MANAGEMENT PLAN

of the River Basins of Central Macedonia River Basin District

Summary

JANUARY 2014

SPECIAL SECRETARIAT FOR WATER

HELLENIC REPUBLIC

MINISTRY OF ENVIRONMENT, ENERGY AND CLIMATE CHANGE
SPECIAL SECRETERIAT FOR WATER

PROJECT: DEVELOPMENT OF THE RIVER BASIN MANAGEMENT PLANS OF THE RIVER BASINS OF WEST MACEDONIA AND CENTRAL MACEDONIA RIVER BASIN DISTRICTS ACCORDING TO THE SPECIFICATIONS OF THE WFD 2000/60/EC, APPLYING THE GREEK LAW 3199/2003 AND THE GREEK PD 51/2007

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DEVELOPMENT OF THE RIVER BASIN MANAGEMENT PLAN OF THE RIVER BASINS OF CENTRAL MACEDONIA RIVER BASIN DISTRICT (GR10)

SUMMARY

G.G. of Management Plan's Approval: G.G. B' 182/31.1.2014

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ABBREVIATIONS

AWB	=	Artificial Water Bodies
CEA	=	Cost Effectiveness Analysis
CMD	=	Common Ministerial Decision
CRR	=	Cost Recovery Rate
EC	=	European Commission
GG	=	Government Gazette
GWB	=	Ground Water Bodies
HMWB	=	Heavily Modified Water Bodies
JMD	=	Joint Ministerial Decision
NSRF	=	National Strategic Reference Framework
PD	=	Presidential Degree
RBD	=	River Basin District
SCI	=	Sites of Community Importance
SEIA	=	Strategic Environmental Impacts Assessment
SPA	=	Special Protection Areas
TC	=	Total Cost
TR	=	Total Revenues
WBs	=	Water Bodies
WFD	=	Water Framework Directive
WWTP	=	Waste Water Treatment Plant

1. INTRODUCTION

The “Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy”(EU Water Framework Directive or WFD) sets a framework for comprehensive management of water resources in the European Community, within a common approach and with common objectives, principles and basic measures

The EU Water Framework Directive 2000/60/EC provides the major driver for achieving sustainable management of water throughout Europe, for many years to come.

The purpose of the EU Water Framework Directive is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. The fundamental objective of the Water Framework Directive is to prevent any deterioration in water quality and to achieve at least 'good status' for all waters by 2015.

The EU Water Framework Directive 2000/60/EC has been harmonized with the Greek legislation with Law 3199/2003 (Government Gazette A 280) and Presidential Decree 51/2007 (Government Gazette A '54). Under these provisions the basic concepts of the Water Framework Directive are incorporated to the National Legislation and at the same time a new administrative structure is formed and the responsibilities of the Management Bodies are defined nationally and regionally.

Priority and necessary step for the implementation of the Directive in the country is the preparation of the River Basin Management Plans of the 14 River Basins in the country, as established by the Decision of the National Water Commission of 16.07.2010[1]. The River Basin Management Plans of the country are prepared under the auspices of the competent authorities for every River Basin. Based on the requests of the General Secretaries of the Regions of Western and Central Macedonia the Special Secretariat of Water of the Ministry of Environment, Energy and Climate Change undertook the preparation of the Water Management Plans of the River Basins of the River Basin Areas of West Macedonia (GR09) and Central Macedonia (GR10). In accordance to the law 4117/2013, which amended the law 3199/2003 and Presidential Decree 51/2007, it is foreseen that in this case the River Basin Management Plans is approved by the National Water Commission, upon recommendation of the Special Secretariat of Water of the Ministry of Environment, Energy and Climate Change

The Special Secretariat of Water of the Ministry of Environment, Energy and Climate Change launched a public international tender in June 2011 to contract the study «Development of the River Basin Management Plans of the River Basin Areas of West Macedonia and Central

[1] www.ypeka.gr/LinkClick.aspx?fileticket=GdFmmT1BtE4%3d&tabid=247

Macedonia according to the Specifications of the WFD 2000/60/EC, applying the Greek Law 3199/2003 and the Greek PD 51/2007». Following the tender, the study was contracted on 27.04.2012, by the Special Secretariat of Water to the Consortium:

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with Representative and Coordinator of the Consortium, the Civil Engineer Abraham Bensasson and Deputy Representative, the Civil Engineer-Environmental Engineer MSc Lisa Bensasson.

2. RIVER BASIN MANAGEMENT PLAN OF THE RIVER BASIN DISTRICT

2.1 Contents of the Management Plan

The present document consists the summary of the River Basin Management Plan of Central Macedonia River Basin District (GR10) and the accompanying detailed documentation texts.

Table 1: Documentation texts of Central Macedonia River Basin District Management Plan

	DOCUMENTATION TEXTS
1	RECORD OF THE COMPETENT AUTHORITIES AND DETERMINATION OF THEIR AREA OF RESPONSIBILITY
2	PROTECTED AREAS REGISTRY
3	ECONOMIC ANALYSIS OF THE WATER USES AND DETERMINATION OF THE CURRENT COST RECOVERY DEGREE FOR THE DIFFERENT WATER SERVICES
4	PRELIMINARY ASSESSMENT OF ALTERNATIVE PROPOSALS FOR FLEXIBLE WATER TARIFF POLICY AND COST RECOVERY MECHANISMS
5	IDENTIFICATION AND TYPOLOGY OF SURFACE WATER BODIES. INITIAL AND FURTHER CHARACTERISATION OF GROUNDWATER BODIES
6	TYPE-SPECIFIC REFERENCE CONDITIONS FOR THE TYPES OF SURFACE WATER BODIES
7	FINAL DESIGNATION OF HEAVILY MODIFIED AND ARTIFICIAL WATER BODIES
8	ANALYSIS OF THE ANTHROPOGENIG PRESSURES AND THEIR IMPACTS ON SURFACE AND GROUDWATER BODIES
9	EVALUATION AND CLASSIFICATION OF THE QUALITATIVE STATUS (ECOLOGICAL AND CHEMICAL) OF SURFACE WATER BODIES
10	EVALUATION AND CLASSIFICATION OF THE QUALITATIVE AND QUANTINTATIVE STATUS OF GROUNDWATER BODIES
11	DETERMINATION OF ENVIRONMENTAL OBJECTIVES INCLUDING “EXEMPTIONS” FROM OBJECTIVES ACHIEVEMENT
12	CATALOGUE OF SCHEDULED AND NEW PROJECTS/ ACTIVITIES/ ALTERNATIONS WITH THE SOCIO-ECONOMIC BENEFITS SERVED
13	PROGRAMME OF BASIC AND SUPPLEMENTARY MEASURES FOR THE PROTECTION AND RECOVERY OF WATER BODIES
14	IMPLEMENTATION REPORT OF THE 2006/118/EC DIRECTIVE ‘‘ON THE PROTECTION OF GROUNDWATER AGAINST POLLUTION AND DETERIORATION’’ AND THE JMD 39626/2208/E130/2009
15	UPDATED MONITORING PROGRAMMES OF THE QUALITATIVE AND QUANTINTATIVE STATUS OF SURFACE AND GROUNDWATER BODIES
16	EVALUATION OF THE PROPOSED PROGRAMME OF MEASURES, INCLUDING COST EFFECTIVENESS ANALYSIS WITH RESPECT TO THEIR EFFICIENCY
17	DESIGN STUDY AND ORGANIZATION OF THE PUBLIC CONSULTATION PLAN AND RECORDING OF SOCIAL PARTNERS COMPOSED BY: • REPORT OF MEASURES • LIST OF MANAGEMENT BODIES ASSOCIATED WITH WATER • PUBLICATION AND INFORMATION CONTENT • QWUESTIONNAIRES FOR SPECIFIC CONSULTATION ISSUES
18	REPORT WITH THE EVALUATION OF THE CONSULTATION RESULTS

2.2 Strategic Environmental Impact Assessment

In the context of the Strategic Environmental Assessment of the River Basin Management Plan of Central Macedonia River Basin District (GR10) a Strategic Environmental Impact Assessment was

prepared, in conformance with the Joint Ministerial Decision of the Special Environmental Agency of the Ministry of Environment, Energy and Climate Change under pr. No. 107017/28.8.2006 «environmental assessment of certain plans and programs, in compliance with the provisions of Directive 2001/42/EK» (Government Gazette B 1225/2006).

Taking into consideration the harmonization of the Management Plan with other National Plans and Programs and the conclusions of the Public Consultation Procedure, the Strategic Environmental Assessment Study of the River Basin Management Plan of Central Macedonia River Basin District (GR10) has been approved with the Ministerial Decision No. 172594/24.12.2013 under the conditions, restrictions and guidelines set out in this decision, which are to be observed at all stages of approval, specification and implementation of the Management Plan by the Planning Authority.

Evaluation and assessment of the impacts of the River Basin Management Plan on the examined environmental factors, concludes that no important negative impact is to be expected. On the contrary, in most cases, the recommended Program of Measures significantly improves -directly or indirectly and cooperatively- current state, due to the fact that its very aim is to achieve sustainability and to address any adverse conditions related to water resources management. Consequently, no alterations to the recommended Program are required towards environmental integration. Variations to specific points of the Preliminary Management Plan resulting during the process of Public Consultation are recorded in detail in the Joint Ministerial Decision of the Strategic Environmental Impact Assessment approval and have been taken into consideration in the final Management Plan.

2.3 Draught and Water scarcity Management Plan

Based on the principles of preventive planning, a Drought and Water Scarcity Management Plan (DWSMP) has been developed for the Central Macedonia River Basin Area (Water District GR10). This Plan evaluates the risks of water scarcity and droughts based on historic hydrological well as abstraction data and recommends early warning mechanisms along with adequate response measures to mitigate or eliminate the negative impacts of such phenomena.
The Drought and Water Scarcity Management Plan includes:

- Definitions and requirements set out in the WFD for water scarcity and drought the management.
- Recording of historical extreme drought events in Central Macedonia Water District (GR10).
- Determination of a water scarcity index based on the water balance variables.
- Evaluation of the risk of future water scarcity and drought events and possible impacts, based on vulnerability indicators, as a function of social, economic and environmental criteria.

- Evaluation of possible impacts of prolonged droughts on the achievement of the environmental objectives of Article 4 of the WFD.
- Determination of a drought index, as a criterion to identify the advent of scarcity and drought events as well as the gradation of this index's values to characterize these events.
- Determination of basic and supplementary measures essential for the prevention and response to the impacts from scarcity and drought.
- Identification and recommendation of alternative sources for various water uses and "strategic water reserves', to be used in critical drought events.
- Recommendations on a flexible and effective early warning system for droughts, taking into account the drought index.

The implementation of the Plan is an additional safety measure in order to protect the Water Bodies and to cover vital needs in the event of drought.

3. CONSULTATION PROCESS

The public consultation processes have a key role during preparation, reading and revision of the River Basin Management Plans.

The consultation period of the River Basin Management Plans, with a minimum required duration of 6 months, began on **June, 2012** and was completed in three phases:

Phase A', lasting until June 2013, addressing the following:

- Report on the consultation measures to be taken, including the Public Consultation Schedule
- Catalogue of stakeholders,

Phase B, from November 2012 until June 2013, addressing the following**:**

- Overview of the significant water management issues

Phase C΄ lasting from January 2013 to December 2013, with the following main objects:

- The Preliminary Management Plan for the River Basin of Central Macedonia
- The Strategic Environmental Impact Assessment

To enhance the participation of shareholders, Seminars / Thematic Meetings and Information Days were scheduled in central cities of the Water District.
On 13 December 2013, the Special Secretariat for Water announced the completion of the Public Consultation on the Preliminary Management Plan of the River Basins of Central Macedonia Water District.

4. CENTRAL MACEDONIA RIVER BASIN DISTRICT

4.1 River Basins

The River Basin District of Central Macedonia according to Decision No. 706/16.7.2010 of the National Water Commission (Official Gazette B '/ 1383) includes four (4) River Basins:

- Axios (GR03), with an area of 3,327 km^2
- Gallikos (GR04), with an area of 1,051 km^2
- Chalkidiki (GR05), with an area of 5,546 km^2
- Atho (GR43), with an area of 239 km^2.

4.2 Administrative & natural characteristics

4.2.1 Administrative status

Water District GR10 is attached, for administrative purposes, to the Region of Central Macedonia and includes the entire Regional Units (ex. Prefectures) of Chalkidiki, large parts of Kilkis (95%) and Thessaloniki (92%), as well as significant parts of the Regional Units of Pella (27%) and Imathia (25%). Moreover, the River Basin District of Central Macedonia includes the Autonomous monastic state of Mount Athos, which is a self-governed part of the Greek State.

The permanent population of the River Basin District of Central Macedonia (GR10), based on the 2001 census amounted to 1,388,496 inhabitants and reached 1,420,321 inhabitants, in accordance to the 2011 census, indicating a total increase of 2.3%.

4.2.2 Land Uses

Agricultural land (56.74%) covers the largest part of the River Basin District of Central Macedonia, while 37.89% of the total area is covered with forest. Urban areas account for 1%, while other uses reach up to 2.44% of the total area -including Industrial and Trade Zones (0.54%), Transport Networks (0.12%), Mining and Mineral Sites (0.13%). Wetlands cover 0.86% of the total area and water surfaces 1.27%

4.2.3 Major water uses

Water uses are distinguished in water supply, irrigation, livestock, industry and mining. The total annual demand for all uses is about 1,593 hm^3 (1,237 hm^3 supplied by RBD's own resources and 357 hm^3 by Aliakmonas' River of the neighbouring RBD of Western Macedonia). The distribution of the above mentioned demand to the individual uses is as follows:

- Water supply 177 hm^3 (11%)
- Irrigation 1,361 hm^3 (85%)

- Livestock 7 hm^3 (1%)
- Industry 41 hm^3 (3%)
- Mining 6 hm^3 (0%)

Total annual abstraction from surface water bodies is estimated at about 828 hm^3 (~ 52% of total annual demand) of which 357 hm^3 (~ 22% of total annual demand) happens outside the River Basin District. Abstraction from the groundwater bodies of Central Macedonia River Basin District is estimated at 765 hm^3 /year, approximately (~ 48% of the total annual demand). Finally, the crucial annual contribution of 3.600 hm^3, of the upstream part of the international river basin Axios should be noted.

5. COMPETENT AUTHORITIES

According to Law 3199/2003 (Government Gazette A' 280), for the Protection and Management of the Water Bodies, as amended and in force, the following competent authorities for the protection and management at national level are specified:

The National Water Commission has been designated as the high-level inter-ministerial body and is responsible for the management and protection of water bodies at national level.

The National Water Council, issues opinions to the National Water Commission on national water resources protection and management programs.

The Special Secretariat for Water, of the Ministry of Environment, Energy and Climate Change, has the authority to prepare national programs for the protection and management of water resources and to coordinate state services and bodies on any matter related to the protection and management of water bodies.

The competent authority at regional level for the Central Macedonia River Basin District is presented in the following table.

Table 2: Competent Authorities and areas of responsibility

River Basin District Code	River Basin District Name	Percentage of area in every Region	Competent Decentralized Authority\Water Directorate[2] (Government Gazette 1383 B\2-9-2010 [3])	National Competent Authority
GR03	Axios	Central Macedonia (100%)	Macedonia and Thrace / Central Macedonia	Ministry of Environment Energy and Climate Change/ Special Secretariat for Water
GR04	Gallikos	Central Macedonia (100%)		
GR05	Chalkidiki	Central Macedonia (100%)		
GR43	Atho	Mount Athos (96.01%) [4] Central Macedonia (3.99%)		

[2] *The Government Gazette refers to Regions, the competences of which are carried out, in accordance with Article 280 of law 3258/2010, by the Decentralized Administrations, with the exception of the cauthorities vested by Article 186 of the Law relevant to the Regions.*

[3] *As amended by Government Gazette B 1572/28.09.10..*

[4] *Under the provisions of Article 105, paragraph 1 of the Constitution, Mount Athos is a self-governed part of the Greek State.*

6. IDENTIFICATION OF WATER BODIES

6.1 Surface water bodies

Surface water according to the WFD fall within one of the following categories: rivers, lakes, transitional waters or coastal waters. In the River Basin District of Central Macedonia surface water bodies of all categories are identified.

6.1.1 Rivers

In the River Basin District of Central Macedonia, one hundred and four (104) rivers are identified, falling under six different types (NgL0, NgL1, NmL0, NsH1, NsL0, NsL1).

6.1.2 Lakes

In the River Basin District of Central Macedonia, six (6) lakes are identified in total, lakes Doirani and Koronia as D type, lake Pikrolimni as I type, lake Volvi as A type and lakes Artzan and Maurouda as L-MX type (artificial lakes).

6.1.3 Transitional waters

Three (3) transitional water bodies are identified in the River Basin District of Central Macedonia, including: two lagoons, as TW-1 type and Axios' Estuarine system, as TW-2 type (estuary or delta).

6.1.4 Coastal waters

All eleven (11) coastal water bodies identified in the River Basin District of Central Macedonia necessarily belong to the single national coastal water body type.

The statistical characteristics of surface water bodies of RBD of Central Macedonia (10), as these were identified per category, are presented in the table here below.

Table 3: Statistical characteristics of surface water bodies of RBD of Central Macedonia

Type of WB	Number	Characteristic size	Minimum	Mean	Maximum	Total
Rivers	104	Length (km)	0.9	10.7	41.9	1,108.6
Lakes	6	Surface (km²)	1.1	27.7	72.1	141.7
Transitional waters	3	Surface (km²)	0.6	23.5	67.6	70.7
Coastal waters	11	Surface (km²)	0.06	350.0	1,328.5	10,307.4

6.2 Groundwater bodies

Thirty-four (34) GWBs are designated at the RBD of Central Macedonia (10), for sixteen (16) of which, ''further characterization'' was carried out.

The spatial characteristics of the groundwater bodies identified in the RBD of Central Macedonia (10) are presented in the table below.

Table 4: Spatial characteristics of groundwater bodies of RBD of Central Macedonia

Type of WB	Number	Minimum area (km²)	Average area (km²)	Maximum area (km²)	Total area (km²)
GWBs	34	1.40	280.08	1598.56	10082.79

6.3 Heavily modified water bodies (HMWB) and Artificial water bodies (AWB)

Surface water bodies have been physically altered by human activity, and identified as artificial or heavily modified, under specific circumstances, in order to meet a variety of human needs and activities for sustainable development, such as flood protection, water storage for irrigation and drinking-water supply, navigation etc.

Four (4) heavily modified (2 rivers, 1 lake and 1 coastal water body) and twelve (12) artificial water bodies (10 rivers, 1 lake and 1 coastal water body) are identified out of a total of one hundred and twenty four (124) surface water bodies (rivers, lakes and coastal waters) in RBD of Central Macedonia (10).

The ecological potential for Heavily modified water bodies (HMWB) and Artificial water bodies (AWB) is yet to be determined, therefore, under this management period the environmental objective for HMWB and AWB is to achieve the 'good ecological status' that corresponds to the type of natural water body to which it most closely resembles.

6.4 Protected Areas

The register of protected areas of the River Basin District of Central Macedonia, specified under Article 6 of the Water Framework Directive, includes the following types of protected areas.

6.4.1 Areas designated for the abstraction of water intended for human consumption

No surface water bodies designated for the abstraction of water intended for human consumption are recorded in the River Basin District. The HMWB Petrenia in the River Basin of Chalkidiki is listed in the register of protected areas as the construction of the reservoir that will supply with water nearby settlements is scheduled.

The register of protected areas intended for human consumption includes the karstic bodies of ground water: Paikos, Mauroneri and Nteve Koran.

6.4.2 Bodies of water designated as recreational waters including areas designated as bathing waters under the Directive 2006/7/EC

In the RBD of Central Macedonia the quality of bathing waters is being monitored at 151 points which are grouped into 84 bathing water profiles. Recreational waters were not identified in the river basin district of Central Macedonia.

6.4.3 Nutrient- sensitive areas

Areas vulnerable to nitrates from agricultural sources under Directive 91/676/EEC

One (1) area, the plains of Thessaloniki-Pella-Imathia, is officially designated as vulnerable to nitrates from agricultural sources (as per Joint Ministerial Decision 16175/824, Government Gazette B' 530/28-4-2006) in the River Basin District of Central Macedonia.

Areas designated as sensitive under Directive 91/271/EEC

In the RBD of Central Macedonia four (4) surface water bodies are recorded as sensitive concerning urban waste-water treatment, being listed in the Joint Ministerial Decision 19661/1982/1999, as updated and supplemented by the Joint Ministerial Decision 48392/939/2002. These are: river Vardarovasis, lakes Volvi and Koronia and the Gulf of Thessaloniki.

6.4.4 Areas designated for the protection of habitats or species

In the RBD of Central Macedonia twenty four (24) areas are designated for the protection of habitats or species directly depending on water, including relevant NATURA 2000 sites. These include thirteen (13) Sites of Community Importance (SCI), nine (9) Special Protection Areas (SPA) and two (2) areas protected as both SCI and SPA.

6.4.5 Areas designated for the protection of economically significant aquatic species

In the RBD of Central Macedonia the following areas designated for the protection of economically significant aquatic species are identified: the protected area for fish life at transitional waters (subregion estuary system of Axios), the region for the development of Aquaculture in the coastal water bodies of Thessaloniki-Imathia (subregions of Eso Thermaikos Gulf and Thessaloniki Gulf) and the region for the development of Aquaculture in the coastal water bodies of Chalkidiki (subregion Aktes Sithonias).

7. ANALYSIS OF PRESSURES IN WATER BODIES

Evaluation of anthropogenic pressures on the water bodies is based on the listing of the total pressures, (point and diffuse sources, water abstractions, water flow regulations, morphological alterations to water bodies, etc.), in order to fully understand the most crucial management issues for every Water Basin.

Every such pressure is characterized as important for a certain Water Body as long as it is likely to impede achievement of the environmental quality objectives set under Article 4 of the WFD for the particular Water Body.

Urban wastewater

In the RBD of Central Macedonia thirty seven (37) Waste Water Treatment Plants (WWTP) are in operation. The only A Priority Agglomeration of the RBD is the town of Thessaloniki, which is served by the WWTP of Thessaloniki, having as effluent recipient the Gulf of Thessaloniki (sensitive). Within the River Basin District there are six (6) agglomerations of Priority B (Alexandria in Imathia, Giannitsa, Kilkis, Kallithea and Kallikratia in Chalkidiki and the tourist zone of Thessaloniki), all provided with collecting systems connected to WWTPs. Out of sixty three (63) Priority C settlements, 34 are provided with adequate collection systems and served by WWTPs. Finally, 25 more WWTP and 18 collection systems, already selected for funding, will soon assure adequate coverage for the all Priority C agglomerations.

Industry

In the RBD of Central Macedonia 408 industrial plants have been identified.

Out of the total 285 industrial plants produce liquid waste with a significant pollution load (before treatment), according their classification[5]. The majority of these (160 units - 56%) falls under the class of food and beverage (including the oil mills), while a significant number of plants is engaged in the manufacturing of chemical substances and products (44 units - 15%), metal manufacturing / processing (31 units - 11%) and textile materials and products (28 units - 10%). Finally, a smaller presence of refined petroleum products (13 units - 5%), paper industry (5 units – 2%) and wood products (4 units – 1%) units is recorded in the RBD.

Sixty eight (68) of the above mentioned industrial plants are categorized as IPPC (Integrated Pollution Prevention Control). Among the facilities that are related to IPPC category, the majority (40 units or 59% of total) is related to chemical substances and products manufacturing (including agrochemicals, paints, detergents etc.). A significant presence is noted of the petroleum products industry (11 units – 16%), followed by the food and beverage industry (5 units – 7%), textile materials and products industry (5 units – 7%), sanitary equipment, plaster

[5] According to the *Statistical Classification of Economic Activities.*

etc. (2 units – 3%), metal manufacturing (2 units – 3%), electricity production and distribution (2 units – 3%) and paper industry (1 unit – 2%).

Livestock

The pig farms (34 units) of the RBD of Central Macedonia fall within the point pollution sources, as the wastewater are not suitable for fertilization, therefore, disposal and dispersion on the fields is not an option.

On the contrary, effluents from the numerous poultry units (66 farms) and cattle farm units (441 farms) as well as other units and free animal breeding -other than pig farms- end up in the fields for soil improvement or further treatment, disposal and eventual use for various purposes.

Significant livestock activity is present in the River Basins of Chalkidiki and Axios that contribute over 70% of the total livestock organic load produced in the RBD.

Landfill Sites – Uncontrolled Waste Dumping Sites

In the River Basin District (RBD) of Central Macedonia 6 Landfills (Mauroraxi, Kilkis, Anthemountas, Kassandras, Giannitsa and Poluguros) are in operation.

According to the reported data of the Ministry of Environment, Energy and Climate Change (March 2012), in the RBD of Central Macedonia, Uncontrolled Waste Dumping Sites have been restored with the exception of two sites in the Municipality of Sithonia in the Regional Unit of Chalkidiki that are not operating and will be restored.

Mines – Quarry

An important number of mines and quarries are operating in the RBD of Central Macedonia which fall under the following categories: Forty-three (43) quarries (inert materials and marbles), eleven (11) red clay exploitation sites, nine (9) quartz exploitation sites, sixteen (16) mixed mineral exploitation sites (sulfur, feldspar, magnesite, manganese). However, these do not present a significant pressure on the RBD waters.

Aquaculture

In the coastal water bodies of the RBD of Central Macedonia 84 aquaculture facilities operate. Of these, 80 facilities produce bivalve molluscs (shellfish aquacultures LONG LINE) and are located in depths of 8÷20 m within 1÷2 km from the coast within the coastal water bodies Thessaloniki Gulf and Esso Thermaikos-Michaniona. Euryhaline species are produced by 4 aquacultures (fish farms) of which three (3) are located at the coastal water body Aktes Sithonias, within 70÷250 m from the coast and one (1) is located at the coastal water body Gulf of Sigitikos, within 350 m from the coast.

In the Regional Unit of Thessaloniki at shallower waters (<6 m) there are 120 units on stakes in the Chalastra Zone, and 37 in the Zone of Kumina, while in the Regional Unit of Imathia, in the zone of Loudias-Aliakmonas there are 13,2 ha stake structures are installed.

Agriculture

In the RBD of Central Macedonia the cultivated land exceeds 50% of the total area. Pollutants flowing into water bodies amount to 16 thousand tons of nitrogen per year, approximately, and to 200 tons of phosphorus per year. The loads leaching annually towards the groundwater bodies amount at approximately 2.7 thousand tons of nitrogen and 2 tons of phosphorus.

In order to co-evaluate the individual pollution sources and quantify the total impacts on surface waters, magnitude of significant pollution pressure criteria have been determined. Taking into account magnitude of total pressure in each surface water body sub-basin, the RBD water bodies have been classified according to the assessment of the likelihood to fail to meet the environmental quality objectives set for each particular body.

Pressures due to water abstractions, hydromorphological alterations and other pressures (sand extraction, forest fires, etc) were examined separately. Pressure of water abstractions was assessed based on a comparison against the available total surface hydrologic potential, while assessment of other pressures' effect was qualitative.

The main reason for not achieving the environmental objectives of the WFD seems to be, in most cases, intensive agriculture. Nutrient accumulation results in surface water eutrophication and deoxygenation phenomena. At the same time, intense industrial and artisanal activity that has been recorded in the RBD may result with pollution of the recipient water body with priority substances, which have a negative impact on the chemical status, and special pollutants, which affect the ecological status.

Pressures on groundwater bodies affect their natural function, which, according to the Directive 2000/60/EC can be described and determined through their quantitative and chemical status. In GWB of Central Macedonia where intense pressures due to agriculture occur, groundwater level lowering is a common phenomenon. However, human activity is concentrated mainly on granular aquifers that include impermeable horizons, which act as filters retaining pollutants and also as dry barriers preventing pollutants' transfer to deeper aquifers. Therefore a very small fraction of pollutants produced by human activities end up and affect the chemical status of the GWB of the RBD.

8. STATUS OF WATER BODIES

8.1 Assessment and classification of status of surface water bodies

The quality of surface waters is defined by its ecological and chemical status. Good surface water status means the status achieved by a surface water body when both its ecological status and its chemical status are at least good.

8.1.1 Surface water bodies ecological status

Ecological status mainly concerns biological parameters, depending on the category of the water body, and secondly general physico-chemical conditions or other parameters (specific pollutants).

Out of a total of one hundred twenty four (124) surface Water Bodies in the RBD of Central Macedonia thirty two (32) are not achieving "good" status at the present. More specifically:

- The ecological status of thirty seven (37) rivers, with total length 361 km, which corresponds to 33% of total length of all rivers of the RBD, is classified as "good ecological status", while the ecological status of twenty seven (27) rivers, with a total length 283 km, which corresponds to 25% of the total length of all rivers is classified in classes lower than good. Due to lack of data, ecological status of forty (40) rivers was not determined.
- The ecological status of three (3) lakes, with a total surface 134 km^2, which corresponds to 95% of the total surface of all lakes of the RBD, is classified lower than "good", while due to lack of data, ecological status of three (3) lakes was not determined.
- The ecological status of one (1) transitional water body, with a total surface 67,6 km^2, which corresponds to 96% of the total surface of all transitional waters of the RBD, is classified under classes inferior to "good", while due to lack of data, ecological status of two (2) coastal waters was not determined.
- The ecological status of eight (8) coastal water bodies, with a total surface of 3.459 km^2, corresponding to 90% of the total surface of coastal waters of the RBD is classified as "high" or "good", while two (2) coastal water bodies, with a total surface of 390 km^2, corresponding to 10% of the total surface of the RBD coastal waters fall under classes inferior to "good". Due to lack of data, ecological status of one (1) coastal water body was not determined.

8.1.2 Surface water bodies chemical status

The criterion of classification of the chemical status of surface water bodies -in a two-class scale- is compliance with the limit values of quality objectives of certain hazardous substances in the aquatic environment. It is classified as:

- **"Good",** when all parameters meet the Environmental Quality Standards set out in the Common Ministerial Decree 51354/2641/E103/2010, Annex 1, Part A
- **"Failing to achieve good",** when even one of the parameters does not meet the Environmental Quality Standards set out in the Common Ministerial Decree 51354/2641/E103/2010, Annex 1, Part A.

The surface water bodies in the RBD of Central Macedonia with "good" chemical status are forty-three (43) and the ones "failing to achieve good" chemical status sixteen (16), while sixty five (65) are characterized as "unknown", due to the lack of priority substances monitoring data. Specifically:

- The chemical status of forty-three (43) rivers, with a total length 412 km, which corresponds to 37% of the total length of all rivers in the RBD, are classified at "good" chemical status. The chemical status of fourteen (14) rivers, with a total length 169 km, which corresponds to 15% of the total length of all rivers in the RBD, is classified as "failing to achieve good" chemical status. Due to lack of data, chemical status of forty-seven (47) rivers is not classified.
- The chemical status of two (2) lakes, with a total surface of 120 km^2, which corresponds to 85% of total surface of all lakes of the RBD, is classified as "failing to achieve good" chemical status, while due to the lack of data, chemical status of four (4) lakes was not determined.
- Due to lack of data, the chemical status of transitional and coastal water bodies was not determined.

The classification of ecological, chemical and total status for each surface water body is presented in the table below.

Table 5: Classification of surface water bodies status of the RBD of Central Macedonia

WB category	WB code	WB name	Ecological status	Chemical Status	Total status
RW	Anthemountas	GR1005R001700029H	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Anthemountas	GR1005R001700030N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Arapitsa	GR1005R000214020N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Asprolakkas	GR1005R000500023N	GOOD	FAILING TO ACHIEVE GOOD	MODERATE
RW	Aspropetra	GR1005R000204011N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Aksios	GR1003R0F0203006N	POOR	UNKNOWN	POOR
RW	Aksios	GR1003R0F0203005N	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Aksios	GR1003R0F0205007N	POOR	UNKNOWN	POOR
RW	Aksios	GR1003R0F0207010N	POOR	UNKNOWN	POOR
RW	Aksios	GR1003R0F0207009N	POOR	UNKNOWN	POOR
RW	Aksios	GR1003R0F0207008N	POOR	UNKNOWN	POOR
RW	Aksios	GR1003R0F0209013N	POOR	UNKNOWN	POOR
RW	Aksios	GR1003R0F0209012N	POOR	UNKNOWN	POOR

WB category	WB code	WB name	Ecological status	Chemical Status	Total status
RW	Aksios	GR1003R0F0209011N	POOR	UNKNOWN	POOR
RW	Aksios	GR1003R0F0201004H	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Varvaras	GR1005R000206115N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Vardarovasi	GR1003R0F0202014A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Vardarovasi	GR1003R0F0202015N	UNKNOWN	GOOD	UNKNOWN
RW	Vardarovasi	GR1003R0F0202116N	UNKNOWN	GOOD	UNKNOWN
RW	Vasdeki	GR1005R000300022N	MODERATE	FAILING TO ACHIEVE GOOD	MODERATE
RW	Vatonias	GR1005R002701035N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Vatonias	GR1005R002702038N	UNKNOWN	GOOD	UNKNOWN
RW	Vatonias	GR1005R002703036N	UNKNOWN	GOOD	UNKNOWN
RW	Vatonias	GR1005R002704040N	UNKNOWN	GOOD	UNKNOWN
RW	Vatonias	GR1005R002705037N	UNKNOWN	GOOD	UNKNOWN
RW	Vatonias	GR1005R002704039N	UNKNOWN	GOOD	UNKNOWN
RW	Mpogdanou	GR1005R000209009N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Mpogdanou	GR1005R000209008N	UNKNOWN	FAILING TO ACHIEVE GOOD	UNKNOWN
RW	Derveni	GR1005R000203005A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Derveni	GR1005R000203004A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Derveni	GR1005R000207007A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Derveni	GR1005R000205006A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Gallikos	GR1004R000201003N	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Gallikos	GR1004R000201001N	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Gallikos	GR1004R000203005N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Gallikos	GR1004R000205006N	GOOD	GOOD	GOOD
RW	Gallikos	GR1004R000206014N	GOOD	GOOD	GOOD
RW	Gallikos	GR1004R000206116N	GOOD	GOOD	GOOD
RW	Gallikos	GR1004R000206015N	GOOD	GOOD	GOOD
RW	Gallikos	GR1004R000201002N	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Gallikos	GR1004R000201004N	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Gorgopis	GR1003R0F0206026N	GOOD	GOOD	GOOD
RW	Gorgopis	GR1003R0F0206024N	GOOD	GOOD	GOOD
RW	Gorgopis	GR1003R0F0206025N	GOOD	GOOD	GOOD
RW	Kaprinikia	GR1005R003102048N	GOOD	GOOD	GOOD
RW	Kerasias	GR1005R000202010N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Koutsikarli	GR1005R000206014N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Koza	GR1003R0F0208027N	MODERATE	UNKNOWN	MODERATE
RW	Lakos	GR1005R000900025N	GOOD	GOOD	GOOD
RW	Loudias	GR1003R000400031A	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Loudias	GR1003R000400032A	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Lukorema	GR1003R0F0208130N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Mauros Lakos	GR1005R000100021N	MODERATE	FAILING TO ACHIEVE GOOD	MODERATE
RW	Maurorema	GR1003R000000001N	GOOD	GOOD	GOOD
RW	Megalo	GR1005R000208017N	POOR	UNKNOWN	POOR

WB category	WB code	WB name	Ecological status	Chemical Status	Total status
RW	Megalo	GR1004R000204011N	GOOD	GOOD	GOOD
RW	Megalo	GR1004R000204113N	GOOD	GOOD	GOOD
RW	Megalo	GR1004R000204012N	GOOD	GOOD	GOOD
RW	Megalo	GR1003R0F0208029N	GOOD	GOOD	GOOD
RW	Megalo	GR1003R0F0208028N	MODERATE	UNKNOWN	MODERATE
RW	Metalliko	GR1003R0F0204121N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Miladino	GR1005R003104050N	GOOD	GOOD	GOOD
RW	Miladino	GR1005R003104049N	GOOD	GOOD	GOOD
RW	Mulou	GR1005R001300027N	GOOD	GOOD	GOOD
RW	Mpagialtzas	GR1003R0F0204019N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Petrenio	GR1005R000700024N	GOOD	GOOD	GOOD
RW	Petrorema	GR1003R000400035N	GOOD	GOOD	GOOD
RW	Potamia	GR1005R000210018N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Psarorema	GR1003R0F0204223N	POOR	UNKNOWN	POOR
RW	Psarorema	GR1003R0F0204222N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Rema 1	GR1005R001900031N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Rema 2	GR1003R000000002N	GOOD	GOOD	GOOD
RW	Richios	GR1005R000201003N	MODERATE	UNKNOWN	MODERATE
RW	Richios	GR1005R000201002N	POOR	UNKNOWN	POOR
RW	Richios	GR1005R000201001N	POOR	UNKNOWN	POOR
RW	Salidika Mandua	GR1005R002500034N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Smiksi	GR1005R001100026N	GOOD	GOOD	GOOD
RW	Spanos	GR1004R000207007N	GOOD	GOOD	GOOD
RW	Tafros	GR1003R0F0204017A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Tafros	GR1003R0F0204120A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Tafros	GR1003R0F0204018A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Tsigano	GR1005R002100032N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Chavrias	GR1005R003101042N	GOOD	GOOD	GOOD
RW	Chavrias	GR1005R003103043N	GOOD	GOOD	GOOD
RW	Chavrias	GR1005R003105044N	GOOD	GOOD	GOOD
RW	Chavrias	GR1005R003107045N	GOOD	GOOD	GOOD
RW	Chavrias	GR1005R003109046N	GOOD	GOOD	GOOD
RW	Chavrias	GR1005R003108052N	GOOD	GOOD	GOOD
RW	Chavrias	GR1005R003110053N	GOOD	GOOD	GOOD
RW	Chavrias	GR1005R003111047N	GOOD	GOOD	GOOD
RW	Ksinoneri	GR1005R003106051N	GOOD	GOOD	GOOD
RW	Ksirolakas	GR1005R002300033N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Ksiropotamos	GR1004R000202008N	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Ksiropotamos	GR1004R000202110N	GOOD	GOOD	GOOD
RW	Ksiropotamos	GR1004R000202009N	GOOD	GOOD	GOOD
RW	Ksiropotamos	GR1003R000400034N	GOOD	GOOD	GOOD
RW	Ksiropotamos	GR1003R000400033N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Ksirorema	GR1003R000000003N	GOOD	GOOD	GOOD
RW	Cholomontas	GR1005R000206013N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Cholomontas	GR1005R000206012N	UNKNOWN	UNKNOWN	UNKNOWN

WB category	WB code	WB name	Ecological status	Chemical Status	Total status
RW	Cholomontas	GR1005R000206216N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Chora	GR1005R000212019N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Zamouni	GR1005R002900041N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Zografitikos Lakos	GR1005R001500028N	GOOD	GOOD	GOOD
LW	Volvi	GR1005L000000003N	MODERATE	FAILING TO ACHIEVE GOOD	MODERATE
LW	Koronia	GR1005L000000004N	BAD	FAILING TO ACHIEVE GOOD	BAD
LW	Pikrolimni	GR1004L000000005N	UNKNOWN	UNKNOWN	UNKNOWN
LW	Doirani	GR1003L0F0000001N	POOR	UNKNOWN	POOR
LW	Maurouda	GR1005L000000002H	UNKNOWN	UNKNOWN	UNKNOWN
LW	Artificial Lake Artzan	GR1003L000000006A	UNKNOWN	UNKNOWN	UNKNOWN
TW	Estuarine system Aksios	GR1003T0001N	POOR	UNKNOWN	POOR
TW	Lagoon Ag. Mama	GR1005T0003N	UNKNOWN	UNKNOWN	UNKNOWN
TW	Lagoon Aggelochori	GR1005T0002N	UNKNOWN	UNKNOWN	UNKNOWN
CW	Eleuthera Cape	GR1005C0001N	HIGH	UNKNOWN	UNKNOWN
CW	Athos Coast	GR1043C0003N	HIGH	UNKNOWN	UNKNOWN
CW	Kassandra Coast	GR1005C0007N	HIGH	UNKNOWN	UNKNOWN
CW	Sithonia Coast	GR1005C0005N	HIGH	UNKNOWN	UNKNOWN
CW	Ekso Thermaikos Kolpos-Kallikratia	GR1005C0009N	GOOD	UNKNOWN	UNKNOWN
CW	Eso Thermaikos Kolpos-Michaniona	GR1005C0010N	MODERATE	UNKNOWN	MODERATE
CW	Kassandrinos Gulf (Chalkidiki)	GR1005C0006N	HIGH	UNKNOWN	UNKNOWN
CW	Thessaloniki Gulf	GR1005C0011H	MODERATE	UNKNOWN	MODERATE
CW	Ierissos Gulf-Chalkidiki	GR1043C0002N	HIGH	UNKNOWN	UNKNOWN
CW	Siggitikos Gulf-Chalkidiki	GR1005C0004N	HIGH	UNKNOWN	UNKNOWN
CW	Potidaia Canal	GR1005C0008A	UNKNOWN	UNKNOWN	UNKNOWN

8.2 Assessment and classification of groundwater bodies status

The overall groundwater status is determined by its quantitative and its chemical status. “Good groundwater status” means that both its quantitative status and its chemical status are at least “good”.

8.2.1 Groundwater bodies quantitative status

The quantitative status of a ground water body is characterized as poor when either of the following occurs:

a. over 20%, of the monitoring positions have shown interannual water lowering level

b. annual water abstraction is larger than the annual recharge, resulting with a continuous increase of the pumping depth.

The quantitative status of twenty six (26) GWBs is classified as "good". These GWBs cover a surface of 6523.68 km² apx. corresponding to 64.7% of the total surface of GWBs of the RBD. The quantitative status of eight (8) GWBs, with a total surface of 3559 km², is classified as "bad". This corresponds to 35.3% of the total surface of the GWBs of the RBD of Central Macedonia.

8.2.2 Groundwater bodies quality (chemical) status

The evaluation of the chemical status of a ground water body is based on the criterion of 20% and more specifically on the rule: « if the percentage of hydropoints that exceed the maximum acceptable values is ≥20%, for the entire groundwater body, then the groundwater body has a poor chemical status». The chemical status of thirty (30) GWBs is classified as "good". The surface of these GWBs covers 7,826 km², apx., corresponding to 77.6% of the total surface of GWBs of the RBD, while the chemical status of six (6) GWBs, with a total surface 2,257 km², which corresponds to 22.4% of the total surface of GWBs of the RBD of Central Macedonia is classified as "bad".

Quantitative and chemical status classification results are presented in the table here below, per GWB.

Table 6: Quantitative and chemical status for each GWB in the RBD of Central Macedonia

No	GWB Code	Name	Chemical status	Quantitative status
1	GR1000010	Loudia	GOOD	GOOD
2	GR1000020	Paikou	GOOD	GOOD
3	GR1000030	Axiou	BAD	POOR
4	GR100F040	Doiranis	GOOD	POOR
5	GR1000050	Gallikou	GOOD	POOR
6	GR1000061	Subsystem Epanomis - Moudanion	BAD	POOR
7	GR1000062	Subsystem Neas Triglias	GOOD	GOOD
8	GR1000071	Subsystem Koronias	GOOD	POOR
9	GR1000072	Subsystem Volvis	GOOD	POOR
10	GR1000081	Subsystem Kato rou Anthemounta	BAD	POOR
11	GR1000082	Subsystem Galarinou- Galatistas	GOOD	GOOD
12	GR1000083	Subsystem Thermis - N. Risio	GOOD	GOOD
13	GR1000090	Kassandras	GOOD	GOOD
14	GR1000100	Ormilias	BAD	POOR
15	GR1000110	Ierissou	GOOD	GOOD
16	GR1000120	Mavroudas	GOOD	GOOD
17	GR1000131	Subsystem Asprolakka	GOOD	GOOD
18	GR1000132	Subsystem Kokkinolakka	BAD	GOOD
19	GR1000140	Olumpiadas	GOOD	GOOD
20	GR1000150	Kroussion - Kerdillion	GOOD	GOOD
21	GR1000160	Mavroneriou	GOOD	GOOD
22	GR1000170	Agiou Orous	GOOD	GOOD
23	GR1000180	Sithonias	GOOD	GOOD
24	GR1000191	Subsystem Skourion - Mavres Petres	BAD	GOOD

No	GWB Code	Name	Chemical status	Quantitative status
25	GR1000192	Subsystem Olumpiadas	GOOD	GOOD
26	GR1000193	Subsystem Holomonta - Oreokastrou	GOOD	GOOD
27	GR1000200	Neon Rodon	GOOD	GOOD
28	GR1000210	Meseou	GOOD	GOOD
29	GR1000220	Deve Koran	GOOD	GOOD
30	GR100F230	Anatolikou Paikou	GOOD	GOOD
31	GR100F240	Evzonon	GOOD	GOOD
32	GR100F250	Pontoiraklias	GOOD	GOOD
33	GR1000270	Vafiohoriou	GOOD	GOOD
34	GR100F280	Megalis Sternas	GOOD	GOOD

8.3 Heavily modified and Artificial water bodies status

The results of classification for each heavily modified and artificial water body are presented in the table below.

Table 7: Classification of HMWB and AWB potential of RBD of Central Macedonia

WB category	WB code	WB name	Ecological Potential	Chemical Status	Total status
RW	Anthemountas	GR1005R001700029H	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Aksios	GR1003R0F0201004H	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Vardarovasi	GR1003R0F0202014A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Derveni	GR1005R000203005A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Derveni	GR1005R000203004A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Derveni	GR1005R000207007A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Derveni	GR1005R000205006A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Loudias	GR1003R000400031A	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Loudias	GR1003R000400032A	POOR	FAILING TO ACHIEVE GOOD	POOR
RW	Tafros	GR1003R0F0204017A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Tafros	GR1003R0F0204120A	UNKNOWN	UNKNOWN	UNKNOWN
RW	Tafros	GR1003R0F0204018A	UNKNOWN	UNKNOWN	UNKNOWN
LW	Artificial Lake Artzan	GR1003L000000006A	UNKNOWN	UNKNOWN	UNKNOWN
LW	Maurouda	GR1005L000000002H	UNKNOWN	UNKNOWN	UNKNOWN
CW	Thessaloniki Gulf	GR1005C0011H	MODERATE	UNKNOWN	MODERATE
CW	Potidaia Canal	GR1005C00084	UNKNOWN	UNKNOWN	UNKNOWN

8.4 Classification results of WBs status of the RBD of Central Macedonia

The number and statistics of the WBs that meet the environmental objectives of the WFD, and those that fail to achieve "good" status are presented in the table below for all WB categories (rivers, lakes, transitional waters, coastal water, groundwater).

Table 8: Statistical data of WB status at the RBD of Central Macedonia

Type of WB	Status								
	Number of WBs			WB Percentage			Surface or length Percentage		
	High or Good	Less than good/Poor [*]	Unknown	High or Good	Less than good/Poor [*]	Unknown	High or Good	Less than good/Poor [*]	Unknown
Rivers	36	28	40	34.6	26.9	38.5	31.6	26.4	42.0
Lakes	0	3	3	0	50.0	50.0	0	95.9	4.1
Coastal Water	0	2	9	0	18.2	81.8	0	10.1	89.9
Transitional Waters	0	1	2	0	33.3	66.7	0	96.1	3.9
Groundwater	23	11	0	67.6	32.4	0	63.2	36.8	0

[*] "Less than good" corresponds to surface WBs status that may be "moderate", or "poor", or "bad", while "Poor" corresponds to GWBs classified at "poor" status.

8.5 Monitoring Program

8.5.1 Monitoring of surface waters

Officially established monitoring program for surface waters

The monitoring programme provided for in the Joint Ministerial Decision 140384/2011 includes a total of thirty-eight (38) monitoring sites of the surface waters of the River Basin District of Central Macedonia; twenty six (26) for surveillance and twelve (12) for operational monitoring,.

Revised Monitoring program for surface waters

The design of the Revised Monitoring Programme for surface waters was based on the new information obtained under the River Basin Management Plan, i.e. new water bodies, the analysis of anthropogenic pressures and their impact, the determination of the ecological and chemical status of surface waters and the inventory of protected areas. This programme is optimised both in terms of the monitoring sites selected, as well as the type of monitoring, the parameters and frequency of monitoring.

The revised monitoring program of the River Basin District of Central Macedonia includes forty three (43) monitoring sites in total; twenty-one (21) for surveillance and twenty two (22) for operational monitoring.

8.5.2 Monitoring of groundwater

Officially established monitoring program for groundwater

The monitoring programme of the Joint Ministerial Decision 140384/2011 includes one hundred and fourteen (114) sites for the GWBs of the RBD of Central Macedonia; six (6) for surveillance and one hundred and eight (108) for operational monitoring, for the groundwater.

Revised Monitoring program for groundwater

The design of the revised Monitoring programme for groundwater is prepared on the basis of the officially established monitoring programme as well as additional data elaborated under the RBMP and specifically, the characterization of GWBs, the analysis of anthropogenic pressures and their impacts, the inventory of protected areas and the status classification of GWBs.

The revised monitoring programme of the RBD of Central Macedonia includes one hundred and fifty-six (156) monitoring sites in total; eighty-seven (87) for surveillance and sixty-nine (69) for operational monitoring.

9. ECONOMIC ANALYSIS OF WATER USES

Article 9 §1 of the Directive 2000/60/EC states that Member states "*shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis […]*". For the estimation of cost recovery ratio, water services, users and polluters of the water resources in the respective water basins of the Water District were primarily defined. Based on that, the total cost of water services as well as the cost recovery ratio was calculated.

Firstly, the financial cost, which includes expenditures on the procurement and management of water services (operating costs, maintenance costs, administrative expenses, depreciation, and other direct costs), was estimated. Apart from that, the environmental cost was also calculated and was defined as the valuation in monetary units of the environmental impacts for water resources and related ecosystems, caused by various socio-economic activities. Finally, the resource cost was also taken into consideration. Resource cost refers to the foregone benefits that are due either to the inefficient allocation of water resources or the excessive use of water resources, i.e. water abstraction greater than the renewable water reserves. Consequently, the resource cost equals to the foregone benefits of the service that is deprived of the use of the particular natural resource, while under conditions of effective allocation this would not have happened.

The general formula for calculating the cost recovery rate for water services used was,

CRR = [(TR – Subsidy)/ TC]*100%,

where CRR is the Cost Recovery Rate, TR the total revenues (in €/year), «Subsidy» the total amount of subsidies paid to the water service, and TC the economic costs (in €/year) of the water service provided.

Initially the financial cost recovery was analyzed and then the overall cost-recovery was estimated that took into consideration environmental and resource cost. The analyses were conducted for water uses and services, in order to facilitate the application of the "polluter-pays" principle. Due to the institutional and legislative structure and organization of the water service providers it was not possible to accurately reflect the revenue and expenditure (and hence cost recovery assessment) separately for water supply and sewerage services, as well as industry. This is why the cost recovery ratio for the water use in industry was based on simplified assumptions.

The cost recovery for public water supply for household – business and industry was calculated as follows:

Water supply- wastewater services: Cost categories	Water District 10
Financial Cost (million €)	107.7
Environmental Cost(million €)	18.6
Resource Cost (million €)	1.5
Total Cost (million €)	128.0
Cost Recovery Ratio	**83%**

Agriculture being the larger water consumer in the RBD, the cost recovery for organized farming is given separately here below:

Organized Farming: Cost categories	Water District 10
Financial Cost (million €)	29.1
Environmental Cost(million €)	1.2
Resource Cost (million €)	0.14
Total Cost (million €)	30.5
Cost Recovery Ratio	**56%**

Evaluating if the pricing policy is sufficient to recover the full cost and to ensure rational utilization of water resources seems not to be satisfactory in certain occasions. The economic analysis identified data collection issues and data gaps issues as well as significant differences in the unit cost between water services of similar physiology. The economic analysis conclusions produced specific measures.

10. ENVIRONMENTAL OBJECTIVES – EXEMPTIONS

In Article 4 paragraphs 4.4, 4.5, 4.6 and 4.7 of the WFD, a list of possible exemptions from the environmental objectives and a description of the terms and processes for their application are provided. The types of exemptions are:

- Article 4.4: Deadline extension
- Article 4.5: Less strict environmental objective
- Article 4.6: Temporary deterioration in status
- Article 4.7: New Modifications – Sustainable human development activities

From the total WBs identified in the RBD of Central Macedonia the list of exemptions from the achievement of environmental objectives include:

- thirteen (13) surface WBs and nine (9) GWBs, according to Article 4.4 (deadline extension)
- two (2) surface WBs and two (2) GWBs, according to Article 4.7 (new modifications- activities)

Following and applying the methodology set out for the documentation on the exemptions, the type and the exemption justification for each WB exempted under Article 4.4., are presented in the table below, as well as the measures that should be implemented.

Table 9: Exemptions from the environmental objectives in the RBD of Central Macedonia (Article 4.4)

a/a	WB Name	WB Code	WB Category	Ecological Status (SWB) / Quantitative Status (GWB)	Chemical Status	Exemption justification	Supplementary Measures
Article 4, paragraph 4.4							
Surface water bodies							
1	LOUDIAS	GR1003R0004000032A	River WB	Poor	Failing to achieve good	Disproportionate cost	SM03-10, SM04-30, SM15-10, SM15-30, SM15-40, SM17-40
2	LOUDIAS	GR1003R0004000031A	River WB	Poor	Failing to achieve good	Disproportionate cost	SM03-10, SM04-30, SM15-10, SM15-30, SM15-40, SM17-40
3	AXIOS	GR1003R0F0203005N	River WB	Poor	Failing to achieve good	Disproportionate cost	SM03-10, SM15-10, SM15-20, SM15-30, SM15-40, SM15-40, SM17-40
4	AXIOS	GR1003R0F0201004H	River WB	Poor	Failing to achieve good	Disproportionate cost	SM03-10, SM04-30, SM15-10, SM15-20, SM15-30, SM15-40, SM15-40, SM17-40
5	AXIOS' ESTUARINE SYSTEM	GR1003T0001N	Transitional WB	Poor	Unknown	Disproportionate cost	SM03-10, SM04-30, SM15-10, SM15-20, SM15-30, SM15-40, SM15-40, SM17-40
6	GALLIKOS	GR1004R0002010003N	River WB	Poor	Failing to achieve good	Disproportionate cost	SM03-10, SM04-10, SM15-10, SM15-30, SM15-40, SM17-40
7	GALLIKOS	GR1004R0002010002N	River WB	Poor	Failing to achieve good	Disproportionate cost	SM02-10, SM03-10, SM04-10, SM15-10, SM15-30, SM15-40, SM17-40
8	GALLIKOS	GR1004R0002010001N	River WB	Poor	Failing to achieve good	Disproportionate cost	SM03-10, SM15-10, SM15-30, SM15-40, SM17-40
9	LAKE KORONIA	GR1005L0000000004N	Lake WB	Bad	Failing to achieve good	Technically unfeasible	SM02-10, SM03-10, SM04-30, SM07-10, SM15-10, SM15-30, SM15-40, SM17-10, SM17-40
10	LAKE VOLVI	GR1005L0000000003N	Lake WB	Moderate	Failing to achieve good	Technically unfeasible	SM03-10, SM15-10, SM15-30, SM15-40, SM17-30, SM17-40
11	ANTHEMOUNTAS	GR1005R0017000029H	River WB	Poor	Failing to achieve good	Technically unfeasible	SM03-10, SM04-10, SM15-10, SM15-30, SM15-40, SM17-40
12	MAVROS LAKOS	GR1005R0001000021N	River WB	Moderate	Failing to achieve good	Technically unfeasible	SM03-10, SM15-10, SM15-30, SM15-40, SM17-40
13	GULF OF THESSALONIKI	GR1005C0011H	Coastal WB	Moderate	Unknown	Technically unfeasible	SM03-10, SM04-10, SM05-50, SM07-20, SM11-80, SM15-10, SM15-30, SM15-40, SM17-40, SM17-70, SM17-80, SM17-90

a/a	WB Name	WB Code	WB Category	Ecological Status (SWB) / Quantitative Status (GWB)	Chemical Status	Exemption justification	Supplementary Measures
Ground water bodies							
1	AXIOS	GR1000030	Ground WB	Poor	Bad	Technically unfeasible	SM03-10, SM04-30, SM05-30, SM05-40, SM11-50, SM11-70, SM15-10, SM15-30, SM15-40, SM16-10, SM16-20, SM17-40,
2	DOIRANI	GR100F040	Ground WB	Poor	Good	Technically unfeasible	SM03-10, SM04-30, SM08-20, SM15-10, SM15-30, SM15-40, SM17-40,
3	GALLIKOS	GR1000050	Ground WB	Poor	Good	Technically unfeasible	SM03-10, SM15-10, SM15-30, SM15-40, SM16-10, SM16-20, SM17-40,
4	KOKKINO LAKAS SUBSYSTEM	GR1000132	Ground WB (Subsystem)	Good	Bad	Technically unfeasible	SM03-10, SM05-30, SM15-10, SM15-30, SM15-40, SM17-40,
5	EPANOMI-MOUDANIA SUBSYSTEM	GR1000061	Ground WB (Subsystem)	Poor	Bad	Technically unfeasible	SM03-10, SM04-20, SM04-30, SM05-30, SM08-30, SM08-40, SM15-10, SM15-30, SM15-40, SM16-10, SM17-40,
6	KORONIA SUBSYSTEM	GR1000071	Ground WB (Subsystem)	Poor	Good	Technically unfeasible	SM03-10, SM04-30, SM05-40, SM07-10, SM08-20, SM15-10, SM15-30, SM15-40, SM16-10, SM17-40,
7	VOVLI SUBSYSTEM	GR1000072	Ground WB (Subsystem)	Poor	Good	Technically unfeasible	SM03-10, SM04-30, SM05-40, SM07-10, SM08-20, SM15-10, SM15-30, SM15-40, SM16-10, SM17-40,
8	KATO ROUS ANTHEMOUNTA SUBSYSTEM	GR1000081	Ground WB (Subsystem)	Poor	Bad	Technically unfeasible	SM03-10, SM0420, SM04-20 SM05-30, SM05-40, SM08-30, SM15-10, SM15-30, SM15-40, SM16-10, SM16-20, SM17-40,
9	ORMILIAS	GR1000100	Ground WB	Poor	Bad	Technically unfeasible	SM03-10, SM0420, SM04-20 SM05-30, SM08-10, SM08-30, SM08-40, SM15-10, SM15-30, SM15-40, SM16-10, SM17-40,

In the River Basin Management Plan of the RBD of Central Macedonia, future projects and activities have also been examined regarding their effect on the achievement of the environmental objectives of dependent WBs according to paragraph 7, article 4 of the WFD. These projects are presented in the Table below:

Table 10: New activities and related WBs

New activity	Short description	Related WB	Exemptions Article 4 Paragraph 7
CHAVRIA'S DAM AND NETWORKS OF CHAVRIA'S DAM	The suggested project refers to the construction of the dam Chavrias and related networks to meet the needs of drinking water in the southeastern part of Chalkidiki as well as part of the irrigation needs in the plain Ormilia, to protect the groundwater bodies and to provide flood protection of the Ormylia plain	River WB GR1005R003101043N (Chavrias)	YES
WATER SUPPLY IN SOUTHERN CHALKIDIKI – STUDY OF PETRENIA DAM IN THE AREA GOMATI AND STORAGE, TREATMENT AND DISTRIBUTION PROJECTS	The suggested projects refer to storage, treatment and distribution of surface water in reservoirs for the additional water needs of the former Municipalities of Panagia and Stageiron - Acanthus. Also, in the future and if requested, the water amounts can be allocated to cover the irrigation needs for approximately 2.700 acres.	River WB GR1005R000700024N (Petrenio)	YES
MINES IN CHALKIDIKI-HELLAS GOLD	The project refers to the utilization of Cassandra Mines and the the utilization of existing and new mining facilities, as well as extensive restorations in areas of the Municipality of Aristotle.	GWB (subsystem) GR1000191 (Skouries – Mavres Petres) GWB (subsystem) GR1000192 (Olympiada)	YES
DRIFTING NEW BOREHOLES IN THE MUNICIPALITY OF YIANNITSA AT THE PREFECTURE OF PELLA	To cover the irrigation needs in the area, the drifting of two new boreholes is scheduled at the Municipal District Yannitsa, with a depth of 250m and 200m.	GWB GR1000010 (granular system of Loudias)	NO
DRIFTING OF NEW BOREHOLES IN VARIOUS POINTS IN THE MUNICIPALITIES OF PROPONTIDA, MOUDANIA AND KALLIKRATIA	To cover the needs for water supply in the area, the drifting of 33 new boreholes in various points of the Municipalities of Propontida, Moudania and Kallikratia is scheduled with a depth of 50 to 300m.	GWB GR1000060 (Epanomis Moudania)	NO
DRILLING, DEVELOPMENT AND CONNECTION TO THE WATER SUPPLY NETWORK OF TWO NEW BOREHOLES IN PARCELS OF THE LOCAL DEPARTMENT OF PERAIAS OF THE MUNICIPALITY OF THERMAIKOS	To cover the needs for water supply in the area, the drifting of 2 new boreholes is scheduled in the local department of Peraias with a depth of 300±20m.	GWB GR1000080 (granular system of Anthemountas)	NO

New activity	Short description	Related WB	Exemptions Article 4 Paragraph 7
DRIFTING NEW BOREHOLES IN THE MUNICIPALITY OF ARISTOTELIS	Drifting and utilization of two boreholes for water supply in the wider area of the Municipal Community of Ierissos in the Municipality of Aristotelis in the region "Chilandari-Campos", in "Kryoneri" Municipal community of Ierissos and drifting a new borehole in the region of the stream "Asprolakkas' in South - South-West of the town Stratoni.	GWB (subsystem) GR1000131 (granular system of Asprolakkas)	NO
DRIFTING NEW BOREHOLES IN THE MUNICIALITY OF ARISTOTELIS AND POLYGYROY	Drifting 24 new boreholes with a depth of 50±10m to 300m in various points of the Municipalities of Aristotelis and Poluguros	GWB (subsystem) GR1000131 (granular system of Asprolakkas) GWB GR1000190 (fractured rock system of Holomontas - Oreokastro)	NO
MORPHOLOGICAL ALTERATION OF THE ANTHEMOUNTAS STREAM (PHASE B)	Morphological alteration of a part from the lowland streambed of Anthemountas stream (length 2,69km) from «Arapis Milos» to the point where it meets with the village road that links rural route of New Rudios-Souroti-Vasilika with the the highway Thessaloniki - Polygyros. The project also includes the morphological alteration of five stream parts that flow into Anthemountas for a length of approximately 100m from the riverbed of Anthemountas	River WB GR1005R001700029H (Anthemountas) GWB GR1000080 (granular system of Anthemountas)	NO
CONSTRUCTION OF ENHANCEMENT AND OPERATION WORKS FOR THE STATE AIRPORT OF THESSALONIKI “MACEDONIA”	The project is about the operation of the existing state airport of Thessaloniki with a final aircraft traffic lane length of 3.440 m and 2.400 m and completion of additional enhancement works in two phases	Coastal WB GR1005C0011H (Gulf of Thessaloniki)	NO
EXPANSION CONSTRUCTION FOR THE WATER TREATMENT PLANT OF THESSALONIKI PHASE A2	Construction of the necessary facilities, equipped with the required electromechanical equipment, of the Water Treatment Plant of Thessaloniki Phase A2, that the capacity of the plant will increase from 150.000m^3 to 300.000m ^{3} daily	Although It refers to a surface water body of the Water Basin District 09 its completion is going to have a positive impact to groundwater bodies of the Water Basin District 10 that are currently used for water supply	NO

In conclusion, for one hundred thirty-two (132) water bodies the environmental objective is to achieve good status in the year 2015, while twenty-seven (27) systems are subject to exemptions.

Programmed or new projects that have not been examined in terms of their compatibility with the WFD and the RBMP or as exemptions according to Article 4.7 are to be examined under the procedure for Environmental Permitting.

Table 11: Number of WBs that will achieve the environmental objectives by 2015 or included in the exemptions, per WB category

WB category	Achievement by 2015	Exemption	
		Article 4 Paragraph 4	Article 4 Paragraph 7
rivers	93	9	2
lakes	4	2	0
coastal	10	1	0
transitional	2	1	0
groundwater	23	9	2

The number of WBs to achieve the environmental objectives by 2015 include WBs of which the status is classified as unknown, due to lack of data. Results of the Monitoring Program for the time period 2012-2015 are expected to allow classification of their status.

In the following tables exemptions of WBs in the RBD of Central Macedonia and relevant justification are presented.

Table 12: Rivers exemption

Type of Exemption	% percentage of WBs total length	Justification	% percentage of WBs of each justification	Comments
Article 4.4	11%	1) Technical infeasibility 2) disproportionate cost 3) natural conditions	1) 80% 2) 20% 3) 0%	
Article 4.5	0%	1) Technical infeasibility 2) disproportionate cost	1) - 2) -	
Article 4.6	0%	1) natural causes (floods, droughts) 2) unforessen circumstances 3) accidents	1) - 2) - 3) -	
Article 4.7	2%	1) new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater 2) New sustainable human development activities	1) - 2) 100%	

Table 13: Lakes exemption

Type of Exemption	% percentage of WBs total surface that consists exemption	Justification	% percentage of WBs of each justification	Comments
Article 4.4	72%	1) Technical infeasibility 2) disproportionate cost 3) natural conditions	1) 100% 2) 0% 3) 0%	
Article 4.5	0%	1) Technical infeasibility 2) disproportionate cost	1) - 2) -	
Article 4.6	0%	1) natural causes (floods, droughts) 2) unforessen circumstances 3) accidents	1) - 2) - 3) -	
Article 4.7	0%	1) new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater 2) New sustainable human development activities	1) - 2) -	

Table 14: Transitional WBs exemption

Type of Exemption	% percentage of WBs total surface that consists exemption	Justification	% percentage of WBs of each justification	Comments
Article 4.4	96%	1) Technical infeasibility 2) disproportionate cost 3) natural conditions	1) 0% 2) 100% 3) 0%	
Article 4.5	0%	1) Technical infeasibility 2) disproportionate cost	1) - 2) -	
Article 4.6	0%	1) natural causes (floods, droughts) 2) unforessen circumstances 3) accidents	1) - 2) - 3) -	
Article 4.7	0%	1) new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater 2) New sustainable human development activities	1) - 2) -	

Table 15: Coastal WBs exemption

Type Exemption	% percentage of WBs total surface that consists exemption	Justification	% percentage of WBs of each justification	Comments
Article 4.4	5%	1) Technical infeasibility 2) disproportionate cost 3) natural conditions	1) 100% 2) 0% 3) 0%	
Article 4.5	0%	1) Technical infeasibility 2) disproportionate cost	1) - 2) -	
Article 4.6	0%	1) natural causes (floods, droughts) 2) unforessen circumstances 3) accidents	1) - 2) - 3) -	
Article 4.7	0%	1) new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater 2) New sustainable human development activities	1) - 2) -	

Table 16: GWBs exemptions

Type of Exemption	% percentage of WBs total surface that consists exemption	Justification	% percentage of WBs of each justification	Comments
Article 4.4	35.3%	1) Technical infeasibility 2) disproportionate cost 3) natural conditions	1) 100% 2) 0% 3) 0%	
Article 4.5	0%	1) Technical infeasibility 2) disproportionate cost	1) - 2) -	
Article 4.6	0%	1) natural causes (floods, droughts) 2) unforessen circumstances 3) accidents	1) - 2) - 3) -	
Article 4.7	3.5%	1) new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater 2) New sustainable human development activities	1) 0% 2) 100%	

11. PROGRAMME OF MEASURES

The program of measures is the key element of the River Basin Management Plan for the achievement of the 2000/60/EC Directive objectives. Measures are divided into basic and supplementary:

- **Basic measures** result from the implementation of national and European legislation on water protection, including 2000/60/EC Directive and the overall environmental policy.
- **Supplementary measures** include measures designed and implemented in addition to the basic measures in specific Water Bodies which, even after the implementation of the basic measures, are likely to fail to achieve the environmental objectives.

In the RBD of Central Macedonia **the Programme of Measures consists of seventy-six (76) measures, thirty-nine (39) basic and thirty-seven (37) supplementary**.

The Basic Measures of the Program of Measures for the Central Macedonia RBD are presented in the table below:

Table 17: Basic measures of Central Macedonia RBD

Measure code	Measure Title	Description
MEASURES TO IMPLEMENT THE COST RECOVERY PRINCIPLE (ARTICLE 9)		
0M01-01	Customization of pricing policy in a flexible and efficient way in order to serve as primary target the environmental sustainability and avoid water wastage.	Formulation of a common pricing policy for refined water for domestic use in order to curb wasting water and gradually recover the cost of water, taking into account social and environmental parameters.
MEASURES TO PROMOTE AN EFFICIENT AND SUSTAINABLE WATER USE (ARTICLE 4)		
0M02-01	Actions to enhance the operation of water supply networks of large agglomerations of the RBD. Leakage control.	The control of leakages in the water supply networks aims at detecting leaks and preventing great losses of water. It is supported by the OPESD, in the framework of the Priority Axis 2 “Water Resources Protection and Management”, within the Invitation 2.6 “Leakages Minimization projects in problematic urban water supply networks”, with a budget of 60 million Euros and a time horizon for project implementation until 2015. Leakages of any type due to defective connections or damages on pipelines, illegal connections, measurement errors, due to defective water meters or merely the absence of water meters, contribute to a non-pricing of water, which the Municipal Enterprises for Water Supply and Sewerage have estimated to be between 5 % and 45%. Methods for the detection of water losses in water distribution networks should be implemented under the responsibility of the Municipal Enterprises for Water Supply and Sewerage on an on-going basis. The detection should be followed by the repair and restore of the proper operation. The installation of water meters and/or replacement of the defective ones should be promoted. Projects involving such actions have already been integrated in the OPESD. However, such actions must be generalized as a priority in all Municipal Enterprises for Water Supply and Sewerage, where losses in the water distribution network of more than 50% occur. Indicatively, such projects for the Municipal Enterprises for Water Supply and Sewerage of Alexandria and Kilkis and for the Municipality of Kassandra are integrated in the OPESD and should be promoted with responsibility of the competent authorities. In order to extend such actions to other Municipal

Measure code	Measure Title	Description
		Enterprises for Water Supply and Sewerage, initially the losses on networks should be recorded by the respective Municipal Enterprises under the supervision of the Direction of Water and the area priorities should be set, so that similar projects can be launched within the next programming period.
0M02-02	Introduction of institutional framework and program of measures for water saving in households.	The potential for water saving at residences has been investigated in the framework of the project "Technical Support to the General Secretariat for Water for the preparation of a Programme of Measures and of the Institutional framework for Residential Water savings", funded by the OPESD. The implementation of residential water saving programs leads to the promotion of new technologies for water reuse and conservation. The relevant study, which has been completed, indicated that simple interventions in the household equipment can achieve important water savings (at least 30% in individual households and around 10% in total). The Ministry of Environment, Energy and Climate Change, through the General Secretariat for Water, started at April of 2014 examining the development of an Institutional Framework and Program of Measures for residential water savings. The measures promoted are of institutional, regulatory, financial and demonstrating character. The New Building Code foresees already the installation of water saving equipment (which will be specified by decisions of the Minister of Environment, Energy and Climate Change) in new residences.
0M02-03	Projects for the rehabilitation / enhancement of existing water supply networks.	The measure refers to the restoration of old damaged water pipes and to the reinforcement of external water supply reservoirs in order to cover increased water supply demand. These projects, aiming at the effective covering of the increasing water needs in agglomerations and municipalities, are priority projects for the implementation of the Directive.
0M02-04	Enhancing actions to contain leakages to the collective irrigation networks	It is necessary to: (1) optimize the irrigation programme through the cooperation of the Local Land Reclamation Organization with the farmers, so that the irrigation during the hours of the day with a very high temperature is avoided. If it is necessary, it is also suggested to update the irrigation programmes after recommendation of the Regional Authority and in collaboration with the supervising department of the Local Land Reclamation Organization. It is noted that the Local Land Reclamation Organizations are already obliged by the existing legislative framework to develop timeschedules and irrigation programme. (2) The water transfer infrastructure should be maintained at a high standard, under the care of the Regional Authority
0M02-05	Reorganization / rationalization of the institutional framework for the operation of management authorities of collective irrigation systems.	The framework for the operation of the Land Reclamation Organisations was enacted in 1958 and since then has been amended / supplemented by a series of acts. The measure refers to the formulation of proposals and institutional changes associated with the upgrade of operation and the clarification of the institutional framework of the Local Land Reclamation Organisations / General Land Reclamation Organisations, so that they are adapted to the current administrative structure of the State and that the irrigation water management is substantially improved. In this framework, the creation of a special group with representatives of all involved authorities is deemed necessary in order to propose the required institutional and regulatory modifications for the modernization of LLRO /GLRO operation.

Measure code	Measure Title	Description
0M02 -06	Enhancing efficient methods of crops irrigation and increasing the crops that are receptive to these methods	The measure aims to the expansion of efficient methods of irrigation, which reduce the volume of irrigation water required. Such method is the micro-irrigation, which applies in tree crops and other receptive crops.
0M02- 07	Compilation of technical specifications manual for the implementation of water reuse methods.	Drafting of a Technical Specifications Manual for the implementation of the reuse methods foreseen in the Common Ministerial Decision 145116/2.3.2011 (OJ 354B) where the following will be indicatively determined: A) The description of the potential reuse methods, in which cases the implementation of each method is recommended, the minimum implementation requirements for each method, as well as the proper and effective Implementation practices. B) The reuse study and application procedures, i.e. the successive approach stages (expression of intent - preliminary study, Environmental Impact Assessment Study, Consultation of interested Parties, Technical implementation study, Licensing, Pilot implementation, implementation), as well as the specification of responsibilities of the stakeholders.
0M02-08	Compilation of the water supply Masterplans from Municipal Water and Sewage Companies (DEYA).	Preparation of general water supply plans, which will identify water resources required to cover the medium and long term demand, will adopt the appropriate protection measures and will design the appropriate external aqueducts at a preliminary level. It is suggested that these Masterplans be developed by the Municipal Enterprises for Water Supply and Sewerage being the competent authorities. These plans should be in accordance with the provisions of the RBMPs as regards status of Water Bodies and programs of measures and should have the consent of the competent Directorate of Water.
MEASURES FOR DRINKING WATER (ARTICLE 7)		
0M03-01	Protection of abstraction projects for drinking water from surface water bodies.	Designation of a protection area around the surface water bodies that are being used for water supply, where no Water Safety Plan is being applied. These areas will be designated by the conduction of special studies. Until those studies are finished, in case of a permission request regarding either new projects and/or activities in the River Basin of the particular WB or the discharge of their wastewater in the RB, the Competent Authorities that are responsible for the environmental permitting should consider the impact of the abovementioned activities on the quality of the surface water, aiming at the preservation of the quality on the current levels. For the WBs that are designated for abstraction of drinking water, during the environmental permission of the projects regarding the utilization of the water resources, the developer of the project should deliver to the competent authorities the following: • Detailed plan of the areas designated for the protection of water, • Regulatory framework of the abovementioned designation and of the permitted activities

Measure code	Measure Title	Description
0M03-02	Designation of protection zones of works for the abstraction of drinking water.	In the drinking water abstraction infrastructure (drillings, springs, wells), and until the completion of the specific hydrogeological studies, temporary protection zones of water abstraction points are defined as follows: ❖ Zone of absolute protection I: 10-20 m around the abstraction site. ❖ Zone of controlled protection II: defined depending on the type of aquifer as follows: • Karstic systems: 1000 m upstream and both sides (recharge area) and 500m downstream of water abstraction site. • Fractured systems: 500 m upstream and on both sides (recharge area) and 300m downstream of water abstraction site. • Granular unconfined systems: perimeter with radius of 500m • Granular confined or semi-confined aquifers: perimeter with radius of 500m For the karstic and fractured systems in case no data is available regarding the piezometric level or the recharge area, a protection zone with radius equal to the abovementioned upstream distance is implemented. ❖ Zone of protection III: It refers to the recharge basin of the abstraction site and can be determined only by the aforementioned hydrogeological study. Activities in principle prohibited by zone: ❖ Protection zone I (absolute protection): The zone, which protects the immediate environment of the abstraction from pollution, is characterized as zone of full ban. Within this zone, all activities are prohibited, with the exception of the necessary works for the operation and maintenance of the water abstraction works. ❖ Protection zone II (controlled): This zone protects the drinking water mainly from the microbiological pollution (50-day zone) and from the pollution cause by human activities or works that are dangerous due to their proximity with the abstraction site. Within this zone, all activities with high polluting risk, such as (indicatively) intensive agricultural activities using pesticides – agrochemicals, livestock facilities, industrial – handicraft facilities, facilities for treatment or transfer of wastewater or solid waste, garages, quarrying and mining activities, cemeteries, and generally any relevant activity that can be a potential pollution source equal or greater than the aforementioned, are prohibited. ❖ Protection zone III (supervised): It surrounds the zones I and II and develops throughout the recharge basin that feeds the underground aquifer from which the abstraction is supplied. In Zone III the existing legislation on water protection applies. The specifications for the aforementioned hydrogeological studies will be determined by the competent authorities, under the coordination of the General Secretariat for Water.
0M03-03	Delineation of protection zones for groundwater abstraction (springs, boreholes) for drinking water abstractions > 1.000.000m³ per year.	Detailed delineation of protection zones of groundwater abstraction points (springs, drillings) for drinking water abstractions> 1.000.000 m³ per year. The elaboration of special hydrogeological studies, after the completion of which the detailed delineation will be feasible, is a prerequisite.

Measure code	Measure Title	Description
0M03-04	Protection of GWBs included in the register of protected areas as drinking water areas and issuing/amendment of the legal framework for their protection.	First, for the installation of new activities the prohibitions of the protection zone II of groundwater abstraction points for drinking with the exception of cemeteries, garages and parkings, and quarrying activities, are implemented. The installation of new activities may be permitted in specific locations after the submission of the hydrogeological study or report, depending on the size and category of the activity and after the positive decision issued by the competent Water Direction. Determination of the legislative protection framework, where the measures for the protection of the groundwater systems included in the register of protected areas will be adopted in detail.
0M03-05	Implementation of Water Safety Plans in Large Municipal Water and Sewage Companies (DEYA).	The Water Safety Plans are a holistic approach related to the qualitative management of water from the water source to the distribution, adopting the principle of multiple barriers and focusing on the need for implementation of control measures in all links of the water supply chain. The Specifications for the implementation of the Water Safety Plans were developed in the framework of the project "Technical Support to the General Secretariat for Water of the Ministry of Environment, Energy and Climate Change for the recording of the problems for the implementation of the Directive 98/83/EC on the quality of drinking water in Greece and investigation of possibilities for the adoption of Water Safety Plans", which was funded by the Operational Programme "Environment and Sustainable Development" (OPESD) and completed by 2011. It is proposed to implement the Water Safety Plans in big Municipal Enterprises for Water Supply and Sewerage, such as these of Thessaloniki, Kilkis, Thermis, Thermaikou and Pellas, aiming at safeguarding public health and adopting and implementing good practices in the drinking water supply network, through the minimization of pollutants in the drinking water and especially at its source, the right water treatment and distribution to water supply networks regardless the size of these networks.
MEASURES TO CONTROL SURFACE AND GROUNDWATER ABSTRACTIONS		
0M04-01	Monitoring surface water bodies abstractions	This measure refers to abstractions greater than 10 m^3 per day and includes the installation or modernization of existing recording equipment (water meters, water level loggers, etc.) at surface water abstraction projects. The associated necessary equipment will be determined upon issuing of a new water use license or renewal of an existing one and the relevant cost will be covered by the individual or entity that performs the abstraction of water; it is possible to provide suitable incentives for the implementation of this measure. The person or entity responsible shall be obliged to declare the start of operation of the metering equipment to the relevant Water Directorate. The measurements of the quantities of water abstracted annually will be communicated to the Water Directorate during the first ten days of November of each year.
0M04-02	Designation of Criteria for the determination of the total abstraction quantities per Water Body	This measure is aimed at investigating the possibility of establishing a methodology and criteria for determining environmental flows downstream of major water projects based on the results of the National Monitoring Network on the status of surface water bodies in the country and having as goal the development of specific standards.

Measure code	Measure Title	Description
0M04-03	Update of the Decision F16/6631/1989 which specifies the minimum and maximum of quantities of irrigation water.	The Ministerial Decision Φ16/6631/1989 defined minimum and maximum necessary quantities for rational use of irrigation water, per category of crop and per River Basin District. These limits were calculated on a monthly basis for the period April - September and can also be applied cumulatively. The calculation of the necessary quantities was done by means of the Blaney – Griddle method. The update of the abovementioned Ministerial Decision is proposed, taking into account meteorological data from 1989 onwards, as well as the provisions of the River Basin Management Plans.
0M04-04	Review of the legal framework for licensing water uses and execution of water resources exploitation projects.	The provisions of JMD 43504/2005 (Government Gazette No. 1784 B') and other relevant regulations should be revised in order to, among other things, (a) examine the compatibility of any water development project with the provisions of the River Basin Management Plan at an early stage for the timely information of stakeholders, and (b) to investigate the licensing procedure of water use for geothermal purposes
0M04-05	Creation of a data base for all water abstractions through the process of licensing water uses.	This measure refers to the unification of the basic information collected by the Water Directorates when issuing water use licenses, mainly in relation to the location of the abstraction, the quantities abstracted and the water body affected, as well as information on the accountable person or persons, so that a rationalization of controls required for compliance with the terms and conditions of each license may be achieved. The information which should be included in the registry will be determined by SSW in cooperation with the Water Directorates. The registry will be available to the regional authorities so as to facilitate the necessary checks provided for such projects.
0M04-06	Installation of monitoring systems to record groundwater bodies abstractions.	This measure requires the gradual installation of water meters in all forms of groundwater abstraction (boreholes, wells or spring water diversions) from which a volume of water equal to or greater than 10m^3 per day is abstracted, for the monitoring and control of groundwater abstractions. This measure refers to all individuals and legal entities responsible for the operation of abstraction (e.g. Municipal Water and Sewerage Companies, Municipalities, Irrigation Boards, individuals). The cost of the necessary associated equipment will be covered by the abovementioned persons or entities, while it is possible to provide incentives for the implementation of the measure. The persons or entities responsible shall be obliged to declare the start of operation of the metering equipment to the relevant Water Directorate while large users (Municipal Water and Sewerage Companies, municipalities, industries, collective irrigation networks) are obliged to report to the Water Directorate the measurement data on the quantities annually abstracted within the first ten days of November of each year.
0M04-07	Prohibition of projects for the exploitation of groundwater bodies (boreholes , wells , etc) for new water uses and the expansion of existing water use permits : • In areas with GWB in bad quantitative status • Within areas of collective irrigation systems • Within the protection zones (I and II) for the abstraction of drinking water.	In GWBs which have been determined to be in poor quantitative status, within areas serviced by collective irrigation networks and within the protection zones of drinking water abstraction points, new drilling should be forbidden in order to avoid further deterioration of their status and to protect these GWBs. This rule excludes special cases with priority to drinking water use projects and projects which can lead to a measurable decrease of abstraction from GWBs. Such projects will be reviewed and approved by the competent Water Directorate after submission of a documented hydrogeological desk study for abstractions less than 10m^3/day or a full hydrogeological study for abstractions greater than 10m^3/day. The technical specifications for the aforementioned hydrogeological studies will be determined by the competent authorities under the coordination of SSW. Within areas of collective irrigation networks, new borehole

Measure code	Measure Title	Description
		licenses may be granted to reinforce the collective irrigation network towards greenhouse water supply, protection against frost and other uses excluding irrigation.
0M04-08	Protection of the Surface Water Bodies from the direct and indirect abstractions via the correlated Ground Water Bodies	This measure refers to inland surface Water Bodies, rivers and lakes. **I.** New direct extraction and utilization of surface water from lakes and rivers is allowed under the following precincts: **i.** For river water bodies the maintenance of the minimum required downstream flow for the protection of the environment and for the guarantee of the needs of the downstream water uses will be examined, during the authorization process. **ii.**Drafting an abstraction program for the average hydrological year and a program for reduced abstractions in case of a prolonged drought to meet a) the minimum water level for the lakes and b) the minimum flow for the rivers. **iii.** In case of abstraction for irrigation, this serves collective networks and / or groups of producers Lakes Volvi and Koronia are excluded because no new direct abstractions are allowed. **II.** For abstractions from GWBs: • with association between the water level of the aquifer and the water level of SWBs and • where no other measures of the RBMP are applied, the hydraulic relation and the maximum possible abstraction of groundwater should be established by a special study (hydaulic- hydrological and hydrogeological). The Directorate of Water defines the areas for which these studies will be elaborated in priority, taking into account the RBMPs, new data from the monitoring network, other relevant studies and research, as well as the number of petitions for new abstraction works permitions. Until the completion of the above mentioned studies: - A special zone of 250 m from the shoreline is determined in which new boreholes are not permitted. - At the stage of the environmental licensing for new lake HMWBs /AWBs or for new abstractions from existing HMWBs /AWBs the above mentioned provisions should be met and especially in the case of par II here above the relevant special studies should be submitted by the concerned party. - for existing lake HMWBs /AWBs relevant provisions included in the approved environmental terms are maintained. Where rules of protection areas (as per Law 3937/2011) apply, the stricter rules are imposed. For the purposes of this measure, in areas that the coastline has not been determined, the limit of the coastline will be defined by the competent Water Directorate based on the available data regarding maximum water level of the lake. This measure aims at protecting the SWBs from impairment of water resources through direct abstractions or through abstractions from a related GWB.

Measure code	Measure Title	Description
MEASURES TO CONTROL THE ARTIFICIAL RECHARGE OF GROUNDWATER BODIES		
0M05-01	Investigation of conditions for implementing artificial recharge in groundwater bodies, as a mean of quantitative enhancement and qualitative protection of GWBs.	The artificial recharge of groundwater aquifers is an essential tool for addressing the quantitative reduction or qualitative degradation of GWBs which is caused by the various pressures on groundwater such as over-pumping, contamination, etc. This is an environmental action taking advantage of natural underground reservoirs, formed in the subsoil, for storing good quality water during the winter period to be available for use during the summer period of increasing demands. The implementation of artificial recharge aims to enhance the quantitative and qualitative upgrading of GWBs. The measure is also important due to its contribution to the mitigation and gradual repelling of the seawater intrusion front in coastal aquifers. The effectiveness of artificial recharge is determined by several factors such as the determination of the storage capacity of aquifers, the water availability in sufficient quantity for the needs of the application and in the desired quality compatible or better than the quality of the recharged groundwater body. The artificial recharge procedures described are based on the exploitation of good quality surface water and are not related to artificial recharge foreseen by the JMD 145116/8.3.2011 (Government Gazette No. 354 B'). For the implementation of artificial recharge applications it will be necessary to conduct a specific hydrogeological study which will investigate the depth of the aquifer, the presence or absence of superimposed strata, the hydraulic conductivity and the depth of enrichment. This study will incorporate the detailed design of the recharge program, the appropriate method and the best implementation procedures. Technical specifications for these Hydrogeological Studies of artificial recharge will be determined by the Special Secretariat for Water (SSW).
0M05-02	Creation of a data base for wastewater application for irrigation purposes or for artificial recharge of groundwaters (FEK354/B/08.03.2011).	Under the current institutional framework for the reuse of treated wastewater either through irrigation or through artificial recharge, the Water Directorate of the Decentralized Administration decides after the submission of the design study. The measure regards the creation of a registry of disposal areas, that will include the details of the body responsible for the construction of the project, the basic technical specifications, the Water Body affected as well as any additional monitoring measure and any data collected from monitoring that was possibly asked during the permitting procedure and was delivered to the Water Directorate. The determination of the information that should be included in the register will be determined from the Special Secretariat for Water in collaboration with the Water Directorates. The register will be available to the competent audit authorities of the Regional Unit in order to facilitate the programmed necessary audits of these projects.

Measure code	Measure Title	Description
MEASURES FOR POINT SOURCE POLLUTION		
0M06-01	Establishment of terms and conditions for the connection of industries to sewerage networks / reception of industrial waste in WWTP	The management bodies of the sewerage networks and WWTP will have to issue sewerage networks operation rules or revise the existing ones in order to define the conditions for connection of industries to sewerage networks and/or terms for the reception of industrial wastes in WWTP. For the issuance of such regulations the opinion of the Water Directorate is required. The operating rules will be communicated to the Water Directorate, to the Special Secretariat for Water as well as to the competent for the relevant controls authorities of the Region.
0M06-02	Issuing/Amendment of the legal framework for licensing of transport sewage trucks.	There is a need to adopt an integrated legal framework that will govern the licensing of tanks that transport sewage, as the existing legal framework, does not require licensing for the work of collection and transportation of urban waste. According to an earlier decision of the Ministry of Infrastructure, Transport and Networks, the licensing of tanks that transport sewage only required the issuance of a vehicle registration document, which only determines traffic issues. Severe problems arise from unmonitored management and uncontrollable disposal of urban waste transferred by the tanks to protected areas, biotopes, water bodies, surface water drains or sewers, landfills, fields etc. due to lack of a control mechanism . The measure involves the Instruction of a regulatory framework for the licensing of tanks transporting sewage that will define special measures for the positioning and control of the tanks. Indicatively: electronic monitoring for each tank, a register of licensed tanks, provision for crosschecking with industries in the area, provision for the expansion of the inspectors' network (defining the competent monitoring services and imposing strict penalties for environmental violations, (e.g. immediate collectable fines and escalation of the above with license withdraw and vehicle seizure), involvement municipalities, confirmation of the disposal of transported waste to a WWTP.
0M06-03	Promoting the design of central treatment units for agricultural and animal waste	Originally the preparation of techno-economic studies and studies of scope per Regional Unit are recommended in order to investigate the sustainability for agricultural and animal waste as well as their preliminary location so as to allow launching of their construction.
0M06-04	Creation of a data base of pollution sources (emissions, discharges and leaks).	According to the first paragraph of Article 5 of «List of emissions, discharges and leaks» of the CMD 51354/2641/E103 (GG 1909B/8.12.2010)« The Water Divisions of the Regions, based on information collected in accordance with Articles 5 and 11 of PD 51/2007, Regulation (EC) No 166/2006 and other available data, compile for each Water District or part of that District within their administrative boundaries, an List of emissions, discharges and leaks for all priority substances and pollutants listed in Part A of Annex I of this Decision, including their concentrations in sediment and biota, as appropriate.» In particular, in the context of developing a list of emissions, discharges and leaks setting up a register of pollution sources is proposed. This will include: a) registration of installations, activities and uses constituting sources of release for priority substances and specific pollutants in order to set up the relevant register, b) the description of the waste that is discharged regularly from specific sources accompanied by the chemical analysis of that waste, c)issuing circulars and other information actions for the staff of the competent departments for licensing and control

Measure code	Measure Title	Description
		d) updating the relevant licenses to various facilities. The register will include the list of emissions, discharges and leaks for all priority substances and pollutants set out in Appendix I to CMD 51354/2641/E103/2010 in accordance with the provisions of Article 5 of the CMD. The register records the potential sources of pollution and forms the basis for an action plan to reduce the above mentioned substances if the increased concentrations of certain substances are due to anthropogenic causes or natural processes it should be investigated in the context of that measure. In addition, the register will assist the licensing authorities with locating all the bound plants and to proceed with the modification of the environmental licenses, where necessary and other relevant requirements deriving from the legislation.
0M06-05	Establishment of criteria for licensing new / expansion of existing aquaculture units.	During the licensing process of new or the expansion of existing aquaculture units in water bodies whose status is characterized as bad, it must be demonstrated that in the immediate area of the units' installation, the status of the water bodies is good according to the Directive 2000/60/EC. The classification of the water bodies' status as bad is presumed by the Water Management Plans and the results of the National Monitoring Program of JMD 140384 (GG 2017/B/9.92011), which is in progress.
0M06-06	Specification of the process to control and designate zones for aquacultures in inland waters.	This measure refers to establishing special specifications and issuing a regulatory act for the designation of zones for the development of inland waters aquaculture, implementation of operation checks (frequency, intensity, infrastructure, waste), imposition of sanctions and fines in case of environmental conditions violations and / or illegal operation. The co-operation of the Special Secretariat for Water with the competent authorities of the Ministry of Rural Development and Food is required as well as with the competent authorities for environmental licensing.
0M06-07	Amendment of national legislation on urban and industrial waste water management.	The Ministerial Decision E1b/221/1965 on the management of urban and industrial waste waters and its subsequent amendments was and still is even today, the basic institutional framework that governs the disposal of urban sewage and industrial and municipal waste waters. The Ministerial Decision E1b/221/1965 was characterized as an innovative institutional framework at its time, which, however, does not cover for the modern environmental policy. The relevant provisions of Articles 2, 7, 8, 12 and 14 of the Health Act No E1b/221/1965 (GG B'138) as amended, have already been repealed, while Article 59 of the Greek Law 4042/2012 describes its universal abolition, which however brings forward poses ambiguity on an eventual legal loophole. After evaluation of the above mentioned requires the establishment of a modern legal framework for the management of urban and industrial waste water is proposed.
0M06-08	Development of a legal framework / guidelines for monitoring water quality in aquaculture units.	In the context of environmental licensing according to the Greek law 1650/86 as amended and in force with the Greek law .3010/2002 as well as protection and management of water bodies in accordance with the Greek law 3199/2003 and Presidential Decree 51/2007 the systematic monitoring of water quality in aquaculture units is provided for. The competent authorities for issuing environmental terms and water use licenses usually apply the CMD No. 46399/1352/27-6-1986 '' Quality required of surface water that are intended for : «drinking water», «bathing», «fish life in freshwater» and « shellfish waters », measuring methods, sampling frequency and analysis of surface water intended for drinking water, in compliance with the instructions of the Council of the European Communities 75/440/EEC,

Measure code	Measure Title	Description
		76/160/EEC, 78/659/EEC, 79/923/EEC and 79/869/EEC" even though it does not relate with the fish life in the sea. It has also been observed that the decisions issued do not include unified terms as to monitoring the parameters for all the units. In this context it is proposed to issue unified guidelines defining the parameters of water and sediment that should be monitored at regular time intervals in aquaculture units of coastal and inland waters in order to protect and maintain the status of the water bodies.
MEASURES FOR DIFFUSE SOURCE POLLUTION		
0M07-01	Gradual, selective conversion of conventional crops to organic	Encouragement and support (Technical & Scientific) of producers that implement conventional cultivation techniques towards conversion of crops to organic, primarily in vulnerable areas of the Directive 91/676/EEC.
0M07-02	Modernization of the institutional framework for sludge management from waste water treatment plants with emphasis on expanding the scope of its applications and review the quality characteristics of the applied sludge.	The agricultural reuse of sludge is subject to the provisions of Directive 86/278/EK which has been incorporated to the National Law with the CMD 80568/4225/91 and amended by the CMD 114218/97 (GG-1016/B/17-11-97). The Public Consultation being completed in January 2012, the Draft Common Ministerial Decision entitled «Measures, conditions and procedures for the use of sludge which derives from domestic and urban sewage treatment as well as some wastewater, in compliance with the provisions of Council Directive 86/278/EEC of the European Communities » has been drafted thereafter. This Draft modernizes and expands the scope of CMD 80568/4225/91 and aims to maximize utilization of sludge and specifically to increase the potential applications of sludge in the form of soil enhancer in agriculture, forestry, urban and suburban green sites and landscape planning. Adoption of a modern institutional framework that will promote viability in the management of sludge and reduce the amount disposed in landfills is recommended.
0M07-03	Development of specialized tools for the sustainable use of fertilizers and water.	Development of specialized tools for the determination of fertilizer treatment, in the pattern of the program «Recording of nutrients, heavy metals and Hydrodynamic Properties of Soils for the rational use of fertilizers and water and Production of Safe Products» of the Region of Central Macedonia to be applied to the nutrient- zones under Directive 91/676/EEC.
MEASURES TO DEAL WITH THE NEGATIVE IMPACT ON THE STATUS OF SURFACE WATER BODIES FROM HYDROMORPHOLOGICAL ALTERATIONS		
0M08-01	Determination of selected areas for taking materials for the needs of construction projects.	The proposed measure aims to deal in a rational and environmentally friendly way with one of the main problems of arbitrary uses and interventions in streams across the country in order to deal with the hydro morphological pressures these undergo. Preparation of a specialized assessment study per river water basin is recommended, with main objects that include: A) Determination of sediment concentration areas along the broad riverbed of streams. B) Assessment of the available quantities per region C) Ecological assessment per region focusing on natural habitat types (structure, status of preservation) on the flora (herbaceous, shrubby and arborescent emphasizing on the arborescent in a good preservation status) and on habitats of fauna species. D) Classification of the areas according to the concentration of materials and potential for abstractions, taking into consideration all of the above mentioned. The assessment is to be carried out under the responsibility of the Water Division for each River Water Basin and it should be assessed whether it subjects to the

Measure code	Measure Title	Description
		need of a Strategic Environmental Impact Assessment The objective of the measure is to manage the sediment transport and regulate the extraction of materials from the riverbed in such a way as to preserve the sustainable management of this resource and to ensure maximum protection of ecosystems developed in the relevant water bodies as well as the protection of the coastline from erosion.
0M08-02	Designation of the minimum water level for lakes	Preparation of a study is proposed for all lakes (natural, heavily modified and artificial) included in the River Basin Management Plans as water bodies, in order to designate the minimum water level is recommended. For this assessment, the following should be taken into account : • The need for periodic alterations of the drainage and flooding zone essential for the life of aquatic organisms, the riparian vegetation and dependent fauna. • Requirements for water storage, intended for human use (taking into account the possibility of safety reserves for use during drought) • Ensuring the desired uses in the riparian zone to the maximum possible extent. • Avoiding unhealthy and unaesthetic conditions due to the creation of water ponds at the zone between minimum and maximum lake water level where the development of septic conditions and insects is favored. The following should also be addressed: • the most complete and fast possible draining of the zone between minimum and maximum lake water level during the periodic water level variations • Avoiding drop of the water level below the minimum designated value. • The quickest possible lake recovery in case the water level falls below the minimum designated water level. Specifications will be prepared by the Special Secretariat for Water by 2015.
SPECIAL MEASURES FOR PRIORITY SUBSTANCES AND OTHER POLLUTANTS		
0M10-01	Designation of emissions levels for each river basin for priority substances and other pollutants included in JMD 51354/2641/E103/2010 as well as for physicochemist parameters in relation to the environmental requirements.	The aim of this measure is the designation of emission limit values for the priority substances and the other pollutants that are established in the Joint Ministerial Decision 51354/2641/E103/2010 and affect the surface water bodies. During the designation of the emission limit values, attention should be paid to the following: i The Environmental Quality Standards that are designated in terms of Annual Average concentration by the Joint Ministerial Decision 51354/2641/E103/2010. ii. The Guidance 91/271/EEC. iii. The dilution during the summer period, when the river discharge is minimum and also the dilution when the wastewater discharge from the industries or from other activities is maximum. iv. The sensitivity of the area. v. The daily and annual estimated pollution load of the companies. vi. The concentration of the basic parameters of the pollution load. vii. The correlation with the protected areas for drinking water. The Emission Limit Values will be the maximum values and the wastewater of the industries or other activities developed in the RBD should conform to them in every case. Originally the Water Directorates should determine the rivers basins that are priority for their regions and then to price the activities that are essential in order to be implemented the appropriate researches and surveys in the next managing period.

Measure code	Measure Title	Description
MEASURES FOR THE PROTECTION FROM ACCIDENTS AND EXTREME NATURAL EVENTS		
0M11-01	Strengthening the synergy of the river basin management plans with the plans to cope with large scale technological accidents (SATAME) for facilities included in the IPPC and SEVESO Directives.	Setting out of a major technological accident prevention policy plan, including ways to protect water bodies from major spills and accidents, especially WBs included in the register of protected areas as well as ways of dealing with such incidents in order to protect the ecosystem (e.g. NATURA 2000 areas), and human health (systems used for or intended for human consumption). Especially for high risk establishments, according to SEVESO, the internal emergency plans should include at least the following: • the WBs in the affected area, which should be visible as points of interest in defining protection areas (and in the relevant maps) • the specification of an early warning system (mobilization in the event of a serious incident) for the responsible water authorities of the Decentralized Administrations and the Regions for the management and protection of the corresponding WBs. Similar changes may be required in the external emergency plans setting out the measures to be taken outside of the establishment in which dangerous substances are produced, used, handled or stored. The external emergency plans implementing the major technological accident prevention policy of the General Plan of Civil Protection Agency, are reviewed, tested, and where necessary updated every three years and in any case whenever there is a significant change in the operation of the establishment or as required by the instructions of the General Secretariat for Civil Protection. Responsible for the preparation of the external emergency plans are the Directorates of Civil Protection of the Decentralized Administration that produce a plan for each Decentralized Administration area which is subsequently elaborated on a regional level within the administrative boundaries of each regional unit. In this context the relevant Water Directorate should send the approved River Basin Management Plan to: (a) the competent authority for environmental licensing of SEVESO establishments in order to initiate the process for updating these licenses according to the existing legislative framework and (b) to the competent Directorates and Offices of Civil Protection of the Decentralized Administration to deal with any necessary amendments to the external emergency plans.

The Supplementary Measures of the Program of Measures for the Central Macedonia RBD are presented in the table below:

Table 18: Supplementary measures of Central Macedonia RBD

Code	Measure Title	Measure Description
Administrative Measures		
SM02-10	Provision to increase the frequency of reports on compliance monitoring with the environmental conditions upon renewal of environmental licensing for companies that operate in areas with pressures.	For companies that based on the environmental permits are required to submit annual environmental reports to the Ministry of Environment, Energy and Climate Change, it is suggested that in areas with severe pressures due to industrial activity and craft industries, increasing the frequency of the reports on one every semester to secure early recognition of possible pollution and the immediate determination of corrective measures only if proved necessary. The new reporting frequency to monitoring the compliance with the approved environmental conditions will be foreseen in the process of the next renewal of the environmental licensing of any business.

Code	Measure Title	Measure Description
Financial or fiscal measures		
SM03-10	Reform accounting systems of water providers	Configuration and application of a uniform calculation method and recording the cost of water supply by water providers, to strengthen the credibility of its estimation. Based on the available data it is indicated that (a) The way of reporting and recording cost categories is highly nonuniform and (b) there is no systematic recording costs and revenue per service (water supply and sewage with / without WWTP). Finally, the environmental and resource costs should be aggregated, with suitable methodologies. Prerequisite for this is the computerization of water supply. The configuration and application of a uniform method of recording the cost of water concerns the providers of irrigation water, in the context of which the calculation of environmental costs and the costs of the resources with suitable methodologies is essential - even to the ones served by private pumping stations. Prerequisite for the application is the elementary computerization of the providers. An annual publication of the total cost of water supply and the degree of recovery to raise awareness of the public is recommended. The disclosure is to be made in a simplified manner and provide the opportunity to the users to compare the costs.
Environmental agreements after negotiations		
SM04-10	Promotion of agreements with industries that consume large quantities of water or generate pollution in Water Bodies in order to adopt initiatives and codes of conduct.	Promotion of agreements with industries causing severe pressures in Water systems in order to achieve a long-term restoration of their ecological status. The companies will promote the creation of mechanisms responsible for the removal of the operative causes of charges and the elimination of the irreversible elements that cause environmental degradation.
SM04-20	Promotion of agreements with owners of tourist accommodation establishments	Promotion of agreements with owners of tourist accommodation establishments for the adoption of practices and technologies aiming to water saving and reuse. The accommodation establishments that are going to be part of these agreements, is possible to be rewarded with special identification marks for their participation in the effort of the water resources preservation. Their participation will contribute to upgrade their recognition, raise awareness and educate the public.
SM04-30	Promotion of producers' participation in the Agricultural Production Integrated Management Systems.	The measure concerns actions and activities of state environmental protection agencies for integration of producers or producer groups active in areas with highly contaminated water bodies in Integrated Management Systems of Agricultural Production. The implementation of such management systems ensures the proper irrigation water management, the precise implementation of fertilizer, the certified use, the quantity and quality of pesticides, the proper handling of the technical means for water resources exploitation with the main aim being a harmonious relationship between production of safe products and protection mainly of water resources, both surface and underground. The implementation process of these systems provides for the «internal inspection», ie the direct participation of the producer as controller for the implementation of the program requirements and ensures ecological agricultural techniques even beyond the requirements of the Code of Good Agricultural Practice and Cross Compliance. AGRO 2.1 & 2.2 is mentioned as an updated system covering the entire spectrum of the agricultural production and is expected to have a significant position in the arrangements of the new Common Agricultural Policy. The system is already part of the Code of Good Agricultural Practice with an effort from the Hellenic Ministry of Rural Development and Food to integrate with certain crops, such as sugar beet etc. and under subsidy.

Code	Measure Title	Measure Description
Emission Limits Values		
SM05-30	Specialised hydrogeological - hydrochemical survey to identify Groundwater bodies or parts thereof, with high concentrations of chemical elements, due to natural background.	Delineation of areas with high concentrations of chemical elements, due to natural background. (As, Fe, Mn, Mg, Cl, B, As, U, etc.) and determination of new maximum acceptable price.
SM05-40	Special protection measures in areas with groundwater bodies where geothermal and mineral waters exist.	The special protection measures for geothermal hot springs are adjusted and combined with the existing institutional framework for their protection. Firstly the prohibitions of zone II, for the protection of groundwater abstraction points for drinking water, are applied. The installation of new activities may be permitted in specific locations after submitting hydrogeological study or report depending on the size and type of activity and a favorable opinion of the competent Directorate of Water.
SM05-50	Rehabilitation of Thessaloniki Gulf by mechanical means	Collection of floating objects and response to pollution incidents by oil spills and other substances.
Recreation and Restoration of wetlands areas		
SM07-10	Series of measures related to Directive 2000/60 from the approved recovery plan of the National Park for the lakes Koroneia - Volvh and Macedonian Tembi (approval decision 58481 \ GG B 3159 \ 27.11.2012). The measures above can be applied immediately.	This measure refers to the following in order of priority: • Construction and operation of a collective irrigation network in sub basin of lake Koroneia • Actions to regulate the licensing of irrigation boreholes • Alteration of irrigation systems • Construction of conservation reservoirs • Creation and formation of wetland areas and deep habitats • Completion of infrastructure projects in wastewater collection and treatment in the lake settlements of Mygdonia • Completion of the construction of the sewerage network in the area of Lagkadas, units for reception of urban and manufacturing wastewaters and operation of a biological wastewater treatment unit • Implementation of agro-environmental actions in the area of the National Park lakes Koroneia-bulb and Macedonian Tempi • Design, implementation, organization of actions aiming to inform the public (non-material resources)
SM07-20	Integrated Coastal Monitoring of Environmental Problems in Sea Region and ways to overcome them (ICME)	The project consists of four work packages. The first work package refers to the development and application of mathematical models, which will contribute to the quality control of the coastline and sea waters of the zone that is to be intervened. For Greece, the intervention area is the Bay of Thessaloniki. The mathematical models will be based on the research program of the Seventh Framework "MyOcean". Actions in the work package 1: • Data Collection • Development of Mathematical Models • Development of Hydraulic Models • Water Quality Model and debris assessment • Evaluation of management scenarios In work package 2 the main fieldwork is going to take place. The measurements to be made in the intervention area concern the quality of water, the quality of the bottom, the quantity and quality of sediment are to be examined, etc. Measurement units will be installed at various points in the area of intervention, while mobile units will take samples from field measurements. A control center is also to be set up, collecting information thus enabling local actors to be directly aware of the water quality, and also the possible causes of pollution. The work packages 3 and 4 refer to actions of publicity and program management. Timetable: To be auctioned during the 4th quarter 2013. Duration: 24 months

Code	Measure Title	Measure Description
Monitoring abstractions		
SM08-10	Setting out terms for the protection of the granular system Ormylia after the completion of Chavrias dam	According to the management study for Chavria, Olynthus and Petrenia dams, and after the completion of the Chavrias dam construction, the supply of downstream aquifers will be reduced by 8.1hm^3. Moreover in the environmental permits is mentioned that among the objectives of the project is the protection of groundwater bodies and the response to the irrigation needs of the plain Ormylia (10,5hm^3). Therefore, after the completion of the dam and the irrigation network, at least an 8,1hm^3 reduction of the pumped water from the integrated granular system of Ormylia is recommended in order to avoid further deterioration of the quality and quantity of the system.
SM08-20	Installation of a functional valve in artesian wells	Installation of a functional valve or a pipe to balance pressure or any other suitable way to control the outflow of artesian wells, during periods of time that they are not used, several times pressurized water field discharge throughout the year creating problems of quantitive sufficiency during the irrigation and drinking water abstraction period.
SM08-30	Definition of principle restriction zones for drilling new wells for new water uses and extensions of existing uses in coastal groundwater bodies where phenomena of seawater intrusion are observed.	In coastal groundwater bodies with a poor quality status owed to seawater intrusion or phenomena of local seawater intrusion that derive from human pressures, prohibitive and / or restrictive measures are obtained for the construction of new projects of groundwater abstractions and the extension of environmental permits for existing water uses. Until the precise Definition of principle restriction zones based on the Specialised hydrogeological surveys that ought to be drafted. The institutionalization of the following restrictions is suggested. Groundwater Bodies: 1. GR1000090, GR1000130, GR1000140, GR1000110, GR1000180, GR1000200, GR1000191, GR1000192 the drilling of new wells and the expansion of existing environmental licenses is prohibited. 2. GR1000060, GR1000081, GR1000100: the drilling of new wells and the expansion of existing environmental licenses is prohibited in a zone of 5.000m width from the seawater where phenomena of seawater intrusion are observed. 3. GR1000010, GR1000030, GR1000050, GR1000193: new wells and the expansion of existing environmental licenses is prohibited in a zone of 300m width from the seawater These restrictions are intended to limit the expansion of seawater intrusion in coastal systems. The restriction zones can be expanded further with the responsibility of Water Directorates. From all the above prohibitions special cases are excluded, which by priority refer to the implementation of projects for drinking water abstraction as well as other special cases such as boreholes, aquaculture, pumping water wells, desalination plants etc. In such cases, environmental licencing is to be granted upon substantiated hydrogeological study which is to be examined and approved by the competent Directorates of Water.
SM08-40	Definition and delimitation of areas of groundwater bodies that have poor quality due to seawater intrusion or exhibit local seawater intrusion	For the coastal groundwater bodies that have poor quality status owed to seawater intrusion or exhibit local seawater intrusion, special hydrogeological surveys are to be drafted for the precise definition of restriction limits for the drilling of new boreholes and the extension of the seawater intrusion, so measures will be taken for the gradual restoration not only through prohibitions but also through reduction or even elimination of water abstractions for the existing water uses prioritizing the invention of new ways to meet the needs for irigation. The specifications for the above mentioned hydrogeological surveys are to be determined from competent authorities under the coordination of the Special Secretariat of Water.

Code	Measure Title	Measure Description
Construction projects		
SM11-10	Chavria's dam and networks of Chavria's dam	The suggested project refers to the construction of a dam on the Chavrias stream in south Chalkidiki about 3,0 Km NE from the settlement of Ormylia and also the construction of an aqueduct which in full growth (274 km) will extend to an area of 14000 km^2 and the main irrigation network of agricultural land covering a total area of 24000 hectares. The objectives of the projects are: • to meet the needs of drinking water for settlements and tourist facilities of southwest Chalkidiki, including Cassandra and Sithonia peninsulas (18,97 hm^3 of water) • to meet part of the irrigation needs of the plain Ormilia (10,5 hm^3 of water) • the protection of the groundwater bodies from seawater intrusion • flood protection of the Ormylia plain
SM11-20	Petrenia Dam in the area Gomati and storage, treatment and distribution projects	The suggested projects refer to storage, treatment and distribution of surface water in reservoirs for the additional water needs of the former Municipalities of Panagia and Stageiron - Acanthus. The total annual amount that can be allocated for water supply in these areas is 1.645.000 m^3 / year for the year 2050. Also, in the future and if requested, the above mentioned water amounts can be allocated to irrigation use of approximately 0.97 million m^3 per year.
SM11-30	Landfill Site Expansion in the area of Cassandra	The project refers to the expansion of the Landfill Site in the area of Cassandra with the construction of a supplementary cell for the deposition of waste coming from the Municipalities of Cassandra, Pallini and Chalkidiki and the restoration of the existing landfill site which operates since 1993.More specifically it includes the construction of a new landfill (with a capacity of 251.339m^3), bottom isulation projects, reduction and management of the produced leachate and biogas, upgrade of the existing support facilities for the operation of the site (leachate treatment facility, firefighting networks, electric lighting, perimeter fence etc.) , restoration of the existing landfills, construction of the necessary support facilities (leachete and biogas collection networks) and also the upgrade-expansion of the existing solid waste treatment plants.
SM11-40	Landfill Site Development in the NW part of the Regional Unit of Thessaloniki	The project refers to the necessary tasks for the refinement and gasket of Cells A3 and A4 of the landfill site in Mavrorachi, and positioning the leachate collection network (supply of pipelines and installation of these, shafts and link with existing Leachate Treatment Facility).
SM11-50	Landfill Site Restoration in the Municipality of Kilkis	The restoration of the Lanfill Site includes the following: - Configuration projects - Waterproofing projects - Leachate management projects - Leachate treatment projects - Biogas management projects - Flood control projects - Infrastructure projects (infrastructure networks, roads, tree planting, fencing, fire fighting, fire protection)
SM11-60	Landfill Site / Residue at the 4th Management Unit in Chalkidiki	It involves the construction and equipment of the 4th Municipal Landfill unit of Chalkidiki which will meet the needs for waste disposal in the Municipality of Aristotle. The capacity of the landfill (after the completion of the proposed Phase A) will be 467.000m^3 and its operating life, will be 24 years.
SM11-70	Completion of maturation processes of Fanos dam at Paionia (Kotza Dere)	In 1993 the Preliminary Design of the dam in Fanos Paionias for the Ministry for the Environment, Physical Planning and Public Works was completed, according to which an embankment dam with a clay core, 87m height and a reservoir volume of about 100 million m3 was suggested. The feasibility of the project was to ensure the water supply to cover the irrigation needs of the wider downstream area of the river Axios. The above mentioned needs are nowadays covered from the river Axios and the homonymous groundwater system of the area. These needs are increasing, and

Code	Measure Title	Measure Description
		so is the uncertainty regarding the water supply of river Axios and the prospect of meeting these needs in the future. Therefore, a significant increase of water abstraction from the already strained groundwater system of Axios appears which is to be a deterrent to the improvement of its situation. Because of the above mentioned reasons a Cost-benefit survey is suggested, study of environmental conditions, final design and tender documents for the Fanos Paionias dam.
SM11-80	Construction of the main sewer of Thessaloniki	The entire sewage system of the city of Thessaloniki, which includes the entry pumping station of the treatment plant, the existing main sewer amd the internal network, is not designed and cannot respond to high-intensity rainfalls. Hydraulic investigations from older surveys showed that by constructing a second branch at the main sewer with a length of 4.500m from the shaft 50 and the downstream, the situation is improving immensely during moderate-intensity rainfall, the particular problems from pressures and overflows are completely eliminated in cases of low-intensity rain. Therefore the construction of a second branch of the main sewer is a necessary project which will reduce the Thermaikos Gulf sewer overflows meeting its the management needs, reducing significantly the pressures into sections of the existing sewer ensuring the flexibility of the system's operation, and will cover the long-term needs for wastewater transportation to the Wastewater Treatment Plant of Thessaloniki and ensure the possibility of bypassing the existing branch of the main sewer to the Wastewater Treatment Plant of Thessaloniki during inspections - maintenance.
Educational Measures		
SM15-10	Enhancing the Environmental Education Centre of the Regional Sections	The continuation of already existing educational programs, activities and networks for environmental education, and the organization and implementation of the new Environmental Education Centers Regional units is recommended. These educational programs contribute to Inform, educate and raise awareness among students of different levels of education in relation to water management and water systems, through activities and personal experiences.
SM15-20	Management of riparian habitats and visitors, knowledge spreading and public awareness raising in protected areas	The project aims to strengthen the environmental awareness among residents of the study area, to inform the visitors about the problems and the threats to the environment, to address the risk of extinction of rare and endangered species and to create an appropriate infrastructure to enable viewing the wildlife.
SM15-30	Educational Actions to promote the prudent and rational utilization of water resources.	A constant public information campaign related to the sustainable water management and the protection of the water systems is recommended. Actions that indicatively can be implemented in some cases during this campaign are: • implementation of Information Days and training Seminars for public awareness concerning the efficient water use, the prevention of pollution caused from various activities and to promote the use of recycled water. • Strengthening educational programs in primary, secondary and higher education to develop a way of thinking and participatory behaviors that will contribute to the protection of water resources, ecological balance and the quality of life and ensure sustainable development. • Creation of a website including interactive applications concerning the sustainable water supply use in order to inform and sensitize the general public. The online platform is user friendly and allows calculation of the water use in each residence based on consumer habits and household devices. • Promote research in the field of Environmental Education, Biodiversity Protection and Conservation of Water Quality as well as the connection with scientific institutions.

Code	Measure Title	Measure Description
SM15-40	Consulting services to farmers for the improvement of implementation practices of means and supplies related to the protection of the environment.	This measure includes actions and activities designed to educate the rural community concerning the irrigation water management and the application of fertilizers and pesticides. The main objectives of the educational informative action are the conservation and improvement of the production in relation to the sustainable water use, fertilizers and pesticides aiming at the maximum protection of water systems especially those under protection. The recommended actions include designing ways of communication between the relevant management bodies, experts on irrigation methods, fertilization and plant protection, by organizing educational workshops and seminars with an emphasis on environmental protection and agricultural soil. The legislation texts and circulars are often difficult to comprehend because of their volume and special conditions listed, so there is no success in their implementation. The direct contact between specialist and producer specifies the achievement of the goal which is the harmonious correlation of water systems production and protection.
Research, development and demonstration Projects (best practices)		
SM16-10	Preparation of research studies for the artificial recharge of groundwater bodies with treated effluents from Wastewater Treatment Plants and Industrial Water Treatment Plants	Research surveys are recommended for the enrichment of groundwater systems with processed water mainly from the biggest Wastewater Treatment Plants and Cleansing Units of Industrial Waste in the Water District. In the context of the conducted surveys the effectiveness of various enrichment methods is to be studied, such as boreholes, basin infiltrations, grooves , ditches, enrichment shafts, combinatorial methods based on geological and hydrogeological conditions of the regions, financial data and quality of treated water. Moreover the recovery capacity of water through boreholes to meet irrigation needs is to be explored.
SM16-20	Integrated Green Cities (INGREENCI)	The project aims to achieve integrated management of urban green areas through education, awareness and mobilization of manpower. For this purpose the creation of a model for the sustainable design and redesign of urban space focusing on the promotion of green areas is essential, along with an integrated model of irrigation water management with emphasizing on the use of rainwater.
SM16-30	LIFE + - ACCOLAGOONS -Actions for the protection of coastal habitats and important avifauna species in areas of the NATURA 2000 network of Epanomi and Aggelohori lagoons, Greece	The project's objective is to conserve and protect the habitats of high priority along with the species than inhabit in those through a modern and innovative integrated management plan. In addition emphasis is given to the restoration of good hydrological and ecological status of the Epanomi lagoon and to the creation of new habitats that alongside with the increasing heterogeneity will enhance the biodiversity and system stability in the region.
Other measures		
SM17-10	Further investigation regarding measurements and causes of exceedances in chemical substances that are recorded in lake Koronia.	The measure refers to further investigation regarding measurements and causes of exceedances in chemical substances that are recorded in lake Koroneia.which belogs to the protected areas with codes GR1220001,GR1220009, so to provide a clear link between pressure-state and measure. The area is consistently burdened by the presence of anthropogenic activities such as the operation of major industries and lack of decontamination infrastructure such as WWTP . Recommended: A) to investigate any physical manufacturing processes of nickel and arsenic from geological formations of the particular region with further measurements and drafting a special geochemical - hydrogeological study, B) to investigate the contribution of the bottom sediment. The investigation should be done over one (1) year in at least three (3) sampling locations where they will be at least three (3) sets of sampling. Factors that should be measured in the samples include: phosphorus, copper, cyanide, lead, cadmium organophosphates and organochlorine pesticides and triazines.

Code	Measure Title	Measure Description
SM17-30	Further investigation regarding measurements and causes of exceedances in chemicals substances that are recorded in lake Volvh	The measure refers to further investigation regarding measurements and causes of exceedances in chemical substances that are recorded in lake Volvh (especially for nickel and arsenic). Recommended: A) to investigate any physical manufacturing processes of every pollutant from geological formations of the particular region with further measurements and drafting a special geochemical - hydrogeological study 2) systematic recording and monitoring of point discharges and imissions-direct and indirect l-in the lake.
SM17-40	Mitigating the Vulnerability of Water Resources in the context of climate change	The measure aims at the development of an integrated transnational cooperation in the field of water aiming to provide the basis for the implementation of national and regional action plans. The technical expertise and the applicable measures are to be transferred from the national to the regional action plans. Indicators of quality and quantity of water resources are investigated, taking into account the climate change and socio-economic conditions in order to create a map of vulnerability with respect to existing and future conditions of quality and quantity of water resources.
SM17-50	ENVI / Local Communities in Environmental Action	Main objectives of the program are the protection of the environmental resources and the encouragement of the local communities to actively participate in the environmental protection. The municipalities of Delta and Kavadarci have the common aim to protect the rivers that cross their territory, i.e. the rivers Axios and Luda Mara. Key objective of the program is the implementation of joint actions and specific interventions for the protection of the natural environment.
SM17-70	Sampling and analysis of water inside and outside the port of Thessaloniki	Sampling and analysis of sea water, twice a year at three fixed points within the port of Thessaloniki and one outside the basin, in application of environmental condition 23 for the operation of the Port of Thessaloniki (Ministry of Environment, Energy and Climate Change Decision 203978/21.12.2012). The analysis' results will be posted on a relevant calendar. Sampling and measurements will be conducted by an accredited laboratory with the corresponding standard methods ELOT, ISO or DIN.. Measurements will be conducted for the following parameters: • temperature • pH • dissolved oxygen • SS (suspended solids) • petroleum hydrocarbons • Heavy metals (As, Pb, Zn, Cd, Cr, Mn, Cu, Co, Ni, Ba)
SM17-80	Further investigation regarding measurements and causes of exceedances in chemical substances in the Gulf of Thessaloniki	The measure refers to further investigation regarding measurements and causes of exceedances in specific chemical substances especially in areas affected systematically by anthropogenic activities, such as the operation of major industries and infrastructures such as WWTP, in order to provide a clear link between pressure-state and measure. Further investigation in the Gulf of Thessaloniki will be on the exceeding chemical substances in specific water systems. The investigation should be done over one (1) year in at least three (3) sampling locations where they will be at least three (3) sets of sampling. Factors that should be measured in the samples include: zinc, copper, lead, cadmium, chromium, mercury, nickel, organophosphate and organochlorine pesticides and triazines.
SM17-90	Masterplan for the Gulf of Thessaloniki	Both the Gulf of Thessaloniki and the Inner Thermaikos Gulf are important and extremely sensitive ecosystems and at the same time are: an area where fishing, tourism, maritime activities take place, the final recipient for outflows of an extensive range which includes the metropolitan center of Thessaloniki and the plain of Central Macedonia and are connected via the major rivers with Western Macedonia and FYROM. Simultaneously, they constitute an integral component of quality of life and environment of the Wider Urban Area of Thessaloniki. It is obvious but not sufficiently understood and quantified the direct and intense interaction of all land uses but also the spatial planning in the region of the

Code	Measure Title	Measure Description
		above-mentioned coastal water systems with their quality and environmental characteristics. The current state of the Gulf of Thessaloniki and the Inner Thermaikos Gulf, although improved over the past, still presents significant and varied problems associated with water contamination, the rivers sediment management flowing into the Thermaikos, the use of water and fishing resources, the protection and management of the natural environment, increased residential-tourist pressure etc. Given the complexity of those issues, the labyrinthine legislation, the administrative split of powers and responsibilities and the competitiveness of the users and uses, the preparation of a Master Plan for the sustainable protection and management of coastal aquatic systems of Thermaikos is recommended. By 2015 the compilation of specifications and the tendering procedure should be completed. The specifications of the Masterplan should include: • Monitoring the impact of industrial operation in Thermaikos Gulf, making use of the data and experience of the homonymous Special Committee of Ministry of Macedonia and Thrace. • Logging in a Geographic Information System processed waste discharge points (municipal and industrial), effluents from stormwater networks but also stormwater overflows from combined sewer networks and the creation of a geodatabase. • Completion of the aforementioned geodatabase with water level time series and outflows quality. • Designing a mathematical model of hydrodynamic water circulation, as well as a quality model concerning diffusion and degradation of pollutants (exploring the possibility of utilizing the results of the grant being awarded or ongoing programs exploring the possibility of utilizing the results of the grant being awarded or ongoing programs, studies and investigations described in measures SM07-30 & SMM17-70 & SM17-80 της δέSMης μέτρων για το Θερμαϊκό). • Creating an electronic library with all existing studies and surveys related to Thermaikos Gulf. • Investigating, costing and prioritizing, with-economic and environmental criteria, procedures and technical projects to reduce pollution of coastal water bodies.
SM17-100	Evaluation of the Dual-Use of the united canal Aliakmonas - Axios concerning the construction of a separate pipeline for water supply in the regional area of Thessaloniki.	The measure aims to the improvement of Thessaloniki water supply transport infrastructures from the river Aliakmonas in order to reduce losses and thus reduce water abstraction (in accordance with Article 4 of the Directive), as well as the prevent deterioration of its quality, in order to reduce the treatment required for the production of drinking water (in accordance with Article 7 of the Directive). The united canal Aliakmonas - Axios transports water, throughout the entire the year (365 days), for the water supply of the broader agglomeration of Thessaloniki. Any disruption this operation will create insurmountable problems in the water supply of Thessaloniki, as the Aqueduct of Aliakmonas today supplies more than 50% of the total water supply for the city. In fact, with the implementation of the A2 stage of the refinery water aqueduct of Aliakmonas, which is in the process of auctioning, the water transferred for the water supply of the city is about to be doubled reaching approximately 3,5m^3/sec. At the same time, during the irrigation season carries irrigation water (400-450 εκ. m^3 per irrigation period)to supply the area of Thessaloniki. The channel presents growth sprouting phenomena in the bottom resulting in degradation of water quality. Moreover it presents slope fracture phenomena resulting in significant leakages estimated at 30%, which is actually a loss of a significant amount of water approximately 150.000m^3/year. The above problems occur because of the technical impossibility of the general organization for land improvement of Thessaloniki to provide maintenance to the canal, also the continuous drainage of 2m^3/sec cannot be interrupted for the water supply of Thessaloniki. As a result, since 2003, when it started serving the water supply of Thessaloniki, no

Code	Measure Title	Measure Description
		large-scale maintenance or cleaning has taken place except for point intervention to restore local major fractures. At the same time, even under conditions of proper conservation and operation of the canal a slighter or greater degradation of the water quality is presented, taking into consideration the favorable growth conditions of algae (especially during the spring period, before the start of the irrigation season, when the sunshine and the air temperature are elevated and the amount of flowing water is still small), the exposure of the water in airborne pollutants derived from the strong rural and other activities on the plain of Thessaloniki and the lack of protection from accidental \ malicious actions, if transported through an open channel. In 2000 the relative preliminary study from the Ministry of Environment, Physical Planning and Public Works was completed titled "water supply in Thessaloniki by diversion dam from the river Aliakmonas to the river Axios with an independent channel", where after a techno-economic investigation an independent twin pipeline Φ1.600m for the transfer of water intended for supply with a length of about 50km, parallel and adjacent to the united canal, was proposed. For the abovementioned reasons a cost benefit study is proposed, environmental impact assessment, final design and tender documents for updating the findings of the investigation of alternatives to improve infrastructure, which will address among other technical solutions for guaranteeing regular maintenance -cleaning interventions for the united canal and the construction of a closed pipeline for water supply, with single or partial implementation of this due to the large capital cost.

Additionally, in the Central Macedonia River Basin District Management Plan, actions related to the implementation of European Directives are also included. Moreover, additional environmental activities are mentioned, which will contribute to the achievement of the objectives of the Water Basin Management Plan without being a part of it.

The implementation cost of the proposed basic measures is estimated at 32 M€ and relates mainly to projects promoting the efficient and sustainable water use and especially restoration/ enhancement/ rehabilitation of existing water supply infrastructure, with a budget of 12 M€, already included in the NSRF 2007-2013. Additionally, the implementation cost of two (2) proposed basic measures is associated with private investments related to the measurement of water abstractions.

The implementation cost of the proposed supplementary measures is estimated at 303 M €.

For the proposed supplementary measures a Cost Effectiveness Analysis (CEA) was carried out.

Based on the Directive, the CEA is used for assessing the cost-effectiveness of potential measures to be implemented in order to achieve the environmental objectives.

The analysis included the following parameters: 1. degree of effect, 2. number of relevant Water Bodies, 3. period of implementation, 4. period of efficiency, 5. social impact, 6. economic impact, 7. environmental impact, 8. synergy with other measures, 9 measure cost and 10 contribution to the durability of the Programme of Measures concerning water scarcity-drought.

Following calibration of these parameters the efficiency ratio of each measure is calculated and the measures are classified accordingly.

Moreover the Management Plan addressed two main issues (restrictions):

- the limited timeframe remaining until the year 2015,
- the limited financial capacity of the country at least until the year 2015.

Taking into account the above limitations, high efficiency was awarded to additional low cost measures of horizontal application.

For the current river basin management cycle (until 2015), it is estimated that 17 of 37 supplementary measures can be implemented, out of which eight (8) have zero or low cost of implementation.

Regarding the remaining 20 supplementary measures, actions towards their implementation are expected to be initiated during the current management cycle but implementation is expected to be completed in the next river basin management cycle (2016-2021). These measures refer to projects that either require preparatory actions and/ or construction works and/ or measures of high cost, which exceed the management and financial capacity of the current river basin management cycle.

12. CROSS BORDER COOPERATION

The international river basin of Axios is mainly shared between fYROM and Greece, while a small part belongs to Boulgaria and Serbia. The total river basin area is 22.250 km^2, of which 2.513 km^2 belong to Greece. Lake Doirani sub-basin is also part of Axios river basin. The lake surface is 39,9 km^2, apx., of which 3/5 belong to fYROM and the rest 2/5 to Greece. The lake's hydrologic basin area is 276,3 km^2, of which lay 84,5 km^2 within fYROM (31%) and 191,8 km^2 in Greece (69%).

Axios river basin is crucial for the national economy of fYROM as it covers 87% of the country and provides residence to 1.800.000 inhabitants. Urbanization, intensive industrial and agricultural activity as well as cattle breeding, in the absence of infrastructure consist the most important pressures on water resources of the area.

The majority of the settlements including major cities lacks the appropriate WWT plans. Moreover surface waters are recipients to untreated or poorly treated industrial effluents. The main potential industrial water polluters belong to the sectors of metallurgy, chemical (fertilizers) and pharmaceutical industry and oil refinery, etc.

Future projects, financed mostly by foreign agencies and institutions, include urban water supply and sewerage as well as irrigation networks,, urban and industrial WWT plans . Moreover, a large number of hydropower plans, reservoirs and dams are planned to be constructed, expected to affect the hydro-morphological elements of the river with impact on the downstream water flow.

The major inhibiting factor for the development of a joint water management plan for Axiosriver basin, during the present management period is due to the different status of the two countries relative to EU and the deriving obligation of the WFD application. Greece, being a member state, is bound to comply with the WFD and prepare the River Basin Management Plan at least for the part of the international river basin within its territory, as well as with all other relevant directives and regulations which promote the sustainable development and protection of the environment. FYROM on the other side, as candidate country, has no obligation to comply with the WFD or, to that respect, to coordinate with the aim of producing a single international river basin management plan for Axios river basin.

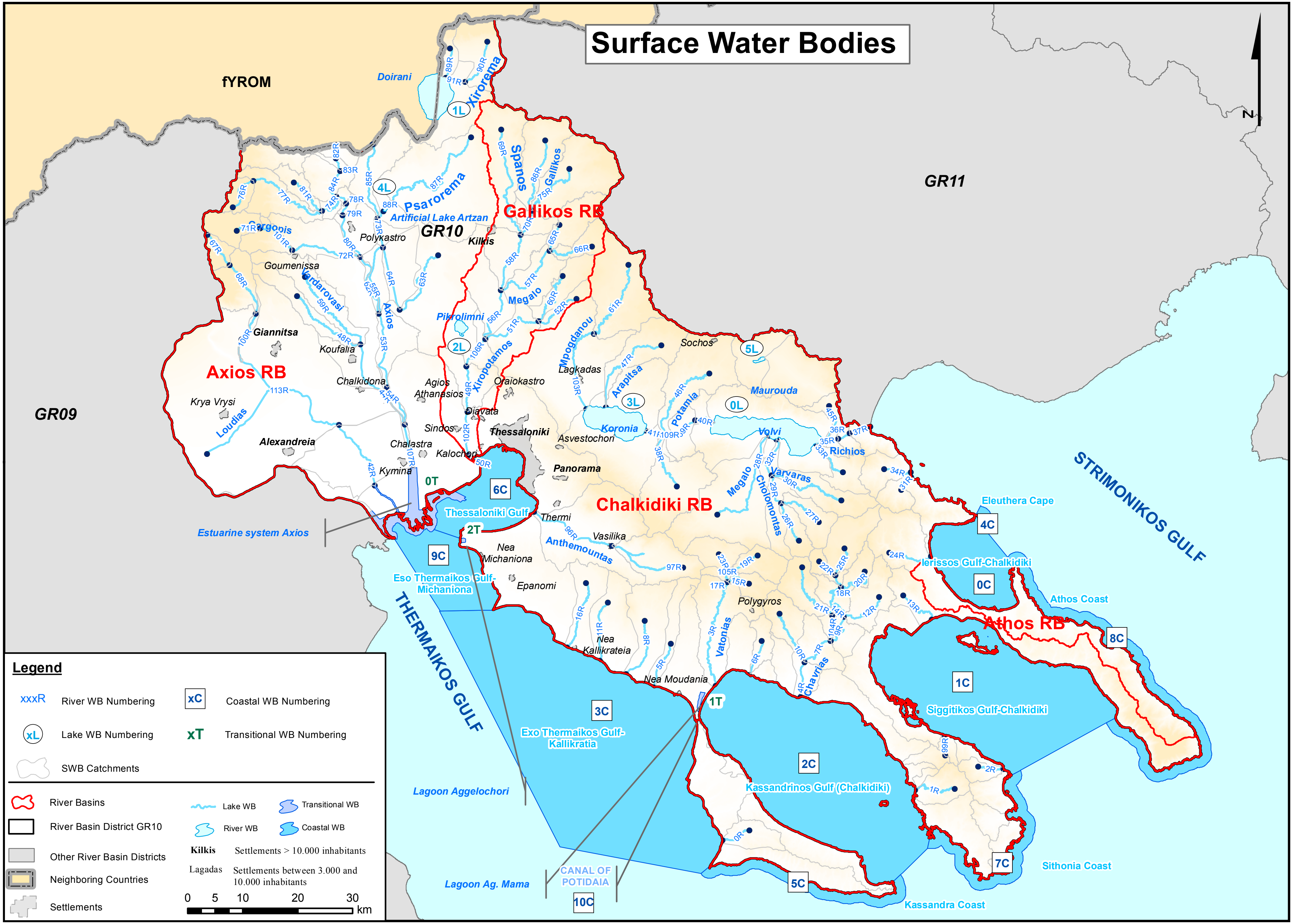
During the current, first river basin management cycle, two meetings with representatives of fYROM have taken place aiming to strengthening of cooperation between Greece and fYROM in environmental policy issues. These meetings, ended up in exchange of verbal notes.

The first meeting, took place in Athens, in June 2012 (07/06/2012), where issues such as sectoral cooperation in environmental management were discussed between representatives of the Ministries of the two countries. Moreover, the Special Secretariat for Water of the Ministry of Environment, Energy and Climate Change of Greece composed a note addressed to fYROM

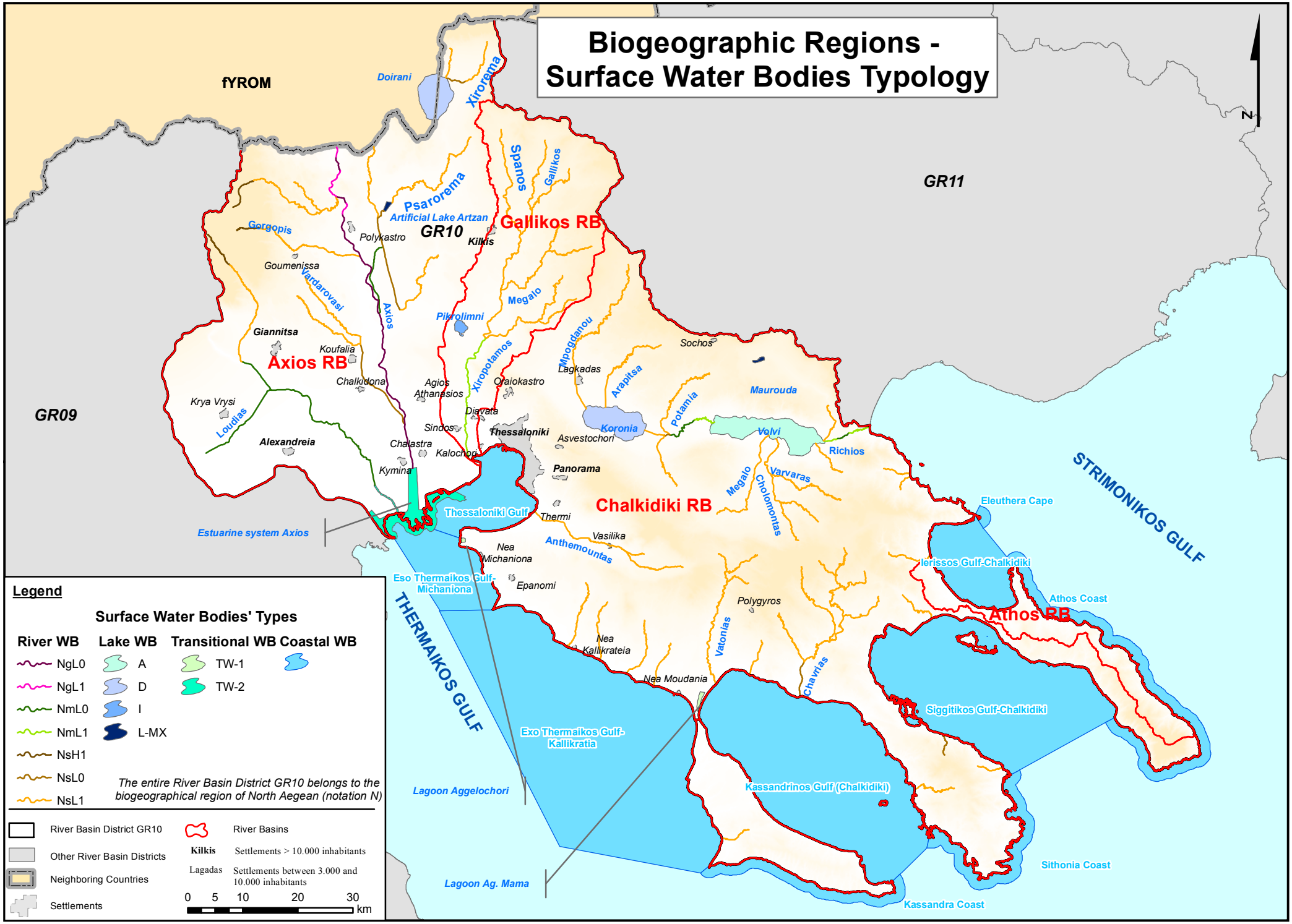
towards coordination in specific issues (EU WFD and biodiversity protection). The Greek part placed an invitation for a Bilateral Experts meeting to be held in May 2013.

The first Bilateral Expert Consultations on Environmental Affairs, with emphasis on management of transboundary waters was held in Thessaloniki, on 13 May 2013. The meeting, which was conducted in a spirit of cooperation, allowed exchange of information on Axios river, the Great Prespa Lake and Doinani Lake, presentation of actions and measures taken by Greece in the field of water policy regarding the implementation of the WFD as well as presentation of the status of approximation and enforcement of the WFD in fYROM and concluded with a view to proceed to a coordinated and sustainable management of transboundary waters shared between the two countries according to the requirements of the EU WFD. The parties agreed to establish a regular cooperation and exchange of data on transboundary waters. Next meeting is expected to be hosted by fYROM.

Appendix – Maps



Surface Water Bodies
fYROM
GR09
GR10
GR11
Axios RB
Gallikos RB
Chalkidiki RB
Athos RB
THERMAIKOS GULF
STRIMONIKOS GULF
Thessaloniki Gulf
Estuarine system Axios
Eso Thermaikos Gulf-Michaniona
Exo Thermaikos Gulf-Kallikratia
Kassandrinos Gulf (Chalkidiki)
Siggitikos Gulf-Chalkidiki
Ierissos Gulf-Chalkidiki
Eleuthera Cape
Athos Coast
Sithonia Coast
Kassandra Coast
Lagoon Aggelochori
Lagoon Ag. Mama
CANAL OF POTIDAIA
Legend
xxxR River WB Numbering
xC Coastal WB Numbering
xL Lake WB Numbering
xT Transitional WB Numbering
SWB Catchments
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
Lake WB
River WB
Transitional WB
Coastal WB
Kilkis Settlements > 10.000 inhabitants
Lagadas Settlements between 3.000 and 10.000 inhabitants
0 5 10 20 30 km
N


Biogeographic Regions -
Surface Water Bodies Typology
fYROM
Doirani
Xirorema
Spanos
Gallikos
Psarorema
Artificial Lake Artzan
Gallikos RB
GR10
GR11
GR09
Kilkis
Polykastro
Gorgopis
Goumenissa
Vardarovasi
Axios
Pikrolimni
Megalo
Giannitsa
Koufalia
Axios RB
Chalkidona
Agios Athanasios
Xiropotamos
Oraiokastro
Mpogdanou
Lagkadas
Arapitsa
Sochos
Maurouda
Krya Vrysi
Loudias
Alexandreia
Diavata
Sindos
Thessaloniki
Asvestochori
Koronia
Potamia
Volvi
Richios
Chalastra
Kalochori
Kymina
Panorama
Megalo
Cholomontas
Varvaras
Chalkidiki RB
Thessaloniki Gulf
Thermi
Vasilika
Anthemountas
Nea Michaniona
Estuarine system Axios
Eso Thermaikos Gulf-Michaniona
Epanomi
Polygyros
Athos Coast
Athos RB
Ierissos Gulf-Chalkidiki
Eleuthera Cape
STRIMONIKOS GULF
THERMAIKOS GULF
Nea Kallikrateia
Vatonias
Chavrias
Nea Moudania
Siggitikos Gulf-Chalkidiki
Exo Thermaikos Gulf-Kallikratia
Lagoon Aggelochori
Kassandrinos Gulf (Chalkidiki)
Sithonia Coast
Lagoon Ag. Mama
Kassandra Coast
N
Legend
Surface Water Bodies' Types
River WB
NgL0
NgL1
NmL0
NmL1
NsH1
NsL0
NsL1
Lake WB
A
D
I
L-MX
Transitional WB
TW-1
TW-2
Coastal WB
The entire River Basin District GR10 belongs to the biogeographical region of North Aegean (notation N)
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
River Basins
Kilkis
Settlements > 10.000 inhabitants
Lagadas
Settlements between 3.000 and 10.000 inhabitants
0 5 10 20 30
km

GWB Code	GWB Name
GR1000010	Loudias
GR1000020	Paiko
GR1000030	Axios
GR100F040	Doirani
GR1000050	Gallikos
GR1000061	subystem Epanomi Moudania
GR1000062	subsystem Nea Triglia
GR1000071	subsystem Koronia
GR1000072	subsystem Volvi
GR1000081	subsystem Anthemoundas Lower course
GR1000082	subsystem Galarinos – Galatista
GR1000083	subsystem Thermi (N) – N. Risio (S)
GR1000090	Kassandra
GR1000100	Ormilia
GR1000110	Ierissos
GR1000120	Mavrouda
GR1000131	subsystem Asrpolakkas
GR1000132	subsystem Kokkinolakkas

GWB Code	GWB Name
GR1000140	Olimpiada
GR1000150	Kroussia – Kerdillia
GR1000160	Mavroneri
GR1000170	Mount Athos
GR1000180	Sithonia
GR1000191	subsystem Skouries – Mavres Petres
GR1000192	subsystem Olimpiada
GR1000193	subsystem Cholomondas Oreokastro
GR1000200	Nea Roda
GR1000210	Meseo
GR1000220	Deve Koran
GR100F230	Eastern Paiko
GR100F240	Evzonoi
GR100F250	Pondoiraklia
GR1000270	Vafiochori
GR100F280	Megali Sterna
GR0900130	Aliakmonas Lower course

GWB Code	GWB Name
GR1000010	Loudias
GR1000020	Paiko
GR1000030	Axios
GR100F040	Doirani
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GWB Code	GWB Name
GR1000140	Olimpiada
GR1000150	Kroussia – Kerdillia
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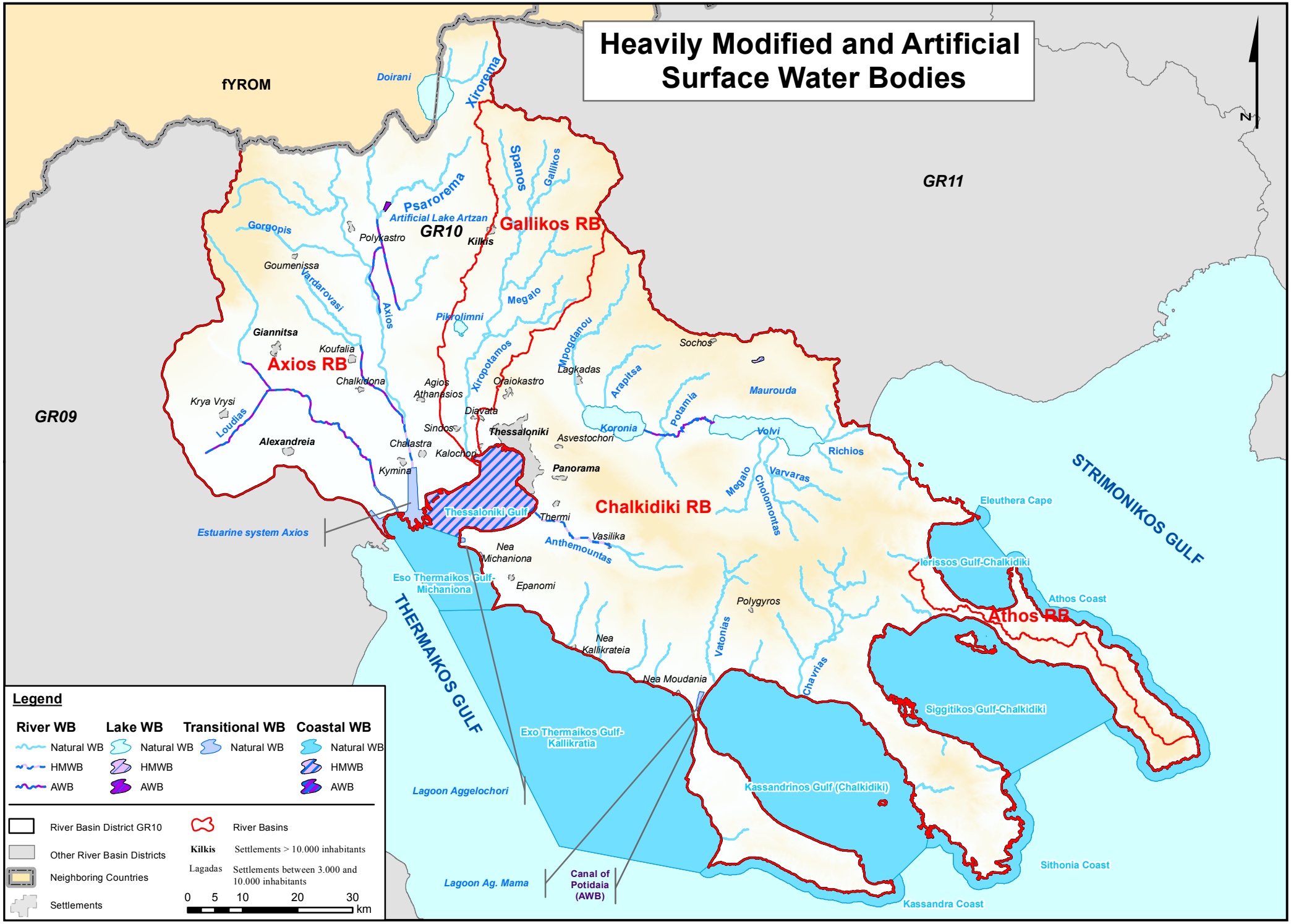
GR1000270	Vafiochori
GR100F280	Megali Sterna
GR0900130	Aliakmonas Lower course


Heavily Modified and Artificial Surface Water Bodies
fYROM
GR09
GR11
Doirani
Xirorema
Psarorema
Artificial Lake Artzan
Gorgopis
Polykastro
GR10
Kilkis
Gallikos RB
Spanos
Gallikos
Goumenissa
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Axios
Megalo
Pikrolimni
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Chalkidona
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Maurouda
Krya Vrysi
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Sindos
Thessaloniki
Asvestochori
Koronia
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Lagoon Aggelochori
Sithonia Coast
Lagoon Ag. Mama
Canal of Potidaia (AWB)
Kassandra Coast
N
Legend
River WB
Natural WB
HMWB
AWB
Lake WB
Natural WB
HMWB
AWB
Transitional WB
Natural WB
Coastal WB
Natural WB
HMWB
AWB
River Basin District GR10
Other River Basin Districts
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Settlements > 10.000 inhabitants
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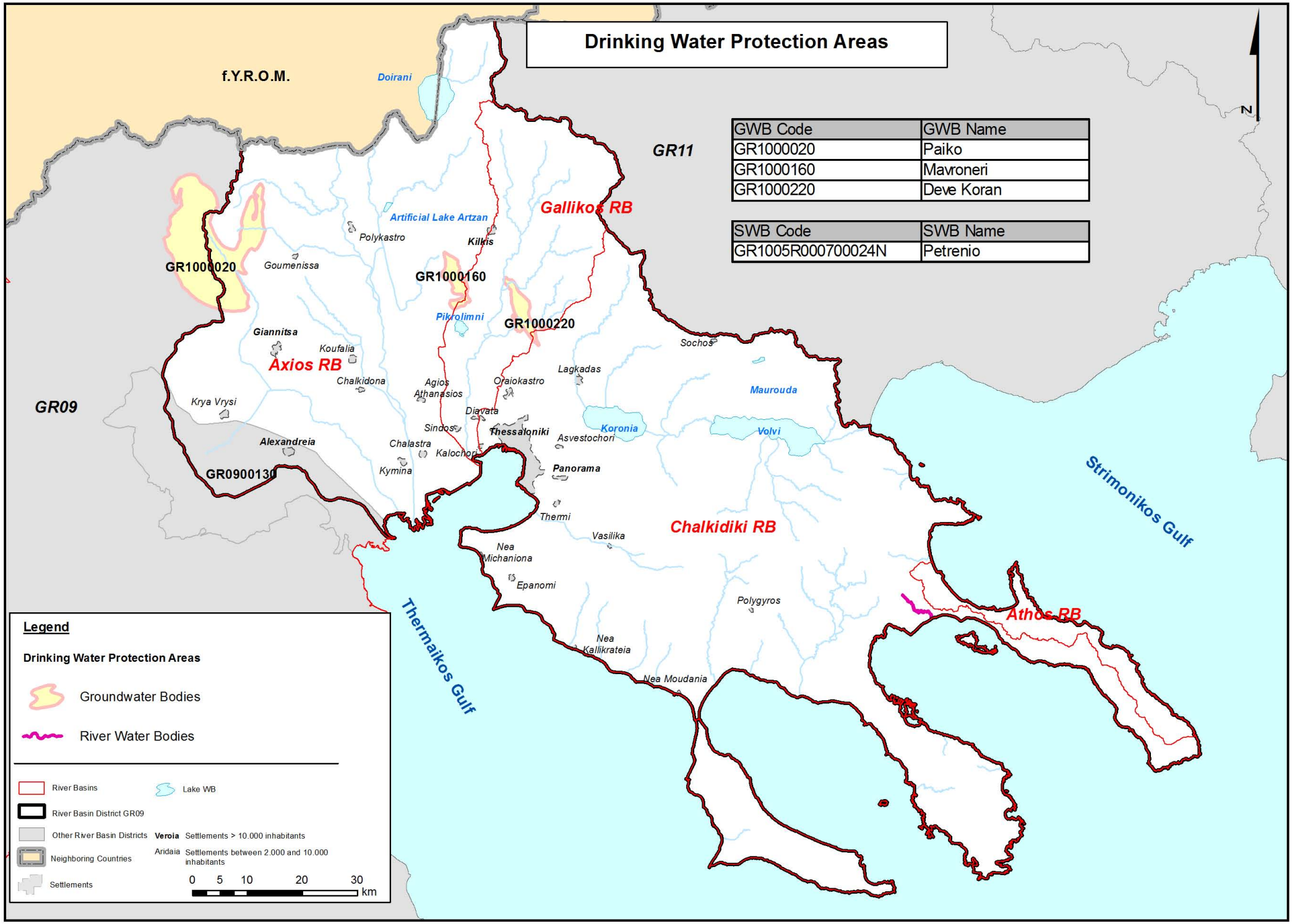
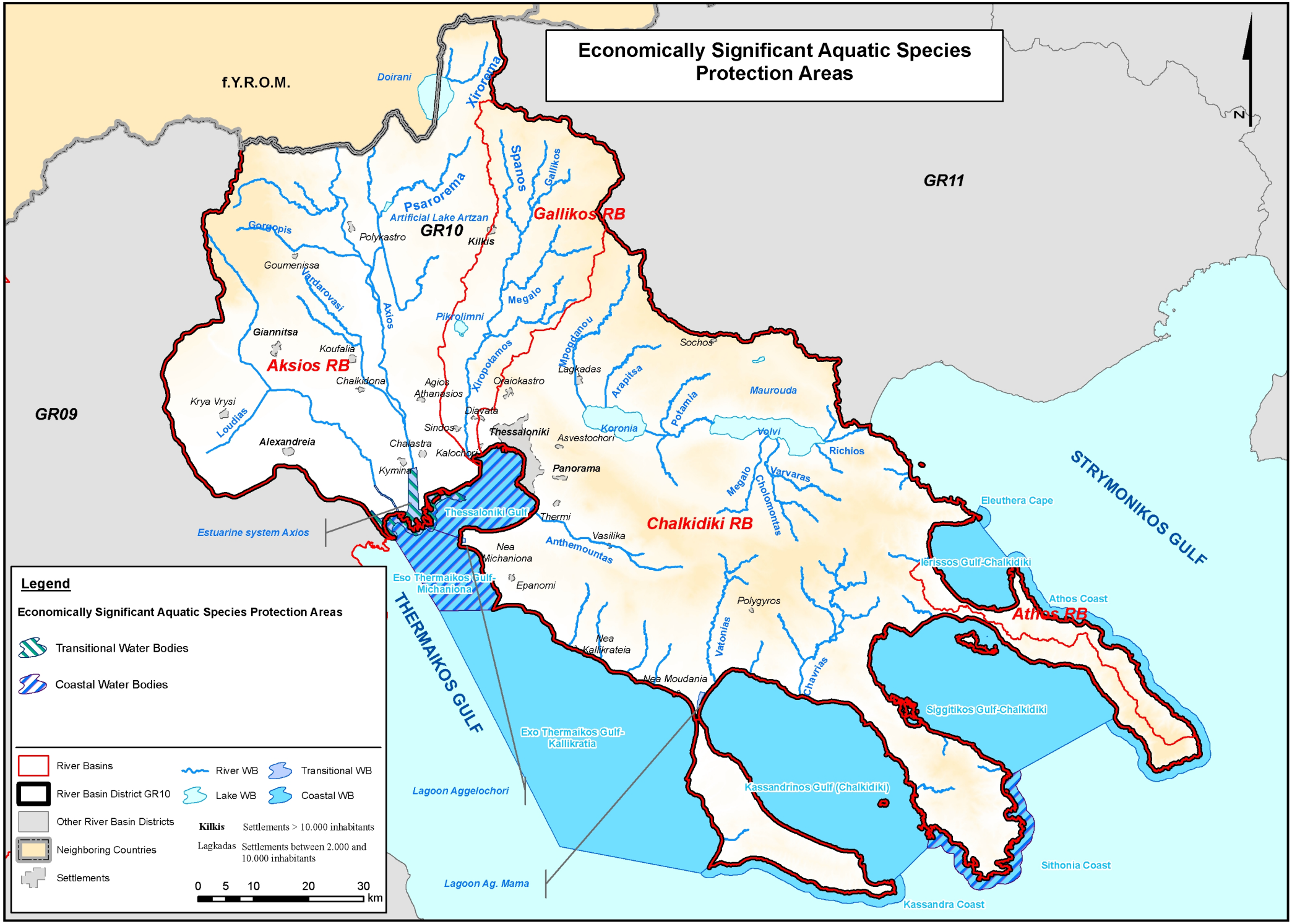
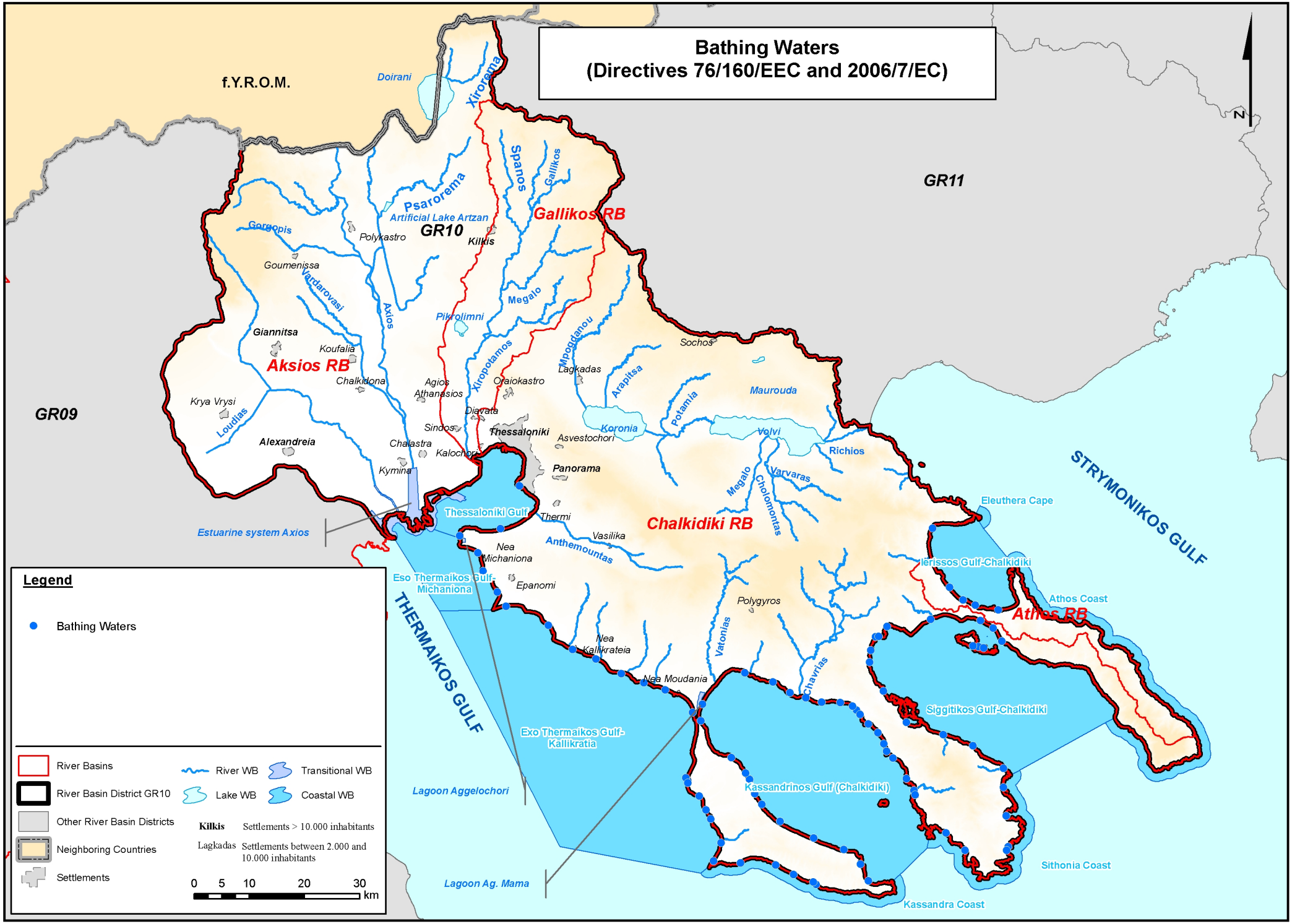
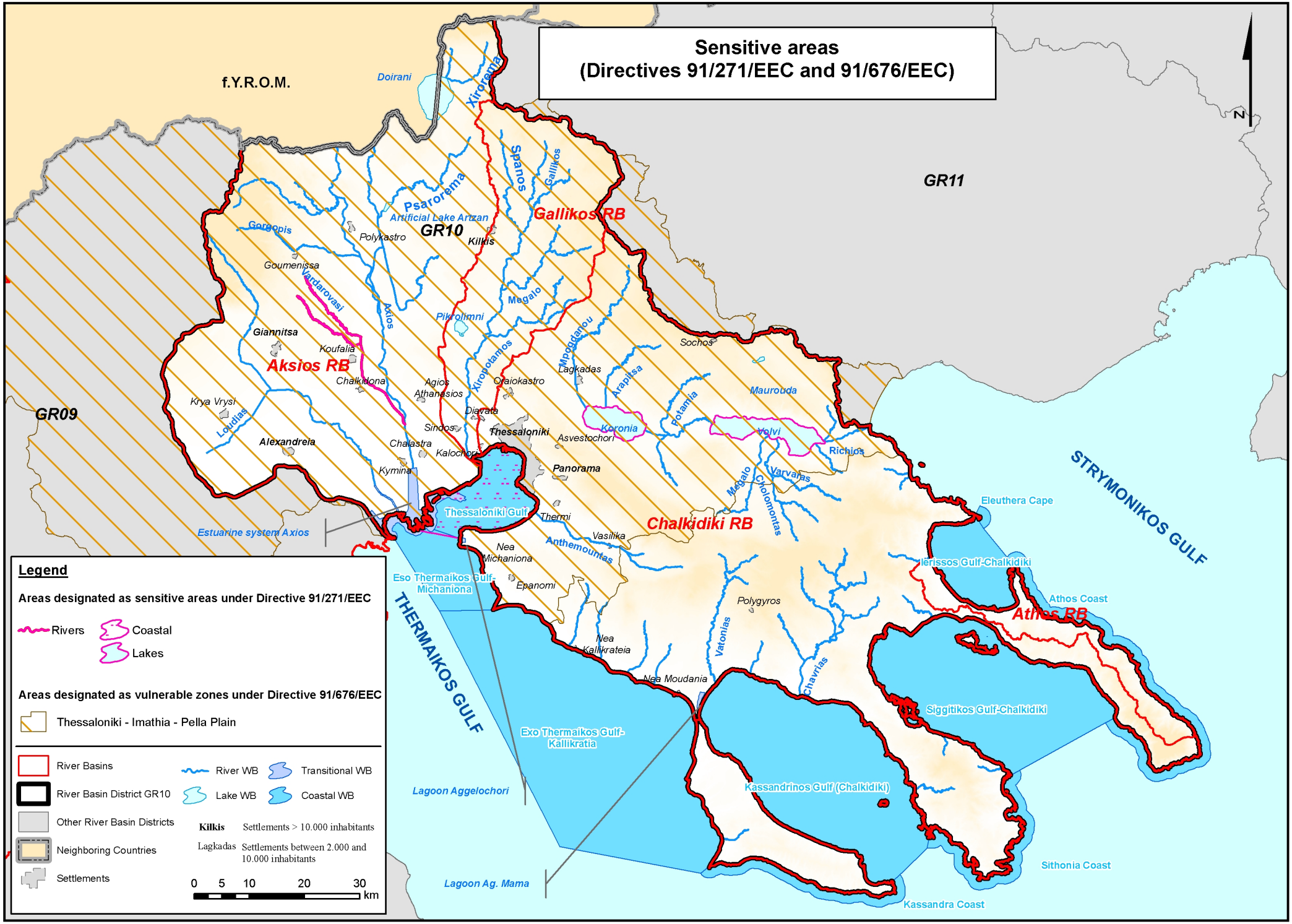
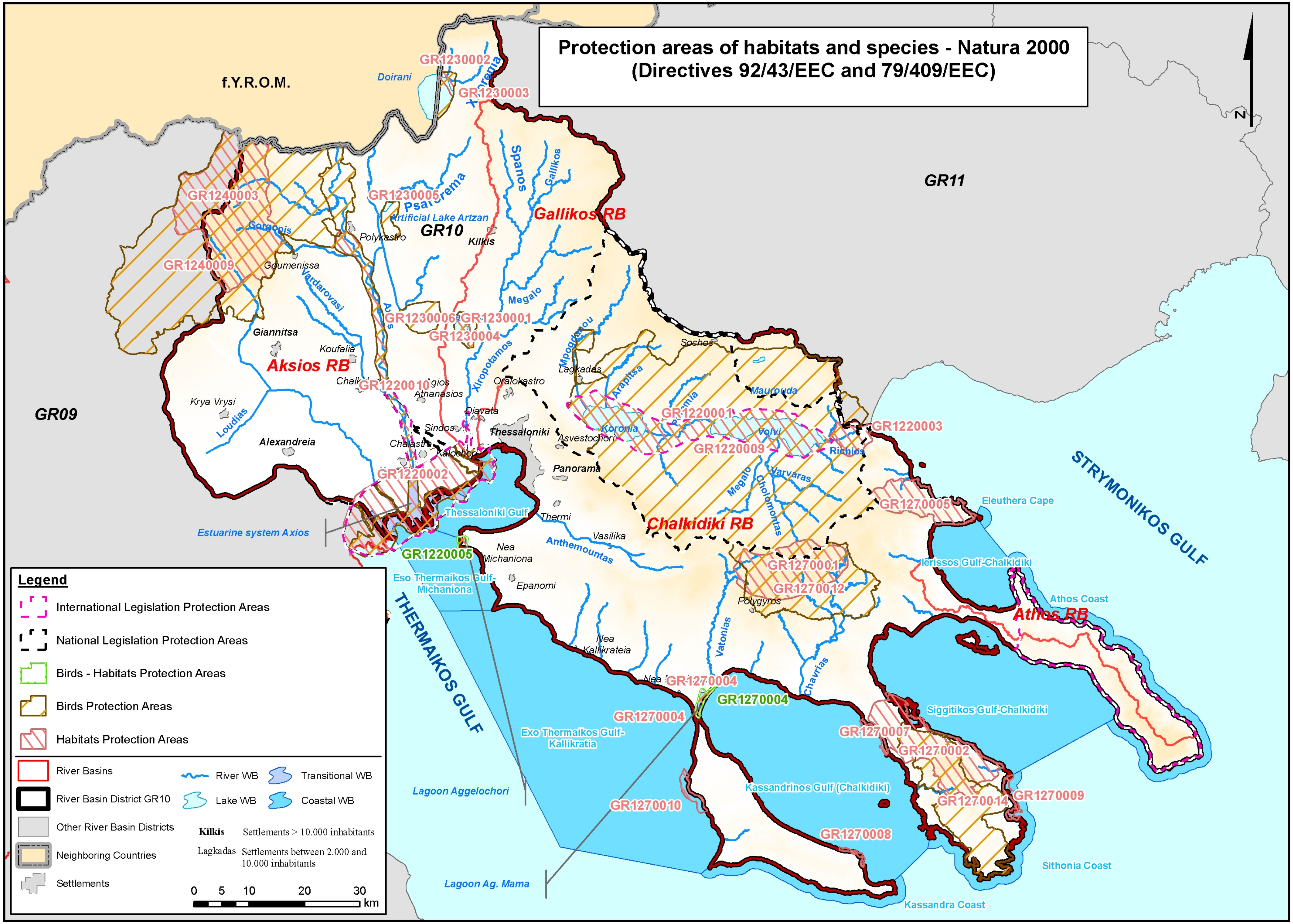
Settlements between 3.000 and 10.000 inhabitants
0 5 10 20 30
km

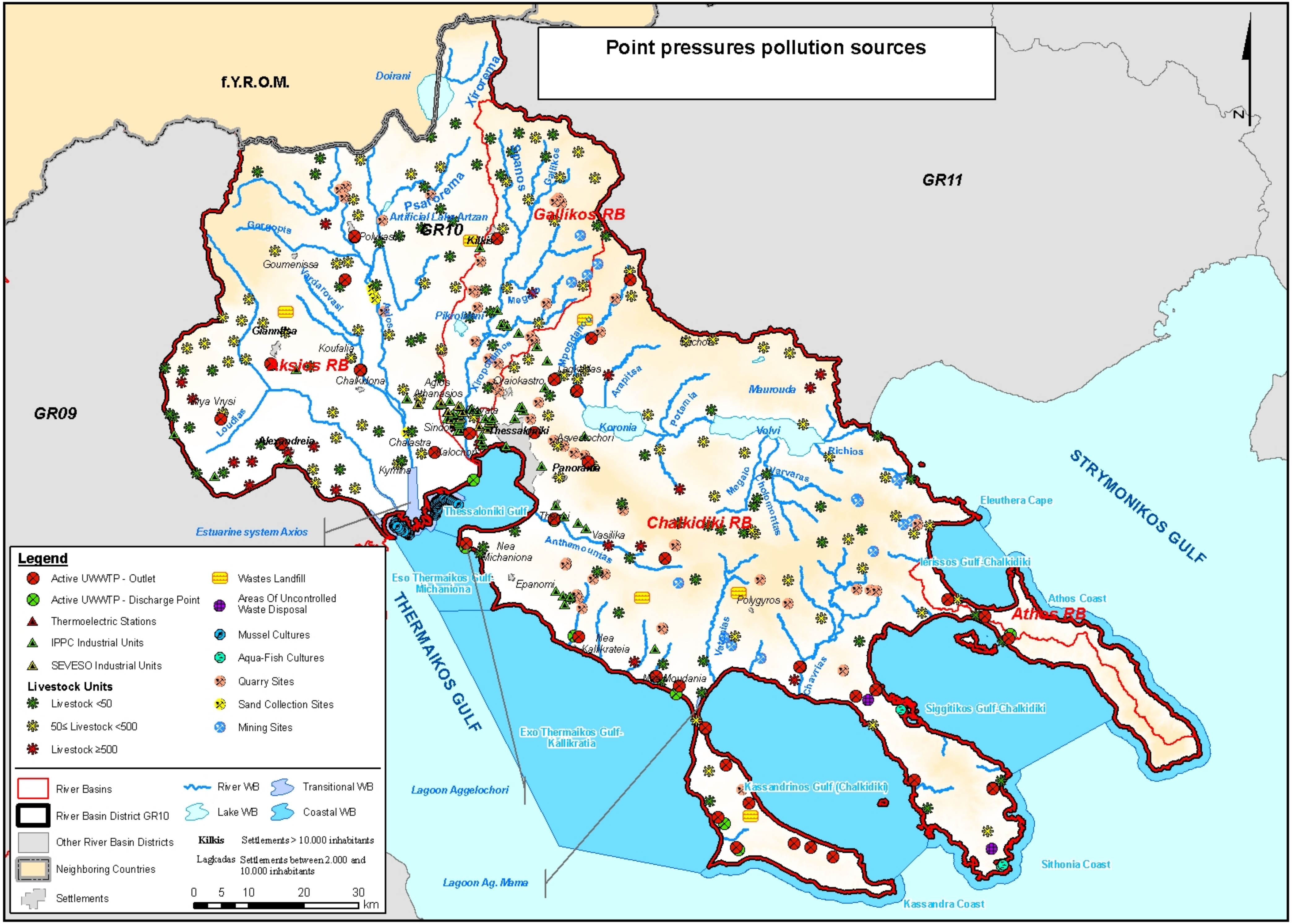

Drinking Water Protection Areas
f.Y.R.O.M.
Doirani
GR11
N
GWB Code | GWB Name
GR1000020 | Paiko
GR1000160 | Mavroneri
GR1000220 | Deve Koran
SWB Code | SWB Name
GR1005R000700024N | Petrenio
Gallikos RB
Artificial Lake Artzan
Polykastro
Kilkis
Goumenissa
GR1000020
GR1000160
Pikrolimni
GR1000220
Giannitsa
Koufalia
Axios RB
Chalkidona
Agios Athanasios
Oraiokastro
Lagkadas
Sochos
Maurouda
GR09
Krya Vrysi
Diavata
Sindos
Thessaloniki
Koronia
Volvi
Asvestochori
Alexandreia
Chalastra
Kalochori
Kymina
GR0900130
Panorama
Strimonikos Gulf
Thermi
Vasilika
Chalkidiki RB
Nea Michaniona
Epanomi
Polygyros
Athos RB
Thermaikos Gulf
Nea Kallikrateia
Nea Moudania
Legend
Drinking Water Protection Areas
Groundwater Bodies
River Water Bodies
River Basins
Lake WB
River Basin District GR09
Other River Basin Districts
Veroia Settlements > 10.000 inhabitants
Neighboring Countries
Aridaia Settlements between 2.000 and 10.000 inhabitants
Settlements
0 5 10 20 30
km

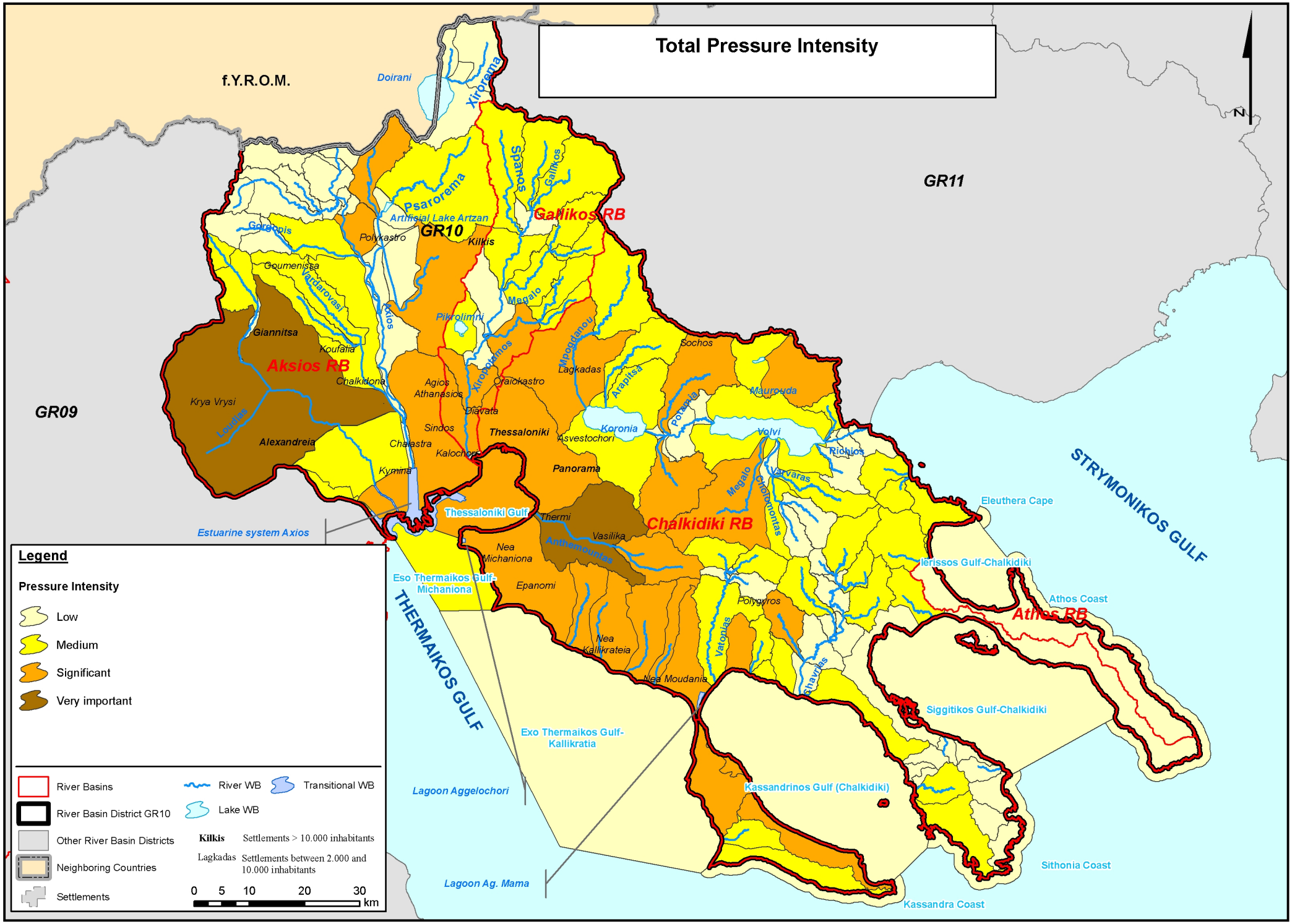

Economically Significant Aquatic Species Protection Areas
f.Y.R.O.M.
GR09
GR10
GR11
Doirani
Xirorema
Spanos
Gallikos
Psarorema
Artificial Lake Artzan
Gallikos RB
Gorgopis
Polykastro
Kilkis
Goumenissa
Vatdarovasi
Axios
Megalo
Pikrolimni
Giannitsa
Koufalia
Aksios RB
Chalkidona
Agios Athanasios
Xiropotamos
Orfaiokastro
Mpogdanou
Lagkadas
Sochos
Arapitsa
Maurouda
Krya Vrysi
Loudias
Alexandreia
Diavata
Sindos
Thessaloniki
Asvestochori
Koronia
Potamia
Volvi
Richios
Chalastra
Kalochori
Kymina
Panorama
Megalo Cholomontas
Varvaras
Eleuthera Cape
STRYMONIKOS GULF
Estuarine system Axios
Thessaloniki Gulf
Thermi
Chalkidiki RB
Vasilika
Anthemountas
Nea Michaniona
Ierissos Gulf-Chalkidiki
Eso Thermaikos Gulf-Michaniona
Epanomi
Polygyros
Athos Coast
Athos RB
THERMAIKOS GULF
Nea Kallikrateia
Vatonias
Chavrias
Nea Moudania
Siggitikos Gulf-Chalkidiki
Exo Thermaikos Gulf-Kallikratia
Kassandrinos Gulf (Chalkidiki)
Lagoon Aggelochori
Sithonia Coast
Lagoon Ag. Mama
Kassandra Coast
N
Legend
Economically Significant Aquatic Species Protection Areas
Transitional Water Bodies
Coastal Water Bodies
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
River WB
Lake WB
Transitional WB
Coastal WB
Kilkis Settlements > 10.000 inhabitants
Lagkadas Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30
km


Bathing Waters
(Directives 76/160/EEC and 2006/7/EC)
f.Y.R.O.M.
GR09
GR10
GR11
Doirani
Xirorema
Spanos
Gallikos
Psarorema
Artificial Lake Artzan
Gallikos RB
Gorgopis
Polykastro
Kilkis
Goumenissa
Vatdarovasi
Axios
Megalo
Pikrolimni
Giannitsa
Koufalia
Aksios RB
Chalkidona
Agios Athanasios
Xiropotamos
Mpogdanou
Lagkadas
Sochos
Arapitsa
Maurouda
Krya Vrysi
Loudias
Alexandreia
Diavata
Sindos
Thessaloniki
Asvestochori
Koronia
Potamia
Volvi
Richios
Chalastra
Kalochori
Kymina
Panorama
Megalo Cholomontas
Varvaras
Strymonikos Gulf
Eleuthera Cape
Thessaloniki Gulf
Thermi
Chalkidiki RB
Estuarine system Axios
Vasilika
Anthemountas
Nea Michaniona
Ierissos Gulf-Chalkidiki
Eso Thermaikos Gulf-Michaniona
Epanomi
Polygyros
Athos Coast
Athos RB
Thermaikos Gulf
Nea Kallikrateia
Vatonias
Chavrias
Nea Moudania
Siggitikos Gulf-Chalkidiki
Exo Thermaikos Gulf-Kallikratia
Kassandrinos Gulf (Chalkidiki)
Lagoon Aggelochori
Sithonia Coast
Lagoon Ag. Mama
Kassandra Coast
N
Legend
Bathing Waters
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
River WB
Lake WB
Transitional WB
Coastal WB
Kilkis Settlements > 10.000 inhabitants
Lagkadas Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30
km


Sensitive areas
(Directives 91/271/EEC and 91/676/EEC)
f.Y.R.O.M.
GR11
GR10
GR09
Doirani
Xirorema
Spanos
Gallikos
Gallikos RB
Psarorema
Artificial Lake Artzan
Kilkis
Goreopis
Polykastro
Goumenissa
Vardarovasi
Axios
Pikrolimni
Megalo
Giannitsa
Koufalia
Aksios RB
Chalkidona
Agios Athanasios
Xirotamos
Oraiokastro
Mpogdanou
Lagkadas
Arapitsa
Sochos
Maurouda
Potamia
Krya Vrysi
Loudias
Alexandreia
Diavata
Sindos
Thessaloniki
Asvestochori
Koronia
Volvi
Richios
Chalastra
Kalochori
Kymina
Panorama
Varvara
Megalo Cholomontas
Thessaloniki Gulf
Thermi
Vasilika
Chalkidiki RB
Estuarine system Axios
Anthemountas
Nea Michaniona
Eso Thermaikos Gulf-Michaniona
Epanomi
Polygyros
Ierissos Gulf-Chalkidiki
Athos Coast
Athos RB
Eleuthera Cape
STRYMONIKOS GULF
THERMAIKOS GULF
Nea Kallikrateia
Vatonias
Chavrias
Nea Moudania
Siggitikos Gulf-Chalkidiki
Exo Thermaikos Gulf-Kallikratia
Kassandrinos Gulf (Chalkidiki)
Lagoon Aggelochori
Sithonia Coast
Lagoon Ag. Mama
Kassandra Coast
N
Legend
Areas designated as sensitive areas under Directive 91/271/EEC
Rivers
Coastal
Lakes
Areas designated as vulnerable zones under Directive 91/676/EEC
Thessaloniki - Imathia - Pella Plain
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
River WB
Lake WB
Transitional WB
Coastal WB
Kilkis Settlements > 10.000 inhabitants
Lagkadas Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30
km


Protection areas of habitats and species - Natura 2000
(Directives 92/43/EEC and 79/409/EEC)
f.Y.R.O.M.
GR09
GR10
GR11
Aksios RB
Gallikos RB
Chalkidiki RB
Athos RB
STRYMONIKOS GULF
THERMAIKOS GULF
Thessaloniki Gulf
Estuarine system Axios
Eso Thermaikos Gulf-Michaniona
Exo Thermaikos Gulf-Kallikratia
Kassandrinos Gulf (Chalkidiki)
Siggitikos Gulf-Chalkidiki
Ierissos Gulf-Chalkidiki
Eleuthera Cape
Athos Coast
Sithonia Coast
Kassandra Coast
Lagoon Aggelochori
Lagoon Ag. Mama
Doirani
Artificial Lake Artzan
Koronia
Volvi
Thessaloniki
Kilkis
Polykastro
Goumenissa
Giannitsa
Koufalia
Krya Vrysi
Alexandreia
Sindos
Chalastra
Kalochori
Diavata
Oraiokastro
Lagkadas
Sochos
Asvestochori
Panorama
Thermi
Vasilika
Nea Michaniona
Epanomi
Nea Kallikrateia
Polygyros
Gallikos
Spanos
Megalo
Axios
Vardarovasi
Loudias
Gorgopis
Xiropotamos
Mpogdanou
Arapitsa
Mauronda
Richios
Varvaras
Cholomontas
Anthemountas
Vatonias
Chavrias
GR1230002
GR1230003
GR1230005
GR1230006
GR1230001
GR1230004
GR1240003
GR1240009
GR1220010
GR1220002
GR1220005
GR1220001
GR1220009
GR1220003
GR1270005
GR1270001
GR1270012
GR1270004
GR1270007
GR1270002
GR1270009
GR1270014
GR1270010
GR1270008
Legend
International Legislation Protection Areas
National Legislation Protection Areas
Birds - Habitats Protection Areas
Birds Protection Areas
Habitats Protection Areas
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
River WB
Lake WB
Transitional WB
Coastal WB
Kilkis Settlements > 10.000 inhabitants
Lagkadas Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30 km
N


Point pressures pollution sources
f.Y.R.O.M.
GR09
GR10
GR11
Doirani
Xirorema
Psalorema
Artificial Lake Artzan
Gallikos RB
Axios RB
Chalkidiki RB
Athos RB
Gorgopis
Polykastro
Kilkis
Goumenissa
Vardarovasi
Pikrolimni
Giannitsa
Koufalia
Chalkidona
Agios Athanasios
Oraiokastro
Lagkadas
Sochos
Mauronda
Arapitsa
Koronia
Volvi
Richios
Loudias
Alexandreia
Chalastra
Sindos
Kalochori
Thessaloniki
Asvestochori
Panorama
Kymina
Estuarine system Axios
Thessaloniki Gulf
Thermi
Vasilika
Anthemountas
Nea Michaniona
Epanomi
Eso Thermaikos Gulf-Michaniona
THERMAIKOS GULF
Nea Kallikrateia
Polygyros
N. Moudania
Exo Thermaikos Gulf-Kallikratia
Lagoon Aggelochori
Lagoon Ag. Mama
Kassandrinos Gulf (Chalkidiki)
Kassandra Coast
Siggitikos Gulf-Chalkidiki
Sithonia Coast
Ierissos Gulf-Chalkidiki
Athos Coast
Eleuthera Cape
STRYMONIKOS GULF
Legend
Active UWWTP - Outlet
Active UWWTP - Discharge Point
Thermoelectric Stations
IPPC Industrial Units
SEVESO Industrial Units
Livestock Units
Livestock <50
50≤ Livestock <500
Livestock ≥500
Wastes Landfill
Areas Of Uncontrolled Waste Disposal
Mussel Cultures
Aqua-Fish Cultures
Quarry Sites
Sand Collection Sites
Mining Sites
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
River WB
Lake WB
Transitional WB
Coastal WB
Kilkis Settlements > 10.000 inhabitants
Lagkadas Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30
km
N

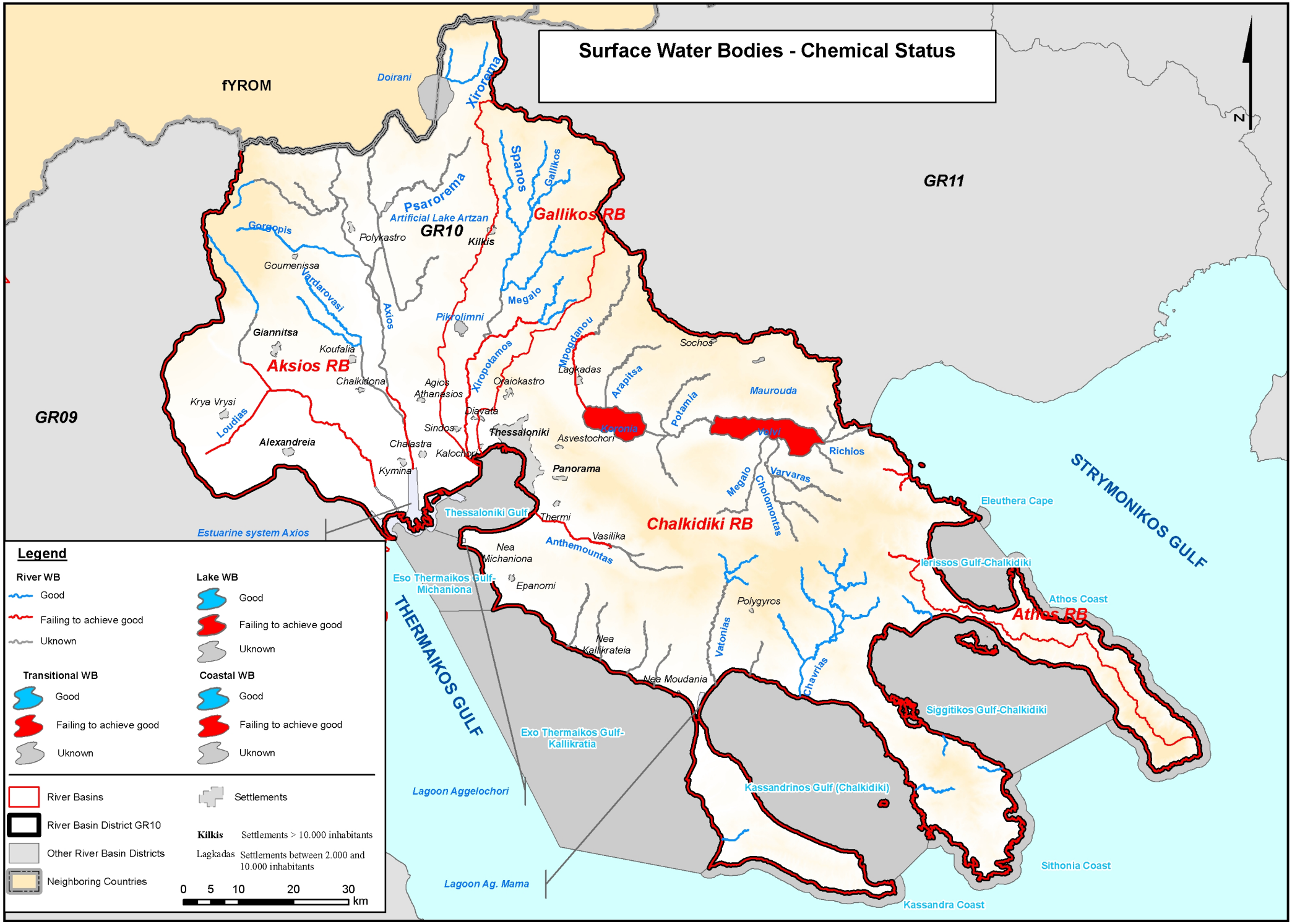

Total Pressure Intensity
f.Y.R.O.M.
GR11
GR09
GR10
Doirani
Xirorema
Psarorema
Spanos
Galikos
Gallikos RB
Artificial Lake Artzan
Goreopis
Polykastro
Kilkis
Goumenissa
Vatharovas
Axios
Pikrolimni
Megalo
Giannitsa
Koufalia
Aksios RB
Chalkidona
Agios Athanasios
Xiropotamos
Oraiokastro
Lagkadas
Mpogdanou
Arapitsa
Sochos
Krya Vrysi
Loudias
Alexandreia
Diavata
Sindos
Thessaloniki
Asvestochori
Koronia
Potamia
Mavrovida
Volvi
Chalastra
Kalochori
Kymina
Panorama
Richios
Varvaras
Megalo Cholomontas
Thessaloniki Gulf
Thermi
Vasilika
Anthemountas
Chalkidiki RB
Eleuthera Cape
STRYMONIKOS GULF
Estuarine system Axios
Nea Michaniona
Ierissos Gulf-Chalkidiki
Eso Thermaikos Gulf-Michaniona
Epanomi
Polygyros
Athos Coast
Athos RB
THERMAIKOS GULF
Nea Kallikrateia
Vatonias
Chaviras
Nea Moudania
Siggitikos Gulf-Chalkidiki
Exo Thermaikos Gulf-Kallikratia
Lagoon Aggelochori
Kassandrinos Gulf (Chalkidiki)
Sithonia Coast
Lagoon Ag. Mama
Kassandra Coast
N
Legend
Pressure Intensity
Low
Medium
Significant
Very important
River Basins
River WB
Transitional WB
River Basin District GR10
Lake WB
Other River Basin Districts
Kilkis Settlements > 10.000 inhabitants
Neighboring Countries
Lagkadas Settlements between 2.000 and 10.000 inhabitants
Settlements
0 5 10 20 30
km

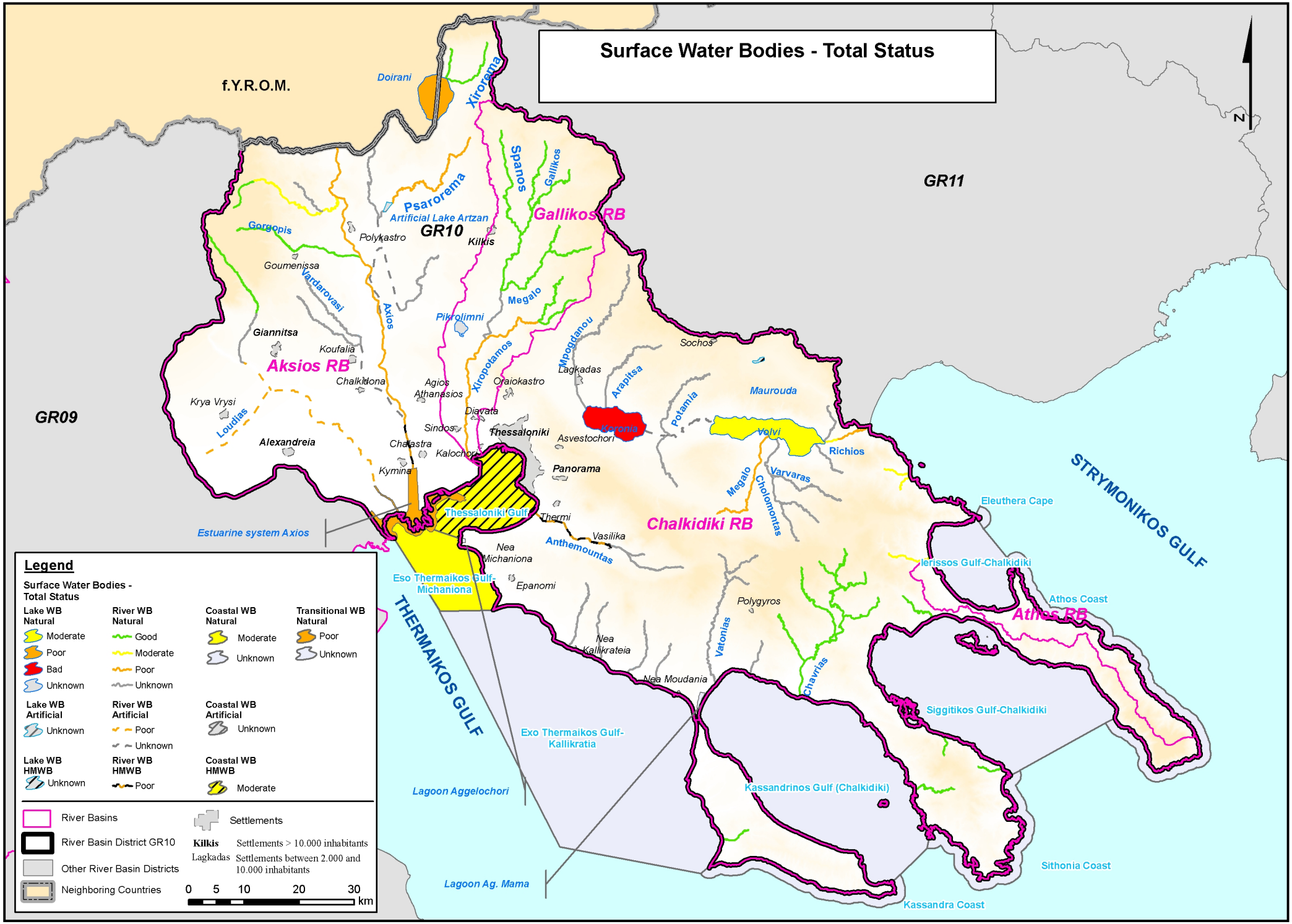
GWB Code	GWB Name
GR1000010	Loudias
GR1000020	Paiko
GR1000030	Axios
GR100F040	Doirani
GR1000050	Gallikos
GR1000061	subystem Epanomi Moudania
GR1000062	subsystem Nea Triglia
GR1000071	subsystem Koronia
GR1000072	subsystem Volvi
GR1000081	subsystem Anthemoundas Lower course
GR1000082	subsystem Galarinos – Galatista
GR1000083	subsystem Thermi (N) – N. Risio (S)
GR1000090	Kassandra
GR1000100	Ormilia
GR1000110	Ierissos
GR1000120	Mavrouda
GR1000131	subsystem Asrpolakkas
GR1000132	subsystem Kokkinolakkas

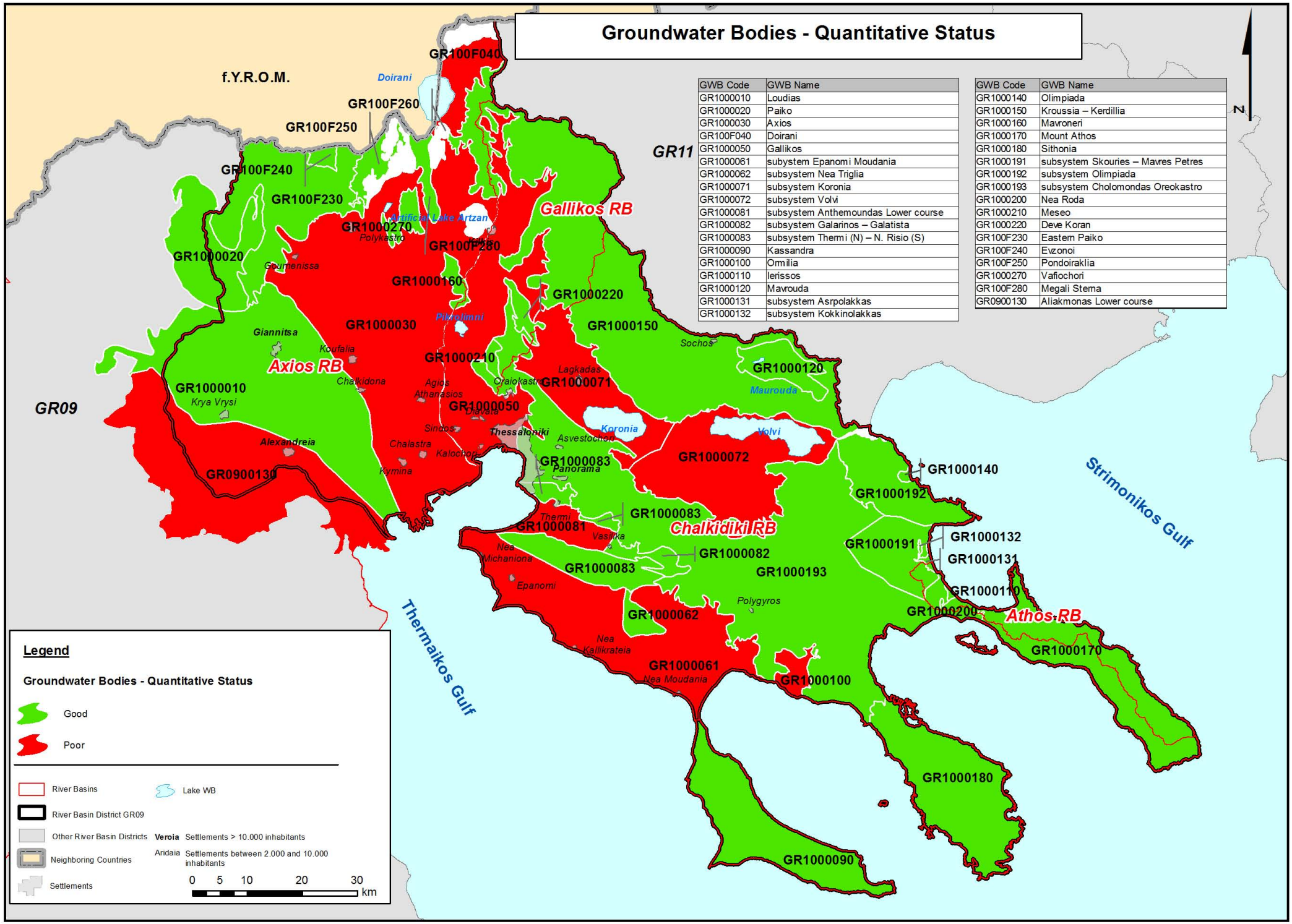
GWB Code	GWB Name
GR1000140	Olimpiada
GR1000150	Kroussia – Kerdillia
GR1000160	Mavroneri
GR1000170	Mount Athos
GR1000180	Sithonia
GR1000191	subsystem Skouries – Mavres Petres
GR1000192	subsystem Olimpiada
GR1000193	subsystem Cholomondas Oreokastro
GR1000200	Nea Roda
GR1000210	Meseo
GR1000220	Deve Koran
GR100F230	Eastern Paiko
GR100F240	Evzonoi
GR100F250	Pondoiraklia
GR1000270	Vafiochori
GR100F280	Megali Sterna
GR0900130	Aliakmonas Lower course


Salination Areas of Groundwater Bodies
GWB Code | GWB Name
GR1000010 | Loudias
GR1000030 | Axios
GR1000061 | Epanomi-Moudania
GR1000081 | Sub. Anthemoundas Lower course
GR1000083 | Sub. Thermi – N. Risio
GR1000090 | Kassndra
GR1000100 | Ormilia
GR1000180 | Sithonia
GR1000193 | Sub. Cholondas – Oreokastro
f.Y.R.O.M.
GR09
GR11
Axios RB
Gallikos RB
Chalkidiki RB
Athos RB
Thermaikos Gulf
Strimonikos Gulf
Doirani
Artificial Lake Artzan
Polykastro
Goumenissa
Giannitsa
Koufalia
Chalkidona
Krya Vrysi
Alexandreia
Pikrolimni
Agios Athanasios
Oraiokastro
Lagkadas
Sochos
Maurouda
Koronia
Volvi
Thessaloniki
Sindos
Chalastra
Kalochori
Kymina
Asvestochori
Panorama
Thermi
Vasilika
Nea Michaniona
Epanomi
Polygyros
Nea Kallikratela
Nea Moudania
GR100F040
GR100F260
GR100F250
GR100F240
GR100F230
GR100F280
GR1000270
GR1000020
GR1000160
GR1000220
GR1000030
GR1000150
GR1000210
GR1000071
GR1000120
GR1000010
GR1000050
GR1000072
GR1000140
GR1000192
GR0900130
GR1000083
GR1000081
GR1000082
GR1000191
GR1000132
GR1000131
GR1000193
GR1000110
GR1000200
GR1000062
GR1000170
GR1000061
GR1000100
GR1000180
GR1000090
Legend
Salination Areas of Groundwater Bodies
Salination Areas of Groundwater Bodies
River Basins
Lake WB
Ground WB
River Basin District GR09
Other River Basin Districts
Neighboring Countries
Settlements
Veroia Settlements > 10.000 inhabitants
Aridaia Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30
km
N


Surface Water Bodies - Ecological Status
f.Y.R.O.M.
GR11
GR09
GR10
N
Doirani
Xirorema
Psarorema
Artificial Lake Artzan
Spanos
Gallikos
Gallikos RB
Gorgopis
Polykastro
Kilkis
Goumenissa
Vardarovasi
Axios
Pikrolimni
Megalo
Giannitsa
Koufalia
Aksios RB
Mpogdanou
Sochos
Lagkadas
Arapitsa
Chalkidona
Agios Athanasios
Xiropotamos
Oraiokastro
Maurouda
Krya Vrysi
Loudias
Diavata
Potamia
Sindos
Thessaloniki
Asvestochori
Volvi
Alexandreia
Chalastra
Kalochori
Richios
Kymina
Panorama
Megalo Cholomontas
Varvaras
STRYMONIKOS GULF
Eleuthera Cape
Thessaloniki Gulf
Thermi
Chalkidiki RB
Estuarine system Axios
Vasilika
Anthemountas
Nea Michaniona
Ierissos Gulf-Chalkidiki
Eso Thermaikos Gulf-Michaniona
Epanomi
Athos Coast
Polygyros
Athos RB
THERMAIKOS GULF
Nea Kallikrateia
Vatonias
Nea Moudania
Chavrias
Siggitikos Gulf-Chalkidiki
Exo Thermaikos Gulf-Kallikratia
Kassandrinos Gulf (Chalkidiki)
Lagoon Aggelochori
Sithonia Coast
Lagoon Ag. Mama
Kassandra Coast
Legend
Surface Water Bodies - Ecological Status / Ecological potential
Lake WB Natural
Moderate
Poor
Bad
Unknown
River WB Natural
Good
Moderate
Poor
Unknown
Coastal WB Natural
High
Good
Moderate
Transitional WB Natural
Poor
Unknown
Lake WB Artificial
Unknown
River WB Artificial
Poor
Unknown
Coastal WB Artificial
Unknown
Lake WB HMWB
Unknown
River WB HMWB
Poor
Coastal WB HMWB
Moderate
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
Kilkis
Settlements > 10.000 inhabitants
Lagkadas
Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30
km


Surface Water Bodies - Chemical Status
fYROM
Doirani
Xirorema
GR11
GR10
GR09
Psarorema
Artificial Lake Artzan
Spanos
Gallikos
Gallikos RB
Kilkis
Polykastro
Gorgopis
Goumenissa
Vardarovasi
Axios
Pikrolimni
Megalo
Giannitsa
Koufalia
Aksios RB
Chalkidona
Agios Athanasios
Xiropotamos
Oraiokastro
Mpogdanou
Lagkadas
Sochos
Arapitsa
Maurouda
Krya Vrysi
Loudias
Alexandreia
Diavata
Sindos
Thessaloniki
Asvestochori
Chortiatis
Potamia
Volvi
Richios
Chalastra
Kalochori
Kymina
Panorama
Megalo Cholomontas
Varvaras
Thessaloniki Gulf
Thermi
Chalkidiki RB
Vasilika
Anthemountas
Nea Michaniona
Epanomi
Eso Thermaikos Gulf-Michaniona
Polygyros
Vatonias
Nea Kallikrateia
Chavrias
Nea Moudania
Exo Thermaikos Gulf-Kallikratia
Lagoon Aggelochori
Lagoon Ag. Mama
Kassandrinos Gulf (Chalkidiki)
Siggitikos Gulf-Chalkidiki
Ierissos Gulf-Chalkidiki
Athos Coast
Athos RB
Eleuthera Cape
Sithonia Coast
Kassandra Coast
Estuarine system Axios
THERMAIKOS GULF
STRYMONIKOS GULF
N
Legend
River WB
Good
Failing to achieve good
Uknown
Lake WB
Good
Failing to achieve good
Uknown
Transitional WB
Good
Failing to achieve good
Uknown
Coastal WB
Good
Failing to achieve good
Uknown
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
Kilkis Settlements > 10.000 inhabitants
Lagkadas Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30
km


Surface Water Bodies - Total Status
f.Y.R.O.M.
GR11
GR09
GR10
N
Doirani
Xirorema
Spanos
Gallikos
Gallikos RB
Psarorema
Artificial Lake Artzan
Gorgopis
Polykastro
Kilkis
Goumenissa
Vardarovasi
Axios
Pikrolimni
Megalo
Giannitsa
Koufalia
Aksios RB
Chalkidona
Agios Athanasios
Xiropotamos
Oraiokastro
Mpogdanou
Lagkadas
Sochos
Arapitsa
Maurouda
Krya Vrysi
Loudias
Alexandreia
Diavata
Sindos
Thessaloniki
Asvestochori
Volvi
Potamia
Richios
Chalastra
Kalochori
Kymina
Panorama
Varvaras
Megalo Cholomontas
Thessaloniki Gulf
Thermi
Chalkidiki RB
Vasilika
Anthemountas
Nea Michaniona
Eso Thermaikos Gulf-Michaniona
Epanomi
Polygyros
Vatonias
Nea Kallikrateia
Chavrias
Nea Moudania
Exo Thermaikos Gulf-Kallikratia
Lagoon Aggelochori
Kassandrinos Gulf (Chalkidiki)
Lagoon Ag. Mama
Kassandra Coast
Sithonia Coast
Siggitikos Gulf-Chalkidiki
Athos Coast
Athos RB
Ierissos Gulf-Chalkidiki
Eleuthera Cape
STRYMONIKOS GULF
THERMAIKOS GULF
Estuarine system Axios
Legend
Surface Water Bodies - Total Status
Lake WB Natural
Moderate
Poor
Bad
Unknown
River WB Natural
Good
Moderate
Poor
Unknown
Coastal WB Natural
Moderate
Unknown
Transitional WB Natural
Poor
Unknown
Lake WB Artificial
Unknown
River WB Artificial
Poor
Unknown
Coastal WB Artificial
Unknown
Lake WB HMWB
Unknown
River WB HMWB
Poor
Coastal WB HMWB
Moderate
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
Kilkis
Settlements > 10.000 inhabitants
Lagkadas
Settlements between 2.000 and 10.000 inhabitants
0 5 10 20 30
km



GWB Code	GWB Name
GR1000010	Loudias
GR1000020	Paiko
GR1000030	Axios
GR100F040	Doirani
GR1000050	Gallikos
GR1000061	subystem Epanomi Moudania
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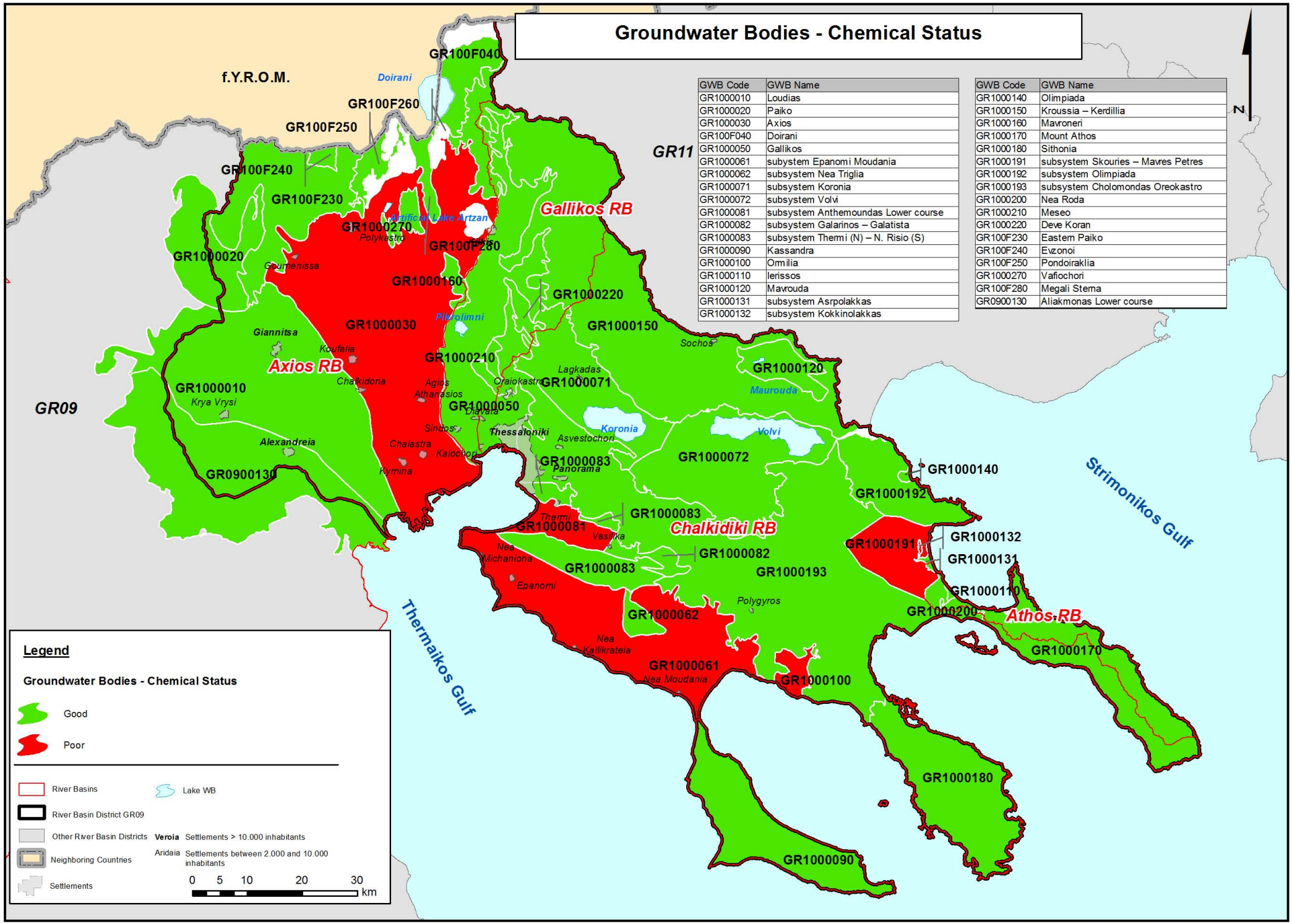
GR1000071	subsystem Koronia
GR1000072	subsystem Volvi
GR1000081	subsystem Anthemoundas Lower course
GR1000082	subsystem Galarinos – Galatista
GR1000083	subsystem Thermi (N) – N. Risio (S)
GR1000090	Kassandra
GR1000100	Ormilia
GR1000110	Ierissos
GR1000120	Mavrouda
GR1000131	subsystem Asrpolakkas
GR1000132	subsystem Kokkinolakkas

GWB Code	GWB Name
GR1000140	Olimpiada
GR1000150	Kroussia – Kerdillia
GR1000160	Mavroneri
GR1000170	Mount Athos
GR1000180	Sithonia
GR1000191	subsystem Skouries – Mavres Petres
GR1000192	subsystem Olimpiada
GR1000193	subsystem Cholomondas Oreokastro
GR1000200	Nea Roda
GR1000210	Meseo
GR1000220	Deve Koran
GR100F230	Eastern Paiko
GR100F240	Evzonoi
GR100F250	Pondoiraklia
GR1000270	Vafiochori
GR100F280	Megali Sterna
GR0900130	Aliakmonas Lower course



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GR100F240	Evzonoi
GR100F250	Pondoiraklia
GR1000270	Vafiochori
GR100F280	Megali Sterna
GR0900130	Aliakmonas Lower course

Legend

Groundwater Bodies - Chemical Status

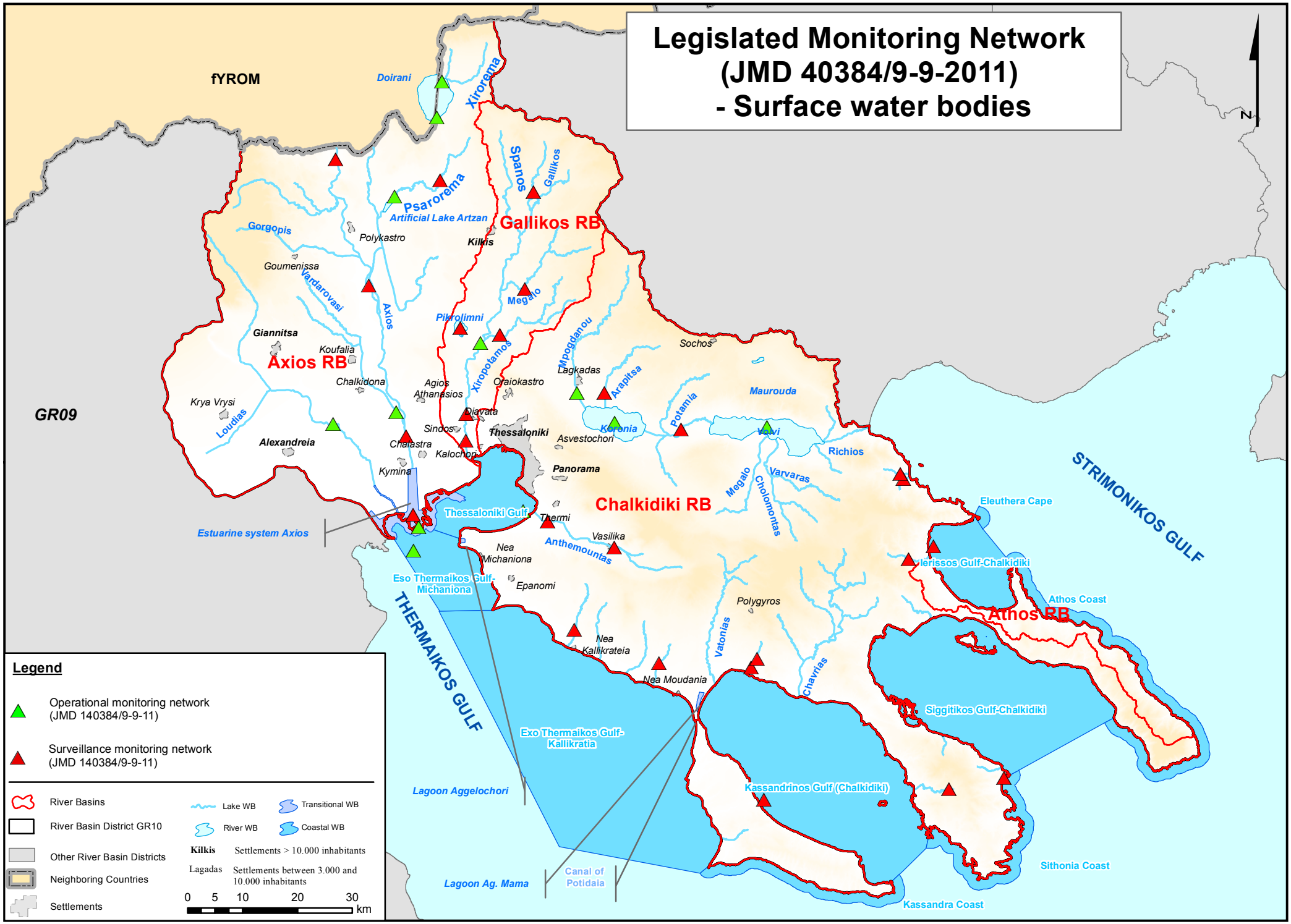
- Good
- Poor

- River Basins
- Lake WB
- River Basin District GR09
- Other River Basin Districts
- Neighboring Countries
- Settlements

Veroia Settlements > 10.000 inhabitants

Aridaia Settlements between 2.000 and 10.000 inhabitants

0 5 10 20 30 km


Legislated Monitoring Network
(JMD 40384/9-9-2011)
- Surface water bodies
fYROM
GR09
Doirani
Xirorema
Psararema
Artificial Lake Artzan
Spanos
Gallikos
Gallikos RB
Gorgopis
Polykastro
Kilkis
Goumenissa
Vardarovasi
Axios
Megalo
Pikrolimni
Giannitsa
Koufalia
Axios RB
Chalkidona
Agios Athanasios
Xiropotamos
Oraiokastro
Mpogdanou
Lagkadas
Arapitsa
Sochos
Maurouda
Krya Vrysi
Loudias
Alexandreia
Sindos
Chalastra
Kalochori
Diavata
Thessaloniki
Asvestochori
Koronia
Potamia
Volvi
Richios
Kymina
Panorama
Chalkidiki RB
Megalo Cholomontas
Varvaras
STRIMONIKOS GULF
Eleuthera Cape
Thessaloniki Gulf
Thermi
Vasilika
Anthemountas
Nea Michaniona
Estuarine system Axios
Eso Thermaikos Gulf-Michaniona
Epanomi
Ierissos Gulf-Chalkidiki
Athos Coast
Athos RB
Polygyros
Vatonias
Nea Kallikrateia
Nea Moudania
Chavrias
THERMAIKOS GULF
Exo Thermaikos Gulf-Kallikratia
Siggitikos Gulf-Chalkidiki
Lagoon Aggelochori
Kassandrinos Gulf (Chalkidiki)
Sithonia Coast
Lagoon Ag. Mama
Canal of Potidaia
Kassandra Coast
N
Legend
Operational monitoring network (JMD 140384/9-9-11)
Surveillance monitoring network (JMD 140384/9-9-11)
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
Lake WB
River WB
Transitional WB
Coastal WB
Kilkis Settlements > 10.000 inhabitants
Lagadas Settlements between 3.000 and 10.000 inhabitants
0 5 10 20 30 km

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GR1000132	subsystem Kokkinolakkas

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GR100F280	Megali Sterna
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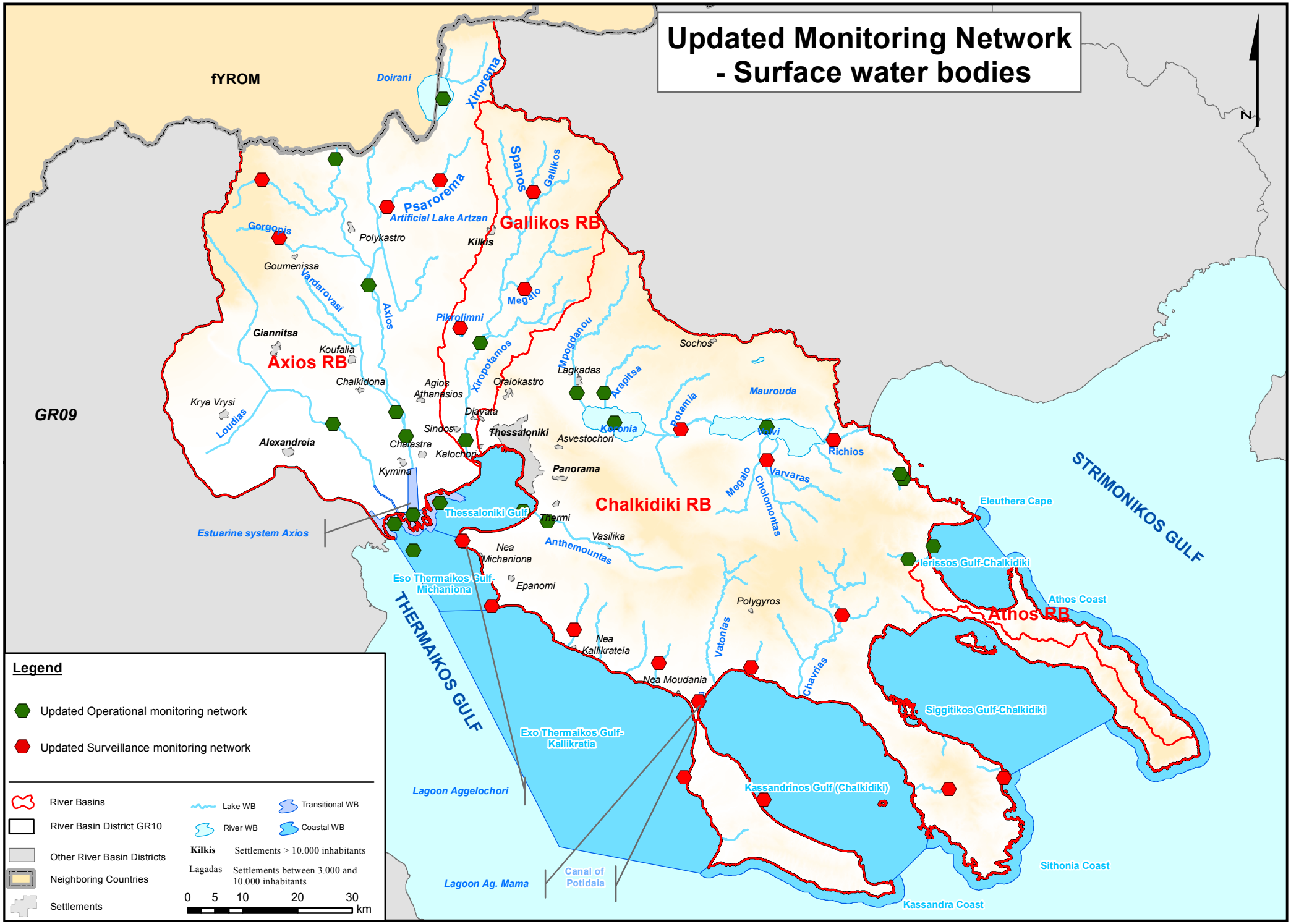
Updated Monitoring Network
- Surface water bodies
fYROM
GR09
Doirani
Xirorema
Spanos
Gallikos
Psararema
Artificial Lake Artzan
Gallikos RB
Gorgopis
Polykastro
Kilkis
Goumenissa
Vardarovasi
Axios
Megalo
Pikrolimni
Giannitsa
Koufalia
Axios RB
Chalkidona
Agios Athanasios
Xiropotamos
Oraiokastro
Mpogdanou
Lagkadas
Arapitsa
Sochos
Maurouda
Krya Vrysi
Loudias
Alexandreia
Sindos
Chalastra
Kalochori
Diavata
Thessaloniki
Asvestochori
Ksironia
Potamia
Volvi
Richios
Kymina
Panorama
Megalo Cholomontas
Varvaras
Chalkidiki RB
Thessaloniki Gulf
Thermi
Vasilika
Anthemountas
Nea Michaniona
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Siggitikos Gulf-Chalkidiki
Exo Thermaikos Gulf-Kallikratia
Kassandrinos Gulf (Chalkidiki)
Lagoon Aggelochori
Sithonia Coast
Lagoon Ag. Mama
Canal of Potidaia
Kassandra Coast
N
Legend
Updated Operational monitoring network
Updated Surveillance monitoring network
River Basins
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
Lake WB
River WB
Transitional WB
Coastal WB
Kilkis Settlements > 10.000 inhabitants
Lagadas Settlements between 3.000 and 10.000 inhabitants
0 5 10 20 30 km

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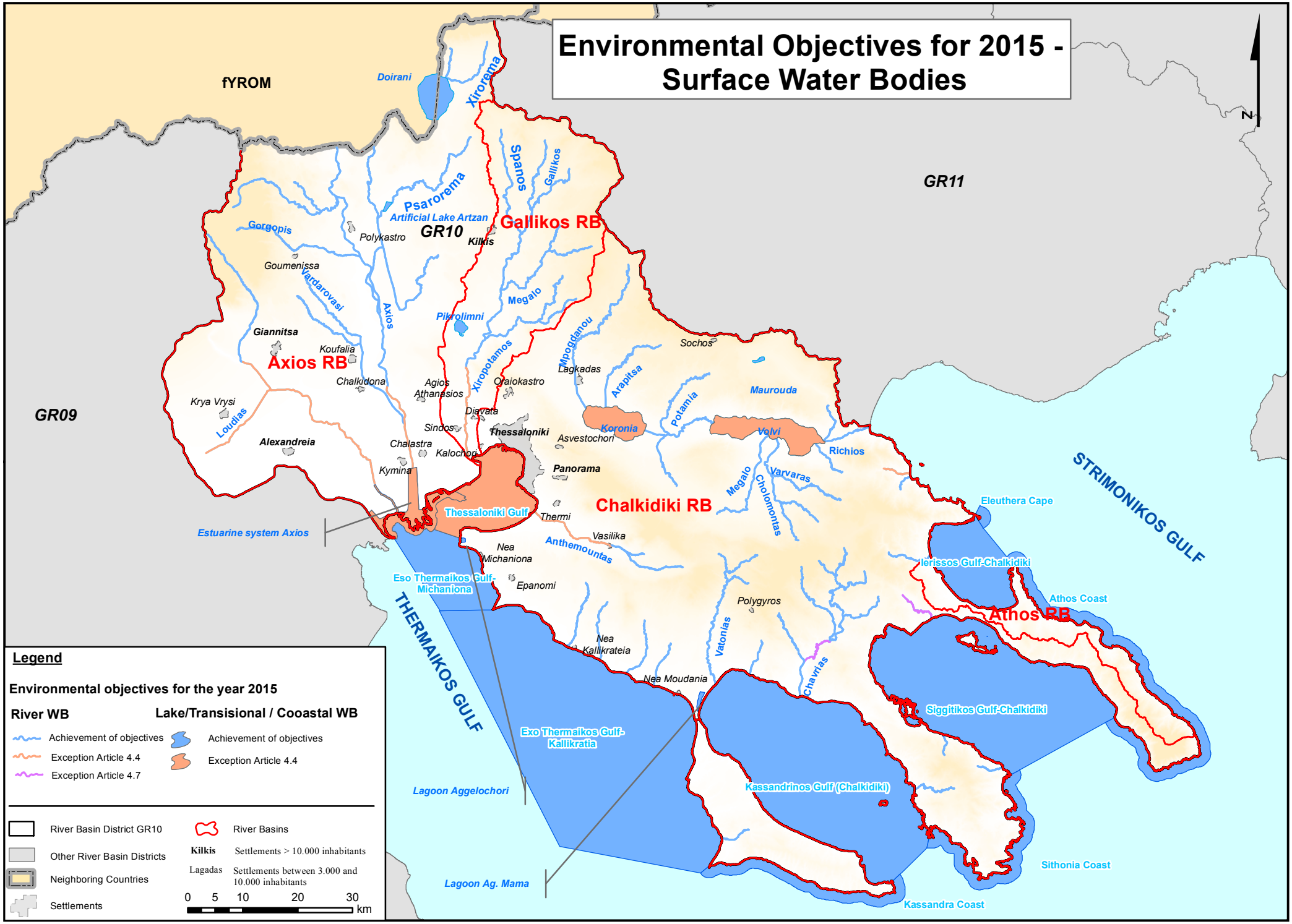
GR1000270	Vafiochori
GR100F280	Megali Sterna
GR0900130	Aliakmonas Lower course


Environmental Objectives for 2015 - Surface Water Bodies
fYROM
Doirani
Xirorema
Sparos
Gallikos
Gallikos RB
GR11
Psarorema
Artificial Lake Artzan
GR10
Kilkis
Polykastro
Gorgopis
Goumenissa
Vatdarovasi
Axios
Megalo
Pikrolimni
Giannitsa
Koufalia
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Cholomontas
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Exo Thermaikos Gulf-Kallikratia
Kassandrinos Gulf (Chalkidiki)
Lagoon Aggelochori
Sithonia Coast
Lagoon Ag. Mama
Kassandra Coast
N
Legend
Environmental objectives for the year 2015
River WB
Achievement of objectives
Exception Article 4.4
Exception Article 4.7
Lake/Transisional / Cooastal WB
Achievement of objectives
Exception Article 4.4
River Basin District GR10
Other River Basin Districts
Neighboring Countries
Settlements
River Basins
Kilkis
Settlements > 10.000 inhabitants
Lagadas
Settlements between 3.000 and 10.000 inhabitants
0 5 10 20 30
km

Environmental Objectives for 2015 - Groundwater Bodies

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GR100F240	Evzonoi
GR100F250	Pondoiraklia
GR1000270	Vafiochori
GR100F280	Megali Sterna
GR0900130	Aliakmonas Lower course

Legend

Environmental objectives of Groundwater Bodies for the year 2015

- Achievement of objectives
- Exception Article 4.4
- Exception Article 4.7

- River Basins
- Lake WB
- River Basin District GR09
- Other River Basin Districts
- Neighboring Countries
- Settlements

Veroia Settlements > 10.000 inhabitants

Aridaia Settlements between 2.000 and 10.000 inhabitants

0 5 10 20 30 km

www.ypeka.gr

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2 M. Iatridou str. & Kifisias Ave. 115 26 Athens, Greece
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E-mail: info.egy@prv.ypeka.gr

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