

## **Guest Editorial: A little imagination**

by Sadruddin Aga Khan. Why the billion dollar mass tourism industry should do something to save the Mediterranean monk seal...

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## **Cover Story: How tourism has ruined the coastal habitats of the monk seal on the Bodrum Peninsula, Turkey**

by Yalçın Savas. Once noted for its sponge diving and tangerine groves, today Bodrum's main claim to fame is as a tourist boom town. Largely due to development pressures, conservationists are now fighting a rearguard action to save the Peninsula's monk seals from oblivion...

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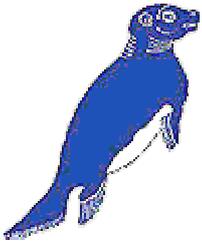
Guest Editorial: Will the mass tourism industry recognise its responsibility for the decline and eradication of the monk seal?



Cover Story: As tourism continues to drive development on the Bodrum Peninsula, will there be any space left for monk seals?



Monachus Science: Tourism's role in the decline and possible extinction of the Mediterranean monk seal.



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## Guest Editorial

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### A LITTLE IMAGINATION

Sadruddin Aga Khan



The author with the orphaned monk seal pup Efstratia on Alonissos

While gladly seizing this opportunity to write The Monachus Guardian's first ever Guest Editorial, I have to admit that sitting down with pen and paper was not quite as simple as I had first imagined.

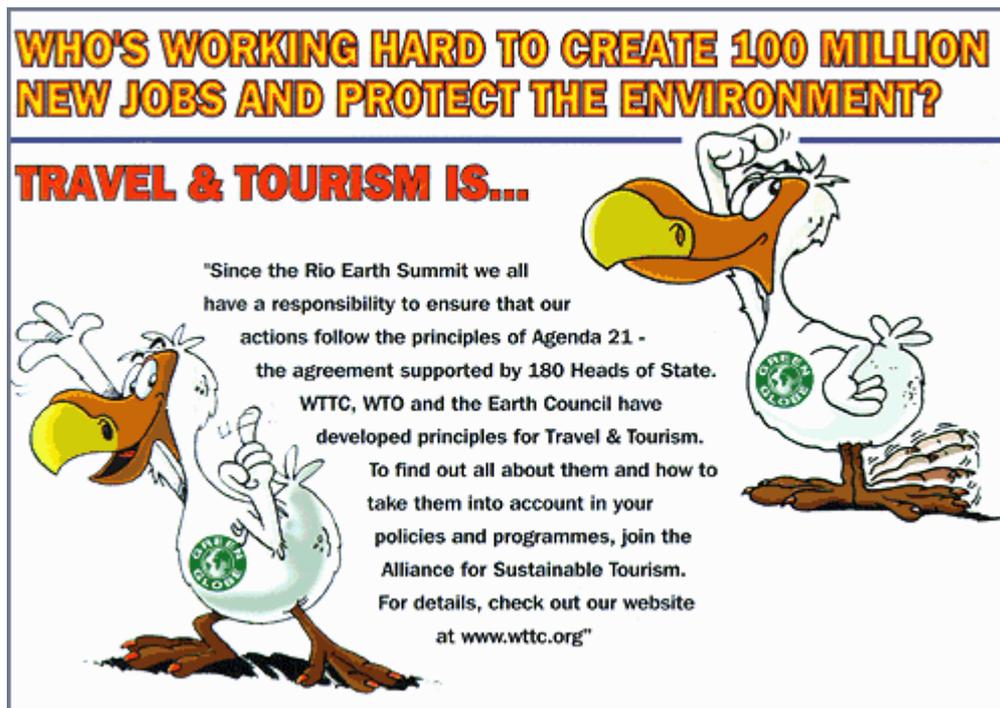
What, exactly, would I write about? Under other circumstances, I might have chosen to relate my own moving experiences with the monk seals *Theodoros* and *Efstratia* on Alonissos in the Northern Sporades Marine Park – two orphans that would almost certainly have perished without human assistance. I might also have written about the frustrations involved in mounting a coherent international campaign for such a critically endangered species, particularly where indifference and bureaucracy seem to erect one demoralising hurdle after another. I might have focused on the inexplicable decision of the EU and other funding agencies to cut financial assistance to Greek and Turkish monk seal projects – at the *precise* moment that substantial progress is being made in creating protected areas. Alternatively, I might have explored the growing concerns over animal welfare as some scientists appear to be spending more time harassing monk seals during the course of their research than devising solutions to protect them.

Yet in considering the contents of the current issue, I cannot miss this opportunity of commenting upon mass tourism's devastating impact upon the Mediterranean monk seal and its habitat.

Promoting the cause of sustainable, environmentally-friendly tourism, the 1992 Rio Earth Summit promised all sorts of initiatives to protect endangered species and vulnerable habitats from the lethal excesses of this lucrative global industry. In its wake came Green Globe, ECoNETT and various other projects promoted by the tourism sector to improve its own environmental track record. While such efforts are laudable in and of themselves, in the case of the Mediterranean monk seal – a species so unrelentingly victimized by the industry since the 1950s – it is hard to escape the suspicion that all of this represents little more than hot air.

As indicated in this issue's main article by William M. Johnson and David M. Lavigne, tourism continues to play a fundamental role in the final eradication of the monk seal, and even poses a serious threat in the protected areas that are at last being established for the species. Monk seals are still being harassed in their caves by tourists and speed boats. Elsewhere, monk seal habitat is being turned into coastal development strips dominated by resort complexes. As far as anyone can see, the

beaches of the Mediterranean are still littered with plastic, and polluted with oil and tar. Incredibly, seals have even been speargunned by snorkelling tourists – no doubt a magnificent trophy to human stupidity.

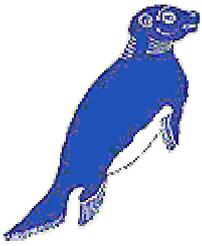


The World Travel & Tourism Council sings its own praises in protecting the environment, but with little tangible benefit for the monk seal.

The question is, *Can anything be done?* Over the years, I have discussed monk seal conservation with numerous people, from government ministers to businessmen and scientists, from conservation activists to school children. Ironically, it is often the young who have the clearest idea of what needs to be done. It is the young who are impatient for answers, intolerant of delay. Where others find themselves wallowing in bureaucratic quicksand, the young often see common sense solutions and cannot understand why establishment figures are reluctant to seize the initiative. Some might call this naivete, but one wonders whether this is just the cynic's way of justifying inaction.

For the last of the monk seals who are losing their homes and their lives to mass tourism, a little imagination could go a long way. It is, for example, not difficult to imagine how the tourism industry could – with no noticeable financial pain to itself – make a significant contribution towards saving Europe's most endangered marine mammal. It could provide funding for grassroots conservation projects in the fields of environmental education and the guarding of marine reserves. It could bring its prodigious lobbying powers to bear in supporting the conservation effort, speeding the creation of protected areas and developing alternative tourism opportunities. It could print its own educational material on the importance of the Mediterranean marine ecosystem, of which the monk seal is a vital symbol.

Some might argue that the industry is under no moral or financial obligation to the monk seal. Regardless of the compelling evidence to the contrary, I ask readers to consider one vital point. This is not a case of charities going, cap in hand, in search of corporate generosity. Quite the contrary. In numerous cases, small grassroots projects in Greece, Turkey and elsewhere are actually *subsidising* this billion dollar industry through conservation activities that seek to prevent or repair the specific damage caused *by* tourism. Although they can ill-afford it, they are establishing marine parks and deploying patrol boats, mounting conservation education campaigns and reaching out to governments, industry and the general public for a helping hand. It is high time that the travel industry reciprocated.



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## International News

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### Winners and losers in LIFE (and other stories from the frontline)...

Despite the inevitable disruption inflicted upon grassroots conservation projects – that require financial continuity in order to implement well-planned campaigns – funding decisions by international agencies are often susceptible to bureaucratic wrangling, deadlock and delay.

Political patronage, nationalist sentiment, vigorous lobbying, and tug-of-war opposition and support may all play a role in these convoluted processes. That might explain why, over the years, rational funding decisions have found themselves with strange, irrational bedfellows – most notably projects that have never received the support of the wider scientific and conservation community.

A revamped web site at DGXI (the EU Directorate that administers the LIFE-Nature fund) allows readers to examine the history of LIFE funding to the monk seal – ranging from habitat protection projects in Greece and Portugal, to the ECU 2 million experiment in translocation in Mauritania and the Canary Islands (<http://europa.eu.int/comm/life/nature/index.htm>).

These documents are also available in our own [Monachus Library](#) under the EU heading.

LIFE-Nature commitments in 1999 have proved particularly unlucky for Europe's most endangered marine mammal. Not one monk seal conservation project has been awarded financial support through this important funding mechanism this year, a decision that now threatens the Hellenic Society for the Study & Protection of the Monk Seal (MOM) with severe project disruption (see [LIFE funding rejected for new millennium](#), this issue).

To make matters worse, LIFE III (that is due to renew the fund) is still jammed in bureaucratic traffic, with the result that needy projects will have to try to survive without their primary funding source for up to a year and a half (<http://europa.eu.int/comm/life/life3.htm>).

As reported in the May issue of The Monachus Guardian, the leading Turkish NGO, SAD-AFAG, has also been in dire financial straits, having been confronted by a cut-off of WWF funding. News on the grapevine, however, suggests that this lifeline may be restored later this year as a result of EU SMAP (The Short and Medium-term Priority Environmental Action Programme) funding. While this news is undeniably welcome (if it *does* come to pass), events of this kind nevertheless serve to underline the needless disruption that lack of funding continuity inflicts upon vital conservation initiatives. **With Greek and Turkish projects now in the middle of establishing protected areas for the species – identified as the number one conservation priority since the Rhodes International Conference in 1978 – one can only wonder at the illogical timing of decisions that disrupt or cut off the funding lifeline.**

Meanwhile, another victim of the EU's 1999 disinterest in monk seals appears to be the Spanish research and translocation project in Mauritania/Western Sahara. According to the grapevine, University of Barcelona researchers recently parted company with their erstwhile Canary Islands comrades after suspecting that the Canary contingent may have been pushing the capture and translocation scheme to promote interests in tourism rather than conservation. While The Monachus Guardian can make no comment on the matter, cynics may wonder why the writing only appeared on the Barcelona wall almost 5 years after such suspicions were originally doing the rounds. As indicated in the [Mediterranean news](#) section, the University of Barcelona team is now cooperating closely with the Mauritanian authorities in planning future research initiatives and in seeking interim funding. In the meantime, reports on the ground suggest that, in the absence of adequate financial support, the team is radically downsizing its operation in the country.

Those who have imaginative monk seal projects in need of funding may want to check out the requirements for applying for grants from LIFE-Nature and from SMAP:

LIFE-Nature

<http://europa.eu.int/comm/life/nature/prepare.htm>

SMAP

<http://europa.eu.int/comm/dg11/smap/>

For those of a more tenacious disposition, the United Nations Environment Programme web site might also provide clues on GEF (The Global Environment Facility) funding:  
<http://unep/gef/>.

## Into print



Although published in its primary form on the Internet, The Monachus Guardian is now also being made available as a hardcopy publication. With the generous financial support of the [Humane Society of Canada](#) (HSC), each volume will incorporate the publishing year's May and November issues. While most readers will prefer to access The Monachus Guardian via the Internet (not least because of the unavoidable delays associated with traditional ink and paper publishing) this additional hardcopy version is intended to fill important gaps in our readership, and will be distributed to libraries, decision makers, and readers unable to access the journal by electronic means. Those wishing to be added to the mailing list should write to [IMMA Inc.](#) or contact the Librarian: [librarian@monachus.org](mailto:librarian@monachus.org). Copies of Volume I are still available. Volume II is expected by January 2000.

## After Valencia, monk seals in Cork?

It appears that Mediterranean monk seals may well feature in the 14th annual conference of the European Cetacean Society (ECS), to convene in Cork, Ireland in early April 2000. The ECS has been taking a growing interest in pinnipeds in recent years. The Society was a co-sponsor of the World Marine Mammal Science Conference (and its monk seal workshop) held in Monaco in January 1998. Although information arrived too late for inclusion in the May issue of The Monachus Guardian, a European Seals Workshop was also held under the auspices of the ECS in Valencia, Spain in April this year. Abstracts of the following presentations (of relevance to monk seals) were made available:

### **The Mediterranean monk seals in Greece: research and conservation activities.**

S. Adamantopoulou, K. Anagnostopoulou, E. Androukaki, P. Dendrinis, E. Fatsea, E. Tounta, V. Zavras, S. Kotomatas. European Seals Workshop, 13th European Cetacean Society Annual Conference, Valencia, Spain, 5 April 1999.

### **Working with the monk seal colony of Cabo Blanco: an approach of the species.**

M. Gazo.

### **Status and reproductive output of the Mediterranean monk seal population of Cap Blanc (Western Sahara) which survived the 1997 die-off.**

M. Gazo, J. Forcada, T. Pastor, G. Cantos, E. Grau & A. Aguilar.

### **Use of an infrared light sensitive camera for monitoring cave-breeding seals, applications for Mediterranean monk seal conservation.**

G. Mo, H. Güçlüsoy, Y. Savas & C. Sigismondi.

### **Implementing the Conservation Strategy for the Mediterranean monk seal in Greece.**

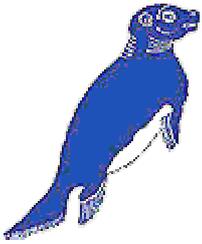
S. Kotomatas, S. Adamantopoulou, K. Anagnostopoulou, E. Androukaki, P. Dendrinis, E. Fatsea, E. Tounta, & V. Zavras.

### **Monk seal study and conservation in Desertas Islands.**

R. Pires & H.C. Neves.

A report on the Workshop ('ECS SEAL WORKSHOP, VALENCIA, SPAIN, 5TH APRIL 1999') can be found in the ECS Newsletter 34, available online at:  
<http://web.inter.nl.net/users/J.W.Broekema/ecs/ecs-news34.htm>.

Further updates on the ECS conference in Cork will be available in due course on the following web site: <http://web.inter.nl.net/users/J.W.Broekema/ecs/>.



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## Hawaiian News

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### Off on another adventure

Ten endangered Hawaiian monk seals were transferred to SeaWorld San Antonio, Texas, in late April. As revealed in our last issue ([The Old Woman Who Swallowed The Fly](#)), eight of the ten seals had become an unwanted financial burden to the National Marine Fisheries Service after a translocation experiment ended up blinding the animals in the NMFS' Kewalo Research Facility in Hawaii.

A SeaWorld press release dated 21 April ("**Highly Endangered Hawaiian Monk Seals Arrive At SeaWorld**") declares that "The animals – all young adult females about 3 years old – were transferred to the world's largest marine life adventure park with the approval of the National Marine Fisheries Service for long-term care and research."

Dudley Wigdahl, SeaWorld San Antonio's general curator, was quoted as saying that "eight of the monk seals have varying degrees of blindness from an unknown cause, while two others are key to research, not having contracted the undiagnosed ailment which caused the blindness."

The press release goes on to state that: "Marine mammal veterinarians who have examined the Hawaiian monk seals say they don't believe the eye condition, which caused the animals to go blind, is contagious. All 10 monk seals appear to be healthy with the exception of the vision problems."

The monk seals, apparently destined for new quarters in SeaWorld's "Seal and Sea Lion Community, adjacent to the Sea Lion, Walrus and Otter Stadium", were put on show to the public soon after their arrival.

In hailing the arrival of the unfortunate animals, PR managers spared little effort in trumpeting the environmental credentials of the SeaWorld facility and those of its corporate overseers: "Their SeaWorld debut," declares the press release, "happens to coincide with the Anheuser-Busch Adventure Parks' Endangered Species Celebration, part of the parks' annual Green Week environmental awareness program for employees and guests as well as a collaborative effort with the National Wildlife Federation's 'Keep the Wild Alive' campaign."

The SeaWorld press release is available at the facility's online press room at: <http://www.4adventure.com/press/swtxpressroom.html>).

**SeaWorld supports Mediterranean monk seals:** Meanwhile, friends of the monk seal will no doubt be delighted that the corporate parent of Sea World Inc., Anheuser-Busch, is extending a helping hand to *Monachus monachus* as well. The company's ever-optimistic web site (<http://www.abenvironment.com/docs/mappage.shtml>) declares that it is supporting "the Mediterranean monk seal recovery plan through the IUCN/Conservation Breeding Specialist Group". It is likely that Sea World PR functionaries are referring to the Captive Breeding Specialist Group, that once attempted, unsuccessfully, to confer a modicum of respectability upon the now infamous 1994 attempt by Antibes Marineland (a kindred marine circus in France) to capture monk seals on the Côte des Phoques.



**Mediterranean SeaWorld supports the Mediterranean monk seal recovery plan through the IUCN/Conservation Breeding Specialist Group.**

## Another Maui birth highlights Q39 controversy

A monk seal pup born on Maui around the 10 August (reports David Jordan), may increase pressure on State and Federal authorities to ensure effective protection of the species in the wake of the notorious Q39 harassment case (Monachus Guardians, *passim*). The pup (ID number D41), tagged on 27 September, was described as "a very large and healthy female." Based on photographic records and scar data, the mother is believed to have previously given birth in 1998 to a pup code-named Y32. The last reported sighting of Y32 was this spring, near the place of his birth.



D41 learning to swim with her mother

Q39 is understood to be the 1997 pup of this same, untagged female, and was most recently sighted on 13 September. The fallout from her day in court has continued since the last issue of *The Monachus Guardian* (['He didn't eat the seal, did he?'](#)). All four Congressional delegates from Hawaii responded to the information they received from David Jordan and his father (Dr. Robert Jordan of the Environmental Protection Agency), which included copies of the harassment video and pertinent letters and emails exchanged between David Jordan and the NMFS, NOAA, and other government agencies and officials.

Senator Daniel Inouye and Representative Patsy Mink both wrote strongly worded letters to NMFS officials asking for an explanation for the lack of Federal follow up to the outcome of the State harassment case.

Senator Daniel Akaka said he would consider the issues raised in this case during the forthcoming debate when the Marine Mammal Protection Act comes before the Senate for renewal and funding. Representative Neil Abercrombie said that he had pursued the matter with local NMFS and Fish & Wildlife Service officials, and there was nothing further that could be done.

Replying to David Jordan's letter of complaint regarding Judge Shigezawa's behaviour and ruling in the case, the State of Hawaii Supreme Court Commission on Judicial Conduct stated that "after careful consideration, the Commission members have determined that there was no judicial misconduct involved. The matter is now concluded and appropriate steps have been taken towards avoiding in the future the kind of conduct you allege to have occurred."

Predictably, several observers have noted the unintentional irony buried in this reply. If no judicial misconduct occurred, why take steps to ensure that it doesn't happen again?

## New birth recorded on Molokai

According to National Park Service (NPS) reports, a monk seal pup was born in the Kalaupapa National Historical Park on Molokai on 28 May. The island of Molokai lies northwest of Maui.

An NPS press release states:

"On the morning of May 28th, park staff noted a monk seal with a new-born pup on one of the park's white sand beaches... The pup appears to be strong and healthy. This is the only recorded birth in the eight main islands this year and the third Hawaiian monk seal birth in Kalaupapa. Last year's pup, also born in May, was successfully weaned and tagged and has been seen several times on the beaches around Kalaupapa. Members of the Kalaupapa community have taken great pride in this birth, as they did with the previous two monk seal births during the last two years, and are assisting park staff in protecting the seal and her pup" (<http://www.nps.gov/morningreport/msg00282.html>).

## Maui Conference

The Society of Marine Mammalogy's 13th Biennial Conference on the Biology of Marine Mammals will convene in Maui on 28 November. The preliminary programme lists various presentations of relevance to Mediterranean and Hawaiian monk seals, including:

**Do Hawaiian monk seals benefit from El Niño?**

J.J. Polovina, J.D. Baker, G.A. Antonelis.

**Effects of the 1997 die-off on the reproductive parameters of the Mediterranean monk seal colony of Cabo Blanco**

M. Gazo, J. Forcada, T. Pastor, G. Cantos, A. Aguilar.

**Population dynamics and status of the endangered Hawaiian monk seal, *Monachus schauinslandi***

G.A. Antonelis, J.D. Baker, T.C. Johanos.

**Population impacts of absolute and functional sex ratio fluctuations on the endangered Hawaiian monk seal**

T.C. Johanos, B.L. Becker, T.J. Ragen, J.D. Baker.

**Foraging habitats and conservation of Hawaiian monk seals**

B.S. Stewart, M.P. Craig, G.A. Antonelis.

**Demographic trajectory and projections of the Mediterranean monk seal population in the Western Sahara**

J. Forcada, R. Pradel, M. Gazo, A. Aguilar.

**Aggressive male behavior and shark predation dramatically increase mortality of Hawaiian monk seal pups at French Frigate Shoals**

M.P. Craig, M. Shaw, G. Mo, M. Rutishauser.

**Managing human activity aids recovery of endangered Hawaiian monk seals at Midway Islands**

W. Gilmartin, S. Canja, C. Vanderlip, J. Mangel.

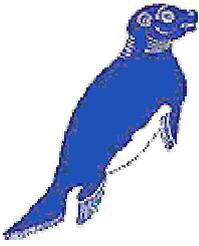
**Effects of research handling and instrumentation on Hawaiian monk seals, *Monachus schauinslandi***

J.D. Baker, T.C. Johanos.

**Use of deepwater coral beds by monk seals at French Frigate Shoals, Hawaii.**

F.A. Parrish, M.P. Craig, K. Abernathy, G.J. Marshall, B.M. Buhleier.

The full preliminary programme can be found on the Society of Marine Mammalogy's web site as an Acrobat PDF download: <http://webdata.soc.hawaii.edu/abstract/Maui.html>.



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## Mediterranean News

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[Albania](#) / [Croatia](#) / [Cyprus](#) / [Greece](#) / [Madeira](#) / [Mauritania & Western Sahara](#) / [Turkey](#)

### Albania & Croatia

#### Monk seals commemorated (sort of)

A rather curious set of stamps was issued by Albania this year to commemorate the Mediterranean monk seal. Depicting two individuals loafing on idyllic white sands, the 4-stamp issue describes the species as *Monacus albiventris*, no doubt a corruption of the taxonomic synonym *Monachus albiventer*, a name most often associated with the 18th century Dutch physician and taxonomist P. Boddaert (**Boddaert, P.** 1785. *Elenchus animalium*. Vol. I. C. R. Hake, Rotterdam, the Netherlands: 170). In fact, Boddaert coined the name *Phoca albiventer* (in recognition of the species' white belly patch), and it was not until 1822 that the British naturalist J. Fleming suggested the genus *Monachus* (**Fleming, J.** 1822. *The Philosophy of Zoology*, vol. 2. Edinburgh and London: 1-618). As a consequence, the term *Monachus albiventer* was still seen in scientific papers up until the 1950s.



#### Field research in Albania and Croatia

The Mediterranean Monk Seal Group in Croatia, headed by Jasna Antolovic, and Aquarius of Albania, led by Andrian Vaso, joined forces in field research during June – August 1999. The ongoing project is being funded through a REC grant (Regional Environmental Center for Central and Eastern Europe in Budapest, Hungary).

In Albania, 19 habitats were investigated in the area of Reza E Kanarit, and in one of them traces of monk seal urine were reportedly found.

In August, the team from Albania joined the Croatian group in monitoring previously investigated habitats in the Vis archipelago, including the islands of Bisevo, Svetac, Vela Palagruza and Mala Palagruza. The field trip resulted in the discovery of one new potential monk seal habitat. All identified *M. monachus* habitats in Albania and Croatia are believed to be sufficiently intact as to permit occupation by the monk seal.

As an integral part of its activities, Aquarius and the Mediterranean Monk Seal Group also published educational posters, picture books (in Croatian, Albanian and English) and special postcards designed to gather sightings data. During the summer period, several of these postcards were received, conveying reported sightings of the monk seal in the Adriatic sea.

Frequent lectures on the monk seal and the problems experienced by the species were held in Croatia by Jasna Antolovic. Radio and television interviews helped to bring this information to a wider audience.

With approximately 50% of the planned activities now completed, the project is expected to draw to a close and issue its final report by September 2000.

## Cyprus

### Monk seal cave dynamited for hotel construction

According to press reports, The Ecological Movement of Cyprus has seized upon the results of a 1997/1998 monk seal population study to level harsh criticism against the island's government. The study (an operation mounted by leading Greek NGO MOM, the Cyprus Wildlife Society and the Fisheries Department of Cyprus) concluded that a "a very small number" of individual monk seals still survive around the island's shores. The population had declined so seriously that only concerted action could save it from extinction. In particular, urgent measures were required to protect two possible breeding locations.

The monk seal in Cyprus, according to a report in the 8 August edition of the Sunday Mail, (<http://www.cynews.com/August/08/news080802.htm>) had previously been considered extinct.

At the same time, the Ecological Movement declared that the report's findings confirmed what they had always suspected – that the monk seal continued to survive but desperately needed protection. "They claimed," wrote Martin Hellicar in the Sunday Mail, that "the Fisheries Department always knew *M. monachus* was not extinct in Cyprus, but had adopted a policy of denying the continued existence of the threatened seal in the mistaken belief that this would better ensure its survival. This tactic had backfired because it meant monk seal breeding sites had not been afforded protection."

Mass tourism on Cyprus remains the greatest single threat to the population's survival (see [Mass tourism and the Mediterranean monk seal](#), this issue). However, according to the Ecological Movement, monk seals that had once bred in caves on the Asprokremmos (Akamas) coast had been driven away by dynamiting during the construction of a massive hotel complex. These allegations are largely confirmed in the aforementioned monk seal status survey (Dendrinou & Demetropoulos 1997). According to the Ecological Movement, the development is the brainchild of the family company of former Foreign Minister Alecos Michaelides. The excavating blasts, claimed the organisation, were also illegal. The Sunday Mail quoted the Movement's spokesman as saying: "Due to the explosions carried out during construction of the hotel, in violation of conditions laid out in the building licence, a sea cave where the monk seal took refuge was destroyed. Michaelides' firm secured relaxations from the Cabinet to allow the hotel to be built larger than local planning zone requirements permitted."

#### Sources:

**Martin Hellicar.** Monk seal clings on in secret Cyprus coves. The Sunday Mail. 8 August 1999. Available in [The Monachus Library](#)

**Dendrinou, P., & A. Demetropoulos.** 1997. Mediterranean monk seal survey of the Cyprus coasts. MOM (Hellenic Society for the Study & Protection of the Monk Seal); Cyprus Wildlife Society; Fisheries Dept., Ministry of Agriculture, Natural Resources & Environment, Cyprus., Nicosia & Athens. RAC/SPA, Tunis. 1998: 1-22.

## Greece

### Natura 2000 sites attract vital support

Leading Greek NGO, the Hellenic Society for the Study & Protection of the Monk Seal (MOM) continues to take major strides towards the establishment of key Natura 2000 reserve areas for *M. monachus* (see [Research Continues for Natura 2000 Reserves](#), [IFAW-ODYSSIA Surveys Aegean Target Areas](#), and [Natura 2000 News](#)).

Progress since May can be summarized as follows:

- Data of relevance to the Mediterranean monk seal, collected from all four project areas, were analysed and then compiled into a "Status Report on the Monk Seal". This was distributed among relevant international and national authorities, as well as experts on the biology and

conservation of the species. Versions were also disseminated among the local authorities of the project areas.

- Data of relevance to the natural environment of the project areas have been collected, evaluated and then compiled into a report entitled "Inventory of the Habitats and Species of the Project Areas". This was subsequently forwarded to relevant national and local authorities.
- Data included in the above report are also being used to update the Standard Data Forms of the Natura 2000 sites of Polyaiagos and Northern Zakynthos. Recent data are also being added on the island of Kimolos and on the west coast of Zakynthos. The updating process is being conducted in collaboration with the Ministry of Environment in order to incorporate the latter areas into the Polyaiagos and Northern Zakynthos Natura 2000 sites.
- Draft management plans and proposed measures governing the Natura 2000 sites were presented in detail to the relevant national authorities, most notably the Ministry of Environment. Following eight comprehensive working sessions with officials from the Deputy Minister's office, the General Secretary's office and the Division of Environmental Planning, it was concluded that the proposed measures were in full compliance with the conservation strategy of the Natura 2000 sites. It was further agreed that these measures should be included in the Special Environmental Studies (SES) document, currently under preparation. In the case of Zakynthos, where MOm works in association with WWF Greece and Archipelagos – Marine and Coastal Management, it was agreed that the SES procedure should be advanced so as to facilitate the establishment of a protected area.
- Regular working meetings and public events have also taken place at a local level, again focusing on protected area management plans. During discussions with local authorities on the islands of Kimolos, Karpathos and Fourni, agreement was reached in principle on the measures governing each respective protected area. The talks also allowed fine tuning of the measures to suit the unique needs of each area. – Vrassidas Zavras, MOm.

## **New law benefits protected areas**

A new law issued in Athens in October creates a mechanism to establish management bodies in protected areas. After years of lobbying to have such legislation enacted, the event has been hailed by MOm and other conservation bodies as a groundbreaking step.

Historically, the operation of Greek protected areas – including the National Marine Park of Alonissos and the Northern Sporades (NMPANS) – have been severely compromised by a quirk in Greek legislation. In spite of the fact that existing legislation foresees three steps towards the establishment of protected areas – defining borders, devising protection measures and restrictions, and the design and establishment of management bodies – up to now there has been no law that allows for the implementation of the latter through Presidential decree.

This posed particular difficulties in already established protected areas, which – although they possess an active protection status – lack integrated management direction. The phenomenon resulted in an organizational vacuum, hampering long-term planning – such as alternative development opportunities, and regulatory enforcement.

The law approved by the Greek parliament, however, will now pave the way for the creation and establishment of management bodies for the protected areas.

In a potentially significant development, the law allows the possibility for the state to create management bodies that operate within the private sector as non-profit organisations.

Management bodies will be governed by a board of directors (comprising 7-11 members), to include representatives of the Ministry of Environment, Agriculture, other relevant (to the area) ministries, representatives of local and regional authorities, specialists, and – in what is being seen as a major advance – representatives of environmental NGOs (which possess previous experience, activities and infrastructure within the geographical area, and are represented nationally).

The Law also suggests that the funding required for the management body to function be available from various sources, including the central government, the EU, and the private sector.

News of the law will be particularly welcome to the NMPANS, whose supporters have been campaigning for a presidential decree establishing a management body since 1992. – Vrassidas Zavras, MOm.

## **LIFE funding rejected for new millennium**

Despite the notable achievements related above, The Monachus Guardian has learnt that DGXI of the European Commission, the Directorate that administers the LIFE-Nature fund, has rejected MOm's application for a continuance of the integrated activity project in Greece. Furthermore, sources in Brussels explain that potential LIFE III beneficiaries have fallen foul of bureaucratic delays in renewing and administering the fund, raising the prospect of funding shortages for up to one and a half years (see [Winners & Losers](#), International News).

The decision therefore threatens to cause significant disruption to various key objectives in the Aegean, most notably the implementation of management plans for EU-promoted Natura 2000 monk seal reserves.

MOm, while conceding that it is facing a considerable funding shortfall, has declined to comment on its LIFE funding proposals at this stage. However, The Monachus Guardian has reason to believe that the funding decision could jeopardise the entire monk seal conservation effort in the Aegean. – The Monachus Guardian.

## **European Network for *Monachus monachus***

Under a EU-funded (DG XI) initiative, an exchange programme has recently been launched involving several Mediterranean monk seal NGOs and research teams. The initiative comes in response to criticism in recent years that a lack of communication between NGOs has encouraged a fragmentary approach to conservation and research, resulting in conflict and duplication of effort. Although still in its infancy, it is hoped that the exchange programme will ultimately open up permanent lines of communication between the projects as well as opportunities for practical collaboration on a range of issues.

Coordinated by MOm and funded by the LIFE programme, exchange visits have so far taken place between Madeira and Greece, Greece and Spain (the University of Barcelona team working in Mauritania), Madeira and Spain. Although MOm plans to issue an assessment of the initiative by year's end, appreciation expressed by participants is already prompting calls for other, non-EU, teams to join the scheme, such as Turkey and Mauritania. – Spyros Kotomatas, MOm.

## **Awareness campaign reaches out over Greece**

Every summer for the last 9 years (1990-1999), MOm has conducted monk seal public awareness programmes throughout Greece.

This year alone, the organisation operated seven Information Centers: Alonissos (Patitiri and Steni Vala), Skopelos and Skiathos in the Northern Sporades, Milos in the Cyclades, Karpathos in the Eastern Aegean and Fourni in the Dodecanese.

All this was made possible through the dedicated efforts of 80 young supporters (between 19 and 41 years of age) who voluntarily offered their time and informed 22,000 island visitors about the plight of the monk seal and the need to preserve the marine environment. – Kelly Vouvousiras, MOm.

## **Strandings report yields important findings**

MOm's long-term data gathering project on the strandings of dead monk seals is beginning to yield important findings on the mortality causes of the species.

The project was initiated in Greece in 1990 as part of a larger project, the Rescue and Information Network. The need for this study became imperative during the mass mortality of Striped Dolphins the

Mediterranean, in order to evaluate the risk of similar epizootics in monk seals.

All information concerning dead seal strandings reaches MOM through the Rescue and Information Network. This network covers all of coastal and island Greece and its operation is based on continuous communication with more than 1000 "members" (port police authorities, fishery and veterinary services, fishing co-operatives, coastal municipalities and local inhabitants) through mail and direct visits.

Upon receipt of a report of a seal found dead, depending on the condition of the body, either a full necropsy is performed (in the case of a recently deceased animal), or an external examination (with body measurements) is conducted (in the case of a decomposed animal). The external and internal examination is performed following specific protocols on pinniped necropsies (Winchell 1990, Dierauf 1994). According to the state of decomposition of the carcass, tissue samples are taken for further examination: bacteriological, virological, immunological, histological, genetical, parasitological, toxicological, morphometrics, age determination, *etc.* The samples are stored in the sample bank of MOM and forwarded to collaborating institutes for analysis. The above activities are conducted under a specific permit from the Ministry of Agriculture.

Over the last ten years 130 dead seal strandings have been reported to MOM and 45 necropsies have been performed. The results of this work provide evidence that deliberate killing remains a major direct threat for the Mediterranean monk seal population, while natural deaths are the main cause of pup mortality. The results of the years 1990-1997 were presented in the paper **Causes of mortality in the Mediterranean Monk seal (*Monachus monachus*) in Greece** by E. Androukaki, S. Adamantopoulou, P. Dendrinou, E. Tounta & S. Kotomatas, published in the journal *Contributions to the Zoogeography and Ecology of the East Mediterranean Region*, Vol. I (1999): 405-411.

Furthermore, from the samples collected during this project, the occurrence of morbillivirus in the monk seal in Greek waters was found for the first time (see A.D.M.E. Osterhaus, M. van der Bildt, E. Vedder, B. Martina, H. Niesters, J. Vos, H. van Egmond, D. Liem, R., Baumann, E. Androukaki, S. Kotomatas, A. Komnenou, Abou Sidi Ba, A.B. Jiddou, & M.E.O. Barham. Monk seal mortality: virus or toxin? *Vaccine* 16 (1998) No 9/10: 979-981).

Additional research allowed for the classification of the identified virus as phylogenetically related to the porpoise morbillivirus (see M.W.G. van der Bildt, E. Vedder, B. Martina, Abou Sidi Ba, A.B. Jiddou, M.E.O. Barham, E. Androukaki, A. Komnenou, H.G.M. Niesters, A.D.M.E. Osterhaus. Morbilliviruses in Mediterranean Monk Seals, *Vet. Microb.* 69 (1999): 19-21).

During 1999, MOM, in its effort to further advance knowledge of the species' biology, initiated a research project on the genetics of the Greek monk seal population in collaboration with the University of Barcelona. The genetic variability of the specific population will be investigated and a genetic comparison between the Greek and the Western Atlantic populations will be attempted. In addition, during the course of this year MOM, together with researchers from the faculty of Ocean Sciences, University of Bangor, N. Wales, has been conducting a study on the levels of heavy and trace metals in the tissues of monk seals, using samples collected over the years of the project from the dead animals. Both projects are anticipated to shed light on areas poorly investigated in the past.

In continuation of these efforts, during 1999 MOM's team conducted necropsies on the following dead animals found along the Greek coast:

- A juvenile female at Porto Rafti Attiki on 22/3/99. According to necropsy evidence the seal was in good dietary condition, while indications of suffocation and probable violent death were found.
- An adult female at Managros beach, W. Chios on 15/4/99. The seal, in the initial phase of decomposition, was emaciated, and evidence suggests that it suffered from an extended infection, probably of viral cause, which had resulted in septicaemia and eventual death. MOM contacted Turkish researchers working in the neighbouring Foça area, who had dealt with a similar incident, and both teams were alerted in case of an expansion of the phenomenon. Fortunately, no additional similar incidents were discovered in the area, while the virological analysis (conducted by Erasmus University, Rotterdam) of the samples taken from both cases did not reveal any viral infection.
- An adult female seal on 2/6/99 at Potidaea beach, Chalkidiki. Although the seal had been stranded alive in the area one week earlier, the locals wasted considerable time in alerting

MOM, thereby ruling out any effective veterinary assistance. The necropsy was performed jointly with the veterinarian of the Veterinary School of Thessaloniki, who collaborates with MOM in the above project as part of an overall agreement between the two institutes. The animal was found in good nutritional condition, and suffered, according to the necropsy evidence, from parasitological infection of the lung. This was probably the secondary effect of a viral infection, an assumption, however, not yet established by virological and histological results.

- A juvenile male in the initial phase of decomposition at Pteleos bay, Magnesia on 20/6/99. The animal was in good dietary condition and, according to the macroscopic investigation, had died by violent death, probably by dynamite.
- An adult female seal in Pelekouda bay, Milos on 22/8/99. The seal, according to the necropsy evidence, had been shot and died of the wounds it sustained.
- A male seal pup at Alonissos, on 2/10/99. The seal was examined by MOM's research team and according to the examination had died approximately 2 days after its birth from natural causes.



Adult female seal discovered at Potidaea beach, Chalkidiki.

MOM, considering this a priority project, has invested considerable effort in its continuous operation. Results gathered to date appear to validate its scientific and conservation value, particularly in offering an early warning system of potential direct risks to the monk seal population – Eugenia Androukaki, MOM.

**Editor's Note:** Observers may find it especially ironic that, for the last 4 years, no one has provided financial assistance to this nation-wide project, obliging MOM to secure funds solely through donations from its members and supporters. This in spite of often-voiced concerns over the potentially catastrophic effects of a viral outbreak in the eastern Mediterranean...

## MOM's bibliography

MOM has released a bibliography of its publications issued between 1991–1999. The full bibliography is available in Acrobat (PDF) format in [The Monachus Library](#), while MOM publications issued since April/May 1999 can also be found in this issue's [Recent Publications](#).

## Gerakas revisited

Reconstruction work at the much-maligned Biological Station at Gerakas ([Monachus Guardian 1:1](#)) in the Northern Sporades Marine Park is now nearing completion. Although MOM has sometimes expressed frustration regarding the convoluted bureaucratic tangle (involving multiple national, regional and local administrative bodies) that has sometimes threatened to ensnare the project, The

Monachus Guardian can confirm that the Station's new monk seal rehabilitation facilities are almost complete.

## Stop Press... Stop Press... Stop Press...



Orphaned monk seal pup Akritas

Shortly before this issue of The Monachus Guardian was due to go to press, MOm announced that an orphaned monk seal pup had been reported to its Rescue and Rehabilitation Network from the Aegean island of Ikaria. The male pup, named Akritas, approximately two weeks old, was subsequently taken to the MOm rehabilitation unit at Steni Vala on the Northern Sporades island of Alonissos. Please refer to our [Breaking News](#) section for further details.

## Madeira

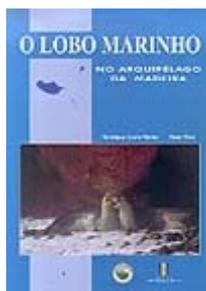
### Feeding behaviour study published

A study on the feeding behaviour of monk seals around the Desertas Islands was published earlier this year in Funchal, Madeira:

**Costa Neves, H.** 1999. Preliminary findings on the feeding behaviour and general ecology strategy of the Mediterranean monk seal *Monachus monachus* (Pinnipedia: Monachinae) on the Desertas Islands. Bol. Mus. Mun. Funchal Sup. no. 5: 263-271.

Thanks to the author, this paper is now available for download in the [Monachus Library](#).

### New book due by year's end



The publication of **The Monk Seal (*Monachus monachus*) in Madeira Archipelago**, a book authored by Henrique Costa Neves and Rosa Pires (see [The Monachus Guardian 2:1](#)) has been delayed but is expected to appear by the end of the year. Although only a Portuguese edition will initially be available (**O Lobo Marinho no Arquipélago da Madeira**), an English version is planned in the future.

The 120-page, fully illustrated, volume focuses on the history of the monk seal in Madeira and the Desertas Islands, and on non-invasive conservation efforts that have brought the species from the brink of extinction in 1988 – when only 6-8 individuals survived – to 20 individuals today.

## Mauritania & Western Sahara

### Regional Recovery Plan

According to sources in Mauritania, discussions are currently underway on a long-term Regional Recovery Plan for the Atlantic population of *Monachus monachus*. The proposal, launched by the Spanish Ministry of Environment (and fronted by Luis Mariano Gonzalez of ICONA) advocates a cooperative approach between the monk seal's Atlantic range states. Under the draft proposal, Spain, Portugal, Morocco and Mauritania would engage in agreed conservation and research activities under the auspices of the Convention on Migratory Species (CMS).

While geopolitical realities in the region – in particular the disputed status of the Sahara Occidental – have long hindered conservation efforts along the Côte des Phoques, there appears to be a growing consensus of opinion that a supranational approach might offer the best hope for a long-term solution.

Advocates of the Plan suggest that a process of this kind might advance the long-stalled aim of establishing an international reserve at the Côte des Phoques the under the umbrella of a neutral international agency (such as a UN body).

Mauritanian participants have also voiced the hope that international dialogue over both the CMS Project and the Mauritanian National Strategy (see below) will heal rifts and stimulate "a more transparent approach by all partners, ultimately refocusing attention on what the real issue is – *i.e.* the monk seal and its survival and recovery."

### Mauritania seeks funding

Reflecting this renewed spirit of cooperation, the various parties involved in the region are currently attempting to secure interim funding for ongoing research and conservation priorities. The PNBA (Banc d'Arguin National Park), the CNROP (Centre National de Recherches Oceanographiques et des Peches) and the University of Barcelona have applied to various agencies – the UN Foundation, Biodiversity Program Network – in the hope of obtaining a bridging grant that would allow a minimal monitoring of the Cap Blanc colony while awaiting the launch of longer term initiatives.

### Strategy makes headway

Meanwhile, the Mauritanian authorities continue to make headway on their National Strategy for the Conservation of the Cap Blanc Monk Seal colony (see [National Strategy to be Launched](#)). Following extensive review on both the international and domestic front, the Strategy is now said to be undergoing final revision before submission to the Mauritanian authorities in the first quarter of the new year.

## Turkey

### AFAG acts against protected area tourism development

AFAG has acted against the construction of tourist facilities in Gemile Bay, Fethiye, SW Turkey. The construction is being pursued by Ozyar Ltd., owned by a Turkish MP. Ozyar had pursued court action, seeking an injunction against the Ministry of Culture for its decision to declare the Bay a 1st degree SIT area (a form of protection that strictly prohibits any development or construction). Ozyar is also taking legal action against the Governorship of Mugla for its decision to halt its construction in August 1997.

Together with two other conservation-minded parties (The Society for Research on Rural Environment and Forest Problems, and Ms. Muruvet Ozsoyler, an individual from Istanbul) the SAD-AFAG board decided to take part in the court proceedings in support of the Ministry of Culture. As in other legal matters, SAD-AFAG was assisted in its legal efforts by the Izmir Lawyers Environmental Movement.

Prior to the commencement of court proceedings, AFAG researchers Yalcin Savas and Ozan Veryeri conducted a survey of Gemile Bay in October 1998 and found that the area was free from human disturbance and offered suitable habitats for monk seals. AFAG divers also discovered two well protected sea caves with internal beaches, one of which was large enough to accommodate an extended family of seals.

At present, the Bay, surrounded by sea, beach and forest, cannot be reached by road. As a result, Ozyar has transported construction material to the site by boat from Fethiye. Its hotel construction is currently half completed. Ecologists have voiced the fear that, unless Ozyar's legal action can be rejected, it would only be a matter of time before economic interests bulldoze a road open from Fethiye to Gemile Bay, leading to an inevitable environmental deterioration in the region.

In submitting its advisory report, AFAG strongly recommended that the court act against the construction of the hotel.

In rendering its judgement on 13 July, the court decided to reject Ozyar's application for an injunction against the Ministry of Culture and Governorship of Mugla.

In collaboration with other groups, AFAG continues to monitor important monk seal sites, including protected areas, that face the risk of tourism development. – Cem O. Kiraç, SAD-AFAG.

### **Morbillivirus no longer suspected in Çesme death**

A suspected morbillivirus infection, implicated in the death of a monk seal at Çesme on Turkey's Aegean coast in February (see [Dead Seal Found at Çesme](#)) has now been discounted as a result of laboratory analysis.

Samples collected during the necropsy were sent to Erasmus University in the Netherlands, but tests proved negative. In September, Dr. Byron Martina of Erasmus reported that: "The samples were not in excellent condition. This would indeed make the isolation of morbilli or herpesvirus difficult. But, the samples were still good enough to perform reliable PCR. Since both, morbilli and herpesvirus, PCRs turned out negative, together with the fact that serology was negative, I think that a full blown infection with either virus is very unlikely. Of course, we can't exclude the possibility of another virus, or a new herpes/morbillivirus, being the cause of death in this seal." – Harun Güçlüsoy, SAD-AFAG.

### **More deaths recorded along Turkish coasts**

According to information received by SAD-AFAG, five additional seals were found dead along Turkish coasts during 1999. From north to south along the Turkish Aegean and then east into the Mediterranean, the dead seals were reported from the following towns: Çesme, Bodrum, Marmaris, Kalkan and Kas. Only in the case of the Kalkan seal was mortality linked to direct killing by a fisherman. Incidental entrapment in fishing nets is suspected in the case of the Kas seal, although no firm conclusion could be drawn from the limited information available. In all other cases, the advanced state of decomposition of the corpses ruled out establishing a cause of death. – Harun Güçlüsoy, SAD-AFAG.

### **Court action follows artisanal fisheries symposium**

On 21 February, the Ministry of Agriculture and Rural Affairs released its "Annual Aqua Products Circular 33/1" regulating commercial fisheries in the marine and fresh water systems between 1999 and 2000.

Some items in the Circular, however, were found to conflict with the official declaration of the [Artisanal Fisheries Symposium](#), convened in Izmir in February 1999. As a result, some participating organisations, including the Yeni Foça Fishing Co-operative, the Urla Fishing Co-operative, the Turkish Association for the Protection of Nature and Natural Resources – Foça Branch (TTKD-Foça) and SAD-AFAG, took legal action against the Ministry of Agriculture and Rural Affairs in public court. Assisted by the Izmir Lawyers Environmental Movement, the legal action, taken on 21 April, requested the court to amend the following clauses within the Aqua Products Circular:

**Item 16/4:** All purse-seine nets used with mechanical or man-powered winches may be used (depending on seasonal restrictions to be applied in various geographical areas) within a depth limit between 7.3 and 18 metres.

In contrast, the declaration of the Artisanal Fisheries Symposium recommended that "The depth limit for the purse-seine fishery must be increased to 40 metres from 18 metres; and any kind of coastal seines should be prohibited."

**Item 17/2:** Lampara fishing is banned between 1 May – 1 September 1999 and 1 May – 31 August in the Aegean.

The Izmir Symposium, on the other hand, recommended that "The Lampara fishery should be forbidden between December and February in Izmir Bay." [Lampara is a form of night purse-seine fishing – *girgir* in Turkish, *grigri* in Greek – utilising powerful lights.]

**Item 18:** Live catching of small fish for aquaculture installations is permitted in the mouth of the Seyhan River in Adana. [In the previous circulars there was no regulation on live catching of small fish for aquaculture installations.]

In contrast, the declaration of the Artisanal Fisheries Symposium states that "Live catching of small fish for aquaculture installations must be prohibited."

**Item 18/6** (amended on 7 April 1999): All types of coastal seines will be banned by the year 2001 in the Aegean.

The declaration of the Izmir Symposium reads: "The depth limit for the purse-seine fishery must be increased to 40 meters from 18 meters; and any kind of coastal seines should be prohibited *now*."

Following defence submissions by the Ministry of Agriculture and Rural Affairs' Legal Consultant, the court, on 24 of August, decided to suspend execution of the entire Circular until such time that the court could appoint a scientific expert to recommend a decision on the contested clauses. In all probability, the expert will be a staff member of one of Turkey's 14 Aqua Products faculties.

Meanwhile, the Izmir Lawyers Environmental Movement, acting on behalf of the plaintiffs, has sent a letter to the Minister of Agriculture and Rural Affairs seeking assurances that the requested amendments be instituted within 30 days of the court's final decision, as required by the Turkish Constitution.

However, on 20 October it was learned that the Ministry had appealed the decision of the court to suspend enactment of the Aqua Products Circular. The court has accepted the appeal. The case continues. – Harun Güçlüsoy, SAD-AFAG.

## **Effective guarding in the Foça SPA?**

In its July meeting, the Foça Monk Seal Committee, comprising the Municipality of Foça, the Foça Fishing Co-operative and other relevant stakeholders, discussed "the effective guarding of the Foça SPA" – an issue that has been the focus of growing controversy in recent years.

At present, guarding activities largely depend on a single patrol boat, *Çevre*, that was donated to the Municipality of Foça and the Foça Governorship by the Ministry of Environment.

The Committee decided that an operational plan for the patrol boat, drafted by the Environment Protection Unit Directorate of the Foça Governorship, be circulated among Committee members for further study and comment. An approved version of the plan was released on 19 August, accompanied by a request that all relevant parties nominate representatives to perform patrolling duties on the *Çevre*. The parties include: the Municipality of Foça (Coastal Protection Unit), the Foça Police Department (Marine Police), the Ministry of Agriculture and Rural Affairs (Foça Directorate), the Foça Environment Protection Unit Directorate, the Foça Health Group Presidency, the Foça Harbour Directorate, the Foça Fishing Co-operatives (as a witnessing participant) and SAD-AFAG (also as a witnessing participant).

The pollution and Aqua Products fishing controls would be performed by two different teams,

specifically responsible for such the matters.

By the end of September, the only representatives yet to be appointed were those from the Municipality of Foça's Coastal Protection Unit. Properly scheduled patrolling activities are unlikely to begin until that process is finalised.

As the captain of the *Çevre* reported recently, the patrol boat has gone out into the Foça SPA only three times since May 1999. – Harun Güçlüsoy, SAD-AFAG.

## Volunteer help for the monk seals of the Aegean

SAD-AFAG's Central Aegean Project, based in Foça, continues to promote its Volunteer Help Programme. Volunteers participate in research and public awareness activities, and assist in the processing of data. Between July 1993 and November 1998, 55 Turkish and foreign volunteers joined the project and participated in its activities. By involving volunteers in public awareness activities, a total of 14,854 people in Foça could be informed about the conservation process.

A poster presentation on the volunteer help scheme will be given at Medcoast 99 (the Fourth International Conference on the Mediterranean Coastal Environment) in Antalya, Turkey, 9 – 13 November 1999:

**H. Güçlüsoy, M. Theunissen, K. Turi Nagy, Y. Öztürk.** Volunteer help for the monk seals of the Aegean.

A copy of the paper will be available from the [Monachus Library](#) in due course.

Those interested in participating in the Central Aegean Project's Volunteer Help Programme should visit the following web site: [http://www.ecovolunteer.org/pro/pro13/pro1\\_13.htm](http://www.ecovolunteer.org/pro/pro13/pro1_13.htm). – Harun Güçlüsoy, SAD-AFAG.

## New pups reported from Cilician Basin

AFAG's Cilician Basin project has reported the birth of two new monk seal pups during the summer season. The research team, which had been observing two pregnant females since August, recorded the birth of one pup (to a female known as Anac) in early October. The second pup was born to a female code-named Yasli, who had previously not been identified as being pregnant. The team still hopes to discover additional newborn pups during the winter period. – Ali Cemal Gücü.



© Ali Cemal Gücü, SAD/AFAG  
A Cilician pup known as Ney, born in 1998.

## Adopt-a-Seal project yields mixed results...

SAD-AFAG's Adopt-a-Seal project, operated in association with Turkey's WWF affiliate in Istanbul, DHKD, has now drawn to a close. The 1998–1999 initiative was launched with both fund raising and public-awareness in mind. Investments in time and material, however, proved extensive, requiring the design and production of 1000 T-shirts, 700 caps, 60 seal toys, 1000 posters, 1000 brochures, 2000 "Sudaki Çocukumuz" Newsletters, 300 adoption certificates and 2000 letters.



Advertisements in the mass media promoted the initiative. During the project's duration a total of 520 people applied for further information, of which 147 became Adoption members, yielding an income of \$16.500. While a part of this was absorbed in organization and promotion of the project, the remainder was committed directly to the protection of the monk seal. – Yesim A. Öztürk, SAD-AFAG.

## New Web Address

The Mediterranean Seal Research Group (AFAG) has established a new Internet presence in recognition of its status as a partner organisation of the Underwater Research Society (SAD). The AFAG section of the new SAD site, which can be accessed through the "Research Groups" option, provides information in both English and Turkish. It covers the history and objectives of the organization, provides information on monk seals both in Turkey and abroad, and lists projects and activities. The site can be found at: <http://www.sad-uwrs.org> – Cem O. Kiraç, SAD-AFAG.

## SAD-AFAG launches membership drive

In early June SAD-AFAG (Underwater Research Society-Mediterranean Seal Research Group) launched its new **Mediterranean Seal Volunteers** membership drive. The aim of the programme is to recruit a large group of people willing to commit some of their time and talent to helping the monk seal.

Promoting the initiative, adverts were placed in magazines and aired on three different radio stations. On one station, the membership drive was broadcast over a period of about two months. Numerous smaller articles and news items have appeared in local bulletins and newsletters.

Those opting for membership of the Mediterranean Seal Volunteers are awarded a special certificate every year, reflecting the life cycle of a monk seal, from pup to juvenile, to adult. Volunteers also receive a newsletter every four months, providing information on the species, its habitat and the threats against it, and news of conservation efforts. Members can also contribute their own articles or letters.

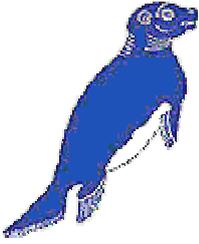
Members are also asked, in effect, to become representatives of AFAG, contributing to the monk seal conservation effort by providing information on seal sightings and illegal activities that threaten seals, and by spreading the word on the need to protect the species. Volunteers are also asked to attend AFAG meetings that are held in Ankara, Boz Yazı and Foça.

Since its June launch, the Mediterranean Seal Volunteers have attracted 143 new members, 45 from Ankara, 39 from Istanbul, 34 from Izmir, 19 from other Turkish cities and 5 from abroad.

Annual membership of the Mediterranean Seal Volunteers costs 5 million Turkish Lira (3 million TL for students). For members outside of Turkey, the annual dues are \$20. – Yesim A. Öztürk, SAD-AFAG.

See also [Letter to Derya](#), this issue.

If you are interested in joining the Mediterranean Seal Volunteers, please contact Yesim A. Öztürk at the [SAD-AFAG Ankara office](#).



## Cover Story

### HOW TOURISM HAS RUINED THE COASTAL HABITATS OF THE MONK SEAL ON THE BODRUM PENINSULA, TURKEY

Yalçın Savas

SAD-AFAG

Underwater Research Society / Mediterranean Seal Research Group

The Bodrum Peninsula can be counted among the regions in Turkey where coastal natural habitats have, to a great extent, been ruined. The main causes for habitat destruction in the region are excessive urbanisation (mainly by secondary summer houses), domestic pollution which increases in the summer season, and both illegal and legal fishing methods over sea grass meadows in shallow coastal waters. Alongside habitat destruction, extensive human activities resulting from increased tourism facilities causes disturbance to surviving populations of endangered mammal, bird and plant species – such as the monk seal *Monachus monachus*, Audouin's gull *Larus audouinii*, Eleonora's falcon *Falco eleonora* and the sea lily *Pancreatium maritimum* – on the remaining undeveloped coasts and islands.

The numerous islands of the Aegean and its mainland coasts provide habitat for the largest surviving population of *M. monachus* (Sergeant *et al.* 1978). The monk seal has survived here for thousands of years and, even today, the seal's historical influence upon the cultures of the region can be detected in the many geographical landmarks that bear its name (Johnson & Lavigne 1999).

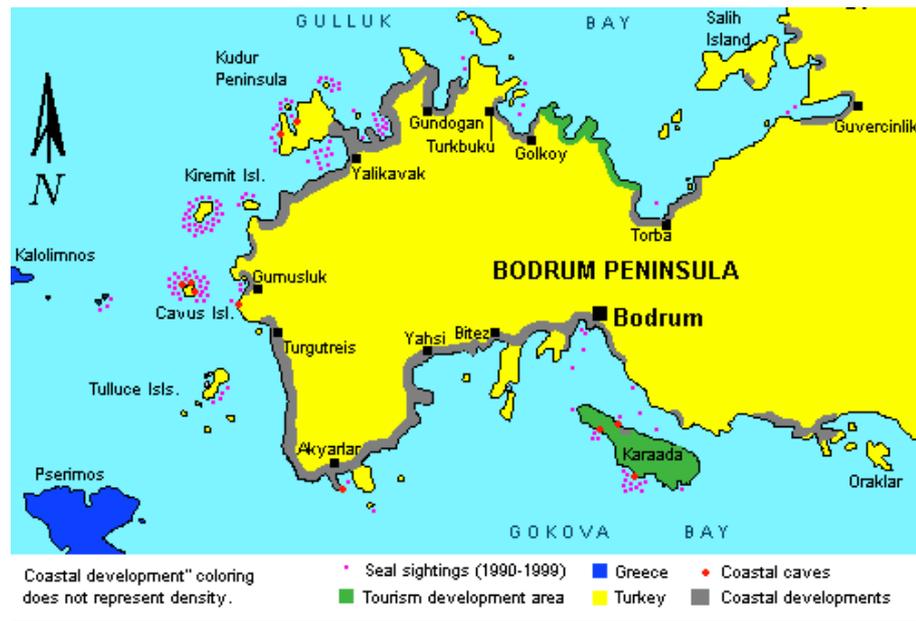


The Bodrum Peninsula from Karaada island.

Bodrum's sub-peninsulas and off-lying islands that have so far escaped development have the typical characteristics of Mediterranean monk seal habitat, and continue to host a small population of the species.

#### Bodrum Peninsula

Bodrum Peninsula is situated on the southwest coast of Turkey, in the eastern Aegean. The Peninsula extends 42 km in the E-W direction and 6 km – 23.8 km in the N-S direction between the bays of Güllük and Gökova. Covering an area of 649 km<sup>2</sup>, its highest elevation is measured as 690m (Kantarci 1998). The Bodrum Peninsula is surrounded by 32 islands and islets (Savas *et al.* 1998, Karauz *et al.* 1998) and forms a 174 km long coastline (Güner & Girgin 1998).



The town of Bodrum, which was famous in history under the name *Halicarnassos*, is the administrative centre of the Peninsula.

The rich natural diversity of the area is particularly noteworthy. On the Peninsula, 398 km<sup>2</sup> out of 649 km<sup>2</sup> (61.3 %) are covered by woodland and maquis, which are registered as "forest areas" (Kantarci 1998, Güner 1998). A recent ornithological study identified 147 bird species in the region, including Eleonora's falcon and Audouin's gull, and concluded that the Peninsula's most important bird areas are the islands, and the forested coastal strip between Torba and Güvercinlik, on the northern coast (Karauz *et al.* 1998). In studies of flora, 168 taxon were identified on the Peninsula, with the number rising to about 1000 in the wider area. The reptiles living on the Peninsula are represented by 36 species (Baran 1994).

The monk seal, one of the best known wild species in the region, continues to survive within the archipelago and along some of the unspoiled coasts of the Peninsula. At least four different individuals have been identified in recent studies (Savas *et al.*, 1998).

### Once upon a time in Bodrum: Seals, sponges, tangerines...

The first record of the monk seal's existence around the Bodrum Peninsula was provided by Ottoman naval officer and geographer Muhiddin Piri Reis in his book "Kitab-i Bahriye". In this guide to Mediterranean coasts and harbors, a cove on the western coast of the Peninsula is named as "Ayı Balığı Körfezi" (The Seal Bay) (Piri Reis 1519).

Since the late 1970s, various researchers have provided data on the monk seal's status around the Peninsula (Berkes *et al.* 1978, Gungor 1981, Berkes 1982, Marchessaux 1987, Mursaloglu 1992, Öztürk 1995, Kirac & Veyerli 1996, Savas *et al.* 1998). All are agreed on a year-round presence of seals in the area, and have suggested population sizes ranging between 8 – 3.

The Bodrum Peninsula became Turkey's center for sponge diving in the early 1930s – an activity that thrived for half a century (Yılmaz & Buhan 1998). During this period, sponge diving and citrus plantations – particularly the cultivation of tangerines – were the main economic interests of the region (Bodrumlu 1945). Small *tirhandils* (a traditional Aegean wooden boat, 8-10 meters long) would set sail in late spring, packed with divers, a couple of sacks of hardtack and a lot of hope for the new, 6-month sponging season. Some set a course to the north to the Dardanelles and the Sea of Marmara, while

others headed south to the Turkish – Syrian border. With the light morning breeze coming down the hills of Bodrum through the lemon and tangerine plantations covering the coasts, the boats would head off into the Aegean, the old sponge divers looking earnestly over the surface of the sea. They believed that the first animal to be seen at the very beginning of the first journey of the first day of the new season, should be a "foça" (a monk seal), since this would bring better luck for safe dives and a profitable season.

Today, it is a rather different story. The coasts are now dominated by secondary summer houses and touristic investments, the tangerine plantations have shrunk into insignificant patches, the sponge fishery has collapsed, divers have turned to tourism for their livelihoods, and that symbol of good fortune, the monk seal, is becoming rarer and rarer, having been transformed into a pest by fishermen and fish farmers.

### **Metamorphosis – from sponge fishery to tourist centre...**

Up until the early 1960s, Bodrum was virtually isolated from the rest of Turkey and retained its character as a small fishing town (Güner 1998). Then the writer Cevat Sakir Kabağaçlı, who settled in the town after completing his prison sentence in Bodrum Castle, began to publish stories about sponge divers, fishermen, captains, sailors, seals and the daily lives of the locals. The stories introduced an unknown facet of life to the intellectuals living in Turkey's big cities and appealed to their sense of curiosity. Kabağaçlı and his intellectual friends, in order to enjoy the unspoiled nature of the region and its local culture, began to organize boat tours every summer to the countless coves and bays around the Bodrum Peninsula, such as Güllük and Gökova Bays. Lasting one or two weeks, these boat tours were called "Blue Voyages" by Kabağaçlı and his friends. Years later they brought fame to Bodrum, establishing the region's most popular tourism activity.

Bodrum was provided with a better connection to the rest of Turkey after the dirt road to Milas was paved in 1968 (Güner 1998), and soon began to develop fame as a summer holiday resort. In the early 1970s, Bodrum was described as one of the "First Degree Tourism Development Centers" by the government (Güner 1998).

In 1974, the town was declared a "Monument City". Law No.1710 was designed to protect its unique architecture and urban landscape. Strict rules were applied to new constructions and the numbers of flats in a building were limited to two. Because of these restrictions on city centre development, investors turned their attention towards rural areas, particularly the coasts. As a result, land prices soared 5-10 fold. The locals began to sell their fields and plantations and to invest in tourist pensions, hotels and boats (Güner 1998).

Historically, most of the settlements on the Peninsula had been established inland, a few kilometres away from the coast to avoid raids by Christian pirates from the Aegean islands. After the mid-1970s however, as a result of the region's increasing popularity, the number of buildings and the population on the coastal strip surged. Tourism activities and investments continued to accelerate during the 1980s. The area also became an important employment centre, attracting manpower locally and from other Turkish cities. Consequently, the human population of the Peninsula increased considerably. Today, it is known that 43.3% of the residents were not born in the region (Güner & Girgin 1998).



The coasts of the Bodrum Peninsula are now dominated by secondary housing.

The regulations limiting house apartment numbers to two caused both the older towns and new settlements to develop laterally, and to occupy larger areas. As a result, 13.4% of the Peninsula (86,96

km<sup>2</sup> out of 649 km<sup>2</sup>) and most of the coasts were covered by buildings (Güner 1998). Over the years, the areas allocated for tourism investments and the areas occupied by secondary summer houses increased more than two fold, exceeding even the areas occupied by towns (towns: 21,82 km<sup>2</sup>; tourism investments and secondary houses: 23,87 km<sup>2</sup>; area allocated for new tourism investments: 21,11 km<sup>2</sup>) (Kantarci, 1998). The Bodrum Peninsula has become the second largest centre in Turkey – after Kusadasi – for secondary houses. The number of secondary houses has now reached 120,000, equalling 5 apartments or houses per resident in the area (Gürdal 1998).

By the mid-1980s, Turkey was introduced to 'diving tourism' in Bodrum which, among sea-related touristic attractions, achieved a popularity second only to the 'blue voyage'.

Since the end of 1970s in particular, tourism has dominated traditional economies and consequently, some sponge divers, captains and seamen switched their occupations to yacht tourism and related businesses. This trend was spurred on after 1986, when sponge stocks in the Mediterranean were hard hit by an epidemic, and the local sponge fishery lost its economic importance (Yilmaz & Buhan 1998).

Besides tourism, aquaculture was another new industry that began to develop in coastal waters in 1980s. Starting from Yalikavak, the northern coasts of Bodrum Peninsula and Güllük Bay became Turkey's fish farming centre. After a number of years, the contribution of the aquaculture installations to the Turkish economy exceeded the income generated by tourism investments in the region (although it should be noted that the tourist sector is a major market for the aquaculture industry). The Bodrum Peninsula provides 19.5% of the total annual aquaculture products of Turkey (Kinacıgil *et al.* 1998).

### **The monk seal's fate...**

While secondary houses and touristic facilities were developing along the coasts, the monk seal's habitat on the Peninsula was also being occupied by humans. In recent years – except for some sub-peninsulas and islands – almost all the coasts of the Bodrum Peninsula have been developed or allocated as "tourism development areas". Even the "Seal Bay" of Piri Reis has been urbanised.

The importance of the islands around the Peninsula as monk seal habitat has been highlighted since the first studies in the 1970s (*e.g.* Berkes *et al.* 1978, Güngör 1981, Berkes 1982). Recent studies indicate that the Peninsula's islands and sub-peninsulas, currently spared from coastal development, are the remaining habitats of the seals in the region, and survivability of the species is strictly dependent upon their preservation (Öztürk 1992, Öztürk 1995, Kiraç & Veryeri 1996, Savas *et al.* 1998). Of the 144 seal sighting records collected around the Bodrum Peninsula between 1990-1999 by SAD-AFAG, 62.5% originated from the islands and islets, while 24.3% originate from the nearby Küdür Peninsula (map). It may therefore be concluded that the islands and Bodrum Peninsula coasts not yet ruined by coastal development should be preserved to protect the monk seal and the other threatened and endangered species of the region.

Excessive coastal urbanisation is not the only problem faced by Bodrum's seals. Human activities stemming from the presence of tourism facilities, which are concentrated on some coasts and islands, cause disturbance to wildlife and destroy the vulnerable vegetation of sandy beaches. Almost all the islands in the archipelago are used for diving or other tourism-related activities.

For the monk seal, it seems that one of the greatest problems is diving in and around the coastal caves on the south coast of Karaada Island. Though this practice was prohibited by the annual Fishery Circulars following an appeal by AFAG in 1991, some dive centres continue to take their customers into the caves used by the seals. Although recorded in off-season months, seal sightings in this area during the summer season are mostly nonexistent. One cave, at the north of Karaada Island, which was known for its monk seals in earlier times is currently exploited by tourism interests for its thermal spring. The cave lost its importance to the seals with the construction of a nearby hotel and the building of a pier at the entrance of the cave, which facilitated the mooring of tour boats and acted as a dam to retain the cave's thermal waters.

Although they were believed to bring bad fortune if killed and good fortune if met on the sea, seals were sometimes killed in the past. And while seal hide and blubber were used as drugs in traditional medicine, seals were not subjected to commercial hunting, either in Bodrum or elsewhere along Turkey's Aegean and Mediterranean coasts. Even today, old people can still be found on the Bodrum

Peninsula who jealously conserve their small fragments of seal hide or their few drops of seal oil in order to treat an illness they describe as "foça" (seal) sickness (Kıraç & Veryeri 1996).



A male monk seal sighted at the Islands of Çavuş and Kiremit off the Bodrum Peninsula.

Today, the risk of deliberate killing of the region's seals may be higher than in the past. Small scale fishermen and aquaculture investors see the animal as a pest – although, despite rumours over the last seven years, AFAG has yet to gather any firm evidence that fish farmers have targeted seals.

While the competition between the seals and small scale fishermen may be thought natural, its intensity is often heightened when fish stocks are overexploited – a common phenomenon along Turkish coasts.

The fish-farm problem can be solved relatively easily by technical means, even if the operators of these facilities are a potentially greater threat to the seals than Turkey's traditional fishermen. The most effective way to keep the seals out of the fish pens is a 'predator' or 'protection' net, strong enough to withstand attack by seals. The first reported incident of seals causing damage and fish losses to aquaculture installations occurred during the winter of 1992–1993 in Yalıkavak, on the NW coast of the Bodrum Peninsula. Since then, such attacks have occurred every winter in different regions of Turkey. Fish-farm owners have hesitated to invest money in predator nets, even though the value of their fish is worth at least 40–50 times more than the cost of the nets. Instead, they prefer to use shotguns as seal-scaring acoustic harassment devices, which seems ineffective in most cases. Sooner or later, the seals attack the fish pens in search of food, liberating the fish in the process.

On the north coasts of the Bodrum Peninsula, aquaculture and tourism investors are fighting each other over control of the bays, with both groups claiming that their sector is the most important economically.

## Attempts to change the fate of the Bodrum Peninsula

Over the years, some efforts were made to implement conservation measures in the area. In 1971, a "Long Term Development Plan for Halicarnassos Sea Shore National Park" was prepared by the Authority for National Parks in cooperation with the United States National Park Service and with the assistance of the United States Agency for International Development (OGM 1971). However, it appears that increasing property values in the region doomed the plan to failure. The best chance of saving the Bodrum Peninsula was lost forever.

The first monk seal protection zone in Turkey was established in 1990, on the western shores of Kūdūr Peninsula by the Municipality of Yalıkavak, and was confirmed by the Ministry of Development.

During the 1990s, some of the islands and the sub-peninsulas were declared 1<sup>st</sup> Degree Natural Sites by the Turkish Ministry of Culture. Some of these areas were proposed by local NGOs and through civil initiatives. In late 1998, the entire Kūdūr Peninsula was declared a 1<sup>st</sup> Degree Natural Site and a "seal habitat" as a result of AFAG's proposal and study reports.

Gündogan Peninsula on the northern coast and the adjacent islands (about 14,95 km<sup>2</sup>) were declared a "wildlife protection zone" in 1997 by the Turkish Ministry of Forestry (Karauz *et al.* 1998).

Construction of a summer holiday village on Karaada Island was prevented in 1990 by AFAG and local NGO pressure.

Following the establishment of the Turkish National Committee for the Monk Seal, a local seal committee was established in Yalikavak, a small village on the northwest coast of the Bodrum Peninsula, in 1993. A year later, the Turkish Ministry of Agriculture (as a result of the Committee's recommendation) prohibited intensive fishing methods (trawls, seines, etc.) within 3 miles of the coast in the vicinity of Yalikavak and Gümüslük towns, including Kiremit and Çavus Islands (KKGGM 1994).

## Quo vadis?

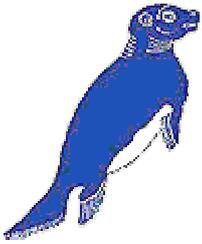
The Bodrum Peninsula continues to attract people and to retain its property values. Tourism investors seek new building sites and, as a result, new secondary houses are constructed. Only the protected shores, the islands and the forest areas are left undeveloped, and these are increasingly appealing to the tourism industry. The most recent fashion in Turkey is the marina. Marina investors are continually looking for unspoiled coasts, and claim that a marina's economic value is much greater than a seal's or turtle's. Kūdūr Peninsula was saved just in time from a marina construction when it was declared a 1<sup>st</sup> Degree Natural Site.

Bodrum is one of Turkey's more extreme examples of nature – tourism interaction. There are many other places along Turkish coasts where the question "Development or conservation?" should be a subject for discussion. While some monk seal habitats on the Turkish Aegean and Mediterranean coasts have been provided with some form of official protection in recent years, illegal construction and other pressures on these sites remain a cause for concern. SAD-AFAG and other Turkish NGOs continue to monitor illegal activities, but it seems that a great effort is still required in order to establish more stable and properly managed coastal protected areas in Turkey.

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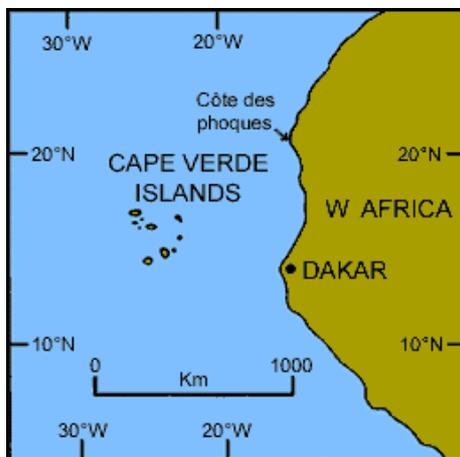


## In Focus

### **MONK SEALS IN THE CAPE VERDE ISLANDS** Accidental visitors or remnants of a local population?

**Cornelis J. Hazevoet**

The Cape Verde Islands are an archipelago of volcanic origin situated in the eastern Atlantic c. 450 km west of Senegal, West Africa. A former Portuguese colony, the islands became an independent republic in 1975. There are 10 islands and several smaller uninhabited islets. The more western islands are geologically the younger and these are mostly highly mountainous with steep and rocky cliff coasts. In contrast, the geologically older eastern islands of Sal, Boavista and Maio are much flatter and have large stretches of sandy beach as well as rocky coasts. Until recently there was no indication of the occurrence of monk seals in the Cape Verde Islands, although stray animals – presumably originating from Mauritania/Western Sahara – had been reported from Senegal and The Gambia (Israëls 1992).



In May 1990, German biologists found the skeletal remains of at least four seals along the southeastern coast of the island of Sal (Kinzelback and Boessneck 1992). Some of the bones were collected and these were identified as belonging to the Mediterranean monk seal, including an adult and a very young animal. It was assumed that these animals had died during the autumn of 1989. Nothing was heard again about monk seals in the Cape Verdes until 1996, when the present author was stationed on Sal in connection with research on Cetacea. On 23 April of that year, two US citizens temporarily resident on the island reported the sighting of a seal off the southwestern coast of Sal and their detailed description of the animal convinced us that they had seen a Mediterranean monk seal (Hazevoet and Wenzel 1997). Despite extensive searches during the following days, the animal was not sighted again. However, some fishermen that were interviewed about their knowledge of seals in

the area told us that they had seen *phocas* every now and then 'not very long ago'. During these interviews care was taken to avoid confusion with dolphins or sea turtles, both common in the area. The only other indication of the occurrence of seals in the Cape Verde Islands is a remark in a popular tourist guide, mentioning that it is 'not unusual' to see large seals at sea between the islands of Sal and Boavista (Matthews 1989). However, it has been impossible to check the reliability of that information.



The northern shore of Maio with the offshore islet of Laje Branca.

On the basis of the limited information available at present, it is impossible to say whether monk seals in the Cape Verde Islands are merely stray animals from populations elsewhere or if there exists a local population, be it perhaps only the remnants of one. It is therefore important that a thorough survey be conducted to establish the status of the species in the Cape Verdes. To start with, such a survey should probably focus on the three eastern islands of Sal, Boavista and Maio, both in view of their apparently more favourable habitat conditions and their closer proximity to the West African mainland. Such a survey should cover the entire coastline of these islands and should also include interviews with fishermen and other sea-going people, using multiple choice charts with pictures of marine animals that they may or may not recognize. In addition, a network of local correspondents could be set up to gather and forward information obtained from local people.

Since 1986, I have worked off and on in the Cape Verdes for prolonged periods, mainly in connection with ornithological research, particularly on seabirds. I have also worked on cetaceans and endemic landbirds and have been involved in several conservation projects in the islands. However, due to other commitments and also because, until recently, I was unaware of the possibility of monk seals occurring in the Cape Verdes, a comprehensive effort to gather data on these animals has yet to be made. Through my long term acquaintance with the islands, I have become thoroughly familiar with the local situation, both in a biological and a cultural sense. Although originally from the Netherlands, I speak both Portuguese (the official language in the islands) and the local vernacular *Crioulo*. This must be regarded as a major advantage for any researcher, because very few people in the Cape Verdes speak any foreign language, especially outside the towns.

In view of the perilous situation of the Atlantic population of the Mediterranean monk seal – particularly in light of the disastrous die-off that hit the Western Saharan population in 1997 – it is surely all the more important to clarify the status of the species in the Cape Verde Islands.

The author is currently attempting to locate funds for a preliminary 2 – 3 month monk seal survey in the Cape Verde Islands. Anyone able to offer assistance or advice should contact Dr Cornelis J. Hazevoet at: Museu e Laboratório Zoológico e Antropológico (Museu Bocage), Universidade de Lisboa, Rua da Escola Politécnica 58, 1250-102 Lisboa, Portugal, email: [hazevoet@fc.ul.pt](mailto:hazevoet@fc.ul.pt)

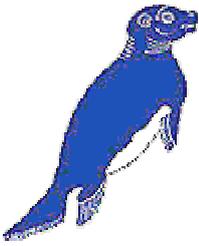
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## Monachus Science

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### MASS TOURISM and the MEDITERRANEAN MONK SEAL

The role of mass tourism in the decline and possible future extinction of Europe's most endangered marine mammal, *Monachus monachus*

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### ABSTRACT

Mass tourism has been implicated in the decline of the Mediterranean monk seal (*Monachus monachus*) since the 1970s, when scientists first began reviewing the global status of the species. Since then, the scientific literature, recognising the inexorable process of disturbance and loss of habitat that this economic and social activity has produced along extensive stretches of Mediterranean coastline, has consistently identified tourism as among the most significant causes of decline affecting this critically-endangered species. Despite apparent consensus on this point, no serious attempt has been made to assess the tourist industry's role, or to acknowledge and discuss its moral and financial responsibility, in the continuing decline and possible future extinction of *M. monachus*. In view of this,

we undertook a review of existing literature to identify specific areas in which tourism has impacted the Mediterranean monk seal. Our results provide compelling evidence that mass tourism has indeed played a major role in the extirpation of the monk seal in several European countries, that it continues to act as a significant force of extinction in the last Mediterranean strongholds of the species, and that the industry exerts a generally negative influence on the design and operation of protected areas in coastal marine habitats. There are compelling reasons to conclude that unless the tourist industry can be persuaded to become an active and constructive partner in monk seal conservation initiatives, it will eventually ensure the extinction of the remaining monk seals in the Mediterranean.

## INTRODUCTION

The Mediterranean monk seal (*Monachus monachus*, Hermann 1779) is Europe's most endangered marine mammal (Johnson & Lavigne 1998). It was identified as one of the twelve most endangered animals in the world in 1984 (IUCN 1984). Fewer than 500 individuals are thought to survive. Eradicated from most of its former range, the species is now mainly confined to two surviving populations, one occupying the Atlantic coast of northwest Africa, and the other, the eastern Mediterranean (Brasseur *et al.* 1997, Johnson & Lavigne 1999).

Historically, a variety of factors have been implicated in its decline, including direct killing by hunters and fishers, entanglement in fishing gear, human disturbance, deterioration and loss of habitat (Johnson & Lavigne 1999) and reduced breeding success (Texel 1990, Johnson & Lavigne 1998). Rather more recently, the risk of disease has also been recognised as a threat, particularly on the *Côte des Phoques* in the Western Sahara, where the largest remaining colony survives (Harwood *et al.* 1998).

While most scientific papers have ranked direct killing by fishers as the single most important mortality factor affecting the species, it is important to distinguish between the causes of adult mortality and causes of species decline. Although the two are interrelated, field research is better able to record specific instances of direct killing than to quantify decline due to factors such as disturbance, habitat deterioration and unsuccessful breeding (Berkes *et al.* 1979). As a result, direct killing (mortality) often has been mistakenly cited as – or implied to be – the major threat to the species, regardless of the fact that the limited available data do not allow a comparative evaluation between this and other causes of species decline (*e.g.* UNEP/MAP 1987, Dendrinis 1998).

Arguably, this deceptive quirk in data collection and analysis has also had its effect upon conservation strategies, persuading governments and non-governmental organisations (NGOs) to focus primarily on coastal fisheries and other threats while largely neglecting the potentially far more substantial problems posed by mass tourism (*e.g.* UNEP/MAP 1988). Nonetheless, a few researchers have recognised the distinction between factors of mortality and decline, seeing fit to categorise habitat destruction and disturbance, primarily by tourism, as the overriding threat to the species (*e.g.* Ronald & Healey 1976, Panou *et al.* 1993, Scoullos *et al.* 1994).



Fig. 1. August tourism on the Greek island of Kos.

There can be little doubt that trends in coastal urbanization have played a significant role in depriving the monk seal of habitat during the 20th century (Ronald & Duguy 1979). Driven by a burgeoning human population, expanding coastal settlements, and the construction of harbour facilities, military installations and road networks, urbanization has eaten into significant portions of seaside real estate formerly occupied by monk seals and other threatened and endangered species (Sergeant *et al.* 1979,

Berkes *et al.* 1979), including sea turtles *Caretta caretta* and *Chelonia mydas* (Yerli & Demirayak 1996).

A major incentive for much of the urbanization along the Mediterranean coastline is mass tourism. This lucrative industry has been the driving force of economic development in the Mediterranean since at least the 1960s and, in many areas, it is also the engine that spurs demand in other relevant sectors of the economy, such as the construction and fishing industries (Holdsworth 1993, Karavellas 1994). Tourism has also been cited as the cause of a dramatic increase in human pressure on the Mediterranean monk seal since the 1950s (Ronald & Duguay 1979, Berkes *et al.* 1979, Sergeant *et al.* 1979). Today, the Mediterranean is one of the most popular holiday destinations in the world, its shores attracting over 110 million people every year, mostly in the high season summer months of July and August (Fig. 1) (Johnson 1988, Anon. 1995, WTO 1997).

To fill what we saw as a void in the available literature, we undertook to review and synthesise the available information relating to tourism's effects upon *M. monachus*. To facilitate this review, we relied on international conference resolutions and action plans spanning more than 20 years of field research and informed debate. In addition, we used various working papers (many of them presented to international conferences and symposia) to compile regional assessments, providing information on how tourism has affected monk seal populations in various countries within the historical range of the species. Finally, we drew upon these and many other secondary sources to analyse the tourism industry's historical threat to the monk seal, its current impact, and its ramifications for the future survival of the species.

## CONFERENCE RESOLUTIONS AND ACTION PLANS

### Rhodes, 1978

At the First International Conference on the Mediterranean monk seal, convened in Rhodes, Greece, by the United Nations Environment Programme and the International Union for Conservation of Nature and Natural Resources (IUCN), disturbance and habitat loss were identified as the overriding threats to the species. Noting that "uncontrolled tourism is a significant factor" in the decline of the Mediterranean monk seal, the conference concluded that, without undisturbed habitats for breeding and feeding, the species would soon become extinct. Recognising this, conference delegates agreed that the establishment of a network of marine sanctuaries was urgently required. Among its listing of priorities, the conference's detailed Plan of Action called for "prevention of specific activities likely to cause irreversible damage to the species, including abortions, or its habitats." In this respect, it was necessary to "regulate tourism, including diving and visits to caves or other areas where monk seals exist or have recently existed, regulate tourist development to safeguard habitats critical to the seal and prevent easy access to such habitats." In establishing a network of inter-connecting marine reserves for the species free from human disturbance and surrounded by buffer zones, the conference recognised a need to "increase awareness of people living near these areas and of tourists and fishermen visiting these areas" (Ronald & Duguay 1979).

### La Rochelle, 1984

Five years later, with little tangible progress to show in creating marine protected areas for the species, the Second International Conference on the Mediterranean monk seal, held in La Rochelle, France, largely reiterated the priorities established at Rhodes, and indeed, reproduced its Plan of Action verbatim.

In addition, the conference heard that "the estimated 400 monk seals that exist within the Mediterranean are under direct threat from the increased pressures of tourism. Tourists may offer direct competition for the beaches used previously by the seals as breeding sites. They may further compete with the seal by their transportation and accommodation requirements" (Ronald & Duguay 1984, Ronald & Yeroulanos 1984).

### Strasbourg, 1986

In 1986, the Council of Europe convened the first meeting of its Group of Experts on the Mediterranean Monk Seal (*Monachus monachus*), under the auspices of the Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats). Again, the establishment of marine reserves was considered the overriding priority for action. The meeting report states that:

"Uncontrolled tourism [is] a cause of frequent seal disturbance, especially the disappearance of suitable breeding areas and direct harassment of animals." It was also stated that, within the core zones of monk seal sanctuaries, no tourism or boat movements should be permitted.

Recognising that conservation priorities remained fundamentally unchanged since previous conferences, the Standing Committee of the Bern Convention (based on the findings of the Group of Experts) simply co-opted the priorities set by the 1984 La Rochelle conference for its Recommendation to the Contracting Parties (Council of Europe 1986b). The Recommendation was prefaced with a statement portraying the monk seal as a species in grave danger of extinction, and called upon the Contracting Parties (among other proposed measures) to establish, within two years, marine and coastal habitat protection programmes which would recognise the species as being of critical importance (Council of Europe 1986a).

### **Genoa, 1985**

Under the auspices of the Mediterranean Action Plan (MAP), the United Nations Environment Programme (UNEP) published an Action Plan for the Management of the Mediterranean monk seal in 1987. This was in response to its obligations under the Barcelona Convention (Convention for the Protection of the Mediterranean Sea against Pollution), whose signatory governments, in their Genoa meeting of September 1985, agreed that "among their priority targets to be achieved by 1995 [was] the protection of the Mediterranean monk seal" (UNEP/MAP 1987, 1988). This document, reprising many of the measures deemed vital to save the species from extinction nine years earlier at the Rhodes conference, noted that "populations of the Mediterranean monk seal have declined rapidly and drastically." As such, "concerted and effective action by all countries of the Mediterranean concerned is required in order to reverse this trend." The two major threats to the species were listed as "deliberate or accidental killings of adults mostly by fishermen, and human disturbance of breeding areas." These threats were both intensifying "as men and seals compete for increasingly scarce resources." In its list of proposed conservation measures, the Action Plan states that:

- "A network of marine reserves should be created across the Mediterranean... Monk seal reserves should protect suitable caves or other breeding and resting areas, and should be surrounded by a buffer zone... Coastal development should be restricted to compatible activities, and intensive tourist development should be avoided in these zones..."
- "Tourist visits or other human disturbance of breeding and resting sites should be carefully regulated; it should be completely prohibited during the seal breeding season and while pups are young."
- "Special information activities should be developed for tourists and the tourist industry in areas where tourism threatens breeding areas" (UNEP/MAP 1987, 1988).

### **Athens, 1988**

The Joint Expert Consultation on the Conservation of the Mediterranean Monk Seal, a meeting convened in Athens in January 1988 by the United Nations Environment Programme (in association with the International Union for Conservation of Nature and Natural Resources – IUCN), attempted to further define conservation priorities. The report of the meeting, while recording a continuing decline in population numbers in all areas except Mauritania, notes that there was general agreement among participants that "disturbance by tourism" was one of the "major threats to the continued survival of the Mediterranean Monk Seal" (UNEP 1988). As part of an intensive and international public awareness campaign to prevent the extinction of the species and promote its recovery, the meeting recommended that the monk seal be adopted as the symbol of Mediterranean conservation; that (multimedia) information packages "be developed quickly" to target specific sectors of society, including tourists, and that financial support for such measures be solicited from the business community (UNEP/MAP 1988).

### **Texel, 1990**

A meeting of a more specialised nature was convened in Texel, the Netherlands in 1990 to consider the risks and merits of captive breeding and other *ex situ* conservation measures for Mediterranean monk seals. Recognising disturbance and loss of habitat as a major factor in the species' continuing decline, the meeting concluded that "the establishment of protected areas which include monk seal pupping sites is undoubtedly the most effective way to preserve the species in the wild." The report of the meeting goes on to caution that detailed management plans, and a long-term commitment of funds

and other resources are required in order to establish such areas effectively. Without such commitments, "there is a risk that the publicity associated with the establishment of a protected area may actually increase disturbance to the seals in the area" (Texel 1990).

#### **Rabat, 1994**

The next international conference on the species (the Meeting of Experts on the Evaluation of the Implementation of the Action Plan for the Management of the Mediterranean Monk Seal) took place in Rabat, Morocco in October 1994, again under the auspices of UNEP's Mediterranean Action Plan (UNEP/MAP) and its Regional Activity Centre for Specially Protected Areas (RAC/SPA) in Tunis. As in all UNEP/MAP meetings on the species, the 1987 Action Plan was appended in conference documentation as a road map towards achieving internationally agreed conservation aims. In addition, the Rabat conference, in its Recommendations, called upon the Contracting Parties to the Barcelona Convention to ensure the effective implementation of adopted conservation measures, "in particular the strict control of potentially dangerous tourism activities" (UNEP/MAP 1994a).

#### **Arta, 1998**

UNEP/MAP convened its follow-up conference in Arta, Greece, in October/November 1998 (Meeting of Experts on the Implementation of the Action Plans for Marine Mammals (Monk Seals and Cetaceans) Adopted Within the Mediterranean Action Plan). Despite the fact that four years had elapsed since the Rabat gathering, the Recommendations of the Arta meeting largely reiterate previously identified priorities. For the most part, the tendency towards such repetition is largely due to unfulfilled commitments on the part of governments and inter-governmental organisations (Johnson & Lavigne 1998, Johnson 1998d). Among listed priorities was the establishment of a network of marine reserves: the meeting recommended that "already identified sites important for the conservation of the species [to] be urgently protected and appropriately managed." In parallel, "Protected sites should be extended to include all valuable habitats for monk seals, aiming at the creation of a network of protected areas." The meeting also heard that on the island of Zakynthos there was strong pressure from tourism, especially around breeding caves (UNEP/MAP 1998a).

## **REGIONAL ASSESSMENTS**

### **Atlantic**

#### **Madeira**

Prior to the establishment of a Nature Reserve in 1990, which severely curtailed public access, the monk seal colony around the Desertas Islands of Madeira was considered to be on the verge of extinction, its drastic decline attributed both to fisheries interactions and "disturbances caused by tourists" (Reiner & dos Santos 1984). Threats posed by tourism were regarded as being particularly acute. Scuba diving was gaining popularity and intrusion into caves was becoming a regular occurrence. Severe impacts on breeding success were suspected (van Haaften & Reiner 1984). Only strict enforcement of regulations has since eliminated tourism pressures as a threat to the monk seal population in the Desertas (Rosa Pires, *pers. comm.* 1999).

### **Western Mediterranean**

#### **Morocco**

Tourism development expanding into remote stretches of Morocco's Mediterranean coastline, traditionally a preserve of small-scale local fishers and monk seals, has been cited as a potential threat to surviving, remnant colonies (UNEP/MAP 1988).

#### **France & Corsica**

Tourism played a major role in the ultimate extinction of the monk seal in French waters in the early 1970s. Along the continental coastline, tourism and industrial development brought irreversible changes to monk seal habitat (Marchessaux 1988a, UNEP/MAP 1994b). "Explosive development" of tourism in Corsica and human demands for coastal real estate followed the same pattern. The last two

monk seals were reportedly killed off Corsica only some months before a Regional National Park was established (Duguy & Cheylan 1979). With coastal development and human pressure on former monk seal habitat unabated, recolonization is unlikely, and reintroduction is generally regarded as futile (Ronald & Duguy 1979).

## **Spain**

As in France, tourism was blamed for irrevocably depriving the monk seal of suitable habitat along virtually the whole of the continental coast of Spain (Marchessaux 1988a, UNEP/MAP 1994b). The species appears to have disappeared from Spain's Balearic islands several years later. Though once frequenting the coasts of the northern islands of the archipelago – Minorca, Majorca and Cabrera – (IUCN/UNEP 1988, Avella 1979), the species is reported to have vanished from the region by the 1960s, due in large part to tourism pressures (Avella 1984, UNEP/MAP 1994b).

## **Central Mediterranean**

### **Algeria**

Historically, hunting and overfishing pressures have been blamed for the decline of the monk seal in Algeria, although, for various cultural and religious reasons, fishers have traditionally refrained from persecuting the animals (UNEP/MAP 1994b). While recent political upheavals may have impacted economic development, increasing tourism is still cited as a major threat to the habitat of the monk seal and its continued survival (Boutiba 1998).

### **Croatia**

A boom in tourism is also largely responsible for eradicating the monk seal from the Adriatic coasts of the former Yugoslavia (Croatia, Montenegro). At the 1978 Rhodes conference, explosive growth in tourism and other coastal developments were cited as the primary causes of the species' dramatic decrease (Gamulin-Brida 1979, Ronald & Duguy 1979) in the area. Surviving seals were suffering increasing harassment by tourist boat traffic, particularly high speed motorboats (Gamulin-Brida 1979). By the early 1990s the monk seal population had dwindled to a handful of individuals, clinging to survival along the most remote coasts and islets. But with boats and yachts invading even these isolated areas, Croatian naturalists reiterated their view that tourism now constituted the main threat to the survival of the species (Draganovic 1994). The species is now considered to be virtually extinct throughout the Adriatic (Antalovic 1998).

### **Italy & Sardinia**

Tourism has also been cited as one of the most important factors in the decline and extinction of the monk seal in Italy (Boitani 1979, Ronald & Duguy 1979, IUCN/UNEP 1988, Ardizzone *et al.* 1991, Anon. 1994c, Johnson 1998a). In particular, disturbance and destruction of habitat caused by tourism has been implicated in the disappearance of the species (and effectively preventing any possible recolonisation) in several key areas, including the Marettimo Islands off Sicily, Montecristo – where the species was still seen regularly in the late 1970s (Boitani 1979, Ronald & Duguy 1979) – the Tuscany archipelago (Guarrera 1999) and the east coast of Sardinia, particularly the Gulf of Orosei (Johnson 1998a). Following a familiar pattern, growth in high-intensity tourism, including pleasure boating and sports fishing, was responsible for bringing human harassment and disturbance into the last refuges of the species (Ardizzone *et al.* 1991). Warnings that summer boat traffic was causing potentially lethal disturbance to seals during the August-September pupping season largely fell on deaf ears (Ronald 1982). Notwithstanding rare sightings (possibly of animals dispersing from other geographical regions) the species now appears to be effectively extinct in Italian waters (Johnson 1998a).

### **Tunisia**

Concerns over tourism's impact on the monk seals of Tunisia were first heard in the mid-1970s. Ronald & Healey (1976) warned that increased disturbance by pleasure boats and skin divers were causing a reduction in the population that survived, mainly in the Galite archipelago. By the 1980s, the monk seal in Tunisia had been virtually eradicated and was considered effectively extinct (Brasseur *et al.* 1997, UNEP/MAP 1998b).

## Eastern Mediterranean

### Cyprus

The monk seal population in Cyprus has also suffered a rapid decline in recent decades and was described as being on the verge of extinction in 1988. The cause was attributed mainly to rapid tourist development along the coasts of the island (Anon. 1988b). In particular, tourism and recreational activities have long been considered a threat to existing breeding areas (Hadjichristophorou 1991, Hadjichristophorou & Demetropoulos 1994, Dendrinou & Demetropoulos 1997, Panos Dendrinou, *pers. comm.* 1999). Efforts to establish a marine park in one of these breeding sites (Akamas-Latchi) have been subject to long bureaucratic delays and political controversy (Hadjichristophorou 1991, UNEP/MAP 1998a). Due to tourism pressures, extinction of the species around Cyprus may be imminent.

### Greece

Despite lingering uncertainties about actual numbers, the scientific consensus is that the surviving monk seal population in Greece has declined to perilously low levels. Aside from the traditional hostility of fishers, mass tourism, destruction of habitat by tourist developments and increasing pleasure boat activity are regarded as a significant factor in the species' decline (Marchessaux & Duguay 1977, IUCN/UNEP 1988, Kouroutos 1991, Dendrinou 1994, Scoullou *et al.* 1994, UNEP/MAP 1994b, Jacobs & Panou 1996).

In some areas, high-intensity tourism may have displaced the monk seal entirely. In others, it is likely to have had a severe impact on regional populations. Epitomising this phenomenon is the case of Kos, an Eastern Aegean island that embarked upon intensive tourism development in the 1970s. The island lies adjacent to the Bodrum Peninsula in Turkey, an area also marked by intensive tourism development in monk seal habitat (Kıraç & Veryeri 1996). Ronald & Healey (1974) estimated that as many as 20 seals frequented the southwest coasts of Kos in 1971/72. Kumerloeve (1976) warned that tourism was increasing in this once remote corner of the island, its scenic beauty already marred by hotel and road construction. A plea for a protected area to be established before the population was entirely exterminated went unheeded (Kumerloeve 1976, Sergeant *et al.* 1979). Within a decade, the coasts of Kos were dominated by high-capacity resort complexes, effectively depriving the monk seal of habitat (Fig. 2). Unfortunately, survivors are unlikely to have found refuge on the adjacent [Bodrum Peninsula](#) (once considered part of a regional, interacting population), where the species has also been brought to the verge of extinction. Indeed, a 1996 survey found only a few seals still inhabiting a region now dominated by urbanisation, summer house construction and tourism (Kıraç & Veryeri 1996).



Fig. 2. The southwest coast of Kos, now dominated by mass tourism.

### Turkey

A sharp decline and fragmentation of the monk seal population in Turkey was recorded during the 1970s (Berkes *et al.* 1979, Ronald & Duguay 1979). Because of the traditional reluctance of certain fishers to kill or injure the animal, it was considered likely that the Aegean and Mediterranean population was declining in direct proportion to coastline and tourism development and coastal overfishing (Sergeant 1984, Mursaloglu 1991, UNEP/MAP 1994b). True to general trends throughout the region, the increasing popularity of pleasure boating, diving and other water sports was considered a primary culprit in depriving the monk seal of adequate habitat (Berkes *et al.* 1979). Today, although

Turkish coasts remain one of the last refuges of the species, research suggests that tourism and habitat destruction represent the single greatest threat to its survival in the region (Kıraç *et al.* 1998).

## LEGISLATION

The destruction of critical monk seal breeding sites by expanding tourism continues despite obligations under international treaties. The **Bern Convention** (Convention on the Conservation of European Wildlife and Natural Habitats), for example, calls upon each contracting party to take appropriate and necessary legislative and administrative measures to ensure the special protection of the Mediterranean monk seal (as a species of wild fauna listed under its Appendix II). Specifically, the Convention prohibits "the deliberate damage to or destruction of breeding or resting sites" and also "the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention" (Bern Convention 1979).

Under the 1976 **Barcelona Convention** (Convention for the protection of the Mediterranean Sea against Pollution), the Mediterranean monk seal is recognised as a priority species (UNEP/MAP 1994b). The 1982 Geneva Protocol requires Contracting Parties to take all appropriate measures to establish marine protected areas in order to safeguard "...the genetic diversity, as well as satisfactory population levels, of species, and their breeding grounds and habitats..." (Art. 3, 2a). In 1985, the Genoa Declaration produced by the contracting parties identified the protection of the Mediterranean monk seal as among its priority targets to be achieved by 1995. The efficiency of the Convention and its various protocols in meeting its declared aims has, therefore, been the focus of criticism (Anon. 1995, Johnson 1998d).

The monk seal is also listed in the annexes of the 1979 **Bonn Convention** (Convention on the Conservation of Migratory Species of Wild Animals – also known as CMS). The Convention calls on contracting parties to enter into bilateral or multilateral agreements to safeguard migratory species, and to take whatever measures are required for the conservation of habitat (UNEP/MAP 1994b). While the monk seal may not be regarded as a migratory species as strictly understood by modern biological science, the species, because of regular feeding and seasonal movements, may often cross national boundaries. The Convention, however, has had little discernible effect in encouraging respective governments to cooperate in implementing practical conservation measures that recognise these movements.

Finally, the monk seal is listed as a priority species within the **European Union Directive on the Conservation of Natural Habitats and Wild Flora and Fauna** (Directive 9243 of 21 May 1992). The Directive requires relevant member states to establish special conservation areas for the species within 12 years of the date of notification of the Directive (UNEP/MAP 1994b). Greece is currently in the process of establishing several monk seal sanctuaries as part of this Natura 2000 initiative (Johnson 1998b, 1998c, 1999).

## DISCUSSION

### Assessing tourism as a threat to the monk seal

Contrary to conventional wisdom, the threat of tourism to *M. monachus* began deceptively early in the Mediterranean. On the islet of Bisevo in the Adriatic, boats first ferried tourists into monk seal habitat and the famous Blue Cave in 1848 (Draganovic 1991). In 1935, two monk seals were captured by tourists in Sardinia (Lungo 1935). On the same island, the Grotto of Neptune, another well-known haunt of the monk seal, was first developed as a tourist attraction in 1958 and, by the 1970s, it was being visited by some 35,000 tourists every year (Scott 1972).

Monk seal numbers appear to have declined in inverse proportion to tourism's explosive growth along Mediterranean coasts. Today, the shores of the Mediterranean, home to 130 million people, act as a lure to a further 110 million tourists every year, many of them squeezed into the two high season months of July and August (Johnson 1988, Anon. 1995, WTO 1997). In the early 1980s, this was said to represent one-third of the entire world tourist trade, imposing an enormous burden on coastal and marine environments in terms of pollution, overfishing and habitat destruction (Lean 1982, Ronald &

Yeroulanos 1984).

There also appears to be little or no disagreement regarding the tourism industry's responsibility in contributing to the plummeting fortunes of the monk seal. From 1978 to 1998, all major scientific conferences focusing on *M. monachus* concluded that tourism poses a significant threat to the continued survival of the species (e.g. Ronald & Duguy 1979 & 1984, Council of Europe 1986a UNEP/MAP 1987, 1988, 1994).

Indeed, evidence suggests that expanding tourism has now assumed unrivalled significance in the fate of the species. In the Ionian and Aegean seas of Greece, for example, which hold the world's largest surviving monk seal population (Brasseur *et al.* 1997, Dendrinis 1998), it is now generally acknowledged that tourism and deliberate killing represent the two greatest threats to the species (Ronald & Duguy 1979, Jacobs & Panou 1996).

In contrast to other historical threats (such as hunting or entanglement in fishing gear) that have diminished over time (due in no small measure to population decline), the tourism industry holds the clear potential of presiding over the extinction of the species in the Mediterranean. There are at least two compelling reasons for drawing this conclusion. First, the surviving population largely occupies geographical regions now dominated by tourism (Brasseur *et al.* 1997). Second, mass tourism has already been implicated in the extinction of monk seal populations in extensive areas of the species' historical range, including Croatia, France, Italy, Spain and Tunisia (Fig. 3) (see [Regional Assessments](#)). In addition, it remains a serious and immediate threat throughout the species' last stronghold in the Mediterranean: Greece and Turkey.

The accumulated evidence suggests that mass tourism may be a particularly efficient exterminator of monk seals because of the multiple threats with which it confronts the species. We discuss these below.



Fig. 3. Mass tourism has been implicated in the eradication of the monk seal in several Mediterranean countries, including Italy.

### Loss of habitat through construction

Direct assaults on seal habitat through the construction of hotels, roads, marinas and other tourist amenities have long been recognised as a major threat to the species (e.g. Ronald & Duguy 1979, Berkes *et al.* 1979, Sergeant *et al.* 1979). Regrettably, monk seal research has never been geared towards a systematic collection of data capable of documenting the development of monk seal habitat. Nevertheless, several specific examples can be found in the scientific literature, suggesting that loss of habitat to tourism construction may be a common phenomenon, particularly where environmental impact assessments (EIAs) are inadequate or nonexistent.

In the Ionian Sea, a hotel construction project in the Straits of Ithaca was approved despite being in immediate proximity to caves frequented by seals (UNEP/MAP 1994b). Similarly, at Akyarlar Cape on Turkey's tourism-dominated [Bodrum Peninsula](#), a massive hotel complex has recently been constructed directly above a monk seal cave, despite an alleged EIA (Fig 4). This particular cave had been deemed suitable for both resting and breeding by monk seals (Kıraç & Veryeri 1996). During a visit to the area in 1997, local fishers stated that the cave was still intermittently occupied by seals, though for how much longer must remain seriously in doubt, since the resort complex at that time had not yet been completed.

A large and controversial hotel complex has also been constructed over a monk seal cave in [Cyprus](#) in the Asprokremmos area (Fig 5), jeopardising one of the species' few remaining habitat areas around the island (Dendrinios & Demetropoulos 1997, Panos Dendrinios, *pers. comm.* 1999).



Fig. 4. A hotel complex constructed above a monk seal cave on Akyarlar Cape, Bodrum Peninsula, Turkey.  
Fig. 5. A hotel complex constructed over a monk seal cave in the Asprokremmos area of Cyprus.

Despite the fact that specific tourism development projects have rarely been studied for their impact upon the monk seal, it appears likely that such construction has deprived the species of broad swathes of habitat, and continues to do so.

A case in point is the Cilician Basin on Turkey's Mediterranean coast. The dangers posed by tourism to resident monk seals were predicted by the late Turkish scientist Bahtiye Mursaloglu in 1984. Without rapid action to protect this area, claimed Mursaloglu, a stretch of coastal habitat virtually untouched by tourism development pressures would be lost forever (Ronald & Duguay 1984). However, tourism is now a burgeoning industry in the area, and is regarded as a serious threat to surviving monk seal populations (Karakoc & Karakoc 1997, Gücü 1998). Antalya and its environs – a major gateway to the Cilician Basin – is swelled by over 2 million people during the high season summer months, generating a self-perpetuating construction boom, pollution, degradation of sensitive wildlife habitat and archaeological areas (Holdsworth 1993).

## Loss of habitat through disturbance

While coastal development obviously poses its own brand of habitat destruction, the millions of tourists who flock to coastal resorts during the summer months may present an even greater threat to the survival of the monk seal.

Despite seeking refuge on barren, cliff bound coasts and islets, a boom in pleasure boating during the second half of the 20th century has meant that even the most remote and inaccessible shores have come under intensifying disturbance by tourism (Johnson 1988, Johnson & Lavigne 1999).

In Greece, researchers have recorded the monk seal's limited tolerance for human disturbance, with animals abandoning habitat when disturbance rises above certain critical levels (IUCN/UNEP 1988, Jacobs & Panou 1996). On the Ionian island of Kefalonia, increased disturbance by leisure boat traffic (including penetration into caves) was implicated in the decline of seal sightings during the high season (Jacobs & Panou 1996), a finding applicable to many other areas of coastal Greece (MOm 1996a, Archipelagos/MOm 1996, Karamanlidis 1997).

A similar phenomenon was also recorded in Turkey by Mursaloglu during cave surveys in 1980. Of the many deserted breeding caves discovered along the densely populated Aegean coast, all were found to be in close proximity to tourist activity, tourist resorts or industrial development. Conversely, Mursaloglu found that caves still actively used by seals were far removed from human disturbance. "Security against disturbance," she concluded, "is considered to be of utmost importance for the survival of the pup because of a long lactation period of four months and the related prolonged strict dependence on the mother" (Mursaloglu 1980, 1984).

The sheer numbers of beach-loafing and water-bourne tourists pose particular difficulties for monk seals, effectively evicting them from their habitat during the summer period. Researchers in Kefalonia, for example, comparing the numbers of tourists present in the habitat area in various months of the year, recorded a 1000% increase in individual tourists occupying beaches between the high and low

seasons and a similar rise in leisure boat traffic. In contrast, during the five winter months (November-March) the area received no tourism at all (Jacobs & Panou 1996).

While seals may return to their caves in the quiet off-season months (Harwood 1987a, WWF Mediterranean Programme 1994, Jacobs & Panou 1996, Karamanlidis 1997), evidence suggests that it would be wrong to downplay the significance of this phenomenon for two reasons: (1) The tourism season partially coincides with the monk seal breeding and pupping season, and (2) Tourism pressures are capable of destroying coastal habitat to such an extent as to rule out such seasonal behaviour (Jacobs & Panou 1996).

In the Gulf of Orosei in Sardinia, research during the mid-1970s indicated that seals abandoned caves during the holiday season, which brought 20,000 tourists a year flocking to the area. Confronted by numerous pleasure craft and speargun divers, it was concluded that the resident seals either found haul-out areas on more remote stretches of coast, or simply stayed out at sea for the duration (Bareham and Furreddu 1975). Ominously, perhaps, the monk seal is now effectively extinct in the Gulf of Orosei, notwithstanding strenuous efforts to exploit the species' ghost as a tourist attraction (Johnson 1998a).

Elsewhere, seals may continue to inhabit caves in the general vicinity of seasonal tourism build-up, but only if such shelters provide additional security from human disturbance (Jacobs & Panou 1996). Unfortunately, there is reason to suspect that the characteristics of some caves used by the monk seal as a refuge from persecution and harassment are inherently incapable of providing the habitat required to meet the biological needs of the species (Johnson & Lavigne 1999).

## Disturbance leading to deteriorating habitat

Accumulated evidence suggests that, in relatively recent history, disturbance and persecution has driven the Mediterranean monk seal into increasingly marginal habitats. A comprehensive review of this trend (Johnson & Lavigne 1999) records various phases in this progressive deterioration:

1. First, the animals were driven from the sandy beaches, shoreline rocks and promontories that offered habitat to relatively large colonies of seals in ancient times.
2. Next, the easily-accessible 'arching caverns', capable of accommodating small colonies of seals, eventually proved too vulnerable to hunting pressures and tourism disturbance (Fig. 6) (Bareham & Furreddu 1975, Johnson 1998a).
3. Then, the animals were displaced from smaller caves, capable of accommodating small family units, incorporating a beach for sleeping, giving birth and nursing of young, a barrier against storm surges, and possibly a 'nursery pool' for pups (Mursaloglu 1984, IUCN/UNEP 1988).
4. Finally, human disturbance reached caves of the same general size or smaller, that offered only limited protection from storm surges. While shelters of this type may sometimes incorporate underwater entrances cutting deep into rock faces – thus providing greater security from human harassment – they may also lack other essential characteristics (*e.g.* offering only a limited haul-out area or none at all).



Fig. 6. The great 'arching caverns' of the Mediterranean were once traditional habitats of monk seals, but eventually proved too vulnerable to hunting pressures and tourism disturbance.

While shelters of types (3) and (4) might be regarded as the bare minimum required to meet the biological needs of the species, research during the late 1970s indicated that numerous caves in use by the species fell below even this marginal standard (Anderson 1978 & 1979, Ronald & Duguy 1979).

The risks to the species are potentially far-reaching. As indicated above, habitat deterioration has acted selectively against colony formation, in favour of individuals or mothers with pups (Johnson & Lavigne 1999, Sergeant *et al.* 1979). By severely limiting social interaction, mating and breeding success has presumably been compromised (Johnson & Lavigne 1999). In addition, storm surges may cause breakers to funnel into caves, washing nursing or recently weaned pups into the sea to be swept away and killed (Anderson 1978 & 1979, Johnson & Lavigne 1999).

By the late 1970s, it was concluded that the cave habitat occupied by the monk seal may not be adequate for the survival of the species, and that some return to sandy beaches might be essential to promote recovery (Sergeant *et al.* 1979, Ronald & Duguy 1979).

However, with human disturbance and harassment increasing dramatically since then, there is evidence to suggest that cave habitat may be continuing to deteriorate. Certified divers and researchers in Turkey have recently discovered monk seals occupying underwater entrance caves that can only be accessed through narrow tunnels cutting almost a hundred metres into cliff faces (Cem Kiraç, *pers. comm.* 1998). In some areas, seals have been discovered inhabiting caves that are, in reality, little more than water-filled crevices. With no internal beach or haul out area, the animals are obliged to rest or sleep while floating in pools (Fig. 7) (IUCN/UNEP 1988, Johnson & Lavigne 1999).

It appears unlikely that caves of this type can meet the essential biological needs of the species. The same conclusion might also apply to less extreme forms of marginal monk seal habitat, where breeding viability is severely compromised by a number of factors associated with the characteristics and constraints of the habitat in question. These include reduction in gregarious behaviour (for which the species was so famed in antiquity), fecundity and pup survival (Anderson 1978 & 1979, Texel 1990, Johnson & Lavigne 1999).



Fig. 7. An adult female seal seeks shelter in a crevice-like cave on the Turkish Aegean.

## Effects on breeding

Tourism may also impact the monk seal's breeding success in a more direct way. As noted previously, while abandonment of caves may be a seasonal reaction to disturbance in certain areas, the fact that the disruption partially coincides with the seal breeding and pupping season may have insidious, long-term repercussions for the survival of the species.

Even where no harmful intent exists, disturbance caused by tourists entering into caves may have dramatic consequences. The behaviour of monk seals, when confronted by humans in caves, can also have unforeseen effects. In contrast to adults, alarmed pups tend to flee further into caves rather than into the open sea, thus rendering them particularly susceptible to deliberate harm, and exacerbating the likelihood of mother-pup separation (Ronald & Yeroulanos 1984, IUCN/UNEP 1988). Disturbance during the pupping season can seriously endanger the pup's chances of survival by breaking the maternal bond (van Haaften & Reiner 1984, Israëls 1992).

Disturbance has also been implicated in monk seals aborting their young (Ronald & Duguy 1979). At the popular *Grotta del Bue Marino* (Cave of the Sea Ox) in Sardinia, Bareham and Furreddu (1975)

discovered six aborted fetuses on a beach at the mouth of the cave between 1965-1970, possibly the result of tourist disturbance (Johnson 1998a).

Tourist development may also be responsible for disrupting breeding movements between seal populations. In the Eastern Aegean, for example, coastal tourism appears to be destroying monk seal habitat on both the Turkish mainland and Greek island coasts, possibly disrupting breeding movements that once sustained interrelated sub-populations (Berkes 1978, Ronald & Berkes 1979). The problem may be particularly acute in Kos and the [Bodrum Peninsula](#) (Kıraç & Veryeri 1996).

## Deliberate killing and harassment

Though available data are limited by under-funded research efforts, by the large geographical areas involved, and by the issue's potential sensitivity, there is evidence to suggest direct killing and malicious harassment of monk seals by tourists on certain occasions.

The last 3 monk seals in the Galite archipelago of Tunisia appear to have been killed by tourists, one of them speared by a snorkelling Italian diver (Anselin & van der Elst 1987, Johnson 1988, UNEP/MAP 1994b). A similar incident was recorded along the Aegean coast of Turkey (Berkes *et al.* 1979). There are also at least two reports of monk seals being killed by divers fishing with spearguns along the Mediterranean coast of Morocco (UNEP/MAP 1998b). Rather more incredibly, a survey of monk seal mortality published in 1991 revealed that one pup had been killed with a speargun by a snorkelling tourist and then eaten (Cebrian & Vlachoutsikou 1991). Van Wijngaarden (1969) also reported that two French tourists captured a seal on the *Côte des Phoques* with the intention of taking it home with them, although the animal's ultimate fate remains a mystery.

Occasionally, harassment (even if innocently motivated) may backfire on the tourist rather than the seal. A curious Austrian tourist approaching an ailing seal off Karpathos in 1997 suffered a bite serious enough to require emergency medical attention (a tooth had broken off in the wound). The seal was found dead a few days later, apparently due to natural causes (Eugenia Androukaki, *pers. comm.* 1997).

## Exploitation by the tourism industry

Despite press and media attention in recent years, the monk seal remains an obscure, largely unknown inhabitant of the Mediterranean sea. Its secretive habits and plummeting population appear to prevent any systematic exploitation by the tourism industry, yet there are exceptions to the rule.

An article in a Turkish magazine, for example, described the sightseeing lure of the famous Blue Cave on the Mediterranean coast beyond Kas. Prior to its discovery by the Turkish Tourism Association for Cave Exploring and Promotion, the grotto had been known simply as the 'Seal Cave' by local fishermen because of the large numbers of seals that once inhabited it (Dougan 1988).

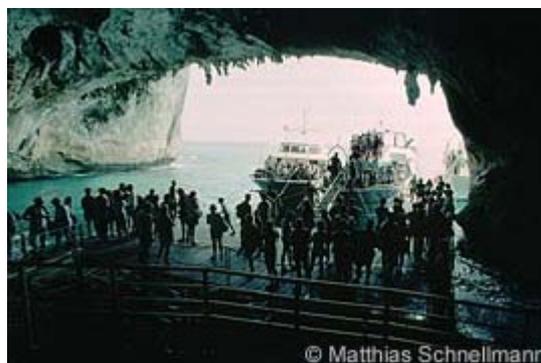


Fig. 8. Day trips to the famous *Grotta del Bue Marino*.

In other areas, the exploitation may be far more cynical, as in the case of Cala Gonone in Sardinia. Despite successfully quashing efforts to establish a marine park in the Gulf of Orosei, and the subsequent eradication of monk seals from the area by tourism pressures, local tour operators and shopkeepers continue to offer popular day trips to the famous *Grotta del Bue Marino* (Fig. 8), continue

to market a variety of monk seal merchandise, and to promote the monk seal as the community's unique corporate identity (Johnson 1998a). Indeed, guidebooks and internet sites promoting Cala Gonone explicitly offer tourists the hope of seeing a monk seal, and even highlight the species' rarity as an additional attraction (e.g. Touring Club Italiano 1999, Italia Turistica 1999).

During the early 1970s, local fishers, plying between the resort town and the grotto in boats converted into tourist ferries, insisted that they would not kill the monk seals because they now regarded them as a tourist attraction and a source of revenue. Increasing disturbance, however, soon brought a lethal debunking to this early example of sustainable, non-consumptive utilisation of species (Johnson 1998a). Scott (1972) states that the sole surviving individual was deliberately killed by a local fisher who resented his rival competitor's success in taking tourists to view it.

At Lopar on the Croatian island of Rab, the official tourist organization promotes the Medova Buza cave as one of its main attractions. The cave, according to its Internet site, is "long since known as the habitat of the Mediterranean monk seal." Rather more incredibly, it also adds that in the cave, "international weddings are arranged for lovers of the out-of-the-ordinary" (Tourist Organization Lopar 1997).

Similarly, a web site extolling the virtues of Poros, a community on the Ionian island of Kefalonia, is illustrated by a photograph of a white-bellied neonate monk seal pup. Poros' caves, the site declares in an obvious lure for tourists, offers shelter for the monk seal (Ionion 1999). Another site promoting Greek tourism and, in particular, Kephallonia, states that the monk seals, "a protected species," can be found in caves along the northern coasts of the island (Travel in Greece 1999).

Accompanied by a photograph of a startled monk seal in a cave, Aegeus Yachts of Greece promotes (among other destinations), the Northern Sporades island of Skiathos. Its Internet site states that "This is probably the last breeding ground in the eastern Mediterranean sea of the seal *Monachus Monachus*" [sic] (Aegeus Yachts 1999). Another charter group promoting holidays to the Northern Sporades notes that a National Marine Park has brought protection to the Mediterranean monk seal, and suggests that the animals "can be sighted on the small deserted islands" to the north of Alonissos (Holiday Islands 1999).

The local, English-language newspaper of Symi, an Eastern Aegean Greek island, also promotes the presence of "the world's most endangered species of mammal" [sic], and informs readers where the half dozen survivors on Symi may be found (Symi Visitor 1998).

Also in Greece, the prominent travel agent chain Manos uses the name and image of the monk seal to promote its business activities, yet appears to provide no educational contribution or sponsorship to monk seal conservation activities. Similarly, Nomikos Lines has coined the advertising phrase "Swim in the Waters of *Monachus monachus*" to promote its ferry service to the Northern Sporades, yet also provides no tangible support to preservation efforts (Vrassidas Zavras, *pers. comm.* 1999).

An Internet site aimed at the scuba diving market suggests that "divers can enjoy the plentiful marine life" around Turkey's Bodrum Peninsula, and may even encounter the occasional monk seal (Bodrum 1999). Another company specialising in yacht charters, diving packages and courses, holds out a similar hope (ERA Yachting 1999). Yet another yacht chartering group suggests that the "Bodrum peninsula is a haven for some globally endangered and rare animal species like the Mediterranean monk seal," conveying a misleading and possibly harmful impression that the species actually receives official protection in the area (Tropical Sails 1999).

Despite tourism's well-established role in the eradication of the monk seal in Tunisia's La Galite archipelago, yachting and chartering interests continue to advertise the presence of the species as an attraction of the islands. The Italian *Nautica Magazine*, for example, states: "Yachtsmen will be more attracted by the famous La Galite island, with beautiful white beaches surrounding it, which is a real Mediterranean fauna oasis: the rare Pharaoh Sarago and the Monk Seal (actually almost disappear) [sic] can be found here" (Nautica Magazine 1999).

The examples cited above do not in any way purport to be an exhaustive listing of the ways in which the Mediterranean monk seal may be exploited by various sectors of the tourist industry. Indeed, given the species' shyness and rarity, many observers may find it illuminating that local and international enterprises use the seal as a marketing tool even to this extent.

However, it may also be worth noting that monk seal scientists have long considered it essential to

keep precise details of the seal's habitat confidential, in order to "prevent its exploitation by the tourist industry as this would surely lead to its extinction" (Ronald & Healey 1974, 1976).

The cross section provided above may serve to highlight such potential risk. Few, if any, of these promotions identify tourism or disturbance as a threat to the species, nor do they caution tourists to stay away from monk seal habitat. Indeed, harassment by divers and deliberate exploration of monk seal caves by dive guides around the [Bodrum Peninsula](#) is cited as a serious threat to the species (Kiraç & Veryeri 1996). This is in spite of a Turkish law – well-intentioned though difficult to enforce – prohibiting entry into monk seal caves (Kiraç & Veryeri 1996).

One exception to the rule is Nando Travel in the USA, which specifically cautions potential customers that they should keep their distance and behave quietly in seal breeding areas (Nando Travel 1999).

## Secondary Effects

While loss of habitat to tourist development and disturbance has played a decisive role in the decline of the Mediterranean monk seal, important secondary effects may add substantially to that lethal equation. Although these particular issues have been largely neglected by researchers, individual reports and anecdotal evidence suggests that they may have an insidious and cumulative effect upon the survival of the species.

Chief among these, perhaps, is the significant influence, both overt and implicit, that the tourism industry exerts on government policy. As the Mediterranean region's major employer and generator of foreign exchange, the industry can be expected to use its extensive lobbying powers to promote its own interests, and this may be particularly true when potential conflicts arise between conservation and development. A variation of the same phenomenon may also be found within governments, particularly where ministerial posts are assigned to represent the potentially conflicting interests of environment and tourism respectively (RSPB 1996).

Such divisions became apparent recently in Turkey's National Monk Seal Committee, where the Ministries of Environment and Tourism are both represented. According to conservation interests represented in the Committee, planned monk seal protection areas in Turkey are now facing an uncertain future due to opposition by the Ministry of Tourism, the Society of Marinas and Yachters and other tourism industry lobbying groups. The same sources allege that these pro-industry forces vehemently objected to establishing a 17-site network of sanctuaries for the species, insisting that greater economic benefits be accrued from tourism activities. Rather than put monk seal sanctuaries off-limits to tourism development, the industry is currently insisting that co-existence between mass tourism and monk seals can be achieved, despite well-established evidence to the contrary. As a result, the fate of up to 10 important monk seal sites remains deadlocked (Kiraç 1999).

## Fisheries

In terms of secondary impacts upon the monk seal, the tourist industry also takes its toll through increased coastal fishing during the summer months, both by professional fishers and hobbyists.

Fisheries interactions, particularly direct killing by fishers angered by net damage and dwindling fish stocks, remains the largest cause of adult mortality in *M. monachus*. In addition, the decline of monk seal populations in some areas has been partially attributed to lack of food due to overfishing pressures (Johnson & Lavigne 1998).

Although little firm data are currently available, research indicates that intensifying summer demand for fresh fish in coastal resorts also leads to greater competition in coastal fishing (particularly between professionals and amateurs), possibly fuelling conflict between fishers and seals (Karavellas 1994). Indeed, researchers in some areas of the Mediterranean have noted that coastal overfishing can be partly attributed to the demand spurred by tourism, and that this may encourage seals to attack fishing nets more frequently than in the past (Panou *et al.* 1993, Karavellas 1994). On occasion, such increased fishing pressure may also contribute to the hostility of fishers towards establishing protected areas for the monk seal (*e.g.* Ronald 1982).

It may also be a long-standing myth that the catch landed by hobby fishers is somehow commensurate with their amateur status. Indeed, a study undertaken by the Parc National de Port-Cros indicates that

the actual tonnage of fish landed by amateurs is of the same order of magnitude as that netted by professionals. The unanticipated result was attributed not solely to the numbers of fishers involved, but also to a quirk of human behaviour. As a rule, professional fishers must either land sufficient quantities of fish to make a living, or must turn to another livelihood. In contrast, amateur fishers have no financial profit or time constraints placed upon their sport. Consequently, they can push the borders of overexploitation that much further (Boudouresque & Lefevre 1991). Karavellas (1994) reports that, in the Ionian islands, fish merchants and restaurant owners buy and sell fish caught illegally by tourists. With this source of income the culprits are able to prolong their vacations, thereby increasing the damage they inflict. Karavellas notes that in the resulting free-for-all, no individual has sufficient incentive to manage the fisheries on a rational basis (Karavellas 1994).

The environmentally disruptive effects of unregulated fishing by tourists and other seasonal hobby fishers should not be underestimated. Speargun fishing is often cited as a major causative factor in disturbance of monk seal habitat and, as noted previously, there are records of several monk seals being killed by speargun fishers. In Greece, tourists have also been implicated in illegal fishing practices, using dynamite and chemicals (Ronald & Yeroulanos 1984, Israëls 1992, Karavellas 1994). Karavellas (1994) also reports that in the Ionian islands, speargun fishing at night with scuba gear and artificial light source is a widespread practice by tourists, despite its illegality.

### **Tourism's impact upon monk seal conservation strategy**

Ironically, mass tourism may exert its most insidious impact upon the monk seal in the way in which it influences conservation strategy. Rather like Mediterranean coastal fishing, development of mass tourism is largely a free-for-all with little or no local, regional, national or international coordination. This is apparent even at the European Union level, where, quite oblivious to each other's objectives, one directorate will dispense funds for protection of the monk seal and its habitat, while another provides EC Structural Funds for tourist development of the last refuges of the species (Gots *et al.* 1992, RSPB 1996).

Because of the relentless pace of Mediterranean coastal development over the last 20-30 years, and sluggish progress towards establishing protected areas, some scientists have advocated extreme measures in efforts to prevent the extinction of the Mediterranean monk seal. The 1978 Rhodes conference, for example, debated the possibility of capturing wild monk seals to establish a captive breeding group, notwithstanding the acknowledged biological and financial risks involved. Holding the animals in semi-natural conditions, possibly in a closed-off bay, would be useful "to promote public awareness and thereby diminish the tourist pressure on monk seal reserves" (Ronald & Duguay 1979).

Similarly, uncontrolled tourist development was cited as a justification for removal of monk seals from depleted populations to stock a captive breeding group (Harwood 1987b). Boulva (1979), using similar justifications, also noted that the "exclusivity" of this captive herd, representing a critically-endangered species, might act as a significant promotional boost, particularly if located "in an important touristic zone" and allied with a well-orchestrated international press campaign. The controversial 1994 plan of a commercial oceanarium on the French Riviera to capture monk seals in the Western Sahara, ostensibly for a captive breeding programme, was also partly justified by its proponents by lamenting conservation's losing battle of wills with the forces of development. The plan also gained added notoriety when evidence suggested that the animals would be put on show to the public (Johnson & Lavigne 1994).

### **Effects on Protected Areas**

Mass tourism also has a profound impact on the implementation of *in situ* conservation measures, including the planning and establishment of protected areas.

Mursaloglu (1991) found that the pace of tourist development along Turkish coasts was so rapid, and its effects upon the monk seal and its habitat so profound, that fresh population surveys were required in order to provide definitive data on which to base proposals for protected areas. A similar situation was experienced in designing a monk seal protected area on Kefalonia (Jacobs & Panou 1996). More recently, designs for a Natura 2000 site on the Aegean islands of Milos, Kimolos, Polyaiagos and Antimilos had to be redrawn in order to remove habitat from the southwest coast of Milos, which had become a popular tourist destination (Johnson 1999).

Tourists also pose other practical difficulties for monk seal conservationists in the field. In August

1995, two Turkish researchers working in the Cilician Basin encountered a group of young tourists picnicking around a camp fire, dancing, swimming and diving in and around a cave, where seals were frequently encountered. In this particular case, the tourists were portrayed as nature lovers who were acting out of ignorance rather than malice. However, they appeared to be oblivious to the fact that they were partying in monk seal habitat and, consequently, had no inkling that their disturbance might cause the animals to abandon the area. Common situations of this type pose a serious dilemma for researchers attempting to protect monk seals from tourist disturbance without highlighting the presence of the animals. This appears to be true both of unprotected habitat and reserve areas lacking adequate guarding and enforcement (see **Risks to Protected Areas**, below). Posting signs in monk seal habitat, for example, might encourage intrusions by curious tourists, rather than deter such activities (Karakoc & Karakoc 1997).

### **Risks to protected areas**

A consensus of scientific opinion has long held that a network of marine reserves, whose core zones must be entirely free of human disturbance, are essential if the Mediterranean monk seal is to survive (Ronald & Duguay 1979, Johnson 1988, Johnson & Lavigne 1998). However, even where marine parks and protected areas have been established, tourism may continue to pose serious threats to monk seals, particularly where management efforts, including patrolling and enforcement, are inadequate.

As noted earlier, tourism – through disturbance, direct killing and capture – is largely responsible for eradicating the monk seal from Tunisia's Galite archipelago, despite the existence of a marine reserve (UNEP/MAP 1994b). Similar threats were seen in Corsica, the monk seal's last refuge in France in the early 1970s. Already under severe pressure by fishers, disturbance and a free-for-all in tourism development, the last two seals were killed just months before the island's Regional National Park was to be established (Duguay & Cheylan 1979). The species also appears to have disappeared from the National Park of the Tuscan archipelago (including the marine protected area of Montecristo) prior to the establishment of all necessary legal and management measures (Anon.1988a, Mo 1999, Guarrera 1999).

Bureaucratic delays, funding limitations and inadequate or non-existent guarding may also encourage unscrupulous developers to exploit legal loopholes or challenge pending or unenforced regulations.

On occasion, development interests may even attempt to subvert deliberately government attempts to establish protected areas. A case in point is Seitani on the Eastern Aegean island of Samos. The first biogenetic reserve of Europe, Seitani was declared 'strictly protected' in March 1980 by the Greek government (Ronald & Yeroulanos 1984). A year later, the site came under development, with bungalows being constructed in the core zone beach area of Megalo Seitani. Construction crews were found to be cutting a road through the area using bulldozers and dynamite, and there were persistent rumours of a hotel development by a London-based Greek shipowner. As a result of prominent media coverage, in April 1982 the Greek government ordered all tourist development work at Seitani halted (Ronald & Yeroulanos 1984), though with little tangible success or enforcement (Johnson 1988 & 1999). At the same time, the government also pledged that the hotel construction would not be approved, that the road construction would be halted, and that the area would be totally rehabilitated. By this time, however, it appeared that resident monk seals had been frightened away from Seitani (Ronald & Yeroulanos 1984, Johnson 1988). In February 1995, Seitani's legal status as a protected area was reinforced by the issuance of a Presidential Decree (MOM 1996a). As a result, all human activities in the core zone of the reserve became 'strictly prohibited,' although Seitani is still awaiting its management plan (Johnson 1998b). The area is also identified as a Natura 2000 site, the network of protected areas being established under a European Union conservation plan for endangered species and habitats (Zavras 1998). Despite these measures, however, the Greek authorities have yet to make good on their original pledge to rehabilitate the area and to demolish the holiday bungalows. There is also no evidence to suggest that summer tourists are being barred from the area (Julia Glauser, *pers. comm.* 1999).

Illegal tourism developments also afflict protected areas in Turkey, obliging non-profit conservation organisations to commit limited time and resources to campaigns that could be better invested in other conservation priorities. Due largely to the efforts of Turkish NGO SAD/AFAG, six Ministry of Culture Natural SIT areas have recently been established, five in the Cilician Basin along Turkey's Mediterranean coast, and one on the Kūdūr Peninsula at Bodrum in the Aegean (Johnson 1998c, Kiraç & Polatkan 1999). In the last two years, the organisation has also successfully campaigned or taken legal action against tourism industry constructions in the Datça Peninsula SPA, and in Ministry

of Culture Natural SIT areas at Gemile Bay, Fethiye (Kıraç & Veryeri 1999, see also AFAG acts against protected area tourism development, this issue) and in the Cilician Basin (Harun Güçlüsoy, *pers. comm.* 1999).

Attempting to meet the needs of both humans and seals, designs for protected areas normally include a strictly-controlled core zone (representing the seal's resting, breeding and feeding sites) off-limits to all human intrusion, and a substantial buffer zone permitting some limited human activities (Ronald & Duguay 1979, Sergeant *et al.* 1979, Council of Europe 1986a, Panou *et al.* 1993, UNEP 1988). The practical application of the rule, however, is often a far cry from the theory. Indeed, with the exception of the Parque Natural da Madeira and the Northern Sporades Marine Park, existing protected areas rarely conform to such essential guidelines. As a result, during the high season summer months, they come under sustained assault by tourists, often with the encouragement of operators within the industry.

In this respect, the situation in Turkey is particularly dire. While successive Turkish governments have tended to portray their nation's monk seal conservation efforts in a favourable, even rose-tinted light, harsher realities lurk at ground zero.

Indeed, serious shortcomings in management and enforcement were revealed during a 1997 visit to 7 marine protected areas that the authorities have portrayed as providing refuge to monk seals (Anon. 1991). These included the Specially Protected Areas (SPAs) at Foça, Gökova, Fethiye-Göcek and Datça-Bozburun, the monk seal protection zone at Bodrum, the Dilek National Park opposite the Greek island of Samos, and finally, the Olympos Beydaglari National Park. During the course of the visit, it was noted that none of these reserves possessed a functioning patrol boat or adequate management plan. In certain cases, the management authorities were not even aware that monk seals were reputed to inhabit their respective reserves. While such areas may impose strict controls on development, coastal tourism – with the possible exception of the Foça SPA – is tolerated and even encouraged. As a result, a boom in pleasure boating and cave-exploring tourism have all cast serious doubt on the conservation viability of these areas for monk seals (Johnson 1998b).

Although funding limitations are a significant obstacle to efficient guarding and enforcement, other problems may be attributed to the inadequate legislative mechanisms governing protected areas.

The Turkish authorities, for example, have described the Dilek Peninsula National Park in Kusadasi (Aydin) and the Olympos-Beydaglari National Park (Antalya) "as important national parks with a remarkable population of seals" (Anon. 1991). Today, however, these areas are notable for their lack of monk seals, and a major causative factor in the decline and disappearance is the designation of them as National Parks. Although National Parks are intended for the conservation of endangered species and their habitats, they are also defined as areas having value for recreation and tourism (Anon. 1991). In summer, both areas are consequently deluged by beach tourism, boat traffic, water sports and diving (Fig. 9).



Fig. 9. Monk seal habitat in the Dilek Peninsula National Park, Turkey.

A similar situation exists in the 'Mediterranean Seal Protection Zone' on the Küdür Peninsula near Bodrum. Although a recent Ministry of Culture decree (establishing a Natural SIT area) provides strict protection against development, it cannot halt invasion of the area by water-borne tourism. The relatively tranquil peninsula is surrounded by high-intensity 'Tourism Investment Zones' throughout the Bodrum Peninsula, thus casting some doubt on its viability to protect surviving monk seals (Kıraç & Veryeri 1996, Kıraç 1999, Kıraç & Polatkan 1999). Developers have already demonstrated their hostility towards setting aside the Küdür Peninsula for the monk seal, since large-scale development

plans, including a marina, a yacht maintenance centre and a holiday village appear to have been scuttled as a result of the decision to establish the 'seal protection zone' (Kıraç 1999, Kıraç & Polatkan 1999).

Protected area status can also provide no guarantee of non-disturbance when there are no patrol boats to enforce regulations. Provisional results from the Foça SPA, for example, suggest that more seals used the protected area during the summer months of 1996 than in 1997 and 1998 – years coinciding with increased illegal activity due to a breakdown in guarding activities (Harun Güçlüsoy, *pers. comm.* 1998, Johnson 1998b, 1998c). During this period (when the SPA's sole patrol boat was sidelined due to mechanical problems and lack of funds), observers recorded tour boats passing only a few metres from critical monk seal breeding habitat at the Siren Rocks (Fig. 10). It is perhaps noteworthy that scientists cautioned almost a decade ago that disturbance to the seals in protected areas might actually increase without detailed management plans and long-term funding commitments (Texel 1990).



Fig. 10. In the Foça SPA, tour boats take advantage of the absence of effective guarding by sailing only a few metres away from important monk seal caves.

In Greece's flagship monk seal refuge, the National Marine Park of Alonissos and Northern Sporades (NMPANS), the need for regulations to secure the inviolability of the core zone was recognised by most of the negotiating parties involved in 1986, when summer disturbance of monk seals by marine tourism was recognised as a threat (Economou & Spiropoulou 1986). While human intrusion into the Park's core zone, where breeding sites exist, is now strictly prohibited (Dendrinou 1994), the NMPANS is still awaiting – 7 years after its creation in May 1992 – the creation of an effective management authority (see [New Law Benefits Protected Areas, Mediterranean News](#)). Lack of a legally constituted management body was criticised by the leading NGO in the Sporades (MOM – the Hellenic Society for the Study & Protection of the Monk Seal) in 1995 as causing "considerable difficulties in the conservation of this area" (MOM 1996b). Although Park signs have recently been installed by the regional government (*Nomarchia*) in some areas of Alonissos, other previously announced initiatives have so far failed to materialise – such as a coherent plan to encourage ecotourism in the area, the production of information material designed specifically for tourists and the tourist industry, and similar measures to manage potential threats by tourism (Scoullou *et al.* 1994, Pakis Athanasiou, Yannis Vlaichos, *pers. comm.* 1999). More recently, a United Nations conference in December 1998 was told that "the park needed to be set up as a matter of urgency and tourism needed to be controlled" (UNEP/MAP 1998a).

At present, the NMPANS operates in a kind of legal twilight zone, with guarding being undertaken by a single NGO (MOM) rather than by government bodies. Due to funding constraints, only one patrol boat is available to the organisation, despite the necessity of guarding the Park's 2200 square kilometres. During its unfamiliar role as regulations enforcer, the organisation found that illegal activities such as spearfishing, scuba diving, and approach to prohibited areas were significantly reduced as a direct consequence of guarding activities (MOM 1996b). It also concluded that, compared to other threats, tourism must be considered particularly severe since it coincides with the monk seal breeding season. The intensity of the threat must also be taken into consideration. While MOM research has demonstrated that fisheries-related infringements are distributed at a low frequency over many

months, tourism related incidents are concentrated only in the summer season, with a distinct peak in August (MOM 1996b).

While mass tourism can act as a barrier, blocking the establishment of reserves, or compromising the integrity of existing sanctuaries, it may also prevent monk seals from re-colonising areas from which the species has formerly been eradicated. This may be a particularly significant issue since a succession of conference recommendations have called for the protection of historical monk seal habitat to permit either natural recolonisation or translocation (UNEP/MAP 1987, Johnson & Lavigne 1998). In Israel, however, a coastal reserve established just south of the Lebanese border has been judged an unlikely site for recolonisation by *Monachus*, since the area is open to the public and caves are frequently visited by tourists (Ronald & Duguy 1984, Tamar Ron *pers. comm.* 1998). Similar constraints affect marine reserves of potential significance to the monk seal in Italy. While they exist on paper, inadequate management and guarding currently appear to make them uninviting areas for recolonisation by Mediterranean monk seals (Mo 1999).

Elsewhere, reintroduction (and also natural recolonisation) of the monk seal in the Canary Islands has effectively been shelved, partly because of tourism pressures on Isla del Lobos, a Natural Park. Despite controversy over its concept, methods and chosen reintroduction site, the project received substantial infusions of cash from the EU (Johnson & Lavigne 1998).

## Balancing Tourism & Conservation Interests

Because of its shy and retiring nature, and its sensitivity to human disturbance, there is a long-held scientific consensus that monk seals and mass tourism cannot coexist in the same geographical location.

However, the design of protected areas cannot help but recognise that coastal communities have become increasingly dependent on tourism even in more remote areas. There is also general acceptance that marine protected areas cannot succeed unless local people participate in the conservation process.

On occasion – and with diminishing frequency over the years – scientists have raised the possibility of monk seals earning their survival by becoming a source of income for local communities. It was hoped, in particular, that coastal fishers might be tempted to relinquish their traditional hostility towards the seals by ferrying sightseers into protected areas, and even acting as park wardens (Ronald 1981, Harwood 1987a, Anselin & van der Elst 1987). In this respect, proposals for protected areas in both the Dodecanese and the Northern Sporades in the late 1970s advocated buffer zones where tourists might be encouraged to join seal-watching tours. In merging conservation and soft tourism interests, it was also hoped that sufficient revenue would be generated to compensate fishers for net damage, always regarded as an unsustainable financial burden (Ronald 1977). Despite its apparent advantages, it was also recognised that such non-consumptive use presented its own risks and would have to be strictly controlled (Council of Europe 1986a). In the case of the Northern Sporades, for example, where this type of scheme was discussed in the mid-1970s, seal-watching cruises were only recommended outside the August-October pupping season, effectively barring such activities during the short-lived tourist season (Schultze-Westrum 1976).

While no scientist can gauge the tolerance of the Mediterranean monk seal to disturbance, it has also been speculated that, if shielded from harassment, the species might conceivably regain the trusting nature for which it was so renowned in antiquity (Ronald & Duguy 1979, Johnson & Lavigne 1999).

Although this view may seem somewhat far-fetched, there is some circumstantial evidence to support it. The monk seal's change in temperament appears to have been a relatively recent phenomenon, driven by human persecution, habitat deterioration and an inevitable reduction in gregarious behaviour (Johnson & Lavigne 1999). Juvenile monk seals, in particular, have been recorded showing little fear of humans, suggesting that such distrust may be a behaviour learnt from experience, rather than an inherited trait. Individual seals have been observed playing or swimming with divers (IUCN/UNEP 1988) and even venturing frequently into busy harbours (Ronald & Duguy 1979, Johnson 1988).

Regardless, it appears – as noted earlier – that the monk seal 'temperament issue' is inherently interrelated with the issue of habitat deterioration. Some scientists, for example, believe that some return to sandy beaches might be essential for the species to survive (Anderson 1979, Ronald &

Duguay 1979, Johnson & Lavigne 1999). By the same token, it will require stringent protection on the part of humans and a certain element of regained trust on the part of monk seals, for that habitat change to take place. While it is theoretically possible that eco-tourists may one day watch Mediterranean monk seals dozing on beaches or playing with their pups along the shore, it remains open to question whether governments have the political will to institute the stringent conservation measures required. Without such precautions, reserves may only create the illusion of protecting the species, while doing little more than slowing a continuing decline (Texel 1990).

Some monk seal protection projects have attempted to integrate alternative development opportunities, such as ecotourism and organic farming, into conservation management plans. While such aims are broadly consistent with conservation priorities and compatible with local culture, they have met with little tangible success. For the most part, failure to institute such integrated conservation measures can be attributed to lack of investment, and to the fragmentary and haphazard approach so common to 20th century conservation (Johnson 1988, Johnson & Lavigne 1998). International organisations that have failed or reneged on commitments to pursue such holistic approaches – either due to financial constraints, bureaucratic malaise or short-sightedness – have borne the brunt of some criticism over the years (Johnson 1988, Jacobs & Panou 1996, WWF Mediterranean Programme 1994). In some cases, failure to implement promised measures of this type have caused a local backlash against the core objectives of monk seal conservation projects (Jacobs & Panou 1996).

## **An Assessment of Conservation Actions**

Available evidence suggests that there has been little tangible progress in eliciting the financial and political support of the international tourism industry for monk seal conservation efforts. The monk seal conservation community – most notably as a consequence of inadequate coordination and bureaucratic malaise in implementing internationally agreed measures – must shoulder some of the responsibility for this failing (Johnson & Lavigne 1998, Reijnders 1998).

In terms of fulfilling the specific recommendations of conferences and action plans, for example, there has been little effort expended in preparing, translating and disseminating multimedia public awareness packages aimed at the tourism industry, as called for in the UNEP Action Plan (UNEP/MAP 1987).

By the same token, the tourism industry continues to demonstrate indifference – and even hostility – towards the plight of the species. Even where tourism interests have been invited to join the conservation process, it appears that participation has been geared more towards hindering the conservation agenda and staking territory than in acknowledging the industry's role in driving the species into oblivion (Kıraç 1999, Kıraç & Polatkan 1999).

In such cases, it may be realistic to assume that governments – at least implicitly – regard monk seal conservation as a potential threat to the tourism industry, a major source of revenue for most Mediterranean nations. Tourism has undoubtedly pumped billions of dollars into the region, while also fattening the corporate accounts of airlines, multinational package tour operators, charter and hotel chains. In contrast, frontline monk seal conservation projects generally suffer from severe funding constraints (both in amount available and in continuity) compromising long-term planning and execution of conservation programmes (Johnson & Lavigne 1998, Johnson 1998b, 1998c, 1999). This is in spite of the fact that in many areas of endeavour, such projects are directly addressing the conservation problems engendered by the tourism industry.

Indeed, instances of the industry funding or otherwise supporting monk seal conservation efforts are few and far between according to reports from Greece and Turkey (Harun Güçlüsoy, Gerald Hau, Cem Kıraç, Alikı Panou, Vrassidas Zavras, *pers. comm.* 1999).

While the formation of HELMEPA (the Hellenic Marine Environment Protection Association) in 1982 by the Greek shipping industry was greeted with some optimism by Ronald & Yeroulanos (1984), the group appears to have achieved little tangible for the monk seal, despite the great affluence of its members.

The Greek-owned shipping company, Minoan Lines, installed MOM collection boxes on its Italy–Greece car ferries, and also continues to promote and sell its own monk seal merchandise in its on-board shops (Fig 11). To an industry that calculates annual profits in the billions, however, it must be

said that this contribution, however welcome, amounts to little more than small change.

The situation appears to be little different in Turkey, with researchers indicating that they have no recollection of the tourism industry ever having provided funds or other support to monk seal conservation efforts (Harun Güçlüsoy, Cem Kiraç, *pers. comm.* 1999).



Fig 11. A Minoan Lines monk seal tablemat.

## CONCLUDING REMARKS

The accumulated evidence suggests that the mass tourism industry serving the Mediterranean region has played a major role in the decline and extirpation of Mediterranean monk seal populations in several key areas including France and Corsica, Spain and the Balearic islands, Croatia, Italy and Sardinia, and Tunisia. It has, in addition, been implicated in the historical decline of the species in Madeira, which almost resulted in its extirpation in the archipelago, requiring a costly recovery effort. Even more crucially, it continues to pose a serious and immediate threat to the last surviving strongholds of the species, most notably in Greece, Turkey and Cyprus (where the species is now virtually extinct).

Many of the factors that make the Mediterranean monk seal vulnerable to tourism pressures are well known. The species is shy and retiring, and is particularly sensitive to human disturbance. The species requires suitable cave and beach habitats in order to breed successfully – areas that are particularly prone to human disturbance.



Fig. 12. The Mediterranean's boom in pleasure boating is evident in almost every harbour and marina.

While it was once hoped that rugged and inaccessible island coasts would form a last refuge for the species against human disturbance and persecution (Kühn 1930, Sergeant *et al.* 1979), a boom in pleasure boating, diving and speargun fishing has succeeded in bringing tourists to even these once isolated areas (Fig. 12) (Anderson 1978, 1979, Johnson 1988). The May to November pupping season, overlapping with tourism's high season, is believed to have a severe impact on reproductive rates (Anderson 1978, 1979, Sergeant *et al.* 1979, Ronald & Yeroulanos 1984). Tourist disturbance has caused mothers to abandon their pups, or even to abort their young (Anderson 1978, Ronald & Duguay 1979, Ronald & Yeroulanos 1984). In addition, the species' relatively recent habitat adaptation, exchanging open beaches for more secure sea caves, poses its own risks. Storm surges can wash

young pups out into the sea to drown or become stranded, eventually perishing from hypothermia (Johnson & Lavigne 1999).

Arguably, these factors alone would appear to make the species inherently incapable of surviving in areas increasingly dominated by mass tourism.

However, our review demonstrates that there are also many other related factors which combine to make mass tourism a major and imminent threat to the species' continuing survival. These include the industry's role as a driving force of habitat deterioration, its effects in spurring seasonal demand for fish, thus contributing to overfishing pressures and hostility towards seals by coastal fishers, its impact on protected areas, and finally, its apparent hostility or indifference to the fate of the species.

Rather than representing a single, uniform factor, mass tourism confronts the monk seal with multiple threats that it is ill-equipped to deal with. In terms of habitat degradation, the species may simply be nearing the end of the line. While centuries of persecution may have been responsible for driving monk seals away from sandy beaches to inhabit the most remote and desolate shores, tourism pressures now appear to be forcing the animals to inhabit caves that are inherently unsuitable for their long-term survival (Johnson & Lavigne 1999).

Despite various appeals over the years, the tourism industry has generally demonstrated indifference towards the plight of the Mediterranean monk seal and, in certain cases, even hostility towards the creation of marine protected areas or sanctuaries.

In spite of the fact that even relatively minor changes in corporate policy might, for the monk seal, spell the difference between survival and extinction, there is currently no evidence to suggest that the industry is prepared to recognise any moral or financial responsibility for its impact upon Europe's most endangered marine mammal. This places an additional, and often onerous, burden upon conservation projects that must (through activities ranging from public awareness campaigns to the design and guarding of protected areas) address the specific threats generated by the tourism industry.

The accumulated evidence strongly suggests that tourism's historical threat to the monk seal also has severe ramifications for the future survival of the species. Unless prompt and concerted international action is taken to persuade the tourism industry to become a constructive partner in the conservation process, there are compelling reasons to believe that it will almost certainly ensure the extinction of the Mediterranean monk seal.



Fig. 13. Turning the tables. The problem as seen by celebrated Swiss cartoonist, Hans Sigg. © Hans Sigg.

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# ON A FEW BACULA OF MEDITERRANEAN MONK SEALS

Peter J.H. van Bree

Zoological Museum, University of Amsterdam  
P.O. Box 94766, 1090 GT Amsterdam, the Netherlands

Havinga (1933) was probably the first zoologist who used the length/weight relation of seal penis bones (bacula) for relative age determination. This was contained in his classic study on Harbour Seals. As is now generally known, these bones mainly grow in length till puberty, afterwards they mainly become heavier. At present, bacula are often used in growth and age studies, see *e.g.* Miller *et al.* 1998.

The penis bones of Monk Seals, however, have yet to be used for such purposes because very little is known about these bones. Chaine (1925) was the first to describe and to illustrate the baculum of a subadult Monk Seal. The present author, in 1994, published a note on the penis bone of a full grown specimen (Fig. 1). Up to now, that is all that is known from literature.

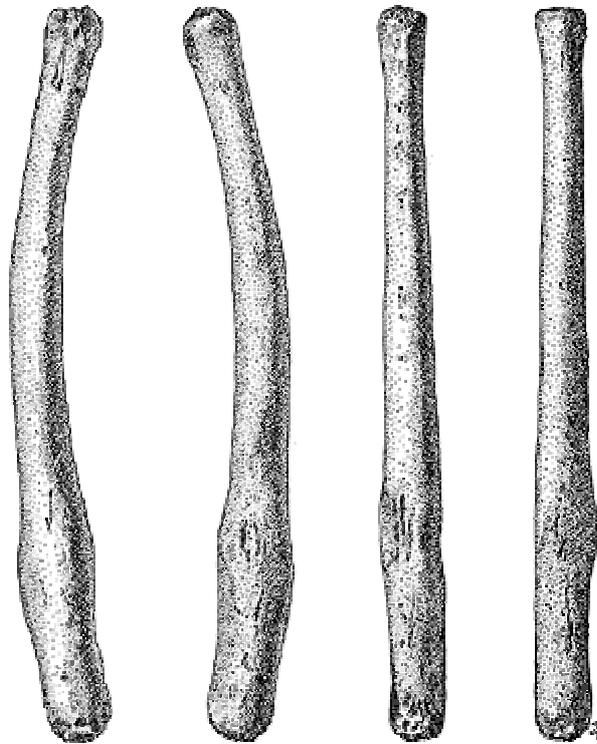


Fig. 1. Baculum of a full grown monk seal, *Monachus monachus*, from the Aegean sea. Length 215 mm. Illus. J. Zaagman.

During the mass die-off of Monk Seals of the Mauritania/Western Sahara colony in 1997, many animals found dead were dissected. The results of these dissections (even the most basic data such as the number of males and females, their lengths, their relative ages, *etc.*) are unfortunately not yet published. Thanks to the kind cooperation of the Mauritanian authorities the bacula of six specimens were donated recently to the Zoological Museum of the University of Amsterdam (ZMA). The bones were cleaned, dried, registered, measured and weighed. The data are:

- ZMA 25.336, dissected on 6-VI-1997, total length of the animal (tip of the nose till end of longest toe ) 197 cm, length baculum 78.0 mm, weight 1.6 g.
- ZMA 25.390, dissected 28-V-1997, TL 228 cm, l. bac. 175 mm, w. bac. 5.9 g.
- ZMA 25.391, dissected 23-V-1997, TL 260 cm, l.bac. 191.5 mm, w. bac. 31.9 g.
- ZMA 25.392, dissected 4-VI-1997, TL 264 cm, l.bac. 176.0 mm, w.bac. 29.2 g.
- ZMA 25.393, dissected 21-V-1997, TL 246 cm, l.bac. 208.1 mm, w.bac. 45.5 g.
- ZMA 25.394, dissected 28-V-1997, TL 265 cm, l. bac. 208.4 mm, w.bac. 52.5 g.

These data are too few to be used in isolation, but they may be useful in future when more bacula become available. At present it can only be said that specimens ZMA 25.393 and ZMA 25.394 are certainly of old males. This conclusion is suggested by a comparison of these specimens with the baculum mentioned by the author (*loc. cit.*), which was from a 254 cm long Monk Seal from near the Island of Skopelos, Northern Sporades, Greece. The length of that penis bone was 215 mm and its weight 36.5 g. A canine of that animal was sectioned and its age was determined, which was 23 years.

The second Monk Seal with a total length of 157 cm, of which the baculum is preserved and of which its age is known, is an animal that was born in a cave on a small island off the town of Foça in Turkey on 16-X-1996. It drowned entangled in a fishing net 117 days later. The baculum of that young seal has a length of 49 mm and a weight of 4.0 g. The length/weight data of the bacula of these two Monk Seals, of which we know the age, are also given in figure 2.

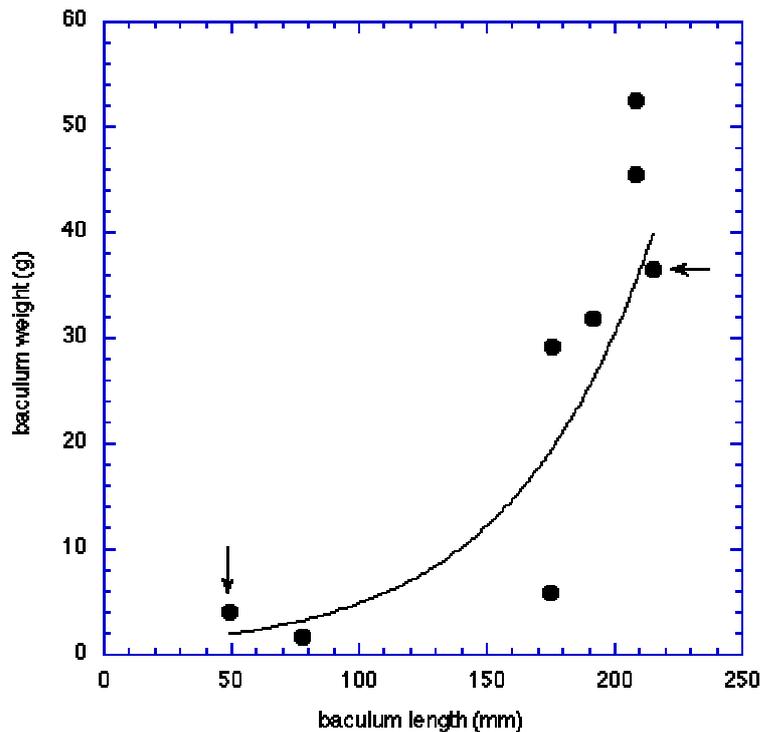


Fig. 2. The length/weight relation of the bacula of 8 Mediterranean Monk Seals. The specimens with known age are indicated by an arrow (see text).

## Acknowledgements

The author gratefully acknowledges the help of Mrs. E.J. Vedder, who took the bacula to the Netherlands, of Mrs. Chr. Lockyer, who determined the age of the Monk Seal from Greece, and of the members of the Foça branch of the Underwater Research Society in Turkey for furnishing the data of the young seal.

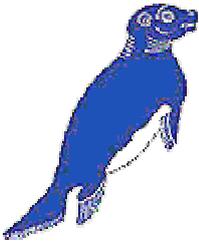
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## Letters to the Editor

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### Monk Seal Bibliography

#### Re. Freedom of Information

The desire for easier and faster access to information concerning the endangered Mediterranean monk seal (in the form of scientific articles, newsletters, books etc.) has been expressed lately by various members of the monk seal conservation community (see Letters to the Editor, [Monachus Guardian 2:1 1999](#)). This desire, coupled with the growing number of organizations and scientists working on the conservation of the monk seal, and the numerous new publications focusing on the species, has inspired us to launch an effort to compile a comparative monk seal bibliography.

Extending the previous work of Ronald *et al.* in 1978, 1983 and 1991 (see references, below), this new bibliography will not only attempt to fill in the gaps since the last edition, but also incorporate lesser known publications not included in previous bibliographies. It is also intended that a list of key words will accompany each reference, enabling users to search for specific topics in the bibliography. The bibliography will initially be published on the Internet, allowing rapid access, effective searching and timely editorial updates.

During the course of compiling the bibliography, we would like to cooperate with monk seal specialists internationally. Hopefully, these experts can be persuaded to share their knowledge of monk seal literature, particularly the literature published in their own respective countries. In this respect, we would like to congratulate the Turkish Scientific League for the Monk Seal for their initiative in preparing a bibliography of literature authored by Turkish scientists. We hope that other organisations and individuals will follow this lead, thereby helping to create a comprehensive information source that might aid scientific knowledge and conservation.

The coordinator,

*Alexandros Karamanlidis,*

Kerassountos 9, GR-55131 Kalamaria Thessaloniki, Greece. Email: [karazar@vet.auth.gr](mailto:karazar@vet.auth.gr)

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✓ **Editor's note:** Readers of this ongoing debate over access to information might also recall the suggestion of an earlier correspondent ([Freedom of Information](#)) that monachus.org or IMMA Inc. establish an online forum to stimulate open debate on all matters relating to monk seals, their habitats and their conservation. We are pleased to announce that IMMA Inc. is currently investigating the possibility of setting-up an automated discussion page of this kind. The question is: will people use it? Might there be other, more fundamental factors limiting free and open debate than the lack of convenient technology? As always, we look forward to hearing your views: [editor@monachus.org](mailto:editor@monachus.org).

## Starving Seals at French Frigates

### Re. Native Hawaiians Speak Out

Aloha Monachus Guardian,

You have a very informative site with much to share. I too am trying to bring attention to the most endangered pinniped in the nation. It is difficult to understand how the starvation can be allowed to continue for the benefit of so few. My name is Isaac Harp and I was the chairman of the Native advisory panel to the western pacific regional fishery management council. You may have noticed that I did not capitalize the name of the council; they don't deserve it!

I've tried to get some sanity adopted by the council and nmfs over the past few years, but it's a waste of time. Commerce is the only driving force at work and unless the management scheme changes, I believe they're prepared to swallow a Northern Right Whale to address the problem they're perpetuating. I've recently become an associate of EnviroWatch Inc., as Director of Indigenous Affairs.

**Isaac D. Harp**

Director, Indigenous Affairs, EnviroWatch Inc. Hawaii  
[www.enviroWatch.org](http://www.enviroWatch.org)

## Caribbean X-Files

This is from Mexico. Maybe this is not the correct address to write to, but some friends told me that recently some (eight) Caribbean monk seals were seen near Belize and, in fact, some US environmental agency took care of them. Do you know anything about this?

*Gerardo Ochoa, Mexico.*

✓ **Editor's reply:** Occasional, unconfirmed sightings of the Caribbean monk seal tend to prolong the hope that *Monachus tropicalis* is not extinct ([Has Anyone Seen a Caribbean Monk Seal?](#)). Despite surveys in recent years, there is no evidence to suggest that any scientist or government agency has located survivors of the species – even if extreme secrecy might be the most logical result of a sensitive discovery of this kind. If anyone knows more, please contact us at [editor@monachus.org](mailto:editor@monachus.org).

## Healthy Circulation?

Is there any statistical information available on the numbers of people who read The Monachus Guardian? How many people are visiting per day? Which countries are showing the greatest interest?

*Harun Güçlüsoy, Foça, Turkey.*  
[SAD-AFAG Aegean Programme Office](#)

✓ **Editor's reply:** According to statistics provided by our server, [www.monachus.org](http://www.monachus.org) is visited by between 55 and 115 people per day. The fluctuation usually ties in with publication dates of The Monachus Guardian, with numbers surging during the publishing months of May and November/December. Visitor numbers have been rising steadily since monachus.org was launched in May 1998 (when the first issue attracted 35 individuals per day). Visitors now come from all corners of the Earth and from as far afield as Mexico and Singapore, Poland and Japan. Statistically, the following countries bring the highest percentage of visitors: North America, U.K., Italy, Greece, Turkey, the Netherlands, Portugal, Germany, Spain. (North American figures, however, can be misleading since countries of origin statistics are based on the domain name extensions \*.com, \*.net, \*.org etc. In fact, many servers located outside North America also utilize these domain name extensions.) Of the numerous Internet search engines directing visitors to the site, the most predominant

statistically are Yahoo, Alta Vista, Go, Netscape and MSN. Topping the list of other 'referring' sites are IMMA.org, AOL, CompuServe, Hawaii.edu and iridescent-publishing.com.

## A Letter to Derya, a Monk Seal in Foça



Derya in the Foça protected area.

My dear Derya\*,

I can scarcely contain my delight. Before even asking how you are, I immediately want to get to the point. When you read my letter, I am sure you will also be very happy.

Now, get ready: I have such good news. You remember I told you about this "Volunteer Membership Program" in my last letter, and since then we have taken a big step forward. We started the program in June. I wish you could have seen our excitement. We were working like crazy trying to get the magazine advertisements ready, to inform the media. Newsletter preparations were underway. The brochures were ready, in their best colours, for distribution. On the cover of the brochure there smiled the beautiful photo of Emine. Do not get upset, your photo is in the newsletter, the photo which Cem took, on the pebble stones... You were a very loveable little pup.

From June on, nice, striking public notices were published in magazines which can easily find readers all over Turkey. Two radio stations having a great number of listeners broadcast our spots about our work and membership program. I joined a live radio program and talked about you. I have to say, I was very excited. Many thanks to their help and effort, we are getting a lot of calls. Almost everyday we are joined by at least one new member. I told you you shouldn't be so pessimistic, there are still people caring about our lovely world's future. We already have over 140 members and all of them are willing to help. Imagine if we could have 1000s of members. But these things take time, we have to be a little patient; Rome wasn't built in a day.

The majority of the seal volunteers are from big cities. Wait, I'm supposed to have the numbers of members from each city; ah here they are: Ankara 45, Istanbul 39, Izmir 31, Mersin 6, Adana 6, Tekirdag 2, and Konya, Mugla, Kayseri, Bursa, Giresun and Aydin all joined our family with one member. We even have international members: 2 from Italy and Spain and 1 from Australia.

I have to ask you something; is it that people are more observant now, or is it that you show up more often? For the last few months, we have lots of observation records. We have eyes all over Turkey now with our members. And you be careful; there are paparazzi after you. Getting news about you, especially through our members, is making us very happy. It is also scientifically very important, every sighting record is taking its place in the "Fokdata" database in the computer. Sometimes, although it is extremely painful, there are friends of yours found dead on the coast. This year there were 5 deaths. Do you remember the terrible epidemic in Mauritania in 1997? We all hope that there won't be anything like this here: your population is already so small.

Let's talk about you a little. What are you up to, besides swimming all day and eating up those delicious fish? The weather is starting to get cold, how are the caves? On our side, except for the very intense work, nothing has changed. With the membership program we

gave speed to our education and public awareness activities. With the help of this program, we can easily contact the people who are interested in the sea and marine life. You are a symbol now; a symbol of a clean, healthy Mediterranean. All the SAD-AFAG team – me and Cem in Ankara, Ali, Funda, Ahmet and Hasan in Mersin, Asuman, Harun, Yalçın and Serdar in Foça – are doing their best to make new members. Our aim is to build up a big and powerful family all over Turkey. With the help of this family we can protect you and your home, the Mediterranean. We are trying to form a wide network of communication. We started this by sending our members a newsletter including information about you every 4 months. We are also planning to organise educational seminars in the very near future.

As you can see, everything seems to be going well. We are getting very tired but it is worth it. With every person who calls us or comes to the office to be a member there appears a great bright hope for the future in the depths of our minds. And this hope is giving speed to our steps, power to our ideas.

You must also keep your hopes bright. Take care of yourself until next time.

With love

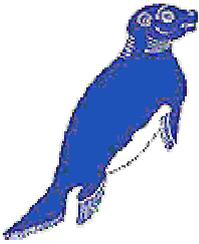
*Yesim A. Öztürk, SAD/AFAG, Ankara, Turkey.*

\* Derya: A monk seal born after long conservation efforts in Foça. She is still using the same address.

✓ **Editor's note:** Readers wishing to support monk seal conservation efforts in Turkey, or to join the Mediterranean Seal Volunteers (see [SAD-AFAG launches membership drive](#), this issue) should contact [SAD/AFAG](#) in Ankara.

**The editor reserves the right to edit letters for the sake of clarity and space**

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## Recent Publications

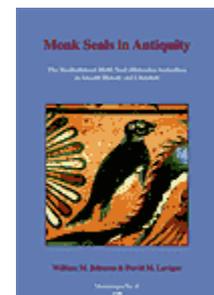
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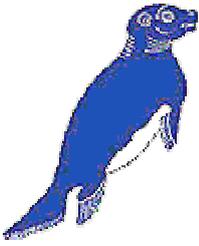
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See also [After Valencia, monk seals in Cork?](#), International News

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