Bystroye Canal

(Documentary research)


EUROPE
ATLANTIC
OCEAN
ICELAND
IRELAND
DENMARK
SWEDEN
FINLAND
ESTONIA
LATVIA
BELARUS
POLAND
GERMANY
FRANCE
UKRAINE
HUNGARY
MOLDOVA
ROMANIA
SLOVAKIA
SPAIN
PORTUGAL
ANDORRA
BULGARIA
GREECE
ALBANIA
MACEDONIA
MALTA
AFRICA
MEDITERRANEAN SEA
RUSSIA
ASIA
KAZAKHSTAN
GEORGIA
AZERBAIJAN
HUNGARY
ROMANIA
MOLDOVA
Belgrade
Bucharest
Constanta
BULGARIA

Vilkovo
Ochakovsky
BLACK
1990 r.
1910 r.
Prorva
TULCEA
Mahmudia
L. Popina
L. Razim
Sulina
Sf. Gheorghe
Gura Portitei

Content

The Danube Delta

The Danube is the single delta in the world declared a biosphere reserve. The international network of the biosphere reserve totals 352 km in 87 countries. Geographic units:

- The Danube river, from Galati city to Sulina town;
- The Isaccea - Tulcea floodplain;
- The saline plain Murighiol;
- The Danube Delta;
- The Lake complex Razim-Sinoe;
- The black sea coastline, from the Chilia branch mouth to Midia Cape, till 20 depths.

Total area:

- 5800 km^2 - 2,505 from the total territory of Romania-on the 22nd position in the world and the third in Europe - after Volga and Cuban - one of the worldwide largest wet zones, a water birds habitat. On the 8th position according Ramsar convention which includes 600 wet zones;
- area Natural Museum of Biodiversity, which includes 30 types of ecosystems;
- the greatest reedbed expenses worldwide 1560 km^2.

The Danube Biosphere Reserve Authority (DDRB)

The DDRB was established by the Romanian Government in 1990, a decision confirmed by the Romanian Parliament through law 82 of 1993. The natural patrimony of the Danube Delta Biosphere Reserve is managed by DDRB, for biodiversity conservation and sustainable development. The main objectives of the DDRB are, as follows:

- to provide sustainable measures and protected of the biological diversity;
- to enforce the measures for ecological restoration;
- to asses the state of the natural resources, the potential for its use, according the capacity of support and the ecosystem's capacity of support;
- to issue licences, for economic activity;
- to support the research and the international cooperation activities;
- to organize information and ecological awareness activities.

In 2000, the DDRB received the European Council Diploma for Protected areas.

The Danube River

- The Danube River is the second longest in Europe (the first being the Volga River) :

- 2840 km length, 81700 km^2
- catchments basin - Danube River catchments basin represents 8% of the total surface of Europe.

- The Danube River springs from the Black forest Mountain and flows into the Black Sea. It rises from 3 joined springs: Breg, Brigagh and Donnau Quelle, and flows into the sea through 3 branches: Chilia, Sulina, Sfantul Gheorghe, which build the delta.

- It crosses 10 countries: Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Romania, Bulgaria, republic of Moldavia, Ukraine and 4 capitals: Vienna, Bratislava, Budapest, Belgrade.
- The water discharge distribution on the main branches is: Chilia 58%, Sulina 19%, and Sf. Gheorghe 23%.

- The Danube delta is situated both on the territories of Romania and Ukraine. The total area covered by the delta is 4178 km^2, from which:

- 82%- 3466 km^2 are in Romania,
- 18%- 732 km^2 are in Ukraine

The Danube Delta Biosphere Reserve - brief presentation

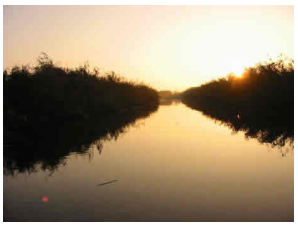
At the end of a course of over 2840 km, collecting the water from a vast hydrological basin that exceeds 8% of the area of Europe, the Danube River, the second largest river of the Continent, has been built during the last 16000 years in the whole world.

The Danube Delta, as one of the greatest wetlands of the earth, offers good conditions for an impressive number of plants and animals. Among these, reed beds form one of the largest single expanses in the world, and Letea and Caraoman forests represent the Northen limit for two rare species of oak, that are more frequently met in the south of the Italian and Balkan peninsulas. Together with a great number of aquatic and terrestrial plants, here are also many important colonies of pelicans and cormorants, which are characteristic for the Danube Delta, as well as a variety of other water birds that reside in or the delta for breeding or wintering. The large number of fish is also notable, with species of both high economic and ecological value.

Without doubt, the impressive range of habitants and species which occupy a relatively small area makes the Danube Delta a vital center for biodiversity in Europe, and a natural generic bank with incalculable value for global natural heritage.

Many of the plant and animal species found in the delta are also important natural resources for economic use as food, building materials and medicine. They have attracted people to the area since ancient times. Human dwellings were based on the use of these natural resources thus traditional activities and characteristic cultural and socio-habits developed here.

Later, tendencies to over-exploit some of these natural resources occurred.



These tendencies, still seen at the present time, put increasing pressure on the resources, especially fish and grasslands, and are compounded by the development of economic activities which are not in harmony with the environment; causing the loss of some areas of natural fish spawning grounds through the sedimentation and eutrophication-nutrient enrichment-of water cannels and lakes.

Because of the cumulative negative effects of human activity in the delta, together with those occurring around the delta itself, there is an increasing danger that the natural ecological balance will become irreparably harmed if appropriate measures are not taken to reduce these impacts, to restore already damaged areas, to protect the existing unaffected areas, and to harness local and regional support for these measures. The factors

briefly described above provide arguments for the designations of the Danube Delta Biosphere reserve (DDBR) by the Romanian Government in 1990, a decision then confirmed by the Romanian Parliament through law 82 of 1993. The DDBR possessed all the main features of a biosphere reserve, namely:

a) it conserves examples of characteristic ecosystems of one of the world's natural area and contains:
   - strictly protected core areas;
   - traditional use areas (fishing and reed harvesting);
   - buffer areas to reduce external impacts;

b) it is a land and coastal/marine area in which people are an integral component, and which is managed for objectives ranging from complete protection to intensive yet sustainable production;

c) it is a regional center for monitoring, research, education and training on natural and managed ecosystems;

d) it is a place where government decision makers, scientists, managers and local people cooperate in developing a model program for managing and water to meet human needs while conserving natural process and biological process resources;

e) it serves as a symbol of voluntary cooperation to conserve and use resources for the well being of people every where.

The DDBR has a total area of some 5800 km square and is located between 28 grades 10 min 50 sec e (Cotul Pisicii), 29 grades 42 min 45 sec E (Sulina), 45 grades 27 min N (Chilia branch, km 43) and 44 grades 20 min N (Midia Cape). The 45th parallel that marks the mid-way line between the North P ole and equator actually runs through the reserve. The position has climatic significance which, associated with the humid nature of the area, has a big influence on the migratory path ways of birds. Because of the complexity and the position of the DDBR, a special program with specific objectives and projects for the management of the area is needed. The Danube Delta Biosphere Reserve Authority (DDBRA) was involved in publishing this specific Management Plan for the Danube Delta.

The international recognition of the Danube delta Biosphere Reserve

The universal value of the Reserve was recognized by the Man and Biosphere Program (MaB), of UNESCO, in August 1990, through its inclusion into the international network of biosphere reserves. This specific UNESCO Program was launched in August 1970.

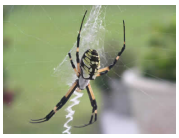
The DDBR was recognized as an internationally important humid zone, mostly in its capacity as a habitat for the aquatic birds, in September 1990, when Romania became a Party in the Ramsar Convention.

The international value of the DDBR was recognized again in December 1990, when it became party of the Cultural and Natural world Patrimony.

Biological diversity

The Danube delta is a natural genetic bank with incalculable value for the world wide natural patrimony: the total number of flora and fauna species is 5149, which includes:

- the greatest population of pelicans from Europe 8000 individuals;
- the Dalmatian pelican 200 individuals;
- 60% from the world wide population of pygmy cormorant 6000 individuals;
- 50% for the entire population of Red-breasted goose (winter time) 40 000 individuals.





The Danube Delta Soils

The soils were formed under periodic flood conditions that explain their hydromorph characteristics where gley soils predominate. Temporal and spatial alterations of the hydrological regime led to very different soil groups:

- alluvial soils with various salinity degrees existed along the embankments;
- initial fluviatile soils with low salinity were present on the embankments in the center of the islands;

- gley soils and peaty gley soils existed in the lower areas with temporary inundation;
- moderately calacarious-limnic soils were formed at the bottom of the permanent lakes and others waters.

The nutrient cycling of nitrogen, carbon and phosphorous occurs in the soils as well as the retention and adsorption of C, N, P, K, S through clay minerals and humic acids.

The Delta Vegetation

The development starts with white willow (Salix alba) that, under good conditions, emerges when the vegetation - free standard sludge banks lay bare. This is when the willow brushwoods, the so-called "renisuri" appear. Through further accretion and ground elevation, white poplars (Populus alba), tamarisks (Tamarix ramosissima) and later, even some species of the hardwood floodplain settle here. On the embankments that extend in the direction of the flowing water, white polar fringes developed as well. The embankments enclosed where broad reed areas appeared.

The repartition of vegetation on the islands was determined by differences of relief created by the dynamics of the Danube and the respective duration and height of the floods. The major part of both islands (about 85-90%) was covered by reed areas appearing as floating reed, the so-called 'plaur'. They were interspersed with grey willows (Salix cinerea), characteristic of plaur formations, as well as with other moisture indicators of the plaur such as the buttercup (Ranunculus lingua), the sorrel (Rumex hydrola pathum), the gypsy-worth (Lycopus europaeus), the comfrey (Symphytum officinale), the bittersweet nightshade (Solanum dulcamara) and others.

The open lake waters were covered with swimming salvinia (Salvinia natans) and water-lily/milfoil communities (Myriophyllo-Nupharetum) with floating leaf plants such as yellow water-lily (Nuphar luteum), the pondweed (Potamogeton natans) and floating macro vegetation such as the water milfoil (Myriophyllum verticillatum), the coontail (Creatphyllum submersum) and others. In some

places one could also find the common bladderwort (Urticularia vulgaris) characteristic of meso-eutrophic waters.

Eutrophic waters contained the pondweed (Potamogeton pectinatus.).

In shallow, silted-up areas one could find the water soldier (Stratiotes aloides) which together with (Hydrocharis morsus ranae) formed a characteristic community hydrochariti-Stratiootetum, which is frequent in the smaller, temporarily dried-out water courses of the center of islands as well. As regards the swallow reed-covered border areas of the lakes, the plant community sagittario-Spargnietum emersi settled in the sludgy soil in the direction of the open water: the plant community sagittario-Sparginietum emersi with water plantain (Alisma plantago-aquatica), the arrow head (Sagittaria sagittifolia) and bur-reed (sparganium emersum), occasionally interspersed with hydrocharis morsus-ranae and the common duckweed (lemna minor).

On the whole and under natural conditions, the species diversity of water and swamp plant communities reflects eutrophic, in some places even eutrophic-mesotrophic and mesotrophic conditions. This may be deduced from the former existence of Carex pseudocyperus and the buttercup rannuculus lingua characteristic of mesotrophic waters and growing on peaty sites.

As a consequence of mineralization of the water, salinity indicators of humid and moderately dry seasons of the year, f.e. limonium gmelini, Suaeda maritime, Salicornia herbacea and Platago maritime. Humid-moderately moist sites were settled by large stands of small-growing reed (Phragmites australis) and Aster tripolium adapted to sites with high salinity.

On the western side of the island one could observe groups of tamarix ramosissima which had existed thanks to former wood vegetation clearings. On the embankments the wood vegetation mainly consisted of white willows (Salix alba), white poplars (Populus alba), the common olive (Elaeagnus angustifolia), in places also the white mulberry (Morus alba) which sporadically appears in the lower Danube floodplains, wild pear and white elm (Ulmus carpinifolia). Along the borders of the islands one could also find alluvial meadows of Agropyro rumicion alliance, mainly predominated by couch grass (Agropyron repens) and (agrostis stolonifera).

The Danube Delta Fauna

Terrestrial and semiaquatic arthropods.

As regards the terrestrial and semiaquatic arthropods, no information is available for the period before the dyking. But from the knowledge available from existing natural biotopes one may draw conclusions and distribution of these animal species (insects, spiders and other arthropods groups) and communities.

In areas adjacent to the Danube Delta where no major alterations have occurred, original bioceonoses have been presented.

Ichtyofauna

Under natural conditions the Danube Delta offered an excellent habitat to a number of freshwater fish, particularly to cyprinids which were almost constantly present on the islands. For other fish the islands were only spawning and feeding sites. During the spring floods of the Danube, when the broad reed areas were inundated, huge schools of short distance migratory visited the spawning sites of the islands.

Sample fishing, carried out more than two decades before the dyking (1963), proved great abundance of carps (Carassius carassius) in calm, muddy and reed-covered waters. This species, which is well adapted to fluctuating oxygen contents in the water and periods of extremely shallow waters, had an advantage compared to other species.

Other significant species were pike (Esox lucuis), red eye (Scardinius erythrophthalamus), roach (Rutilus rutilus carpathorossicus) as well as carp (Cyprinus carpio), catfish (Ssilurus glanis), pikeperch (stizostedion lucioperca), bream (Abramis brama), barbell (Barbus barbus), orfe (Leucuscus idus), asp (Aspius aspius), tench (Tinca tinca), white bream (Blicca bjoerkna) and perch (Perca flubiatilis).

Even though considerable fish stands of economically valuable species existed on both island, they were not used commercially but for the personal requirements of the local populations.

Avifauna

The Danube Delta offers breeding, feeding and resting places to large populations of approximately 300 bird species and is known as a veritable paradise for birds. Nevertheless, the summary data on avifauna was first published in the 1960s, with a list comprising 109 nesting birds and 59 migratory birds. This list is being constantly updated as are the assignments of the Danube Delta's bird species to certain aquatic, amphibious and terrestrial habitats. Ecological representation of the delta's fauna is also updated.

The surface area covered by reed offered breeding and nesting places to numerous bird species. Open waters and temporarily inundated muddy banks were used as feeding and resting places by many waders and marsh birds. On the whole, the species of the island area may be assigned to various aquatic, semiaquatic and terrestrial habitats.

Mammals

Only a few mammals' species were represented although with a very high density compared to their current presence and density in the Delta. Some of them were of great hunting interest. We could find the following species: otter (Lutra lutra), mink (Mustela lutreola), ermine (Mustela erminea aestiva), wild boar (Sus scrofa), fox (Vulpes vulpes melanogaster), deer (Caprelous caprelous), common hare (Lepus europaeus), raccoon dog (Nyctereutes procynoides), muskrat (Ondatra zibethica) and nutria (Myocastor coypus).

Use of the natural resources

The most important natural resource of the islands was fish. In spring, they were traditionally caught with large gill nets (multiple fish traps), fish traps and fish fences. In autumn, active traps were used.

A further naturally regenerated resource of the area was reed. It was traditionally harvest by hand in winter and met the personal requirements of the local populations. From 1965-1974, reed was mechanically harvested in large quantities, notably a total of 46300 t. After the extraordinary flood events of 1970, the reed stands was depreciatory as far as their economical use was concerned. From 1975-1979, the total

annual reed production for both islands amounted to 8246 t (yearly average 2062 t), with a very low production of only 535 t in 1978.

Reed mace was among the most appreciated resource that could be harvest by hand and was used for articles such as mats, baskets, partition walls and for roof coverings. Along with reed, reed mace is a perfect heat insulator.

Willow or popular wood did not represent an economically significant resource, but large, well dried trunks were used as firewood. Large poplars were cut down with an ax and used for construction purposes.

Hunting was practiced to cover the needs of the local population, mainly ducks, geese and pheasants. Traps were used for wild boar, deer, muskrat and raccoon dog hunting.
Depending on elevation and flood duration, the soils were used in different manners. The only suitable sites for agricultural use were the embankments, the so called "grinduri" in the western border areas and the center of the islands, which served as pastures. With the increase of the local population, the soils on the embankments of both islands were cultivated with useful plants such as vegetables, potatoes and sweet-corn. Among the fruit trees, the quince revealed to be the most flood and salt tolerant. It flourished well and a few trees may still be found nowadays on the borders of the islands. Due to high soil salinity, a vine planting project on the western side stopped. The extremely small lots could only be cultivated when the Danube water levels at gauge Chilia and Peribrava did not exceed 4-5 hydrograde.

Reopening of the Danube-Black Sea deep-water navigable waterway

Introduction. The danube as the european life-line

1. Throughout the ages the Danube waterway has played a crucial role in the transport infrastructure of Central and Eastern European countries, serving as a transportation artery between Central Europe and the Black Sea. This role has been recognized with the Danube's status as one of the top ten pan-European corridors. According to the conclusions of the European Commission, the Danube waterway along with the Rhine is the most important component of the inland transport market in Europe.

2. The benefits of the Danube waterway for the harmonious economic and social development of the region can be realized only on the basis of principles of equal access and equal opportunities. These principles have been pivotal in the international legal regime of the use of the Danube, established in the Belgrade Convention and other relevant international legal instruments. Equally important are the obligations of the participating states to preserve the environmental integrity of the river basin, and to co-operate with each other in achieving this goal.

The economic and social rationale of the project

3. Until the late 1950s, Ukraine used three navigable waterways in the Danube delta: the branches of the Bystroye, Ochakiv and Prorva estuaries. The available archive data, in particular, confines the commercial use of the Chilia waterway since 1830.

In 1959, the exploitation of the Bystroye waterway ceased due to natural processes of waterway silting.

In 1994, the same situation took place at the Prorva waterway. As a result, the Ukrainian part of the VII pan-European transportation corridor became non-operational. Until now the traditional transportation flows have been diverted to their neighboring Romanian waterways. This situation resulted in significant deterioration of the competitive position of the Ukrainian inland transport companies operating there. The operations of the port infrastructure (the ports of Ismail, Reni, Chilia and Ust-Dunajsk) were brought to a standstill, putting enormous pressure on the local economy and society.

4. The exclusion of Ukraine from the Danube transportation corridor might have a general adverse impact on the prospects of developing Europe-Asia transport networks, in particular, the possibilities of connecting the VII transport corridor with the TRASECA transport corridor "Black Sea -Caucasus -Central Asia" which has a transportation potential estimated by the EU experts at a level approaching 20 million tons of cargo per year. Such impact is even less desirable when one takes into consideration the potential of Ukrainian shipping companies at the Danube which comprise almost 24,1% of commercial shipping along the Danube.

5. According to the feasibility study conducted in 2003, the reopening of Ukraine's Danube-Black Sea navigable waterway will increase the volume of inland shipping by 60-80 percent and create an additional 4,230 jobs.

Technical characteristics of the project

6. The construction necessary for restoring the navigable waterway is conducted according to the feasibility study and the business plan, prepared with participation of international experts and endorsed by the Cabinet of Ministers of Ukraine on 12 May 1004.

7. According to the plan, the dredging activities are carried out in the bar and along several river rifts, situated at the following points: 73- 74th kilometers, 69- 70, 67-68, 64-66, 61-63, 52-53, 47-49, 35-38, 31-32, 28-29, 24-25 and the 11th kilometer. The general volume of works constitutes 1726 thousand cubic meters on the river section and 1 683 thousand cubic meters at the bar.

8. The route of the waterway consists of the following four sections:

- the seaward canal and the encompassing dam;
- the section of the sea - Vilkovo;
- section Vilkovo - Ismail Chatal;
- section Ismail Chatal - Reni.

9. THE SEAWARD CANAL with a length of 3 km will have a projected bottom width of 100 m and depth of 7.65 m. The slope ratio of the canal will be 1:9. The curve of the seaward canal will have a 2000 m radius. The direction of the seaward canal route is planned at 126,07° -306,07°. The canal will operate running in a single-direction.

10. The purpose of the encompassing dam at the sea section of the waterway is to protect the canal against coastal current silting as well as serving as a breakwater. The project envisages a trapezoidal type of dam with a slope index of 1:3 and a top width of 3 m. The stone facing has a diameter of 300 mm with a 400-800 mm coating at the external wave-facing slope.

11. THE SEA - VILKOVO WATERWAY SECTION (1.534 km -20.585 km) will have a bottom width of 60 m (single-direction section of 1.534 km -10.000 km) and 120 m(double-direction section of 10.000 km -20.585 km) with slope ratio of 1:6. The radii of

its curves will be 1000 m and more, except for a curve radius of 800 m at the entrance to the Bystroye arm from the Old-Stambul arm. At this section the rift at the entrance to the Bystroye arm should be removed.

12. THE VILKOVO - ISMAIL CHATAL DOUBLE-DIRECTION WATERWAY SECTION (20.585 km - 116.000 km) will have a bottom width of 120 m with a slope ratio 1:6, and curve radii of 1000 m. At this section 11 rifts have to be removed at 73-74, 69-70, 67- 68,64-66,61-63,52-53,47-49,35-38,31-32,28-29 and 24-25 km. The storage of the excavated soil is planned for specially designed burrows of 2-3 m height which will be subsequently used as flood-prevention dams on the Ukrainian bank, as well as for the repair of damaged dams.

13. THE ISMAIL CHATAL - RENI section currently completely meets the shipping safety requirements and will not be dredged.

14. Considering the proximity of the existing parameters of the river arm to the technological requirements of the waterway, the volume of excavating work is expected to be marginal, thus ensuring minimal impact on environment.

15. The exhausts from construction vehicles will be short-term and localized. Fixed sources of exhaust during the period of the excavation works, as well as its operation will be non-existent.

16. Considering the temporary nature of the dredging works, as well as absence of fixed sources of exhaust, a sanitary protection zone along the waterway is deemed unnecessary.

17. The required lessening of the low-altitude concentration of the main polluting agent -nitrogen dioxide-during the excavation activities will be achieved by the deconcentration of construction vehicles and power distribution management, as well as the management of the mechanization work simultaneity ratio. In the case of unfavourable weather conditions, the engine-driven works will be suspended.

18. The use of dredging equipment and the assisting fleet will be continuously controlled by the observance of national exhaust pollution standards DST 24585- 81 and DST -24028-80.

19. With the half-width of the waterway and the accompanying water channels of 50m the noise pollution at the riparian zone will not exceed 55 dBa.

20. The general contractor, the German company "Josef Mobius Bau A.G.", will utilize the following dredging equipment:

- sea mobile dredger Josef Mobius;
- fixed dredger M30;
- pontoons MS57, MS58 with excavator Kohmatsu 3S340-1;
- pontoons MS49 with excavator Kohmatsu PS240-1,
- pontoons MP25 with excavator Libcher 974, CA T365 and CAT 325,
- passenger cutter "Gasel";
- two towboats, five pipe-connecting pontoons, five floating pipes for pulp.

It will be assisted by the following Ukrainian dredging companies:

- "Chorazmorshlach", employing two mobile dredgers and one multi-bucketed caravan;
- "Chomomortechflot", employing one mobile dredger and one multi-bucketed caravan;
- "Aquatoria-Jug", employing one multi-bucketed caravan.

21. The dredging works commenced on May 12, 2004. The construction of the dam commenced on 5 July 2004.

22. The dredging of the river section was scheduled to start on 5 July 2004.

According to the plan, the excavated soil will be dumped at the coastal dumping sites of the Kilija delta as material to support the flood-prevention dams.

23. The route of the Danube-Black Sea navigation waterway was chosen after thorough consideration and public debates. Thus, the feasibility study analyzed 10 possible routes of the deepwater navigable waterway.

24. These options were divided into two groups based on the type of waterway:

Group A: routes using the natural branches of the dynamic part of the Danube delta;

Group B: artificial canals with constructed locks.

25. According to the study, the most promising projects are: the Bystroye branch in Group A and a sluiced canal linking the Solomonov Rukav branch of the Danube with the Zhebryanskaya Bay in Group B.

26. The advantages of the Bystroye branch option are as follows: a low-meandering branch with sufficient natural depth, low rate of growth of the delta, a 950 m radius of the

entrance from the Starostambulske branch, and the possibility of creating a port in the mouth of the branch. Its disadvantages are: the need for bank consolidation in three sections and the single-direction flow of the route along the 13-km sector.

27. The advantage of the sluiced canal linking the Solomonov Rukav branch of the Danube with the Zhebryanskaya Bay option is its location outside the dynamic area of the delta. Its disadvantages are: a large volume of ground that needs to be removed and dumped (over 16 million m^3), the allocation of about 900 hectares for the construction of the canal, the clearing of forests, the construction of bridges allowing the passage of sea vessels, and a considerable environmental impact including the impact on the Zhebryanskaya strand.

28. The analysis of the environmental impact of both options of the waterway demonstrated that the major share of the impact - both during waterway construction and its operation -would be determined by the volume of the excavated soil and the allocated areas. The ratios of removed soil are 1:50 and areas allocated are 1:135 in favor of the Bystroye branch option.

29. The implementation of the sluiced canal linking the Solomonov Rukav branch of the Danube with the Zhebryanskaya bay option would also lead to the loss of over 500 hectares of land in the buffer and transition zones of the Danube Biosphere Reserve. The implementation of this option was viewed as unacceptable because of the considerable adverse impact on the Danube Biosphere Reserve.

30. The major drawbacks of the sluiced canal linking the Solomonov Rukav branch of the Danube with the Zhebryanskaya bay option are: large-scale changes of the water regime at the Zhebryanskaya spits and Zhebryanski wetlands; a possible destabilization and imbalance of the water flow as a result of the creation of an artificial water object which would affect internal processes in the Zhebryanskaya bay; degradation of water quality in the bay due to dredging in the course of construction and the operation of the canal; pollution of the water and the seabed of the Black Sea in the area of soil dumping.

31. The waterway of the Bystroye branch goes along the riverbed and requires a considerably smaller intrusion into the environment, including water environment. This is due to the lack of necessity of dredging and bank consolidation in the segment crossing the reserved territory -the navigation markers will be placed in the water. The major possible adverse impact resulting from implementing this option is the opening of the sandbar of the

Bystroye branch. However, taking into account the considerable current of the branch and the free water exchange in the nearby coastal area, the water quality would be less affected than in the Zhebryanskaya bay. It is expected that the pollution of water and the seabed in the area of soil dumping will be smaller due to the smaller volume of soil to be excavated and dumped.

32. Therefore, the Bystroye branch results to be the optimal solution both from the economic and environmental points of view. Currently, its width and insignificant malleability fully meet the technical requirements of reopening the deepwater navigable waterway.

33. This option has also a number of other advantages, namely:

- the slowest advancement of the marine edge of the delta;
- a consistent increase in the river run-off of the Chilia Delta which flows the Bystroye branch;
- the improvement of the main mass of detritus drainage from the Bystroye branch beyond the coastline;
- a comparatively fast increase of the sea depth beyond the bar.

34. A possible adverse impacts on the flora and fauna will be minimized by the following technical solutions:

1) The creation of special engineering installations at the site of the separation of currents between the Bystroye and Starostambulske branches, will enable the regulation of water flow in the Bystroye Gyrlo and prevent the acceleration of the gradual natural disappearance of the northern branches of the delta;

2) The optimal placement of protective dams along the seaward canal will slow down the possible transformation of the newly formed Ptichya spit to the south of the sandbar of the Bystroye branch;

3) The limitation of vessel speed along the waterway will prevent possible erosion of banks along the Bystroye branch.

35. The biotic groups in the Bystroye branch, including rare species and associations are not unique for the Danube Biosphere Reserve; they are widely found in other parts of its territory. Some local evolution of plant associations and the limited migration of animals from the branch and its banks are possible due to the creation and use of the waterway and

should pose no threat to the preservation of the biological diversity of the Reserve, in particular to the habitats of its most rare and valuable animals and plants.

Possible environmental impact

36. The environmental assessment of the reopening of the navigable waterway shows that the envisioned environmental measures will ensure marginal impact on the environment which will be limited to the territories of the banks of the Bystroye branch.

37. According to evaluations of the experts from Taras Shevchenko Kyiv National University and the Ukrainian Center for Land and Resourse Management, the Bystroye branch option is preferable from an ecologic point of view because its implementation would result in lesser environmental impact than the construction of the sluiced canal option linking the Solomonov branch of the Danube with the Zhebryanskaya Bay.

38. The reopening of the waterway within the given parameters will have a certain environmental impact, although to a lesser degree when compared with other waterway options. In particular, it may lead to the reduction of the population of local swamp avifauna.

39. The waterway reopening activities envisage a number of measures aimed at minimizing the adverse environmental impact, namely:

a) the construction of the encompassing dam in the area of seaward canal will limit the spread of vessel-caused waves;
b) the construction of current-directing dam in the area of the divergence of Bystroye and Starostambulske branches, as well as deepening of the riverbed of the Starostambulske branch below the divergence point will prevent erosion of the Bystroye banks;
c) the limitation of vessel speed along the seaward canal and the Bystre branch will considerably reduce adverse wave impact;
d) artificial afforestation of the riverbed banks prone to erosion;
e) storage of the soil along the Chilia branch only in areas previously damaged during the artificial damming and the subsequent use of this soil for dam repair.

40. The first stage of the reopening activities envisages only the partial implementation of these measures. Following the results of the monitoring of their consequences further works and parameters of necessary structures will be determined.

41. The reopening activities can also affect the local ichthyofauna due to changes of the hydromorphic parameters in the zone of the bar of the Bystroye branch. These changes can lead to disturbances in fish migration routes and their spawing conditions. In particular, the deepening of the Bystroye branch may cause the penetration of salt water into the branch which will affect the freshwater ichthyofauna.

42. To minimize this impact, the project envisages deconcentration of the dredgers along the route of the waterway, suspension of work during spawning and the environmentally friendly selection of the soil sea-storage site.

43. The basic factor influencing the fauna of other vertebrates is the disturbance during the construction of deepwater passages and in the process of ship passage. The prohibition of works in the zone of Bystroye branch bar during the nesting season is necessary with a view of decreasing this adverse impact. Navigation rules will prohibit sound signals and music broadcasting during ship passage along the Bystroye branch.

44. The project provides significant financial compensation in the amount of 2.457.000,00 UAH in case of damage caused to the ground flora and fauna that could be prevented by environmental measures. This sum will be directed to the maintenance of the Reserve and scientific research on the new DBR territories.

45. The project also provides for financial compensation for damage afflicted to the fish industry near construction sites in the amount of 720.320,00 UAH and in the places of sea dumping -461.330,00 UAH. After the opening of the waterway, the annual amount of compensation for damage caused by the sea dumping is established at 280.320,00 UAH. This amount must be directed firstly to the protection and environmental recuperation of the Black Sea and Azov Sea, including restoration of the fish escapement.

46. Also compensation for the damage from the deterioration of water quality due to dredging and the dumping during construction is provided in the amount of 52.844,00 UAH and 58.120,00 UAH. After the opening of the waterway this sum will be 9767 and 21720 gryvnas.

47. It should be mention that the study of possible damages to the environment, based on greatly hypothetical estimates of the compensation payments, was calculated for the pessimistic scenario of adverse impact of the reopening of the waterway. Taking into account protective and security measures, any real damage can be prevented in many respects. In any case, the money appropriations made available would be used for the DBR development and improvement of the environment.

48. In view of the urgent need to reopen the waterway and the exceptional ecological value of the surrounding territory, the decision was made to proceed with reopening activities in two stages. The first stage is of experimental nature. The parameters of the vessel passage during the first stage provide draught restrictions of 5,85 metres, which will diminish the extent of the dredging and hydrotechnical works and, accordingly, will reduce the environmental impact. According to the environment monitoring programme for this period, a large amount of examination and scientific research is to be carried out with a view to specify the prognoses of possible adverse ecological impact of the reopening and operation of the waterway, as well as in order to define the environmental measures to be taken at the stage of its overall development.

Environmental impact in a transborder context

49. According to the Ukrainian legislation, the environmental impact, including in the transboundary context, of the implementation of any project is to be determined by the national expertise of the environmental impact assessment materials, which are to be attached to the project documentation. Such national expertise was undertaken within the project preparation and attached to its materials. The results of the expertise do not confirm the possibility of ADVERSE TRANSBOUNDARY ENVIRONMENTAL impact on the territories of the neighboring states.

50. Therefore, no additional transboundary environmental impact assessment study foreseen by the Espoo Convention on Environmental Impact Assessment in a Transboundary Context would be needed.

51. This view is also endorsed by a report from the Institute of hydromechanics of the National Academy of Science of Ukraine regarding scientific and research activities in the

Course of optimization of the technical decisions affecting the course and bar area of the deepwater waterway. According to it "the reopening of the deepwater WAY on the river and mouth bars will not cause the essential flow reforming, except for the inessential increase of the water waste across the mouth from the secondary branches.(It does not concern the territory of Romania because the Sulina and the Georgiev branches can hardly be considered as "secondary branches"). This means that the waste of water in the Ochakiv mouth will be diminished by 4%. It is expected that construction of the waterway through the Bystroye bar (Novostambulsk branch) will cause reductions in the flow on the Ochakiv branch at the rate 220 M3/C, the waste of the branch Staryj Stambul will not be changed. Thus, the creation of the first stage of the navigable waterway will not inflict any damage to the Starostambulsk branch boundary.

Designed projects characterization

1.1 The necessity for a deep water navigable canal to be constructed in the Ukrainian sector of the Danube Delta

The Experts' Technical Explanations with respect to the construction of a deep water navigable canal thoroughly analysed the social, economical and strategic importance that this project could have for Ukraine.

Socially, the sudden decrease of the goods and passengers flow through the Ukrainian harbours (such as Reni, Izmail, Chilia, Vilcovo and Usti-Dunaisk), as well as the high fees to be paid when sailing along the Sulina arm, determined the collapse of the shipyards. The decrease of number of jobs, the re-orientation of the qualified workers towards other types of jobs, the deterioration of the standard of living of the population etc., determined the social-economical decline of the region. Strategically: the construction of a deep water navigable canal in the Ukrainian sector of the Danube Delta will strengthen the military, energetic and economic Independence of Ukraine.

The existence of such a significant waterway, as Chilia, on the Ukrainian territory favours the construction of a deep water navigable canal, allowing the sailing of vessels to the sea. Loosing its own deep water navigation canal in 1997 has caused the decline of the position of Ukraine in the region.

The Government of Ukraine approved the project with respect to the creation and functioning of the national transportation network, which is an integral part of the international transportation network. The driving concept of the program as far as the water transportation is concerned is as follows: all river and maritime harbours of Ukraine belong to the international transportation network and are directly or indirectly connected with it.

The main waterway linking the harbours where terminals and transportations deposits need to be created is MKT N7 (Rhine -Main -Danube) and it includes Izmail, Reni, Ust-Dunaisk harbours.

The international community is interested in the achievement of these transportation links. This interest can be explained by economical factors imposing the shortening of the waterways linking Europe to the Middle East and North African countries. In this context, should the shortest waterway tract be created in the Euro-Asian region, Ukraine shall play an important Geopolitical role in the area.

After the deep water navigable canal shall have been constructed, Romania's monopoly in the Danube Delta shall be eliminated and conditions to lower the fees with respect to the passing of the vessels on the Danube shall be created.

Ukraine could have significant economic benefits from the transit of goods, such as other Central and North European countries have recently done.

Conclusions

1. All the choices with respect to the construction of a deep water navigable canal envisage for its tract to pass through a sector of the Danube Delta and of the Chilia arm, from the Reni harbor to the Chilia Harbor, and, partially or entirely, through the water area between Chilia and Vilkovo harbours.

Notwithstanding the above mentioned water sectors, all the choices can be ranked out in two categories:

- category "A" of choices, envisaging for the tract of the canal to pass on the natural channels of the active Danube;

- category "B" of choices, envisaging the construction of artificial locks canals. The "A" category includes choices 2, 4, 5, 6, 7, 8, 9 (chart 1.1, 1.2). The "B" category includes: choices 1, 3,10. Choice 2, envisaging the passing of a small sector of the tract on an already existing artificial canal, has been included in the "A" category, as it doesn't provide the construction of any locks and, consequently, alluvia are likely to be generated.

2. The choices have been elaborated by various designing institutes, during various periods of time; they have envisaged the construction of a canal for the passing of variously sized vessels.

3. When elaborating the Assessment on the environmental impact, the best choice within each category has been chosen, taking into account all necessary technical and economic criteria.

4. Choice 6 within the "A" category, envisaging for the tract of the canal to pass on the Bystroye branch, is acceptable, according to the following criteria:

- dredging is least required during exploitation;
- of all the choices, this one requires for the smallest volume of soil to be dug out during construction;
- the economic efficiency of the construction.

At the same time the following favorable circumstances have been taken into account when considering this choice:

- the straight tract of the river bed, with a natural acceptable depth;
- the, rather slow advancement of the delta into the maritime area, next to the mouth of the branch.

5. Considering these criteria and according to the data of chart 1.1, choices 2 and 4 are better than choice 6. But, while the data concerning choices 2 and 4 have been calculated for a 3 m, respectively 4.5 m ship depth, the data for choice 6 have been calculated for a 7.2 m ship depth. Should choices 12 and 4 be calculated taking into account a 7.2 m ship depth, their technical and economic criteria would be less favorable, compared to choice 6.

6. The choices within the "B" category are less favorable, compared to the choices of the "A" category, considering the economic efficiency of the construction and the volume of the soil to be excavated criterion.

7. The main benefit of the choices within the "B" category is represented by the possibility to partially or entirely get the tract of the deep water navigable canal out of the active delta, thus permitting a longer exploitation of the canal. Nevertheless, the exploitation would bear constant dredging compared to the choices within the "A" category, taking into account the natural evolution of the delta.

8. Among the choices within the "B" category; choice 1 has been chosen, as choice 3 provides for the deep water navigable canal to pass through the Oceacovsk branch network, which is about to clog in the active sector of the Delta (chart 1.2). No Technical Argumentation with respect to choice, 1 0 has been yet done by the experts.

9. In order for the best choice to be selected, the Assessment on the environmental impact shall hereinafter be examining two alternative choices: - choice 1 , envisaging the construction of a locks canal on the Solomonov branch and Jebnansk gulf;

- choice 6, hereinafter referred to as choice 2, with the tract passing from the Vilkovo harbor to the sea, on the Starostambulsk and Bystroye channels.

Technological exploitation (navigation) conditions required by the construction of the deep water navigable canal and the exploitation requirements provided by the project

The type and category of the deep water navigable canal are similar to the Sulina canal, which belongs to the VII class, of the "E" waterway category. Thus, the Danube-Black Sea deep water navigable canal has the following characteristics:

- waterway type
- international significance;
- waterway class - superior thoroughfare, in conformity with DSTU B V 2.3-1-95;
- VII class - in conformity with the European waterway classification.

The deep water navigable canal passes, in the Reni - Vilkovo water sector, on the already existing waterway, having a 120 m width (130 m in the turning areas), thus permitting two-way sailing. The characteristics of the deep water navigable canal in the Bystroye channel area, as well as in the locks canal area, allow the unilateral passing of vessels, as the width of the waterway is only 60 m (65 m in the turning areas). According to the project, the river bed of the canal is 100 m wide in the shore and in the Jebriansk areas. The acceptable

length of the radius of the turnings of the deep water navigable canal should not exceed 800 m. According to the project, the depth of the canal shall allow the passing of ships having the following overall dimensions: length - 125 m, width - 17 m, depth - 5.85 and 7.2 m (in a first stage and, eventually, for the future), should the water level be 99% in conformity with the navigation requirements.

Comparative evaluation of the potential choices and argumentation with respect to the selection of the examined choices related to the construction of a deep water navigable canal

The comparative evaluation of the potential choices of construction of a deep water navigable canal in the Ukrainian Delta of the Danube is presented in chapter 1. All the projects are ranked out in two categories:

A. the construction of the deep water navigable canal on the existing channels within the active delta, through the sand banks at their mouths;
B. the construction of the deep water navigable canal beyond the active delta, by building up a locks canal.

The choices considered to be the most advantageous from a technical and economic point of view are being analyzed further on - one choice for each category. Both envisaged waterways follow the Danube line from Reni to Vilkovo (on the Chilia arm).

The already existing canal, Renl - Izmall - Klslltkll Island, has a natural depth which is acceptable for the construction of the canal (the depth designed by the project should be 8.1 m); further on to Vilkovo, there are a few sand banks, with a 5 to 6 m average depth, that need to be dredged, in order for them to reach the depth provided by the project. The temporary depositing of the excavated soil (up to 90%) shall be done in places that have been previously and particularly designed for this purpose, on the banks of the canal where dykes needing reconditioning are situated. The dykes exploitation office is required to advise with respect to the selection of alternative lands to deposit the extracted soil. The total area necessary to deposit soil is 96 hectares.

According to Choice 1, the tract of the deep water navigable canal passes from Vilkovo on the Solomonov channel, on the Bazarciuk gulf, on the Jebriansk channel and

the Jebriansk pools, to the Jebriansk gulf, in the Jebriansk land split and the Morskol Kut area. A lock is to be constructed at the entrance in the canal, in the Bazarciuk pools area.

According to Choice 2, the tract of the canal passes from Vilkovo, on the Starostambulsk channel and on the Bystroye channel, reaching the sea shore.

Both choices envisage for the tract of the canal to pass on the territory of the Danube Natural Reserve. Both canals would pass along the Ermakov island, belonging to the buffer zone of the Danube Natural Reserve, further on, according to choice 1 , the tract would cross the geographical anthropogenic configurations and the buffer zone of the Danube Natural Reserve while, according to choice 2, it would cross the geographical anthropogenic configurations, the buffer zone and the reserve strict regime area.

Characterization of the Solomonov - Jebrianovsk gulf choice related to the construction of the deep water navigable canal (choice 1)

The choice with respect to the Solomonov channel - Jebrianovsk gulf locks canal has been selected, as it fulfils the following conditions:

- a small volume of soil needs to be dug out;
- the complete preservation of the Jebriansk and Ermakov island rocky structure;
- the complete preservation of the technological systems within the Bazarciuk river gulf;
- there are no crossing over existing waterways.

The project envisages the construction of the following:

- a navigable canal and harbor, delimited by dykes;
- a navigable locks, along with a tunnel-like road pass, for automobiles;
- depositing areas for the excavated soil, settled next to the canal;
- a maritime access canal;
- the displacement of the installations and enterprises within the Bazarciuk river gulf, whose activity is going to be affected by the construction of the canal;
- the dykes in the offing within the Bazarciuk pools and the harbor area.

Taking into account the fact that this canal is to cross the Danube Natural Reserve, whose surface waters level is under the average level of the sea water, the canal should be

provided with a dyke the water depth in the pools area is 0.5-0.8 m. Consequently, should the canal be exploited without the previous construction of the dykes, the waves caused by the passing of the ships are bound to affect the pools area. Dykes shall be more than necessary during flooding periods.

According to the project, the dykes are to be built out of soil, being 0.5 higher than the maximum secure height.

The locks shall allow the navigation no matter the difference between the water level of the river and the water level of the sea and it shall prevent the sand pushed by the Danube to be deposited in the canal. However, where the canal goes out into the sea, the protection of the canal is technically burdened, as the tract of the maritime access canal runs parallelly to the current line of the deposits along the sea shore.

According to the calculations of the Academy of Science of Ukraine, the annual volume of the exploitations from the maritime access canal shall be 300,000 cubic meters.

Hydro-monitors (absorption dredges and excavation dredges) shall be used for the construction of the canal, of the dykes and of the maritime access canal.

The daily productivity of an absorption dredge is 3,000-4,000 cubic meters, while that of an excavation dredge is 2,000-2,500 cubic meters. During the spawning period, the works are to be stopped for a month's time.

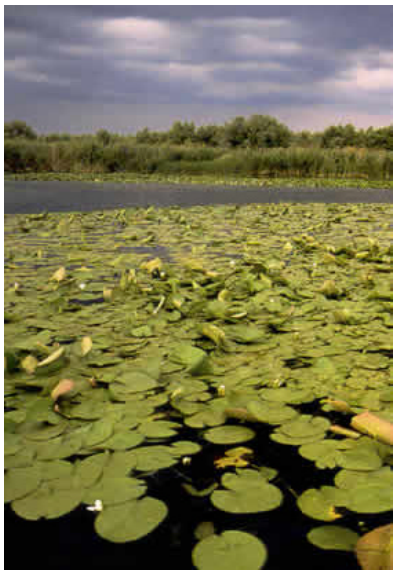
In case that, in various sections of the canal : 6 absorption dredges and 3 excavation dredges were used concomitantly with the construction of the hydro technical installations, construction process shall last for 64 months, including the 4 months of preparatory works. Besides dredges, floating cranes, barges and tug boats are going to be used.

The excavation soil, not to be used for constructions, will be dumped into the deep sea; this dumping area shall be previously established, according to the law.

Utilization of the choice related to the construction of a deep water navigable canal on the Bystroye channel (Choice 2)

According to this choice, the construction of the canal shall be carried out in two stages. In the first stage, the parameters of the deep water navigable canal envisage a 5.85 m ship depth.

The Reni - Vilkovo section of the deep water navigable canal (km 22) is common to both choices and necessary to be performed for this section have been examined above.



The Vilkovo - Bystroye channel section has a 8-12 m depth and, in the first stage, no works to deepen the river are envisaged. Works to deepen the river bed, as well as some other hydro-technical works, are to be performed in the second stage. The average volume of the depth, necessary for an adequate functioning of the canal is 506,500 cubic meters, on a 278,400 square meter area. The anua1 exploitation excavations in this area shall be 140,000 cubic meters.

The hydro-technical works to be undertaken in the second stage will consist in the strengthening of the banks, by constructing 13 semi-dams in three eroding sections of the Bystroye channel (between km 6 and 8), having a 1.05 km total length on the water surface.

All the works within this section shall be carried out outside the actual limits of the Danube Natural Reserve.

In the sand bank area, at the mouth of the Bystroye channel, in order for an adequate depth of the canal to be ensured (so that it can be adequately functioning), works to deepen the bottom shall be needed - 2,331,000 cubic meters on an 600,000 square meters area. In the first stage, the volume of the excavations shall be 1,948,000 cubic meters. In order to reduce the sand depositing, parallel surrounding dykes shall be built up in the second stage, having a 3,000 m length. When performing these works an approximately 100,000 square meter area shall be affected. According to the results of the research of the Academy of Science of Ukraine, the annual volume of soil excavation in order to preserve the depth envisaged by the project is 232,000 square meters.

When calculating the construction period, the previous data, used for choice 1, were considered 4 absorption dredges and an excavation dredge are recommended to be used for construction, concomitantly with the performance of hydro-technical works. In this case, the works would last for 41 months, including the 2 months needed for the preparatory works. The performance of the works in the first stage can be done during a year time.

The construction of the temporary deposits, where the excavated soil is to be placed is not examined in the Experts' Assessment for sections downstream Vilkovo. The soil excavated from this area shall be directly transported to and dumped in the deep sea.

The navigation during the exploitation and the traffic of the ships is used for the construction works and for the works to deepen the bottom.

The second and the third of the above-mentioned groups of factors will also determine a hydrologic impact on the surface waters (thus causing an alteration of the following regime of the surface waters). The factors within the second group can determine a redistribution of the water flow of the Danube River in the Chilia Delta, while the factors within the third group - the changing of the aquatic regime in the Jebriansk pools.

The impact of all the above-mentioned factors can be noticed from the beginning of the construction works and they are bound to persist during the exploitation of the canal.

The impact area of these factors on the hydraulic parameters is limited to the aquatic environment, either natural or artificial (channels or canals), while the impact area on the hydrologic regime can consist of all the area of the Danubian pools, belonging to Ukraine.

The physical and chemical impact factors that can affect the water environment, determining the alteration of the water compounds, as well as the alteration of the water and bottom deposits quality, are represented by the excavating works to deepen the bottom and the deposing of the excavated soil. These kinds of works are indispensable for the construction and exploitation of the canal.

When the deposits on the bottom of the canal contain radioactive substances, the radioactivity impact factor can be noticed.

Taking into account the fact that some of these substances can convert in a gas, one can reach the conclusion that the physical and chemical factor can also influence the atmosphere.

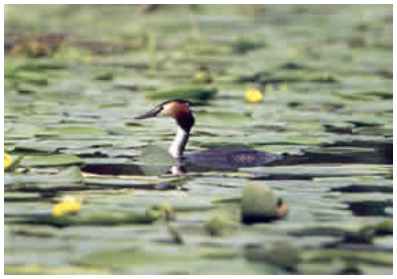
The impact of these factors on the environment is at its highest during the construction works and it is gradually decreasing after the depositing of the excavated soil in the permanent maritime deposits, after the elimination of temporary deposits next to the canal and the tilling of the land where quality is generally restricted to the sections of the canals and of the channels neighboring those on which the works to deepen the bottom are carried

out, following the direction of the stream (the intensity of the impact is gradually decreasing, as the contaminated waters are mixing with the uncontaminated waters).

Another physical-chemical impact factor is represented by the infiltration in the water of the noxious substances from the ships to be used for the construction of the canal. In normal conditions of exploitation, the influence of this factor will be a minor one, but if damage were to be produced, its influence can have catastrophic consequences, from an ecologic point of view.

According to Choice 2, the works to deepen the riverbed in the Bystroye mouth area, can be considered an indirect physical-chemical impact factor on the aquatic environment, as it will cause the penetration of salted waters from the sea in the Bystroye Channel. The impact of this factor will be periodically noticed, during the high tide from the sea, and its area of impact is likely to be restricted to the water layers at the bottom of the Bystroye channel and in the delta area in the proximity of the mouth of the channel (although there are some prognostics envisaging the possibility of the extension of the salted waters in the larger area of the Danubian pools).

The gas emanations and the noise caused by the ship engines are the main physical and physical-chemical impact factors of the projected activity on the atmosphere. According to the calculations, these factors can affect a several hundred meters wide area, during the construction period. During the exploitation period, the impact of this factor will depend on the intensity of the navigation and can be as strong as during the construction period.



The main physical and physical-chemical factors, with a direct and permanent influence on soil, flora and fauna, causing their partial or total degradation, are represented by the lands to be used for construction or exploitation, the depositing of the excavated soil and the constructions of the installations to ensure navigation.

All the above-mentioned factors, affecting the water and air, indirectly affect the flora and fauna. This is a difficult evaluation, as the dimensions and the importance of an indirect impact generally cannot be evaluated according to the parameters of the main factors, but according to the ecological value and the vulnerability of the recipients to the alteration of the abiotic elements.

Comparative evaluation of the impact factors of Choice 1 and 2

The evaluation presented above proves that the quantitative parameters of most of the factors with a direct impact on the environment depend on the volume of the construction and exploitation works, as well as on the area of the territory necessary for the construction of the deep water navigable canal. All these are examined as main factors in the comparative evaluation of the two choices (chart 1.2.1)

Chart 1.2.1. - Characteristics of impact factors, according to Choice 1 and 2

Name of factor	**Measure**	**Choice**	
		1	**2**
Reni - Vilkovo section	Thousand cubic maters	4485.2	4485.2
Vilkovo - Delta mouth (where Danube flows onto the sea)	Thousand cubic maters	2,4202	506.5
At the shore	Thousand cubic maters	3,062	2,331
Total	**Thousand cubic maters**	**31,749**	**7,322.7**
Excavated soil during the exploitation period			
Reni - Vilkovo section	Thousand cubic maters	800	800
Vilkovo - Delta mouth (where Danube flows onto the sea)	Thousand cubic maters	-	140
At the shore	Thousand cubic maters	300	232
Total	**Thousand cubic maters**	**1,100**	**1172**
Land area to be permanently used for the construction and exploitation of the canal			
Reni - Vilkovo section	Hectares	96	96
Vilkovo - Delta mouth (where Danube flows onto the sea)	Hectares	133	-
Total	**Hectares**	**229**	**96**

The evaluation of the data in the chart show the fact that Choice 2 presents unquestionable advantages: the volume of the excavated soil in the exploitation period,

stipulated by Choice 2 is 6.5 bigger than the volume envisaged by Choice 1 , but the volume of the excavated soil during the construction period, stipulated by Choice 2 is 23% of the volume of the excavated soil during the construction period. Moreover: within the Danube Natural Reserve, the volume of the excavated soil stipulated by Choice 1 is 50 times bigger than the volume stipulated by Choice 2.

A similar conclusion can be drawn as far as the land area to be used for the construction works is concerned: Choice 1 provides for 547 ha within the Danube Natural Reserve to be used, including 414 ha for the permanent use, while Choice 2 provides for only 4 ha to be used.

Conclusions

1. The evaluation of the impact factors done in the Experts' Technical Explanations with the respect to the choices of construction of a deep-water navigable canal, shows the fact that most of the impact factors, expected to be produced either during the construction period or during the exploitation period, depend, directly or indirectly, on the volume of the excavated soil and on the total area of the land to be used (exploited) in this respect. The quantitative comparison of these basic factors reveals the advantages Choice 2, on the Bystroye channel, has, as against Choice 1 , on the Solomonov - Jebriansk gulf. On various sections of the tract from Volkovo to the place where Danube flows into the sea, crossing the Danube Natural Reserve territory, there is a 1:50 scale between the volumes of the excavated soil, while between the areas of the land to be exploited, there is a 1:135 scale, to the advantage of Choice 2. Taking into account these criteria, the impact of Choice 1 on the territory of the Danube Natural Reserve is to be considered as unacceptable, especially having in mind the fact that some of the choices previously evaluated are more reasonable as far as the landscape of the Danube Natural Reserve is concerned.

2. The assessment on the economic activities reveals the fact that the maritime and fluvial activities are particularly developed in this region, at a domestic and at an international level, as well. The most developed industrial activities of the region belong to the maritime field, such as the construction and reconditioning of ships or fishery industry. The development of the cities of the region depends mainly on the transportation flow on the Danube waterway.

3. A decline of the navigation on the Ukrainian section of the Danube could be noticed during the latest years, as a necessary depth, acceptable to navigation, had not been maintained on the Prorva channel. The decline of the navigation caused the decline of the industrial and transportation centers. The construction of the Danube-Black Sea navigable canal is thus necessary for the economic regeneration of the region.

4. Nowadays, the territory of the Delta Favors the development of agriculture, fishing and hunting. The land areas within the Danube Natural Reserve are used as meadows for cattle. On the Delta channels (including Bystroye), industrial fishery is well developed.
The construction of the deep-water navigable canal shall obstruct the fishing in the area, but not some other economic activities on the territory of the Delta.

Environmental and impact elements

2.1 Natural environment characterization

2.1.1 Flora

Choice 1

According to the data of the report with respect to the landscape and flora of the Solomonov channel and of the Jebriansk rocky structure, on whose territory the tract of the locks canal is to pass, this area is characterized by a floral diversity. The flora of these territories consists of 905 vascular plants (95.68% of the whole flora of the Danube Natural Reserve), and it has the first place in the southern region of the Black Sea, as far as the species diversity is concerned. It is to be noticed the diversity of species of the psammofil neo-endemic floristic structure of the seashore, with the significant presence of the steppe vegetation, of the boreal vegetation (in the pools) and of the nemoral vegetation (the rocky structures). The high endemism of the flora can be explained mainly by the sand deposits along the channels (this causes the diversity of the sand endemic vegetation, such as Senacio borzsthenicus, Tragopon borzsthenicus, Onosma borzsthenica, Stipa borzsthenica etc.) and by the existence, on the rocky structures, of the maritime flora.

Prehistoric vegetation is also very richly represented (the tertiary and quaternary species), which started their existence on the shore areas of Tetis. 13 species registered in

the Red Book of Ukraine can be found here, as well as 3 species within the red List of Europe, a species registered in the International Red List and 5 species within Annex 1 of the Berne Convention. 58 species and 55 endemic species are registered in the rare, vulnerable and disappearing species list, established according to the JUNC scale.

The flora of the area to be crossed by the locks canal is characterized by the diversity of the species, categorized in various systems: flooding meadow species, forest, bush, pools, sand, salted land species, as well as marsh and water species; this diversity can be explained by the variety of the environment conditions, from semi-desert to water. Some flora categories are registered in the Green Book of Ukraine.

The report stresses the diversity of the adventive flora, explained by the excessive anthropogenic interference. The new environmental conditions determined by the construction of the protection dykes and by the exploitation of the canal are expected to cause a spreading of these species and a wide proliferation of some new species.

The tract of the Solomonov channel - Jebriank gulf canal will divide the Kebraonsk rocky structure in two. This will cause the degradation of the ecosystems, as they are extremely vulnerable due to the extreme circumstances of their existence: arid and unstable sands.

It is to be noticed the fact that the ecosystems of this area have been already subjected to a significant anthropogenic transformation. Any interference, no matter how insignificant, is due to cause dramatic changes to the ecosystems and to the flora and the construction of the canal is bound to destroy its mid section, the most diversified one, whose variety of species is unique and whose loss cannot be compensated in some other areas, by any means.

Choice 2

As far as the Danube Natural Reserve areas, on the banks of the Bystroye channel, are concerned, whose flora is bound to be affected by the construction and exploitation works, according to choice 2, the report briefly mentions the uniqueness of the flora, determined by the specific conditions of the flooding meadows and by the influence of the Black Sea (on the territories of the Starostambulsk and Kubansk islands). It is assumed the fact that similar flora can be found along other channels or islands of the Danube Natural Reserve, as well.

The maps indicating the spreading areas of the vascular plants, registered in The Red Book of Ukraine, and of the flora registered in the Green Book of Ukraine, reveal the fact that the areas crossed by the locks canal (choice1) are far more valuable than those in the Bystroye area (choice 2), as far as diversity and protection of species in their spreading areas are concerned.

Equally important is the criterion of existence of these places in other sectors of the Danube Natural Reserve. According to the maps, along the tract of the canal, there are places where 10 species listed in the Red Book grow, out of which 7 species can be found only here and 7 groups listed in the Green Book out of which 4 cannot be found in other sectors of the Danube Natural Reserve.

In the Bystroye Channel area only 2 species listed in the Red Book and 2 listed in the Green Book grow; moreover, the places where these species grow are widespread all over the territory of the Danube Natural Reserve. Thus, taking into account this criterion, the flower species growing on the territory of choice 1 have to be considered as more valuable than those in the Bystroye channel area.

One should stress that the danger for flora on the territory of choice 1 is not inevitable. If the installations necessary for the exploitation of the canal were floating and not placed on the banks and if the works to strengthen the banks were reduced to a minimum, any impact on these territories flora can be avoided. If these conditions are respected, the impact of the canal built in accordance with choice 2 on the flora of the neighboring territories cannot be considered as decisive.

Thus, taking into account the value of the territories as far as flora and the impact on this flora are concerned, the construction of the canal on the Bystroye branch has to be considered as preferable.

2.1.2 The insects

Choice 1

Almost 5000 species of terrestrial and amphibious invertebrates live in the area of the locks canal on the Solomonov branch - Jebriank gulf (ECZ), out of which 90% are insects (up to 4000 species). Out of the 8 entomological

groups of the Danube Natural Reserve, 5 are well represented in the ECZ area, namely: reeds, meadow, sandy, and shrubs, anthropic. The forest group is poorly represented, and the steppes and salted soil groups cannot be found here. Scientifically and ecologically, the meadow and sandy groups are the most interesting.

Out of the insects living in the ECZ area, 32 species are protected (i.e. 76.2% of the protected species of the Danube Natural Reserve and around 70% of the protected species in the Ukrainian part of the Delta) pertaining to 27 genera, 20 families, and 7 others: hymenoptera - 11 species (34.4%), butterflies - 8 species (25%), dragon flies - 6 species (8.8%), bugs - 3 species (9.4%), orthoptera - 1 specie (3.1%). Out of 32 species protected in the UCE, 20 are listed in the Red Book of Ukraine (URB), 5 species in the European Red List (ERL), and the Bern Convention list (BC), 3 species in the ERL, 2 Species in the IUCN, URB and ERL, one specie in the IUC, BC and UBC. The rarest of the protected species are the manure bugs. Around 80 rare and extinction menaced species, not listed in the protection lists have been discovered in the ZCE. Among these, 5 are unknown species, 2 are new to Europe and 12 new to the Ukraine fauna, 2 are endemic for the Danube Delta and one unknown species belongs to the Picnoflastor genus. In respect to the diversity, the area of the rocky structure in the Vilkovo Primorske road sector is the richest; here all the main entomological complexes are represented. 26 protected species live in the area, out of which 14 are rare species.

The scientific literature mentions the fact that the Jebrianovsk Gulf area and its neighboring swamps and marshes area are the first in respect to the species diversity. The largest number of insects (22) listed in CRU and LRE live in this area. The Stentsevo-Jebriansks swamps is the only area in the Ukraine where the CRU Aeschna viridis Ev. dragonfly lives. Some species of parasites living in the swamps area have been lately discovered in this area.

Choice 2

In the area corresponding to choice 2 of construction (the Bystroye channel), among terrestrial and amphibious invertebrates, insects are the most numerous (around 3,500 species) belonging to 32 genuses. Most of them (90%) belong

to 6 genuses: hymenoptera; diptera; bugs; butterflies; ticks. Out of the 8 entomological groups, one is not represented: the steppe group; 5 of them are very well represented: the reeds, meadows, sandy, bush and forest group. The largest surface is bush covered; the bush and meadow group are remarkable by the diversity of species. The anthropic and salted soils groups are poorly represented and they can be found in a small area. 23 species among the insects living in this area are protected (56% of all the protected species represented in the Danube Natural Reserve) belonging to 7 orders: butterflies (8 species), hymenoptera (7), bugs (3), dragon flies (2), ephemeredes (1), orthoptera (1) and diptera.(1). Most of the protected species discovered in the Danube Natural Reserve area are listed in the Red Book of Ukraine.

Comparing the terrestrial and amphibious invertebrates habitats in choice 1 and 2 areas reveals the significant difference between them. The diversity of species in choice 1 area is 12% larger than in the other area. Yet, in the choice 1 area, fewer insect orders live than in the Choice 2 area (19, compared to 23). In both areas the same 6 orders are represented, but their proportion differs. The compared areas differ also in respect to the composure of the entomological habitats. Many rare and protected species live in both areas, but their lists are quite different. 78% of the species in the choice 2 areas and 56.3% of the species in choice 1 are protected. The species menaced by extinction are fewer: choice 1 - 29.4%; choice2 - 33.3%. Unknown species, new to Ukraine and Europe, have been discovered in both areas. Due to the specific conditions of this area, specific zoological habitats, with unique functional components, were created.

Data related to the existence of the protected species in other areas of the Danube Natural Reserve are not to be found in the Hydrobiological Institute report.

The compared areas are recognized and equally important from a scientific and ecological point of view, in respect to the presence of insects.

The choice of the Bystroye Channel is nonetheless preferable, because of the lesser impact on the flora constituting the insects' habitat.

2.1.3 The aquatic fauna

Fish and aquatic invertebrates represent the Danube Natural Reserve aquatic fauna.

The fish population is an important component of the Delta's biodiversity. Fish play an important role in the tropic chain. Moreover, no other component of the fauna has the same economic importance.

The extremely large biodiversity and large density of the fish population is due to the diversity of the natural conditions and by the dimensions of the Danube Natural Reserve. In accordance with the data communicated by the Hydrobiological Institute, 95 fish families live here pertaining to 31 families, including the fish listed in L.R.E., namely sturgeons (as the atlantic sturgeons) salmons (Black Sea and Danube salmon), perch (Zinger strebel and Zinger zinger). 15 species of fish out of the 32 listed in the U.R.B.(Ukrainian Red Book) live in the Danube Natural Reserve.

Sturgeon is the most interesting fish for the fishery industry but, the Danube shad is more economically important. The annual average shed capture is 400 tons.

Currently, the reproduction conditions are one of the most important factors influencing the fish population. During the 1960-1970 period, the massive construction of dams caused the destruction of around 300.000 ha of land used for spawning. The main factor directly influencing the fish reproduction condition in the lower part of the river is the water level regime (the height and ration of the freshet).

One can notice the sudden reduction of the sturgeon population, which formerly played an important role for the fishery industry, and also for the Black Sea ecosystem. We have to stress that Acipenser Nutriventis and Atlantic sturgeon (Acipenser sturio) have always been rare species in this region. Nonetheless, the Ancipenseruthenus was formally an object of the industrial fishing, but since 1964, it has not been registered any more in fishery reports, although the number of young, migratory Acipenseruthenus is sometimes the largest of all the sturgeon species.

As to the Huso huso, Acipenser guldenstadti colhicus and Acipenser stellatus population, sudden decrease is noticeable. In 1994, the Huso huso was listed in U.R.B.(Ukrainian Red Book) and it's fishing was prohibited. The same year, Ukraine unilaterally prohibited the sturgeon fishing thus, since 1995 only experimental fishing for scientific purposes has been carried out. Currently, the Danube is the only river, flowing into the Black Sea, where migratory sturgeons spawn.

Rare endemic species, such as Zinger streber, Zinger zingel, gymnocephalus schraecter and others have not been accidentally caught by the industrial fishing installations. Thus, no special measures are necessary to protect them or any other small species, except to preserve the existent conditions.

The Danube shed represents almost half of the industrial fishing (48.6%); it is typical migratory fish that spawn beyond the Ukrainian sector of the river. Because of the pelagic type of their spawn, the species has become resistant to the sudden decrease of the area of their traditional territories; contrary to the phytophile species, whose population has suddenly decreased.

The qualitative component of the aquatic invertebrates in Danube Natural Reserve is distinctive because of the so called relict ponto-caspic fauna. These water-living species emerged and were formed 1,5 millions years ago, in the antic semi-salted waters that are presently the Aral Sea, the Caspian Sea, the Azov Sea and the Black Sea. In the Caspian Sea and in certain areas of the Black Sea and of the Azov Sea, the unique habitat of these water-loving species is preserved, a habitat which is remarkable by the richness of the species and which plays an important role as a food provider for fish.

In the Ukrainian sector of the Delta, including the Danube Natural Rezerve, the relict species of the aquatic invertebrates are numerous. They represent the basis of the plankton and of the biotic (Cenozoic). In the composition of the aquatic habitats of the Danube Natural Reserve, 96 relict ponto-caspian species can be found, among which 3 hydroids species, 12 worm species, 1 specie leech, 22 mollusk species, 2 crustaceous species, 9 crustaceous-mollusk species and 1 ticks species.

The impact of the works to deepen the river bed shall be approximately the same for both choices, nonetheless the construction of the canal in accordance with choice 1 shall have a greater impact on the Bystroye channel.

The main impact factor is the construction of the maritime canal by depositing sand at river mouth, and the most important negative consequences for the aquatic fauna of the Bystroye canal shall be caused by the infiltration of salted water into this channel. These consequences can be significant for the biocenosis of the Bystroye channel, but they shall

not affect the aquatic, fauna in the entire delta. To reasonably predict the possible impact of the opening of the mouth of the Bystroye channel, a scientific evaluation on this channel is necessary, and the models conceived for other channels cannot be applied to this particular one. The impact on the marine ecosystem.

The depositing of the excavated soil into the deep sea is an impact factor that can be found in both cases. The consequences shall be more serious in the case of choice 1 , taking into consideration that the volume of the excavated soil is bigger.

In the areas - or the construction works, the impact factors affecting the aquatic fauna are similar for both choices. The volume of the excavated soil and its loss during the execution of works to deepen the bed in the construction stage, as well as in the exploitation stage, are 23% smaller in choice 2. The area of the marine subsoil to be deteriorated shall be basically the same in both choices. The probable losses of spawning areas in choice 1 and 2 shall be 75, respectively 45 ha, but these figures are only estimated.

Comparing of the impact on the shore fauna envisaged by choice 1 to the impact envisaged by choice 2 is not likely to have a relevant outcome, as circumstances are different for each area. The main impact factor in the Jebriansk gulf (a slow water circuit) can lead to the degradation of the water quality, following the construction of the sea access canal and of the widening of the bed during the exploitation stage. In the Bystroye channel area (deposits of sand at the mouth of the branch) the main factor shall be the construction of the protection dams which shall cause the change of the components of the bottom biocenosis and shall impede the migration of fish to the sea.

As stated in the report, the fauna in both choice areas is equally valuable. It is stressed that the biotic bottom groups in the Jebriansk Gulf are unique, but it is also supposed that the negative results shall be only partial, due to the anthropic influences after the construction of the Ust- Dunaisk port.

Generally speaking, it is our opinion that the damages of the aquatic fan including the marine, shall be equally important in both choices.

2.1.4 The amphibious and the terrestrial vertebrates

Choice 1

In accordance with the data of the report, in the Solomonov channel- Jebriansk Gulf area there are 11 species of amphibians, 4 species of reptiles and 34 species of mammals, representing 100%, 80% and, respectively, 97% of the composition of species of the groups which are typical to the Danube Natural Reserve. Among these, 10 species of mammals are listed in the URB, 3 species of amphibians, l reptile species and 6 species of mammals are listed in the IUCN, 3 species of mammals are listed in the LRE, 11 species of amphibians, 4 species of reptiles and 23 species of mammals are listed in the CB. Thus, 39 species of amphibians, reptiles and mammals make the 53 species in the Danube Natural Reserve (74% are protected in this area).

A large or significant part of the population of thc following species: Triturus dobrogicus, Bombina Bombina, Hyla arborea, Pelobates fuscus, Emus orbicutaris, Mustela enninea, Mustela ltttreola, Lutrat Lutra can be found in the Danube Natural Reserve, including in the Jebrinaski area. Taking into account the fact the many of these species are menaced by extinction, the Danube Natural Reserve, including the Jebriansky area, is very important for their preservation in Europe. Triturus dobrogicus lives only in the Danube Delta, so it is locally endemic, while its species is endemic in the Danube basin. The Monachus monachus seal is an extremely rare animal, menaced by extinction all over the world. Sometimes this anirnal is noticed in the Jebriansk area. The preservation of these species on the territory of CNJ is extremely important.

The herpetological fauna of swamps is characterized by the diversity and large number of amphibians, while the reptiles are represented only by two species- Emys orbicularis and Natrix natrix. In the Danube Natural Reserve and in the neighboring territories the most important habitats of these species are situated in 5 areas, among which 4 can be found in the territory of the canal construction on the Solomonov channel - Jebriansk Gulf.

- the Jebriansk sand strip and the neighboring area (10 species ofamphibians)
- the land areas between the Vilkovo-Yrimorskoe road and the fishing ponds and the Jebriausk marshes from the turning of the road to the Leski village to km 7

- the western bank of the lake arid the sands area discovered within the Jebriansk rocky structure and in sectors 10 and 7 of the Vilkovo forest district (a representative area, where all the 12 species typical for this zone can be found)
- the Vilokovo mountain and the north-westem territory (13 species)

The JNC territories are the most valuable of the Danube Natural Reserve in respect to the diversity of serpent species.

The land fauna of this area is represented by the usual land species (Erinaceus concolor, Talpa europea, Lepus ew-opaeus, Apodemus agrarius) and by several species which are typical to steppes (Mustela eversmanni, Cricelus migratorius); the latter are not to be found in the secondary delta of the Danube, including in the Bystroye channel area.

Many hunting species, such as: Rana ridibunda, Ondrata zubetlmicus , VuLpes vulpes, Nyctereutes procyodonides, Sus scrofa, Lepus europeus live in the Jebriansk and Belgorodsk swamps and the Badâk Gulf area, where the canal is envisaged to pass.

Choice 2

In accordance with the data of the report, in the area of the canal coustruction corresponding to choice 2 there are 10 species of amphibians, 2 species of reptiles, and 29 species of mammals representing 91.40% and respectively 74 % of the species of the vertebrates groups typical to the Danube Natural Reserve. Among them, 10 species of mammals are listed in the UCR, 3 species of amphibians, one specie of reptiles and 5 species of mammals are listed in the IUCN, 3 species of mammals are listed in the ERL, 9 species of amphibians, 2 species of reptiles and 19 species of mammals are listed in the BC. Thus, 32 species of amphibians, reptiles and mammals are protected in this area, including 78% of the mammals living in this area.

A significant part, of the population of the following species: Triturus dobrogicus, Bombina bombina, Hyta arborea, Pelobates fuscus, Emus orbicularis, Mustela ertninea, Mustela lutreola, Lutra lutra live in the Danube Natural Reserve, including the Bystroye channel area. Taking into account the fact that these species are menaced by extinction in many European countries, the Danube Natural Reserve is extremely important for their preservation on the European continent. Triturus dobrogicus lives only in the Danube Delta, so it is locally endemic while its species is endemic in the Danube basin. The Rana lessonae frog can be found only in three places in the Danube Natural Reserve, two of which are

located in the Bystroye channel area. The felis sylvestris cat and the Monachus monachus seal are very rare animals, the territory of Danube Natural Reserve, including the Bystroye channel area being thus extremely important for their preservation.

Most of the amphibians, reptiles and mammals living in the Bystroye channel area have their habitat in the rocky structures near the channels, the banks and the lake. Due to these circumstances, the herpetolo gical fauna is extremely rich.

In the Bystroye channel area, where the canal is to pass, many important hunting species, namely Rana ridibunda Ondatra zubethnicus, Vulpes vulpes, Nyctereutes procyinides and Sus scrofa, live.

The comparative analyzing of the species of amphibians and terrestrial vertebrates in the area of the canal construction show that the territory of the JNC where almost all of the animals of the Danube Natural Reserve pertaining to this group live is the most valuable. This area is unique for reptiles, among the territories of the entire Danube Natural Reserve. For example, 80 % of species living in the JNC area are listed in the BC, compared to only 40 % of the species living in the Bystroye channel area.

Nonetheless, in the Bystroye channel area, as well as in the JNC area, several species (Triturus dobrogicus, Bombina bombina, Hyla arborea, Pelobates fuscus, Emus orbicularis), menaced by extinction in Europe live.

As a conclusion of the comparative analysis of both projects in respect to the impact on the amphibians and terrestrial vertebrates fauna, the authors of the report do not consider that one choice is preferable to the other, because there is a unitary fauna structure in the entire Danube Natural Reserve area. Nonetheless, the scientists are concerned that the destruction of one of the components of this structure could lead to its total destabilization.
Our opinion is that, taking into account the criterion of the impact on these animal groups, choice 2 is preferable, because the composition of these groups in the Bystroye channel area is poorer, moreover the surface of the territories for which the modification of the natural conditions is predicted, is much smaller in the case of choice 1 .

2.1.5 Birds

The territories of the Danube Delta, including the Chilia area, represent, at an international level, important areas of massive reproduction and gathering for the waterfowl. 257 species of birds (62% of the bird species of Ukraine) can be found here, among which 124 species build their nests in the Danube Delta. The migratory birds are the most numerous - 196 species, 129 species remaining in the delta during winter. Besides them, there are 41 species that stay here only temporarily. 42 species are listed in the URB and ERL. The Chilia area of the Danube Delta is listed, since 1975, among the wetlands of international importance. This status was confirmed in 1996 by the Conventions on the wetlands of international importance, on the basis of the 1971 Ramsar Convention.

Most of the Danube Natural Reserve birds are protected. 42 species (around 16 %) are listed in the UCR (1994) and the ERL (1991) among which one specie build is nests here, 31 stay only temporarily and 22 species spend winter here. Pelecanus crispus, Phalacrocorax pigrnaeus, Rufibrenta ruficollis and others are listed in the IUCN.

The waterfowl represent most of the species in the delta, especially swans, geese and ducks, pelicans and cormorants, ibises and herons, seagulls, among which Pelecanus onocrotalus, Platalea leucorodia, Plegadis falcinellus, Ardeola ralloides, Aythya nyroca and others are listed in the URB.

Some of these species, for example Phalacrocorax pigmaeus are not found anywhere else in the world and Pelecanus crispus - anywhere else in Europe.

Out of the 4 main sectors of the Danube Natural Reserve, the area of the secondary delta of the Chilia arm is remarkable for the extreme diversity of birds. On the second and third places are the Stentsovko-Jebriansk swamps, the Jebriansk rocky structure and the Ermakov Island.

In the area of the secondary delta of the Chilia arm (territory of the former natural reserve) the main colonies of cormorants, ibises and herons are located. The large territory of the Delta with its shallow waters is of great importance for bird life. Most of the migratory ducks gather here. In certain periods of the year the number of the big wild ducks is about 16,000-20,000 birds. Other species are less numerous. Almost every year about 500-5,000 swans spend their moulting period in the southern part of the delta.

Presently, the anthropic influence on the birds on the territory of the Danube Natural Reserve is relatively insignificant. The anthropic factors can be ranked out in two main groups: the ones having a direct influence (fisheries, tourism, fires, pasturage) and the ones having an indirect influence (the anthropic modification of the river and delta regime, the influences on the processes of formation of the delta, the degradation of the water and air quality). Nonetheless these factors are not decisive for the living of the birds on this territory.

The comparative significance of the territories to be crossed by the tract of the deep water navigable canal can be seen in the following chart:

Chart 2.2.1

Comparative characteristics of the impact on birds of the coitstruction and exploitation works of the canal

Indicators	**Choice 1**	**Choice 2**
Number of bird species within the area directly affected by the construction works	223	245
Number of species within LRE	5	5
Number of species registered in the Ukrainian Red Book(URB)	31	36
Number of nests within the directly affected area (couples)	up to 850	Up to 5,600
Number of nests of the URB species, within the directly affected area (exemplars)	Up to 15	Up to 10
Number , of exemplars within the directly affected area, during autumn migration	Up to 7,500	Up to 3200
Number of couples during autumn migration (URB species)	Up to 120	45
Number of exemplars during autumn migration within the directly affected area (URB species)	Up to 1,150	Up to 1,150 Up to 450
Number of exemplars within the directly affected area, during winter time	Up to 12,000	Up to 750
Number of exemplars within the directly affected area (LRE species)	Up to 460	Up to 25
Number of exemplars within the directly affected area (URB species)	Up to 510	Up to 270
The Danube Natural Reserve areas, to be crossed by the deep water navigable canal	Buffer area, anthropogenic configurations	Reserve, buffer area

The probability for the main ornithological structures to be disturbed	Big	Big
The probability for the character of main ornithological structures to be disturbed	Very Big	Very Big
Practical possibility to recover the envisaged damages	Small	Small

The data of the chart reveal the fact that, as far as choice 1 is concerned, the direct impact territory has a special value, being the nesting place of migratory birds during autumn and winter; moreover, many of these species are protected. As far as the direct impact area on the Bystroye channel is concerned, this area is more valuable, taking into consideration criteria related to the number of nests, the diversity of species and the number of protected species.

Basically, both areas can be considered equally valuable for the conservation of the ornitho-fauna within the Danube Natural Reserve.

Following the works on the sand banks at the mouth of the Bystroye channel, the Pticiia land strip is expected to join the maritime edge of the delta and, as a consequence, many of the nesting and hibernating places of many of the species will be destroyed. Such consequences are expected for choice 1 , for the Baklanii island (Pereboinaina land strip). choice 1 provides for a significant area of territories valuable from the point of view of the preserving of birds to be used for the construction of the locks canal and of the installations necessary for its good functioning during the exploitation period. This is not provided by choice 2. Thus, the construction of the canal according to choice 1 has more negative consequences for the ornitho-fauna than those caused by choice 2.

Conclusions

The territories where the canal is envisaged to be constructed according to choice 1 should be considered more valuable than those to be crossed by the canal according to choice 2, considering the following criteria: the diversity of the flora and of the herpetofauna. As far as other fauna groups are concerned, both areas are equally valuable.

Should the canal be constructed according to choice 1, the flora and the majority of the above evaluated animal groups are expected to be more affected, while the aquatic fauna is to be equally affected by both choices.

Consequently, as far as the impact on flora and fauna are concerned, choice 2 should be preferred.

Environmental and assesment issues

3.1 Characterization of the social environment and assessment on the impact elements affecting it

In the Ukrainian sector there isn't any deep water navigable waterway, and thus, the maritime and fluvial structures of the regions, as well as the economical activities related to them, are very much affected. As a consequence, the whole economic development of the region is hindered and the standard of living of the population has been deteriorating.

The reconstruction of a deep water navigable canal on the Danube shall positively influence the social environment of the region and shall improve the standard of living of the population.

First of all, new jobs will be available and salaries will grow in the dynamic economical fields. As an example, new jobs will need to be created within the Ukrainian Danube Ship Agency, in harbors, in the railways and freeway field, in the ship construction and reconditioning field etc. An investment growth is expected not only in the transportation field, but also in some other domains, as well as in the infrastructure of the region. The transportation network will be improved. New perspectives for the development of tourism will be created, including international tourism.

The positive effect of the project for the economy of the region and for the social environment will compensate for the eventual negative consequences that the project could have for a part of the Vilkovo population. Thus, the fishing conditions in the Bystroye fishing shall be deteriorated, a decrease of the number of jobs is likely in the Ust-Dunaisk harbor - should this be the case, the Ust-Dunaisk personnel is to be moved in some other areas to contribute to the construction or Exploitation of the canal.

Basically, the reconstruction of a deep water navigable canal on the Danube is very significant not only for the development of the economic and transportation fields, it also has a political and strategic importance, contributing to the development of the region and even of Ukraine, as a whole.

3.2 General assessment with respect to the impact of the designed project on the natural environment

In order to comparatively evaluate the impact on the environment of the choices related to the construction of the Danube-Black Sea deep water navigable canal, the tract of each envisaged canal has been divided in three sections, among which the Reni-Vilkovo section is common to both projects. The last section of each tract includes the maritime canal and the dykes in the Jebriansk gulf area (Choice 1) and the mouth of the Bystroye channel area (Choice 2).

The impact has been assessed separately, for the construction period, respectively, for the exploitation period. The impact factors related to the construction works have been examined with respect to the construction period. The impact factors related to the works to deepen the bottom and to the passing on the ships on the canal have been mainly examined, with respect to the exploitation period.

The comparative characterization of Choices 1 and 2 was based on the materials within the Experts' Technical Explanations, while the characterization of the eventual consequences has been based on the scientific report of the Academy of Science of Ukraine and on the scientific research performed by the Institute for Hydro-mechanics within the Academy of Science of Ukraine and by the Biology Institute of the Southern Seas within the Academy of Science of Ukraine, of Odessa.

Taking into account the fact that the mid and final sections of the proposed canals cross various areas within the Danube Natural Reserve, an extremely important criterion used for the evaluation was the ecological value of the territories within the impact zone, according to each choice. The data of the report reveal the fact that, notwithstanding their differentiated reserve regime, the territories to be crossed by the canal, according to Choice 1 (the Jebriansk rocky structure, the Jebriansk pools and Jebriansk gulf) and to Choice 2

(Bystroye channel, the sea shore, where Bystroye flows into the sea and the mouth of the Bystroye channel) can be considered equally valuable, although, taking into account the type of flora and the diversity of fauna, especially of the herpetofauna, the areas within the impact zone of Choice 1 are more valuable.

Considering the fact that both areas are equally valuable from an ecological point of view, we are of the opinion that the comparative evaluation of the impact of the construction of the deep water navigable canal on the environment should be based on the premise that the seriousness of the ecological consequences depends on the total area of the territories to be affected by equal factors and on the extent to which the natural conditions in these territories might change.

During the construction period, according to Choice 1 (Solomonov channel -Jebriansk gulf), all the works, except for the works to strengthen the banks of the Bystroye channel, according to Choice 2, shall have equally negative consequences, or even more serious than the impact envisaged for Choice 2. The construction of the locks canal is bound to unjustifiably affect the Jebriansk rocky structure, the Jebriansk pools and the Jebriansk gulf, belonging to the Danube Natural Reserve. During the exploitation period, the negative consequences, generated by the construction of the locks canal, will persist and even become more serious. Considering all these elements, we are of the opinion that Choice 1 should not be recommended.

The exploitation of the canal on the Bystroye channel is also bound to cause a series of negative consequences, but this impact will be less serious compared to the impact the construction of the canal according to Choice 1 might have on the environment.

Conclusions

1. Two choices to construct a deep water navigable canal in the Ukrainian sector of the Danube have been selected out of the 10 various choices elaborated in the last 10 years. All the choices have been ranked out in two different categories: those passing on the channels of the active delta and those whose functioning imposes the construction of locks canals. The best choice has been selected out of each category. Thus, there are two choices left for examination: Choice 1 (the construction of the locks canal on the Solomonov channel --

Jebriansk gulf) and Choice 2 (Vilkovo harbor-Black Sea, on the Starosambulsk and Bystroye channel).

2. The Chilia Delta of the Danube River is an ever-changing structure of channels and islands. The territories between channels are water covered (the pool area). The great speediness of the evolution of the delta, as well as the quick changing of the hydrological and hydro-physical conditions are the basic factors to have a decisive influence on the natural and technological environment within this territory.

3. The general evolution of the delta depends on the mutual interaction of the river with the sea and it is revealed by the advancement of the delta into the sea, by the formation of new channels and the disappearance of former channels, by the permanent changing of the number of channels, and the redistribution of the water flow, by the sand banks at the mouths of the channels in the river-sea current interaction area, by the alteration of the aquatic regime on the islands, that is the slowing of the water flow in the pools area and the decrease of the water level, as the channels are disappearing.

4. Besides these modifications, there are some periodically repeating phenomena in the delta, among which the most important are the sand depositing at the months of the channels periodically disappearing and regenerating and the internal changing of the water debit during the year. These phenomena cause the alteration of the water debit in the channels and pools and, as well, the deformation of the river bed and of the banks of the channels.

5. Thus, the technological impact of the construction and exploitation works will take place in the context of the above-mentioned phenomena, determining the attenuation, respectively, the accentuation of some of them.

6. The main technological impact factors are: the construction of dykes on the banks, determining the alteration of the water regime of the channels and of the pool areas, thus allowing the agricultural development of the meadow and island area; the regulation of the water flow in the upper section of the channels, determining a decrease of the sand flow in the latest 10 years, without changing the annual water debit. To a certain degree, these works have slowed down the depositing of mud in the channels and they can be considered a positive factor, in favor of the construction of the deep water navigable canal.

7. The Jebriansk gulf is characterized by the accumulation of sand deposits flowing from the access canal, in the south-eastem part of the gulf, from the Belgorodsk channel, in the southwestern part of the gulf and it is influenced by the marine current, in the north-western part of the gulf. These phenomena are causing the growth of the land strips and are affecting the depth of the gulf, negatively influencing the construction and the exploitation works of the canal.

8. The examination of the hydro-dynamical conditions of the delta in the area of the tract envisaged by Choice 1 reveals the fact that, compared to some other choices within the A category, Choice 2 has the following benefits:

- the slowest advancement of the sea in the area of the Bystroye channel;
- the debit of the Chilia delta waters, where the Bystroye channel is, is continuously growing;
- the sand and mud deposits of the Bystroye channel flowing far away into the sea (although this factor is unstable, the sand depositing at the mouth of the Bystroye channel has become more active in the latest 10 years, while the land strips on the right side, called Pticiia, has developed).

9. The examination of the economic activities in the area reveals the fact that the region is focused on the development of the maritime and fluvial industry, at a regional and international level. The industrial specialization of the region is based on the ship construction and reconditioning, on fishing and fishery industry. The basic factor of the development of the towns and cities in the region is represented by the transportation on the Danube, taking into account their geographical circumstances. The decline of navigation in the Ukrainian sector of the Danube, caused by the decrease of the water level in the Prorva channel, determined the decline of the industrial and transportation centers. The construction of the Danube-Black Sea deep water navigable canal is necessary for the development of the economy of the region.

10. Nowadays, the territory of the Delta favors the development of agriculture, fishing and hunting. The land areas within the Danube Natural Reserve are used as meadows for cattle. On the Delta channels (including Bystroye), industrial fishery is developed. The

construction of the deep water navigable canal shall obstruct the fishing in the area, but not some other economic activities on the territory of the Delta.

11. The evaluation of the impact factors and of the deep water navigable canal choices, reveal the fact that most of the impact factors to affect the environment during the construction or the exploitation period depend, directly or indirectly, on the volume of the excavated soil or on the total area of the land to be used for the construction or for the appropriate functioning of the canal. The quantitative comparing of these factors reveals the advantages that Choice 2 (on the Bystroye channel) has on Choice 1 (on the Solomonov channel-Jebriansk gulf). On various sections of the tract from Vilkovo to the place where Danube flows into the sea, crossing the Danube Natural Reserve Territory, there is a 1:50 scale between the volumes of the excavated soil, while between the areas of the land to be exploited there is a 1:135 scale, to the advantage of Choice 2. Taking into account these criteria, the impact of Choice 1 on the territory of the Danube Natural Reserve is to be considered as unacceptable, especially having in mind the fact that some of the choices previously evaluated are more reasonable as far as the landscape preservation of the Danube Natural Reserve is concerned.

12. The air contamination further to the hydro-technical construction works will not be on long term and will not surpass the legal limits. The gas emanations from mobile sources will be local arid short. There aren't any mobile contaminating sources during the construction and exploitation period. Considering the air contamination criterion in the construction period, Choice 2 should be preferred.

13. Taking into account the semi-width of canals and channels, the noise intensity within the banks limits is not bound to overpass the legal limits (55dBA). As far as the impact the dredging factor has on animals, Choice 1 should be preferred, as it is not crossing the Danube Natural Reserve.

14. The evaluation of the impact of the above-mentioned choices on the aquatic environment reveals the fact that it is complex and distinctive for the various sections of the tract. The main impact factor is determined by the works to deepen the river bed. The volume of these works is several times higher for Choice 1 compared to Choice 2. Thus, the impact of this choice on the environment is higher.

15. The main negative impacts on the surface, underground, maritime waters after the achievement of the project are the following:

- the alteration of the water regime on the land strip and Jebriansk pools area;
- the construction of the canal can lead to a certain instability of the water flow, with negative consequences for the aquatic phenomena within the Jebriansk gulf;
- affecting the water quality in the Jebriansk gulf, as a consequence of the works to deepen the, river bed;
- the contamination of the waters and of the sea bed in the area where the excavated soil has been deposited.

16. The tract of the canal follows the natural tract of the river, according to Choice 2 and provides a lesser impact on the environment compared to Choice 1. The main negative impact of this choice is determined by the area of the Bystroye channel mouth. This is bound to determine the alteration of the water formation phenomena in the Bystroye channel and in the area of its flowing into the sea. However, taking into account the high speed of the water flow on the Bystroye channel, the alteration of the water quality will be less serious, compared to Choice 1 . The water and sea bed contamination in the area where the excavated soil is to be deposited will also be less serious compared to Choice 2. Consequently, one can draw the conclusion that the entire impact on the aquatic environment shall be less serious, should Choice 2 be considered.

17. The territory of the tract envisaged by Choice 1 should be considered more valuable, taking into account the diversity of the flora and herpetofauna. As far as other categories of fauna, both territories, envisaged by both choices, are equally valuable.

18. As far as the impact on the flora and fauna is concerned, Choice 1 is less advantageous compared to Choice 2, except for the aquatic fauna, which is equally affected by both choices.

19. The fact that the construction of the lockscanal shall divide the Jebriansk pool area in two sections is bound to strongly and irremediably affect the aquatic regime of the Danube Natural Reserve and it call even cause the degradation of the biocenosis on areas larger than those envisaged for the construction of the canal; considering these elements, Choice 1

should be regarded as unacceptable from the point of view of the necessity to preserve the Danube Natural Reserve.

20. The construction of the locks canal in the Jebriansk rocky structure area, according to Choice 1, contradicts the ecological aims of the Danube Natural Reserve, requesting the necessity of a stable functioning of the natural and anthropogenic systems, as well as of the preservation of the biological diversity; beyond the Jebriansk pools and gulf buffer zone, the alteration of the type and character of the landscape is forbidden.

21. The works to deepen the bottom of the river bed in the Bystroye mouth area can cause the natural evolution of the delta in the future, thus contradicting the aims of the natural reserve, to preserve, as much as possible, the natural circumstances of the evolution of the delta.

22. The comparative assessment of the two choices reveals the fact that any choice, is, more or less, bound to affect the functioning of the reserve and, thus, the request formulated by the Academy of Science of Ukraine, to chose the project which will not at all affect the Danube Natural Reserve is impossible to be put into practice.

23. The decision with respect to the construction of the deep water navigation canal should be taken considering the aims of the Danube Natural Reserve.

24. On the basis of the thorough evaluation of the choices with respect to the tract of the Danube-Black Sea canal, Choice 2 could be recommended. Nevertheless, there is still the possibility to get the approval with respect to the performance of the construction works within the strict regime of the reserve of the Bystroye channel, including settling the navigation installations on its banks.

25. Taking into consideration the fact that the ecological forecast is not accurate enough to determine the quantitative impact should the canal be constructed according to Choice 2, during the first stage of the construction, a thorough monitoring will be necessary, with respect to the aquatic environment and to the flora and fauna.

The works of the second stage of the project shall be started only after the strict reserve regime area has been delimited.

Bystroye report

This report was submitted by a Ukrainian university experts that later told the press that the report was made under political and temporal pressures. The report clearly

contradicts those made by other Ukrainian experts and international experts. We included this report to show how official pressure can influence the integrity of local experts.

Where and how to build a navigational trench in the Ukrainian part of the Danube Delta ?

Part 1

The problem of restoration of navigation in Ukrainian part of delta Danube can not receive the rational decision already more than 10 years. As how to be spoken, there is no prophet in the fatherland, there was a necessity of attraction of the international scientific public to the decision of this problem. Essence of a problem is stated below. One of major, in opinion of the author, aspects of a soluble task is the necessity for such decision, which will put the minimal harm to an environment.

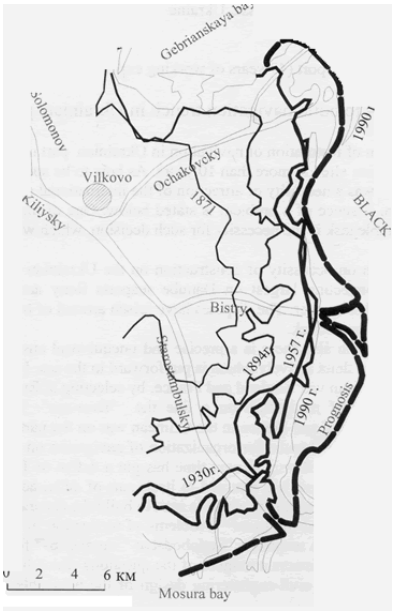
The question on necessity of construction on the Ukrainian part of delta of a deep-water navigable line connecting largest on Danube seaports Reny and Izmail to the sea, has the unequivocal positive answer. The disputes have arisen around of other question: where and how to build this ship's canaltrack.

On last question also there is a precise and unequivocal answer-it is necessary to build away from a part of delta actively which is put forward in the sea. It was clear 1,5 centuries back, when after the Crimean war England and France, by selecting at Russia all delta of Danube, have begun maintenance of navigation on a line the "river-sea". That an overall objective of participation of England and France in the Crimean war on the party of Turkey was replacement of Russia from delta of Danube for organization of navigation on a line Danube -sea, that fact testifies, that later, when Russia in next time has put a defeat of Turkey, the former allies were not excited with that Russia has returned to itself part of delta, actively put forward in the sea, Kilya delta, i.e. place, where the reasonable man to build the channel will not be.

All this is described in clause "Problems of navigation in delta of Danube (history and practice)", published in a magazine "Sudohodstvo" number 6-7 for 1999. I shall bring her in a superbrief kind, as she answers a number of the questions which have left for limits of attention of the developers of the civil-engineering design of the navigable channel in a mouth branch Bystroye.

But before some words about hydrographic and hydrologic features of examined object, without these items of information the separate details will not be clear.

Part 2



On conditions of navigation this transport line is divided into River Danube (extent more than 2 thousand km, from interface to system of channels "Rhine -Danube" up to the Romanian port Braila, with navigating depths from 1,5 up to 4,0 m) and Sea Danube (extent about 300 km, from Braila up to a mouth natural navigating depths 7,3m, however, natural depths on arrival to navigable sleeves of delta less than 2,5 m prevail.

For top of delta of Danube it is accepted to consider a place of division of the river above than city Izmail on two largest sleeves: (left) and Tulcha (right). At cities Vilkovo Kiliysky the sleeve is divided on two basic sleeves: Ochakovsky (left) and Starostambulsky (right). Now each of them runs in the sea by two large sleeves:

- First -sleeves Prorva and Potapovsky the channel;
- Second -sleeves Bystroye and actually Starostambulsky. The sleeve also is divided into two large sleeves - Sulinsky and Georgievsky.

Dynamic changes of external edge of delta depends on a parity between intensity of adjournment river soil on a beach and intensity them destruction by washing away, caused by action of sea waves. The essential distinction between these sizes in a sea part of deltas Tulcha and Kiliysky of sleeves causes that the delta Tulcha of a sleeve already some centuries is in a condition of dynamic balance, and the delta Kiliysky of a sleeve located in territory of Ukraine, intensively was put forward, is put forward and still will be long to be put forward in side the sea.

The beginning of formation Kiliysky if delta is lower Vilkovo XVIII centuries concern to middle, when there was a break Kiliysky of a sleeve in an extensive gulf through sand braid in area of village a Ferry. In the beginning the mouth remained open. Then the islands

and delta of a beginning quickly were formed to be put forward in the sea: for the period from 1830 to 1957 its area has increased in 4,2 times.

The evident picture of having place deformations Kiliysky of delta in the period from 1871 to 1990 is submitted on the circuit, and the given table characterizes rates of growth of the area and volume of a part Kiliysky of delta located below Vilkovo.

Part 3

Years	1830	1856	1883	1894	1922	1943	1957
The area, km3	78, 7	111, 4	122,2	214,5	284,9	308,5	328,2
Volume, km3	1,90	2,53	3,69	4,28	5,30	6,19	7,18

In complete conformity to the "laws of river hydrodynamics now occurs fade Ochakovsky and lade of a part Starostambulsky and the intensive growth branch Bystroye begins. Hence, the formation deep-water navigable trench in a b& it sharply will speed up process of redistribution of a drain of Kiliysky a sleeve for the benefit of Bystroye, that will result in sharp acceleration begun rather recently advance in the sea of a site of delta in area Bystroye, and it will result that in some years all constructed stf\1ctures will appear far in rear of the external edge territory, put forward in the sea, of delta.

At advance Kiliysky of delta to north and south from it two bays were formed: and Mosura. Originally rather shallow (prevailing depths 7-10 m) the Gebrianskaya bay contrary to persevering published (is especial in Romanian, transferred on Russian, the scientific editions) statement about its intensive deceleration of depth was enough well kept, while there is no time deep-water (with depths up to 17 m) and extensive bay Mosura, to a considerable affliction of Romania has lost the significance - now in it the depths less than one meter prevail.

One more surprising detail: the development of the feasibility project of construction of the navigable channel in a mouth Bystroye is executed as if experience of construction and operation of channels in a mouth of Danube does not exist at all, therefore it is meaningful to return for 1,5 centuries back.

In 1857 the captain Sprat has presented to the European Danube Commission (EDC) the offer on the device in a mouth Ochakovsky of a sleeve of two parallel dams directed in the beginning on NO, and then is direct on East down to depths, necessary for navigation.

After inspection Kiliysky of delta the English engineer C. Hartley, by establishing, that the delta Kiliysky of a sleeve is quickly put forward in the sea, the offer Sprat has rejected also in spring of 1858 has offered EDC two projects: formation of deep-water exits through a mouth Sulinsky or Georgievsky of sleeves. In a basis them a principle undertaking dams longitudinally river lades and moves forward of two parallel dams in the sea for depth 5,5 meters also be fixed. Cost of construction under these projects made 18 and 25 million francs.

Taking into account rather large cost, EDC has decided to create an independent technical commission for consideration of the projects, submitted to it. The commission has made the conclusion that the construction pair by grinding in a mouth of the large river running in not rising tide the sea, is measure which is not ensuring of the complete, cardinal decision of a put task, as piers be not capable to suspend take away river soil in the sea and formation of a bar (have swept aside) on an exit from dams, and that a unique means cardinally deciding a problem, is the device of the channel with a sluice away from an existing mouth. It is meaningful to run forward and to note, that in 28 years later the First International congress on internal water ways of Europe has proved the above-stated conclusion. The engineer Hartley, by agreeing with the decision of this commission, has presented the project of the channel with a sluice for Georgievsky branch in cost 17,5 million frank, or 5.8 million. Gold Russian rubles.

As the construction would borrow not one ye&, EDC has decided as temporary variant with the purpose of the prompt maintenance of interests of navigation, suffering heavy losses, (in that time neither railway, nor motor transport did not exist) to begin realization of the project Hartley on temporary, on nearest 5-6 years, equipping Sulinsky of a mouth by two cheap temporary dams with increase of depths on a bar with 2,5 up to 4,0 -4,5 m. The construction of dams was finished on September 1861, the depth above a bar between dams for the account influence by its river flow has increased with 2,9 up to 5,3 m (almost twice!). Taking into account so encouraging result and by not taking into account temporal substance it, EDC in 1865 has decided to transform temporary dams in constant.

Part 4

And from this moment the continuous war of the people with a nature began: before dams were formed extensive bar, the dams should be extended is gave only temporary

effect. The sum of expenses by 1895 has exceeded 70 million frank (compared to 17.5 francs on construction of the channel with locks near to a mouth Georgievsky of a sleeve). And design 7.3 m (for the miss of courts with draft 22 ft) the depth was achieved in 40 years after a beginning of construction. Now length of compressing dams has exceeded 15 km.

In the period (1917-1944), when all delta of Danube belonged to Romania, the numerous attempts essentially were done to improve operational qualities Sulinsky of navigable system. All projects on reconstruction of this system (and they were about ten) did not maintain criticism. Therefore Romania has accepted the decision on construction of the channel with sluices outside of delta of Danube and, by beginning in 1957, has finished with the essential help former USSR in 1986. The commissioning of this channel cardinally has decided a problem of navigation on a line River Danube -Black sea.

Let's return to belonging Ukraine to delta Kiliysky of a sleeve. The first navigable channel in Kiliysky to delta was constructed by Russia on Polunichne in 1902. This channel, as well as was predicted by the engineer P. Chehovich, "disappearance" in 2 years, by throwing out in Gebrianskaya a bay weight soil, formed an existing till now peninsula.

In 1904 P Chehovich on the basis of the executed two-years researches the project of the channel with a sluice on a line Solomonov a sleeve -Gebrianskaya a bay was developed. Cost of construction was estimated in 4 million Gold rubles. The project was not carried out.

During the First World (global) War to the admiral Potapov the brilliant idea "-has come in a head-" to enter into Danube battleships of a coastal defense and demolish from instruments of main caliber of capital of the allies of Germany. Under his order in a mouth Ochakovsky of a sleeve the channel was dug. Battleships in Danube have not got -channel has brought up to their approach. Nevertheless, brave the admiral has entered the name in a history for ever -lade a part Ochakovsky on all charts refers to as Potapovsky the channel. In 1957 the Soviet Union has constructed the channel in a mouth Prorva, which provided pass of ships of a type "river -sea". The volumes repair work in the beginning were less than 150 thousand m3. It was necessary to expect ground per one year, however, as well as, length of the channel was continuously increased, the compressing dams have remained far up rear on land, and the volumes repair continuously grew and in the end eightieth of years

have exceeded 2,5 million m3-year, that is equal to three volumes navigable trench. Differently, the channel was under construction anew three times per one year.

In middle of the ninetieth years of the last century the channel Prorva "has ordered long to live". Two attempts of its restoration have terminated is pitiable. Development of the feasibility project of restoration of the channel Prorva, executed with assistance of Belgium, display hopelessness of this measure.

At absence of the channel Prorva the navigation with of courts up to 3 M was carried out on the technological channel connecting Prorva to water area of port Ust-Dunaisk. Two years back on this channel passed up to 1500 courts per one year, including type "Slavutich", which could carry out transportations and considerably to lower losses, which are born(carried) by(with) Ukraine, not having an own output to the Black sea. However, on the same channel in the party of water area of port and is farther in Zhebriyanovskaia a bay acted and continue to act river (?sands). Now depths of water area of port have decreased with 14.5 until 3.5-4.0 m. It corresponds (meets) to adjournment on water area about 5 million M3 of a ground.

And how much ground was postponed at the bottom Zhebrianskoy of a bay? By forbidding the posting of courts on the connecting channel, the authors of this measure sharply have complicated social conditions in Vilkovo, but the problems of protection Zhebriyanovskaia of a bay have not been solved. If to leave the connecting channel in a present kind, early or late we shall lose not only port Ust-Dunaisk, but also while rather deep-water.

Zhebriyanovskaia, a bay-invaluable property of Ukraine. From here follows what to throw on an arbitrariness of destiny port Ust-Dunaisk and to postpone reconstruction of the connecting channel, which should sharply lower receipt river in a bay, is inadmissible.

Just in view of above-stated and all complex of tasks of a problem, including, and ecological, the scientific and technical decision protected by the copyright certificate of Ukraine IIA 296, about construction of the channel with locks on the line close to offered in 1904, equal hundred years, offered in 1904 was formulated. Chehovich, in view of modem environmental and technical requirements, and as the temporary decision -reconstruction of the connecting channel.

This offer was supported by(with) the conducting experts of sea transport of Ukraine: the pro-rector on scientific work of the Odessa State Sea University, corresponding member

of a Transport Academy of sciences of Ukraine, professor O. Stalnichenko, professor of the Odessa State Sea University, academician of a Transport Academy of sciences of Ukraine P. Yakovlev etc., which have addressed in January, 1996 to that time to the chief of administration of the Odessa area and the Ukraine's R. Bodelan with the argued offer "About restoration of navigation in the Ukrainian part, river Danube and creation of sea transport unit in area Zhebriyanovskaya of a bay" are glad to the deputy Supreme on the basis of the copyright certificate of Ukraine IIA 296. On it the failure(refusal) with complete neglect to authority and knowledge of the authors of the offer was received.

Part 5

The small project-business concern "Projecthydrostroj" has undertaken an embodiment of this decision. In 2002 the study of this firm which has been made out as the technical offer, has received support HAH of Ukraine. The institute of economy NAS of Ukraine, with attraction of the conducting experts on all sections of a problem, has carried out the complex comparative analysis of variants of restoration of sea navigation on the Ukrainian site of delta of Danube (see 3-4 magazines" Sudohodstvo" for 2003) and has made a conclusion that on the sum more than four tens parameters optimum the variant of construction of the channel with locks on a line Solomonov a sleeve - Zhebriyanovskaya bay is. This result was received even without the account of hydrological aspects of a problem. It seemed, that the rational approach has won.

But there are simply inexplicable things: the order of the President of Ukraine about study of alternative variants is not carried out, as made "Rechtransproject", so-called, the study of alternative variant is pure(clean) falsification. Besides the source of repeated pollution of the Black sea, that dragging on mouth bars - without that a catastrophic situation with pollution of a shallow shelf of the Black sea before mouth Kiliysky of delta and resulting (bringing) to mass death a fish, including sturgeons. Nevertheless, at a level of Government is made a decision on construction of the channel in a mouth girlo Bystroye.

Above-stated was published in the newspaper "Evening Odessa" on May 5th, 2004. And in two months began construction of the channel in a mouth Bystroye. It has turned out how the channel intensively was predicted - was brought. Money to performance of design amount of works has not sufficed, as it was necessary to take out not only volume of the ground which has been counted up designers, but continuously postponed ground of a

river origin - that ground, which "the experts, who predicted volume of bottom sediments in cut of the channel have not noticed."

To the moment of a spelling of given clause of work be not ordered already about one month. The trench of the channel continues to be brought. It is possible to assume, what by the next spring from the dug out trench there will be no also trace. Where to write off(copy) the spent millions? The civil-engineering design of one dam is developed which will not render essential influence on a mode of adjournment of a ground in navigable trench. Again vain expenditure of money. Again damage to an environment (in area of reserve of the international meaning (importance)).

The channel is necessary, but not at a level in engineering sense of the decision, by carrying out which, in some years the channel should be dug anew two - three times per one year. It is offered to construct the channel, with costs (stands) three times more dear (more expensive) than channel in a mouth Fast, but in 40 (!). Than time is cheaper, than the channel Chernavode-Constance, not conceding it (him) on throughput, and which will serve without essential operational expenses some centuries, not putting damage of ecology of a northwest part of the Black sea.

And the last argument: it is necessary to rescue a bay - invaluable property of Ukraine. Actual liquidation of port Ust-Dunaisk without prevention of the reasons its water areas and Zhebriyanovskaya of a bay cannot be named as a rational measure. Therefore, the first stage of the decision of a problem should become works on reconstruction of the technological channel and port Ust-Dunaisk, ensuring posting of courts of a type "river - sea" and preventing water area of port Ust-Dunaisk and contiguous of sites Zhebriyanovskaya of a bay. This temporary measure will ensure (supply) transportation around Sulinskaia of system 90-95 % Ukrainian traffic on a line "Danube - sea" and will enable to lower social intensity in Pridunavie, and also cardinally to decide(solve) a problem with the minimal damage for an environment without unreasonable haste.

I hope for the effective help of the international scientific public in realization of the project, which will protect reserve "Danube plavny " from actions of the officials illiterate in the ecological attitude(relation).

Impact

The negative impact of the Bystroye Canal on the Danube Delta ecosystem can be specifically observed in the following preliminary study made by the Romanian Ministry of Environment and Water Management, based on unofficial data: Construction and navigation activities on the Canal will change the Danube Delta hydrological regime and flow on the Bystroye Canal causing severe impact and detriment to the other canals and neighbouring ecosystems.

The changes in the hydrological regime of the Chilia Delta will lead to water eutrophication in the inner depression due to the disappearance of the canals that have been connected to the Bystroye Canal. The lack of water circulation will transform the actual wetlands in pastures and result in a negative influence on the Danube Delta's most important function: bio-filtration.

Local pollution

Navigation activities on the canal will increase the risk of the pollution by oil products in the area.

Fish Communities

The building activities and navigation on the canal will cause damage to the nature and habitat of most of the fish species in this area, including the seven species mentioned in the European Red List and the 16 mentioned in the Ukrainian

Red List.

Another result will be the decrease of the annual fresh water fishery by approximately 19 tons and the decrease of the annual sea fishery by approximately 80 tons.

The Danube shad breeding migration takes place, too, by the Bystroye Canal; building and navigation activities will damage the natural development of the populations of this fish species and will reduce the industrial fishery by 90 tons.

The deepening of the Canal bottom, the permanent dredging works for its maintenance, as well as the waves due to ships passing through the canal, will impair the breeding development of several species (sturgeons, shads, etc).

The dyking of the banks of the Bystroye estuary will destroy the breeding area of many fish species. Sand banks in the front (aval) of the Bystroye Canal represent the feeding territory for a lot of fish species, used for trade purposes; construction activities and navigation on the canal, as well as the subsequent washing of the sandbanks will destroy the natural area.

Bird Communities

In the Ukrainian part of the Danube Biosphere Reserve alone there are 257 birds species present, 9 of them listed in the European Red Book and 42 of them listed in the Ukrainian Red Book.

This area represents also the specific habitats for thousands of waterfowls. This area is a nesting zone for a 1000 pairs of pygmy cormorants (Phalacrocorax pygmeus) and 3 pairs of white-tailed eagles (Haliaeetus albicilla). During the breeding period there are around 2,500 white pelicans (Pelecanus onocrotalus), 80 Dalmatian pelicans (Pelecanus crispus), 800 pygmy cormorants (Phalacrocorax pygmeus), 900 red-breasted gooses (Branta ruficollis) and 35 white-tailed eagles (Haliaeetus albicilla). The proposed navigation canal will affect the banks where there are 223 birds species, 5 of them listed in the European Red Book and 31 of them listed in the Ukrainian Red Book; the building of the canal and the navigation will lead to the destruction of the nesting areas and will worsen the

living condition for birds, as well as the loss of the resting, feeding and wintering areas.

From the existing three birds migration routes in the Black Sea catchments, the Pontic way is the most important and it crosses the area situated on the Western coast also included in the Danube Delta. On this migration route, pass species that nest in North and Central Europe and also some that have distribution areas in Asia.

The most migratory species are flying on the route situated near to the seaside, where the trophic resources are rich and there are moderate climate conditions.

Within the Danube Delta Biosphere Reserve were identified over 331 bird species, very important for European fauna, listed on the different Annexes of the International Conventions concerning the species conservation and protection (Red Book - DDBR). Only the Bern Convention mentioned 320 protected bird species.

It must be mentioned that any antropic interventions that determine changes in the natural habitats affect the optimum development of the essential process of the existing species in this area.

Hydro-technical works for navigation have the biggest impact because they affect the entire wetland biome, wreaking havoc in the aquatic ecosystems that are interconnected in such a complex structure.

Constructing a navigable channel in the central part of the Ukrainian Delta – Bystroye – by the increasing of the water flow in this area will not only affect the natural habitats from neighbouring ecosystems, but also on large scale, the entire Danube Delta Biosphere Reserve.

The first areas affected will be situated in the North-Eastern part of the Danube Delta:

the strictly protected areas Letea (S=2825 ha) and Rosca-Buhaiova (S=9625ha), reconstructed islet Babina (S=2100 ha) and Cernovca (S=1580 ha), as well as the restored areas Popina (S=3600 ha) from the fishery with the same name.

As a result of the changes in the aquatic habitats, firstly it is possible that the pelican colonies will disappear from Hrecisca-Buhaiova, as well as other poli-specific colonies of egrets (Egretta sp.), herons (Ardea sp.), spoonbills (Platalea leucorodia), glossy ibis (Plegadis falcinellus) and cormorants (Phalacrocorax sp.).

As a result, the avifaunistic and other biodiversity values of the Danube Delta will be considerably reduced.

Animal and plant communities

The vascular plants community of the reserve counts for more than 950 species, 3 of them are mentioned in the European Red List, 16 of them are mentioned in Red Book of Ukraine. Half of them can be found in the area proposed for the canal construction, between them the presence of immigrant species.

The communities from the reserve are considerably different from those from other deltas (Nipre, Nistre, Don, Kuban) from the North-West Black Sea coast and Azov Sea. The area is comprised of a majority of communities specific to the wetlands that represent 80% of the total area.

There will be two types of impact of the construction works:

- the waves produced by the ships will determine changes in plant species;
- communities, many species, including the rare ones will disappear;
- navigation represents a vector for the introduction of exotic species;

The proposed canal will cut through the central area of the biosphere reserve and will result in a high level of pollution on in a 5 sq. km area and have negative influences on the reserve's flora and fauna. The reserve's territory is the permanent or temporary habitat for many rare and/or endangered insects, amphibians and reptiles, many of which are on the European Red List or on the Red Book of Ukraine. The majority of the mentioned vulnerable species are very sensitive to industrial activities.

The Human Communities

The local peoples' livelihood in the Danube's mouth area is based mainly on fishing. The canal construction puts a question mark on this traditional activity.

The Danube-Black Sea transport canal construction through the Bystroye estuary will cause the destruction of the natural communities from Danube Delta, at the same level that will destroy the traditional forms of natural resources management and can lead to worsening the socio-economic conditions of the region. In other words, the completion of this project will lead to the violation of the management principles for a biosphere reserve defined by UNESCO under the "Man and Biosphere" programme.

Existing Transport Ways

Today, sea ship traffic on the Danube river takes place on the Sulina-Braila sector.

The sediments carried by the Danube river through the Chilia branch - that defines the Romanian-Ukrainian border – and implicitly through the new Bystroye transport canal – will be deposited by sea currents in the north-south direction on the Sulina canal's mouth. This increases the necessity for expensive dredging works – due to silting – to maintain the navigation depth.

Also, the important sediments contribution carried through the new canal section will cause morphological changes with irreversible effects in the delta-sea contact area.

In conclusion, the construction of the canal through the Bystroye estuary threatens the existence of the Danube Biosphere Reserve in Ukraine with severe negative impact on Danube Delta Biosphere Reserve in Romania, as well.

Bystroye alternative

1. The Government of Ukraine wishes, with the consent of all parties concerned, to establish a navigable waterway through the Ukrainian part of the Danube delta. Several choices have been proposed as to the routing of this waterway. At present, three choices are still under discussion. As requested by the Ukrainian Ambassador to France, and Permanent Delegate to UNESCO, Yuriy Sergeyev (in his letter of 7 July 2003), the purpose of our mission was to examine these choices in view of their impact on the status and

functioning of the Ukrainian Danube Biosphere Reserve (Dunaisky Biospherny Zapovidnik) designated by Presidential Decree on 10 August 1998 as part of the transboundary Biosphere Reserve in the Danube delta. The mission took place at the invitation of the State Agency for Protected Areas of the Ministry of the Environment and Natural Resources of Ukraine (issued on 16 October 2003), in collaboration with the Ukrainian National Commission for UNESCO.

2. The area covered by the Danube Biosphere Reserve (DBR) was listed by Ukraine under the Ramsar Convention as a Wetland of International Importance on 23 November 1995: the Kyliiske Mouth Ramsar Site (originally designated by the former Soviet Union as Kylijske Gyrlo, on 12 October 1976). The Ramsar Convention gives special attention to assisting Contracting Parties in the management and conservation of listed sites whose ecological character is changing or likely to change as a result of technological development, pollution or other human interference. This is carried out through Ramsar Advisory Missions, a technical assistance mechanism formally adopted by Recommendation 4.7 of the 1990 Conference of the Contracting Parties. The report summarizes the findings of the 53rd Ramsar Advisory Mission.

3. Choice A envisages a waterway situated in the "Bystre Gyrlo" branch of the Danube, cutting across the middle of the core zone (Nature Reserve) of the DBR and Ramsar Site - part of the transboundary Danube Delta Biosphere Reserve and Ramsar Site in Ukraine and Romania. The Ukrainian National Academy of Sciences, responsible for managing the DBR through its offices at Vilkovo, considers this proposal unacceptable. Other institutions, including numerous environmental NGOs in Ukraine and abroad, criticised the proposal. During our meeting with NGO representatives in Odesa, all participants speaking in the discussion, except for a representative of the Green Party, criticised this choice and the procedure of its adoption by the Ministry of Transport. Their two main arguments against Choice A are the environmetal damage it would provoke, and its unfavourable impact on the core zone of the DBR and Ramsar Site. However, the Ministry of Transport and the state enterprise Delta Pilot (Delta Lotsman) consider Choice A as the most feasible and most economic solution, claiming that its environmental impact would be minimal. Their view is supported by a State Ecological Expertise, approved by the Ministry of Environment and Natural Resources on 10 July 2003, by statements of some scientists from Odesa and Kyiv universities, and by the conclusions of a workshop,

specially convened in Odesa on 16-20 October 2003, with scientists from the Ukraine and some other countries, invited by the advocates of Choice A.

4. Choice B proposes the renewal and modernisation of the hitherto used waterway along the "Ochakivsky Rukav" Danube branch and Prorva canal in the northernmost part of the delta (in the transition area of the Biosphere Reserve, along the northern boundary of the core zone), and of the short "technical canal" linking these Danube branches with the Ust'-Dunaysk port on the Zhebryanskaya bay of the Black Sea. This choice, whose impact on valuable parts of the DBR is claimed to be minimal, is favoured by the Ukrainian National Academy of Sciences, the management office of the DBR and numerous NGOs as a permanent or temporary solution before the materialization of choice C (see below). According to them, choice B can be accomplished relatively easily, in a short time and at a relatively low cost.

5. Choice C concerns the construction of a sluiced canal in the northern part of the DBR (in the transition area), linking the "Solomonov Rukav" branch of the Danube with the Zhebryanskaya bay of the Black Sea. Choice C is a variant of an earlier proposal, made by engineer Chekhovich at the beginning of the 20th century, for a canal running parallel about 1 km apart. This choice is considered as being feasible and sustainable in the long-term by the Ukrainian National Academy of Sciences, the management office of the DBR, and numerous NGOs. The durability of the canal would, in their opinion, justify its high construction costs (financed from private sources). Geologists and geographers of Odesa University criticise choice C because of its environmental impact on the only ancient dune system in the Ukrainian part of the Danube delta. As the canal would cut only through the edge of the ancient dune system, and as most of the old dunes are planted with non-native black pine, biologists from the Ukrainian National Academy of Sciences and the management office of the DBR regard the environmental impact of choice C as marginal.

6. On 13 October 2003 (just prior to our mission), the Ukrainian Government allegedly approved the principle of choice A, proposed by the Delta Pilot state company and the Ukrainian Ministry of Transport. On 27 October 2003, according to the NGO campaign, this decision was cancelled. The Ministry of the Environment and Natural Resources informed the mission that it was now asking for environmental impact assessments of all three choices, and possibly others, to be submitted by May/June 2004. Only then will the Ministry adopt a final view with respect to these choices.

7. The respective locations of the proposed alternative waterways, and of existing ones, are shown in the attached map of the DBR (Figure 1). The dotted line no. 1 is the canal proposed earlier by Chekhovich, no. 2 is the present proposal of a sluiced canal (choice C), no. 3 is the existing, but narrow and unsuitable irrigation canal Danube-Sasyk Lake, nos. 4, 5, 6 and 7 denote the possible routings of restored waterways using mainly the Ochakivsky branch (choice B), no. 8 is the Bystre branch (choice A), with a dotted line indicating the necessary proposed construction of a leveed canal cutting across the sand bars at the mouth of Bystre into the Black Sea. Nos. 9 and 10 are the Cyganka Gyrlo and Starostambulske Gyrlo branches.

8. In the context of the examination of the question concerning the construction of a waterway across the Ukrainian part of the Danube Delta Biosphere Reserve, a new Presidential Decree was issued on 10 June 2003, on the improvement of the functioning of the DBR. Besides the subject of the location of the waterway, it addresses the following issues: the improvement of the zonation of the DBR and the necessity to create additional reserves, the maintenance of traditional forms of land use by local inhabitants, the need to make local development compatible with national and international commitments, the need to reinforce legal measures in view to implement the Seville Strategy for Biosphere Reserves (cf. www.unesco.org/mab/docs/stry-5.htm), and the need to set up a monitoring programme in view of potential environmental impacts of the waterway.

9. The maps of the DBR do not yet show a zonation as required for a UNESCO Biosphere Reserve which specifies a core zone (existing, the Dunaiskie Plavni Nature Reserve), a surrounding buffer zone (not yet delimited), and a transition area (not clearly identified). They show, however, the strictly protected zone (apparently corresponding with the "core zone" in MaB terminology) and some maps also show areas of economic use or zone of anthropogenic landscapes (probably corresponding with the "transition zone"), located predominantly in the surroundings of Vilkovo and along the Ochakivsky branch towards Ust'-Dunaisk. The remaining part of the DBR is identified as its buffer zone or zone of regulated protection regime: it may thus be regarded as the "buffer zone" sensu MaB (see the attached map, Figure 1 [above]). Scientists from Odesa Mechnikov National University pointed out the biodiversity values to be found in the NW part of the DBR (Stensovskye Plavni), mainly composed of freshwater ponds and lakes surrounded by extensive reedbeds, cut through by the irrigation canal bringing Danube freshwater to

Sasyk Lake. With regard to the requirements of the Presidential Decree of June 2003, it is suggested that i) the core zone be expanded to include all priority areas for biodiversity (thus providing a full gradient from saline coastal marine habitats to inland freshwater habitats, as suggested by scientists of Odesa Mechnikov National University), ii) a buffer zone be delimited adjacent to the core zone to help protect it, and iii) the economic use area be identified including indications on land uses acceptable in accordance with the Biosphere Reserve principles.

10. The Ramsar Convention has elaborated guidelines for management planning for Ramsar Sites and other wetlands (Resolution VIII.14), on wetland restoration (Resolution VIII.16), and for establishing and strengthening local communities' participation in the management of wetlands (Resolution VII.8). They are accessible at www.ramsar.org/index_key_docs.htm#res. It is suggested that they be consulted when modifying and implementing the management plan for the Biosphere Reserve.

11. In the context of the sustainable management of the Biosphere Reserve, the future of the, currently derelict, Ust'-Dunaysk port facilities in Zhebryanskaya bay is of importance. The mission recognizes the socio-economic importance of these facilities in terms of prerogatives for local development. However, it is essential that any industrial infrastructure of this size does not have negative environmental impacts on the core zone of the Biosphere Reserve. A consequence of the re-opening of a waterway through the Ukrainian Danube delta will be the renewed need for port facilities. A Strategic Environmental Assessment plan for the entire Danube delta region should therefore evaluate alternative locations for Danube port facilities, preferably outside the Biosphere Reserve and Ramsar Site (e.g., a location upstream near Kyliya was mentioned by Delta Pilot).

12. With the opening of a waterway through the DBR, the need to monitor key environmental indicators will arise. The elaboration of a monitoring programme and its implementation should be prepared in close cooperation between the navigation authorities (supposedly Delta Pilot) and the DBR management experts in Vilkovo.

13. The opening of a visitors' center for the DBR in Vilkovo with support from WWF was noted with satisfaction, as well as the joint projects under way between the DBR and Flevoland Province in the Netherlands. However, the development of environmentally friendly forms of nature tourism, as a source for local income, remains a socio-economic

priority for the benefit of local people in Vilkovo (in terms of providing accommodation, food, transport, guidance, etc. to paying visitors) and should be seriously planned. The unique beauty and setting of Vilkovo, the "Venice of the East", merits more attention than it currently receives.

Navigation versus biodiversity

14. The objective to re-establish a waterway through the Ukrainian part of the Danube delta was accepted by all parties. Delta Pilot assured the mission that state-of-the-art technology and safety standards would be applied to the waterway and its operation to avoid unnecessary damage to the natural environment and to prevent accidents by large scale vessel navigation, as demonstrated by their operations (and supporting infrastructure) in the Dnipro and Yuzhny Bug estuary. In this particular area, near Ochakov, the waterway through the Dnipro-Bug Liman is clearly separated from the Chornomorsky Biosphere Reserve and Tendrivska Bay Ramsar Site situated further south; although the waterway crosses further upstream right through the Dnipro River Delta Ramsar Site.

15. The geographical separation of the waterway from areas with important biodiversity would indeed provide the ideal solution. Unfortunately, such a solution is not really possible in the case of the Ukrainian Danube delta. The construction of a potential navigation canal connecting the Kyliiske Danube branch with the Black Sea, avoiding built up areas and those important for biodiversity (including the DBR and the Sasyk Lake Ramsar Site), seems to be prohibitively complicated and expensive. Therefore, the remaining waterway choices for the Ukrainian Danube delta will affect existing protected areas in some way. By proposing to separate the waterway from the dynamic part of the delta area, choice C (to construct a sluiced canal from the Solomonov Danube branch to Zhebryanskaya bay), comes close to this ideal goal of separating the waterway from the areas important for biodiversity.

16. Choice C is criticized because of its cutting through the only intact geomorphological area of former coastal dunes in the Ukrainian part of the Danube delta (there are more extensive areas on the Romanian side). These ancient dunes are now planted in their largest part with non indigenous black pines, currently starting to form a closed canopy, interspersed with remaining open areas and dune slacks. This provides appreciated leisure and picnic areas for the local population (mainly from Vilkovo),

especially during the hot summer months. Some scientists are concerned about the possible impacts of the canal construction on rare species (mainly plants and insects) dependent on and restricted to these particular dune habitats. If Choice C were to be chosen, a specific study would need to assess the environmental impact of the canal construction on these species. Independent of a possible canal construction or not, management prerogatives should be elaborated for this area (as part of an overall management plan for the Biosphere Reserve), providing guidance for forest management with regard to the closing of the pine canopy, and its negative impact on the specific dune biodiversity.

17. Furthermore, this sluiced canal would cut in its northern part through valuable fens and the shallow Zhebryanskaya bay that is constantly silting up. Some scientists fear that the construction of the canal would isolate the Solonyi Kut lake from Zhebryanskaya bay (currently connected to the shallow bay) and seriously alter underground water flows in the delta area.

Navigation versus delta dynamics

18. By their very nature, river deltas are dynamic and unstable in geo- and hydromorphological terms. Processes of sedimentation (mainly carried downstream by the river, but also provoked by coastal currents) and of erosion (mainly through marine currents, wave action and subsidence) are making navigation a difficult task in these areas. The best long-term option is to avoid dynamic delta areas when planning waterways. The core zone of the DBR and its surroundings represent the most dynamic part of the Danube delta as a whole (including the larger Romanian part) and should therefore, in principle, be avoided when planning a waterway.

19. With regard to the constraints evoked above (paragraph 15), choice C comes closest to the goal to avoid the most dynamic part of the Ukrainian Danube delta. The long-term efforts needed for dredging the waterway to maintain the required depth for large scale vessels are clearly minimal for the proposed constructed canal, except at its entrance to the Zhebryanskaya bay. In this case, low dredging costs in the long term are an economic trade-off for the heavy initial investment needed for the construction of the canal. Any waterway using a natural river arm would need continuous dredging on a significant scale. Delta Pilot presented hydrological river models demonstrating that the dredging effort for choice A (Bystre) would be less than for choice B (Ochakivsky).

The need for compensation of ecological damage

20. The Convention on Wetlands (Ramsar, Iran, 1971) obliges Contracting Parties to "designate suitable wetlands within [their] territories for inclusion in the List of Wetlands of International Importance" (Article 2.1). "The inclusion of a wetland in the List does not prejudice the exclusive sovereign rights of the Contracting Party in whose territory the wetland is situated." (Article 2.3). "Any Contracting Party shall have the right . because of its urgent national interests, to delete or restrict the boundaries of wetlands already included by it in the List ." (Article 2.5). "Where a Contracting Party in its urgent national interest, deletes or restricts the boundaries of a wetland included in the List, it should as far as possible compensate for any loss of wetland resources, and in particular it should create additional nature reserves for waterfowl and for the protection, either in the same area or elsewhere, of an adequate portion of the original habitat." (Article 4.2). General guidance for interpreting "urgent national interests" under Article 2.5 and considering compensation under Article 4.2 is provided in Resolution VIII.20, adopted by COP8 in 2002 (accessible under www.ramsar.org/key_res_viii_index_e.htm).

21. Resolution VIII.20 lists (in paragraph 3 of its Annex) twelve issues that Contracting Parties may take into account when invoking their right to restrict the boundaries of a Ramsar Site in the case of urgent national interest. Those most relevant to take into account in this case seem to be:

> 3.1 the national benefits of maintaining the integrity of the wetlands system and its related benefits;
>
> 3.3 whether the proposed change is consistent with national policies;
>
> 3.6 all reasonable choices to the proposed action, including the "without project" option, finding an choice location, introducing buffer zones, etc.;
>
> 3.8 the particular value of habitats harbouring endemic, threatened, rare, vulnerable or endangered species;
>
> 3.11 the choice that will best minimize harm to the site in question; and
>
> 4. transboundary effects."

22. Choice A to construct a waterway through the Bystre branch would need to open the river mouth towards the Black Sea and undertake substantial continued dredging in this area. The mission was told by Delta Pilot that the construction of dykes in this area would replace sediment deposition patterns towards the open sea in a way to minimize the

dredging effort needed to keep the waterway functional. However, the managers of the DBR fear that this would result in substantial disturbance and loss of vital habitat for breeding and staging waterbirds using the sand banks situated in this area, as well as result in damage to the fish spawning area in the shallow coastal waters (with possibly disastrous consequences for the local fisheries). The mission was not shown substantial results of an environmental impact assessment study concerning this choice, but believes that these fears are well founded. It follows therefore that specific habitat for fish and migratory birds lost at the Bystre mouth would need to be created elsewhere in the Danube delta, possibly in front of the mouth of the Ochakivsky branch, or in Zhebryanskaya bay. In order to make this compensation valid, it would need to be accompanied by the removal of the Ust'-Dunaysk port facilities (cf. paragraph 11) and large scale habitat restoration works.

23. Such habitat compensation would need to be effective at the latest by the time the Bystre branch mouth would be damaged when starting the waterway works, in order to fulfil its compensatory role for the species affected. The creation or rehabilitation of fragile habitats in dynamic ecosystems such as these is likely to take several years. This will require quality control measures of the works undertaken, i.e. a quantitative monitoring programme of key species affected by the waterway works that would show how they would make use of the compensation habitats. Given this constraint imposed by the obligations inherent in the Convention on Wetlands, choice A does not seem to provide a rapid solution to create a waterway through the Danube delta.

24. Choice B to re-open the former waterway using the Ochakivsky branch was not considered ideal by the engineers (Delta Pilot) because of the lesser depth of this river branch compared to the Bystre. This would require more dredging efforts downstream of Vilkovo. Also, most probably works to re-design the technical canal connecting the Prorva branch with the Zhebryanskaya bay would need to be undertaken to make the waterway operational again. Given the former use of this route for navigation, large parts of the pristine delta habitats have already earlier been degraded or disturbed. Engineering works to re-open this waterway would therefore have much less environmental impact than those needed for choice A (Bystre) which would take place in a pristine natural part of the delta. Again, the mission argues that a comprehensive environmental impact assessment study should be undertaken for choice B. It should also identify possible needs and opportunities for compensation of natural ecosystems, through habitat restoration measures in this area.

The need for transboundary cooperation

25. The Danube Delta Biosphere Reserve was declared a transboundary protected area in 1998 with parts in Romania and Ukraine. The Wetland of International Importance, i.e. the Ramsar Site, covers the area of the transboundary Bio sphere Reserve. Article 5 of the Ramsar Convention mentions that "Contracting Parties shall consult with each other about implementing obligations arising from the Convention especially in the case of a wetland extending over the territories of more than one Contracting Party or where a water system is shared by Contracting Parties. They shall at the same time endeavour to coordinate and support present and future policies and regulations concerning the conservation of wetlands and their flora and fauna." The mission was not presented with any substantive information that such consultation, coordination and support of respective policies and regulations does indeed occur. It is therefore strongly advised that such bilateral processed be engaged and a Strategic Environmental Assessment on navigation through the different parts of the Danube Delta be undertaken (cf. paragraph 11). Bilateral consultation and coordination on these aspects is also required by other international and bilateral treaties signed by both states.

Actions

Facts

1. According media, on Tuesday, the 11th of May 2004 Ukrainian Government has formally launched a project aiming at the adjustment for navigatron of the channel Bystroye on the Chilia Arm of the Danube – an inland watercourse belonging to Ukraine, situated in the Danube Delta, within the Ukrainian Natural Reservation of Danube. The construction of the canal is undertaken by the German company "Josef Mobius Bau Aktiengeselschaft". The channel begins from a point on the Romanian-Ukrainian river border, situated upstream the junction of the Chilia Arm with the Musura Arm and flows into the Black Sea to the North of the common border.

2. It is to be mentioned that the navigation on the Sulina arm of the Danube, as on the entire river, is regulated by the 1948 Belgrade Convention on the Legal Regime of Navigation on the Danube, that defines the navigable Danube as a river open to free navigation ('the Danube between Kellheim and Sulina on the Sulina arm of the Danube').

Therefore, the navigation on this arm of the Danube situated in the Danube Delta is being organized in full respect of the International Law. Furthermore, Romania underlines that Sulina is the only arm from the Danube Delta subject to the provisions of the 1948 Belgrade Convention. As far as Cernavoda-Constantza canal is concerned, this is situated far to the South of the Danube Delta, its legal regime being that of Romanian inland waterway.

3. By now, despite all demands, the Ukrainian authorities did not respect their obligations of information and consultation regarding this project with possible substantive negative impact on the Danube Delta, as set forth by the applicable international legal instruments.

Consequences of the Bystroye project on the Danube Delta Ecosystem

4. According to preliminary assessments of the Ministry of Environment and Water Management of Romania, based on unofficial data, the Ukrainian project concerning the deep navigation canal on the channel Bystroye will start a more active process of water - flow, which will entail consequences on the Chilia Secondary Delta, as well as on the Danube Delta as a whole. There are about 4000 species of plants and birds in the region of the Bystroye channel, some of which are only found in the Danube Delta. Also, the Bystroye channel is the place of breeding migration for 95 percent of the Danube shad (Alosa Ponticus) population of the Danube. The artificial adjustment of the channel through the building of a navigation canal implies embankments to restrain waters, followed by dredges to eliminate the alluvia. These works will affect the ecological equilibrium of those waters and will cause significant losses

– of fish and birds, on the channel itself, including those in the territory of Romania where 80% the Danube Delta Biosphere Reservation, that was established in 1993, lies, as well as in the neighboring areas, including those in the territory of Romania where the Danube Delta Biosphere Reservation was established in 1993. It should be stressed that the Danube Delta is a single ecosystem, protected by UNESCO as a component of the world natural heritage and the damage inflicted to its Ukrainian side endangers the system as a whole. The area in which the Ukrainian authorities are building the navigation canal is situated within the part of the Danube Delta, which due to its natural characteristics is included in the Danube's Biosphere Reservation, as set forth by the Ukrainian domestic legislation.

Thus, the size of the reservation has to substantially be reduced for the concrete works to start. A more comprehensive assessment regarding the possible impact of the Bystroye must be made. Effects of canal building on the environment are presented in Annex I, based on unofficial information because no official information was received up to now from the Ukrainian authorities.

Demands in reaction to the Ukrainian project development

5. In reaction to the Ukrainian project development, several Demands were made by the Romanian Ministry of Foreign Affairs and Romanian Ministry of Environment and Water Management before and after the formal launching of the canal: 12 Diplomatic Notes addressed by Romanian Ministry of Foreign Affairs to the Ukrainian Side asking for information and consultation on this issue, but no concrete answer was received up to now and no consultations took place. Romanian request was made under the provisions of the Agreement between the Government of Romania and the Government of Ukraine on the cooperation in the management of border waters (Galati, 30 September 1997) .Under Article 2 (Objectives and Principles of the Cooperation), paragraph 3, "None of the parties may carry out on its territory without prior consultations, any work which might modify or lower the quality standards of the border waters". As well, under Article 4 of this Agreement, the obligation to inform the other party about the projects which might have a negative impact in the territory of the other contracting state, is stipulated in a similar way as that existing under other multilateral legal instruments. Thus, the party planning to take actions that might have negative consequences in the territory of the other contracting state has the obligation to notify about its intentions the other contracting state and to transmit all data on the planned actions and to offer the possibility of the other contracting state to participate to the assessment of the impact of such actions on the border waters. In June 2003, in Kiev, at the European Conference of the Environment Ministries, the Governor of the "Danube Delta" Biosphere Reservation has requested the accomplishment of an impact assessment study from the biodiversity, hydrological, social and economic point of view. This requirement has also been supported by the General Director of WWF, Claude Martin. In

October 2003, the Common Mission of Ramsar Convention on Convention on Wetlands of .International Importance Especially as Waterfowl Habitat (Ramsar 1971) and of the Programme "Man and Biosphere" - MAB UNESCO, have also asked for the environmental impact study for the canal project. The fact has been reflected in the Report of the Permanent Committee of the Ramsar Convention in 2004. The Romanian Governor of the "Danube Delta" Biosphere Reservation : The Romanian Governor of the Danube Delta Biosphere Reservation has insisted that an environmental impact study be realized within the 3rd Session of the Authorized Authorities for the implementation of the Romanian-Ukrainian Agreement on cooperation in the field of transboundary waters management (4th-7th of November 2003 in Piatra Neamt), and the Romanian Party has invited the Executive Secretary of the ICPDR (International Commission for Danube Protection) to participate in the meeting. Within this framework, informal discussion took place regarding the construction of a navigation canal on the Bystroye Branch. The Romanian Party requested the technical documentation of this project. The Ukrainian Party answered that there "are six alternatives for carying out this project, and the final alternative had not yet been chosen. After internal approval of the final alternative by the Ukrainian Party, these alternatives would be transmitted also to the Romanian Party but it was never done. As a result of the request of the Head of the Romanian delegation to the ICPDR, at the beginning of 2004, the Executive Secretary of ICPDR has informed tile Ukrainian Party about the damages that the construction of the Bystroye Canal might cause to the Danube Delta.

On the 12th of May, 2004, Romanian Ministry of Environment and Waters Management has sent a letter to the Committee of State of Ukraine for Water Management in which it was asked, in compliance with articles 2 and 4 of the Bilateral Agreement between the Ukrainian Government and Romanian Government on Cooperation in the Field of Transboundary Waters Management, to be informed and consulted regarding the Bystroye project and to receive data on the planned measures. On May 2004, after the formal launching of the canal construction, the Ministry of Foreign Affairs of Romania and the Romanian Ministry of Environment and Waters Management have sent letters to the Secretary of the Espoo Convention in order to be submitted to the Implementation Committee of this Convention, for consideration. The content of the letters expressed the fact that Romania has requested to be notified by

Ukraine on the proposed project to be constructed in the Ukrainian Danube Delta. In this respect, a recommendation from the Implementation Committee has been requested.

The Bystroye issue was formally raised by the head of the Romanian delegation at the Third Meeting of the Parties to the Espoo Convention (Cavtat, Croatia, 1st-4th of June 2004). On this occasion, during the plenary session, the Secretary of the Convention has asked the Implementation Committee to take the appropriate measures in this case.

Letters on the Bystroye matter were sent by the Romanian Prime-Minister, Mr. Adrian Nastase to: the Ukrainian Prime-Minister, Mr. Viktor Yanukovici; to the President of the European Commission, Mr. Romano Prodi; to the European Commissioner for Enlargement, Mr. Gunter Verheugen; to the Commissioner for the Environment of the European Commission, Mrs. Margot Wallstrom; and to the Prime-Minister of the Republic of Ireland, Mr. Bertie Ahren. Other letters in this respect were also sent by the Ministry of Foreign Affairs to the Ramsar Secretariat, UNESCO MAB Programme and to the Standing Committee of the Bern Convention.

In March-April 2004 the Romanian Parliamentary delegation to the Parliamentary Assembly of the Council of Europe proposed a draft resolution on the Bystroye canal which was signed by many other delegations.

At the beginning of May 2004, the Governor of the Danube Delta Biosphere Reservation has asked the Secretariat of the Ramsar Convention, the Secretariat of the Programme "Man and Biosphere" - MAB UNESCO, and the center for World Heritage - UNESCO (the Danube Delta Biosphere Reservation- Romania, as well as Danube Biosphere Reservation Ukraine are falling under the provisions of the 3 conventions above mentioned) to support the Romanian request regarding the accomplishment of the environmental impact study and to respect the provisions of these legal instruments.

Subsequent to demands, international conventions have addressed the Ukrainian President and authorities. During some rounds of bilateral negotiations of the Agreement concerning the delimitations of the maritime zones of Romania and Ukraine in the Black Sea (e.g. Braila, Romania, 14th of April 2004), the Romanian delegation asked for information and

consultation but no answer was received in this respect until now – even during the meetings, Ukraine has shown peoccupation with the Bystroye matter.

During 6th -10th of May 2004, Mr .Herve Lethier, expert of the Council of Europe, expertised the Danube Delta Biosphere Reservation- Romania and with this occasion, he has requested that the Governor of the Danube Delta Biosphere Reservation be a member of the common mission that visited Ukraine in the second half of June 2004. The mission was composed of the representatives of the Ramsar Convention, of the MAB Programme and of Council of Europe. The Governor of the Danube Delta Biosphere Reservation will represent, within this mission, the Ramsar Convention.

The Bystroye issue was also approached by the Presidents of Romania and Ukraine, Mr. Ion Iliescu and Mr. Leonid Kucima respectively, during the 11th Summit of the Heads of States. Demands to the Ukrainian authorities have also been pleaded by other Governments (Germany and United States of America), so far with no success.

6. The International Commission for the Protection of the Danube River (ICPDR), created under the auspices of the 1994 Sofia Convention on Cooperation for the Protection and Sustainable Use of the Danube River, adopted a Resolution on the Bystroye issue at its 6111 Ordinary Meeting (Vienna, Austria, 1st-2nd of December 2003). The Resolution outlines the ICPDR's recognition of, and concerns regarding, the construction plans for the Bystroye Canal. According to the Resolution, the lCPDR President wrote a letter to the Government of the Ukraine requesting information about the canal project and expressing concerns related to possible environmental assessments of the project and concerns shared by other international bodies devoted to Danube and Black Sea water management (Black Sea Commission, Ramsar Secretariat, UNESCO MAB and European Commission). ICPDR asked also for an impact assessment of the Bystroye Canal construction, but up to now, no answer was received from the Ukrainian Government.

A lot of demands were also made by Ukrainian, Romanian and international environmental NGOs. For example, the World Wildlife Fund has been especially active in involving the international community in coming to terms with the reality of the Canal's impact on the region and its inhabitants. Additionally, the Danube Environmental Forum (DEF) drafted at its General Assembly (Qbrenovac, Serbia & Montenegro, 27th-28th November 2003) a "Bystroye Statement", recommending to Ukrainian authorities that all canal construction presently underway be halted until a complete and independent

environmental impact assessment of transboundary magnitude is conducted, and adequate participation of all interested and affected parties, namely NGOs, relevant stakeholders and the general public basin-wide, is guaranteed.

Disregarding environmental impact assessments, Ukrainian authorities are promoting the Bystroye Canal, specifying the project as an opportunity for social and economic development in the region, as it will create jobs for locals and encourage trade in the region. It is worth mentioning that the Report released in October 2003 by the Ramsar- UNESCO Mission in the Ukrainian Danube Delta, signaled that the choice of the Bystroye branch for the waterway construction represents the worst solution and that a request was made for a comprehensive environmental impact assessment that was never fulfilled. Finally, it is to be mentioned that Ukraine's Bystroye Canal project contravenes several bilateral agreements and multilateral conventions as are mentioned in the following chapter.

Multilateral and bilateral regulations in the field of environmental protection relevant to the Bystroye channel

Several international legal multilateral instruments are applicable to the Bystroye issue, such as:

1. the Convention on the Conservation of European Wildlife and Natural Habitats (Bern, the 19th of September 1979) to which Ukraine is a Contracting Party stipulate that its aims are to conserve wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the co-operation of several States, and to promote such co-operation. Particular emphasis is given to endangered and vulnerable species, including endangered and vulnerable migratory species. According to the provisions of Article 4 of the Convention, the Contracting Parties undertake to co-ordinate, as appropriate, their efforts for the protection of the natural habitats when these are situated in frontier areas. Building the Bystroye Channel, Ukraine may cause serious damages to the wild flora and fauna species located in the Danube Delta ecosystem, producing a deliberate disturbance, damage and destruction of these species, actions strictly prohibited according to the Bern Convention. At the same time, according to the article 11, the Contracting Parties (including Ukraine) undertake to co-operate in carrying out the provisions of the Convention.

2. The Convention on the Wetlands of International Importance, especially as Waterf1ow Habitat (Ramsar, 1971), which has as a goal the conservation of wetlands, of their fauna and flora which serve as a habitat for waterfowls. Under this Convention, Ukraine has listed 22 such wetlands, among them the Bystroye channel area. Here the Ukrainian authorities intend to build the canal disregarding that this area enjoys a regime of integrated protection (in the similar zones existing in Romania, no such works are permitted, even the access of the visitors is restricted).

In conformity with the Convention, Ukraine has a number of obligations among which to consult with the other parties to the Convention on the implementation of the Convention, in particular in the wetlands which exceed the territory of one contracting state or where a hydrologic basin is divided among several contracting states (Article 5). This is the case of the Danube Delta. At the same time, Ukraine has the obligation to undertake a study of the impact of the project on the environment, prior to any concrete steps to achieve it. Such a study should be examined together with each state which may be affected.

3. The Convention on the Environmental Impact Assessment in a Trans'-Boundary Context (ESPOO, the 25th of February 1991), to which Ukraine is a party as well, provides that any party which intends to carry out all activity which might have a significant negative trans-boundary impact has the obligation to notify and to have direct and efficient consultations with the party which might be affected. These consultations should be carried out as soon as possible, but not later than the date that party informs its own citizens about the project (Article 3). In conformity with this obligation, Ukrainian authorities should have informed Romanian authorities about the activities envisaged to be undertaken, so that the latter may express their viewpoint as to the trans-boundary impact of such activities and the actions to be taken in order to reduce or eliminate it. Although the Ukrainian authorities have taken some steps at the internal level to consult with institutions involved, in the development of the project (Ministry of Transportation, the Academy of Science of Ukraine), no information on this subject was provided to the Romanian authorities. Moreover, the Romanian authorities have requested formally several times to be informed about the possible impact of such a project on economy and environment.

4. The 1994 Sofia Convention on Cooperation for the Protection and Sustainable Use of the Danube River. Ukraine, by becoming a Party to this Convention undertook to comply with its provisions. Thus, in article 2, paragraph 2 it is stated that the Contracting

Parties pursuant to the provisions of this Convention shall cooperate on fundamental water management issues and take all appropriate legal, administrative and technical measures, to at least maintain and improve the current environmental and water quality conditions of the Danube River and of the waters in its catchments area and to prevent and reduce as far as possible adverse impacts and changes occurring or likely to be caused. According to the paragraph 3 of the same article the Contracting Parties shall strengthen, harmonize and co-ordinate their adopted measures and their measures planned to be taken at the domestic level. In article 3, paragraph 2 is stipulated that, subject to this Convention in particular shall be the planned activities and measures in the field of water construction works, in particular regulation as well as run-off and storage level control of water courses, flood control and ice-hazards abatement, as well as the effect of facilities situated in or aside the watercourse on its hydraulic regime. Article 11 of the Sofia Convention provides a very useful mechanism of bilateral consultations stipulating that, having had a prior exchange of information, the Contracting Parties involved shall at the request of one or several Contracting Parties concerned enter into consultations on planned activities as referred to in Article 3, paragraph 2, which are likely to cause transboundary impacts, as far as this exchange of information and these consultations are not yet covered by bilateral or other international cooperation. The consultations are carried out as a rule in the framework of the International Commission, with the aim to achieve a solution.

5. The Convention concerning the Protection of the World Cultural and Natural Heritage adopted in Paris, the 16th of November 1972. According to its provisions, States Parties to the Convention commit themselves to ensure the identification, protection, conservation, and presentation of World Heritage Properties. States recognize that the identification and safeguarding of heritage located in their territory is primarily their responsibility. They agree to do all they can, using their own resources and, at times with international assistance, to protect their World Heritage Properties, They agree, amongst other things, to as far as possible: -adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programmes'. -undertake appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation and rehabilitation of this heritage'. -refrain from 'any deliberate measures which might damage, directly or indirectly the

cultural and natural heritage' of other Parties to the Convention, and to help other Parties in the identification and protection of their properties.

6. An agreement was made between the Ministry of Environment and Territorial Planning of the Republic of Moldavia, the Ministry of Waters, Forests and Environmental Protection of Romania and the Ministry of Environment and Natural Resources of Ukraine on the Cooperation in the Zone of the Danube Delta and the Lower River Prut Protected Natural Areas (Bucharest, the 5th of May 2000). This Agreement includes in its geographical scope the Danube Delta Reservation of Ukraine. In conformity with the provisions of this Agreement, the contracting parties undertook to control the economic activities so that they do not alter the characteristics of the natural protected area, as well as to coordinate among themselves in the framework of a Joint Commission as to the regional projects of development or administration in order to establish a joint management plan of the zone.

7. An agreement between the Governments of Romania and Ukraine was made on the cooperation in the management of border waters (Galatzi, the 30th of September 1997). Under Article 2 (Objectives and Principles of the Cooperation), paragraph 3, "None of the parties may carry out on its territory:.. without prior consultation, any work which might modify the .flow or the quality standards of the border waters". As well, under Article 4 of this Agreement, the obligation to inform the other party about the projects which might have a negative impact in the territory of the other contracting state is stipulated in a similar way as that existing under other multilateral legal instruments. Thus, the party planning to take actions that might have negative consequences in the territory of the other contracting state has the obligation to notify about its intentions the other contracting state and to transmit all data on the planned actions and to offer the possibility of the other contracting state to participate to the assessment of the impact of such actions on the border waters.

8. The Treaty between Romania and Ukraine on the Romanian-Ukrainian State Border Regime, Cooperation and Mutual Assistance in Border Matters, was signed at Cernautzi, on the 17th of June 2003, and entered into force on the 27th of May 2004. This Treaty which contains provisions for all matters related to the regime of the State frontier provides, under Article 12, the obligations as to the management of the border waters. In accordance with this article, none of the parties may modify unilaterally the riverbeds, the banks or the flow regime of the border waters through works carried out on these waters; should such

modifications occur, the party which carried out these unilateral works must bring the waters back at their initial condition. In Romanian experts' view, the building of a canal on the Bystroye channel is to bring about modifications on the Chilia Arm (which constitutes a Romanian-Ukrainian border water). Consequently, Romania is entitled under this Treaty as well, to request and receive explanations from Ukraine as to the envisaged actions – Ministry of Foreign Affairs, Ministry of Foreign Affairs, Ministry of Environment and Water Management, Romania.

Bibliography

- www.seu.ru;
- www.anaconda.ro;
- http://epl.org.ua;
- www.ecopravo.lviv.ua;
- http://dordeduca.ro;
- http://europa.eu.int;
- www.daphne.sk;
- The Eco Counseling center, Galati
- The "Viata Libera" newspaper, Galati
- www.rosa.ro
- www.simnet.js
- www.homepages.mcb.net
- www.bwifingal.ie
- www.brent.com
- www.henkel.at
- www.turismdelta.ro
- www. caraorman.ro
- www.panda.org/dcp
- www.excursii.ro
- The Romanian Ministery of Environment
- IBIS TOURS BIRD-WATCHING SPECIALISTS
- The World Wildlife Fund
- Ministry of Environmental Water Management Romania
- "Danube Delta Romania"-- Florin Andreescu
- Ecologic al Restoration in the Danube Delta Biosphere Reserve/Romania
- Reports published by
    - Ministry of Foreign Affairs, Romania
    - Ministry of Environment and Water Management, Romania
- Assesment with respect to the environmental imact of the choices envisaged for the construction of the Black Sea - Danube Canal on the Solomonov locks canal - Jebriansk Gulf and on the Bystroye Channel - Ministry of Ecology and Natural Resources of Ukraine.
- Dr. Nicolai Shtefan, hydraulic and engineer hydrology. Institute of Marine transport, Odessa, Ukraine. Main specialist - hydrologist Institute of Marine transport (49 years of working experience), Odessa, Ukraine