Conflict Studies Research Centre

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The Caspian:
A Catastrophe In the Making
The Destruction of a Unique Ecosystem
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Introduction

"The situation is becoming complicated so that in the not too distant future we can be witnesses to the catastrophic consequences in vandalising the nature of this unique body of water" 1.
"The ecological aspect of the problem must not be forgotten. It is necessary to consider now the possible direct and indirect consequences which might take place even before serious extraction from the deposits takes place" 2.

A previous paper, "The Caspian: A Sea of Troubles"3, concentrated on some of the obstacles that need to be overcome before benefits can be obtained from the exploration, exploitation and passage to world markets of the hydrocarbon riches of the Caspian Sea. It emphasised that the situation was further complicated by the legacy of the Soviet Union which could lead to the very real dangers of collision and miscalculation in the geopolitical sphere. The previous paper's analysis placed environmental and ecological issues after four geo-political factors which were seen to be working at mutually inter-related levels, namely: legal confusion over the definition of the Caspian Sea's status; traditional regional power rivalries, with the potential for proxy manipulation of minor players; the extension of Western influence through the presence of North American power, investment, and global corporate experience, together with the return of traditional European commercial interest, acumen and technical expertise; and fourth, relations between Russia and the Islamic world.
Whilst the Caspian region is becoming sensitive, tense and highly explosive due to rekindled regional rivalries, intensified by the arrival of new competitors from the West, there is an even greater, perhaps earlier danger about which politicians and 'oil-men' remain silent, namely, the ruination of the Caspian's unique ecosystem which could soon lead to an irreversible environmental catastrophe. The aim of this paper is to examine some of those ecological concerns.

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(1) Nezavisimaya Gazeta No 101(1426) 4 June 1997, page 5, "Na Kaspii stolknulis' interesy mirovikh derzhav - Zapad stremitsa vytesnit' Rossiyu iz etogo regiona" by Kamilzhan Kalandarov.
(2) Nezavisimaya Gazeta No 101 (1426) 4 June 1997, page 5, "Vo chto oboydetsa kaspiyskaya neft' - put' k realizatsii dogovorennosti mozhet okazat'sya ves'ma slozhnim" by Karine Gevorgyan.
(3) C W Blandy The Caspian: A Sea of Troubles CSRC August 1997.
Following two earlier "page 5" in-depth articles4 devoted to the Caspian, Nezavisimaya Gazeta published another major article5 which concentrated on highlighting the present serious ecological problems and in particular those related to the waning presence and life cycle of the sturgeon (osetr). It attributes these problems to the violation of the former well-understood, accepted and practised norms in the regulation of the Caspian and the present lack of control in oil exploration operations by some of the newly independent Caspian riparian states, aided and abetted by firms from the USA. The article compares the "well-ordered past", under the aegis of the Soviet regime, with

the present state of disorder in the Caspian and makes recommendations for the future.

However, before we investigate and examine some of the ecological issues, it is perhaps important to mention two other features of potential future concern. The first is centred on growing evidence that Russia is becoming increasingly active in pursuing her standpoint on the status of the Caspian, the way the Caspian should be managed and the increased level of involvement by Russian oil concerns. Taking this recent article in "NG" as a case in point, it would appear that greater use is being made of the ecological argument to support the continuation of the previously established regime, based on the principle of condominium, joint responsibility and joint participation in the exploitation of resources, which incidentally would also yield Russia a greater portion of wealth from oil deposits6. The second point is very much connected with ecology matters, namely the human element, the food chain and one which could seriously affect the 10 million or so people living around the Caspian whose employment and life is bound up in the fishing industry. Rushed desire on the part of Western companies and others to obtain the maximum 'cut' in exploiting the Caspian's oil deposits to the exclusion of the Caspian's ecosystem could well rebound against the West, unless, in parallel with the extraction of hydrocarbons from beneath the sea bed, Western companies give thought to the development of universal awareness, the need to accept responsibility and implement measures devoted to preserving the ecosystem.

The Caspian's Physical Features

General Characteristics

The Caspian Sea is one of the largest landlocked intercontinental bodies of water in the world. In reality it is a lake, having no direct connection with any of the world's oceans or seas7, but one which has considerable economic significance for the 10 million people living along its coastline whose main livelihood is connected with the fishing industry. Some basic details concerning the size and depth of the Caspian together with other important characteristics are contained in Box 1.

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(4) See Notes 1 and 2.

(5) "Nezavisimaya Gazeta" No 156 (1481) 22 August 1997 page 5 "Kaspiyskoye More: Ryba ili Neft'?" by Professor Vyacheslav Zilanov. In 1994-1996 Zilanov was President of the International Commission on the preservation of aquatic biological of the Caspian.

(6) C W Blandy "The Caspian: A Sea of Troubles", CSRC, August 1997, Box 7 - Oil Deposit Exploitation Rights as an "Enclosed Sea".

(7) The Volga-Don Shipping Canal is 101 km in length. Bol'shaya Sovetskaya Entsiklopediya

Box 1 - The Caspian Sea - Physical Georgraphical Statistics

Bol'shaya Sovetskaya Entsiklopediya8

General Dimensions: "Length of the Caspian from north to south - 1200 km, average width - 300 km; depth in south - 334 m to 980 m, in northern coastal areas - 25 m, central part - 170 to 790 m". Water Level Variation: The level of the Caspian varies constantly. Variations not caused by world oceans, but by climatic changes and volume of river water entering the sea. Main Rivers: Volga (Astrakhan (Russia)), Ural (Kazakhstan), Emba (Kazakhstan), Atrek (Iran), Kura (Azerbaijan), Samur (Daghestan-Azerbaijan border), Sulak (Daghestan), Terek (Daghestan) and Sefidrud (Iran).

The Cambridge Encyclopedia9

"Area of Caspian is 371,000 sq km/143,000 sq miles. Largest inland body of water on Earth, surrounded on three sides by the Soviet Union, and in the south by Iran; c 28m/90ft below sea-level, but much variation in level, especially affected by dams on the Volga; maximum depth, 980 m/3215 ft in south; shallow north area, average depth 5.2 m/17ft;low salinity; frozen in north for several

months in severe winters; no outlet and no tides; chief ports Astrakhan, Baku; freight trade especially oil from Baku; Beluga caviar".
Nezavisimaya Gazeta10
"Area - 378,000 sq km. Length of the Caspian from north to south - 1030 km, width east to west - 435 km, maximum depth - 1025 m and area - 378,000 sq km".

The Caspian can be divided into three zones, a northern zone from the line of Ostrov Chechen' to Tyub-Karagan (Mangyshlak), a central zone from the line Ostrov Zhiloy to Kuuli and a southern zone, south of the line Ostrov Zhiloy - Kuuli.

Third Edition Volume 5 1971, page 301. From the Volga, within 20 km 9 locks lift vessels (limit - 5,000 tonnes) 88 m and then 4 lower vessels 44 m over 80 km to the Don, then to the Taganrog Gulf in the Sea of Azov to the Black Sea. The Canal cannot take vessels fully laden.
(8) Bol'shaya Sovetskaya Entsiklopediya Second Edition Volume 20, 4 June 1953.
(9) The Cambridge Encyclopedia, Cambridge University Press 1990, page 224. NB printed before the demise of the Soviet Union.
(10) Zilanov, Op cit.

Map 1 - Division of the Caspian Sea into Three Sectors 11

(11) Based on map in Nezavisimaya Gazeta No 126 (1451) of 11 July 1997, page 3, "Ot sosedyey zhdut vzvesheninikh resheniy - Ashkhabad vystupayet protiv vozrozhdeniya deleniya na 'starshikh' i 'mladshikh' i zakulisnoy diplomatii" by Vladimir Mikhaylov and Georgiy Smol'nikov.

Fluctuating Water Levels of the Caspian

Effects of Rise in Water Levels at the Present Time. One of the characteristics noted in Box 1 above was the wide variation in the area covered by the Caspian (consolidated in Table 1 below). The area has now slowly started to increase to the present figure of 378,000 sq km, causing flooding of coastal zones in Astrakhan oblast', the Republic of Kalmykia 12 (Russian Federation) and the independent Republic of Azerbaijan13.

Table 1 - Caspian Sea - Variations in Area

Area	1930	1952	1970	1997
Caspian (sq km)	424,30014	394,00015	371,00016	378,00017

Reasons for Present Rise in Level of the Caspian

Decisions and Action by Soviet Authorities in Early 1970s. This present rise in the water level of the Caspian is due primarily to the decision to take remedial action made by the Soviet authorities in the early 1970s, to arrest the continuing dramatic fall in the level of the Caspian and its subsequent reduction in area. It was thought that without intervention "it was possible that by the year 2000 the water level of the Caspian would drop by 2 metres" 18. Table 2 provides a comparison of the average water loss and increasing negative water balance in the Caspian between 1878-1945 with another reading in 1970.

(12) The problem of the increasing saturation and greasiness of the soil with the unsuccessful land reclamation scheme in Kalmykia further exacerbates the situation.

(13) Gevorgyan, Op cit. According to Azerbaijani specialists, by the year 2010 the water level will rise by 25 metres. In Azerbaijan, 800 km of coastline run the risk of flooding where the maximum area of flooding could reach some 25-35 km with 35-40 km being affected to a lesser degree. Already there is serious flooding of arable land in Lenkoran-Astara rayon. Furthermore, there is also a requirement to realign roads along the coastline from Daghestan to Astara. All the sea and permanent platforms, permanent buildings and moorings in the port of Baku are under threat from flooding.

(14) Bol'shaya Sovetskaya Entsiklopediya Second Edition Volume 20 page 325.

(15) Ibid. The area of the Caspian in the period from 1930 to 1952 decreased by 30,000 sq km, that is about half the size of the Sea of Azov.

(16) Bol'shaya Sovetskaya Entsiklopedia Third Edition Volume 11, 1973.

(17) Zilanov, Op cit.

(18) Bol'shaya Sovetskaya Entsiklopediya Third Edition Volume 11 1973 page 501.

Table 2 - The Caspian Average Water Balance between 1878 - 1945 19and 1970 20

Water Inflows			Water Outflows		
Water sources	Vol. Water (cu km)		Water leaving	Vol. Water (cu km)	
	1878 to 1945	1970	1878 to 1945	1970	
Surface water (rivers)	324.2	266.4	Evaporation	400.2	357.3

Underground flows					
Sub-soil waters	5.5	5.0	Outflows to Kara-Bogaz-Gol	22.2	4.0
Rain on sea	71.0	66.8		1.0	
Totals	400.7	338.2	Totals	422.4	362.3
Overall Average Negative Balances 1878-1945 and in 1970				21.7	24.1

From Table 2 it can be seen that there were significant reductions in the amount of water produced by rivers to feed the Caspian, from a figure of 324.2 cu km in the 1878-1945 period to only 266.4 cu km in 1970. Furthermore the overall negative balance deteriorated from 21.7 cu km in the period 1878-1945 to 24.1 cu km in 1970. Besides climatic changes and evaporation, the reduction in water supply provided by rivers can be directly attributed to the Volga where the development of conurbations, the construction of hydro-electric installations, dams and reservoirs and the fact that the water level of the Gulf of Kara-Bogaz-Gol was 4 metres below the level of the Caspian had a significantly deleterious effect on the Caspian Sea's water balance. Box 2 below provides a general comparison of river-water supply to the Caspian.

Box 2 - Amounts of Water supplied by Rivers 21

80% of annual water from all rivers supplied by: Rivers Volga22, Emba, Ural and Terek.

Western coast rivers supply 7% of water: Rivers Sulak, Samur, Kura and other smaller ones.

Iranian rivers supply 5% of water: Rivers Gorgan, Kheraz and Sefidrud.

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(19) Bol'shaya Sovetskaya Entsiklopediya Second Edition Volume 20 page 327.

(20) Bol'shaya Sovetskaya Entsiklopediya Third Edition Volume 11 1973 page 501.

(21) Bol'shaya Sovetskaya Entsiklopediya Third Edition Vol 11 1973 page 500.

(22) Ibid, Vol 5 1971 page 294. The Volga's annual supply of water comes from: snow 60%, surface water 30% and rain 10%. In order to remedy the reduction of water from the River Volga, a project was considered in 1973 to divert the waters of the northern Pechora and Vychegda

Blocking-Off the Gulf of Kara-Bogaz-Gol. In 1972, a project was worked out to regulate the flow of Caspian water into the Gulf of Kara-Bogaz-Gol, as Soviet scientists believed that the Caspian and Aral Seas were connected by an underground channel causing the Caspian to recede. The project was completed in 1980, when the Kara-Bogaz Gulf was closed off from the Caspian, thus preventing the Caspian waters draining into the Aral Sea. Regrettably, government cost-cutting did not permit the construction of a lock or massive sluice by which the level of the Caspian could be regulated.

Silt Deposits from Northern Rivers. The silt deposits brought down into the Caspian Sea from the Volga, Ural and other rivers reduce the capacity of the Caspian Basin, complicated further by the sheer size of the Volga delta23, where the waters are very shallow, together with the fact that much of the coastline and land immediately surrounding the Caspian is very low lying, in fact below the level of world seas and oceans, but the level of the Caspian itself was some 28.5 m below world sea level in 1973.

Movement of Water in Caspian. The water flow in the Caspian, affected by the prevailing wind and the flow of the Volga, follows the coastline in an anti-clockwise direction along the western shoreline to the south and then the eastern coast to the north. In the shallow northern part it does cling to the coastline.

The Fishing Industry In The Caspian

The World of Fish

Although in the Caspian Sea one can find around 124 species and sub-species of fish, only about 30 or so have commercial or economic significance in the food production chain24. Perhaps the most important fish living in the Caspian is the sturgeon, producer of the much sought after Black Caviar, whose general characteristics are listed in Box 3.

Rivers into the Volga Basin. Soviet scientists estimated that this would provide the Volga and the Caspian Sea with approximately 32 cu km of water annually.
(23) Ibid. "The Volga delta begins at the Buzan branch some 46 km north of Astrakhan. In the delta there are up to 500 branches, channels and small rivers. The main branches are the Bakhtemir, Karamyzyak, Staraya Volga, Buzan and Akhtuba. The Bakhtemir is navigable to vessels".
(24) Zilanov, Op cit. Valued fish are Sturgeon (Beluga (White Sturgeon), Osetr, Sevruga, Ship), Belorybitsa (White Salmon), Caspiyskaya Kumzha (Salmon Trout), Kutum (Carp family), Zherekh (Carp family), Sazan (Carp family), Leshch (Bream), Vobla (Caspian Roach) and different varieties of Sel'di (Herring), Shemaya (Carp family), Sudak (Pike) and others. Concerning the Kutum (Carp family), Robert Chenciner in"Daghestan: Tradition and Survival" Curzon Press, Richmond, Surrey, 1997, page 119 "Kutum is an estuary fish, from where the Sulak River meets the Caspian. The deep burgundy-coloured fibrous meat of this large scaled fish had been dried in the wind for four days, then salted once, dried for another week and salted again".

Box 3 - General Characteristics of the Sturgeon
The Sturgeon (Acipensiderae)) belongs to a group of large primitive fish found in fresh and marine waters of the Northern Hemisphere: body elongate, armed with rows of heavy bony scales, head tapering, underside mouth with large barbels; tail asymmetrical, upper lobe long; body length 1-5 m/3-16 ft. Acipenseridae, 4 genera, 25 species25.
Beluga (Huso Huso) valuable fish of commercial value, belonging the the Osetr fish family. Length up to 9 m, weight 1t, exceptionally 1.5 t. It differs from other Sturgeon (Osetr) having a huge half-moon shaped mouth and interlocking branchiate membranes. Produces from 0.5 to 5 million roe. The roe of the Beluga is larger than that of other Sturgeon (Osetr)26.
Sevruga (Acipenser stellatus) valuable fish of commercial value. Length 2.2 m, weight up to 68 kg. The mouth area differs from other members of Osetr family by having an elongated turned up snout. Produces from 20 thousand to 363 thousand roe27.
Ship (Acipenser nudiventuris) valuable fish of commercial value. Length 2 m, weight up to 30 kg or more. Similar to Beluga in having two different spawning groups. Produces 200,000 to 1,290,000 roe28.

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(25) The Cambridge Encyclopedia, Cambridge University Press 1990.
(26) Bol'shaya Sovetskaya Entsiklopediya Third Edition Vol 3 1970 page 162.
(27) Ibid, Vol 23 1976 page 160.
(28) Ibid, Vol 29 1978 page 409.

Box 4 - Selection of Fish found in the Caspian29

Key to Illustration:
1. Leshch (Bream). 2. Sevryuga (Sturgeon). 3. Vobla (Caspian Roach). 4. Kefal' (Grey Mullet). 5. Sudak (Pike). 6. Aterinka (Sild). 7. Osetr (Sturgeon)30. 8. Tuylen' (Seal).

Migratory Behaviour of Caspian Sturgeon (Osetr)
At the present time, the biological behaviour of the main species of Caspian sturgeon, Beluga, Osetr (Russian and Persian), Sevryuga and Ship has been more than adequately studied. In the sea, both fully grown and immature fish tire themselves out after spawning in the rivers, having completed an extended migration along the shores of all five Caspian riparian states. In this, shoals or accumulations of bulging and hungry sturgeon often venture beyond the existing 10 mile fishing zone of the riparian states. At the same time the main feeding grounds both for the young and the fully grown sturgeon are situated in the northern, shallow parts of the Caspian. The Map at Appendix 1 illustrates the direction of fish migration together with location of major hydrocarbon deposits. Within this overall general behaviour there are slight variations between the different species of sturgeon, which are covered in Box 5.

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(29) Bol'shaya Sovetskaya Entsiklopediya Second Edition Vol 20 page 328.
(30) Chenciner, Op cit page 119 "The pollution in the Caspian Sea, from Baku oil spillage and chemical effluent from there and the river Volga, almost killed off all the Sturgeon . . . Rich baked fresh Sturgeon, delicious with thick pomegranate syrup, was also forbidden in order to conserve the fish".

Box 5 - Minor Differences in Migrational Behaviour of Sturgeon (Osetr)
Beluga - The Beluga have two different spawning groups during their time in the waters of the Volga. The first spawning group enters the Volga in April and produces roe in the May of that same year. The second spawning group swims into the Volga in the autumn and produces roe in the spring of the following year, some 6 to 7 months later31.
Sevryuga - Spawns in rivers from April until September. Sevryuga will swim 200-600 km upstream in large rivers and in smaller ones 30-60 km. The young roll out of the River Volga into the Caspian at the age of 2-3 months, but from the River Kura (Azerbaijan) as soon as they are hatched. In summer the Sevryuga are drawn to shallow waters, in autumn and winter they seek deeper water up to 100 m. Males attain maturity in 5-13 years, females 10-17 years32.
Ship - Male maturity is reached between the ages of 6-9 years. The female attains maturity between 12-14 years. Spawning takes place between March and May every year33.

Evidence of Falling Fish Catch
From the data in Table 3 below, there is no doubt that the general fish catch from the Caspian Sea is reducing rapidly. The reason for this of course lies in the fact that there are fewer fish of commercial economic interest swimming in the Caspian and especially the number of sturgeon (Osetr).
Table 3 - Falling Fish Catch from the Caspian34

Year	Weight of Fish (tons)	Weight of Osetr (tons)
1970	530,000	23,000
1980	387,000	16,000
1992-1996	Between	Between

190,000- 250,000	6,000 - 11,000

(31) Bol'shaya Sovetskaya Entsiklopediya Third Edition Vol 3 1970 page 162.
(32) Ibid, Vol 23 1976 page 160.
(33) Ibid, Vol 29 1978 page 409.
(34) Zilanov, Op cit.

Fishing Regime during Soviet Times

From a Russian point of view, over the course of a century of fishing in the Caspian Sea, a basis was formulated for the rational exploitation of fish resources, especially the sturgeon, between the two Caspian riparian states, the Soviet Union (Azerbaijan, Kazakhstan, Turkmenistan and Russia) on the one hand and Iran on the other.

"Theoretical methods and practice in the fishing industry played a defined role in our country which caught 85%-90% of the overall fish catch in the Caspian. Furthermore, the Soviet Union exercised fishing control of about 95% of the sea surface area. The last situation, taking account of the working system of control operating at that time on the sea and in ports, together with an adjusted system of bookkeeping allowed the executive authority in the provinces and the centre to control the situation fully"35.

In those days, basic guide-lines on policy were established for conservation of fish stocks, the reproduction and rearing of fish under artificial conditions and the desirability of continuity in achieving unfluctuating and steady yields of sturgeon. These were all calculated and developed through scientific studies, the active participation of specialists, experts in the field and fishermen. One of the measures was the introduction of new species of fish to the Caspian, rearing them amongst those such as the Kefal' already regarded as an item of commercial value. Other measures included the implementation of a whole series of preventive measures, such as the restrictions in the northern shallow waters of the Caspian36. In the past " . . such a regime of Osetr husbandry [fish management] through widescale reproduction in fish farms allowed in the 70s and 80s and in the first half of the 90s, the maintenance of a total from all the countries, with Osetr catches at a level of 20,000-28,000 tonnes per annum giving a total of not less than 2,000-2,500 tonnes of Black Caviar" 37.

The Problem Of Fish Conservation

Problem 1 - Violation of Northern Conservation Area

Before the joint action of the Kazakh SSR in 1974 and the RSFSR in 1975 to establish a fish reserve in the northern waters of the Caspian, the problem of reconciling fish conservation, particularly sturgeon stocks, with hydrocarbon exploration and exploitation, had already been discussed and decided, for "During the time of the Soviet Union in 1963

(35) Ibid.
(36) Zilanov, Op cit. "In order to create in this area of the Caspian favourable conditions for the fattening of Osetr and other species of fish, and furthermore to ensure their conservation and reproduction, Kazakhstan in 1974 and Russia in 1975, with the corresonding decisions of their governments established in the northern part of the Caspian Sea together with the Volga and Ural deltas a reservation zone, in which not only was it forbidden to carry out geological surveys and seismological work, but it also introduced a special regime of water dues for navigation and other activities".
(37) Ibid.

the decision was not difficult to find in favour of the sturgeon, for 90% of the world's sturgeon catch came from the Caspian, whereas the Caspian accounted for only 3% of the oil extracted in the Soviet Union" 38.

In the past and in practice, total and absolute control of the Caspian was vested in the Soviet Union, but at the present time from a Russian viewpoint, it is: "already clear that Azerbaijan and Kazakhstan and to a limited degree Turkmenistan are counting on Caspian oil, considering it as a guarantee of their future independent prosperity" 39. Whilst this nature or fish conservation in the northern Caspian is still in existence, the regime has essentially been violated. "Kazakhstan, with the participation of a series of American companies and firms, has unilaterally begun to carry out seismological work and surveys along its own shoreline bordering the conservation area" 40.

Central to the issue concerning the conservation of sturgeon and other fish stocks lie the complex, difficult and emotive questions of the status of the Caspian Sea41, where for instance, the views of Azerbaijan and Kazakhstan42 for a sectorised Caspian which would project their national sovereignty out to a central division line are directly opposed by Russia, Iran and Turkmenistan who favour a condominium approach, although it must be said that the support from Turkmenistan has been somewhat ambivalent43.

Problem 2 - Limited Food Supply

Both the Volga and Ural Rivers occupy a leading position in the creation, formation and development of sturgeon stocks. Not only does natural spawning take place in these rivers but fish farms rear and produce stocks of sturgeon, where for example, some 13

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(38) BBC Monitoring "Inside Central Asia" Issue 172 12-18 May 1997, page 6, "Azeri sturgeon stocks under threat from oil extraction".

(39) Zilanov, Op cit.

(40) Ibid.

(41) Also applies to exploration and exploitation rights to hydrocarbon deposits below the sea bed.

(42) Kalandarov, Op Cit "Today, Azerbaijan and Kazakhstan already operate on the path of dividing the Caspian according to their designs and in a unilateral manner. Iran, Russia and Turkmeniya consider such a position out of order" .

(43) Paper by Yagmar Kh Kochumov, an Adviser to the International Legal Department Ministry of Foreign Affairs, Turkmenistan: "The New Legal Status of the Caspian" at an International Workshop held by CSRC at RMA Sandhurst in May 1996 on "The Caspian: Politics, Energy, Security", page 3. " . . . current practice and norms cannot apply. The decision on the division of the sea demands non-traditional steps, to be decided by the Caspian states themselves. This approach is proposed by Iran, Russia and Turkmenistan. The supporters of this propose that each state should have its own border and fishing zone, a defined section of the shelf to exploit the mineral resources, the width of this zone to be determined by consultation with all the Caspian states. The remaining part of the Caspian - the so-called Caspian centre - to be determined by the principle of condominium - of joint exploitation".

out of 18 fish farms are situated on the Volga. They release 55-82 million small fry into northern Caspian waters. The total number of fry released into the sea by all the riparian states amounts to 100 million44. However, at the present time the sea is not capable of feeding and supporting more than 140-160 million sturgeon small fry.

Problem 3 - Lack of Female Sturgeon and Finance

Another problem which prevents the utilisation of all the natural potential for the restoration of sturgeon stocks is the fact that there are insufficient female fish. Additionally, there is a great shortage of capital funding in the government treasuries of the Caspian riparian states. The active life cycle including the later period of maturity of the sturgeon stretches over 7-15 years. A most important measure which has been justified in practice, is the imposition of a complete ban on large scale commercial fishing of sturgeon in the sea, the protection of the fry during the fattening up period in the northern part of the Caspian and a ban on the fishing of immature fish in rivers during the migrational spawning periods, with the exception of a strictly scientifically based limit on fishing for monitoring purposes.

Problem No 4 - Poaching and the Black Market

However, the creation of new Caspian riparian states and the commencement of the market economy led to the destruction of the whole fisheries system in the Caspian, including those measures which so effectively demonstrated their value in regulating sturgeon fishing. The market inflicted a severe blow on the conservation of sturgeon stocks through increased internal demand at home and externally in world fish markets. Due to the market economy, a widescale poaching business began to develop not only in the rivers but also in the sea. As a result, the system of statistical bookkeeping and the lack of fishery control were responsible for making maritime and piscatorial studies unfeasible. Previously it was these studies which had enabled specialists to monitor the actual size of fish catches and consequently the state of fish stocks. All this has been instrumental in the reduction in the numbers of fish in the Caspian which are reflected in the total of registered catches, shown in Table 4 below, together with the annual amount of catches not accounted for and unregistered:

Table 4 - Differences between Registered and Unaccounted Catches 45

Year	Catch Officially Registered in tonnes	Catches not Accounted for in tonnes
1993	7,000	5,000-7,000
1996	6,000	5,000-7,000

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(44) BBC Monitoring, Op cit. When the issue of fish (sturgeon) or oil was discussed some 35 years ago, the decision then was to find in favour of developing the sturgeon fish stocks with the result that 12 sturgeon farms were built in the Caspian, three being in Azerbaijan with the intention of producing 120 million young sturgeon, 20 million of which were to be reared in Azerbaijan.

(45) Zilanov, Op cit.

The scale of poaching and illegal fishing in and around the Caspian along the Russian coastline is confirmed not only by the amounts of Black Caviar seized and confiscated at source, but also by the amount uncovered from unregistered canneries, other places of preparation and outlets in readiness for dispatch to internal and world markets. The sturgeon black market is not only found in Russia which is "growing like a snow ball" but throughout the new regions surrounding the Caspian and continues to inflict irreparable damage to sturgeon stocks. Table 5 demonstrates the rise in the amount of Black Caviar that is now proceeding on to the black market.

Table 5 - Caviar confiscated during Operation "Putina"46

	1994	1995	1996
Confiscated Black Caviar (tonnes)	5.0	11.0	8.3
Uncovered from secret outlets (tonnes)	5.0	19.0	34.0
Firearms seized (weapon/barrel)	142	365	944

Further confirmation of the rising seriousness of this problem is found in the number of firearms seized, which have shown a dramatic increase between 1994 and 1996, a sevenfold increase in two years. It is useful to note the fact that the new Caspian states have taken steps to form their own navies to protect and patrol their 10 mile territorial water fishing zones. Doubtless in the future these forces will also serve to protect maritime oil platforms and drilling rigs. Without doubt the militarisation of the Caspian will also have an effect on fishing and could curb poaching activities, as "unfortunately, poachers are very well armed and meanwhile only have respect for force" 47. The militarisation of the Caspian increases the dangers of collision between the riparian states.

Problem 5 - Incompatibility of Fish Conservation and Oil Extraction
World experience shows that the maritime extraction of oil undoubtedly has a negative effect on fishing. First, drilling platforms are established and pipelines are laid in traditional fishing grounds. The migrational cycle of shoals of young and mature fish are disrupted and in many instances their feeding and spawning deteriorates. As a result of inevitable obstructions the ecosystem of individual areas is destroyed. The facts in Table 6 below speak for themselves concerning the scale of the obstructions and resultant pollution. Even under normal conditions, during the extraction of oil each drilling rig or platform discharges into the water a collection of waste and pollution. Besides, pipeline laying entails a substantial disturbance and destruction of ground habitation and of earth, mud or sand on the bottom. Oil, drilling solutions, different compounds of sludge and drilling waste fall into the water subjecting maritime organisms to toxic substances. Such pollutants and toxic substances have a lethal effect on primitive and indigenous species of fish such as the sturgeon.

(46) Ibid.
(47) Ibid.

Table 6 - Discharge of Waste into the Sea from One Platform48

Oil (Tonnes)	Sludge(Tonnes)	Earth from Drilling Operations (Tonnes)
30 - 12049	150 - 400	200 - 1,000

Trouble on drilling platforms or rigs (but not including violent storm or ice conditions of the Caspian Sea) leads to ecological consequences which could affect the 10 million people living around the Caspian. If the forecast of a series of research studies is added to these factors, "then by the year 2020 the level of the Caspian could rise by 22 metres, ie 7 metres higher than the 1977 level, 5 metres higher than the present level, then all the maritime platforms which are in place at the present time and those which are established before the year 2000 as a consequence will be submerged. It is fraught with catastrophe, the scale of which is hard to foresee"50.
At the present time, even with the current comparatively low volume of extracted oil in the Caspian the pollution of coastal areas has assumed an unpleasant character and image. The area around the Apsheron Peninsula in the Baku Bight has already become the mortality sector of the Caspian. The Azerbaijan coast has lost 35 fish-farming sectors because of oil pollution. The coastal zone and a whole string of islands have lost their significance as a feeding ground for fish51. The Azerbaijan government is faced with the dilemma of having to decide whether to give priority to oil extraction or to the conservation and further development of sturgeon stocks and those of other fish.
The oil reserves, with intensive exploitation and taking into account the current world market demand, could last for 30-40 years, possibly 50. The current widely publicised figures of the Caspian oil reserves are contained in Table 7.

(48) Ibid.
(49) BBC Monitoring, Op cit. It is believed that the development work on the Azeri, Chirag and Guneshli oil fields has produced a concentration of hydrocarbon waste which is three times higher than the permitted norm. This concentration of hydrocarbon waste floating around Chirag, Azeri and Guneshli is precisely in the area where large shoals of sturgeon spend the winter months. The concentration of hydrocarbon waste amounts to: "45-50 mg per litre of water, which is permitted by the standards for an open body of water, as in the case of the North Sea . . . when the concentration of oil waste exceeds 15 mg per litre in the Caspian it leads to the formation of a film of oil which cuts off the oxygen to the water, killing off young sturgeon in the areas adjacent to the fields"
(50) Zilanov, Op cit. See also Blandy, Op cit, for a comparison.

(51) BBC Monitoring, Op cit. Currently, the rising Caspian water level has affected the main sturgeon farm at the mouth of the Kura River, which is now under water with the result that the fish are now reared further upstream at Ali-Bayrami. Additional problems of pollution are also found in Azerbaijan, for instance. It is not only hydrocarbon waste, but the main beaches, Pirshagi, Shykov and Bilgah are now considered unsafe for bathing as a result of being polluted by raw untreated sewage and effluent.

Table 7 - Variations in Estimates of Oil Reserves in the Caspian Sea

State	"Enclosed Sea Concept" 52		Border Lake53	NG 54
	12 Mile Limit	Central Area		
Kazakhstan	1.0 mlrd tonne	2.3 mlrd tonne	4.5 mlrd tonne	1.0 mlrd tonne
Azerbaijan	1.0 mlrd tonne	2.3 mlrd tonne	4.0 mlrd tonne	4.5 mlrd tonne
Russia	0.5 mlrd tonne	2.3 mlrd tonne	2.0 mlrd tonne	1.5 mlrd tonne
Turkmeniya	0.3 mlrd tonne	2.3 mlrd tonne	2.6 mlrd tonne	2.6 mlrd tonne
Totals	2.8 mlrd tonne	9.2 mlrd tonne	13.1 mlrd tonne	9.6 mlrd tonne

2.8 + 9.2 = 13.0 mlrd tonne

Zilanov's Proposals To Rectify The Situation

"The wholesale value of 1 tonne of Black Caviar depends on the type of sturgeon, in the world market from US $ 180,000 to US $ 600,000, and oil US $ 80 to 110". Professor Vyacheslav Zilanov 55

Introduction of Compulsory Conditions

The thrust of Professor Zilanov's solution emphasises that the combination of fishing and the extraction of hydrocarbons requires a special approach which is fortified by compulsory conditions for the conservation of fish stocks, namely, the inadmissibility of destroying the Caspian ecosystem and the implementation of measures for the restoration of maritime sectors, where hydrocarbons have been found or transported. It is extremely important not to allow the conduct of seimographic surveys and exploitation of oil deposits in conservation areas, in spawning grounds, during the development of young sturgeon and throughout the period of their intensive migratory passage.

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(52) Op cit.
(53) Ibid.
(54) Zilanov, Op cit, noted by Gevorgyan. Whilst this total is certainly lower than those, Zilanov does acknowledge that a whole series of researchers and scientists have estimated the total to be higher between up to 12-13 mlrd tonnes. Even more significant are the prospected reserves of gas. However, prospected, declared and extracted resources differ as a rule by about 20-40%. The publicised reserves of oil are 7-10 milliard (7-10 x 1,000,000,000) tonnes.
(55) Ibid.

Establishment of International Fund

Professor Zilanov also believes that it is now important to create an International Fund for saving the sturgeon (Osetr). Participation in the fund would be compulsory for oil companies carrying out both seismological surveys and extraction operations in the Caspian. This is probably a good and sensible idea, in that it provides an automatic defence for the oil prospecting corporations and companies against future charges of wilful damage to the ecosystem, for they are then seen not only to be arresting and repairing any damage but are also assisting in future development of fish stocks and preservation of marine life, to the benefit of the population living around the

Caspian. Charges of short term gain could be alleviated by evidence of long term interest.

Compulsory Conditions for Seismographical Surveys

To avoid the mass slaughter of fish even during seismographical surveys the legislatures of the Caspian riparian states must enforce a requirement to have representatives of fishery organisations on board such vessels. Furthermore, the survey and exploitation of maritime oil deposits can only take place with the agreement of the relevant government department or authority, when "As a whole, it is agreed in International Law that the maritime exploitation of mineral resources can only take place if such activity does not inflict damage on living resources. This is even more relevant to the Caspian as it is an enclosed body of water" 56.

Dismissal of Status Argument

He dismisses the main argument used by the government foreign affairs departments of a few Caspian riparian states that the question of the Caspian's status must be solved first and then the other questions later. Such an approach is perceived as an absurdity for the problem of conserving the sturgeon.

Full Embargo on Commercial Fishing of Sturgeon

The important conclusion to draw from the above is the urgent need to introduce a full embargo on all commercial fishing of sturgeon (Osetr) by all the Caspian riparian states for a period of not less than 10-15 years, and in this period only to maintain the catching of sturgeon for the purposes of scientific research on monitoring the replenishment of the depleted Sturgeon stocks.

Comments

From this article it is clear that Professor Zilanov is well aware that the proposed measure will be extremely unpopular, but at the present time there are no other means possessing the necessary rapidity to restore sturgeon stocks. However, he believes that all the Caspian riparian states must take a long term view concerning the restoration and stable utilisation of sturgeon stocks, the creation and maintenance of a living nucleus of these fish and their development with a concrete programme of operation.

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(56) Ibid.

Whilst there can be no doubt of the requirement to take urgent action now to conserve sturgeon stocks, other fish and Caspian marine life in general, Professor Zilanov's points raise a number of questions. The first question is how to enforce a total ban on fishing for 10-15 years. Surely that will also produce hardship to people living in and around the Caspian and involved in the fishing industry when there is no single enforcement agency as yet. Maybe this could be enforced. Robert Chenciner noted that in Daghestan, "Rich baked fresh Sturgeon, delicious with thick pomegranate syrup, was also forbidden in order to conserve fish" 57, but that is Daghestan; conditions may not be so strict elsewhere.

The second point concerns the oil extraction industry itself. It would seem that an unregulated quest for oil by international consortiums on behalf of the post Soviet Caspian riparian republics, not forgetting that the companies also benefit, would by itself exterminate fish stocks, because the scale of potential operation is so large and the area in which this activity takes place is comparatively restricted. Most damage to fish stocks and marine life occurs in the initial stages of oil extraction with drilling, establishment on platforms and laying of pipelines. It was the early stages in the preparation for oil extraction in the North Sea which caused the damage to fish and marine life, but once platforms and pipelines were established marine life returned to its normal cycle, fish found a degree of sanctuary in and around the platforms where they could breed and feed without interference from fishing vessels and their nets.

(57) Chenciner, Op cit p 119.

CONCLUSION

Basically, the Caspian ecosystem is subject to two main problems, the problem of rising water levels and the incompitability of fish and marine life living in a world dominated by prospecting, extraction and exploitation of hydrocarbon deposits from under the sea bed, exacerbated by industrial and chemical pollution from the Volga.

Continued pollution of the Caspian could also completely destroy sturgeon stocks together with those of other species of fish, unless there is a complete ban on catching sturgeon. However, how practical is that course and could it be enforced?

The danger is that the obliteration of this valuable source of food and employment for some 10 million people living around the Caspian could result in a hostile reaction against Western companies instrumental in exploitating hydrocarbon black gold, or possibly further use of this fact by Russia to manipulate public opinion in the minor post-Soviet republics to secure an adverse reaction toward Western countries some time in the future. To some extent, companies involved in the oil or gas business could contribute financially towards a "Fish Fund" devoted to the conservation and development of sturgeon and other fish stocks.

It is quite clear that there needs to be one unified authority with effective powers of enforcement to monitor and control activity in the Caspian, both hydrocarbon extraction and the fishing industry. This again would tend to underline and support the Russian case for joint activities in the Caspian, activities mutually agreed between the five Caspian riparian states under the concept of a condominium.

Whilst the militarisation of the Caspian with the legitimate establishment and development of navies belonging to the riparian states in the form of armed flotillas may curb the activities of poachers and their organisations, there is a danger of these forces being used to enforce ownership of disputed oil deposits, thus, increasing the risks of conflict.

With regard to the projected rise in the level of the Caspian, perhaps the answer is to allow the Caspian waters to once more help to feed the Aral Sea.

APPENDIX 1

Map of Migratory Movement of Sturgeon (Osetr) and Caspian Water Movement 58

Key to map: Oil and gas deposits. Translation of boxed notes overleaf.
Feeding migration of sturgeon
Spawning migration of sturgeon
Boundary of conservation area in Northern Caspian.

Boxed Notes from Map

Box A1 - Northern Part of Caspian Shelf - Astrakhan and Lagan Zone
Potential reserves in the northern part of the shelf are estimated to be approximately 1 mlrd tonnes of oil. Today the resource base of Astrakhan oblast' consists of the Bishkul' deposit with extractable reserves of 100,000 t of oil.

Box A2 - Atyrau Oblast' - Kazakhstan
75 oil deposits with reserves of 929.2 mln t from which 39 are being exploited with reserves of 864.1 mln t of oil and 7 deposits ready for exploitation. Largest deposits: Tengiz, 781.1 mln t, Korolevskoye 55.1 mln t and Kenbay 30.8 mln t.

Box A3 - Mangistau Oblast' - Kazakhstan
66 oil deposits with reserves of 724.8 mln t of oil, 172.3 mlrd cu m of gas and 5.6 mln t of gas distillate. Largest deposits: Uzen', Zhetybay, Kalamkas and Karazhanbas having total reserves of 504.5 mln t of oil.

Box A4 - Kalmykia
44 deposits of oil and gas have been opened with opening balances of 64.1 mln t of oil

Box A5 - Daghestan coast
Potential reserves along the Daghestan coast comprise 132 mln t of oil and 78 mlrd cu m of gas.

Box 6 - Turkmenistan
Oil reserves in the Caspian zone are estimated to be 2.6 mlrd t of oil.

Box A7 - Baku - Apsheron to River Kura - Azerbaijan

Oil reserves in the Azerbaijan sector of the Caspian are estimated to be 4-5 mlrd t of oil and 600 mlrd cu m of gas. In the oil deposits of Azeri, Chirag and Guneshli reserves are estimated at 511 mln t of oil

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(58) Zilanov, Op cit.