



**The Ministry of Ecology and
Natural Resources of Ukraine**

THE PRUT RIVER BASIN MANAGEMENT PLAN (UKRAINE)

A Brief Outline Description

Objectives

The Prut River Basin Management Plan (Prut RBMP) has been developed in the framework of Environmental Protection of International River Basins Project (EPIRB), funded by the European Commission, seeking to promote understanding of key elements of the EU Water Framework Directive 2000/60/EC (WFD) and the process of planning actions for improvement of environmental quality of certain river basin sections. The Plan was developed by a team of experts led by MAMA-86 UNENGO with substantial support of EPIRB project experts and with assistance of the Ministry of Ecology and Natural Resources of Ukraine.

The RBMP was developed for all surface and groundwater bodies (WBs) in the Prut river basin that underwent assessment of their ecological and chemical status, and included development of the monitoring program, setting environmental objectives and development of the Program of Measures to meet the objectives. As the long-term aim of the Plan, the RBMP seeks to reach good ecological status of surface and groundwater WBs in the Prut river basin.

Activity framework, methodology and limitations

The RBMP is a management tool, to be developed and implemented by all stakeholders including central executive bodies (the Ministry of Ecology and Natural Resources, the State Agency for Water Resources, relevant sectoral ministries), basin-level and local authorities, main water users groups and the general public. Besides that, the Plan may be applied by potential donors as a guideline document for financial decision-making.

The RBMP covers the period from 2015 to 2021 - i.e. the first 6-years planning cycle for Ukraine. The RBMP is primarily focused on surface WBs under substantial anthropogenic impacts. As a result, the Program of Measures predominantly seeks to improve ecological status of rivers in the basin that are now at risk of failing to meet environmental objectives, as well as of heavily modified water bodies HMWBs - (WFD and Guidance Document N 4 "General Implementation Strategy").

In terms of its contents and structure, the RBMP follows WFD requirements and incorporates the following sections: description of the river basin; identification, typology and delineation of surface and groundwater WBs; a brief description of substantial pressures and potential anthropogenic impacts on status of surface and groundwater WBs, assessment of risk of failure to attain good status by these WBs; the program of monitoring; environmental objectives; the program of measures; economic valuation

and priority ranking of the measures proposed; results of public consultation and the list of competent bodies.

The main problems in the course of RBMP development included the following ones: lack of reliable and necessary data on quantity and quality of water resources due to the fact that the existing monitoring system in Ukraine is not WFD-compliant.

According to WFD requirements, natural surface water bodies were identified (i.e. rivers and lakes). These water bodies were delineated based on their natural typology (geology, watershed altitude and watershed areas); groundwater bodies were delineated by classes and characterisation of aquifers; while heavily modified water bodies were delineated based on relative degrees of their modification.

European approaches to efficient water management - as set up in WFD - are based on a proactive approach, that in addition to response and mitigation of adverse human impacts, incorporates also risk assessments and planning of prevention actions. Such actions are intended to reduce risks of failure to attain good ecological status of WBs due to anthropogenic pressures in the context of climate change.

Substantial pressures and impacts in the Upper Prut basin were identified with application of "Drivers - Pressures - State - Impacts - Response" methodology. The analysis relied on standard matrices, state water quality monitoring data, results of field surveys of 2013 and 2014, and expert assessments. The above data were used for both risk assessments and identification of WBs at risk, based on estimates and scales for fixed and diffuse pollution sources (e.g. cultivated lands area to watershed area ratios; wastewater volume to water flow ratios for rivers, etc.) and for GIS analysis. Environmental objectives for WBs were set according to the risk reduction/elimination principle. Environmental cost efficiency of the key measures was assessed to prioritise their implementation.

Description of the Prut river basin

The Prut River is one of the largest rivers in Western Ukraine, Moldova and Romania, and it is one of the main tributaries of the Danube River. The territory of the river basin is located in Ukraine (33% of the overall watershed area) and Moldova (28%). The river length reaches 967 km, and the watershed area reaches 27540 km². At the territory of Ukraine, the Prut river basin (with the overall area of 9168.25 km²) is located in Ivano-Frankivska oblast (4878.87 km²) and Chernivetska oblast (4289.38 km²). (see Fig. 1).



The Prut River basin at the territory of Ukraine

As an important specific feature of the river, it has a high water content and is prone to frequent floods that pose real threats to the regional economy and even endanger lives of local residents in the Prut river basin.

The Prut River originates on the south-western slope of Goverla mountain, at the distance of about 15 km to south-east from Vorokhta village (at altitude of 1750 m asl), and discharges into the Danube River south of Giurgiulesti village, at the distance of 164 km from the Danube mouth. Initially, the Prut flows to the north-east and nearby Delyatin village the river channel makes a sharp turn to the south-east. While flowing through the Carpathians, the river intakes many tributaries (predominantly ones of small length and low water contents). Among larger tributaries, Luchka, Kamyanka, Tovmachik, Rybnytsa and Ceremosh rivers are worth mentioning as they supply a major share of water inflows to the Prut. The Prut valley is enclosed by steep slopes (often covered by dense spruce forests). Almost at the whole its mountainous section, the river bed is of a stepped pattern with numerous waterfalls. At the boundary between Ivano-Frankivska and Chernivetska oblasts, the Cheremosh discharges to the Prut. Downstream of the influx point, water contents in the Prut increase, the river becomes a plain type one and flows through Carpathian foothills plain. Nearby Mamalyga village, the river leaves the territory of Ukraine and flows along the border between Romania and Moldova.

Terrain. At the territory of Ukraine, the Prut is a mountainous type river, with the average river slope of 1.7 - 1.9 m/km. The river basin area is of a pear-like shape with the average width of 140 km. In terms of terrains, the river basin is subdivided into three sections: mountainous, Carpathian foothills and plains.

Geology. In geological terms, the Prut basin is subdivided into three large geo-structural zones: infolded Carpathian mountains; Carpathian foothills fore deep; and the Ruska platform area.

Soils. In terms of natural conditions - i.e. terrain, climate and vegetation - the Prut river basin is subdivided into three distinct strips or zones: mountains, foothills and plains. These zones are represented by relevant soil types. In the Prut basin, the following main soil types may be found: sod-podzolic gley soil; grey podzolic soils; meadow and boggy soils; mountainous soils.

Vegetation. Diverse environmental conditions, altitudinal zonation and different types of landscapes support diverse flora in the area. The vegetation cover demonstrates a clearly defined vertical zonation. In the Carpathian foothills zone, mountainous plateaus and ridges are often covered by oak and horn-beech forests - in addition to the local oak, at brownified loamy clay soils (typical for the Western Europe), green oaks, horn-beech and West European beech often grow there. The zone of low mountains (400 - 600 m) is characterized by deciduous forests of old oaks, horn-beech, beech, maple, linn and (somewhere) fir and local fir varieties. Then, the zone of broadleaf forests is replaced by beech and spruce forests. At altitudes over 1250 m, predominantly fir forests prevail up to altitudes of 1700 m. Mountain tops are covered by sub-alpine meadows and bushes (mountain pines, green mountain alder and rosebays). The left bank part of the basin, approximately from Delyatin village to Chernivtsi, is categorized as a forest-steppe zone. The territory is predominantly covered by cultivated fields, with small areas of young deciduous forests and (rarely) coniferous forests. Woodland coverage of the basin reaches 35%. Carpathian forests are of major hydroclimate importance for natural run-off regulation and erosion protection.

Climate. Climate in the Prut river basin is of a temperate continental pattern. Climate conditions in Carpathians are defined by continental air flows from the East and North East, as well as by wet marine air flows from the West and South West. In terms of climate features, the territory may be subdivided into two zones: mountains and foothills, which, in their turn, differ in terms of all climate formation factors. In Carpathian foothills zone, winter seasons start in late November and finish in the first third of March. In Carpathian mountains zone, winter seasons start earlier and their duration increases from 3.5 to 4.5 months. Spring season duration in the Prut river basin varies from 75 to 85 days. Spring seasons start there in the first third of March and ends in 2nd to 3rd thirds of May. In Carpathian mountains,

spring seasons start 10 to 15 days later. In these seasons, weather patterns are unstable with frequent frosts.

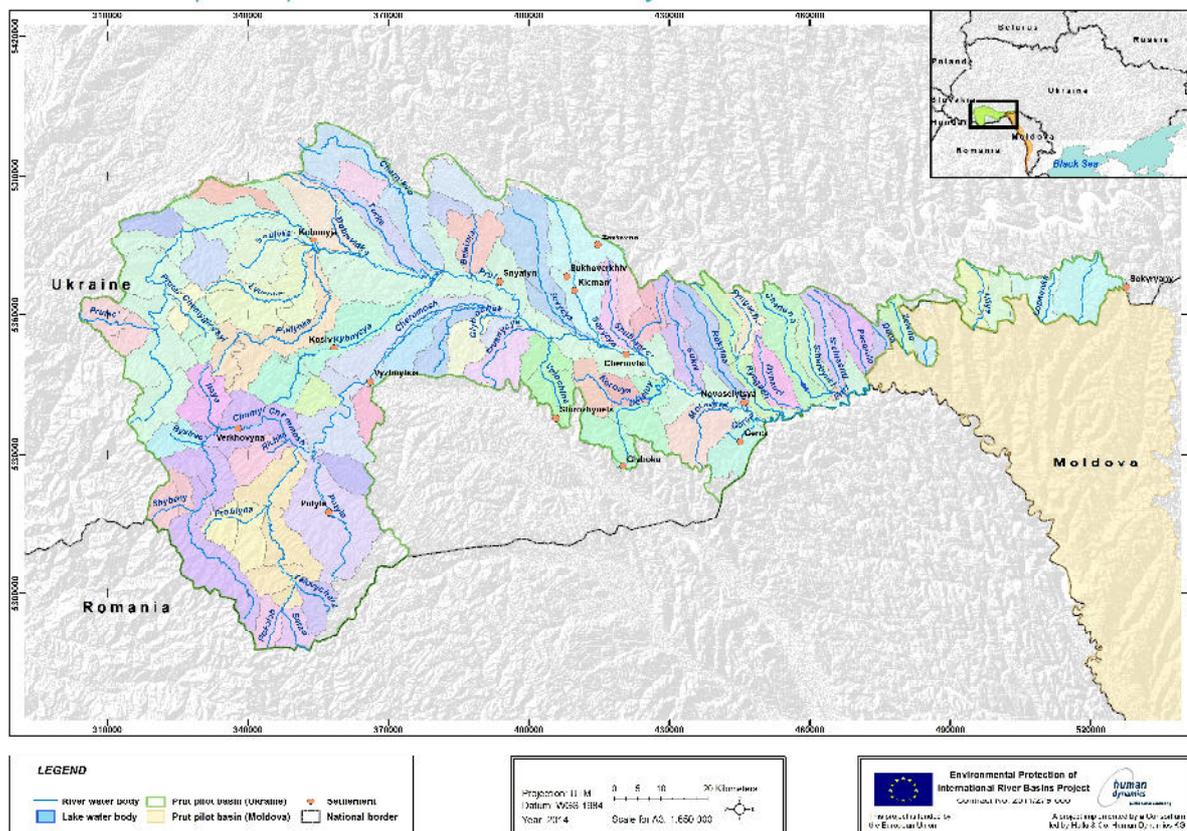
Summer seasons there start in late 2nd third of May and end in the first third of September. In summer seasons, West and North West transfer of air masses prevail, accompanied by heavy rains, causing severe floods in rivers. Autumn seasons in Carpathian mountains and foothills last for 65 - 80 days. In early autumn seasons, inflows of air masses from the South and the south-east are more often observed.

Temperature conditions in the basin are fairly diverse. In particular, average air temperatures in the foothills part of the basin reach 7°C - 8°C, while in mountains zone at altitude of 1200 m, they reach about 3 °C. Throughout a year, relative air humidity is rather high and reaches about 80%. Precipitation intensity in the area is distributed very unevenly and increases at higher altitudes. The highest precipitation intensity is observed in the mountains zone, at altitudes over 1000 m (1200 - 1500 mm/year), in the foothills zone precipitation intensity is lower (600 - 700 mm/year), while in the plains zone precipitation intensity is even lower. The seasonal distribution of precipitation in Carpathians demonstrates a clear prevalence of precipitation intensity in warm seasons (April to November), in that period, it reaches about 80% of the annual precipitation in the case of North-eastern Carpathian slopes. Precipitation falls very often - about 150 - 190 precipitation days in an average year.

Surface water bodies. In the Prut river basin, 122 surface river water bodies, 1 surface lake water body and 7 heavily modified WBs were identified. According to WFD, a heavily modified WB is defined as "a surface water body that substantially altered its nature due to physical alterations as a result of human activities". All rivers with watershed areas over 50 km² were considered for purposes of identification of surface water bodies. Rivers with watershed areas under 50 km² were categorised as separate water bodies depending on their significance. At the same time, all minor rivers are incorporated into larger watersheds that are used as the base for WB management. Identification of surface WB types was based mainly on geographic and morphological features. In the Prut river basin, 12 types of water bodies were identified in 2 eco-regions associated with geographic zones. The Prut river basin area belongs to 10th and 16th eco-regions (Carpathians and Eastern Plains). The lake WB in the Prut river basin was categorised as 1 group: type I includes 1 WB in 16th eco-region with water area from 0.5 to 1 km², with average depth from 3 to 10 m, at altitudes under 200 m asl.

29 WBs were identified as WBs "at risk of failing to reach good ecological status", 52 WBs were identified (due to lack of information) as WBs possibly at risk, while 34 WBs were identified as WBs not at risk.

Prut Pilot Basin (Ukraine): Delineated Surface Water Body

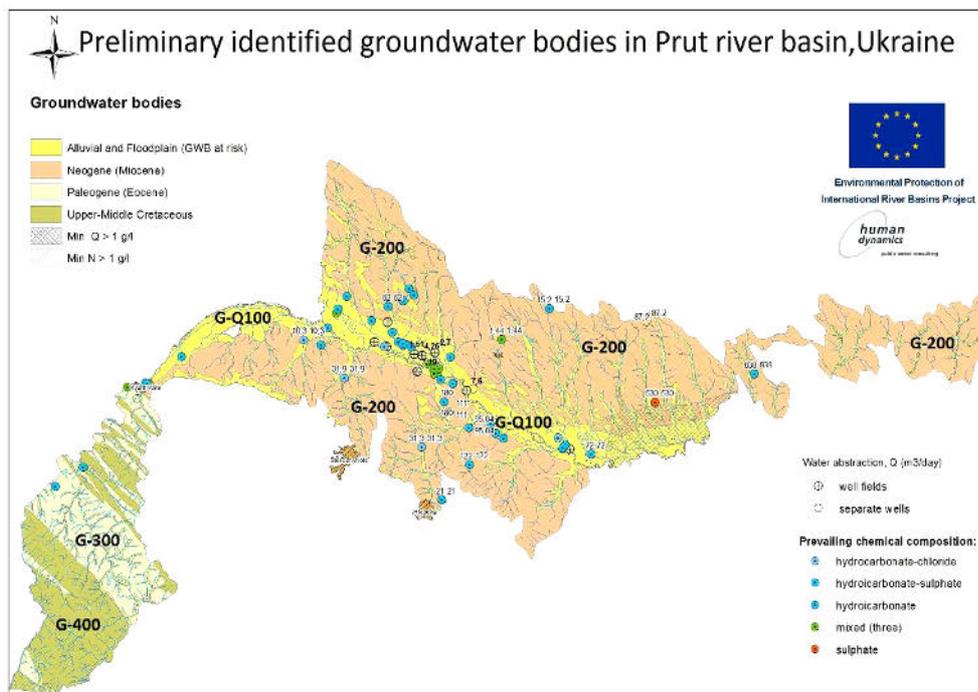


Delineated surface WBs in RB Prut

Groundwater bodies. Groundwater bodies were identified by geologic zones and natural parameters of existing aquifers. Four freshwater aquifers are used for drinking water supply in the Prut river basin:

1. Quaternary (alluvial) aquifers of Prut river valley and its terraces;
2. Neogene (Miocene) aquifers;
3. Paleogene (Eocene) aquifers;
4. Upper-Middle Cretaceous aquifers.

Devonian aquifer can potentially be used for mineral water supply in future, but now it is not used - therefore groundwater WBs in the aquifer were not identified and delineated. In general, all four groundwater bodies are of good quantitative and chemical status, while pollution of aquifers is only of a local pattern.



Key water resource management problems/drivers, substantial pressures and impacts

The range of substantial water management problems in the Prut river basin that result in direct or indirect adverse impacts on quality of surface water, incorporates the following ones:

- organic pollution;
- pollution by nutrients (nitrogen and phosphorous compounds);
- pollution by hazardous substances;
- hydromorphological alterations.

Other pressures include: flood protection; forestry-related activities; tourism and recreation.

Direct or indirect pressures on quality of groundwater include pollution by hazardous substances and uncontrolled water extraction. Groundwater in the Quaternary aquifer is contaminated by nitrogen (nitrates and ammonium), sulphates and chlorides.

One of the most important human pressures on quality and quantity of water resources in the Prut river basin is associated with point (fixed) pollution sources, including discharges of untreated municipal and industrial wastewater, inadequate management of solid household waste, industrial waste and agricultural waste (manure).

According to the analysis conducted, the main pressure on surface water bodies in the Prut river basin is caused by pollution from fixed and diffuse sources. Organic pollutants, nutrients and hazardous substances enter surface water bodies with discharges of untreated/insufficiently treated wastewater flows from WWTFs of water utilities and industrial facilities (point sources) and due to inadequate management of solid household waste, industrial waste and agricultural waste (manure).

More than 200 industrial facilities with different production capacity operate in the pilot Prut basin. It is worth to note that the majority of them belong to so called "secondary" water users as they discharge their wastewater to municipal sewers.

Analysis of multi-year data on a critically important water quality indicator (NH_4), revealed substantial water quality impacts associated with lack of and inadequate operations of wastewater treatment

facilities in the pilot basin. Municipal utilities of Kolomya and Chernivtsi were identified as the largest polluters (WBs downstream of their points of discharges were classified as WBs at risk), taking into account that water contamination by ammonia nitrogen suggests discharge of untreated/insufficiently treated municipal wastewater. According to results of Joint Field Surveys (JFS) of EPIRB Project in 2013-2014, the overall length of river WBs with NH_4 pollution reaches 231 km; while the overall length of river WBs with high BOD5 and COD levels reaches 208 km.

The analysis of water quality pressures and water quality assessments in the Prut river basin were based in water quality monitoring data provided by the Central Geophysical Observatory of the State Hydrometeorological Service of Ukraine (for the period from 2000 to 2011) and by the Dniester-Prut Basin Management Directorate of the State Water Agency of Ukraine (for the period from 2000 to 2013). We analysed specific physical and chemical parameters covered by WFD requirements in the data provided. The following WFD physical and chemical indicators for river WBs were used: dissolved O_2 , BOD, COD, acidity (pH), and nutrients (NH_4 , NO_3 , PO_4). According to physical-chemical risk assessments for the Prut river basin, 34 water bodies were categorised as WBs not at risk, 52 WBs as possibly at risk and 36 WBs at risk.

According to Directive 2013/39/EC that amends Directive 2000/60/EC and Directive 2008/105/EC, now, in order to assess chemical status of water bodies, it is necessary to measure water levels of 45 priority (hazardous) substances and "certain other pollutants" and check them against relevant environmental quality standards (EQS).

Multi-year monitoring data of the Central Geophysical Observatory provide some information of WBs contamination by some heavy metals, oil derivatives and phenols in the period from 2000 to 2011. In the course of JFS 2013, the following indicators were collected: heavy metals, DDT, Aldrin, Endrine in water samples from 24 surface water bodies in the Prut river basin (DDT, Aldrin and Endrine were not found in the water samples studied).

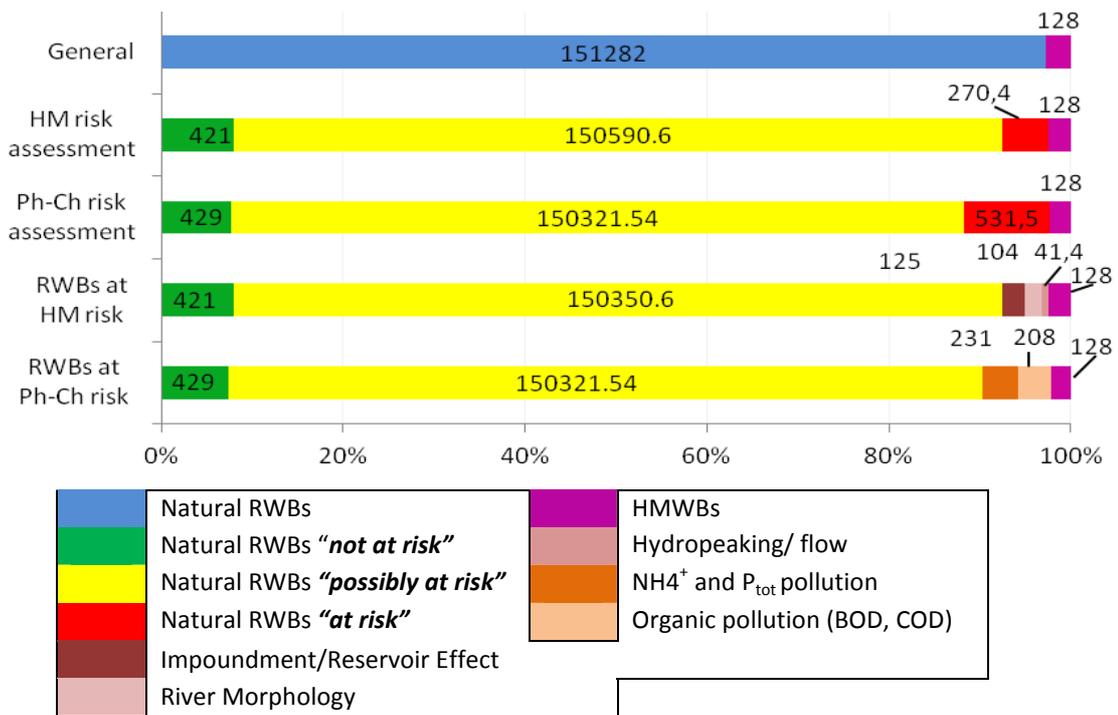
Phenols in rivers may suggest both natural and anthropogenic pollution sources (similarly to that of heavy metals) - as a result, these pollutants require further research studies and monitoring with adjustment of measurement methods and data verification in duly equipped analytical laboratories with sensitive instruments allowing to measure heavy metals according to WFD environmental quality standards. At the contemporary stage, it is impossible to evaluate chemical status of water bodies in the river basin due to lack of data and unreliable monitoring information on priority (hazardous) substance and "certain other pollutants" according to WFD requirements, as the existing water monitoring system of Ukraine does not comply with European requirements.

Anthropogenic pressures on surface and groundwater bodies from diffuse pollution sources are associated with the following causes: lack of water protection strips and areas; poor management of household waste, particularly in rural areas; storages of pesticides and agrochemicals; diffuse pollution from transport (exhaust emissions and surface run-off from roads); agriculture (application of pesticides, surface run-off from animal farms). Many human settlements with less than 10,000 residents (small towns, townships and villages) in the pilot basin apply decentralised sanitation options (septic tanks and cesspits) that represent diffuse sources of pollution of local water bodies by organic pollutants, nutrients and microorganisms. Besides that unauthorised waste dumps, inadequately managed landfills and lack of drainage systems at many industrial sites also adversely affect surface and groundwater WBs.

Timber harvesting and transportation operations are performed either manually or with application of tractors and with use of temporary roads on mountain slopes. Due to these activities and large areas of erosion-prone sedimentary rocks, the Upper Prut basin is affected by substantial surface run-off of sediments, particularly suspended matter.

Tourism and recreation generate additional pressures on water resources, as well as new point and diffuse pollution sources.

In order to evaluate hydromorphological alterations, the following criteria were used: flow regulation (flood protection, ponds), morphological alterations due to extraction of riverbed alluvium, disruption of flow continuity (construction of small hydropower plants). According to assessments of hydromorphological risks in the Ukrainian section of the Prut river basin, 29 river WBs were classified as WBs at risk of failing to attain good ecological status, 52 river WBs were classified as WBs possibly at risk (due to insufficient information), 34 river WBs were classified as WBs not at risk and 7 WBs were classified as heavily modified ones.



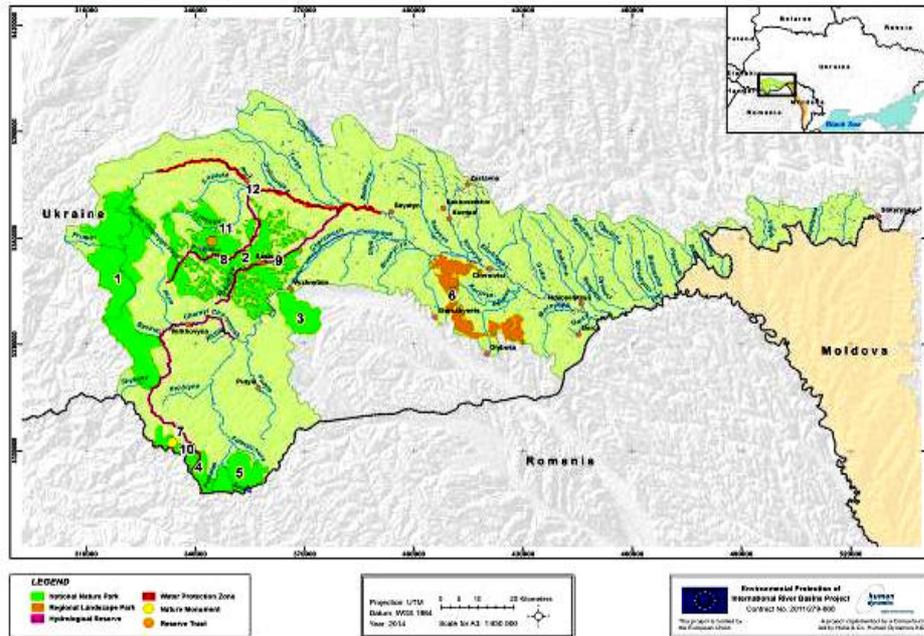
Results of the hydro-morphological and phisico-chemical and risk assessments for the WBs of the Prut RB

Protected territories

In the Ukrainian section of the pilot Prut river basin, three types of protected territories exist (for protection of rivers, water supply sources and wildlife habitats), including the following ones:

- 1) water protection areas, coastal water protection strips;
- 2) sanitary protection zones of water supply sources, including surface water and groundwater intakes;
- 3) natural; protected areas (5 national parks: Carpathian National Nature Park, Guthuschina, Vyzhniskiy, Verkhovinskiy, Cheremoskiy, Chernivetskiy Regional Landscape Park; three hydrological reserves with coastal protective strips: Cheremosh, Pistynka, Rybnitsa; Slope Swamp natural monument of national significance, and Lebedin protected stow).

Prut Pilot Basin (Ukraine): Protected Areas



The monitoring program for the Prut river basin

The monitoring program for surface water bodies. Two key WFD environmental objectives for surface water include: prevention of deterioration of status for all surface water bodies and attainment of good status for surface WBs. Status of surface WBs is defined by their ecological and chemical status. Monitoring and evaluation programs are necessary to confirm attainment of these objectives. WFD established three types of monitoring programs: surveillance, operational and investigative monitoring.

The monitoring program for surface water bodies in the Ukrainian section of the Prut river basin covers:

- categories of surface WBs: rivers and lakes;
- protected territories as defined by Art. 6 WFD;
- artificial and heavily modified WBs.

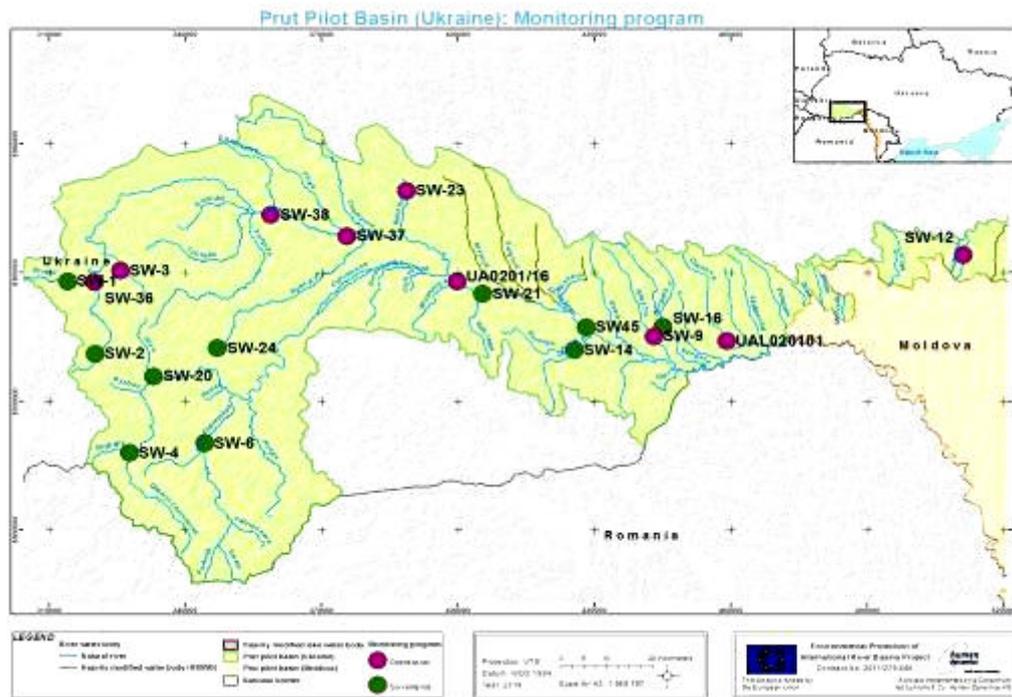
In order to attain objectives of **surveillance monitoring** of surface water bodies, that should ensure assessment of long-term changes of WBs status in natural conditions and due to substantial anthropogenic impacts, 10 sampling points were selected in the Prut river basin as the ones to be representative for the surveillance monitoring program. The list of sampling points is of preliminary nature and may be adjusted in the course of further research studies.

The program of **operational monitoring** is particularly focused on monitoring of efficiency of supplementary measures that seek to achieve WFD objectives for water bodies "possibly at risk". The program is intended to collect information on efficiency of specific actions being implemented in the Upper Prut basin.

Objectives of the operational monitoring program include:

- to identify status of WBs categorised as WBs at risk of failing to achieve good ecological status;
- to evaluate any changes in status of these WBs due to implementation of the program of measures.

Overall, in the Ukrainian section of the Prut river basin 8 sampling points were selected at rivers for



operational monitoring.

WFD also stipulated the third type of monitoring - i.e. **investigative monitoring**, that is necessary in extraordinary situations, when a WB is at risk of failing to achieve WFD environmental objectives due to some very specific reasons. The latter type of monitoring is intended to respond to new information in potential risks associated with new pollutants or due to other changes. However, in the framework of the current RBMP, no investigative monitoring activities are stipulated in the Ukrainian section of the Prut river basin.

Ecological status assessment

Monitoring data are needed for assessment of ecological status for every ecological quality element and for every surface water category. According to WFD, in order to assess a WB ecological status, it is necessary to measure biological, hydromorphological, physical-chemical parameters and relevant pollutants. In the course of classifying a WB by its ecological status/potential, first of all biological quality elements are assessed (species composition and abundance of aquatic organisms: fish, plants, algae, invertebrates, etc.). Every biological element in natural WBs is evaluated by deviation of observed parameters (if any) from type-specific reference conditions. Reference conditions mean conditions of biological quality elements that are observed in the absence of pollution or external impacts (or at least with minimal external impacts).

Physical-chemical and hydromorphological quality elements are supplementary to biological ones and are used for general ecological status assessments. Chemical status of surface water bodies is associated with 45 pollutants listed in Annex X to WFD (Directive 2000/60/EC and Directive 2008/105/EC) and Directive 2013/39/EU, that amends them.

In order to achieve "good chemical status", measured indicators for specific pollutants should meet two mutually supporting environmental quality standards:

- annual average levels - environmental quality standard, applying to the arithmetic mean of one year of data, with monthly sampling presumed;

- maximal concentrations - environmental quality standard, applying to the maximum concentration in the annual set of data.

Recommendations for the groundwater monitoring program in the Prut river basin

Groundwater monitoring programs include monitoring of quantitative and qualitative water parameters in all delineated groundwater WBs in the river basin. Main objectives of quantitative monitoring include study of long-term trends of water levels and assessment of saltwater or other intrusions caused by groundwater extraction. Qualitative monitoring of groundwater WBs include operational, surveillance and investigative monitoring, as well as monitoring of GW drinking water sources, monitoring of habitats, monitoring for prevention and restriction purposes.

No monitoring wells for GW resources exist in the Ukrainian section of the Prut river basin. A new network of GW monitoring in the basin needs to be designed and implemented.

Pending development of the new GW monitoring network, we recommend to sample water from natural springs and analyse their quality. The option is particularly appropriate for the upper section of the Prut in the Carpathian mountains. Besides that, water samples may be taken from small watercourses in low water periods, when they are predominantly fed by groundwater. Such data would provide general information on GW quality.

We recommend to drill 16 new observation wells for GW monitoring.

Environmental objectives and exemptions

According to WFD requirements, the following environmental objectives should be achieved for WBs in 15 years:

- a. good ecological/chemical status of surface WBs;
- b. good ecological potential and chemical status of HMWBs and AWBs;
- c. good chemical/quantitative status of GWBs.

According to WFD, the following objectives were set for the Prut river basin:

- achievement of good ecological status for all WBs;
- prevention of deterioration of ecological status of WBs;
- ensuring sustainable water resources management;
- meeting specific requirements to protected territories.

In the case of WBs with high and good ecological status, the key aim is to maintain the existing status. In the case of WBs with moderate or poor ecological status, measures should be applied to attain environmental objectives according to WFD planning cycles.

Environmental objectives were set for the Prut river basin according to WFD requirements. Accounting for results of (a) pressures and impacts analysis, (b) risk assessments and (c) monitoring, environmental objectives were agreed for all delineated WBs and relevant measures were considered for attainment of the objectives, in the framework of 6-years WFD planning cycles.

The list of key environmental objectives for delineated surface WBs in the Prut river basin - WBs at risk of failing to achieve environmental objectives in 2015, includes the following ones:

- in connection with contamination by NH₄, COD, BOD, phenols - to reduce levels of these pollutants in water to applicable environmental quality standards;

- in connection with HM alterations: impoundment/reservoir effect - to restore natural hydrological regime in the water bodies,
- in connection with river morphology alterations/interruption (gateways, mini-HPPs), river-channel straightening - to restore natural river conditions to the maximal extent possible (restoration of water flow continuity, continuity of habitats, provision of favourable conditions for fish breeding);
- in connection with modification of riverbed morphology - prevention of unauthorised gravel and sand extraction from rivers.
- To introduce the ecosystem approach to protection of the natural environment and economic activities in the river basin.

Application of exemptions according to Art. 4 of EU WFD

According to Art. 4 EU WFD, due to some reasons, exemption may be applied - in such cases, good ecological/chemical/quantitative status or good potential of WBs cannot be achieved within the first planning cycle (by 2021), may be achieved later on or may not be achieved at all. Requirements for exemptions should be taken into account in the course of setting environmental objectives.

Application of exemptions necessitates comprehensive assessments to substantiate for each WB why relevant measures may be applied only (a) after the first planning cycle with extension of implementation terms, or (b) by means of setting less stringent environmental objectives. Such evaluation must confirm that implementation of necessary measures to achieve environmental objectives and good status/potential:

- is impossible within the first planning cycle due to natural conditions;
- is technically impossible or
- is technically feasible but is prohibitively expensive.

So far, the final classification of all WBs in the Prut river basin has not been completed. However, even now we can conclude that in the case of some WBs at risk, it would be difficult to set environmental objectives attainable in the set terms due to HM alterations (channel straightening, impoundment, flow continuity interruptions). In the case of such WBs - 12 WBs in total - exemptions may be applied.

A brief economic analysis of water use in the Prut river basin

According to Art. 2 (38) EU WFD, water supply is defined as all services provided to households, public facilities and other economic sectors, including:

- intake, accumulation, storage, treatment and distribution of surface water and groundwater;
- collection and treatment of wastewater flows at WWTPs with their further discharge to surface water bodies.

The overall population in the Ukrainian section of the Prut river basin reaches 890 thousand persons - predominantly residents of small communities. Only two large cities are located in the area - Kolomyia and Chernivtsi. Water supply and sanitation coverage of rural residents is very low (4-6%). The largest share of water use is associated with fish ponds (40%), the latter type of water use is a specific feature of Chernivetska oblast, in Ivano-Frankivska oblast water is not used for such purposes.

Main sources of water supply include surface waters in the Prut river basin, as well as groundwater from hydrogeological provinces of the Carpathian zone.

Water is predominantly used for household and agricultural purposes, the share of water for industrial use is low.

Cost-efficiency as the criterion for selection of measures to meet targets

As results of expert assessments and analysis of dedicated state programs, costs of proposed measures were preliminary estimated. Overall costs of the activities reach about € 45,856,460 (including € 30,000,000 for investment project of Reconstruction and Development of Municipal Water Management in Chernivtsi). The preliminary budget estimates for basic and supplementary measures will be checked and corrected with competent bodies and adjusted for inflation rates. Since 2016, in Ukraine, regional and local environmental programs will be developed according to the National Environmental Action Plan.

Program of measures. Basic and supplementary measures for maintenance and restoration of water bodies.

According to recommendations of the Guidance on development of programs of measures, the Program of Measures should include basic and supplementary measures. Basic measures apply to all water bodies in the Prut river basin and seek to comply with the due Ukrainian legislation. These measures will maintain high or good status of water bodies and will ensure attainment of good status by WBs at risk.

Supplementary measures include specific measures for particular WB at risk of failing to attain good ecological status/potential. These latter measures seek to improve ecological status of the WBs by 2021.

Basic measures rely on the national legislation and include:

- measures to streamline and modernise institutional and economic mechanisms for protection and recovery of water resources;
- measures to promote efficient and sustainable use of water resources;
- measures to protect drinking water sources;
- measures to control water intakes and recovery of surface water and groundwater;
- measures to control point and diffuse pollution sources;
- measures to control priority substances (Annex X to EU WFD);
- measures to prevent all activities that adversely affect water quality;
- measures to prevent accidental spills (oil spills, etc.).

In the case of Ukraine, the range of basic measures in the Program of Measures should include measures for harmonisation/approximation of the due environmental legislation of Ukraine to EU environmental acquis, including inter alia EU directives in the sphere of water quality and water resources management - the ones listed in Annex XXX to the EU-Ukraine Association Agreement. These measures are mandatory for execution by central executive bodies by December 2017 (applicable for the first planning cycle of the Prut RBMP).

Competent bodies

The range of national institutions active in the Prut basin incorporates the Ministry of Ecology and Natural Resources of Ukraine, the State Agency of Water Resources of Ukraine (with its regional subsidiary - Dniester-Prut Basin Management Directorate) and the State Service for Geology and Mineral Resources of Ukraine.

Public participation and public consultations

The Ministry of Ecology and Natural Resources of Ukraine organized a stakeholder meeting to present and discuss draft Prut RBMP. The event was the starting point in the process of consultations on the draft Prut River Basin Management Plan. The consultations continued for three months - from May 27

to August 31, 2015. Consultation documents were posted on the Ministry's web-site menr.gov.ua. Stakeholders were provided opportunities to mail their comments to the following e-mail address: bon@menr.gov.ua.

Overall, in the course of the consultations, 56 comments were submitted by stakeholders and the general public, including 25 written comments from individual representatives of concerned public and 31 comments that were presented at the stakeholder consultative meeting in Yaremche on May 26. Overall, 35 comments were accounted for and incorporated into the final Prut RBMP draft.

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