TWReferenceNET Project
"Management and sustainable development of protected transitional waters"

The European Union promotes actions of transnational and interregional cooperation to stimulate a balanced and long-lasting harmonious development of the European Space. One of the EU initiatives is the INTERREG Programme, which is directed to improve the territorial integration between the members states, candidate countries and other European countries.

As far as the field of the Environment, the interest of the European Union is turned on one side to the analysis and to the prevention of the environmental risks and from the other to the protection and the conservation of natural heritage and environmental resources, with a major emphasis to the water resource. The conservation and the management of the water resource constitutes one of the priorities for European Union (EU) that, on such matter, recently promulgated a Directive, the Water Framework Directive (WFD), which is directed just to the protection of the water resource in Europe. The WFD promotes for all the aquatic ecosystems of Europe, from groundwaters to coastal marine or heavily modified waters: (a) the definition of typology of the European aquatic ecosystems, (b) the classification of the state of health, (c) the monitoring and the eventual recovery to a good state within year 2016. In this phase, all the European countries are developing the technical and procedural protocols for giving legislative performance to WFD in each country. For a number of reasons, including scientific, cultural, technical and administrative considerations, it exists also a great interest to the involvement of the countries in Pre-Adhesion and of the other European and Mediterranean countries. The interest does not depend only from the fact that all countries will be required to adapt itself to the European norms for the adhesion, but above all from the issue that the water is a not operational resource to level of national States but has transnational characteristics. The great European rivers or the marine coastal zones are representative examples of transnational ecosystems.
In this context, the University of Lecce, Department of Biological and Environmental Sciences and Technologies, has proposed a project directed to the conservation, management of the coastal ecosystems of transition in the Adriatic, Danube and South Eastern area of the Mediterranean and the Black Sea, with financing through the Programme of Community Initiative INTERREG IIIB CADSES (Central, Adriatic, Danubian & South Eastern States).

The project, which acronym is TWReferenceNET, was approved and financed with 2.4M Euro. TWReferenceNET has a total duration of 36 months (1/1/2004- 31/12/2006) and has as study objective the coastal transitional ecosystems (i.e., estuaries, delta, lagoons, watertight ponds and coastal lakes) occurring inside protected areas, whichever is the protection degree. The rationale was that these ecosystems can be consider reference ecosystems of naturalistic value and relatively unaffected by anthropogenic pressures. In such a way they can constitute control ecosystems, or Ecosystems of Reference, on which establishing the Conditions of Reference. Reference conditions define the optimal ecological state of ecosystems on which the ecological status classification of all transitional ecosystems in the Ecoregional area is based.
Some of the most important Eastern European lagoons are study sites in the project; they include the lagoons of the Po delta, the Grado lagoon, the lagoons of Lesina, Varano and Alimini in the Puglia, the natural preserves of Torre Guaceto and the Cesine, some of the

more important protected transitional aquatic ecosystems of Albania, the lagoon system of the gulf of Amvrakikos, theatre of the battle of Atium between the fleets of Antonio and Ottaviano Augusto, the lagoon system of Varna in Bulgaria and the Danube delta lagoon of Sinoe.

TWReferenceNET partnership includes 22 partners among Universities and Academies [Lecce Bologna, Trieste (IT); Atene, Ioannina, Aegean (GR); Tirana, Academy of Science (AL); IO-Academy of Science (BG); Galati (RO)], Public Administrations, Research Institutes and Agencies [Puglia Region, Lecce Province, ARPA Emilia Romagna (IT), HCMR Atene, NARF (GR); Ministry of Environment (AL)], Associations, Consortia and NGOs'. [MareAmico, Torre Guaceto, NetProject (IT), Amvrakikos Gulf, Nomos & Physis (GR); Ecoforum (BG)] of 5 countries (Albania, Bulgaria, Greece, Italy, Romania).

Historically, for their ecological peculiarities and their positioning in coastal plains, the transitional ecosystems have always had an associate-economic role of relief for the local populations. Since the Roman age, and also before, the transitional aquatic ecosystems were among the environmental inheritance of great value for the human societies and were used for fishery and agriculture; all these services were offered from the ecosystems to the human societies, which contributed with a adaptive management to maintain ecosystem health. In the last centuries, the development of the industrial activities and the urbanization also in the coastal area have drastically modified the relationship between human societies and ecosystems, compromising drastically the traditional models of management and increasing dramatically the anthropogenic pressures on these fragile ecosystems. The result has been a progressive indifference and abandonment of such ecosystems that have determined in many cases serious pollution events, like the dramatic pollution event that has recently affected the Danube. For such reasons, the conservation and the management of transitional waters suffer from their geographic fragmentation, from the fragmentation of competencies and expertises, from a lack of ecological scientific knowledge and monitoring effective tools. However, fishery, aquaculture and agriculture can still be supported from the transitional aquatic ecosystems, as well as tourism and environmental education. However, a sustainable fruition of transitional ecosystems requires a strong engagement for the conservation of the ecological organization of such ecosystems to maintain their good ecological health state, to prevent pollution manifestation and to avoid their negative effects at environmental and socio-economic levels.
The project is proposed to satisfy these lacks pursued of the purposes which the improvement of the state of conservation of the aquatic ecosystems, the strengthening of integration of the environmental norm in the area CADSES, the promotion and the implementation of the acquaintances and information dissemination in environmental matter, also through the constitution of a transnational e-Centre to guarantee the exchange of experiences and competencies among project partners, local communities and societies and to supply an informative service to the customers. The activity of the project is organised in 6 WORK PACKAGES (WP):

WP1: **Context analysis of anthropogenic pressures on natural heritage in Ramsar transitional waters**
WP1 has the major objective to define the state of the art on pressures on the protected transitional ecosystems considered in the project, with special reference to Ramsar sites, and to evaluate the resulting vulnerability of those ecosystems. To this aim, WP1 involves a

data mining activity on the existing information on anthropogenic driving forces (agriculture and fisheries, industry, urbanisation, tourism) and pressures, including remote sensed images, a data systematisation and a data analysis activity and an image analysis activity. WP1 will produce data bases, GIS of anthropogenic pressures and Reports on the State of the Environment of the protected transitional ecosystems considered in this project).

WP2: **Transnational studies and innovative strategies on monitoring and conservation of protected transitional waters**
WP2 has the major objective to develop methodological tools and standardise procedures to improve conservation strategies of public administration through an effective monitoring of the protected ecosystem ecological status. To this aim WP2 involves the analysis of the existing knowledge on the ecological quality elements and ecological status of protected TW and Ramsar sites included in the project, the development of transnational studies to fill in the gaps in existing knowledge and to investigate the likelihood of new more effective descriptors of transitional aquatic ecosystem health, the standardisation of the methodologies to apply these new descriptors into monitoring programmes and the definition of monitoring procedures for both EU member and non member states according to the EU Water Framework Directive. WP2 will produce eco-technological prototypes for monitoring, Handbooks of methodologies and Guidelines for monitoring transitional waters to support administration into the definition of conservation and sustainable development strategies of the coastal environment.

WP3: **Legislative integration in the CADSES area, with respect to WFD and Nature 2000**
WP3 has the major objective to reinforce legal and institutional protection on transitional aquatic ecosystems to and contribute to European environmental normative integration of CADSES countries. To this aim WP3 involves data mining and comparative analysis of environmental legislation dealing with transitional aquatic ecosystem conservation in the countries sharing the project partnership; it also involves identification of best practices in water protection politics through the elaboration of an handbook of regulation on methods and procedures to be adopted for a more transparent and effective governance, to the aim of implementing WFD and enforcing the territorial cohesion in the CADSES area.

WP4: **Sustainable exploitation and development in transitional protected area: pilot actions on spin-off enterprises.**
WP4 major objective is to translate efforts on conservation into sustainable development strategies, creation of new jobs opportunities and improvement of quality of life. WP4 will involve basic studies on the optimisation of the relationships between potential fruition activities and transitional ecosystem health; the WP will also produce pilot actions promoting local Consortia involving researchers and end-users, in the development of sustainable activities at local area level (e.g., large scale, ecologically based, natural aquaculture for the production of high quality fishes; local enterprises specialized into the development of mitigation actions to agricultural impacts on aquatic ecosystems; local enterprises for the dissemination of scientific results using information technology, etc.).

WP5: **Transnational TWReferenceNET e-Centre**
WP5 will produce the technical instruments to implement this project, i.e. the Network between different ecosystems, different partners and countries, different competencies and expertises, different institutions and organisations (research institutions, administrations and agencies, NGO's and associations, private enterprises and citizens). WP5 is based on the creation of an e-Centre, which will : 1. constitute a functional networking among protected transitional Ramsar and Nature 2000 areas, by bridging knowledge, expertises and competencies of project partners, administrations NGOs and enterprises; 2. guarantee the information flow, organising and publishing information and knowledge produced by the project and performing result dissemination to different end-users, from Institutions to local people; 3. organise training and formation; 4. produce services through spin-off of 'niche' enterprises, encouraging management by young people and woman; 5. ensure project follow-up, being itself a service, as a consultant agency on transitional protected area management and sustainable development.

WP6: **Project management**
Co-ordination and management of the project with the purpose to create a project of effective communication for the parts and aspects of the whole project.