Comunità Montana Val Cavallina
E-mail: valcaval@valcavallina.bergamo.it

Parco Naturale del Lago di Candia
E-mail: cerry@provincia.torino.it

Comunità Montana n° 2
"Su Sassu Anglona Gallura"
E-mail: cmdue.tonina@tiscalinet.it

Regione Lombardia
Direzione Generale Agricoltura

Provincia di Bergamo

Comune di Endine Gaiano

Comune di Ranzanico

Comune di Monasterolo del Castello

Provincia di Torino

Val Cavallina Servizi srl
E-mail: vcsservizi@tiscalinet.it

Fitotecnologie Applicate sas
E-mail: fitotecnologie@libero.it

CCS Aosta srl
E-mail: ccs@envipark.com

Consiglio Nazionale delle Ricerche
CNR Istituto per lo Studio degli Ecosistemi
E-mail: r.debernardi@iii.to.cnr.it

Consorzio interuniversitario nazionale
per la biologia molecolare delle piante
Università di Milano

Politecnico di Milano Dipartimento di
Progettazione dell'Architettura
E-mail: marinamolon@polimi.it

Politecnico di Torino Dipartimento
di Georisorse e Territorio
E-mail: aquaglino@polito.it

Università di Sassari Dipartimento di
Scienze Ambientali Agrarie e
Biotecnologiche Agroalimentari
E-mail: sadeiana@uniss.it

Project Manager: Aldo Gervasio
E-mail: aldo.gervasio@libero.it

THREE LAKES

Member of Italian Delegation

The 3rd
World Water Forum
March 15 - 23 2003
in Kyoto Shiga and Osaka
Japan

EUROPEAN COMMUNITY
ENVIROMENT LIFE 2002
THREELAKES PROJECT

www.life.trelaghi.it

EUTROPHIC REDICTION THROUGH NATURAL TECHNICS OF THREE LITTLE ITALIAN LAKES WATERS

Lake Candia Natural Park (Turin Italy), the mountain community Val Cavallina (Bergamo Italy) and the mountain community n. 2 Su Sassu-Anglona-Gallura (Sassari Italy) share the common problem of lake water eutrophication (lake Candia, lake Endine, and lake Coghinas).

Three organisations are actively working to find common planning solutions, by comparing their various experiences. The project aims to demonstrate the validity of using innovative natural technology based on the synergistic use of mycorrhizas, PGP (Plant Grower Promoter) bacteriums, zeolites and BSF waste depuration techniques, in order to obtain a substantial reduction of eutrophic substances (Nitrogen and Phosphorus) in the Trelaghi (three lakes) waters, and in all wet areas affected by significant eutrophic problems.

The biological structure of these three lakes share many common aspects: eutrophication has occurred over a period of time, especially in the Candia marsh, due to an excessive amount of nutrients flowing into the area from pipes and various agricultural techniques. This has caused a progressive impoverishment of existing biotypes, leading to loss or reduction of life forms within the lake's trophic chain ecosystem.

The reduction of fertilising (C) and eutrophic (N, P) elements from waste deriving from civilian and agricultural sources is achieved with natural methods known as ecosystem filters, consisting of innovative multistage depuration plants with a rizospheric system, that foresees the addition of bacteriums and mycorrhizas to plant roots. The medium consists of zeolitic rocks and siderurgic waste.

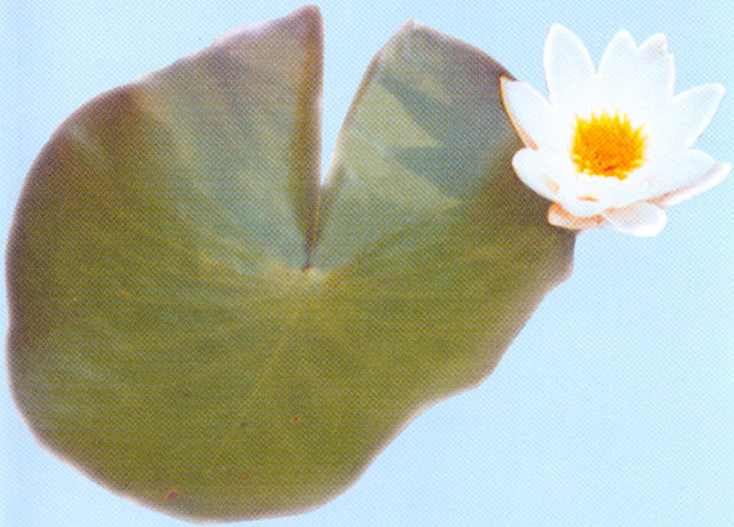
Reduction of eutrophic elements is achieved by means of three different activities:

Specific activity ecosystem filters placed between waste pipes and the lakes, or a complete depuration plant for refining effluents. The ecosystem filters, thanks to the physical and chemical properties of the chabasitical zeolites, are able to absorb polluting elements within the water and release them to plants that have bacteriums and mycorrhizas in common with the zeolithes of the rizo-sphere.

Reduction of Nitrogen and other eutrophic elements is compared to the amount of the same elements without intervention, in percentage: 70% for Nitrogen; 50% for Phosphorus.

Spread area activities: reduction of eutrophic elements is achieved through low impact fertilisation agricultural methods, with improvement of root apparatus instead of using chemical fertilisation.

Area activities: Reduction of the eutrophication of Lake Candia's waters is achieved by marsh revitalisation restoring the plants' natural capacity to extract nutrients; a typical process of wet areas.



The project also includes water analysis for incoming flows, in the various parts of the ecosystem filters and lakes. The aim of this project is to acquire environmental certification for these three lakes in line with European EMAS and international ISO 14000 standards, and to set up environmental/ educational courses.

The use of ecosystem filters provides a valid means of combating surface pollution by using low impact environmental systems, characterised by operational efficiency and low running and maintenance costs. Since there is no need for electricity, chemical elements, oxygen, or extra administration, the running costs are halved as compared with traditional systems. The maintenance costs are limited to normal care, performed by a non-skilled worker.

The enrichment of the ground with mycorrhize and bacteriums has lower costs than traditional fertilisation using synthetic products. As a consequence agricultural production costs are also reduced. Moreover the quality of agricultural products is improved, as confirmed by preliminary tests. The end of chemical fertilisation which involves the use of nitrates will greatly reduce eutrophication, allowing for the development of a new type of cultivation with a low environmental impact.

This project is important on an international level; the three Italian lakes benefiting from these new techniques are geographically and climatically diverse. The project is therefore a perfect test bed for the validity of these innovative techniques in various climatic conditions. It can also be easily exported to developing countries, thanks to its simple management.