



The figures illustrate important terms that are used to define protection forest:

- Figure above:
1. potential forest area (green)
 2. gravitational (snow avalanches, rockfall, debris slides) and fluvial (torrents, flooding) natural hazard processes
 3. developed areas (settlements and infrastructure)

Figure below (see text for details):

Column 1 (yellow): soil protection forest (function-F1, effect-E1)

Column 2 (orange): protection forest that grows on formation and process areas (F2, E2)

Column 3 (red): forest that directly protects developed areas (F3, E3);

Column 4 (blue): forest with indirect protection benefits for developed areas (F4, E4)

Why a definition for protection forest?

The term protection forest is used inconsistently and sometimes misleadingly both nationally and throughout the Alps. In order to achieve the objectives of GreenRisk4Alps, a consistent definition matrix is necessary to facilitate scientific progress and to communicate clearly among partners and to the public.

Terminology - protection function and protective effect

The term **protection function** is used in planning bases such as the forest development plan. To control land use development, desired forest functions such as protection, recreation, timber production or regulation of water quantity and quality are defined. The concept of function therefore represents the description of socio-economic interests. A forest with a protection function designation is a potential forest area intended to protect against soil degradation and/or natural hazards. In this context, it is of secondary importance in what condition the forest actually is or whether a forest currently exists on a potential forest area. The term protection function only describes an area's assignment to protect against soil degradation and/or natural hazards.

The term **protective effect** is used in the context of protection measures, forest or risk management. The protective effect describes the actual protective capacity of a forest against natural hazards or soil degradation. The concept of effect implies a description of the forest structure, which allows one to assess the actual protection against soil degradation and/or natural hazards. For example, a high protective effect against rockfall is only possible, if a stand has the necessary number of stems, basal area, DBH-distribution or tree species composition in the transit and/or deposit zones. If forest cover is absent from a potential forest area, this area will not have a protective effect.

Figures E1-E4 therefore show symbolically forest areas with stands that have a protective effect (tree elements) and forest gaps without protective effect (full color).

Terminology – site protection and object protection forest

The term **site protection forest** is used for forest areas in which the preservation of the forest itself is the main objective. Two types have to be distinguished:

1. **Soil protection forest** protects against soil degradation (e.g. loss of humus and/or other soil horizons, erosion) and supports the sustainability of the forest location (F1, E1).
2. **Process protection forest** reduces the formation and development of hazard processes in the forest area (F2, E2). Depending on site conditions and process intensity, continuous forest cover loss can be caused by regular natural hazard processes (avalanches, rockfall) and erosion.

The term **object protection forest** is used for forest areas that protect objects in developed areas against natural hazards. An object protection forest can only be assigned, if an object is endangered; otherwise it falls into one of the categories described above (1, 2). Two additional types have to be distinguished:

3. **Direct object protection forest** (F3, E3) protects objects from gravitational natural hazards such as rockfall and snow avalanches. A direct link between the precise locations of the gravitational hazard process and an endangered object can be established.
4. **Indirect object protection forest** (F4, E4) protects objects from fluvial processes such as torrents. Typically, it is not possible to establish a direct connection between a precisely located protection forest area and a flooding scenario since the entire catchment area contributes to flood protection. The relationship is therefore indirect.

DEFINITIONS OF PROTECTION FORESTS

		Site protection forest		Object protection forest				
		Soil protection forest		Process protection forest				
		Process protection forest		Direct protection forest				
		Indirect protection forest						
Protection function defines what should be	F1		F2		F3		F4	
Protective effect defines what is	E1		E2		E3		E4	