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## 4. The Caspian Sea: threats to its biological resources and environmental security

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### I. Introduction

The Caspian Sea is the world's largest inland sea. Physiographically it is unique. It is the most productive body of water in the world<sup>1</sup> and the only one that preserves the geno-fund of the sturgeon, the source of almost all the black caviar produced. About 10 million people live around the Caspian Sea and the occupations of many of them are connected with the sea, and first of all with fishing. By virtue of its oil and gas potential the Caspian has a place among the major world centres of hydrocarbon production. The rivers of the largest water catchment area in the world discharge into it from the industrial and production regions of the littoral states. This fact accounts for the periodic fluctuations of the sea level and for the nature and scale of pollution of the sea.

As for the water body itself, there has always been a conflict between the use of its principal natural resources—biological resources (fishing of valuable fish species, first and foremost the sturgeon)—and the exploitation of hydrocarbons (the development of shelf and offshore oil and gas fields). This conflict has become especially acute since the breakup of the Soviet Union, as a result of which the legal status of the Caspian Sea changed, regulation of the exploitation of the sea's resources has broken down, and the geopolitical interests of five different states conflict. These interests are those connected with military and political security, with shipping, with the exploitation of biological and mineral resources, and with environmental security. The newly independent states in the Caspian region link their prospects of socio-economic development with the implementation of hydrocarbon projects financed by other major countries.

Hydrocarbons can be considered both a direct and an indirect source of many environmental problems in the region, but also as a means, and sometimes the only means, of solving those problems. The existing and planned exploitation of the hydrocarbon resources in the Caspian is fraught with risk to the integrity of its ecosystem, and this risk is multiplied many times because the Caspian is an inland sea. Threats to the natural environment include fluctuations in the sea level, surge effects, the increasing salinity of groundwater, industrial pollution, loss of biodiversity and other factors.

Trans-border environmental problems could give rise to conflicts here. They include a sharp reduction in and deterioration in the quality of commercial fish

<sup>1</sup> Measured as the quantity of all animals and other living organisms living in the sea per volume of water. The productivity of the Caspian Sea is 1.2 tonnes per km<sup>3</sup>.

stocks, particularly sturgeon; water pollution from land, coastal and marine sources; accidents at coastal plants and accidents in the course of the extraction and transport of oil and gas in and across the sea; cross-border air pollution, including emissions from gas condensate plants; and the environmental consequences of military action.

The crisis and even impending catastrophe that are becoming visible in the Caspian ecosystem are reminiscent of the environmental problems in the nearby Aral Sea and have aroused great anxiety all over the world. The suggested division of the Caspian Sea into national sectors and uncontrolled development of its hydrocarbon resources could make matters worse.

Hitherto in the system of national interests of the Caspian littoral states—in the first place Azerbaijan, Kazakhstan and Turkmenistan—the environmental importance of the territories under their control has been somewhere in the background. Their deliberate overstating of their hydrocarbon resources and of the profits to be expected from their exploitation, and the struggles over rights to ownership of the energy potential and the right to determine the future routes for the transport of hydrocarbons to the world market, have contributed to the neglect of environmental issues. This makes it very difficult and at times even impossible to formulate a coordinated regional policy in the field of nature conservation and rational management of the resources of the sea.

Control over international projects to develop the hydrocarbon resources will also be especially significant for the improvement of the environmental situation in the Caspian region. National and international environmental security will require a system of coordinated state and interstate mechanisms, actions and guarantees based on each and every state observing general principles and norms of international law to guarantee the efficient solution or elimination of environmental problems of regional or global significance.

## II. Threats to the Caspian's biological resources

Throughout its history the Caspian Sea has been a very important source of biological resources. They make up a single ecosystem and are the result of the interplay of many natural and man-made factors—the flow of fresh water into the sea, the hydrological and hydro-chemical regimes<sup>2</sup> of the sea, feeding productivity,<sup>3</sup> natural and artificial reproduction of fish, the toxicological situation and fishing in the region.

The Caspian is important as a region for the seasonal migration, moulting and hibernation of birds which fly there from almost the whole territory of the former Soviet Union and from the Mediterranean. Roughly 10–12 million birds find a temporary habitat in the region on their annual migrations. About 3–3.5 million birds winter on the Caspian, settling in wetlands on river deltas. Most of these wetlands are nature reserves and included in the list of wetlands

<sup>2</sup> A hydro-chemical regime is defined as changes in the chemical composition of water in a water body over time.

<sup>3</sup> Feeding productivity is defined as the amount of biogenic elements consumed by fish.

of international importance under the Ramsar Convention of 1971.<sup>4</sup> The Caspian also preserves the only marine mammal of northern origin, the Caspian seal (*Phoco caspica*). It has been hunted since ancient times. In recent decades the population of the Caspian seal has been in a poor state because of a reproduction crisis: according to recent estimates the population is now only 420 000 head. It is no accident that in 1996 the World Conservation Union named the Caspian seal as being a vulnerable species.<sup>5</sup> However, the most important of the Caspian's biological resources is its fish stocks—about 123 fish species and subspecies. Their composition has been determined by the historical evolution of the sea: isolated from the other oceans of the world, it incorporates species originating in both the north and the south (the Mediterranean).

Intensive solar radiation and a rich inflow of biogenic elements have contributed to the high productivity of the Caspian. Total fish resources in the Caspian Sea are estimated at 2 900 000 tons. Here are found purely marine species (53 species, accounting for 43.5 per cent of the total fish stocks of the sea), such as herring, sand smelt and bullhead; river species (42 species, or 34.4 per cent of Caspian fish stocks), such as pike, various kinds of carp, loach and so on; migratory fish (18 species, or 14.7 per cent), such as sturgeon and salmon; and anadromous fish (9 species, or 7.4 per cent), such as some kinds of carp, perch and sheatfish.<sup>6</sup> It is believed that the Caspian Sea is able to produce 500 000–590 000 tons of fish annually, provided no overfishing is allowed.

The Caspian is biologically unique because, together with the rivers that flow into it—first and foremost the Volga—it contains the world geno-fund of the sturgeon and is the world's only repository of a diversity of species of sturgeon. It includes six species and one subspecies—the great sturgeon, *Acipenser nudiventris* (the spiny sturgeon), the sterlet, the Russian sturgeon, the Persian sturgeon, the North Caspian stellate sturgeon, and the South Kura stellate sturgeon.<sup>7</sup> Until recently catches of sturgeon in the Caspian Sea accounted for up to 82 per cent of total world catches.

The fresh, shallow water in the northern Caspian is especially significant. The inflow of river water rich in food, uniquely favourable conditions for spawning and the growth of fry, and the limited role of carnivorous predators make the region a kind of kindergarten for the most valuable fish species. It is not accidental that in the 1970s an area of the Caspian Sea lying to the north of 44°12' N.L. was declared a nature reserve.

<sup>4</sup> World Conservation Monitoring Centre, *Directory of Wetlands of International Importance* (Ramsar Convention Bureau: Gland, 1990).

<sup>5</sup> The International Union for Conservation of Nature and Natural Resources/World Conservation Union defines as vulnerable those species that are 'facing a high risk of extinction in the wild in the medium-term future'. See the IUCN Internet site at URL <<http://www.redlist.org>>.

<sup>6</sup> Kaznacheev, Ye. N., *Ryby Kaspiyskogo Morya: Opredelitel'* [Fish of the Caspian Sea: determinant] (Russian Food Ministry: Moscow, 1981), p. 16.

<sup>7</sup> Ivanov, V. P., *Biologicheskiye Resursy Kaspiyskogo Morya* [Biological resources of the Caspian Sea] (Caspian Fishery Research Institute: Astrakhan, 2000), p. 12.

**Table 4.1.** Sturgeon catches in the Caspian Basin

Figures are in thousand tons.

Years	Russia	Kazakhstan	Azerbaijan	Turkmenistan	Iran	Total
1940	3.6	1.3	2.2	0.4	0.5	8.0
1950	11.0	0.1	2.4	–	0.8	14.3
1960	7.4	1.6	1.1	–	1.5	11.6
1970	10.7	5.2	0.2	–	2.5	18.6
1980	16.7	8.1	0.3	–	1.5	26.6
1990	11.7	1.9	0.1	–	2.6	16.3
1995	2.00	0.58	0.16 <sup>a</sup>	0.18 <sup>a</sup>	1.5	4.42
1997	1.14	0.48	0.13 <sup>a</sup>	0.10 <sup>a</sup>	1.5	3.35
1998	0.96	0.53	0.09 <sup>a</sup>	0.06 <sup>a</sup>	..	1.64

<sup>a</sup> Includes sturgeon quota catches in the Volga Delta.

– Nil or a negligible figure.

.. Data not available.

Source: Ivanov, V. P., *Biologicheskoye Resursy Kaspiyskogo Morya* [Biological resources of the Caspian Sea] (Caspian Fishery Research Institute: Astrakhan, 2000).

The sturgeon are valuable among other things for their caviar, an expensive delicacy in high demand on the world market. However, diminishing catches in the Caspian have led to a drop in caviar production. In 1989 the Soviet Union produced 1365.6 tons of black caviar and Iran 282 tons. By the late 1990s Russia produced only 40 tons per year, other new sovereign Caspian states (excluding Turkmenistan) 34.8 tons, and Iran about 150 tons. Already, even before full-scale production of hydrocarbons in the Caspian Basin has begun, the situation of the sturgeon in the Caspian Sea is catastrophic—so much so that some experts speak in terms of the Caspian losing its fishery significance.

The Caspian sturgeon has faced crisis more than once. In the late 19th and early 20th centuries, the sturgeon wealth of the Caspian was almost destroyed by overfishing. Only the regulation of fish catches by government decree helped to avoid catastrophe. Then in the mid-20th century, as a result of the construction of hydroelectric plants on practically all the rivers of the Caspian Basin, many natural spawning grounds were destroyed. That crisis was overcome by setting up a powerful system of fish farming of sturgeon, a complete ban on offshore fishing for sturgeon and the introduction of single fishing rules. The present crisis is connected with the breakup of the USSR and heavy pollution of the Caspian Sea. It is now practically impossible to regulate and control sturgeon fishing, and the new sovereign littoral states neglect mutually agreed quotas and scientific recommendations on fishing.

While diplomats and politicians discuss the problem of the division of the Caspian Sea, criminal structures—the ‘sturgeon caviar mafia’—have already divided the coast between themselves irrespective of national borders, and as ordinary people are not concerned with high ideals but are trying to survive in

difficult economic conditions, widespread non-regulated fishing, or poaching, has started not only in the rivers but in the sea as well. The poaching catches are 11 to 13 times higher than the scientifically validated catches.<sup>8</sup> Especially great are offshore catches. Poaching has become common in all the new Caspian littoral countries and even in Iran. As participants on a Cousteau Society Expedition observed: ‘Given the equation: one sturgeon = one month of wages, poaching will be a vocation for many years to come’.<sup>9</sup>

At present over 90 per cent of the populations of the great sturgeon, white salmon and Caspian salmon, up to 27 per cent of the population of the Russian sturgeon and 53 per cent of the population of the stellate sturgeon are maintained by fish farming.<sup>10</sup> The main burden of the cost of maintaining the populations of the valuable fish species in the Caspian has always been and still is born by Russia. In 1999 alone the total release of sturgeon juveniles grown to a viable stage at fish farms in Russia was about 50–60 million.

Caviar is usually obtained from fish that were spawned and grown in a natural habitat. However, it is these that are caught first when they go to spawn in rivers where the major commercial catches are made. The populations of sturgeon of natural origin are therefore shrinking. Today the legal catches of Russian fishermen are insufficient even to provide fish farms with sturgeon species for getting caviar for fish farming and for commercial production of fish products and black caviar.

Pollution of the sea results in morphogenetic deviations in fish—changes in size, weight and age parameters—and morphological, physiological and biochemical anomalies. Under the cumulative effect of constant long-term pollution the sturgeon develop a degradation in muscular tissue called myopathy and total desorption of caviar. In the early 1990s these were demonstrated in 60 per cent of sturgeon. Moreover, through the food chain toxic matters can reach the human organism, damage its genetic system and, in the final run, cause hereditary disease and cancer.

In the light of this, and in spite of quotas on sturgeon catches being established in the littoral countries, the problem of the rational management of sturgeon in the Caspian basin is becoming the problem of the maintenance and reproduction of sturgeon resources, including its species composition.

As the legal status of the Caspian Sea still remains unresolved, no agreement on the preservation and use of the Caspian’s bio-resources has as yet been signed. The critical condition of the sturgeon makes it urgent for Russia to suggest a tentative moratorium on sturgeon fishing, a simultaneous increase in the scale of fish farming and adoption of a federal act On the State Monopoly on Production and Sale of Caviar and Sturgeon Fish Products.

<sup>8</sup> Ivanov (note 7), p. 83.

<sup>9</sup> Equipe Cousteau, ‘La Caspienne: rapport d’expédition, mai–août 1998’ [The Caspian: report of an expedition, May/Aug. 1998], p. 70.

<sup>10</sup> Ivanov (note 7), p. 15.

### Depletion of biological resources and its economic effects

The development of Caspian oil and gas will affect fishing first of all because drilling began in the northern Caspian, in the areas where the sturgeon spawn and fatten and on their migration routes. Fishermen are losing their traditional fishing areas, the migration cycles of fry and mature fish are broken, and ecosystems in some sea areas are deteriorating because of pollution. According to Brandon's estimates the Caspian littoral countries will lose about \$6 billion every year as a result of the reduction in sturgeon fishing alone.<sup>11</sup> In addition, the revenue of the caviar business would be reduced by 90 per cent: its annual turnover is estimated at \$10 billion.

The market value of other commercial fish species and Caspian sea animals is also considerable. The annual catch of seals is worth \$2.3 million, of pike-perch \$14.4 million, of sea roach \$13 million and of common carp \$2.1 million.<sup>12</sup>

### III. Environmental problems

The ecology of the Caspian Sea depends to a great extent on the state of the environment in its water catchment area. That area in turn abounds in environmental problems which are the result of the economic orientation of each region in the Caspian basin—of the sea itself, of the coastal territories and of the rivers that flow into the sea.<sup>13</sup> Among these problems are: (a) the quantitative and qualitative depletion of natural resources (including bio-resources) involved in economic cycles; (b) the degradation of natural and man-made ecosystems; (c) the deteriorating living conditions and health of the population; (d) pollution of the marine environment; and (e) the degradation of water ecosystems. This last is one of the key environmental issues.

At the end of the Soviet period 'the general environmental situation in the Caspian Sea basin, which was accompanied by a drastic worsening of the sanitary-toxic and fishery situation, could be referred to as pre-crisis'.<sup>14</sup> In 1992 the Volga Basin and the coastal territories of the Caspian Sea were termed 'ecological catastrophe zones'.<sup>15</sup> The major sources of pollution in the Caspian are pollutants flowing in with river waters (overland run-off); the disposal of untreated industrial and agricultural waste water, and municipal and domestic effluent from cities and settlements in the coastal zone; sea and river navigation; oil and gas production on land and in the shelf zone; oil transport by sea;

<sup>11</sup> Brandon, S., 'Oil on troubled waters', *Focus Central Asia*, no. 22 (30 Nov. 1995), pp. 12–16.

<sup>12</sup> Tolbojev, M. O. and Andurakhmanov, G. M., *Problemy Obespecheniya Ekologicheskoy Bezopasnosti Prikaspiyskogo Regiona* [Problems of environmental security in the Caspian region] (Dagestan Scientific Center: Makhachkala, 1997), pp. 64–68.

<sup>13</sup> Zonn, I. S., 'Ecological consequences of oil and gas development', eds W. Asher and N. Mirovitskaya, *The Caspian Sea: A Quest for Environmental Security* (Kluwer Academic Publishers: Dordrecht and London, 2000), pp. 65–77.

<sup>14</sup> Russian State Committee for Nature Protection, 'Sokhraneniye biologicheskogo raznoobraziya v Rossii' [Preservation of biological diversity in Russia], Moscow, 1997.

<sup>15</sup> Russian Ministry of the Environment, 'O sostoyanii okruzhayushchey sredy Rossiyskoy Federatsii v 1992 godu' [On the state of the environment in the Russian Federation in 1992], Moscow, 1993.

secondary pollution in the course of dredging work; and the air- and water-borne transfer of pollutants from other regions.

The inflow of pollutants with river waters is measured using an integral index of a number of natural and technogenic factors<sup>16</sup> which include the scale and duration of floods, observation of established fishing quotas, and the effects of industrial, domestic and agricultural waste water containing over 1000 chemical compounds. Every year the Caspian Sea receives 40–45 km<sup>3</sup> of waste water—23–25 km<sup>3</sup> from the Volga and 17–20 km<sup>3</sup> from other rivers. If these were distributed evenly over the sea surface, then every year the waste water would add 10–11 cm to the depth of the sea.<sup>17</sup>

In considering the pollution of the Caspian in general, the following features must be kept in mind. On the one hand, the uneven distribution of the sources of pollution along the perimeter of the sea leads to uneven pollution of its different parts. On the other hand, as currents going along the seashore are of a cyclonic nature, the pollution of one part of the sea invariably leads to pollution of other parts. It should also be noted that pollutants accumulate in the surface layer, localize in the transitional zones—between the water and the atmosphere and between the water and the sediments at the bottom—and tend to move towards marginal (peripheral) areas of the sea. In other words, the areas of the sea which are biologically most significant are the most heavily polluted.

Chemical pollution is of higher priority and is most dangerous because it involves a high level of oil hydrocarbons, chlorine–organic compounds, heavy metals and radionuclides. The leading pollutant in the Caspian basin is hydrocarbons, the average level of which exceeds by 150–200 per cent the level admissible for waters exploited for fishing. Fortunately, in the Caspian Sea no other harmful substances exceed their maximum admissible levels for fishing, except in individual cases of local pollution, one-time releases and technogenic accidents. Every year 20–30 one-time releases are registered, and the number of technogenic accidents is constantly growing.

The main polluters are first and foremost oil production and underwater oil pipelines near the Apsheron Peninsula (Azerbaijan) and the Mangyshlak Peninsula (Kazakhstan). From the late 19th century Azerbaijan pioneered the development of shelf and offshore oilfields, and it was the first to suffer from pollution of its waters. The first major shelf oilfield, Neftyanje Kamni, opened and developed in the late 1940s, produced 10 million tonnes of oil annually. When oil platforms appeared in the sea this was considered a great achievement of Soviet science and engineering: only a few scientists predicted the negative environmental implications, no critical comments about the further development of offshore oil production in the Caspian were published in the press, and the opinions of biologists were tabooed.

The Baku Bay is one of the most polluted in the Caspian Sea. Biologically it is dead. There are bottom deposits 8–10 metres thick of oil wastes, accumulat-

<sup>16</sup> Technogenic factors are any man-made impact associated with the use of technical facilities.

<sup>17</sup> Butayev, A. M., *Kaspiy: Status, Neft', Uroven'* [The Caspian: status, oil, level] (Promstroyinvest: Makhachkala, 1999), p. 220.

ing about 200 million tonnes of toxic substances in concentrations that exceed the maximum admissible levels by 100 times.<sup>18</sup> Vast areas of water are covered with an oil film that stops oxygen dissolving in the water, so that the flora and fauna of the sea are damaged. According to Brandon, near the Neftyaney Kamni oilfield the oil film covers an area of over 800 km<sup>2</sup>.<sup>19</sup> In 1996 on the Russian shore the level of oil hydrocarbons in the lower reaches of the Terek River exceeded the admissible level more than 500 times.<sup>20</sup> This was connected with the military campaign in Chechnya.

New oil- and gas-producing centres—Tengiz (Kazakhstan) and Cheleken (Turkmenistan)—are going the same way as Apsheeron. The environmental situation there largely repeats that in the western Caspian, but it is even more aggravated because the oil there has a higher content of sulphur and mercaptan. Such oil requires special de-mercaptanation before it is pumped via a pipeline. Spillages of such oil into the sea entail serious environmental problems. Complex stratum conditions (high temperature and pressure) will require additional expenditure on the trouble-free operation of oil wells. What can now be seen near the Azerbaijani coast will be seen in the very near future over the whole area of the Caspian Sea if the further development of the region's oil and gas riches progresses without strict observance of ecological standards in exploration and production. In this context even the standards of the US Environmental Protection Agency (EPA) applied by Western companies will not be adequate for oil projects because they are not intended for inland water bodies.<sup>21</sup>

In spite of all this, and notwithstanding catastrophic local pollution of some areas of the sea, in general the level of pollution of the Caspian is low. The northern Caspian is assessed as moderately polluted. Where water purity is concerned, an important role is played by the reservoirs on the Volga and other rivers, which act as artificial settling basins (without which it would be impossible to maintain any biological diversity in the deltas of Caspian rivers), by the sediments at the Caspian bottom, and by various physico-chemical and biochemical self-purification processes which take place in the heated top layers of the sea. The above-zero temperatures of surface water that are observed in the middle and southern Caspian even in winter accelerate chemical reactions and this in turn facilitates the rapid year-round decomposition of many pollutants. (Pollution increases with the increase of river flow.)

The environmental problems in the Caspian Sea are made even more acute by the constantly varying sea level and the high natural seismicity in the region.

<sup>18</sup> Guly, A. K., 'Investments to improve Baku Bay will repay', *Caspian Energy*, no. 2(5) (summer 2000), pp. 62–63.

<sup>19</sup> Brandon (note 11).

<sup>20</sup> Saipulayev, I. M. and Guruev, M. A., 'Zagryazneniye vodnykh ob'yektov Severnogo Dagestana nefteproduktami' [Pollution of water bodies in North Dagestan with oil products], *Melioratsiya i Vodnoye Khozyaystvo*, no. 3 (1997), pp. 41–43.

<sup>21</sup> Cox, R. and Norman, D., 'The Great Environmental Game: whether the oil resource development in the Caspian will lead to environmental catastrophe?', *Caspian Sea Bulletin*, no. 6 (1999), pp. 50–59.

## Fluctuations of the Caspian Sea level

Since 1978 the Caspian has been in a state of transgression:<sup>22</sup> a rise of over 2.5 metres in the sea level has led to coastal land disappearing under water at a rate of 1–2 km a year, surges when surge waves up to 2–3 metres high reached as far as 20 km inland, the erosion and migration of river beds accompanied by breaching of embankments, abrasion of the bank at a rate of up to 10 metres a year, an overall rise of the groundwater table and submersion of land. Tidal events make their contribution to the pollution of the sea by washing in coastal wastes.

In recent years the sea level has stabilized, but any further rise of the sea level in the oil-producing regions will lead to emergency situations—the flooding of drilling sites in low-lying coastal areas, the breaching of dams and embankments around drilling sites, the breaking of on-field pipelines, and pollution of groundwater, which will in turn pollute the sea.

## Seismicity and trans-Caspian pipelines

The southern Caspian and the greater part of the middle Caspian are at great risk from earthquakes, yet the construction of underwater pipelines across the Caspian in these regions is still being planned. One pipeline would carry up to 20 million tonnes of oil annually from the Tengiz field in Kazakhstan either via Uzen, Adjikuil and Baku to Ceyhan or via Kianli to Baku and Ceyhan. In addition a gas pipeline across the Caspian from Turkmenistan to Azerbaijan, Georgia and Turkey is planned.<sup>23</sup> This last project, which has been actively lobbied for by the USA and Turkey, is still on the agenda (although Turkmenistan was trumped by the Russian company Gazprom when the latter embarked on construction of Blue Stream, a gas pipeline from Russia via the Black Sea to Turkey). The idea of a gas pipeline across the Caspian and on to the Black Sea, from Turkmenistan to Azerbaijan, Georgia and Ukraine, also appeared recently.

According to Russian seismologists, the construction of oil pipelines over the Caspian seabed involves the danger of accidents and oil spills as a result of underwater earthquakes. In the long run this could have very serious environmental and socio-economic consequences.<sup>24</sup> There are also many mud volcanoes in the seabed. Especially dangerous environmentally are the oil and gas fields that contain hydrogen sulphur (such as the Tengiz field). A strong earthquake could release millions of tons of hydrocarbons containing hydrogen sulphur to the surface and into the atmosphere under a pressure of 1000 atmospheres, causing global catastrophe.<sup>25</sup> The serious environmental

<sup>22</sup> Sea transgression is defined as rising of the sea level.

<sup>23</sup> See chapter 3, figure 3.1 in this volume.

<sup>24</sup> *Caspian Sea Bulletin*, no. 5 (1998), pp. 50–51.

<sup>25</sup> Vostokov, Ye. N., 'Destabilizatsiya prirodnoy sredy Kaspiyskogo regiona v svyazi s osvoeniem toplivno-energeticheskikh resursov' [Destabilization of the natural environment in the Caspian region in connection with development of fuel and energy resources], Russian Ministry of Natural Resources, Moscow, 1997.

consequences in the long term of the relatively local impact of hydrogen sulphur are seen in the example of the Astrakhan (Aksaraisky) gas condensate plant.<sup>26</sup>

The President of Kazakhstan, Nursultan Nazarbayev, has commented on the likely consequences of the construction of underwater pipelines: 'As the Caspian Sea, being an autonomous water body, is not connected with the World Ocean and the pollutants that build up on its bottom gradually poison the local ecosystem, then . . . the construction of oil pipelines over the sea bed is, of course, potentially dangerous and risky. If you like, this is one more reason why we, in Kazakhstan, do not overestimate the role of seabed pipelines'.<sup>27</sup> Similar statements are often heard from senior officials in other Caspian countries as well. But this does not mean that if such pipelines become geopolitically and commercially viable they will not be constructed.

The Russian Government is in principle against the construction of any pipelines over the Caspian seabed. In this it is vigorously supported by Iran. This was reflected in a joint statement of the foreign ministers of Russia and Iran in 1998: 'The parties voiced their objections against construction of pipelines for transit of oil and gas over the Caspian seabed which may cause irreparable damage to ecology of this water body'.<sup>28</sup>

The position of Russia was stressed once more by the head of the Foreign Ministry's working group on the Caspian Sea, Andrey Urnov:

Their [the pipelines'] construction must wait until all the Caspian states arrive at some common stand on the new legal status of the Caspian Sea and at least until issues of the environmental safety of the Caspian are settled. The unique Caspian ecosystem and its biodiversity are very vulnerable because of the inland location of this body of water. In such a situation it is very important to develop measures to minimize damage to the marine environment, in particular as a result of accidents on pipelines for technogenic or natural reasons, all the more so as the planned routes cross areas with very active geo-dynamics. Such measures should be coordinated among the 'five' [Caspian littoral states], because in the event of an accident to a pipeline the interests of each coastal state will be harmed.<sup>29</sup>

Russian officials probably brought the subject of ecology to the fore not because they were so concerned about the environment of the Caspian Sea, but for political reasons, since they felt that if a pipeline was constructed over the seabed Russia would lose control over energy flows from the region. However, the construction of a safe oil pipeline in this area is practically impossible. An absolutely safe line would cost an enormous amount of money and mean that the transport of any, even the cheapest, oil was not feasible.

<sup>26</sup> Zonn, I., *Kaspiy: Illyuzii i Real'nost'* [The Caspian: illusion and reality] (Edel-M: Moscow, 1999), pp. 323–24.

<sup>27</sup> *Caspian Sea Bulletin*, no. 1 (2000), p. 7.

<sup>28</sup> *Caspian Sea Bulletin*, no. 2 (1998), p. 2.

<sup>29</sup> Urnov, A., 'O mezhdunarodno-pravovom statuse Kaspiyskogo morya' [On the international legal status of the Caspian Sea], *Caspian Sea Bulletin*, no. 3 (2000), pp. 11–14.

Taking into account the conflict potential of the Caspian region, the possibility of 'technological terrorism' choosing sea platforms or oil pipelines as targets in order to damage the natural environment cannot be ignored. Oilfields and oil pipelines were used as objects of terrorism during the Iraqi invasion of Kuwait in 1990 and during the first and second Chechen wars.<sup>30</sup>

The large-scale transport of oil by tanker over the Caspian also greatly increases the risk of oil pollution. Such transport has already started between Aktau (Kazakhstan) and Dyubenty (Azerbaijan): the KazTransoil company plans to carry 1 million tons of oil by tanker annually. Since delivery of Azerbaijani oil via the Baku–Novorossiysk pipeline stops from time to time, the possibility is being discussed of transporting oil from Aktau across the sea to Makhachkala (Russia), from where it will be re-loaded into the recently built pipeline via Tikhoretsk which bypasses Chechnya. As specialists assert, it is impossible to prepare Tengiz oil for safe transport as it has high sulphur and mercaptan content and easily erodes metal. Thus, no one is insured against possible accidents and oil spills. For the Caspian Sea as a land-locked ecosystem a small-scale oil spill is enough to trigger the 'death' of the sea.

In recent years thousands of small launches and outboard motor boats have appeared on the Caspian and become a serious source of pollution of the water with petroleum products. Another significant pollution source is waste water from ships in such major Caspian ports as Makhachkala, Turkmenbashi, Baku and Aktau. The planned expansion of these ports, the construction of new ships and an increase in the number of large ships, tankers and barges for the transport of crude oil and oil products are potential sources of pollution as well, and they create a serious risk of accidents. To the sources of pollution should be added the naval military facilities being established in new Caspian littoral states. Kazakhstan has already received high-speed gunboats from the USA, Azerbaijan has received similar boats from Turkey, and Turkmenistan has been given US financial assistance to build up its naval capability.

Finally, the Caspian has a strong chance of becoming the most important segment of the North–South and East–West transcontinental transport systems, the development of which is expected to bring considerable benefits for the Caspian states—the transport corridor from the Russian Caspian Sea port of Olya (in the Astrakhan Region) to Iran and India. The strategic goal of this project is to redirect part of the cargo traffic away from TRACECA, the Transport Corridor Europe Caucasus Asia, an EU project to revive the ancient Silk Road which is planned to bypass Russian territory and goes against Russia's interests.

<sup>30</sup> Zonn, I. S. and Zonn, S. V., 'Ob ekologicheskikh posledstviyakh voyennoy aktsii v Chechenskoy respublike' [On ecological consequences of the military action in the Chechen Republic], *Ecology and Noospherology* (Kiev), vol. 3, nos 1–2 (1999), pp. 96–109.

### Biological pollution

Apart from chemical pollution, there is biological pollution: foreign organisms from ballast water from tankers enter the Caspian waters from the Azov–Black Sea basin along the Volga–Don shipping canal. Not long ago near the Turkmen coast jellyfish (*Aurelia aurita*), comb-jellies (*Mnemiopsis leidyi*) and plankton (*Penilia avirostris*) were found. One of these intruders, the sea gooseberry, can propagate extensively in the Caspian and damage the catch of plankton-eating fish, particularly sprat: the sea gooseberries compete with sprat for food and can deprive the end-users of a cheap protein product.<sup>31</sup> In four to six years the sprat that are currently worth \$300 000 per annum could completely lose their commercial fishing significance. Moreover, the Caspian seal feeds mostly on sprat, and the disappearance of sprat could decimate the population or even lead to the complete extinction of the Caspian seal. Increased volumes of transport between the Caspian and other seas in connection with increased oil and gas output can therefore indirectly facilitate biological pollution.

## IV. Future scenarios

The Caspian Sea has always been a zone of important Russian national interests. Today its significance for Russia's economy and security is even greater. A deepening political, socio-economic and ecological crisis in the Caspian basin constitutes a serious threat to the national security of Russia and its interests. To withstand it Russia needs to have a more active policy in the region, particularly because the legal status of the Caspian is still unsettled—a fact which makes the resolution of the problems over the use of Caspian natural resources and of the associated environmental problems all the more difficult.

The Russian Government has been trying to find an acceptable agreement on the legal status of the sea that would take into consideration not only Russian interests but also the interests of other Caspian countries, that is, to establish a legal status of the sea that would enable all the littoral states to use the natural resources of the region efficiently.<sup>32</sup> The introduction in May 2000 of the office of Special Envoy of the Russian President for Caspian affairs has facilitated negotiations on the issue.

Today the positions of the littoral states on the legal status of the Caspian Sea differ significantly. The division of the sea into sectors will not satisfy either the political or the economic interests of Russia. The Caspian is a unique bio-

<sup>31</sup> *Mnemiopsis leidyi* came to the Black Sea from the Sea of Marmara in 1987 and devoured an enormous amount of zooplankton. Its total mass reached 1 million tons. This affected the catches of plankton-eating fish. Catches dropped from 160 000–190 000 tons per annum in the period 1980–91 to 15 000 tons in 1996.

<sup>32</sup> The foreign policy concept of the Russian Federation adopted in 2000 states that 'Russia will seek such status of the Caspian Sea that will facilitate mutually beneficial cooperation of all Caspian states in management of the regional resources on a just basis and taking into consideration mutual legitimate interests'. 'Konceptsiya vneshney politiki Rossiyskoy Federatsii' [Foreign policy concept of the Russian Federation], *Diplomaticheskiy Vestnik*, no. 8 (Aug. 2000), p. 8.

system, and if each littoral state sets its own rules and arrangements in bio-resource management this will only accelerate the depletion of these resources. Taking into account existing realities, in July 2000 Viktor Kalyuzhny, Deputy Foreign Minister and Special Envoy of the Russian President for Caspian Affairs, put forward the concept of ‘sovereign use of mineral deposits’—the division of the seabed in such a way as to entitle each country to exploit the natural deposits available in its own zone. It is suggested that disputed deposits be developed jointly on a 50 : 50 basis: the ‘other’ side that raises a claim to mineral deposits should compensate half of its costs to the country that is already developing these deposits. The idea is not to divide territory but to redistribute resources between countries. Under this proposal the waters of the Caspian Sea would remain in common use—the principle of ‘common water’. This will make it easier to settle environmental and bio-resource issues of the sea. These ideas were reflected in the declaration signed by the presidents of Russia and Kazakhstan in 1998.<sup>33</sup>

However, while discussions about the legal status of the Caspian Sea are going on, its sturgeon population is being destroyed, its biodiversity is shrinking and the ecosystem is degrading. This affects the quality of life of the population in the region. The longer the solution of this problem is delayed, the greater is the responsibility to future generations to preserve the unique bio-resources of the Caspian. Anxious for the fate of the Caspian Sea, the Russian Academy of Sciences in 2000 addressed the scientific communities in other Caspian littoral states in connection with the intensive development of hydrocarbons in the shelf areas. It suggested that an organization of the Caspian littoral states be set up as soon as possible with the aim of the integrated development of natural resources and environmental protection. These ideas were supported and further developed by the presidents of Russia and Kazakhstan when in October 2000 they launched a joint proposal to establish a single strategic centre for the development of the Caspian by the five littoral states. Among the functions of this centre should be monitoring of the environmental condition of the sea.<sup>34</sup>

In the context of ensuring the environmental security in the Caspian region, Russia should direct its efforts to solving two interconnected strategic tasks. First, nature conservation and nature management must be improved within the framework of Russian policy in this region as an instrument to counteract the attempts of some countries to reduce the role of Russia in the region and its influence on the political and economic situation. Second, all necessary measures must be taken to preserve the marine environment and the ecosystem of the Caspian because, in the long run, the biological resources of the sea, unlike its mineral resources, are renewable and with proper management they can serve people as long as possible.

<sup>33</sup> *Diplomaticheskii Vestnik*, no. 12 (2000), pp. 20–23. On current debates about the legal status of the Caspian Sea see also chapter 3 in this volume.

<sup>34</sup> Romanova, L. and Tesyomnikova, Ye., ‘Putin otstaiavaet rossiyskiye interesy na Kaspii’ [Putin defends Russian interests in the Caspian], *Nezavisimaya Gazeta*, 10 Oct. 2000.

A weighted approach to the management of all kinds of natural resources of the Caspian, agreed on by all the littoral states, is not only the correct one from the legal point of view: there is practically no alternative if the long-term interests of all the littoral states are taken into consideration. US President John Kennedy once said in his address to the Canadian Parliament: 'Geography has made us neighbours. History has made us friends. Economics has made us partners. Necessity has made us allies'.<sup>35</sup> These words can be usefully applied to the Caspian Sea region and the countries located there.

<sup>35</sup> Carrol, J. E., *Environmental Diplomacy: An Examination and a Prospect of Canadian-US Trans-boundary Environmental Relations* (University of Michigan Press: Ann Arbor, Mich., 1983), p. 1.