



Bulletin

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Marine Programme Report

Progress to date

Launched a year ago, the Marine Programme now has around 30 active projects plus 9 projects approved and ready to start and a further 28 being developed. The Programme will increasingly derive from the World Conservation Strategy—and will increasingly focus on “process conservation”.

Page 2

The marine revolution

Even though we still know very little about marine biology, the “marine revolution”, in the opinion of Dr Carleton Ray, is already here. Our accelerating dependence on the sea marks a fundamental change in our relationship with planet Earth.

Page 3

Management of harvested species

Whales. Sperm whale quotas, reduced last June, were sharply raised again in December as a result of data-weak models. These are a poor basis for scientific management and IUCN is now helping to develop new models of the dynamics of whale populations. . . . A different issue is the bowhead. On scientific grounds this whale ought to be totally protected. But should subsistence rights have prior claim? And what are subsistence rights today?

Harp seals. Here again the models used to justify quotas are suspect; essential data are lacking. IUCN has asked the Canadian government to cut this year's quota (10,000 up on 1977) and to delay or call off the hunt next year so that a thorough census can be carried out.

Tuna and dolphins. To fishermen the sight of dolphins plunging through the waves may mean yellowfin tuna swimming beneath. So fishing nets are set around the dolphins which are often caught and

drowned. Strong conservation pressure has compelled the US tuna fleet to reduce dolphin deaths. But they are still too many—especially as non-US fleets, whose dolphin-saving techniques are sometimes rudimentary, are growing fast.

Pages 4, 5 and 6

Increasing or declining? . . . Extinct or surviving?

Indus dolphin. A study of the behaviour and ecology of this freshwater dolphin is expected to aid the conservation of its sea relatives. It is not yet clear whether this endangered animal is increasing in numbers or declining.

Japanese sea lion. Reports that this animal, thought to have been extinct since about 1960, may still survive off eastern Korea are being investigated. On balance there seem to be good grounds for hope.

Page 7

Action in the Mediterranean . . . and new projects

Mediterranean monk seal. This species is a top priority. Its minute population is widely scattered and its habitat continues to be destroyed or polluted. Projects in Turkey and Italy will shortly be joined by an action plan encompassing the entire range of this critically endangered animal. **New projects.** Since the Programme was launched, 16 projects and 7 “action priorities” have been added. While species and their habitats naturally form the bulk of these, alternative technology, education and “ethno-ecology” are included.

Pages 8 and 9

Turtles: bad news from Mexico, omens good in Oman

Mexico. A chance discovery in the Gulf of California has led to the near extermina-

tion of green turtles there. And further south an allegedly scientific turtle industry has decimated what until last year was a large rookery of olive ridleys.

Oman. Oman has one of the largest concentration of loggerheads in the world and the government is adamant that these and other turtles should be harvested on a strictly sustainable basis.

Also: how tourist agencies could help—and leathery turtles in Malaysia.

Pages 10 and 11

Countering industrial threats to—US Atlantic coast, Wadden Sea fishery, Palau coral reefs

US Atlantic coast. Along the whole length of this coast “leisure” development of offshore islands and oil and gas exploration pose serious environmental threats. The Natural Resources Defense Council has been taking effective counter-action.

Wadden Sea. Land reclamation schemes in this vital nursery for many fish species could further deplete North Sea stocks. Conservationists in Holland, West Germany and Denmark are putting up counter proposals.

Palau. A superport is proposed for Palau, one of the most species-rich islands in the Pacific and now a centre of controversy: oil versus coral. IUCN is intent on providing the local people with a proper assessment of the options.

Pages 12 and 13

And

Alternative technology goes to sea—oil risks to wildlife in the North Sea—whale tagging—coral reefs in Sudan and Malaysia—seabirds in West Africa and the mid Pacific.

Pages 14, 15 and 16

Marine Programme makes progress

This issue of the *Bulletin* is a progress report on IUCN's Marine Programme. Since much of this Programme is funded by World Wildlife Fund, it is in large measure also a report on the WWF Marine Programme.

Programme objectives

As noted in previous marine issues of the *Bulletin* (July 1976 and December 1976) the immediate objectives are to:

- safeguard the most vulnerable animals;
- conserve the most precious habitats;
- stimulate governments and intergovernmental bodies to act more vigorously and on a bigger scale;
- generate public support for such action.

Since its early formulation by IUCN's Marine Steering Committee (see box on page 3) the Programme has also had a broader, more ambitious aim: the conservation of major marine processes. Major marine processes are defined as dynamic systems of linked feeding, resting, breeding and nursery areas, including the areas that supply them with nutrients and other essentials.

In short, IUCN is interested in developing management methods that reflect the special continuities and divisions of the seas rather than the narrow interests of different economic sectors.

At the level of species management this has involved IUCN in the search for an alternative to Maximum Sustainable Yield (MSY) and in a scrutiny of the models used to determine quotas for whales and seals. Both activities are in their early stages, but the latter has already led IUCN to criticize the IWC's sperm whale model (see page 4) and to call for a reduced harp seal quota and a delay or even cancellation of the hunt so that a reliable census can be made (see page 5).

At the level of area management, IUCN has decided to concentrate on a small number of regions: Caribbean, South Pacific, Mediterranean, Western Indian Ocean and Southern Ocean. Lack of resources may require that this number be further reduced.

Project development

Converting process conservation from theory into practice is difficult and time-consuming, and progress is bound to be slow. However, there has been notable progress with the more conventional parts of the Programme.

When the WWF Marine Programme was launched in December 1976, it consisted of a small number of approved projects, rather more proposed projects, and a large number of "action priorities". The term "action priority" has caused confusion and perhaps should be replaced by "re-

quest for a proposal"—in other words, a problem and ways of tackling it have been identified and a project proposal is required for action to be taken.

The evolution of a project from proposal request to active project can be illustrated as in Figure 1 below.

Many of the priorities and projects described in the December 1976 issue of the *Bulletin* are not reported on here—either because they are not yet active or because the annual reports have not been received. So far some 30 projects are active, 9 others have been approved and are ready to start, and 28 more are being developed. There remain about 30 "action priorities" on which development work has yet to begin.

Influence of Strategy

Development of the Marine Programme will increasingly be influenced by the World Conservation Strategy, now in preparation. The Strategy will have a substantial marine element, and its priorities will be reflected in the Programme. Accordingly, it is possible that some "action priorities" will be given a different priority than at present.

Programme support

As noted above, the Marine Programme largely consists of activities funded by WWF. But the Programme also receives substantial support from UNEP, particularly at the levels of the World Conservation Strategy and the regional sub-programmes. In addition, a few projects in which IUCN has an interest are supported by organizations other than UNEP or WWF. The relationship of the different elements of the Programme is shown in Figure 2.

Liaison with UN programmes

The Marine Programme is closely coordinated with the programmes of UNEP, FAO and UNESCO, largely through the Ecosystem Conservation Group (ECG) but also direct. At a 2-day meeting of the ECG in September, the three UN bodies and IUCN reported on their marine conservation activities and discussed areas in which they might cooperate. The most likely areas are UNEP's regional programmes (in which there is considerable cooperation already) in the Mediterranean, Caribbean, Red Sea, Gulf, West Africa, Straits of Malacca and South Pacific. Other areas include the Southern Ocean, mangrove ecology, marine mammals, incidental take and Palau.

Fig. 1. Evolution of a project from proposal request to active project

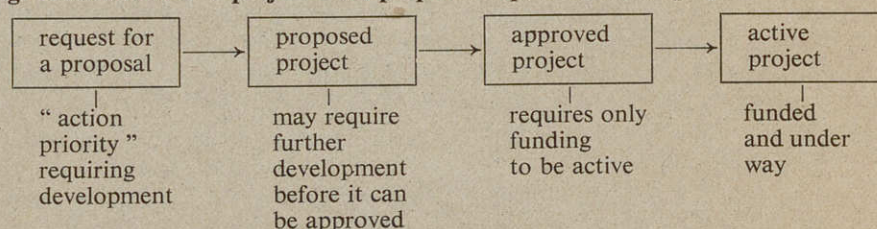
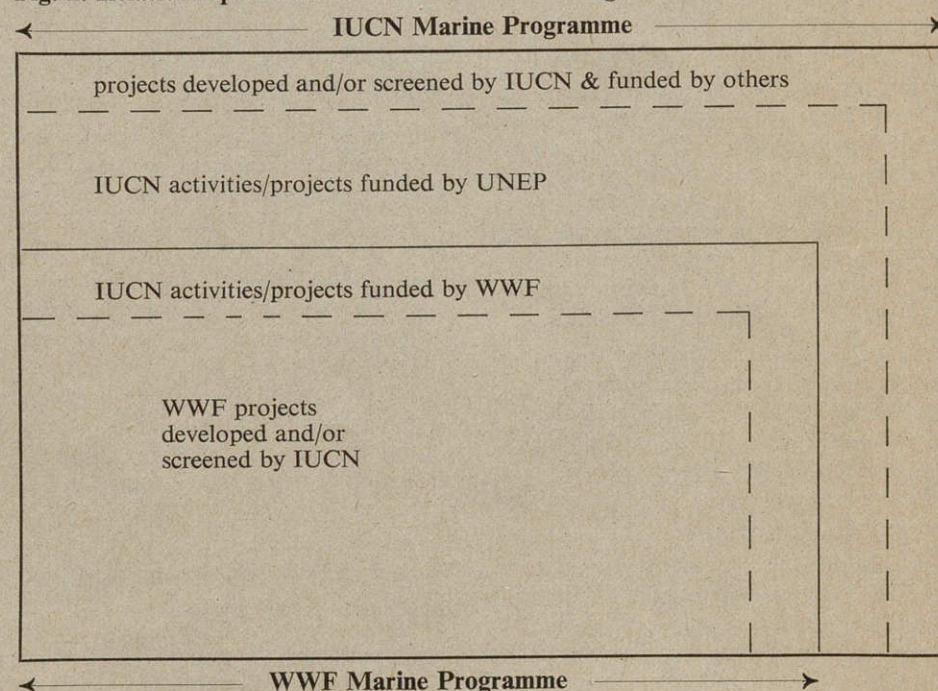


Fig. 2. Relationship of main elements of Marine Programme



"We know the sea is in danger but we do not know how it works"

Comment

The marine revolution

With man's accelerating dependence on the sea and massive entry into it, the "marine revolution" has arrived. The agricultural revolution allowed hunter-gatherers to become city folk. The industrial revolution taught these folk to withdraw still farther from the land. Now in the marine revolution we seek to "conquer" the sea—though we are still largely hunter-gatherers there. We hunt whales and fish and gather clams and kelp and, as our needs increase, we lower the sea's productivity through pollution and coastal development.

The marine revolution, no less than the earlier socio-economic revolutions, marks an evolutionary change in our relationship with this planet. It requires a new awareness of Earth-Sea's true nature. We know the sea is in danger, but we do not know how it works. Some say it is dying which is deceptive. Others say it is too big to pollute which is irresponsible nonsense.

Our problem is that marine science lags decades behind terrestrial science and marine conservation is minimal. Is there time to study the sea before man has so altered it that what he learns today will not apply tomorrow? We *must* learn more—and fast. But also on the basis of what we already know nations *must* learn to act with greater wisdom and self-restraint.

Rather in desperation we seek to set aside pieces of nature as "parks" or "protected species". Are these actions worthwhile? Obviously protection of areas and species is part of the picture, as are research, pollution abatement, coastal zone planning and so on, but I would like to emphasize a concept which helps bring these separate actions into integrated focus—*critical habitat*.

How does the sea work? To answer, we must recognize functional units. Cells are small functional units which combine to make up the larger functional unit of a

body. Interbreeding animals and plants form units called "populations" and these form "communities". Now visualize a living community together with the non-living components of the environment, and you will be focusing on the largest and most important functional unit of all—the "ecosystem".

But the ecosystem is not just an assemblage. It is a *system* with its own functional characteristics. Ecosystems are modelled in complex ways by which scientists describe energy transfer, cycling and storage of materials, homeostasis and diversity. Essentially what scientists seek is description of *processes* which make the engine go.

It is ecosystem process which we must protect and herein lies the challenge, especially in the sea where ecosystems are huge, where ocean currents create subtle boundaries and linkages, and where most species' populations are highly migratory during various phases of their life cycles, even to the extent that whole components of communities travel hundreds of miles in larval form.

Species and habitats are the results of these processes—a difficult matter for traditional conservation to address. It is easy to excite interest in "endangered species", but who will get excited about "process conservation"?

One definition of critical habitat is: *where an essential species function occurs*. But what is the support system for such places? Where do the nutrients originate that feed juvenile shrimp, for example? We now suspect that without the leaf fall from mangroves which supports the "detritus cycle" some shrimp populations would become too small to support a fishery. Mangroves are critical to both shrimp and shrimp fishermen, so a critical habitat is also: *where an essential ecological process occurs or originates*. These two aspects of critical habitat together describe ecosystem function, extent, linkages and stability.

All this can be pretty theoretical stuff. Its application to the real world involves not

only delimiting the ecosystems of the sea—a task hardly begun—but also modelling the coastal and marine processes—where we are in not much better shape.

How are we to emerge from our dilemma of ignorance? Bearing in mind that species' functions and habitats are dependent upon ecological processes, perhaps we can best acquire the knowledge we need by concentrating on habitats, classifying their varieties, protecting samples of each and evolving a scheme for monitoring process.

The critical habitats approach requires a linked system of reserves representative of system-wide processes. It goes hand-in-hand with system-wide protocols for pollution abatement and the like. This is a far cry from putting a few places aside as marine parks or protecting a few species individually. I would not like to regard it as "the impossible dream".

Conservation will fail in the end unless it stops treating problems piecemeal and starts treating the ecosystem whole—unless, in brief, it becomes programmatic and not just a motley assortment of projects. Both sea and land are in reality complex compilations of interwoven critical habitats. Maybe the marine revolution will bring this forcefully home to us, if only because nations are becoming aware that the growing problems of the sea require integrated and often international solutions.

Marine parks serve many purposes and will always be necessary. But let's not stop there. I hope this generation will establish a second level—networks of integrated critical habitat reserves for the coasts and the seas. Then the next generation can unite them in a third level—"biosphere reserves" for man and nature together. What is the critical habitat for the blue whale but the sea itself? What is it for man other than Earth-Sea?

G. Carleton Ray

Dr. G. Carleton Ray is a marine biologist at The Johns Hopkins University, Baltimore, and the chairman of IUCN's Marine Steering Committee.

Central role of the Marine Steering Committee

Composed of members of all six Commissions plus three marine biologists, IUCN's Marine Steering Committee not only "steers" the marine programme but to a very significant extent creates it. During the past extremely busy year the MSC, acting in close concert with IUCN's marine programme officer, has advanced the programme considerably—in terms of both active projects and programme design.

Every proposal put forward for inclusion in the programme is assessed by each member of the MSC individually on four criteria: urgency, practi-

cability, information richness (the more information a project yields, the wider its application elsewhere) and breadth (the more functions a project fulfils, the "broader" it is). The proposal is then judged for overall quality and a consensus arrived at.

The proposal may be unconditionally accepted (very rare); it may be rejected; it may be conditionally accepted—meaning that before it becomes a funded project the proposer must strengthen it in certain respects or perhaps reshape it to fit into the structure of the programme.

IUCN's marine programme officer

Mats Segnestam came to IUCN from the World Wildlife Fund to take up the post of Marine Programme officer. A Swede and an ecologist, he has for long been active in international conservation. From 1967-76 he was executive director of the Swedish Society for the Conservation of Nature, where his duties included directing projects for saving threatened species, establishing education programmes and advising the government on environmental issues. He has lectured at universities in Sweden and the USA and has for many years played a prominent part in the activities of the International Council for Bird Preservation for which he is the liaison officer to WWF and IUCN.

Management of harvested species: Whales... sperm, bowhead...

Sperm whale quotas leap

Last summer the International Whaling Commission was congratulated on cutting whale quotas by 36%. Congratulations were premature. In June the quota for North Pacific sperm whales was set at 763. In December it was sharply raised to 6444 (1339 females and 5105 males). For the year 1977-78 the total cut in quota is thus not 36% but 16%—not over a third but under a sixth. How come this abrupt change? The short answer is new "evidence" submitted by Japan.

Population estimates of the sperm whale rely heavily on data provided by the Japanese whaling fleets (Russian data are too gross to be usable) in the form of "catch per unit effort" (CPUE). Japanese whalers have introduced asdic as an aid to finding and tracking whales. This should obviously lead to a higher CPUE—which in turn will give a higher estimate of population *unless the correct allowance is made for improved efficiency*.

It is on this score that there are grave doubts. At the November meeting of the IWC Scientific Committee the Japanese claimed that asdic had improved the efficiency of their North Pacific whaling fleet by only 5%—a raw statistic presented to the Committee without supporting data. Yet the figure given in June for exactly the same vessels operating in the Southern Ocean had been 38%.

Because of this discrepancy a "correction" was applied to the November figure, raising it to 16%. Nevertheless this still resulted in a sharp upward revision to estimates of the sperm whale population in the North Pacific. And on the basis of this evidence, quotas too were sharply increased.

It could be that in this instance 16% is all the difference that asdic made—even though it does compare rather curiously with a figure of 130% for South African coastal whaling. But whether correct or not, it is pressed into the service of a fairly

crude device for estimating whale populations. And from these "guesstimates"—buttressed by assumptions on pregnancy rates and the factors affecting them which may or may not be true to life—are derived the quotas.

At present there are too few scientists working full-time on whale problems—too few to know whether the correct work is being done or even to know whether work is being done correctly. We are very ignorant of the population dynamics of whales. And management rooted in ignorance will only manage to be right by luck.

IUCN statement on sperm whales

The following statement was made by IUCN to the special meeting of the International Whaling Commission, Tokyo, 6-7 December 1977.

The International Union for Conservation of Nature and Natural Resources (IUCN) is unhappy both about the conclusions reached by the Scientific Committee at their special meeting in Cronulla (Australia) and by the way they were reached. It is not confident that an adequate assessment of the status of the stocks was made nor that the mathematical model used is valid.

IUCN notes that the Scientific Committee stated that the dramatic change in

the stock assessment was largely brought about by an adjustment of the effort modifiers and it regrets that no indication of the sensitivity of these results to those statistics was given. This is particularly serious when one of the effort modifiers used, that for ASDIC, was calculated from data sufficiently problematic to be derived from operations in both the North Pacific and the Southern Ocean.

IUCN further notes the Scientific Committee's request for raw data to be made available prior to the meetings of the Committee and feels that this is an absolute prerequisite for adequate assessment.

IUCN therefore feels unable to support the Commission's decision to endorse the Scientific Committee's recommendations on the quotas for the 1978 North Pacific Sperm Whale season.

Accordingly, it reserves its right to continue to work for alternative assessment and management procedures to those used by the IWC.

Call for moratorium

WWF Switzerland has collected 700,000 signatures for a moratorium on whale hunting. These signatures will be submitted to the ambassadors of Japan and the USSR in Berne on 6 and 7 May.

Eskimos win, bowheads lose

The IWC has also revised its ruling on the bowhead whale. Last June a ban was imposed on subsistence hunting. Foremost among the reasons were (a) that during its 40 years of protection from commercial hunting the bowhead population has shown no signs of recovery (even when the subsistence kill has been only one or two animals a year), and (b) that the intensity of the present-day Inupiat Eskimo hunt could well lead to the bowhead's extinction.

The IWC decision sparked a fierce debate within the US. Some argued that as custodians of native rights it was the government's duty to file an objection; others that such an action would weaken international opposition to commercial whaling. A compromise plan, involving intensive bowhead research plus a strictly limited native hunt, was put to the November meeting of the IWC Scientific Committee. The Committee reaffirmed that on biological grounds a zero quota was the only right one, but said that members of the IWC—which was due to meet two weeks later in Tokyo—might wish to take into account subsistence and cultural needs.

In Tokyo, by a majority vote, a quota was agreed for the 1978 Spring hunt: 12 bowheads landed or 18 struck, whichever comes first. The situation will be reviewed next June in the light of information gained from the US research programme.

Too many struck-and-lost

Commercial whaling, whatever may be said against it, "loses" very few whales. But the Inupiat, now armed with destructive though not very efficient weapons, are losing a great many—and from a stock which is believed to number at most 2000 and maybe as little as 600 or 6% of the original size.

Since 1970 the Inupiat kill has been rising sharply from a previous average of only 10 a year to a peak in 1976 of 48 landed plus 8 killed-and-lost and 35 struck-and-lost. Bearing in mind that this final category must include many lethally wounded, the 1977 figures are perhaps even more disturbing: 29 landed, 2 killed-and-lost and 77 struck-and-lost.

The new quota is a lot less than the Inupiat have been taking of late. It is also a little less than the US requested (15 landed/30 struck). Even so it may be more than the bowhead can stand.

At IUCN's General Assembly in Zaire a resolution was passed calling for "protection of traditional ways of life which enable communities to live in harmony with their environment". The Inupiat/bowhead controversy illustrates the need to be precise about how far and in what ways people can depart from a traditional style of life before it ceases to be traditional—and "harmony" becomes disharmony.

Chile, Panama should stick to rules

Under an agreement between the governments of Chile and Panama, the Panamanian whaler, Paulmy Star III, has been authorized to catch up to 500 sperm and sei whales annually for the next three years in Chilean waters. Letters signed by the Directors General of IUCN and WWF have been sent to the Presidents of Chile and Panama pointing out that the IWC, of which Panama is a member State, permits no commercial hunting of sperm whales in the south-east Pacific. They are a protected stock. The Presidents of both countries have been requested to ensure that Paulmy Star III does not take sperm whales from this stock and that any catch of sei whales be coordinated with those of other whaling companies, including those of Peru, USSR and Japan, to ensure that the IWC quota is not exceeded.

Harp seals and MSY

The harp seal issue and the dubious worth of MSY in the scientific management of whales were the chief matters discussed at the first meeting of IUCN's Interim Committee on Marine Mammals. Dr David Lavigne, a Canadian biologist who has made a special study of the harp seal, presented evidence which strongly suggests that the 1978 harp seal quota is not only too high but also out of line with the Canadian government's avowed management strategy. After reviewing the evidence and the recommendations of the Committee, IUCN has stated

its position both to the Canadian government and to the press.

The discussion on MSY was led by Dr John Beddington, a British biologist whose studies on the dynamics of whale populations have convinced him that whaling quotas based on the narrow concept of MSY are frequently excessive. It was agreed that MSY may be a dangerously misleading management tool and that alternatives should be evolved. Two sub-committees have therefore been set up—one to construct an alternative model and the other to examine all aspects of management regimes, including the interests of non-whaling nations.

The following message was sent by IUCN on 16 February to the Hon. Romeo Le Blanc, the Canadian Minister of Fisheries.

Statement of IUCN's position on the harp seal

IUCN understands that the Canadian government's strategy for management of the harp seal is to allow a gradual build-up by limiting the harvest to 75% of the sustainable yield. IUCN is in agreement with this strategy. However the factors noted below have led IUCN to the view that this strategy is not being rigorously applied.

The ICNAF meeting in November reviewed five different models for estimating present birth rates. Incorporating broadly similar data on mortality rates, age of maturation and other relevant factors, all five models were essentially forward projections of earlier analyses, and forecast an increased pup production for 1978—ranging from 309,000 to 347,000.

Using the Benjaminsen-Lett model (which gave the highest of the five projections for 1978 births), sustainable yields were worked out on (a) 310,000 births and (b) 350,000 births. These gave sustainable yields (on the assumption that pups represent 80% of the harvest) of 227,000 and 245,000 respectively.

The 1978 quota was fixed at 180,000—a "conservative" application of the 75% strategy would have resulted in a quota of 170,000.

Moreover, IUCN understands that a recent revision of the Benjaminsen-Lett estimate, taking full account of the 1977 estimate for natural mortality, suggests a sustainable yield of 204,000 rather than 245,000. On the 75% strategy this would give a quota of 153,000.

The ICNAF meeting in November also considered the results of the aerial census undertaken in 1977 by Lavigne. Using ultraviolet photography a census of the whelping colonies was conducted last March. On the "front" (the main area), it was completed. Five different methods of estimating the pup populations were applied to the photographic data and a correction of 10% was added to allow for pups missed. The method adjudged the soundest (which also gave the highest

result) produced a count of 203,675.

The census was incomplete for the Gulf of St Lawrence. However, Lavigne states that the 1975 estimate for Gulf births was 46,300 and that total births for 1977 might therefore have been around 250,000. This is a far lower estimate than the ones on which the government's quota for 1977 was based and from which the 1978 projection was derived.

Preliminary figures put last year's kill at 165,000 (155,000 in the northwest Atlantic plus the 10,000 allotment to the indigenous peoples of northern Canada and Greenland). On the evidence of the aerial census this harvest may well have represented not 75% of sustainable yield (as intended), but over 100%. In which case this year's still higher quota can only make matters worse.

For more than 15 years, Canadian scientists have done a great deal of work on harp seal biology. Invaluable data have been collected from which overall populations and birth rates have been estimated. But the estimates vary greatly. Some of the basic facts essential to a scientific management strategy are still lacking.

Since pups remain fairly stationary on the ice for their first two or three weeks of life, the vital missing data can best be collected from the *undisturbed* whelping colonies using ultraviolet aerial photography in combination with ground-truth sampling.

Bearing in mind that on all assessments harp seals are currently well below their MSY level, IUCN requests that:

- a. the quota for 1978 at the very least be brought into line with Dr Lett's revised estimate of sustainable yield, and preferably taking into account the evidence of the 1977 aerial census;
- b. the hunt in 1979 (or preferably even in 1978) be called off or sufficiently delayed so that a reliable census may be taken of the whelping colonies to provide the data basic to a scientific management strategy.

The following press statement was issued by IUCN on 24 February.

IUCN calls for cancellation, delay of harp seal hunt

IUCN (the International Union for Conservation of Nature and Natural Resources) today called for the Canadian harp seal hunt to be cancelled or sufficiently delayed so that the facts essential for scientific management of the harp seal can be gathered.

If this year's hunt cannot be called off or delayed, then the 1978 quota of 180,000 should be reduced to bring it into line with the best available scientific findings—and the 1979 hunt should be postponed or cancelled.

In a message to the Hon. Romeo Le Blanc, Canadian Minister of Fisheries, IUCN pointed out that this year's quota is not consistent with a conservative application of the Canadian government's own strategy on the harp seal, nor with the latest revision of the population model used. It also conflicts with the best available census results.

It was possible, IUCN concluded, that the 1978 quota will reduce the total population of the harp seal rather than allow it to grow (as is Canada's policy).

Although Canadian scientists have done a great deal of invaluable work on harp seals, "some of the basic facts essential to a scientific management strategy are still lacking".

"Since pups remain fairly stationary on the ice for their first two or three weeks of life, the vital missing data can best be collected from the *undisturbed* whelping colonies using ultraviolet aerial photography in combination with ground-truth sampling", IUCN said.

WWF acts to stop seal hunt in Peru

Last November the Peruvian Ministry of Fisheries lifted the ban—issued in March 1976—on the hunting of two species of fur seals, attaching a quota to each. WWF Peru has written to the President of Peru requesting (the request is signed by 1100 conservationists and scientists) that the ban be reimposed for a period of 10 years to allow the populations of both species to recover.

A census in 1974 estimated their combined populations on the Peruvian coast to be under 33,000—as against 400,000–500,000 in 1940. WWF also points out that by Peruvian law seals come under the jurisdiction of the Ministry of Agriculture because they give birth on land and not at sea. The Ministry of Fisheries is therefore not empowered to permit hunting.

Too many tuna fleets netting too many dolphins

Must tuna fishing kill dolphins?

Tuna fishing kills vast numbers of dolphins in the eastern Pacific. Because yellowfin tuna (for reasons unknown) swim beneath certain species of dolphin (or porpoises, as they are called in the USA), tuna fishermen set their purse seine nets on these dolphins which frequently get ensnared and drowned. Until about 1970 almost the sole culprit was the US tuna fleet but in recent years other tuna fleets have been growing fast while the US has been trying to mend its ways.

In 1972 the US Marine Mammal Protection Act gave the tuna industry two years to reduce their "incidental take" to near zero. The task proved too much. Although dolphin deaths in the US fleet came down from about 300,000 a year to 99,000 in 1974, in 1975 they rose again to 134,000. That year the estimated dolphin kill for all east Pacific tuna fleets was 181,000; in 1976 it was 143,900.

Furthermore these estimates are almost certainly too low. They are extrapolations from direct counts by US government "observers" and are based on three unlikely assumptions. One: US skippers are just as conscientious when unobserved. Two: non-US tuna fleets, which until this year have had no on-board observers and few inhibiting regulations, are killing dolphins at no more than the US-observed level. Three: dolphin deaths from injury and trauma (including harmful effects on breeding) are negligible.

Implementation of the 1972 Act, however, has now become much more rigorous

in the US, not least because the National Marine Fisheries Service, the government enforcing agency, was sued by two conservation bodies for failure to implement the Act and (in 1976) lost the case—losing it again on appeal. Tougher regulations plus a strict dolphin quota for the US fleet have brought the US kill of dolphins down to an estimated 26,477 for 1977 (the total for all fleets is not yet available). Moreover this estimate should be more accurate than previous ones because last year for the first time observers were (in theory) accompanying all US tuna fishing trips.

"Disaster sets"

Certain dolphin-saving techniques and gear are now standard throughout the US fleet. Since 1974 every skipper before hauling in his catch has been required to "backdown"—to back his vessel so that the rear end of the vast net sinks slightly, sluicing the dolphins to freedom over a fine-mesh panel that prevents tangling.

Most animals seem to have experienced the process before and show no obvious symptoms of fear. But even when the manoeuvre is skilfully carried out, some may remain in the net—whether from frustration or from the stress of repeated chase and capture. These, unless helped out by hand, become casualties.

US agencies expect that further technological advances will have solved the problem within three years. But the decisive factor is the human element. While good skippers will often succeed in freeing the catch of all dolphins before hauling it aboard, "bad" skippers are prone to "disaster sets"—the killing of 25 or more dolphins in one haul. Disaster sets may also be caused by rough seas, poor light or

faulty gear. In all they account for 74% of dolphin deaths.

Extensive IUCN study

Last summer an IUCN study was undertaken in the US. It has provided IUCN's Interim Committee on Marine Mammals with a most thorough review of all aspects of the tuna-dolphin controversy. The study points out that with the huge expansion of the international tuna fleet, catch per vessel is declining. This strengthens the conservation case for reducing the size of national tuna fleets, thus reducing dolphin deaths. At present there is little incentive for any single nation to govern its use of a common property resource; self-interest suggests fishing for all one can get.

It is also clear that beyond a certain point, pressure on the US tuna industry may be self-defeating. Skippers are now being offered prodigious salaries to "go foreign". The Inter-American Tropical Tuna Commission has eight state members and the US share of the international fleet has dropped from 98% in 1970 to 60% in 1977. The IATTC is beginning to take dolphin conservation seriously, but most members lag far behind the US.

In the eastern Pacific non-US ships are now probably causing the majority of dolphin deaths. And the issue is not confined to this one region. Tuna fishermen off West Africa also set on dolphins. The problem is now an international one, requiring internationally agreed solutions.

Tuna-porpoise controversy

Budget \$6200

Project 1480

Principal investigator: Stephanie Kaza, University of California, Santa Cruz

Tuna-dolphin facts and figures

Yellowfin tuna—quotas and catches

1966. Inter-American Tropical Tuna Commission first sets tuna quota: 66,000.

1966-70. Tuna season shrinks from 9 to 3 months to balance growing efficiency and size of tuna fleets.

1972-76. Catch exceeds greatly increased quota by c. 50,000 tons a year.

1976. Catch: 257,000 tons (= 4×1966 quota).

1977. Non-US ships now comprise 40% of total (30% of tonnage capacity) compared with only 2% in 1970.

IATTC policy. "Experimental over-fishing" to determine MSY. Evidence unclear, but overall decline in catch per day per vessel suggests present tonnage excessive (1977 catch not yet issued).

IATTC members. Canada, Costa Rica, France, Japan, Mexico, Nicaragua, Panama, US. (Ecuador resigned in 1968—the only substantial tuna-fishing non-member.)

Dolphin mortality, populations and management

Dolphin deaths in eastern Pacific. 1973—217,000; 1974—120,000; 1975—181,000; 1976—144,000; 1977—not yet available.

N.B. Figures are extrapolations of counts by observers in US tuna fleet. They are probably too low—see main text. (1964-72. Annual average estimated at 400,000 with a high of 529,000 in 1969.)

"Disaster sets" in which 25 or more animals are killed comprise 11% of all sets and account for 74% of dolphin deaths. (Percentages apply only to US fleet.)

Present populations of dolphins chiefly affected. Offshore spotted *Stenella attenuata* (= 60% of incidental take) 3.7-6.6 million; eastern spinner *Stenella longirostris* ssp. 1.3-1.7 million; whitebelly spinner *Stenella longirostris* ssp. 0.7-1.1 million; common dolphin *Delphinus delphis* 1.4 million.

N. B. Where two figures are given, first figure is US (NMFS) estimate and second is IATTC estimate.

Dolphin management goals. US requires stocks to be maintained at optimum sustainable population—defined as 60%-100% of estimated original (1959) population; IATTC requires stock maintenance "at or above levels that would assure survival in perpetuity"—defined as 50% of original population. All affected stocks are estimated to be above their 50% levels, although the eastern spinner is marginal.

Progress in reducing dolphin deaths

1972. US Marine Mammal Protection Act passed. Marine Mammal Commission set up to see that Act is properly implemented by Department of Commerce through its National Marine Fisheries Service.

1973. NMFS institutes on-board observer programme—covering 100% of trips by 1977.

1974. "Backdown" becomes obligatory throughout US tuna fleet. NMFS sued by conservation bodies for failure to implement 1972 Act—including not giving quotas on individual dolphin species as required.

(Continued on opposite page)

Indus dolphin increasing? Japanese sea lion surviving?

Strong local support for Indus dolphin

In December 1974 the Government of Sind (Pakistan) prohibited the hunting of *Platanista indi*, the endangered Indus dolphin whose numbers by then had dropped to at most 600. On the recommendation of IUCN, the Government of Sind also established a reserve to protect the Indus dolphin—the first dolphin reserve in the world.

Since February 1977 in collaboration with the Government and supported by WWF and the Volkart Foundation, Switzerland, an IUCN project has been carrying out scientific studies—identifying the threats to the dolphin in order to propose remedies.

Living only in the Indus and certain other rivers of the Punjab, the Indus dolphin is a freshwater species. However the project is part of the marine programme because it is expected to be relevant to the conservation of the dolphin's marine relatives.

Irrigation schemes pose one threat. The many barrages on the Indus and its tributaries have split the original population into separate groups, rendering the more important migrations impossible. Some of the groups may now be too small to survive.

Hunting is another threat. Dolphins are certainly being caught illegally, but a visit to the Commissioner in Sukkur brought prompt enforcement of the law. Three men in a boat who were attempting to catch dolphins were arrested and fined.

Competition for the dolphins' food supply does not appear to be a factor. Fishermen take only enough fish for their own needs; as yet there is no commercial fishing. Nor does human activity seem to disturb the animals. They are often seen close to anchored boats and swimming children.

Population—up or down?

So far it has not proved possible to check whether the Indus dolphin is found in all five rivers of the Punjab. But in certain unprotected reaches that have been surveyed their numbers are drastically low.

However the protected 130 kilometre stretch between the Guddu and Sukkur barrages (the dolphin reserve) gave more encouraging results. Counts made in February and again in May produced figures of 170 and 198 respectively, the increase being babies. It is too early to be certain, though, that the population decline has been halted. In 1974 two counts made in this same stretch of river gave in one case a lower total than in 1977, in the other case a higher.

A television programme on this dolphin made by project personnel was shown in Pakistan last autumn, and an English translation of their book *The secrets of the blind dolphins* will be published this year for distribution to the schools and elsewhere.

Since last April a Pakistani forest officer has been seconded to the project and will be in charge of follow-up action during 1978. It is already clear that protection should be extended to all the tributaries of the Indus.

Members of the Sind Wildlife Management Board have been most helpful and enthusiastic. Without their close support there could be little progress and no long-term prospects of success.

Indus susu

Budget \$24,600

Project 1221

Principal investigators: G. Pilleri, J. Knuckey, Brain Anatomy Institute, Berne, Switzerland; I.A. Arain, Sind, Pakistan.

Quest for Japanese sea lion

Regarded as extinct since about 1960 the Japanese sea lion *Zalophus californianus japonicus* may still exist in the Sea of Japan off eastern Korea. A Korean zoologist is checking reports of the animal's survival and attempting to confirm them first-hand.

On balance survival seems likely. Many coastal dwellers in east Korea are convinced they have seen this sea lion—though they may be confusing it with the northern fur seal *Callorhinus ursinus*. And in 1972 what was probably a female of the species was captured by fishermen and taken to a Korean zoo, there giving birth to a pup. Unfortunately both mother and pup died and there remains some doubt as to species. However the pup, suitably preserved, is now in the zoo museum so identification should still be feasible.

But perhaps the most reliable information comes from a Korean who in 1953-56 lived on the small island of Dokto off the east coast of Korea. He developed a keen interest in the 500 or so seals and sea lions which landed there daily. There were three different species, he says, and from his description it is plain that one of them was the Japanese sea lion.

In 1957 for no known reason most of the animals suddenly left Dokto and went north. However in December 1975 this same informant, on a visit to Dokto, claims to have seen two Japanese sea lions there.

If the survival of this animal is confirmed a conservation plan will be drawn up and the government of the Republic of Korea—which with World Wildlife Fund is assisting the present survey financially—will be requested to declare the species a national monument.

Japanese sea lion

Budget \$1800

Project 1463

Principal investigator: Kim Hon Kyu, Seoul, Republic of Korea

Tuna-dolphin (continued)

1976. Case against NMFS upheld. Judge rules that "the interests of the marine mammals come first and the interests of the industry must be served only after protection of the animals". NMFS sets quota of 78,000 dolphins: US kill 103,000. Observer reports show that dolphin deaths are largely the fault of a few "bad" skippers.

1977. Dolphin quota reduced to 68,900 and setting on eastern spinner prohibited: US kill down to 26,477. Incentive scheme for "good" skippers, penalties for "bad". Observers on all US tuna ships.

1978. "Super apron" net system made obligatory in US fleet despite objections by tuna industry. Industry agrees to provide fishing vessel with experienced crew for research into dolphin behaviour.

IATTC institutes observer programme for non-US tuna fleets—covering 10% of trips. And workshops will instruct non-US skippers in American techniques and gear.

1978-80. Despite industry's objections US dolphin quotas to be progressively reduced: 1978—51,945; 1979—41,610; 1980—31,150. And despite industry's objections setting on depleted eastern spinner remains prohibited.

Some measures recommended in IUCN report

Strengthening system of "rewards and punishments" for skippers (perhaps by instituting a dolphin quota for each vessel); training dolphins to respond to cues; devising dolphin "substitutes" that will attract tuna; regulating the number of tuna ships.

The pirate whaler with a lockerful of flags

Once upon a time there was a pirate whaler called M/V *Run*. South American waters were its beat and reports spoke of connections with Japan. A little while (and several whales) later a remarkably similar vessel, by name M/V *Sierra*, was spied in African waters flying the flag of Angola. And then spied again under the flag of Somalia.

When these strange goings-on were discovered and denounced by the International Society for the Protection of Animals, down came the Somali flag and up went that of Cyprus.

The *Sierra*, which currently operates out of Abidjan, Ivory Coast, is a factory ship—so she can deliver her whale products virtually anywhere, including to another ship.

New projects: whales, seals, turtles, crocodiles, birds, marine parks, new marine ethno-ecology, education and public information...

New projects

The following is a list of projects and action priorities (urgent problems requiring attention) added to the WWF Marine Programme since its launch a year ago. For launch list and details, see December 1976 *Bulletin*.

Cetaceans

Gray whale (lagoon study), Mexico. Unlike most whales, gray whales calve not in the open sea but in lagoons. Detailed observations will be taken of gray whale behaviour just outside a lagoon and comparisons made with well-documented behaviour inside. This should enable us to learn why lagoons are so important to the breeding success of this whale and hence to assess the effects of disturbance. The correct protective measures can then be taken.

Budget \$10,000 Project 1484

Narwhal, Canada. The curious narwhal with its long projecting spiral tooth has long been exploited by Eskimos for its meat and ivory. Little is known of its life and the impact of exploitation and habitat disturbance. A study is to be carried out at Baffin Island, in the Canadian Arctic, where there is an annual hunt.

Budget \$8000 Project 1450

Tuna-porpoise controversy. See page 6.

Budget \$6200 Project 1480

Humpback whale, Tonga.

A protected stock since 1966, subsistence hunting of the South Pacific humpback whale still persists among the people of Tonga. The annual take, though small, may be impeding the recovery of a stock decimated by commercial hunting in the 1950s and probably now numbering only a few hundred. The whales breed in Tonga waters and most of the animals taken (including struck and lost) are mothers and calves or pregnant females.

The Tonga government is apparently willing to phase out the whaling activities of its people, at least for the time being, to prohibit *all* commercial whaling within its newly declared 200 mile sea zone and, given some financial help, to become a member State of the IWC. Assistance is required in monitoring the population, designing breeding sanctuaries, promoting scientific research and in organizing "whale-watching" to attract tourists.

Action priority 1485

Seals

Monk seal, west Mediterranean. The focus of this project is Italy. There are now only three areas within Italian waters where the monk seal is found. Unless help comes

soon the population is likely to die out. Already it may be down to single figures. Effective conservation is handicapped by big gaps in our biological knowledge of the species. For example, when are pups born? Before, during or after the main tourist season? Knowledge on this score is vital to a protection programme.

Population surveys are also required along the coasts of Corsica, Tunisia, Algeria and Morocco (including the Atlantic). The project was originated by WWF Italy.

Budget \$58,000 Project 1482

Japanese sea lion. See page 7.

Budget \$1800 Project 1463

Marine turtles

Turkey. Excessive exploitation is a severe threat to marine turtles nesting on the Aegean and Mediterranean coasts of Turkey. This project will study the problem and recommend conservation measures.

Budget \$21,700 Project 1419

Italy. A survey of turtle nesting areas in Italy will be carried out as a basis for conservation proposals linked to a public information programme.

Budget \$7000 Project 1474

Pacific coast, Mexico. See page 10.

Budget \$3200 Project 1471

Indian Ocean. The western Indian Ocean contains some of the largest turtle rookeries in the world. Results of studies over several years should be coordinated and a conference of countries and authorities involved should then be organized to promote overall conservation measures.

Action priority 1438

French Guyana. In coordination with experts from neighbouring countries there is a need to make a demographic study of the turtle populations nesting in French Guyana, to conserve the nesting beaches and to safeguard the eggs and hatchlings. Data are also needed to help establish appropriate legislation.

Action priority 1481

Sarawak. Sungei Samunsam, on the coast of Sarawak, is already a sanctuary for green turtles and for the rare proboscis monkey, which is confined to the mangroves. Dugongs have also been reported. Assistance is required to strengthen the protection of these species and their habitats.

Action priority 1418

Crocodiles

Coastal crocodiles—salinity tolerance. For coastal crocodiles the salinity of the water is a critical factor. Adult crocodilians of several species live in habitats that would be lethally salty to hatchlings. Similarly, adults raised entirely in fresh water will perish in seawater. This project sets out to study both the salinity tolerance of crocodiles and the body mechanisms by which young crocodiles increase this tolerance. Without this information it is virtually impossible to manage estuarine habitat for the benefit of crocodiles when human activities are affecting the salinity of the water.

Budget \$20,000 Project 1483

Birds

Sea and coastal birds, Italy. Development is a growing threat for sea and coastal birds in Italy. A survey of the present situation is being carried out to establish important areas for conservation. An education programme will be launched to win the support of the local people.

Budget \$21,500 Project 1473

Langue de Barbarie, Senegal. Senegal's Langue de Barbarie National Park was created in 1976. This means that from Mauritania to Guinea-Bissau most important breeding sites for waterfowl are now under protection. Covering 2000 hectares in the mouth of the Senegal river, the park is a vital nesting area for both palaearctic and Ethiopian birds—forming, as it does, the boundary between the two types. The project gives logistical support (vehicle and boats) to Senegal's National Park Service.

Budget \$13,000 Project 1564

Birds and mammals

Iles de la Madelaine, Senegal. The Iles de la Madelaine (also called Iles du Serpent) National Park in Senegal covers an area of some 500 hectares near the city of Dakar. It has important nesting colonies of birds, while dolphins and possibly Mediterranean monk seals visit the area. Educational and recreational facilities are needed. So too are a vehicle and diving equipment for the park authorities.

Budget \$7150 Project 1232

Sine Saloum, Senegal. Senegal's Sine Saloum National Park protects 180,000 hectares of mangroves, forests, islands, coast and ocean. Rare aquatic mammals such as otter, dolphin, and West African manatee occur in the area, and marine turtles and numerous birds nest there. There is a need to ensure that the

ew management methods, alternative technology, Action on the Mediterranean monk seal

traditional hunting rights of the local people do not lead to over-exploitation.

Action priority 1233

Marine parks

Italy. Only three marine areas are protected in Italy at present, of which only the Miramare Marine Park is in any way controlled or managed. All underwater ecosystems needing protection will be identified and promoted as marine parks, while the Miramare Marine Park will be developed as a model management area for the Mediterranean.

Budget \$23,000 Project 1475

Mozambique. The coast of Mozambique is important for marine turtles and dugong, and there are fine coral reefs with rich fish resources. Only one national park and one reserve exist, and they are inadequate. A survey is needed to assist the authorities to protect the most vital areas.

Action priority 1464

New management methods

Coastal fishing, Italy. Italy has rich coastal fishing grounds which are being over-exploited. Biological data on typical species will be gathered in order to promote sound management. A ban will be sought on spear fishing.

Budget \$8400 Project 1476

Alternative marine technologies. See page 14.

Budget \$18,500 Project 1479

Ethno-ecology, Caribbean. Inappropriate commercial expansion has severely disrupted a great many traditional fishing communities. So far those in the eastern Caribbean have largely escaped. A study in ethno-ecology is required to explore the fishery conservation methods of these island people in the light of present problems and traditional customs and knowledge. It is important that conservation practices, developed and proven over the

centuries, are incorporated into any future fishery plans. They may also be applicable elsewhere.

Action priority 1486

Education and public information

Italy and adjacent areas. Projects in Italy and some adjacent areas are being centrally coordinated through contacts with government legal bodies and in conjunction with a public information programme.

Budget \$12,200 Project 1472

IYF, Wadden Sea. The International Youth Federation for Environmental Studies and Conservation has prepared a Wadden Sea programme with a coordinating committee from Denmark, West Germany and Holland. International camps are being organized for field investigations as a prelude to devising campaign material.

Budget \$7000 Project 1375

Monk seal action plan

The Mediterranean monk seal is one of the top priority species in the IUCN Marine Programme. Although occurring over a very wide stretch of ocean, from Turkey to the Azores and along parts of the west African coast, its total population is tiny. The estimate is 500-1000 with the biggest concentration probably in the eastern Aegean. Overall the trend is still down as fishermen, tourism and pollution continue to take their toll.

This "umbrella" project will build a comprehensive conservation programme for the seal throughout its range. Projects such as those in Italy (see *New projects*) and Turkey will provide some of the basic data. The objective is to set up regional parks and sanctuaries supported by strong laws and an informed public.

In May the Greek government will be convening a conference of seal experts to approve an action plan. A background document is being prepared under the direction of Professor Ronald, the chairman of IUCN's Seal Group.

Monk seal, Mediterranean and eastern Atlantic

Action priority 1118

Now on Turkey's protected list

Monk seals in Turkish waters number somewhere between 150 and 300. That is the latest estimate based on studies begun in 1976, continued throughout 1977 and scheduled to be completed this year. The seals are mainly found in remote cliff-bound

coasts and islets. The population still declines due to increasing human disturbance during the breeding season, over-fishing, pollution and loss of habitat to coastal development.

The seals must also contend with the hostility of fishermen. Most fish species in the Turkish Mediterranean are demersal and are caught with stationary nets set on the seabed. Seals often damage these nets—and will eat their own weight in fish in 20 days. Hence competition is intense and seals are sometimes shot. In the Black and Marmara seas, however, most fishermen revere the monk seal and refrain from harming it. In these regions commercial fish species are mainly pelagic and are caught with seines and mid-water trawls. Seals rarely cause damage to gear and so competition is less intense—especially as numbers are even lower here than along the western and southern coasts of Turkey.

It should prove possible, given a network of core reserves that are free of human disturbance, to save at least some of the remaining populations. The Turkish National Park and Wildlife Directorate is being kept fully briefed and coordination between the Parks Directorate and WWF Turkey has been excellent. In April 1977 the monk seal was added to Turkey's list of protected species.

Mediterranean monk seal, Turkey

Budget \$3700 Project 1403

Principal investigator: F. Berkes, Concordia University, Montreal

Monk seal conference

The First International Conference on the Mediterranean Monk Seal will take place at the Rodos Bay Hotel, Rhodes, Greece, from Wednesday 3 May to Friday 5 May 1978 (inclusive).

The conference will first discuss the present status of the Mediterranean monk seal *Monachus monachus*—its population dynamics, zoogeography, ecology and biology, protection and conservation. The conference will then consider the monk seal's future—its management, husbandry, conservation, and international programmes and cooperation. In particular, the conference will draw up an international action plan for the conservation of this highly endangered animal.

A field trip will visit monk seal habitat and the sites of proposed reserves. Languages of the conference will be English and French. Accommodation will be available at about US\$25 per day (half board).

Further details may be obtained from Mrs Jane Selley, Registration Secretary, College of Biological Science, University of Guelph, Guelph, Ontario, Canada N1G 2W1. Telex: 069-56500. Telephone: (519) 824 4120 (extension 3342). Registration should also be made with Mrs Selley.

More monk seal news

According to the IUCN SSC Newsletter of the League for the Conservation of the Monk Seal, the important Cap Blanc colony of Mediterranean monk seals is to form a special enclave of the National Park of the Banc d'Arguin, Mauritania. The colony, located to the north of the main park, is reported to have "experienced a spectacular increase" with numerous young of all ages.

Turtles: massacre masquerades as science...

Sad year for Mexico's turtles

All along the Pacific coast of Mexico, in the sea and on the nesting beaches, turtle populations are being driven to extinction. And with their disappearance will go both the livelihood of many fishermen and an important source of hide, oil and protein.

During just three months last year a new Spanish-owned turtle industry, *Industria Pesquera de Oaxaca*, took a large part of Mexico's breeding population of olive ridleys—nearly all of them egg-laden females. So crippling was the toll that the last of the year's three *arribadas* (mass nestings) never occurred.

1977 was also a calamitous year for Mexican green turtles. For the fourth year in six the entire nesting effort was lost. Although Mexican marines had been posted to guard the last main nesting beach (of a very depleted population), they were unfortunately withdrawn while the 10,000 eggs were still unhatched. Within two days all had been taken. Six years ago as many as 700 nesting females might come ashore on a single night; last year the number varied between seven and 30.

And yet, despite the clearest signs of imminent extinction, commercial operations continue. Where populations are too low to justify hunting by individual boats, fishing cooperatives are using large nets to snare the few survivors. Unless these activities are banned forthwith and the nesting beaches rigorously protected, the Mexican populations of olive ridley and green turtles (plus the few remaining leatherbacks, loggerheads and hawksbills) will almost certainly be wiped out. Already the East Pacific stock of green turtles may too decimated to survive.

A WWF-backed project has been assessing the situation from every aspect—bio-

logical, economic and cultural—in order to make recommendations on the basis of verified data (as against the claims put out by commercial interests). Very close links have been maintained throughout with Mexican scientists, conservationists and members of the government. The project's findings have received a lot of publicity, and magazine articles, both popular and scientific, are planned.

Accidental find hastens slaughter

In the winter of 1973 a Gulf of California fisherman from Kino Bay, diving for lobsters with the aid of an old air compressor, made an exciting, though in retrospect disastrous, find: he came upon green turtles lying dormant in the cold waters on the seabed. (The turtles had not been discovered before because the depth, 12-18 metres, was too great for the harpooning techniques of the Seri Indians—who for many hundreds of winters have been harvesting the "sea turtle lying down" in the shallower waters of the Canal del Infiernillo.)

From this accidental discovery grew the Kino Bay turtle fishery, employing local divers equipped with air compressors. Ranging over a constantly expanding area the fishery has virtually eliminated the Gulf of California green turtle population. 1977 saw the catch reduced to near zero. Only in the Canal del Infiernillo—out of bounds to Mexican divers and exclusively controlled by the Seri—are there some survivors. 14 of these were tagged early last year, but by May the Seri had recaptured five of them from almost the very spots where they had originally been found—thus dispelling the local myth that *Chelonia* leave an area when harassed by divers and also indicating that hunting

pressure is too much for this low residual population.

Massacre masquerading as science

Industria Pesquera de Oaxaca has a monopoly of sea-turtle fishing along the coasts of all Mexican Pacific states with the exception of Sonora in the north and Chiapas (which has very few turtles anyway) in the south. Fishermen are obliged by law to sell their turtles to IPOSA. Last year the owner, Señor Suarez, persuaded the government to lift the ban on the taking of turtles during the breeding season. He claimed that females on the nesting beaches could safely be harvested—the eggs would be removed and artificially hatched in his sparkling new laboratory and an astronomical number of hatchlings (Señor Suarez is said to have spoken of 20-30 million) would be returned to the sea.

Whether or not the intent was sincere, the result has been catastrophic. Señor Suarez organized a ridley census which was undertaken on behalf of the Aquaculture branch of the Department of Fisheries by a man with no biological training. The breeding population at La Escobilla, Oaxaca (the ridley's last *arribada* beach in Mexico), was estimated at 2,700,000—justifying a quota of 112,000. In the event 70,000 were taken from what Mexican biologists believe to be a population of no more than 150,000.

As part of IPOSA's allegedly scientific management, hatchlings were released at the same time and place daily during October—resulting in an enormous build-up of predatory fish within 150 metres of the beach. In any case, predators apart, will pen-reared hatchlings dumped in the sea be able to fend for themselves? And even if they do survive to maturity will they then be able to find their way back to the breeding beach—or is the epic journey from nest to sea immediately on hatching essential for "imprinting" the location? These are unresolved questions which no genuine management scheme can ignore.

Not many years ago La Escobilla had six *arribadas* annually—one for each lunar cycle of the breeding season. Human predation then altered the ridley's population dynamics and the number fell to three. Last year it was two. In the autumn a great many pregnant ridleys were being taken off shore, but there was no *arribada*.

What to do?

All predation on turtles should be stopped so that populations may recover. Mexican marines guarding the green turtle nesting beaches should be on duty from late June through December. Local people or concerned students (there are many of these) should be paid to transplant

(Continued on next page)

An important element of the Mexican turtle project has been to ensure that the very extensive folk knowledge of turtle behaviour, much of it unknown to mainstream science, is collected before being lost for all time.

The Seri Indians

Seafaring hunter-gatherers from the Gulf of California, the Seri have an enormous knowledge of the ways of turtles which in former days comprised at least 25% of their subsistence. While biologists recognize a single species for each of the five genera of sea turtle found in the Gulf, the Seri make further subdivisions: six ethnospecies of green turtle, two ethnospecies of ridley, two of loggerhead and one each of hawksbill and leatherback. All were once abundant in the Gulf and each has its own characteristics of behaviour, morphology and ecology. All leatherbacks

seen by the Seri in the past century have been females and this giant turtle features prominently in the Seri creation myth.

Immensely skilled hunters, the Seri still go armed with only the traditional 10-metre harpoons, but today in their petrol-powered fibreglass boats they are too efficient for their own good. Most of the few turtles they now catch are below the legal minimum size.

Kino Bay fishermen

The Mexican fishermen from Kino Bay also subdivide some of the main turtle species, though slightly differently from the Seri. They recognize five ethnospecies of green turtle, two of hawksbill and a single species of ridley, loggerhead and leatherback. Again each has its own characteristics—and commercial value. But in 1977, for the first time ever, most Kino Bay fishermen caught no turtles.

Oman goes for good management

In the seas off Oman turtles are relatively abundant. One of the largest concentrations of loggerheads in the world, over 30,000, nests on Masirah Island. Green turtles are also common and there are smaller populations of hawksbills and olive ridleys.

In concert with the government of Oman an IUCN project (jointly funded by Oman and WWF) to collect data, to recommend conservation controls, to prepare educational material and to train the nucleus of a permanent staff is now fully operational. The overriding aim is to ensure that any commercial exploitation (Oman has high hopes of setting up a turtle fishery) is not excessive. This aim is shared by the government which recognizes that its marine resources are of great importance and is concerned to see that they are harvested on a sustainable basis.

An aerial survey to look for nesting beaches and feeding grounds along the entire 1700 km coastline has been undertaken. Meanwhile on Masirah, the main centre of the project, an intensive survey of the nesting populations has begun. Last year 1830 loggerheads were tagged.

Only about 25% of loggerhead eggs laid on Masirah beaches hatch and reach the safety of the sea. The number of eggs removed by people is small compared with natural destruction but human disturbance is a factor. One problem is lights in buildings behind the nesting beaches. Young turtles, hatching out at night, are disoriented and often fail to reach the sea before dawn breaks and the gulls get them. Negotiations are under way to reduce this problem.

Prompt response to threat

The green turtle is the only one eaten by Omanis. In remote areas this is not a worrying factor, but around Masirah the practice of killing female turtles while they are nesting, plus drownings in trawl nets, has had a disastrous effect. The population is down to a few hundred.

These facts were reported to the Ministry of Fisheries and the response was

gratifyingly prompt. The local Governor has been instructed to prohibit killing turtles on the nesting beach and a new clause limiting fishing off nesting areas is to be included in the government contract with the fishing boats.

Nesting sites of hawksbills and olive ridleys have also been found. Tortoiseshell was exported from Masirah in the 19th century but this trade has ceased and hawksbills are no longer killed. The same is true of olive ridleys.

One further purpose of the project is to involve the local people and to educate them in the need for conservation.

Tour agents could help

Tourism has discovered the Maldiv Islands. Visitors now number about 15,000 a year—five years ago they hardly featured. The tourist boom may be good for the Maldiv economy but it is no good at all for the endangered hawksbill sea turtles of the Indian Ocean. The shopfronts of the capital town, Male, are filled with stuffed and empty shells bought up eagerly by plane-loads of tourists who seldom realise that turtles are on the endangered list.

82 airlines signed a 1974 WWF resolution against transporting endangered wildlife and wildlife products. Are these airlines doing anything to see that their passengers abide by—or at least are aware of—this resolution?

A related matter. On a recent plane trip to Bali, Indonesia, with a tour party, a young American zoologist was distressed to hear the tour guide say over the intercom: "It is illegal to bring tortoiseshell products into the United States. However you could probably sneak in one or two bracelets if you are careful." She remonstrated and was invited to state her case publicly. This she did and was roundly applauded.

Many of her fellow tourists later came up and said they were glad she had spoken and that they had been quite unaware of the situation. And none, to

her knowledge, made any tortoiseshell purchases during the 7-day tour.

She has now made the excellent suggestion that when an endangered species is likely to appear in the tourist shops of a country to be visited, the tour agencies should instruct their guides to make the same sort of plea that she made. Done world-wide this would amount to environmental education on a massive scale. And in a situation where, so it seems, the message goes home. *Source: IUCN/SSC Marine Turtle Newsletter, No 5.*

Turtle management, Oman

Budget \$23,500

Project 1320

Principal investigator: J. P. Ross, Muscat, Oman

Egg collectors to double as wardens

The world's second largest population of leathery turtles nests along 8 km of beach in Trengganu, Malaysia. A hatching scheme involving the purchase of wildlaid eggs from licensed collectors has formed part of this project. The method has not proved satisfactory and it is now intended that collectors should also be employed as wardens. This will be done as soon as the other part of the project becomes operational—which is as soon as state legislation decrees the nesting beach a sanctuary.

Leathery turtle nesting sanctuary, Malaysia

Budget \$32,000

Project 1348 (+969)

Principal investigator: Siow Kuan Tow, Director of Fisheries, Trengganu

Trengganu's turtle plans

In addition to the project described above, Siow Kuan Tow, Director of Trengganu's Fisheries Department, has plans for a hatchery programme for *Chelonia mydas* and *Lepidochelys olivacea* and for a *C. mydas* ranch in a fenced-off natural pasture.

Mexico's turtles (Continued)

the eggs to protected hatcheries. Hatchlings should be released at night along different sections of beach and allowed to crawl to the water.

In July the project team will carry out a first-ever aerial census along the whole Pacific coast of Mexico to discover where and in what numbers the turtles are nesting. In August the team will join Mexican biologists at La Escobilla to

document an event which has been occurring for millions of years in Mexico but which, if present policies continue, may then be occurring for the last time—the olive ridley *arribada*.

Marine turtles, Pacific coast, Mexico

Budget \$3200

Project 1471

Principal investigators: R. Felger, K. Clifton, D. Cornejo, Arizona-Sonora Desert Museum, Tucson, Arizona

Warding off the threat to the Wadden Sea

80% of North Sea plaice, 60-70% of North Sea sole, 40% of North Sea herring start life in the unique silty flatlands of the Wadden Sea, that immensely rich stretch of ocean off northern Holland, northwest Germany and southern Denmark. The Wadden Sea is also home at some time of the year to vast flocks of seabirds which gather there from northern Europe and Siberia—and even Greenland and the Canadian arctic—to feed, breed and shelter.

But the Wadden Sea is under attack: from three main sources. One, tourism and the mushrooming development that goes with it. Two, the toxic outpourings from heavy industry in the estuaries of the Rhine, the Elbe, the Ems and other large rivers—already laden with pollutants from the heartland of industrial Europe. Three, the threat posed by large land reclamation schemes along the whole length of the Wadden Sea shoreline.

It is this last threat which is perhaps the most menacing. And it is this threat which the Marine Programme, through one of its projects, is particularly concerned to rebuff.

Land gained = fish lost

Every so often (about once in 10 years) great tracts of land along the Wadden Sea are flooded by freak storm-blown tides, causing serious damage to crops and property. Government reclamation schemes include proposals for a double line of dikes to give security to farmers and others living along the coast. The land thus gained would also provide grazing for sheep or arable land for root crops (in Holland, potatoes).

Conservationists concede that coastal dwellers deserve greater security against flooding. What is at issue, though, is the means to this end. To go to the expense of building two lines of dikes is unnecessary. One really strong defence line would give just as much protection.

Dike-building is essentially an act of land reclamation rather than a security measure. As such (and ignoring the high construction costs of the scheme) the economic gain in terms of extra farmland must be weighed against the economic loss in terms of fewer fish. The size of fish populations depends upon their food supply. The dike scheme, as planned, would mean less food and therefore fewer fish.

No way to rebuild stocks

North Sea fish stocks are already sorely depleted. They will hardly be built up again by damaging the main source of replenishment. While it is always hard in these matters to draw up any precise balance of profit and loss, it seems unlikely that any marginal gain to farmers would offset the loss of fish to a hard-

pressed industry and the further rise in the price of fish to the consumer.

Conservationists are wholly with the farmers in their bid for flood protection, but reject the idea that this entails reclaiming large chunks of land lost to the sea, the fish and the birds 800 years ago.

The projected dike schemes would destroy about two-thirds of the alluvial mudflats of the Wadden Sea. That a portion of the mudflats will have to be sacrificed in order to give farmers and others the protection from flooding that they need is conceded by conservationists. But in the conservationists' plans the loss is kept within tolerable bounds.

Supporting local bodies

IUCN's Marine Steering Committee has made the Wadden Sea a top priority for remedial action and a WWF-funded project has been launched to support local conservation groups and government bodies—several of them IUCN members—which have for many years been concerned about the deterioration of the Sea.

The project is costed at \$500,000 and covers the entire Wadden Sea coastline. For boundary reasons it is divided into four sections: one for the Netherlands, one for Denmark and two for the two West German states of Lower Saxony and Schleswig-Holstein.

WWF Netherlands has raised about \$240,000 for the project, part of which will be spent on the services of an administrator to coordinate action between the three countries.

Crocodile programme ready to go

All crocodilians except the American alligator are threatened. While the prime cause of their present plight is the international hide trade, their extermination as "dangerous vermin" plus continuing loss of habitat have helped hasten the decline.

In fact, far from being dangerous vermin, crocodilians are unaggressive and very useful reptiles. They enrich fresh waters by speeding up nutrient cycling; and by preying on coarse fish they enable populations of more desirable fish to build up.

The Survival Service Commission's Crocodile Group has devised a worldwide conservation programme for coastal and estuarine crocodilians. The 18 project proposals have been ranked for urgency of action. Highest priority is accorded to a project in Cuba and the adjacent Isle of Pines. Essentially it is a rescue operation

In Denmark, although several organizations have objected to the dike schemes, much of the conservation effort is directed towards seeing that the new land behind the projected new line of dikes is used only for grazing and is thus of value to birds.

In Lower Saxony the Hanover state government has contributed \$20,000 and WWF \$10,000 towards the cost of a full-scale survey to identify critical habitats, to discover present and potential threats and to recommend appropriate action. In Schleswig-Holstein the North Sea Action Group has combined with other nature groups and conservation bodies. In a joint letter to the state Prime Minister the conservationist case is rehearsed in detail and it is pointed out that the Convention on Wetlands of International Importance—which West Germany has ratified—is being violated. Denmark is also a party to this convention.

A symposium is being planned for March in Kiel. It will cover all main aspects of the problem and include all three countries concerned.

Wadden Sea, Netherlands, Federal Republic of Germany and Denmark

Budget \$500,000

Project 1411

Coordinators: Netherlands, Society for the Preservation of the Wadden Sea; West Germany, Society for the Protection of the North Sea Coast; Denmark, Wadden Sea Working Group.

on behalf of *Crocodylus rhombifer*, a species which does not occur elsewhere and which is being genetically swamped as a result of being placed in captive-breeding enclosures with *C. acutus*.

It is important that with the help of the Cuban authorities the two species be separated, that sanctuaries in the wild (if possible) be set up and that the introduced population of exotic caiman be eliminated from the sparse amount of swamp habitat that still remains.

As management schemes in Papua New Guinea and the US have shown, it is possible to restore wild crocodilians to levels which allow them to perform their normal role in the ecosystem. Thereafter a careful harvest programme can legally supply hides to the international market (a major source of revenue) and highly palatable protein to the local populace.

Watchdog from Maine to Mexico

Some 200 barrier islands are strung along America's Atlantic coast from Maine to Mexico. Insignificant in size they have recently become a hot environmental issue. Prominent among the conservation groups involved is the Natural Resources Defense Council. NRDC is handling IUCN's Atlantic coast project, one of whose aims is to protect the islands.

The chairman of the Barrier Islands Coalition (it consists of private citizens and 25 environmental groups) is also a staff member of NRDC. Under his auspices a highly successful conference brought together key federal and state officials, environmentalists and scientists. Unanimously the conference voted for a "major effort" to purchase those islands that are still unowned and so save them from becoming a sprawl of motels, week-end homes and fast-food snack bars—a fate which has already overtaken too many of them.

There has been a healthy shift in government thinking on this issue. President Carter has slated "short-sighted" development and called for a revised islands policy. The present policy subsidizes the building of roads, bridges, sewers and so on—including anti-erosion devices that fail as often as not. Carter wants the new programme in hand by

mid 1978. NRDC staff are assisting the Department of Interior in drawing it up.

Checking energy development

The NRDC is also concerned with coastal development in the wider context. It is monitoring the Coastal Zone Management Act with the aim of seeing that the federal oil and gas leasing programme poses no danger to marine life. In a few short months much has been accomplished.

Project staff have prepared written critiques of state coastal programmes and have presented testimony at public hearings. These efforts have borne fruit. Maryland must now enunciate its environmental policies governing coastal development. Massachusetts is committed to tightening its laws in this area. Rhode Island has strengthened its environmental controls over key coastal resources—barrier islands, dunes, wetlands. In all these instances NRDC has played a prominent role.

At the federal level NRDC has commented in detail on proposed regulations which conflict with the Coastal Zone Management Act. NRDC has made it clear that it will challenge these regulations in the courts unless they are amended to reflect the environmental goals of the Act.

In California NRDC has intervened in a lawsuit whose outcome is of critical importance to Atlantic coast development. Several oil companies have challenged federal approval of California's coastal management programme. NRDC contends that the oil companies are interpreting the Act as supporting their own energy goals.

Case lost but victories won

Back on the Atlantic coast NRDC has challenged the first sale of leases for oil and gas development on the outer continental shelf. Success in a district court was reversed in a court of appeal—but only after the government had promised that any development of offshore oil or gas finds would be contingent upon full environmental impact assessments.

Add to this a much needed clarification of the federal power to impose environmental controls on energy production and a public that is now alert to the issues involved, and it can be seen that though the case was lost, important victories were won.

NRDC Atlantic coast project

Budget \$40,000

Project 1458

Principal Investigator: Natural Resources Defense Council

Oil wealth or coral riches: it's Palau's choice

The Palau archipelago in western Micronesia is one of the most spectacular and pristine environments in the world. The diversity of life-forms in Palau's coral reef communities is the highest found in the oceanic Pacific islands. This unique environment is now threatened by a proposal to build a superport and petroleum store—known as Port Pacific—largely to serve Japan.

Because the consequences of the superport for the people of Palau are potentially so devastating, and because the issue is highly controversial, IUCN has begun what is primarily a public information project intended to

- provide the people of Palau with an assessment of the consequences of a superport—including likely ecological changes which may affect their livelihood;

- provide the people of Palau with an assessment of the development alternatives open to them, so that they may choose their own future on the basis of the fullest possible ecological and economic information;

- ensure that work on the superport does not begin before the people of Palau have been given the opportunity to make an informed decision.

The project, which so far has been entirely funded by World Wildlife Fund, is divided into 5 parts: monitoring, legal, ecological, economic, and information.

The monitoring and legal parts are being undertaken by NRDC (the Washington-based Natural Resources Defense Council, a member of IUCN) under a 1-year project which aims to

- provide regular, up-to-date information about the superport proposal to concerned persons in Palau, USA, Japan and elsewhere;

- compel compliance with laws requiring that the likely environmental impact of the superport plus alternatives to it be fully considered before the proposal is approved;

- require obedience to laws which prohibit or minimize adverse environmental impacts.

NRDC works closely with the Save Palau Organization (a local, entirely Palauan, body) and the Micronesian Support Committee. It has helped the former with publicity and petitions and has petitioned NOAA (the US National Oceanic and Atmospheric Administration) to consider making Palau a marine sanctuary—a process which requires first a study and inventory of marine resources, including development possibilities, and then the formulation with the people of Palau of an appropriate mix of conservation and development proposals.

NRDC has been checking the extent to which US federal laws apply to the Trust Territory (Palau is part of the

Trust Territory of the Pacific Islands, mandated to the US by the UN). It is also probing the willingness of the Trust Territory Government to apply those laws now that trust territory status is being reassessed and the Palauan Legislature is assuming increasing responsibility for Palau's internal affairs.

The ecological and economic components of IUCN's Palau project have begun with the preparation of planning documents. An ecological document has been completed and is being reviewed by IUCN's Marine Steering Committee. An economic document is scheduled for completion by the end of March.

The threats to the marine environment in Micronesia are not confined to the superport proposal nor to Palau. Therefore the scope of the entire Palau project is now being reviewed prior to the design of the public information effort—which will begin later this year.

Palau ecological feasibility study and information service

Budget (first year): \$55,360 (monitoring and legal \$40,000; ecological \$7,440; economic \$7,920).

Project 1443

Principal investigators: Natural Resources Defense Council; Dr. S.V. Smith, University of Hawaii; Dr. R. T. Johnson, Stanford University.

"Sailing" into the future

Alternative or "soft" technology has gained a secure foothold in *terrestrial* development projects. Individuals, companies and governments are increasingly involved, even if the movement is still in its infancy. But the *marine* counterpart is not yet born, though the need is as great and the scope as wide.

IUCN will act as midwife. A project entitled "Alternative marine technologies" will seek to establish *what* schemes of this type are feasible, *where* they are practical and *how* they should be applied.

Why necessary?

But first of all why are they necessary? **Because** the invasion of the oceans by all the paraphernalia of big business—superports, oil rigs, fishing factories and the like—is becoming a big threat to the health of marine ecosystems. **Because**

attempts to grapple with this threat typically take the form of dosing the symptoms rather than treating the disease—palliatives not cure. **Because** cost-benefit analysis when applied to *social* costs and benefits as well as to the purely economic might often give "alternative" means of extracting food, energy and raw materials from the sea a decisive edge over the heavy-handed methods of heavy technology.

Small-scale mariculture by advanced methods, energy from waves, tides and wind for local needs, sail-powered vessels of modern design (on grounds of economy)—there are "soft" equivalents for most current uses of the sea. Ecodevelopment does not stop where the land ends.

Headquarters of the project is the University of California, Santa Cruz, but there is close collaboration with Malta's International Ocean Institute which has a fine collection of relevant source material. Initial efforts will be concentrated on island communities—particularly those of the South Pacific and the Mediterranean.

Alternative marine technologies

Budget \$18,500

Project 1479

Principal investigator: S. J. Holt, University of California, Santa Cruz

Coral reef parks in Caribbean?

The marine institute of *Invenmar* in Colombia is engaged in studies of the fauna and flora of the Caribbean coast. The IUCN project forms part of these studies and consists of gathering information about the coral reefs. The first requirement was an aerial survey—now mainly completed and resulting in a recommendation to set up two marine parks. Detailed proposals will be submitted to *Inderena*, the Colombian conservation agency. The next task is to assess the situation in close-up through underwater photography of the reefs.

Coral reefs, Caribbean coast of Colombia

Budget \$2000

Project 1416

Principal investigator: F. Köster, "Invenmar", Santa Marta, Colombia

News from Members

North Sea: wildlife and oil

The North Sea, rich in wildlife, is now also a rich centre for oil extraction. The UK Nature Conservancy Council therefore invited countries bordering the North Sea to an informal 3-day meeting in London last October to explore the current state of knowledge of North Sea wildlife and to work out how best to coordinate research and reduce the risk to wildlife in the event of massive oil spills.

With the exception of Belgium all the North Sea countries sent delegates: Denmark, France, Ireland, Netherlands, Norway, Sweden, West Germany, United Kingdom. The Norwegian delegate also acted as representative for IUCN.

Agreement on mammals, fish, birds

On mammals it was agreed that more work is required into the distribution and declining population of common seals and the effects on them of oil. Common seals are likely to be more vulnerable than grey seals to oil pollution because of the differences in their breeding sites and food requirements.

It was agreed that more information on the distribution and population of porpoises and dolphins is required. A drastic decline was reported in continental waters. In Swedish waters significant amounts of DDT and PCBs have been identified in body tissues of porpoises. Because of their close affinity to man these animals may have a particularly

important role as indicators of environmental quality.

On fish and invertebrates it was agreed that information is required on the overall quantities of oil in sea-water and seabed sediments—a prerequisite to considering uptake in marine organisms and biological pathways—and the implications of invertebrate mortality on organisms higher in the food chain.

On birds it was agreed that more studies are needed on breeding sites, population dynamics and seasonal distribution, that oil rigs should be used for observations, that suitably qualified biologists should be available to amass information following an oil incident and that the reported casualties of migrating birds at flare stacks on oil rigs should be urgently investigated.

Liaison to continue

It was agreed that information on national contingency plans and the development of clean-up methods should be exchanged and that nature conservationists of states whose interests are mutually affected at the time of an incident should maintain close contact. All countries have contingency plans but the degree of emphasis on wildlife varies. Oil on the open sea can at present be effectively removed only by dispersants but containment and recovery are preferable methods once research has made them more efficient than they are today.

Maps showing areas of importance to wildlife, and guidelines for their protection in the event of an oil spill, were accepted

as practical aids to contingency planning. Early detection and reporting of oil spills are of paramount importance.

Sustaining the impetus

To sustain the impetus achieved by the meeting it was agreed that delegates would recommend to their governments that liaison be maintained by the delegates themselves—pending any formal governmental arrangement—and by a smaller group of wildlife experts concerned with research. It was also agreed that each country should nominate an officer responsible for the exchange of information and to act as contact in emergencies.

Maltese seabird sanctuary?

At the end of October the Council of Europe held a 3-day meeting on the management of fish and shellfish in European seas. The venue was Malta and the Malta Section of the International Council for Bird Preservation took the opportunity of issuing a press release highlighting the need to declare the small island of Filfla a nature reserve.

Filfla is uninhabited and contains probably the largest breeding colony of storm-petrels in the Mediterranean as well as a fascinating variety of other seabirds. The island could well serve as the focus of a future marine reserve in Maltese waters.

Action priority 1417

Tagging right whales...

Whale tagging hits snags

Tagging whales, like ringing birds, is a method of learning more about their movements and behaviour. The project here is to devise a form of tagging which does not involve (as previous methods have) killing the whale in order to recover

14th General Assembly

IUCN's 14th General Assembly will begin one day earlier than previously announced —on Tuesday 26 September 1978 (rather than 27 September). The key dates are:

24-26 September: registration of participants in General Assembly

25-26 September: Commission meetings

26 September: Council meeting

26 September-5 October: General Assembly and Technical Meeting (the General Assembly begins at 2000, Tuesday 26 September, and ends at 1200, Thursday 5 October)

5 October: Council meeting

30 September-1 October } excursions
6-15 October }

Registration and meetings will take place in the Turkmen Agricultural Institute, Ashkhabad, Turkmen SSR. Besides numerous short excursions there will be longer excursions to Uzbekistan, Azerbaijan, Caucasus Mountains, Siberia and Leningrad.

Full details of the 14th General Assembly, Technical Meeting, and associated events will be published in the March issue of the *Bulletin*.

Marine science needs craft

Yachtsmen planning a voyage and willing to take a scientific researcher on board—or to collect marine data themselves—are asked to contact *The Oceanic Society*. The society exists to protect the marine environment by helping scientists to become seaborne. Projects accomplished or under way include: monitoring pollution, tagging fish, observations on marine mammals and research on underwater communications. Those interested should write to Dr M. Herz, *The Oceanic Society*, 240 Fort Mason, San Francisco, California 94123.

"New Growth" lecture in full

Readers will recall that the October *Bulletin* carried an extract of an important talk by Maurice Strong calling for a radical change in the goals of economic growth. It has since come to our notice that the talk *in full* was published in the autumn issue of the quarterly journal, *Environmental Conservation*. The same issue also carried a detailed account of the work of IUCN's Threatened Plants Committee. Those requiring information about this journal should write to the publishers: Elsevier Sequoia S.A., PO Box 851, 1001 Lausanne, Switzerland.

the tag. "Live" research is especially important on those depopulated species for which commercial whaling is now banned.

The tag now being developed and tested is attached to a short streamer—0.8 metres in length. In 1976 tests were carried out on right whales off South Africa. Altogether 78 streamer tags were fired from a helicopter in early August and late October. The August firings were unsatisfactory but design improvements gave a very much higher rate of "hit and streamed" in October.

But even then it was evident that most of the tags were lodged only in the blubber of the whale. Fears that they would be quickly shed were reinforced by post-operation monitoring flights. While

no animals tagged in October were subsequently sighted, a cow with a calf, double-tagged on 6 August still had both streamers on the 9th, but only one by the 13th and none by the 24th.

If range tests can show that the basic design problem has been overcome, and that tags once lodged will normally stay lodged, then field-testing may be resumed later this year.

Development of an externally visible tag for marking large whales

Budget \$9240

Project 1217

Principal investigators: P. B. Best, Marine Mammal Laboratory, Cape Town; S. G. Brown, Whale Research Unit, British Museum, London

Director required for WWF Conservation Programme Division

The World Wildlife Fund is a leading international foundation for promoting conservation through the raising and granting of funds, and undertaking related functions in the fields of public information and awareness. Its international headquarters in Switzerland comprises three divisions, covering Marketing (fund-raising and public relations), Administration and Finance, and Conservation.

The headquarters has a small but highly qualified staff, which coordinates and services 26 national organizations throughout the world (more will be established) and relies on the expertise of other specialist organizations, particularly the International Union for Conservation of Nature and Natural Resources (IUCN), to establish its Conservation Programme. This programme forms part of the World Conservation Strategy being prepared by IUCN with the support of the United Nations Environment Programme (UNEP) and WWF.

Although IUCN prepares and manages WWF's Conservation Programme, ultimate responsibility for its execution rests with the WWF International Board of Trustees, which is advised by a Conservation Programme Committee consisting of some Trustees, some representatives of WWF national organizations, some IUCN representatives and other eminent conservationists.

A Director is being sought for the Conservation Programme Division. The main responsibilities will be:

1. to serve as permanent secretary to the Conservation Programme Committee, and especially
- a) to evaluate and report on implementation of programmes and pro-

jects during the previous calendar year;

b) to gather, assess and collate proposals and comments from Board and staff members, WWF national organizations and other sources regarding the Conservation Programme for the following year;

c) to summarize policy proposals for the Conservation Programme Committee in order to establish guidelines for IUCN in preparing the long-term conservation programme.

2. to maintain liaison with WWF national organizations on all matters concerning the conservation programme;

3. to maintain liaison with IUCN on all conservation matters;

4. to coordinate, in close cooperation with IUCN, high-level representations in support of the conservation programme, to be made by WWF officers or Board members, or by others on behalf of WWF.

Qualifications The Director of the Conservation Programme Division will have had sound administrative experience over many years up to senior executive level in National Park and/or wildlife service, or in a leading conservation organization. The successful candidate will speak and write absolutely fluent English, and will preferably have a good knowledge of French and/or Spanish.

Remuneration Remuneration will be commensurate with experience and qualifications.

Applications Applications, in confidence, should reach the Director General, World Wildlife Fund, 1110 Morges, Switzerland, by 30 April 1978. They should be marked "Confidential—DCP".

Coping with the coral reef thief... birds in Mauritania...

Protecting Sudan's coral reefs

The invention of the aqualung has made the Red Sea the Mecca of sports-divers. The spectacular coral reefs, undisturbed for thousands of years, have become the playground of wealthy European holiday-makers. Laws prohibit spear fishing and coral and shell collecting, but they are not often enforced so damage to the reefs continues—and now comes from an additional quarter. Merchant sailors, frustrated by the long waits to enter Port Sudan, have turned to the reefs for recreation—and destruction.

At the moment the Red Sea is remarkably unpolluted, although with the re-opening of the Suez Canal oil discharges do occur. There is little industry along the coast, but with hopes of Sudan becoming "the breadbasket of the Arab world" foreign investment is heavy and many new factories are in the pipeline.

As part of the IUCN project the Port Sudan reefs are now being studied in preparation for monitoring the effects of pollution. But the project is also educational, directed both at visitors—the divers and sailors who are doing most damage to the reefs—and at the local people and law-enforcing agencies.

Most inhabitants of modern Port Sudan come from inland. Often they are unaware of the value of the sea as a resource and are superstitious about the underwater world.

In collaboration with Sudan's National Council for Research and backed by the Ministry of Tourism and the provincial government, the project forms part of the conservation programme of the Institute of Oceanography. Multi-lingual leaflets and notice boards now explain the law and the need for conservation. Tourists are encouraged to observe the law by being provided with mooring buoys (anchors damage the coral) in prime diving sites. There are also prospects for setting up marine parks in the near future.

Coral reefs, Sudan

Budget \$15,500

Project 1163

Principal investigator: R. J. Moore, Institute of Oceanography, Port Sudan

Candidate for national park

A team from the Zoology Department of the University of Malaya has during the past year been surveying the island of Pulau Redang (8000 hectares) off eastern Malaya to decide whether all

or part of it should become a national park. The island and others in this group are fringed by magnificent reefs which are still largely intact.

While the final recommendations of this survey have not been received, an earlier report makes it clear that there is a good case for proposing that the whole island be made a national park. The stretch of sea along its east coast is unique in Malaysia. Though small in area it holds a wide range of superb tropical corals in waters of exceptional clarity.

The other coast, the west coast, has beaches of unique vegetation that are nesting sites for four species of turtles. The mangroves are prime breeding and nursery grounds for fish and crustaceans; their destruction would greatly damage offshore fish and prawn stocks. The western ridge contains virgin forest which is too small and distant from the mainland to be economical to log—a fact which in no way detracts from its scientific or aesthetic worth.

Island/marine reserves, Malaysia

Budget \$10,000

Project 1422

Principal investigator: J. Green, University of Malaya

Wetland of a million waders

The Banc d'Arguin on the coast of Mauritania is one of the most important wetlands in the world. A national park since June '76, this enormous area (nearly 8,000,000 hectares) is a lifeline to vast numbers of waterfowl. Well over a million waders winter there or pause there on their migratory journeys. Among the 25,000 pairs of nesting birds are greater flamingoes, grey herons, royal terns, spoonbills and long-tailed cormorants—the last two demonstrating a nice mix of palaearctic and tropical species.

The park includes an area of desert land inhabited by the very rare dorcas gazelle. And two islands just outside the park are monk seal reserves. Within the park live the Imraguen fishermen, while nomadic tribesmen pass in and out. In both cases great care is being taken not to upset traditional patterns of life.

Basic wildlife data still need to be collected. But while funding the necessary surveys, the project here is essentially concerned to see that the park is properly equipped and scientifically managed. Equipment includes a seagoing boat which also serves as the headquarters for the park personnel—three specialists provided by the French *Fonds Aide Coopérée*.

The project will also address the question of tourism. If tourism finally comes to this remote region, as it quite likely will, how can it best be accommodated?

Banc d'Arguin, Mauritania

Budget \$105,000

Project 1333

Principal investigator: J. Trotignon, Association de soutien au parc national de Banc d'Arguin, France

Not so happy Christmas Island

Christmas Island, within the Gilbert Islands and one of the most important seabird colonies in the Pacific, is being developed for tourism. The island is a wildlife sanctuary but there is little observance of the law among the workforce of some 700 people now living there. Eggs have been freely plundered while many adult and fledgling populations have been decimated. Domestic cats gone wild are a big additional problem.

The project here aims to put an end to these depredations and to train a local warden to take over. Part-funded by Britain's Ministry of Overseas Development, the project was initiated by the Gilbertese government which wishes to attract tourists on the basis of the island's unique wildlife. Recommendations made to the government include barring all

public access to one of the most threatened colonies of sooty tern.

As a first step towards what will become a comprehensive and well-equipped education programme, a conservation textbook has been written for use in the local schools.

Conservation of seabirds, Gilbert Islands

Budget \$14,500

Project 1401

Principal investigator: R. Perry, Wildlife Conservation Unit, Christmas Island

Welcome to Seychelles

The Republic of Seychelles has become the 49th State Member of IUCN. Notification of adherence to the IUCN Statutes was contained in a letter dated 16 February.

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