

- by using the model, it is possible to estimate the effects of land use and water protection activities to runoff
- the model indicated major runoff sites in a study area

For the recreational and nature travel development plan

- A plan for sustainable recreational use of nature (VirSu) was developed

- ## 7. DEVELOPMENT OF RIVER BASIN MONITORING SYSTEMS

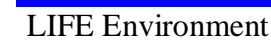
- current monitoring methods were evaluated in terms of ecological status of surface waters

- the possibilities for bringing the surface water monitoring requirements by the WFD and Habitat Directive together was investigated

- an environmental web database of the environmental administration was developed further (Hertta database)

- biological monitoring will be increased and novel methods and strategies will be used

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Karjaanjoki LIFE 2001-2005

LIFE-00 ENV/FIN/000668, also called INNOWA (Integrated river catchment management- a network for optimized water management, rehabilitation and protection of aquatic ecosystems at the river basin scale)

Managing the Karjaanjoki River Basin

The Karjaanjoki River basin (2050 km²) consists of numerous lakes, rivers and brooks of various types and sizes, which cover 12% of the river basin area in total. The river basin is characterised by the large Lakes Lohjanjärvi (92 km²) and Hiidenvesi (29 km²). In addition, the numerous small lakes and clear-watered rivers form a beautiful mosaic in the headwater region. River Mustionjoki transports water from the river basin to the Pojo Bay area of Gulf of Finland through an old cultivated landscape.

Towards the good ecological status of surface waters

The project worked towards sustainable use of the water body. The goal was a good ecological status of surface waters, which includes rich aquatic biodiversity and good water quality.

Diverse problems in surface waters-various tools and management activities

The Karjaanjoki Life project aimed at developing efficient methods for the Karjaanjoki watercourse management.

The project consisted of seven sub-projects, aiming at an efficient exchange in experiences and information between them, and with other associates within the network.

Water protection is a team sport

The network included local residents, community organisations, researchers, authorities, polluters and all municipalities of the area, altogether 32 partners and financiers.

Locals were involved in the project since the beginning, in order to guarantee the future continuity and success of water management in the area. It was also

important to draw attention of locals to non-point pollution from scattered settlement, which is a significant source of pollution in the lower course of the river basin.

1. ECOLOGICAL RESTORATION OF RUNNING WATERS

Surveys were conducted throughout the river basin area

- over 370 km of streams were surveyed; biological and hydro-morphological data was collected during the surveys
- restoration surveys included all rivers and majority of the streams in the area
- different species were surveyed; freshwater mussel survey was conducted along the entire length of river Mustionjoki
- electric fish stock surveys were conducted in 90 different channel sections

Restorations were accomplished at demonstration sites

- 20 sites were restored: channel restoration, taking down dams and weirs, making fish passages and catchment area restoration

Stream survey methods were developed further with the help of the experience gained from the present survey

- the aim is to have a fast and effective method for obtaining basic information of the state and restoration needs of the river system

2. IMPROVING THE FUNCTIONAL VALUE OF LAKE LOHJANJÄRVI

Volunteer monitoring and activation of locals

- over 80 volunteers took part in monitoring and over 2500 measurements were recorded by the volunteers
- Secchi transparency measurements and algal records were used in remote sensing and mathematical modelling
- a database for volunteer monitoring was created to serve volunteers monitoring waters throughout the country

- a report on comparison of different management possibilities for Maikkalanselkä was written
- shore management guide was published

Four waste water surveys were carried out in the Lake Lohjanjärvi area for applying the waste water management act for scattered settlement.

- an effective method based on questionnaires and field work was developed

A novel monitoring method based on remote sensing was developed

- Secchi transparency measurement results from volunteer and official monitoring were compared for interpretation of satellite images taken from the lake

Mathematical modelling in Lake Lohjanjärvi catchment area

- modelling produces real time water quality results, pollution information and algal bloom predictions
- discharge and water level measurements can be monitored in the entire catchment area
- a scenario was produced of different sewage treatment plants discharge points and the possible effect of those on water quality in the area
- the influence of changes in land use patterns on water quality was estimated. Also effect of buffer zones on nutrient leaching was estimated by modelling

3. MASTER PLAN FOR MUSTIONJOKILAAKSO

A master plan was prepared for the river valley Mustionjokilaakso

- surveys conducted in the area gave background information on the values and characteristics of nature and cultural landscape in the area
- a special attention was given to water nature and human impact on waters

The Master plan promotes and guides sustainable building in the area

- building sites are directed to forested areas
- river sides are left unbuild and the cultural landscape is kept open

The water protective actions and possibilities were investigated during the planning process - plan marks and regulations as well as the planning process were developed further

- surveys on aquatic nature, pollution and the state of surface waters in the area were conducted
- the use of water models for comparing different plans was examined

4. WATER POLLUTION CONTROL METHODS IN AGRICULTURE

The project developed a nutrient balance program, which describes the balance between nutrients applied to a field area and the amount of nutrients that have been removed from the same area during harvest.

- calculations were performed for 33 farms, for 933 field parcels altogether

Wisu- software program was developed based on the results from nutrient balance calculations

- the use of nutrients can be optimized by Wisu. This decreases overall costs and water pollution by nutrients

5. WATER POLLUTION CONTROL METHODS IN FORESTRY

Means of water protection were improved by developing tools and methods of forestry planning

- mapping of erosion sensitive areas was combined to regional forestry planning
- the project has further developed the Luotsi-mapping program, which enables mapping of the soil type and erosion sensitivity, and thus supports planning of water protection
- soil identification in forestry survey guide (Solmu- survey method) was developed further. The method enables precise soil survey together with forestry planning