely

documented, yet certainly contains many habitats rarely bettered elsewhere in the region, including coral reefs and mangroves. However, development and industrialization are occurring more quickly than elsewhere in the region. A survey is urgently needed so that conservation proposals can be made as soon as possible.

Action priority. Cost: \$40,000. 1466

1.7.50. Island/marine reserves, Malaysia.

The islands of Pulau Redang, Pulau Lang Tengah and Pulau Paya/Segantang Island Group are fringed by what are probably the finest reefs in West Malaysia. Very few people live on the islands, and the reefs are relatively intact. A survey is intended to provide enough information for the State governments concerned to protect the islands and their reefs as marine reserves.

Project. Cost: \$10,000. 1422

1.7.51. Pulau Balambangan, Sabah.

A survey is required to provide data to support a proposal that this island (important for migratory birds and with rich coral reefs) be a national park, and to draw up a management plan for it.

Project. Cost: \$4855. 1423

1.7.52. Sunderbans, India and Bangladesh.

The Sunderbans is the largest area of mangrove in the Indian Ocean. Assistance in conserving it will be provided.

Action priority. Cost: \$20,000.
1420 & 1421

1.7.70. Manuae atoll, Cook Islands.

Manuae has been generously and imaginatively designated a world marine park by the Government of the Cook Islands. The atoll is valuable for its corals and associated species, and is also important as a wintering ground for migratory coastal waders such as the bristle-thighed curlew (*Numenius tahitiensis*) and the wandering tattler (*Heteroscelus incanus*). A marine survey of the atoll will be undertaken, a management plan drawn up, and assistance provided for the establishment of the park.

Project. Cost: \$30,000. 1434

1.7.71. Survey of coral reefs, Fiji.

The coral reefs of the nations of the South Pacific—such as Fiji—are among their greatest natural endowments. Unhappily, they are threatened by run-off of silt, freshwater and nutrients (caused by forest clearance) and pollution from urban development. It is therefore important that the reefs be properly surveyed and a management plan be drawn up for their conservation. This project provides for this.

Project. Cost: \$20,000. 1468

1.7.90. Conservation of marine environments, Galapagos.

The marine environments of the Galapagos are unique and are exceptionally important scientifically, educationally and intrinsically. A wide variety of physical environmental conditions and a high diversity of habitats has resulted in a considerable diversity of species. Almost all groups show high percentages of endemism. There are plans to extend the Galapagos National Park to

protect this invaluable genetic resource. Patrol boats and a supply and transport vessel are essential for protection, and this project will supply and equip the former and provide partial support for the latter.

Project. Cost: \$93,450. 1404

1.7.91. Logistical support for Charles Darwin Research Station, Galapagos. The Charles Darwin Research Station provides vital support for the conservation programmes and applied field research on which protection of the Galapagos' flora and fauna depends. The station itself needs support, and this project provides for certain essential needs.

Project. Cost: \$28,870. 1316

1.8. Action plan for the establishment of international agreements

National actions alone will not solve the problems of the seas. Because so many nations use the seas, and because marine animals often cross national boundaries or occupy international waters, international agreement is essential if conservation progress in one area is not to be undone by regress in another. The aim of this action plan is to see that conservation is properly provided for in treaties concerning the seas, and to provide support for the drafting and promotion of certain key conventions (international agreements). One is described here. The others are described under the next sub-programme (on page 73).

1.8.1. Convention on Conservation of Certain Islands for Science.

This convention aims to protect remote, mostly uninhabited islands which are regarded as laboratories for the study of evolutionary processes and population dynamics; a draft prepared by IUCN was circulated by the United Nations before the UN Conference on the Human Environment in 1972; the draft will be revised in the light of the comments received, in preparation for a meeting in late 1977 or early 1978 to conclude the convention.

Project. Cost: \$5250. 1426

1.9. Action plan for the development of new methods of management

The relationship between people and the seas is a dynamic one, and the establishment of reserves is only one of a number of recognized conservation practices. Others come under the term "management", being various methods for regulating use and the other activities that affect the seas. At present, management methods are regrettably unsophisticated, reflecting humanity's ignorance of much of the life of the seas as well as an apparent incapacity to come to terms with what is known. In the long term, the development of new methods of management is likely to be among the most important results of the marine programme. Most of the activities in this action plan come under the second and third sub-programmes (regulation of use, and regulation of competing and other destructive activities) and are described there. But two focus on habitat and are described here.



1.9.1. Ocean trench conservation. Ocean trenches are among the most fascinating of marine environments, harbouring many uniquely interesting species. We know little about them, except to suspect that they are as vulnerable as they are deep and mysterious. Their conservation poses special institutional and legal problems: these will be investigated and conservation proposals will be made.

Action priority. Cost: \$23,000. 1425

1.9.2. Southern Ocean conservation area.

The Southern Ocean—the area between the shore-fast ice of Antarctica and the Antarctic Convergence (the zone where cold waters flowing north meet warm waters flowing south)—is the least exploited of all the oceans. It contains many endemic species and many species of potential economic importance, and is of great biological value. It is desirable that the Southern Ocean be accorded international protection as an international resource, in much the same way as Antarctica itself is. A study of the legal and institutional implications of managing the Southern Ocean as an international conservation area will be made.

Action priority. Cost: \$23,000. 1459

Sub-programme 2: Regulation of use

The populations of many marine animals have been severely depleted by overuse. The following projects and action priorities are intended to regulate use—or to provide the means for regulation—either so that depleted stocks and populations may recover or to prevent such depletion from happening in the first place.

2.1. Global action plan for the conservation of cetaceans

The exploitation of large whales is controlled internationally through the International Whaling Commission (IWC)—although this control is incomplete since not all whaling nations belong to the IWC. There is no international control of small whale exploitation, and indeed very little national control. Although the IWC's new management procedures are a great improvement on those of the past, serious deficiencies remain. These include: the continuing reliance on the concept of maximum sustainable yield, and the lack of a system that takes account of ignorance and error; and a tendency to opt for interpretations of inadequate data that allow for a higher take than more prudent interpretations would permit (for example, establishing the maximum sustainable yield of sperm whales on the basis of numbers rather than of weight; and adopting disputed calculations of the initial populations of minke whales and of the recruitment rates of sei whales).



This section of the action plan is intended to help improve the regulation of use of whales, dolphins and porpoises, by investigating different management systems, developing one or more alternatives to maximum sustainable yield, filling in gaps in the information on which management decisions are based, and promoting forms of use that do not put excessive pressure on cetacean populations. Indicative projects and action priorities are described below.

2.1.1. IUCN Working Group on Management of Whales. Whale management is both complex and controversial, and the Scientific Consultation on the Conservation of Marine Mammals and their Environment (Bergen, Norway, 31 August-9 September 1976) made clear the need for an impartial body to review the effectiveness of present arrangements for the regulation of whaling, taking account of the requirements of humanity at large, including future generations. IUCN intends establishing a working group to conduct such a review, to make explicit the objectives and principles of whale management, and to make detailed proposals for more effective procedures and institutions for the conservation and management of whales. The working group will not be a standing body, but will meet only for as long and as often as is required for it to achieve these aims.

Project. Cost: \$46,000. 1427

2.1.2. Sperm whales, Lomblen, Indonesia. The people of the island of Lomblen, and to a lesser extent of neighbouring areas, have traditionally depended on the sperm whale, *Physeter catodon*, for their main protein supply, supplemented by some fish and by catches of smaller cetaceans.

In recent years fishery assistance has been given to the people of Lomblen through the Freedom from Hunger Campaign. This has increased their capacity to secure cetacean meat possibly beyond subsistence needs. The resource on which they depend may be affected by the intense pelagic hunting for sperm whales in the Indo-Pacific area by industrial nations.

It is possible that the sperm whale stock on which the people of Lomblen depend is now being exploited at a higher rate than is sustainable, and also that a fine balance between people and whales is being altered. It is proposed that a biological and social study be conducted, to assess the situation.

Project. Cost: \$10,000. 1428

2.1.3. North Atlantic sperm whaling, Azores. This project will extract and analyze whaling records in the Azores and Lisbon, and collect current data on whale catches and the economic and social significance of whaling, with a view to (a) determining long-term changes in North Atlantic whale stocks which may

affect current International Whaling Commission decisions on sperm whale quotas; and (b) proposing alternative non-consumptive uses of sperm whales, such as tourism and whalewatching, for the economic benefit of the islanders.

Project. Cost: \$20,000. 1429

2.1.4. Sperm whales off Peru. This stock is believed to have been heavily affected by catches, and evidence is needed of possible changes in population variables so that alternative management policies may be proposed. Recent data will be analyzed for this purpose.

Action priority. Cost: \$15,000. 1430

2.1.5. Determining sperm whale size. In order adequately to regulate use of sperm whales it is necessary to know much more about their behaviour. This depends in part on developing methods of study which do not involve killing whales. An acoustic method of determining the size and other vital data from free-swimming sperm whales has been developed. This will now be evaluated.

Action priority. Cost: \$10,000. 1431

2.1.6. Dolphins and porpoises, Black Sea. The initial (before harvesting) numbers of the combined Black Sea populations of the common dolphin, *Delphinus delphis*, bottlenosed dolphin, *Tursiops truncatus*, and harbour porpoise, *Phocoena phocoena*, are now estimated as 600,000-1,000,000. Since then, they have declined to an estimated 25,000-30,000, and all nations except Turkey have stopped exploitation. A ground survey will be carried out along the Turkish coast to document all landing localities and seasons of catch and to establish a preliminary system for collecting adequate catch statistics.

Action priority. Cost: \$14,500. 1433

2.1.7. Bowhead whale, Bering Sea. A major current problem is documentation of removals from the Bering Sea population of the bowhead whale, *Balaena mysticetus*, and of the loss rate in different stages of the fishery. A pilot project for logbook extraction studies is proposed, which will enable a comparison to be made of estimates of stock sizes at various times, and will also help in determining the status of the population. Since harvesting by the Eskimos has apparently expanded as the result of their ability to buy improved technology with money derived from the Alaskan oil boom, a socio-economic study of new and developing threats will be included.

Action priority. Cost: at least \$40,000. 1434

2.1.8. Northern bottlenose whale, North Atlantic. The northern bottlenose whale, *Hyperoodon ampullatus*, is thought to have declined drastically because of exploitation, and population studies are seriously needed. A multi-species fishery exists but present catches of this species are almost nil. Possible stock divisions and the schedule of winter migration are unknown. An historical study is proposed, so that

basic biological data can be provided to improve management.

Project. Cost: \$14,000. 1432

2.1.9. Trade in marine mammal ivory. Exploitation for its ivory is a particular threat to the narwhal, *Monodon monoceros*. Other species, especially the walrus, are also heavily exploited. The nature and impact of this trade will be assessed, and recommendations made for its regulation.

Action priority. Cost \$15,000. 1435

2.6. Global action plan for the conservation of marine turtles

As noted in the introduction to the section of this action plan within the conservation of critical habitats sub-programme, turtles suffer considerably from over-collecting of eggs and overexploitation for meat, hides and shell. The projects and action priorities described below are the first in a major effort to regulate use of marine turtles, so that they can continue to benefit local peoples. In addition, public awareness campaigns will be conducted in Germany, Japan, UK and USA to limit non-essential uses of turtles (for example, trade in turtle soup and tortoiseshell), for as long as these uses menace the sustainability of essential uses, such as the supply of food.

2.6.1. Survey of turtle nesting beaches, Panama. A marine turtle specialist is to be provided to survey nesting beaches on Panama's Atlantic and Pacific coasts as the basis of a management plan.

Project. Cost: \$13,600. 1321

2.6.2. Turtle management, Oman. IUCN is recruiting a marine turtle specialist and providing technical direction for a project intended to protect the nesting sites of four marine turtle species on Masirah Island, and develop suitable management techniques for the sustainable use of this resource.

Project. Cost: \$9320. 1320

2.6.3. Conservation of turtles, Hawkes Bay and Sandspit, Pakistan. Main nesting beaches of green and ridley turtles, which occur in spectacular concentrations, are threatened by heavy recreation pressure (beach cottages encroach on the nesting area), feral dogs, and exporters of turtle products. Assistance will be given to establish a multiple use reserve and draw up a management plan.

Action priority. Cost: \$25,000. 1451

2.6.4. Leathery turtle, Malaysia. With the object of achieving a 15% hatch of eggs collected in Trengganu, Malaysia, wildlaid eggs are bought from licensed collectors, and a hatching scheme is operated.

Project. Cost: \$10,000. 969

2.6.5. Turtle status survey, Solomon Islands. Turtles are an important source of meat for islanders, but the status of the local populations (green, olive ridley, and leathery) is unknown. A survey will be undertaken.

Project. Cost: \$20,000. 1452

2.7. *Global action plan for the conservation of molluscs, corals and other invertebrates, and mangroves and sea-grasses*

Invertebrate populations are threatened not only by habitat destruction but also by misuse, and measures must be initiated to promote rational use.

2.7.90. Investigation into international trade in coastal marine wildlife and its products. There are indications of serious declines of many coral reef and other coastal marine animals, due to heavy collecting, particularly for the tourist trade. Very few data exist for the key areas (for example, Thailand, Malaysia, Philippines, Hawaii), and little action can be recommended without factual support. Field data will be collected on the species and quantities involved in key areas, and these will be integrated with statistics kept by the IUCN TRAFFIC (Trade Records Analysis of Flora and Fauna in Commerce) Group. The investigation will also cover the major consumer countries (Japan and USA). Recommendations will be made for ways to regulate the trade, and a report will be published.

Project. Cost: \$33,000. 1453

2.8. *Action plan for the establishment of international agreements*

2.8.1. Convention for the Protection of Migratory Animals. IUCN is closely involved in helping the Government of the Federal Republic of Germany prepare for a plenipotentiary meeting to conclude this important treaty, and is advising on its form and content. Marine animals covered include: whales and other cetaceans, seals, birds, marine turtles and fish. A draft convention was completed in 1975. An expert meeting to discuss the draft was held in Bonn in July 1976. A second meeting of governmental experts will be convened in Bonn in 1977 or 1978. The plenipotentiary conference will then be convened probably in the summer of 1978 in Bonn. Activities under this project will include all preparations, organization and administration for the draft and meetings.

Project. Cost: \$11,000. 1454

2.8.2. IUCN Law of the Sea Task Force. A small task force has been established to advise IUCN on the UN Conference on the Law of the Sea. The task force was consulted before the New York session of the Conference in 1976 and as a result a statement was sent to all national delegations in an attempt to strengthen the conservation aspects of the Single Revised Negotiating Text. Follow-up action will be necessary before the May 1977 session of the Conference.

Project. Cost: \$2500. 1247

2.9. *Action plan for the development of new methods of management*

2.9.1. Krill and Southern Ocean management options. The problem of direct exploitation of swarming euphausiids (krill) in the Southern Ocean, and of the effects of

this exploitation on marine animals, especially baleen whales, has evoked enormous interest. The problem affects five species of baleen whales, three species of seals, many species of oceanic birds, several species of pelagic fish and of oceanic squids. Since IUCN's interest in Antarctic conservation is not restricted to any one of these groups, it will promote an international study of the relationships between krill and all these species. At the same time, IUCN will attempt through workshops to develop a "rolling" statement of management options (that is, a statement that can be made more precise, and even change, as knowledge improves).

Action priority. Cost: \$23,000+. 1455

2.9.2. California Current regional management scheme; and

2.9.3. Bering Sea regional management scheme. The sustainable yield of one species (or stock) is often affected by the harvesting of others. Yield is also affected by the harvesting of species on which the target species feeds, by destruction of critical habitat, and by many other factors. Unfortunately, management decisions do not take these factors into account. Indeed, it is likely that they can be catered for adequately only with the creation of regional structures, managing the marine resources of an ecological region as a unit. In order to investigate the practicability of that politically difficult but ecologically more realistic approach, a small number of model regional management schemes will be devised. It is expected that the first regions to be examined will be either the California Current or the Bering Sea, or both. A report on the state of biological knowledge and a review of current management practices will be prepared. These will be followed by a workshop to agree management criteria and procedures and to recommend an appropriate institutional structure, and to relate the proposed criteria and structure to local socio-economic circumstances.

Action priorities. Cost: \$32,000 each.
1456 & 1457

2.9.4. Ecodevelopment, appropriate technology and marine conservation. Ecodevelopment is development of a locality taking the fullest sustainable advantage of the locality's physical, biological and cultural resources. As such it is a means of assisting human communities to develop in ways that are in accordance with their cultural heritage and do not destroy the natural resources on which they depend. It is important that practical codevelopment projects for the rational use of marine resources be identified and promoted. A workshop will be convened to do this.

Action priority. Cost: \$22,000. 1460

Sub-programme 3: Regulation of competing and other destructive activities

Besides destruction of critical habitat and direct overexploitation, the most serious threats to marine life are: incidental take



(when a marine mammal, turtle or bird is caught incidentally in the nets of a fishery, discarded fishing gear, or anti-shark nets); competition for food (when people seek to harvest species—such as krill—on which marine animals depend); pollution; disturbance by visitors; and major (particularly industrial) developments. The following projects and action priorities address these problems.

3.1. *Global action plan for the conservation of cetaceans*

Cetaceans are threatened by competition for their food (a problem covered to some extent by action priority 2.9.1), and dolphins and porpoises in particular suffer from incidental take and pollution. The projects and action priorities below are among the means that will be sought to alleviate these problems.

3.1.1. Incidental take workshop. Incidental take seriously affects many small cetaceans, sirenians, seals, marine turtles and seabirds. Because the problem is so widespread, it is proposed that an attempt be made to develop and promote modifications to fishing gear and fishing strategies (if necessary) that will (if possible) benefit more than one group of animals. A workshop will be convened, consisting of specialists in the groups affected and of representatives of some of the fisheries most concerned (e.g. the Gulf of Mexico shrimp fishery which severely threatens the survival of the Gulf ridley turtle, *Lepidochelys kempi*; the Greenland salmon fishery which has an incidental take of 1500 harbour porpoises, *Phocoena phocoena*; and the Japanese salmon fishery which has an incidental take of more than 10,000 Dall's porpoise, *Phocoenoides dalli*).

Action priority. Cost: \$16,000. 1436

3.1.2. Cochito, Gulf of California, Mexico. The cochito, *Phocoena sinus*, is a species of porpoise confined to the upper Gulf and taken incidentally in anti-shark nets and by the totoaba (*Cynoscion macdonaldi*, an endangered species) fishery. A status survey is proposed to assess what remedial action may be necessary.

Project. Cost: \$5000. 1437

3.1.3. Dolphins and porpoises, North Sea and Baltic Sea. The numbers of common dolphin, *Delphinus delphis*, bottlenosed dolphin, *Tursiops truncatus*, whitebeaked dolphin, *Lagenorhynchus albirostris*, and harbour porpoise, *Phocoena phocoena*, in the North Sea, and of harbour porpoise in the Baltic Sea, appear to have decreased severely. A study is proposed to determine the status of these populations, their migration patterns, and the extent to which incidental take and pollution by heavy metals and organochlorines affect them.

Action priority. Cost: \$30,000. 1440



3.2. Action plans for the conservation of seals and marine otters, Atlantic and Pacific

A number of seal and otter populations are affected by conflict with fishermen, harassment by visitors and pollution. This section of the action plan will attempt to resolve these problems. The first two proposed activities are described below.

3.2.1. California sea lion and northern sea lion, eastern North Pacific. The migratory California sea lion, *Zalophus californianus*, and northern sea lion, *Eumetropius jubatus*, suffer from conflict with fishermen, harassment by tourists and possibly pollution. A socio-economic study of the impact of the sea lions on fishing, especially sport fishing, is planned, and it is hoped to follow this up with a public awareness campaign.

Action priority. Cost: \$60,000. 1439

3.2.2. Sea otter, California. The damage and benefits to different fisheries caused by the sea otter, *Enhydra lutris*, are the subject of investigation and controversy. The issue well illustrates the complexity of the problems of competition for marine resources between different interest groups, and will form the basis of a public education effort.

Action priority. Cost: \$2000. 1446

3.7. Global action plan for the conservation of molluscs, corals and other invertebrates, mangroves and seagrasses

Whole human communities depend upon the rich environments formed by (for example) corals and seagrasses. Their livelihood is menaced by threats great and small, from wholesale transformations, such as the superport proposed for Palau, to piecemeal—though widespread—alterations, such as the quarrying of sand from lagoons. Similar activities also threaten rich invertebrate environments in temperate waters. The three projects described below indicate the range of activities proposed under this action plan.

3.7.70. Palau ecological feasibility study and information service. The Palau archipelago in western Micronesia is one of the most spectacular and pristine environments in the Pacific. Financial and industrial interests in Iran, Japan and the USA are considering the formation of an international consortium to construct a superport and petroleum store to serve the entire Pacific area. The building of a major refinery, petrochemical plant and electrolytic-transformation industries has also been proposed.

The consequences could be severe for the people of Palau, their way of life and their environment—as well as for such threatened species as the hawksbill turtle,

leathery turtle, dugong, Palau ground dove, La Perouse's megapode and Palau owl.

It is proposed that an independent study be made to provide the people of Palau with an assessment of the consequences of the superport and of the ecological feasibility of their continuing to derive support from their environment if the superport be built. It is also proposed that an assessment be made of the economic alternatives open to the people of Palau, so that they may be given an opportunity to choose their own future on the basis of the fullest possible ecological and economic information.

Project. Cost: \$60,000. 1443

3.7.71. Exploitation of coral sands in lagoons, French Polynesia and French Antilles. Coral sands are being extensively quarried from lagoons for construction purposes. The possibly serious biological consequences of such effects as increased turbidity are little known. Both these consequences and the economic aspects of such exploitation will be investigated, and proposals will be made to limit both exploitation and its consequences.

Project. Cost: \$20,000. 1442

3.7.90. Southwestern Britain investigation. Surveys are planned to study unknown or little known rock sites underwater; to investigate the effects of diving activities and selected industrial operations; to identify species and sites that would benefit from conservation measures; and to begin biological monitoring.

Project. Cost: \$48,900.

3.9. Action plan for the development of new methods of management

Unprecedentedly large developments require unprecedented methods of management, including both multinational management agreements and a greatly increased effort by non-governmental organizations to monitor the extent to which legal and other safeguards are observed. Projects and action priorities such as the two below will be increasingly necessary as the exploitation of marine resources extends beyond the capacity of existing institutions to regulate it.

3.9.1. NRDC Atlantic coast project. The NRDC (Natural Resources Defense Council), an IUCN Member, is embarking on a project designed to see that the Federal oil and gas leasing programme on the outer continental shelf incorporates adequate safeguards to protect the marine environment, to monitor the Coastal Zone Management Act on a state-by-state basis, and to work for the protection of barrier islands. The project requires the employment of a marine biologist for one year, and will provide a useful test of the ability of a sophisticated industrial society to make multiple use of the marine environment.

Project. Cost: \$30,000. 1458

3.9.2. Oil exploitation, and conservation of the Arctic ice environment. The legal and institutional implications of planned

exploitation of oil in the high Arctic have scarcely been investigated, although the ecological impact is likely to be heavy. A workshop will be held to review thoroughly the problems and opportunities.

Action priority. Cost: \$23,000. 1441

Completion of launch phase and development of main phase

Completion of the launch phase of the marine programme requires both the conversion of action priorities into projects and the supervision of projects. Development of the main phase requires the identification of action priorities (and their conversion into projects) in order to close gaps in the programme.

Project supervision is primarily the task of the World Wildlife Fund. Conversion of action priorities into projects and development of the main phase are the tasks of IUCN. However, IUCN will remain closely involved in a number of projects, particularly those demanding a high scientific input.

The principal gaps to be closed are as follows: sirenians; Pacific sea and coastal birds; coastal crocodiles; marine turtles; the section of the conservation of critical habitats sub-programme covering molluscs, corals and other invertebrates, and mangroves and seagrasses; and the sub-programmes covering regulation of use and regulation of competing and other destructive activities.

Conversion of action priorities into projects and closing most of the above gaps will be carried out by IUCN under project 4, overall development of the marine programme. Further development of the conservation of critical habitats sub-programme and of regional activities will be carried out by IUCN under project 5. The singling out of the critical habitats sub-programme is a reflection of its greater size, which in turn is a reflection not so much of its importance as of its relative practicability. Roughly the target figures of the three sub-programmes are:

Conservation of critical habitats	\$6m
Regulation of use	\$2.25m
Regulation of competing and other destructive activities	\$1.75m

Ideally the latter two should be larger. Regrettably, only a limited number of activities in these fields is within the scope of the WWF Marine Programme, and the sub-programmes have been restricted to these. However, it is hoped that further work can be carried out by IUCN and the appropriate UN bodies, such as UNEP, FAO, and UNESCO.

4. Overall development of the marine programme. Overall programme development will be carried out by the IUCN Secretariat, guided by the IUCN Marine Steering Committee (MSC), and assisted by the appropriate specialist groups of IUCN's Survival Service Commission (principally, the Crocodile and Marine Turtle Groups, and the Interim Committee on Marine Mammals).

The MSC is composed of the Chairmen or representatives of IUCN's scientific Commissions, together with three marine scientists serving in their individual capacities. The names of the MSC members are given on page 66. The Committee's terms of reference are:

1. To provide for coordination among IUCN's Commissions in the development of the Marine Programme;

2. To determine which of the action priorities and projects proposed by Commissions, IUCN Members, WWF and other bodies are suitable for inclusion in the Programme; and to establish their relative importance for funding;

3. To screen project proposals;

4. To identify gaps in the Programme, and to otherwise assist in its development.

The criteria for selecting projects and action priorities, and for deciding their relative importance are given below.

Guided by the MSC, the IUCN Secretariat will convert current action priorities into projects, and will continue to supervise the more complex ones (about a third of the projects and action priorities identified so far). Together, the MSC, the Secretariat, and the appropriate specialist groups, will identify and develop the additional action priorities required for the main phase of the Programme. The main phase is expected to be at least 1½ times larger than the launch phase. These action priorities, too, will have to be converted into projects.

The IUCN Interim Committee on Marine Mammals is being established especially to formulate action priorities and projects within the global action plan for the conservation of cetaceans, the Atlantic and Pacific action plans for the conservation of seals and marine otters, and the global action plan for the conservation of sirenians. The Interim Committee is also charged with proposing improved international arrangements for the formulation and transmission of scientific advice at the international level, and with monitoring and evaluating both the status of marine mammals and the results of scientific research on marine mammals. The objective of this work is to provide an independent assessment of the short and long term consequences of human activities that, directly or indirectly, affect marine mammals; and to promote changes in those activities whenever necessary.

In addition, the Crocodile Specialist Group and the Marine Turtle Specialist Group will be provided with assistance to develop the action plan for the conservation of coastal crocodiles and the global action plan for the conservation of marine turtles, respectively.

Project. Cost: \$433,260. 1400

5.1. Development of critical habitats sub-programme. Development of the conservation of critical habitats sub-programme as a whole and of additional activities within the global action plan for the conservation of molluscs, corals and other invertebrates,

and mangroves and seagrasses, will be undertaken by the IUCN Critical Marine Habitats Team, directed by Dr Carleton Ray.

The Team will be responsible for compiling dossiers on critical habitats within key regions (such as the Caribbean, Mediterranean, Red Sea, Persian Gulf, northern Indian Ocean, Indo-Malay archipelago and the South Pacific); supervising surveys and other fieldwork; and carrying out certain surveys and appraisals. Supported by UNEP and WWF, the Team has already carried out certain surveys in the Mediterranean, northern Indian Ocean and the South Pacific, and these are now being followed up. Additional surveys are required in the Andaman Islands, Papua New Guinea, Western Samoa and Tonga.

Surveys and appraisals in two regions of particular importance—the Caribbean and the Indo-Malay archipelago—will be the subject of separate projects. That for the Indo-Malay archipelago is scheduled to begin in 1978. That for the Caribbean is scheduled to begin in 1977 and is described below.

Project. Cost: \$165,000. 1037

5.2. Marine conservation in the Caribbean. An appraisal of the status of marine conservation in the Caribbean will be conducted, and surveys will be carried out where necessary, with a view to promoting a regional network of parks and reserves to conserve unique and representative areas of coral reef, mangroves and other critical habitats. A workshop to develop a conservation strategy for the Caribbean will be held, probably at Santa Marta, Colombia, in September 1977. In addition, it is hoped to carry out status surveys of the Caribbean manatee in Cuba, Belize, Honduras, Nicaragua, Panama and Colombia. Other surveys are under way or scheduled in Costa Rica, Jamaica, Mexico and Venezuela, and requests for assistance in establishing reserves are expected.

Project. Cost: \$100,000 1462

6. Public education projects. Public education components are included in most projects. However, many marine conservation issues are so difficult to grasp and the questions of public policy they raise are so difficult to resolve that two special public awareness projects are also required. One (6.1) will be carried out by IUCN; the other (6.2) by WWF.

6.1. Public education in indicative marine issues. This project focusses on two complex problems that are indicative of the more acute marine conservation issues facing the governments and peoples of the world today: whales, and critical marine habitats. Whales evoke considerable public sympathy, but appreciation of the problems of conserving them is less widespread. As the solutions to these problems tend to be expensive, complex and unglamorous, clear explanations are needed so that public support (particularly among policy makers) for these solutions can be increased. Similarly, officials in aid agencies and in



the governments of many countries insufficiently understand what critical marine habitats are, why they are critical, and how they should be conserved. Articles and a book will be prepared and distributed.

Project. Cost: \$9,000. 1461

6.2. Marine conservation education. This project will be directed principally at young people in order to help foster in future generations an understanding of the need to conserve the life of the seas. Audio-visual and other educational materials will be produced.

Project. Cost: \$9000. 1402

Criteria for the selection of projects and action priorities

IUCN's Marine Steering Committee uses the following criteria when selecting projects and action priorities for inclusion in the Programme, and deciding their relative importance.

1. *Urgency.* Projects should concentrate on the most threatened or misused populations and habitats—subject to criterion 2 below—and bearing in mind that some actions have long lead-times.

2. *Practicability.* Projects should be restricted to those topics and areas for which money can be raised and high quality manpower supplied. In addition, the right political climate for conservation action should exist already or be emerging: for example, governments should be committed to conservation and prepared to contribute actively to projects, and they should either have or be planning effective systems of pollution control; or inter-governmental bodies such as UNEP should be active, or prepared to be active, in the area.

3. *Information richness.* In order that projects should be properly informative to other nations and organizations, the problems tackled should be representative and the methods of tackling them widely applicable.

4. *Breadth.* Ideally, projects should be sufficiently comprehensive to fulfill more than one function. For example, a habitat conservation project that protects an area important for its contribution to the productivity of a fishery as well as one that is critical for the survival of a threatened species, is preferable to a project that does only one of these things.

5. *Other considerations.* This is a catch-all criterion to include various factors not covered by the other four criteria, such as the potential publicity value of the project or action priority, and the ability of funding bodies (particularly WWF) to raise money for it.

Table 1. WWF Marine Programme, 1977/1978—launch phase: sub-programmes and action plans

ACTION PLANS	SUB-PROGRAMMES					
	1. Conservation of critical habitats	2. Regulation of use	3. Regulation of competing and other destructive activities			
	US\$	US\$	US\$			
1. Global action plan for the conservation of cetaceans	1.1.1. International system of cetacean sanctuaries	1,000,000	2.1.1. IUCN WG on Management of Whales	46,000	3.1.1. Incidental take workshop	16,000
	1.1.2. Grey whale sanctuaries, Mexico	105,000	2.1.2. Sperm whales, Indonesia	10,000	3.1.2. Cochito, Mexico	5,000
	1.1.3. Blue whale, Canada	27,840	2.1.3. North Atlantic sperm whaling, Azores	20,000	3.1.3. Dolphins and porpoises, North Sea and Baltic Sea	30,000
	1.1.4. Humpback whale, Hawaii	28,500	2.1.4. Sperm whales off Peru	15,000		
	1.1.5. Externally visible tag for large whales	9,240	2.1.5. Sperm whale size determination	10,000		
	1.1.6. Indus susu	22,000	2.1.6. Dolphins and porpoises, Black Sea	14,500		
			2.1.7. Bowhead whale, Bering Sea	40,000		
2. Action plans for the conservation of seals and marine otters, Atlantic and Pacific	1.2.1. Mediterranean monk seal, Mediterranean and East Atlantic	420,000	2.1.8. Northern bottlenose whale, North Atlantic	14,000	3.2.1. Sea lions, eastern North Pacific	60,000
	1.2.2. Mediterranean monk seal, Turkey	3,780	2.1.9. Trade in marine mammal ivory	15,000	3.2.2. Sea otter, California	2,000
	1.2.3. Seals, Baltic Sea	100,000				
	1.2.4. Harbour seal, Wadden Sea	150,000				
	1.2.5. Marine otter, Chile and Peru	23,000				
	1.2.6. Juan Fernandez fur seal					
3. Global action plan for the conservation of sirenians	1.3. Surveys	100,000				
	1.3.1. Dugong management areas, Papua New Guinea					
4. Action plans for the conservation of sea and coastal birds	1.4.1. Coastal waders, Europe and North West Africa	300,000				
	1.4.2. Banc d'Arguin, Mauritania	178,000				
	1.4.3. Wadden Sea	500,000				
	1.4.4. Coastal wetlands in industrial areas	10,000				
	1.4.5. Directory of Western Palaearctic Wetlands	10,000				
	1.4.6. Sea eagle, North Europe and Greenland	57,000				
	1.4.7. Audouin's gull, Mediterranean					
	1.4.8. Filfla, Malta					
	1.4.9. Conservation of the Finnish archipelago	25,000				
	1.4.50. Conservation of sea birds, Line Islands	25,450				
6. Global action plan for the conservation of marine turtles	1.6.1. Leathery turtle nesting sanctuary, Malaysia	16,800	2.6.1. Survey of turtle nesting beaches, Panama	13,600		
	1.6.2. Survey of turtle nesting beaches, Brazil	20,000	2.6.2. Turtle management, Oman	9,320		
	1.6.3. Survey of turtle nesting beaches, India	20,000	2.6.3. Conservation of turtles, Hawkes Bay and Sandspit, Pakistan	25,000		
			2.6.4. Leathery turtle, Malaysia	10,000		
			2.6.5. Turtle status survey, Solomon Islands	20,000		
7. Global action plan for the conservation of molluscs, corals, and other invertebrates, and mangroves and seagrasses	1.7.1. Salamanca I. National Park, Colombia	21,000				
	1.7.2. Coral reefs, Caribbean coast, Colombia	2,000				
	1.7.30. Coral reefs, Sudan	20,000				
	1.7.31. Coastal survey, Sudan	20,000				

ACTION PLANS	SUB-PROGRAMMES				
	1. Conservation of critical habitats	2. Regulation of use	3. Regulation of competing and other destructive activities		
	US\$	US\$	US\$		
8. Action plan for the establishment of international agreements	1.7.32. Coastal survey, Saudi Arabia	40,000			
	1.7.50. Island/marine reserves, Malaysia	10,000			
	1.7.51. Pulau Balambangan, Sabah	4,855			
	1.7.52. Sunderbans, India and Bangladesh	20,000			
	1.7.70. Manuae atoll, Cook Islands	30,000		3.7.70. Palau study and information service	
	1.7.71. Survey of coral reefs, Fiji	20,000		3.7.71. Exploitation of coral sands in lagoons	
	1.7.90. Conservation of marine environments, Galapagos	93,450	2.7.90. Investigation into international trade in coastal marine wildlife	33,000	3.7.90. South West Britain investigation
	1.7.91. Logistical support for CDRS, Galapagos	28,870			
	9. Action plan for the development of new methods of management	1.8.1. Islands for Science Convention	5,250	2.8.1. Migratory Animals Convention	11,000
				2.8.2. IUCN Law of the Sea Task Force	2,500
9. Action plan for the development of new methods of management	1.9.1. Ocean trench conservation	23,000	2.9.1. Krill and Southern Ocean management options	23,000	3.9.1. NRDC Atlantic coast project
	1.9.2. Southern Ocean conservation area	23,000	2.9.2. California Current regional management scheme	32,000	3.9.2. Oil exploitation, and conservation of the Arctic ice environment
			2.9.3. Bering Sea regional management scheme	32,000	
			2.9.4. Ecodevelopment and marine conservation	22,000	

Table 2. WWF Marine Programme, 1977/1978—launch phase projects and action priorities: classification by species

Whales, dolphins and porpoises

Bowhead whale: 2.1.7.
 Grey whale: 1.1.2.
 Blue whale: 1.1.3.
 Humpback whale: 1.1.4.
 Indus susu: 1.1.6.
 Bottlenosed dolphin: 2.1.6., 3.1.3.
 White-beaked dolphin: 3.1.3.
 Common dolphin: 2.1.6., 3.1.3.
 Harbour porpoise: 2.1.6., 3.1.1., 3.1.3.
 Cochito: 3.1.2.
 Dall's porpoise: 3.1.1.
 Narwhal: 2.1.9.
 Sperm whale: 2.1.2., 2.1.3., 2.1.4., 2.1.5.
 Northern bottlenose whale: 2.1.8.
 Threatened whales, dolphins and porpoises, general: 1.1.1., 1.1.3., 1.1.5., 1.9.2., 2.1.1., 2.8.1., 2.9.1., 2.9.2., 2.9.3., 3.1.1., 3.9.2., 6.1.

Otters

Marine otter: 1.2.5.
 Sea otter: 3.2.2.

Seals

Harbour seal: 1.2.3., 1.2.4.
 Ringed seal: 1.2.3.
 Grey seal: 1.2.3.
 Juan Fernandez fur seal: 1.2.6.
 California sea lion: 3.2.1.

Northern sea lion: 3.2.1.

Mediterranean monk seal: 1.2.1., 1.2.2.
 Seals, general: 1.9.2., 2.8.1., 2.9.1., 2.9.2., 2.9.3., 3.1.1., 3.9.2.

Sirenians

Dugong: 1.3.1., 3.7.70.
 Sirenians, general: 1.3., 3.1.1., 5.2.

Birds

Sea eagle: 1.4.6.
 Audouin's gull: 1.4.7.
 Coastal waders, general: 1.4.1., 1.4.2., 1.4.4., 1.4.5., 1.4.9., 1.7.1., 1.7.32., 1.7.51., 1.7.52., 1.7.70., 2.8.1., 2.9.2., 2.9.3.
 Seabirds, general: 1.4.2., 1.4.3., 1.4.8., 1.4.9., 1.4.50., 1.7.31., 1.7.32., 1.7.51., 1.7.70., 1.9.2., 2.8.1., 2.9.1., 2.9.2., 2.9.3., 3.1.1., 3.9.2.

Crocodiles

American crocodile: 1.5.
 Estuarine crocodile: 1.5.

Turtles

Hawksbill turtle: 3.7.70.
 Atlantic ridley turtle: 3.1.1.
 Leatherly turtle: 1.6.1., 2.6.4., 3.7.70.
 Turtles, general: 1.6.2., 1.6.3., 1.7.32., 2.6.1., 2.6.2., 2.6.3., 2.6.5., 2.8.1., 3.1.1.

Molluscs, corals and other invertebrates, and mangroves and seagrasses

General: 1.7.1., 1.7.2., 1.7.30., 1.7.31., 1.7.32., 1.7.50., 1.7.51., 1.7.52., 1.7.70., 1.7.71., 1.7.90., 1.7.91., 1.9.2., 2.7.90., 2.9.2., 2.9.3., 3.7.70., 3.7.71., 3.7.90., 6.1.

Table 3. WWF Marine Programme, 1977/1978—launch phase projects and action priorities: classification by oceanic region

North Atlantic, western (includes Gulf of Mexico and Caribbean Sea)

1.1.3., 1.6.2., 1.7.1., 1.7.2., 2.1.3. (part), 2.1.8. (part), 2.6.1. (part), 3.7.71. (part), 3.9.1., 5.2.

North Atlantic, eastern (includes Baltic Sea, North Sea, Mediterranean Sea and Black Sea)

1.2.1., 1.2.2., 1.2.3., 1.2.4., 1.4.1., 1.4.2., 1.4.3., 1.4.4., 1.4.5. (part), 1.4.6., 1.4.7., 1.4.8., 1.4.9., 2.1.3. (part), 2.1.6., 2.1.8. (part), 3.1.3., 3.7.90.

Indian Ocean, western (includes Red Sea)

1.1.6., 1.4.5., (part), 1.7.30., 1.7.31., 1.7.32., 2.6.2., 2.6.3.

Indian Ocean, eastern, and Indo-Malay archipelago

1.3.1., 1.6.1., 1.6.3., 1.7.50., 1.7.51., 1.7.52., 2.1.2., 2.6.4.

North Pacific, eastern (includes Bering Sea and Gulf of California)

1.1.2., 1.1.4., 2.1.7., 2.1.9. (part), 2.6.1. (part), 2.9.2., 2.9.3., 3.1.2., 3.2.1., 3.2.2.

South Pacific, western

1.4.50., 1.7.70., 1.7.71., 2.6.5., 3.7.70., 3.7.71. (part).

South Pacific, eastern

1.2.5., 1.2.6., 1.7.90., 1.7.91., 2.1.4.

Arctic Ocean

2.1.9. (part), 3.9.2.

Southern Ocean

1.9.2., 2.9.1.

Global

1.1.1., 1.1.5., 1.8.1., 1.9.1., 2.1.1., 2.1.5., 2.7.90., 2.8.1., 2.8.2., 2.9.4., 3.1.1., 4., 5.1., 6.1., 6.2.

Table. 4 Threatened Marine Animals

The following list of threatened marine mammals, birds and reptiles is derived from the IUCN *Red Data Book*. A supplementary list from other sources is available.

The species are classified as follows: E = endangered; V = vulnerable; R = rare; I = indeterminate.

CETACEA	Whales		
Balaenidae			
E <i>Eubalaena glacialis</i>	Black right whale		
E <i>Balaena mysticetus</i>	Bowhead whale		
Balaenopteridae			
V <i>Balaenoptera physalus</i>	Fin whale		
E <i>Balaenoptera musculus</i>	Blue whale		
E <i>Megaptera novaeangliae</i>	Humpback whale		
Platanistidae			
E <i>Platanista indi</i>	Indus susu		
I <i>Lipotes vexellifer</i>	White fin dolphin		
Ziphiidae			
V <i>Hyperoodon ampullatus</i>	Northern bottlenose whale		
CARNIVORA	Carnivores		
Ursidae			
V <i>Ursus maritimus</i>	Polar bear		
Mustelidae			
E <i>Lutra felina</i>	Marine otter (Chingungo)		
PINNIPEDIA	Seals		
Otariidae			
V <i>Arctocephalus galapagoensis</i>	Galapagos fur seal		
V <i>Arctocephalus philippi</i>	Juan Fernandez fur seal		
V <i>Arctocephalus townsendi</i>	Guadalupe fur seal		
E <i>Zalophus californianus japonicus</i>	Japanese sea lion		
Odobenidae			
I <i>Odobenus rosmarus laptevi</i>	Laptev walrus		
Phocidae			
I <i>Phoca kurilensis</i>	Kurile harbour seal		
R <i>Phoca hispida saimensis</i>	Saimaa seal		
E <i>Monachus monachus</i>	Mediterranean monk seal		
E <i>Monachus tropicalis</i>	Caribbean monk seal		
V <i>Monachus schauinslandi</i>	Hawaiian monk seal		
SIRENIA	Sirenians		
Dugongidae			
V <i>Dugong dugon</i>	Dugong		
Trichechidae			
V <i>Trichechus manatus</i>	Caribbean manatee		
E <i>Trichechus inunguis</i>	Amazonian manatee		
V <i>Trichechus senegalensis</i>	West African manatee		
AVES	Birds		
Spheniscidae			
R <i>Spheniscus mendiculus</i>	Galapagos penguin		
Diomedidae			
E <i>Diomedea albatrus</i>	Short-tailed albatross		
		Procellariidae	
		E <i>Procellaria parkinsoni</i>	Parkinson's petrel, black petrel
		V <i>Procellaria westlandica</i>	Westland black petrel
		E <i>Pterodroma phaeopygia</i>	Dark-rumped petrel
		V <i>Pterodroma hasitata</i>	Black-capped petrel
		E <i>Pterodroma cahow</i>	Bermuda petrel, cahow
		E <i>Pterodroma barau</i>	Reunion petrel
		E <i>Pterodroma axillaris</i>	Chatham Island petrel
		E <i>Pterodroma cookii</i>	Cook's petrel
		R <i>Pterodroma leucoptera</i>	Stout-billed gadfly petrel, Gould's petrel
		I <i>Bulweria macgillivrayi</i>	MacGillivray's petrel
		I <i>Puffinus heinrothi</i>	Heinroth's shearwater
		V <i>Puffinus puffinus huttoni</i>	Hutton's shearwater
		V <i>Puffinus puffinus newelli</i>	Newell's shearwater
		Sulidae	
		E <i>Sula abbotti</i>	Abbott's booby
		Phalacrocoracidae	
		R <i>Phalacrocorax carunculatus</i>	New Zealand king shag
		R <i>Nannopterum harrisi</i>	Galapagos flightless cormorant
		Fregatidae	
		V <i>Fregata andrewsi</i>	Christmas Island frigatebird
		Haematopodidae	
		E <i>Haematopus chathamensis</i>	Chatham Island oystercatcher
		Charadriidae	
		E <i>Charadrius novaeseelandiae</i>	New Zealand shore plover
		Scolopacidae	
		I <i>Tringa cancellatus</i>	Tuamotu sandpiper
		E <i>Numenius borealis</i>	Eskimo curlew
		R <i>Limnodromus semipalmatus</i>	Asian dowitcher
		I <i>Tringa guttifer</i>	Spotted greenshank
		Recurvirostridae	
		R <i>Himantopus himantopus knudsensi</i>	Hawaiian stilt
		E <i>Himantopus novaezealandiae</i>	Black stilt
		Laridae	
		V <i>Larus audouinii</i>	Audouin's gull
		I <i>Sterna zimmermanni</i>	Chinese crested tern
		E <i>Sterna albifrons browni</i>	California least tern
		TESTUDINES	Turtles
		Cheloniidae	
		V <i>Caretta caretta</i>	Loggerhead turtle
		R <i>Chelonia depressa</i>	Flatback turtle
		E <i>Chelonia mydas</i>	Green turtle
		E <i>Eretmochelys imbricata</i>	Hawksbill turtle
		E <i>Lepidochelys kempii</i>	Atlantic ridley turtle
		E <i>Lepidochelys olivacea</i>	Olive or Pacific ridley turtle
		Dermochelyidae	
		E <i>Dermochelys coriacea</i>	Leathery turtle
		CROCODYLIA	Crocodiles
		Crocodylidae	
		E <i>Crocodylus actus</i>	American crocodile
		V <i>Crocodylus porosus</i>	Estuarine crocodile

Books

Marine ecology and oil pollution

edited by Jenifer M. Baker

Applied Science Publishers, 566 pp, 168 figures, \$75

Oil pollution kills seabirds, mars beaches, and (locally) can damage ecosystems. This book—almost entirely written by staff of the Field Studies Council's Oil Pollution Research Unit (UK)—is a valuable contribution to knowledge of the effects on marine ecosystems both of oil and of pollution treatment methods.

Three particularly interesting chapters discuss ecological changes in Milford Haven during its history as an oil port; the effects of refinery effluents on a salt marsh; and physical and biological effects of oil films floating on water.

After 15 years as an oil port, no overall effects attributable to the oil industry have been observed in Milford Haven, except for local damage caused by spills or refinery effluent. However, Milford Haven is probably not representative: the port itself is very well administered, and the haven is not as rich biologically as some other oil port sites.

Elsewhere, chronic pollution by refinery effluents has killed tracts of saltmarsh vegetation. In one area, *Spartina/Spartinetum* saltmarsh denuded of plants by refinery effluents, is now recovering, probably due to a combination of mild winters and reduced oil levels in the effluent. However, plants other than *Spartina* are recolonizing the area, and it looks as if the composition of the vegetation will be substantially different from the original.

Marine ecology and oil pollution is a worthwhile addition to any library con-

cerned with marine ecology; but the price is too high.

Living marine molluscs

by C. M. Yonge and T. E. Thompson

Collins, 288 pp, 6 full-colour plates, 10 half-tone plates, 162 other figures, £6

A useful introduction to marine molluscs, and a timely demonstration that the behaviour of living marine molluscs is even more attractive and interesting than their shells. Species discussed are largely north European, although examples are also drawn from many other parts of the world. Unfortunately, the book is spoiled by stylistic clumsiness: for example, "These denouements of bivalve evolution carry us on, without separation into a new chapter, to description of the invariably tube-dwelling, although burrowing, elephant's tusk shells or scaphopods, the most isolated of molluscan classes".

There are also all-too-frequent lapses into gobbledygook: "The distal parts of the expanded parapodia are said to be non-muscular, the contractile proximal regions being responsible for movements of the whole". Why not say, "the outer parts of the swimming wings apparently lack muscles, the wings being moved by contractions of the inner parts"? Have Collins sacked their editors?

The ecology of the seas

edited by D. H. Cushing and J. T. Walsh

Blackwell Scientific Publications, 467 pp, 134 figures, £8.75

Fourteen contributors here summarize what is known about various aspects of marine ecology: the sea and the organisms that live in it; the structure of life in the seas; functions in the marine ecosystem;

yield from the sea; evolutionary consequences; and theory.

Coverage is not as comprehensive as this list implies, or as the publishers claim in the blurb. Marine mammals are neglected, and there is scarcely a mention of seagrasses. However, a number of the contributions are helpful—notably the discussions of patchiness by J. H. Steele and of vertical migration by A. R. Longhurst.

Other useful reviews are contributed by Kenneth Mann on production on the bottom of the sea, J. A. Gulland on production and catches of fish in the sea, and D. H. Cushing on the biology of fishes in the pelagic community. Altogether, *Ecology of the seas* provides a helpful (if partial) guide to how the seas work, and a telling reminder of how incomplete our knowledge is.

A field guide to the Mediterranean sea shore

by W. Luther and K. Fiedler

Collins, 272 pp, 500 animals and plants illustrated, 300 in full colour, £4.95

There are so many species in an area as large as the Mediterranean Sea that authors and publishers of a field guide of this scope are obliged to be selective. They are then faced with the choice of restricting coverage so that either all the species in one or two zones are described, or all zones are covered but only at the level of families or super families.

The authors of this field guide have chosen neither alternative. Instead, they offer a random selection, including species from all zones, but with fish relatively over-represented and invertebrates under-represented. This seriously limits the book's usefulness as a field guide, although it remains a pleasant and informative survey of some of the Mediterranean Sea's inhabitants.

News from Members

IUCN Members with news of interest to other Members are invited to send it to Membership Officer, IUCN, 1110 Morges, Switzerland.

The column this month is devoted to marine news.

Senegal: concern for the monk seal

Le Directeur des Eaux et Forêts, Senegal, has expressed concern about the monk seal. He points out that at present too little is known about its movements. Its normal habitat is off the coast of Mauritania, but from time to time it appears in Senegal waters, where its rarity makes it peculiarly vulnerable. He has suggested a survey of its movements and distribution throughout the area.

Canada: critical marine habitats

In Canada the National Parks Planning Division has been busy over the past two

years identifying important marine areas. Many of these areas encompass critical marine habitats and the intention is to make a number of them into national parks.

Israel: emphasis on public awareness

In October the Society for the Protection of Nature in Israel together with the Nature Reserves Authority and the Environmental Protection Service ran an educational campaign along the western shore of the Gulf of Elat. The campaign featured the conservation problems of the shore and underwater landscape of the Gulf and took place during the week of the Jewish feast of Sukkot (Tabernacles) when holidaymakers are present in thousands.

Public education is also an important part of the work of the two Field Study Centres set up along the Gulf last year.

Already thousands of youngsters and adults have visited one or other of them. Three similar centres have been in existence for some time on the Mediterranean coast. Two further ones are planned.

Sweden: full-scale marine programme

The Swedish Society for the Conservation of Nature is launching a full-scale national marine programme in cooperation with the WWF Swedish National Appeal and appropriate government departments. Activities will include: projects on such threatened Baltic species as sea-eagles, seals and tortoises; surveys geared towards setting up marine reserves; policies concerning oil-drilling, supertankers, fishing and underwater exploitation of minerals; the strengthening of anti-pollution laws; and so on. In short the programme will cover all aspects of marine conservation.

Sea turtle saga crowns endangered species conference

Turtle soup, tortoiseshell and turtle leather are on the way out—thanks to the successful outcome of a dramatic last-minute tussle between governments at the first meeting of the parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

The five-day meeting, attended by 24 of the 33 governments party to the treaty, was held to review the problems of enforcing it and to agree ways of making it more effective. The meeting ended on Saturday, 6 November.

One of the biggest tasks of the meeting was to consider more than 800 proposed amendments to the two main lists of animals and plants protected by the treaty: Appendix 1, which lists species which cannot be traded internationally; and Appendix 2, which lists species which can be traded provided such trade is monitored.

Since the treaty came into force on 1 July 1975, it has become obvious that some species on Appendix 2 urgently needed the protection of Appendix 1. Prominent among them were the sea turtles.

Of the seven sea turtle species, five are classified in the IUCN *Red Data Book* as endangered, one as vulnerable, and one as rare. Although, IUCN's sea turtle specialists believe that all are so threatened that none should be traded internationally, only one species (the Atlantic ridley turtle) and one subspecies (a variety of the hawksbill turtle) were on Appendix 1.

The United Kingdom and Australia therefore proposed that the endangered leathery turtle be transferred from Appendix 2 to Appendix 1, and the UK and Switzerland proposed that the other subspecies of the hawksbill (also en-

dangered) be transferred too. The UK further proposed that the loggerhead turtle (vulnerable), the flatback turtle (rare), the green turtle (endangered) and the Pacific ridley turtle (endangered), also be transferred to Appendix 1.

The leathery turtle and hawksbill proposals met with no opposition and were quickly adopted. But the others ran into trouble immediately. The proposals were grouped together in a single package covering the family (Cheloniidae), to which all sea turtle species, except the leathery turtle, belong. The package was vigorously resisted by a number of governments, largely on the grounds that the flatback turtle although rare is not threatened. After a vigorous debate, the UK consented to withdraw.

Subsequently, observers from IUCN, alarmed that three threatened species were now insufficiently protected, decided to take action. They distributed a note to the delegates, urging them to reopen discussion on the sea turtles.

This was done. The UK argued effectively that the loggerhead and the Pacific ridley should go on Appendix 1, and on they duly went. But Australia and West Germany put up a stiff resistance to the inclusion on Appendix 1 of the green turtle. Whatever its status elsewhere, the Australians said, the green turtle was abundant in Australian waters. As for West Germany, its delegate insisted that the green turtle was not endangered at all—a claim he backed up with the news that imports of green turtle products into Germany were increasing.

Immediately, Ghana intervened to remark that this was the first time he had heard the fact of increased trade in an endangered species being interpreted as

evidence that the animal was not endangered—and in a meeting to control international trade in endangered species too! In turn, Ghana, Zaïre and the observers from UNEP and IUCN, argued vigorously that international trade in sea turtles should be stopped. Sea turtle eggs and meat provided much needed food for people in the tropics, and this resource should not be destroyed to supply the luxury markets of developed countries.

Eventually, the scientific committee of the meeting agreed that all sea turtles should go on Appendix 1, except for the flatback and the Australian population of the green turtle. All seemed well until, on the last day, the proposal came before the final plenary session. The West German delegate repeated his opposition to the proposal that the green turtle be on Appendix 1, and forced it to the vote—making it the only proposal that had to be voted on.

At intergovernmental meetings like this one, voting is avoided whenever possible—because it forces governments to declare positions on which they might prefer to be ambiguous. For a few minutes, the survival of the sea turtles hung in the balance; and then all was well. Only West Germany, Switzerland, Australia and Papua New Guinea, voted against the green turtle going on Appendix 1. In three months' time, it will be illegal for the countries party to the Endangered Species Convention to export or import turtle soup, tortoiseshell or any other sea turtle product—except where one of the parties enters a reservation excluding the green turtles from protection.

Time will tell. But for the moment, sea turtles and the human communities that depend on them have a safer future than they have had for years.



**The Caribbean monk seal:
probably the latest marine
animal to become extinct;
and, we hope, the last.**

The Caribbean monk seal is almost certainly extinct. Although still listed in the IUCN *Red Data Book* as endangered, its presence there is more in the hope than in the belief that the species still exists.

The last reliable sighting of the seal was almost 25 years ago, in 1952. An aerial survey in 1973, which covered the main parts of the species' former range and particularly the less disturbed parts, found no sign of the seal. Offers of a \$500 reward for information on recent sightings brought no response at all.

The main cause of the decline of the Caribbean monk seal was overexploitation. The species was hunted heavily in the 18th century and was already rare by 1850. Since then, habitat destruction, disturbance by visitors, and persecution by fishermen have finished off what animals remained.

The fate of the Caribbean monk seal is symptomatic of the plight of the seas. Humanity has yet to come to terms with the life of 70% of the earth's surface. The IUCN and WWF marine programmes have come too late to help the Caribbean monk seal. Let us hope they are not too late for the remaining life of the seas.

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