

State of Biodiversity

in West Asia

A. Background

1. West Asia benefits from a wealth of biological diversity that harnesses a variety of terrestrial, freshwater and coastal ecosystems and associated habitats. The West Asian region comprises the Mashriq subregion (Iraq, Jordan, Lebanon, the Occupied Palestinian Territory and the Syrian Arab Republic), characterized by conditions ranging from Mediterranean humid to semi-arid, and the Arabian peninsula (Bahrain, Oman, Kuwait, Qatar, Saudi Arabia, the United Arab Emirates and Yemen), dominated by conditions ranging from semi-arid to desert arid. West Asia is part of three eco-regions that incorporate a variety of ecosystems, including Mediterranean forests, deserts, plains, rangelands, savannas, oases, mountains, rivers, lakes, springs, mudflats, swamps, marshes, mangroves, seagrass beds and coral reefs, all of which provide a wide array of ecosystem services and ecological corridors for migratory species through the region. Societies in West Asia depend heavily on the nutritional, industrial and health benefits of the region's biodiversity,

which are harvested without a true understanding of the value that they represent for ecosystem functioning, and yet biodiversity is one of the main factors contributing to sustainable development in West Asia, in particular by supporting agricultural ecosystems (animals and plants).

B. Status of biodiversity in 2010

2. Three of the world's 34 biodiversity hot spots are located in West Asia (Environment Outlook for the Arab Region – EOAR, 2010)¹: the Irano-Anatolian region, the Mediterranean forest region and the Horn of Africa region, including the Arabian peninsula and the Socotra archipelago in Yemen (Conservation International, 2007).² The last mentioned is a World Heritage Site known for its rich biodiversity with 850 plant species, 254 (about 30 per cent) of which are endemic. In

1 The Environment Outlook for the Arab Region (EOAR 2010). United Nations Environment Programme (Arabic version). <http://www.unep.org/dewa/westasia/eoar/> (Last accessed 25 March 2010).

2 Conservation International (2007). Biodiversity Hotspots. http://www.biodiversityhotspots.org/xp/Hotspots/hotspots_by_region/Pages/default.aspx.



Dendrosyochos socotranum, along the north coast of Yemen, 2005



Male dragonfly *Crothemis erythraea* – Bahrain

- the Middle East, some 200–250 plant species are commercially used for medicinal purposes (EOAR, 2010).³ Marine resources represent a major source of protein for human beings and arid rangelands provide rich sources of animal and plant protein, thus contributing extensively to meeting food requirements in the region. Arid ecosystems also offer forage crops of nutritional and medicinal value, with a production ranging from 50 to 1,600 kg/ha (Arab Organization for Agricultural Development, 2005);⁴ examples include *Periploca angustifolia*, *Dactylis glomerata*, *Schismus barbatus* and *Oryzopsis milacea*.
3. The forests and woodlands of West Asia occupy only 1.34 per cent of West Asia's total land area (Global Environment Outlook – GEO-4, 2007)⁵ but this figure is steadily rising as countries recognize the value of forested areas. The majority of forest cover (62 per cent) is in the Arabian peninsula, with tracts of mangrove forests growing along the coasts and

³ See footnote 1.

⁴ Annual book of statistics, 2005, vol. 25, Arab Organization for Agricultural Development, Khartoum.

⁵ UNEP 2007. Global Environment Outlook (GEO-4). United Nations Environment Programme, Nairobi.

stands of *Juniperus* spp., *Acacia* spp., *Tamarix* spp., and *Prosopis* spp. The remainder of the forests are scattered across the mountains and hills of northern Iraq, Jordan, Lebanon, the Occupied Palestinian Territory and the Syrian Arab Republic. The best stands of closed forests are found on the uplands near the Mediterranean. Mediterranean forests provide rich plant and animal habitats dominated by *Abies* spp, *Pinus* spp, and *Cedrus* spp.

4. Protected areas play a vital role in protecting unique ecosystems and act as models for effective sustainable management, while offering opportunities to promote awareness and education. Protected areas have existed in the region throughout history, in accordance with the concept of hima, which enforced strict customary regimes on conservation and ensured the appropriate use of natural resources for long periods. After the second half of the twentieth century many protected areas were lost in the Arabian peninsula and the Mashriq, owing to the gradual abandonment of the hima regime (EOAR, 2010).⁶ The number of

⁶ See footnote 1.

hima-based enterprises in Saudi Arabia dropped from 3,000 in 1969 to 9 in 1997 (IUCN/WCPA, 2008).⁷

5. West Asia harbours wetlands and water bodies of international significance, a number of which are listed under the Ramsar Convention on Wetlands of International Importance, Especially as Waterfowl Habitat. Important rivers in the Mashriq include the Euphrates, the Tigris, the Jordan and the Litani, which enjoy a wide range of aquatic plant, fish and bird diversity, providing significant ecosystem services to the communities that protect them. The Arabian peninsula is characterized by oases, springs, swamps, coastal sabkhas (salty mudflats) and human-made water bodies that act as important paths for migratory birds and sustain reed beds and rare endangered species of water birds of international importance.
6. Dryland agro-biodiversity in West Asia is adapted to the region's harsh climatic conditions. Some of the countries of the region possess unique flora of their own. Among the estimated 350,000 species of plants only 200 species are domesticated food sources and only 15–20 species are of major economic importance, constituting 83 per cent of cultivated food crops worldwide (EOAR, 2010).⁸

Interestingly, most of these major food crops originate in the Mediterranean drylands of what is known as the “Fertile Crescent” area, which contain 4 of the 18 endemic flora hot spots. The Near East is one of the three centres of origin of species used in agriculture defined by Hawkes (1983),⁹ serving as the centre of origin for wheat, barley, lentils, forage species and many fruit trees. Species which originated from



Cedars of Lebanon, *Cedrus libani*



Date palm, *Phoenix dactylifera*, Darkulaib village, Bahrain

Note: there are more than 100 varieties of date palm in Bahrain

this area currently feed over 38 per cent of the world's population. Wheat alone accounts for one third of global food production (International Centre for Agricultural Research in the Dry Areas (ICARDA) – West Asia Global Environment Facility (GEF) project).¹⁰

⁷ IUCN/WCPA (2008). WCPA North Africa and Middle East. The World Conservation Union – IUCN / World Commission on Protected Areas. http://cms.iucn.org/about/union/commissions/wcpa/wcpa_work/wcpa_regions/wcpa_naf-rica/index.cfm.

⁸ See footnote 1.

⁹ Hawkes (1983), *The Diversity of Crop Plants*. Harvard University Press, Cambridge, Massachusetts and London.

¹⁰ ICARDA West Asia GEF Project (2010). *Dryland Agro-biodiversity*. <http://www.icarda.org/gef/explain.html>.

7. The coastal ecology of West Asia is varied in nature and surrounded by major open, semi-closed and closed oceanic water bodies and marine habitats. All its water bodies except the Dead Sea enjoy an abundance of marine communities. The Red Sea includes a wide range of species of fish, seagrass, corals, invertebrates and sea turtles. The Arabian Sea is known for a variety of unique fishes, algae, invertebrates, shrimps and molluscs. The Gulf of Aden and the sea area of the Regional Organization for the Protection of the Marine Environment (ROPME) are characterized by important reef fishes and coral species with a unique tolerance to variations in water temperature and high salinity rates. Lastly, the Mediterranean Sea benefits from comparatively rich marine resources, hosting 8–9 per cent of the world’s marine varieties, with 622 sponge species, 600 fish species, 3 turtle species and 12 squid species (EOAR, 2010).¹¹

C. Key biodiversity challenges in the region

8. West Asia has recently undergone profound ecological changes. According to fragmented assessments, the region has suffered a substantial loss of biodiversity and a degradation of habitats as a result of human activities. The environment is dominated by limited water resources, a scarcity of arable land, fragile ecosystems and episodic droughts. The relatively narrow ecological corridors, and the closed and semi-closed ocean areas that surround the region’s territory, in addition to the limited connectivity caused by fragmented habitats, render these ecosystems more sensitive to the threats of climate change, thus limiting the opportunities for species to migrate or adapt to the changes to which they are subjected. National, regional and international efforts to conserve biodiversity and combat desertification notwithstanding, biodiversity in West Asia is being degraded by the direct pressures of modern development and correlated underlying indirect drivers of biodiversity loss, such as population

Table 1
Red Sea species that have migrated to the East Mediterranean over the past 25 years

Species	Family
<i>Apogon taeniatus</i> – <i>Apogon thrustoni</i>	Apogonidae
<i>Callionymus filamentosus</i>	Callidnymidae
<i>Cynoglossus sinus</i> – <i>arabici</i>	Cynoglossidae
<i>Hemiramphus far</i>	Hemiramphidae
<i>Silhouettea aegyptia</i> – <i>Oxyurichthys papuensis</i>	Gobiidae
<i>Sargocentron rubrum</i>	Holocentridae
<i>Leiognathus klunzingeri</i>	Leiognathidae
<i>Stephanolepis diaspros</i>	Monacanthidae

Source: Fourth national report of the Syrian Arab Republic¹²

¹¹ See footnote 1.

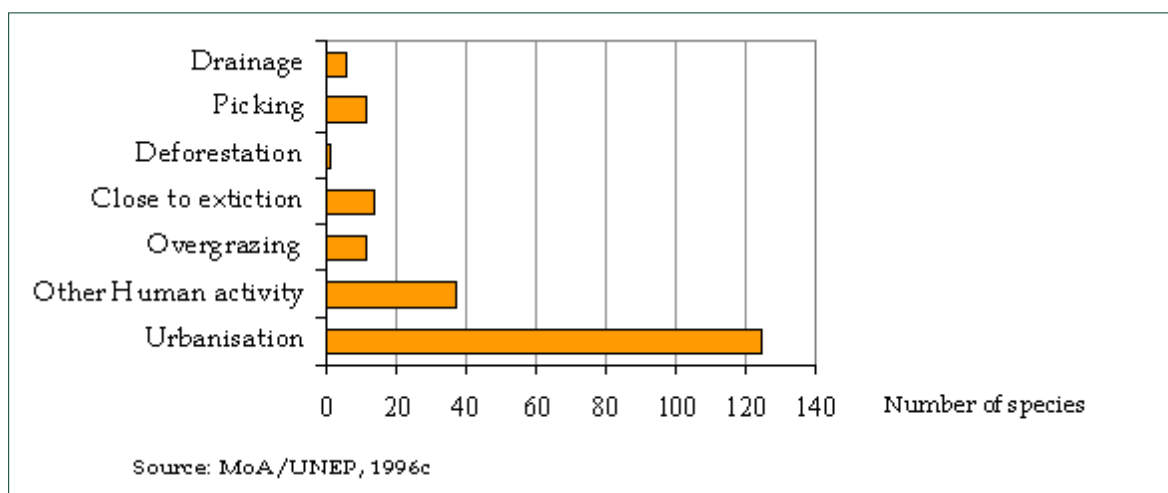
¹² SCBD (2010) Secretariat for the Convention of Biological Diversity: Fourth national Reports. <http://www.cbd.int/secretariat/>.

growth and inadequate economic subsidies.

9. Moreover, West Asia has witnessed an abrupt surge in coastal development in most of its main cities, owing to a rapid increase in population growth over the past 30 years. The region's population is continuing to increase at more than 3 per cent a year – by about 3.6 per cent a year in the Arabian peninsular subregion and by about 2.7 per cent a year in the Mashriq subregion (GEO Data Portal, 2005).¹³ West Asia's total population grew from 36 million in 1970 to 118 million in 2005. In the Arabian peninsula, urban growth patterns were much more rapid and are among the highest worldwide. This urbanization was accompanied by a change in consumption patterns and lifestyles, triggered by financial wealth from oil resources in the Arab region and the rise in oil prices during the 1970s and 1980s.
10. In general, the increase in demand for food, coupled with the economic policies of the region, has led to the spread of intensive agriculture systems and the cultivation of marginal land to meet population needs. This has resulted in an overexploitation of natural resources and the misuse of land, freshwater and marine resources. In addition, threats to biodiversity components have been exacerbated by the consequential reduced range of the species' natural distribution. As a result, land degradation and the fragmentation of unique terrestrial and aquatic ecosystems and loss of habitats have become the main biodiversity issue in West Asia. Unless rigorous measures are taken at the highest levels to halt the loss in biodiversity, the imbalance between development and conservation is likely to intensify in the future and be further compounded by the impacts of climate change.
11. West Asia is also considered to be one of the most arid regions of the world. The ecosystems in the

region's drylands are fragile and the degradation of habitats and the loss of related biodiversity are already leading to irreversible situations, provoking the migration of local communities, desertification and the spread of mass poverty. Severe water scarcity has been worsened by heavy water demand in recent years from urbanization and industrialization. One of the main biodiversity challenges is posed by the management of water resources and the maintenance of inland water biodiversity. The absence of effective regulatory mechanisms, the overexploitation of groundwater and widespread pollution are all contributing to further water scarcity in the region. Pressures from agriculture are causing the salination of groundwater, the depletion of fresh water resources, the deterioration of soil biota and a decrease in land productivity. The degradation of dryland soils could also be a potentially significant source of carbon emissions. Limited ecosystem productivity in all sectors is likely to facilitate a shift to alternative technologies in agriculture and fisheries management, which may in turn lead to the further loss of biodiversity from systems that pursue uniform monoculture production at the expense of other important genetic resources.

¹³ GEO Data Portal, (2005). <http://geodata.grid.unep.ch/>.

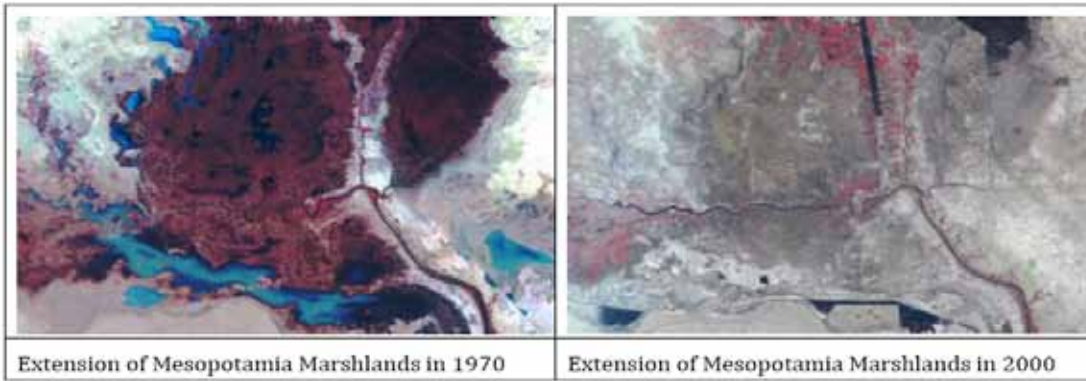


Source: Fourth national report of Lebanon¹⁴

12. The depletion of groundwater resources by unsustainable pumping has major effects on ecosystems in the drought-dominated conditions of the region. Wetlands in Iraq and Jordan have been dramatically degraded. The drawing of groundwater for urban and agricultural needs in Jordan has resulted in the deterioration of the Azraq wetlands and related ecosystems and a drop in tourism (EOAR, 2010).¹⁵ Water extraction in eastern Saudi Arabia and Bahrain over the past few decades has led to the degradation of many of the region's date-palm oases and natural water springs. Serious wetlands degradation has been observed in southern Iraq, with the loss of 90 per cent of lakes and marshlands due to land reclamation, the construction of dams and drainage activities. The international community and the United Nations system have pulled together to respond to this loss, rehabilitating Mesopotamian marshlands and working with marshland communities on various sustainable development initiatives.
13. Forest cover has recently undergone significant losses and dieback primarily as a result of climate change, diseases and insect pests, forest fires, illegal and excessive fuelwood collection and charcoal production, the conversion of forests and rangelands to croplands and the clearing of forests for unplanned urban expansion. Destructive quarrying in mountain habitats takes place in some countries for development purposes, thus exerting major stresses on the resilience of forest ecosystems. In response to these problems, most countries have developed national action plans to combat desertification, and have mounted reforestation and afforestation efforts with indigenous species in an endeavour to restore forest ecosystems. Reforestation efforts, however, are more likely to result in less diverse and more uniform ecosystems, an outcome which validates the argument that prevention through conservation is always preferable to restoration.

¹⁴ See footnote 12.

¹⁵ See footnote 1.



Extension of Mesopotamia Marshlands in 1970

Extension of Mesopotamia Marshlands in 2000



Recovery of the Mesopotamia Marshlands 2003-2007 (UNEP-GRID, 2007)

Source: UNEP report on support for the environmental management of the Iraqi marshlands, 2004–2009.



Azraq Wetland Reserve in Jordan

- In 1978, the Royal Society for the Conservation of Nature established the Azraq Wetland Reserve to conserve the invaluable oasis located in the heart of Jordan's eastern desert, which lies between a limestone desert in the west and a basalt desert in the east. It is distinguished by lush marshland and natural water collections that form glittering pools and streams, giving Azraq its name, which is the Arabic word for "blue".
- In 1977, the Ramsar Convention identified the Azraq wetland and the adjacent Qa mudflat as a major station for migratory birds on the African-Eurasian flyway. A variety of birds flock to the reserve each year, stopping for a short rest along their migration routes, staying for the winter, or breeding within the wetland. The Azraq wetland is the only oasis in the Arabian desert with a self-replenishing system that has enabled it to sustain itself throughout the years.
- Unfortunately, the wetland has suffered an environmental disaster because of the misuse and overuse of water from the Azraq basin. Owing to excessive pumping of water from the oasis to large urban areas and the illegal drilling of artesian wells for agricultural purposes, water levels have steadily dropped over the last 50 years, starting to decrease significantly in 1981 and reaching alarming rates in 1993. These high levels of water extraction have led to the extreme depletion of this natural oasis, drying up massive areas of invaluable wetland measuring in excess of 25 square kilometres.
- With international support, the Royal Society for the Conservation of Nature began a rescue effort in 1994, managing to restore a significant portion of the wetland, and aims to restore depleted water levels by 10 per cent. So far, this target has not been achieved because of continued water pumping, lack of manpower, and insufficient experience in wetland management. Thanks, however, to efforts by RSCN, many bird species for which Azraq was once renowned are now returning and special boardwalks and bird hides have been constructed to enable visitors to observe and enjoy them.

Source: Fourth national report of Jordan, 2010

14. Terrestrial species and indigenous plants are lost through overgrazing in marginal lands. Tree species have been lost as a result of deforestation in Jordan, Lebanon, Oman, and Yemen. Bahrain and Saudi Arabia have lost a variety of animal and plants species that used to thrive naturally.

The over-hunting of large mammals and birds is another practice that has adversely affected biodiversity in the region. In most West Asian countries the regulations governing hunting are ineffective and legislation in this area is not enforced.

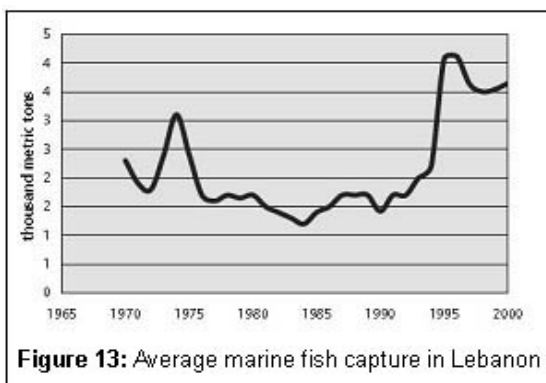
Examples of species depleted by overhunting include the gazelle, which has been reduced both in number and range; the Arabian oryx, *Oryx leucoryx*, which was driven to extinction in the wild but has been successfully reintroduced through captive breeding; the Arabian bustard, which is now

extinct in Saudi Arabia; and the houbara bustard, which has lost most of its population (GEO-3, 2002).¹⁶



Al-Shahaniya Oryx Centre in Qatar

¹⁶ UNEP 2002. Global Environment Outlook GEO 3. United Nations Environment Programme, Nairobi



Fragmented forest cover – Lebanon (Source: Fourth national report of Lebanon¹⁷)

15. There is considerable marine pollution from a range of agricultural and industrial sources. Heavy navigation by oil tankers has also been causing substantial marine pollution in the region. Oil and gas extraction and recurrent oil spills, in addition to the discharge into the sea of industrial effluents from land-based sources, are the main drivers of biodiversity loss. Examples of contamination have been found to the north of the Sitra industrial zone in Bahrain (ROPME 2004),¹⁸ affecting major shrimp farming grounds and thus threatening a major source of income to the country's economy. In the Mashriq subregion many marine species such as turtles and sponges are threatened by a

¹⁷ See footnote 12.

¹⁸ ROPME (2004) State of the Marine Environment Report: ROPME Sea Area. Regional Organization for the Protection of the Marine Environment, Kuwait City.

deterioration in water quality from the discharge of sewage, wastewater and sedimentation. Resulting eutrophication events are believed to constitute the main cause of the recurrent red tides in recent years on the east coast of Oman and in the ROPME sea area. Some coastal areas in Lebanon were found to be heavily polluted by discharged wastewater, leading to the destruction of existing marine life.

16. Although fisheries management is practised to some extent in some countries in West Asia, unsustainable fishing by communities afflicted by extreme poverty continues to destroy fish in massive numbers, often at a rate that prevents fish populations from replenishing themselves; 1.5 million tons of fish are exploited in the Mediterranean Sea (EOAR, 2010),¹⁹ using illegal methods such as dynamite, poison bait and electrical devices. The Red Sea has suffered the loss of major marine vertebrates and benthic invertebrate species and the fishing communities dependent on this sector are faced with extreme financial losses and poverty, further encouraging the illegal overexploitation of marine natural resources.
17. The spread of invasive alien species has become another increasingly serious problem in the region. Globalization and world trade have contributed indirectly to the introduction of foreign animal and plant species across terrestrial borders and via ballast water, with resulting ecological, economic and health problems. West Asia is part of the Arab region and the International Union for Conservation of Nature and Natural Resources (IUCN) has classified 551 species of invasive species in the Arab region as a whole. For example, in the Syrian Arab Republic *Ziziphus mauritania* is considered invasive; the red palm weevil, *Rhynchophorus ferrugineus*, has become one of the principal pests of date palms in the

¹⁹ See footnote 1.

Arabian peninsula (EOAR, 2010);²⁰ *Prosopis juliflora* in the United Arab Emirates has caused biodiversity loss of associated shrubs; the wild cactus *Opuntia* spp. in Yemen has invaded rangelands and is now being eradicated through mechanical means; and the house crow, *Corvus splendens*, is considered a widespread invasive avian species. In the Mediterranean Sea around 400 species of plankton have been registered, some of which are foreign to the sea's ecosystem. Invasive alien species are paid relatively little attention in the region and hence fewer assessments are available to track trends in their distribution and population size. The lack of financial and technical resources has impeded the capacity of research laboratories and government agencies to improve their knowledge about invasive species, while concerned sectors such as agriculture and trade continue to have limited access to education programmes about this serious threat.

18. Biodiversity in marine ecosystems is threatened by human encroachment on to native habitats, mainly from physical habitat alteration, sand dredging and reclamation to expand coastal development, an observed rising trend in the Arabian peninsula. A large percentage of the gulf coastline has been reclaimed; Bahrain, for example, has expanded its coastline by 40 square kilometres; 40 per cent of Saudi Arabia's coastline has been developed, with the resulting destruction of 50 per cent of its mangroves (EOAR, 2010).²¹ In the ROPME sea area, near the United Arab Emirates coast, the development of massive marine artificial islands has been gaining momentum over the past decade. Prior spatial planning and assessment of habitat destruction has been ignored and only limited sustainable management procedures have been implemented. Marine benthic species and corals

that support existing fish stocks have been buried or smothered by heavy construction activities and the remaining species subjected to a deterioration in water quality. Coral bleaching incidents have been reported as a consequence of rising seawater levels, high temperatures and salinity. Furthermore, recent natural disasters such as the Gono hurricane have caused algal blooms and resulted in red tides following the heavy sedimentation and turbidity on the Omani coast, which destroyed most of the marine life in the vicinity.

19. The Gulf Cooperation Council (GCC) countries are responsible for about half the world's production of desalinated water, to meet their growing water needs. The environmental impacts associated with desalination include the impingement and entrainment of aquatic creatures in plant intakes and the discharge of rejected hot brine, residual chlorine, trace metals and anti-foaming and anti-scaling agents into the near-shore marine environment, with direct impacts on marine biodiversity. Furthermore, wastewater recycling is widely practised for irrigation in landscaping, thus contributing to soil nitrification from effluents and inducing algal growth and the deterioration of water quality in aquatic ecosystems. Large numbers of deaths of sea turtles, dugongs, dolphins, seals and birds have been reported in the nearby coastal areas.
20. Biosafety has become a rapidly growing area of concern for ecosystems and health in the region, notwithstanding the benefits of biotechnology for food security. Although some West Asian countries such as Bahrain, Iraq, Kuwait and the United Arab Emirates have not yet ratified the Cartagena Protocol, while others have not set up or implemented suitable frameworks to regulate the use and transboundary movement of genetically modified organisms and living modified organisms, there is evidence that biotechnology products

²⁰ See footnote 1.

²¹ See footnote 1



Marine biodiversity in Oman

are being experimented on or traded in many countries. This issue requires urgent attention. Nonetheless, further capacity-building efforts relating to risk assessment and the management of genetically modified organisms and their impacts on health and biodiversity continue to be required in the region.

21. Uneven land tenure across the region has led to a mismanagement of natural resources and is hampering the implementation of adequate administrative procedures. In addition, unregulated tourism has allowed access to ecologically important sites and pristine habitats by motor sports adherents and the infrastructure of the sport, resulting in considerable biodiversity loss. The unique traditional knowledge, innovations and practices associated with these ecosystems, which are essential to the conservation of existing genetic resources, have become threatened.
22. Lastly, the lack of progress in achieving peace and security in the region has been a great barrier to biodiversity conservation in West Asia. Natural resources are used unsustainably for survival purposes and conservation is paid scant attention on the political agenda by decision makers in conflict-riven territories. The Government of Iraq and the Palestinian Authority have, however, been vigorously promoting regional biodiversity activities and participating in biodiversity conservation programmes,



Arabian Gazelle, *Gazella gazella cora*, al Saleel, Oman

although they continue to endure hardships from recurrent wars. Iraq has recently become the 192nd signatory to the Convention on Biological Diversity.

D. Trends in the decline and extinction of species

23. Across the Arab region as a whole, 1,084 species are threatened with extinction, 24 per cent of these being fish, 22 per cent birds and 20 per cent mammals (IUCN/WCPA 2008).²² In West Asia, mammals have been undergoing major losses in populations as a consequence of habitat destruction. In the Mashriq, the numbers and natural distribution of *Capra ibex*, and *Gazella* spp. have been limited by geographical area. Leopard populations have dropped significantly in the mountains of the Arabian peninsula (EOAR, 2010).²³ The *Oryx leucoryx* has become extinct in the wild but has been salvaged through captive breeding in a number of Arab countries. In Socotra, Yemen, 250 endemic species are threatened with extinction (Ministry of Water and Environment and Environment Protection Agency, 2005);²⁴ in Oman 136 plant species are threatened and 46 per cent of all native species are endangered

²² See footnote 7.

²³ See footnote 1.

²⁴ Ministry of Water and Environment – Environment Protection Agency (2005). National Biodiversity Strategy and Action Plan for Yemen. UNDP/GEF/IUCN YEM/96/G31 <http://www.cbd.int/doc/world/ye/ye-nbsap-01-en.doc>.

(Ministry of Environment and Climate Affairs, 2001);²⁵ in Jordan the bird species *Pterocles alchata*, *Fulica atra*, *Ammoperdix heyi* and *Falco peregrinus* are classified as rare and endangered (Ministry of Environment, 2008).²⁶

24. Wild medicinal plant species are becoming rare or threatened with extinction because of habitat destruction resulting from changes in land use, excessive harvesting and harsh climatic conditions. In Jordan, *Crocus hermoneus* and *Origanum syriacum* habitats have been reduced in size while *Capparis decidua* has become threatened with extinction. In Jebel El-Arab in the southern Syrian Arab Republic, there is evidence that 50 per cent of the loss of plant species is due to poor management practices. Coral bleaching in the ROPME sea area has affected 20,000 square kilometres of coral beds, representing approximately 7.9 per cent of the world's total coral cover (ROPME, 2004).²⁷ Dugong populations in Bahrain, Qatar and the United Arab Emirates have been heavily affected by marine construction activities that have destroyed most of the seagrass beds on which they feed.

E. Country responses in pursuit of the 2010 targets

25. The determination of West Asian countries to conserve and restore biodiversity has been demonstrated through the ratification and implementation of biodiversity-related multilateral environmental agreements, protocols and regional agreements and through their support for the Millennium Development Goals, in particular goal 7, to ensure environmental sustainability, and goal 1, to eradicate extreme poverty and hunger. The harnessing of synergies with efforts to attain climate change mitigation and adaptation targets is

²⁵ First report on the state of the environment in Jordan, Ministry of the Environment, Amman.

²⁶ See footnote 12.

²⁷ See footnote 17.



Spiny-tailed Lizard, *Uromastyx microlepis*, Sakhir desert area, Bahrain



Soft coral *Dendonephthya sp.*; Sergeant damselfish *Abudefduf vaigiensis*, United Arab Emirates

seen as an essential undertaking, given the inherent links between climate change and biodiversity. Although some parties to the Convention on Biological Diversity have reported successes in such matters as the gazetting of protected areas and the community management of natural resources, West Asia is in the same position as other regions in that it has still failed to meet the 2010 target of achieving a significant reduction in biodiversity loss. This failure is principally attributable to the fact that biodiversity is undervalued and the environment is not at the top of the political agenda. The region is not homogeneous and it lacks the financial and technical resources necessary to achieve regional conservation goals. Political will and environmental awareness, coupled with the necessary legislative and institutional reforms, are required to enhance the integration of biodiversity in sectoral planning

Table 2

World Conservation Monitoring Centre world database on the protection of nationally designated protected areas

Country	Number of designated protected areas
Iraq	6
Syrian Arab Republic	17
Jordan	22
Lebanon	15
Yemen	6
Saudi Arabia	128
Kuwait	19
United Arab Emirates	15
Oman	6
Qatar	4
Bahrain	4

and decision-making in economical valuation procedures.

26. Environmental impact assessment studies have been implemented to a certain extent in the region; as yet, however, public participation in the process is limited. Efforts must be mounted in the region to incorporate biodiversity policies into national development planning processes in all economic sectors. In West Asian countries, as is the case elsewhere, effective enforcement measures in biodiversity conservation need support from decision makers and legislators who are officially mandated with ensuring the integration of economic valuation of biodiversity in the market and government taxation systems.
27. Endeavours to expand protected areas and biosphere reserves in West Asia have been gaining momentum in some countries, with the aim of extending their proportion of overall

land cover to 10-15 per cent over the coming 10 years. Protected areas and biosphere reserves in the Arab region continue to be established and wetlands of international importance are being registered under the Ramsar Convention. Nevertheless, the overall area under such protection remains small when compared to global efforts towards this target. For example, the proportion of protected areas in Jordan and Oman is below 6 per cent of the countries' total area, as compared to a worldwide ratio of over 12 per cent (UNEP, 2008)²⁸. In West Asian countries, the number of international terrestrial and aquatic protected areas rose from 120 in 1970 to 231 in 2007, totalling 87,863,902 hectares (UNEP 2007).²⁹

28. While in some countries, such as Jordan and Lebanon, the number of protected areas has grown and

²⁸ UNEP (2008). GEO Data Portal. United Nations Environment Programme. <http://geodata.grid.unep.ch/>.
²⁹ Ibid.

management schemes have been introduced, local communities need to be more closely involved in decision-making to ensure effective administrative and financial management. In Saudi Arabia 16 protected areas have been gazetted, adding 71,782 square kilometres to the total area under protection. In Bahrain, a breeding programme for the highly endangered marsh frog, which disappeared as the country's freshwater springs became degraded, has been established and a recovery programme has been implemented for the rare Arabian sand gazelle in the al-Areen wildlife park.

29. The most significant achievement in ecosystem restoration was the work to restore the aquatic ecosystems destroyed by drainage and dam construction in the Ahwar marshlands between the Tigris and Euphrates rivers in Iraq (UNEP, 2003).³⁰ The creation of large artificial wetlands in Iraq and the Syrian Arab Republic, however, has offset the loss of biodiversity on the Euphrates river by attracting migratory and water birds important to the West Asian region. At the same time, successful in situ conservation of endemic cereal crops has been undertaken in Jordan and the Syrian Arab Republic (EOAR, 2010). In Yemen, populations of the Arabian leopard have been restored through ex situ conservation and progress has been made towards biodiversity conservation targets through research programmes and establishment of gene banks. In Qatar, progress has been made towards the restoration of the Arabian oryx, populations of which were extinct in the wild. A small founding herd was successfully bred in captivity at the Arabian Oryx Breeding Centre and animals from this stock



were reintroduced in three reserves, Shahanya, Ushaijrij and Almazhabyah. The Rhim gazelle, which had become locally extinct, was also reintroduced following successful captive breeding efforts. The reintroduced populations have grown to number 650 Arabian oryx and 3,500 Rhim gazelles. In addition, some captive breeding efforts to reestablish the wild cow, and also certain gazelle species, have been undertaken in Jordan, Oman, Saudi Arabia and the Syrian Arab Republic.

30. West Asia relies on a wealth of community-based traditional knowledge and customary laws that are at the core of biodiversity conservation. There is general consensus among the countries of the region to support an international regime on access and benefit-sharing, to regulate the use of genetic resources and to protect the rights of the indigenous communities that are preserving them. The benefits of biodiversity as a resource which underpins ecosystem services and the potential advantages from bioprospecting, which may result in patents or sales of new drugs, together with the inherent economic value of biodiversity, are evidenced by the income generated for stakeholders. For example, in the Syrian Arab Republic, traditional ways of life, such as nomadic grazing and forest use, are encouraged and already protected

³⁰ UNEP (2003). Environment in Iraq: UNEP Progress Report. United Nations Environment Programme, Geneva. http://postconflict.unep.ch/publications/iraq_PR.pdf.

under local laws. National laws and by-laws by all parties are yet to be reviewed in line with the international regime on access and benefit-sharing, which is to be adopted at the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity in Nagoya, Japan, in 2010. The Convention's clearing-house mechanism has demonstrated that international cooperation is fundamental to global biodiversity conservation. Stakeholders in West Asia, in particular Lebanon and Saudi Arabia, have been implementing this mechanism effectively to develop further knowledge on biodiversity trends, technologies and success models of conservation programmes.

31. In conclusion, more substantive efforts are required in West Asia to meet the global biodiversity objectives set

by the Strategic Plan and the new post-2010 biodiversity targets under the Convention on Biological Diversity. To bridge the gap between science and policy and to assess the status of the biodiversity of the entire region and the associated indicators and trends, more research based on sound science and more intensive monitoring are needed. Decision makers in the region must make concerted efforts to endorse national laws governing human behaviour. To that end, regional dialogue between Governments, stakeholders and the science community must be encouraged. Last but not least, efforts to reconcile development and conservation while maintaining an ecological balance in the surrounding natural world represent the path that must be followed if the future of this planet is to be safeguarded.



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