IMPROVING THE MANAGEMENT OF PROTECTION FORESTS IN SWITZERLAND: THE PROJECT SILVAPROTECT-CH

Marzio Giamboni[1], André Wehrli[2]

INTRODUCTION

Many mountain forests effectively protect people and assets against natural hazards. In order to provide an optimal protective effect, these forests are often managed by means of public funds. Since these funds are restricted, they have to be applied as efficient as possible. For that purpose, the management of protection forest needs continuous enhancement on different management levels (e.g., national, regional, local).

A preliminary condition to an improved management of protection forests on a national level is a consistent nationwide definition and delimitation of these forests. Such a consistent definition and delimitation in combination with the estimation of the need of action then allows a realistic estimate of the necessary funds. Moreover, it provides a solid basis for the integration of protection forests in the hazards management.

The Swiss Federal Law for the Forest of 1991 engages the cantons to delimitate forests with a protective function against natural hazards. For that purpose, the Federal Government defined the criteria for the determination of the damage potential and the effectiveness of forests against several natural hazards in the 1990es. In practice, however, these criteria were not restrictive enough and gave to much leeway to the cantons. This led to a heterogeneous delimitation of protection forests, which is far from being comparable between the different cantons. This, in turn, makes an integrative dealing with protection forests impossible on a national level.

For this reason, the Federal Office for the Environment FOEN recently launched the project SilvaProtect-CH. This project has several major aims, namely to provide:

(i) an objective nationwide distribution key for the allocation of public funds for the management of protection forests,

(ii) a basis for a standardized and consistent delimitation of protection forests in the long-term and

(iii) a data base on natural hazards and protection forests in a geographic information system (GIS), which can be used for scenario modelling.

METHODS

SilvaProtect-CH is organized in five modules, and the generated data are governed in a geographic information system (GIS) at the FOEN.

The five modules

SILVA containing the forested area, extracted from the national maps of Switzerland.

1 Dr. phil. nat., Bundesamt für Umwelt, Abt. Gefahrenprävention, 3003 Bern, Schweiz, (Tel.: +41.31.324.86.40, email: mazio.giamboni@bafu.admin.ch)

2 Dr. sc. ETH, Bundesamt für Umwelt, Abt. Gefahrenprävention, 3003 Bern, Schweiz (Tel.: +41.31.323.93.98, email: andre.wehrli@bafu.admin.ch)

DAMAGE defining the damage potential and including all objects available over whole Switzerland, extracted from different national data sources such as maps, statistical databases etc. Thereby, the following topics were considered: residential, industrial and public buildings, lifelines, main roads and railways.

EVENT containing the natural hazards. By means of process models, hazards such as snow avalanches, rock fall, debris flow and drift wood were modelled nationwide. This was done by several specialized companies (cf. Liener et al. 2008).

The results of the first three modules are governed, intersected and finally analyzed in the GIS-specific modules INTERSECT and SYNTHESIS:

INTERSECT defines the data management by a data model. In this module the intersection between the damage potential and the hazardous processes is worked out.

SYNTHESIS delivers the final results: the potentially damaging hazards (results of INTERSECT) are intersected with the forested area. This intersection carries out forested areas with potentially protective function. The result of this last intersection are the forested areas with a potential protective function (FAPPF).

RESULTS AND OUTLOOK

As mentioned above, SilvaProtect-CH has several major aims. Two of these aims have been achieved up to now: First, the objective distribution key for the allocation of national public funds for the management of protection forests has been accomplished. This has been done by calculating a ratio between the cantonal and the national FAPPF per canton.

Second, the FAPPF of SilvaProtect-CH have been compared with the existing cantonal delimitation of protection forests for each canton to identify the most important differences between these data sets and to elicit the causes for these differences. An analysis over the 26 cantons of Switzerland revealed that most of the differences between the two approaches were due to (i) different definitions of damage potential, (ii) different databases for the forested area or (iii) an imprecise process modelling within the EVENT module due to inaccurate input data. Based on the results of the comparisons of the FAPPF with the current cantonal delimitations of protection forests, standardized criteria for the delimitation of protection forests will now be elaborated in a participatory process between experts from the cantons and the FOEN. Afterwards, these criteria will then be applied by the cantons, i.e. the latter will have to adapt their current delimitation to the standardized criteria by end of 2011.

In order to achieve the third major aim of SilvaProtect-CH, several scenarios will be modelled in the coming months. The scenarios include mainly differences in quantity (e.g., adding touristy infrastructure) and quality (e.g., weighting different categories of damage potential) of the damage potential. This will provide a basic information for a further improvement of the management of protection forests on a national level and the basic module for a national natural hazards geographic information system.

LITERATURE

Liener S., Hunziker G., Pfeifer R., Giamboni M. 2008: Simulation of potential hazard areas for determining protection forest in Switzerland. Tagungspubl. Interpraevent 2008. Internationale Forschungsgesellschaft Interpraevent, Klagenfurt.