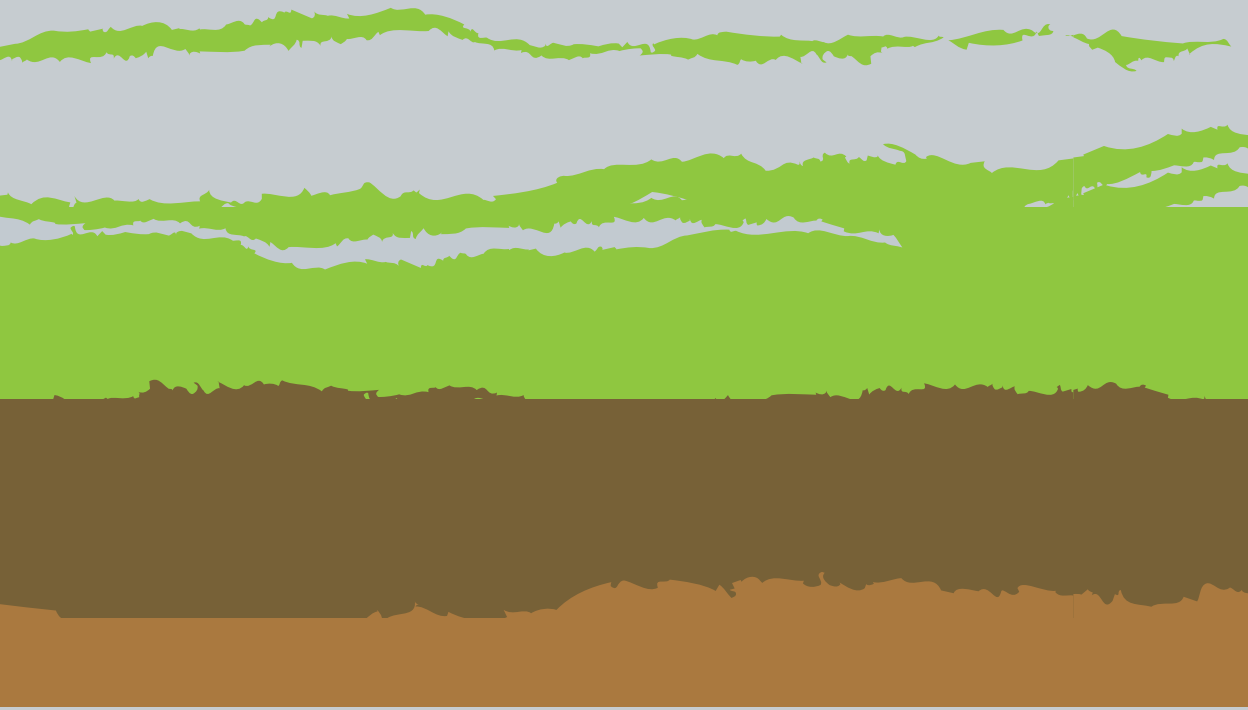
Soil management practices in the Alps

A selection of good practices - Case Study 15



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CS15.

Environmental management of the Skilifte Lech

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Country, Region:	*Austria, Vorarlberg Austria, Vorarlberg*
Organisation:	*Skilifte Lech Ing. Bildstein GmbH*
Sector:	*ski resort and (nature) tourism; reconstruction and conservation*
Land uses:	*agricultural land and forest, infrastructure*
Main soil threat:	*erosion, compaction, sealing, loss of biodiversity*
Key soil ecosystem services:	*protection forest, biodiversity, (nature) tourism, recreation area*
Summary:	*Tourist land use in the Alpine region has a major environmental impact on the Alpine environment leading to issues like erosion, compaction, sealing and loss of biodiversity. With a focus on both sustainable environmental management and tourist use, this project aims to promote and develop methods and procedures to be included in Skilifte Lech's existing environmental programme, and to be promoted throughout all business divisions. The anticipated activities include as follows: infrastructure development using minimal logging, demarcation of wildlife areas, and the preservation of sufficient snow cover through snowmaking. A desired result is the renewal of the EMAS certification.*
Keywords:	*erosion, loss of biodiversity, protective forest, recreation area, Lech*

Background and description of the problem

The Alpine region enjoys great popularity with summer and winter tourists. This means the touristic land use, such as the development and connections with ski areas, represents a major burden on the Alpine environment. Known problems concerning soils are erosion, compaction, sealing and loss of biodiversity.

The Skilifte Lech Ing. Bildstein GmbH (SLIBG), a service provider for summer and winter tourism and operator of one of the largest ski areas in Austria, focuses on a sustainable and careful environment management parallel to tourist use of their facilities by promoting and developing methods and procedures for securing the indigenous, high-alpine flora and fauna and to conserve soil and landscape. For the SLIBG, ecological aspects in addition to economic aspects, are major criteria in making business decisions.

Expected improvements / contribution to better soil management

Goals and implemented measures / an asset for the area and the people:

- Building installations only where hardly any or as little logging as possible is necessary

- Making buildings and (lift) stations fit the landscape.

- Logging and making changes to terrains for ski slopes only to an absolutely necessary extent, and adapting them to the surrounding area.

- Measures for protection of slopes and embankments; since 2008, the company Skilifte Lech is also active in farming and manages of about 48 hectares of private land and leased, no longer managed "problem areas". On the "Schottenhof", an innovative farm operated by the SLIBG, live more than 30 Scottish highland cattle, which secure the steep areas against sliding of snow and erosion by grazing. The Schottenhof is visited by many farmers and authorities from all over Austria.

- Working towards a healthy tree population and conservation, as well as rehabilitation of the protection forest; in the forest management reforestation and fertilisation with helicopter and organic fertilisers is used with advice from public and private research institutes.

- Consideration of the geological and hydrogeological situation when implementing projects.

- Preservation of natural plant diversity, site-specific greening and planting, since the late 1930s. Methods for the restoration of vegetation cover after earthmoving works have been developed. Additionally, the renaturation after earthmoving works includes the maintenance of an orderly water balance, the use of native seeds, taking into account the geological conditions, altitude and exposure. The first batches of native seeds, which were compiled by Univ. Prof. Erwin Lichtenegger, were co-financed and used by the SLIBG in combination with wild-type vegetation and organic fertilisers for re-greening. At present, crops are planted with seed cannons/liquid seeds and seeding by hand, where necessary.

- Causing as little disruption to the natural water balance as possible when implementing projects.

- Preservation of sufficient snow cover with snowmaking, alternative possibility of closure of ski slopes on time; since 1973, the SLIBG operates snowmaking systems, currently with automated snowmaking equipment. They have a unique test bench system for measuring all the technical parameters of all snowmaking equipment on the market. For example, the snow management

for slope preparation is implemented through snow depth measurement, which is based on a laser-scanned terrain model in combination with GPS data.

- For example, existing and newly collected location descriptions were used for an expert report on the time-related beginning of man-made snowmaking and the effects of many years of ski operation. In order to study the effect of 45 years of snowmaking, vegetation recordings of the study area from different years were used as indicators for no vegetation changes under natural and man-made snow layers.

- Demarcation of wildlife areas in cooperation with hunting communities.

- Economical aspect: efforts are made to reduce the negative environmental impact but with respect to economically justifiable costs.

Stakeholders and target groups

- The SLIBG supports knowledge transfer with dedicated environmentalists, farmers, institutions and scientists.

- The cooperation with agricultural partners is of particular importance.

- The SLIBG was Member of the BAUM (Bundesweiter Ausschuss für umwelt-bewusstes Management; Federal Committee for Green Management). The main topic in the BAUM was a purposeful eco-audit. The BAUM was active from 1995 to 1999.

Data and methods

Due to the range of measures, the SLIBG uses a variety of data sources, for example:

- A comprehensive examination of the soils and the gas exchange under the snow cover were carried out by Prof. Franz Solar.

- The SLIBG use a unique test bench system for measuring all the technical parameters of international snowmaking equipment. They also run tests for the producing industry. For example, the snow management for slope preparation is implemented through snow depth measurement, which is based on a laser-scanned terrain model in combination with GPS data.

Additional activities

The core services of the SLIBG include transport services with ski lifts and cable cars as well as preparation, maintenance and securing of ski slopes.

The company pursues a sustainable corporate policy with the following goals:

- Increasing the safety of customers and employees.
- Increasing the comfort standard.
- Optimising the working conditions of the employees.
- Protection and care of the environment.

For this reason, the SLIBG set up environmental management so that the compliance with legal requirements through special organisational measures is ensured Systematic improvements are planned, which are included in company's annual environmental programme. The efforts to promote sustainable development include all business divisions, in particular the planning of all installations and changes to terrains, the procurement, ongoing operations and the use of resources. Efforts are made to reduce the negative environmental impact with economically justifiable costs.

Part of the environmental management includes a comprehensive energy management with power limitation, CO_2 recording and use of geothermal, solar thermal, photovoltaic and heat recovery.

The SLIBG committed to the principle of waste prevention and waste reduction and takes this into account in planning and procurement. They carry out consistent waste separation across all business divisions and also offer their guests the opportunity to actively participate in environmental protection. With their activities and measures in place, they act as a model for other tourist service providers. In addition, regular training of employees in matters of environmental protection and measures to promote environmental awareness are carried out.

Results

- The SLIBG is the first cable car company in Austria which was certified according to ISO 9001 (it defines requirements for effective quality management in an organisation) and ISO 14001 (this standard specifies requirements for an

environmental management system that enables an organisation to improve its environmental performance, fulfil legal and other obligations and achieve environmental objectives).

- The company was also EMAS certified in 1999 (Eco-Management und Audit Scheme, a voluntary instrument of the European Union that helps companies and organisations of all sizes and industry branches to continuously improve their environmental performance) – a renewal is planned.

For example, information boards and brochures are used for communication and information work.

Transferability and applicability to best soil management practice

The methods, procedures and results are relevant not only for other operators of ski areas, but also for dedicated environmentalists, farmers, institutions and scientists. Thus, the SLIBG actively supports knowledge transfer.

Environmental and climate change impact

At the altitude, at which the SLIBG is operating the ski slopes, the snow conditions are favourable and the collected winter data (since 1926/1927 until now at Lech/ 1,480 m a.s.l.) are constant over long periods due to the given weather conditions . The great number of sunny days during the last few summers resulted in relatively high temperatures and good conditions for summer tourism.

References and further reading

Franz Solar (1991): Skipisten und technischer Schnee, Realität, öffentliche Meinung und Meinungsbildung

MMag. Günther Aigner (2018): Eine Analyse amtlicher Temperatur- und Schneemessreihen aus Lech, Zürs, Warth und Schröcken.
https://www.zukunft-skisport.at/site/assets/files/1019/studie_lech-zurs-warth-schroecken_wint_ertemperaturen_schnee_g-aigner_2018.pdf

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Photos / illustrations / maps

Figure 53:
Photo taken from the expert report on the time-related beginning of artificial snowmaking and the effects of year-long ski operations. It shows the location of the study area; black dotted areas: ski slopes.

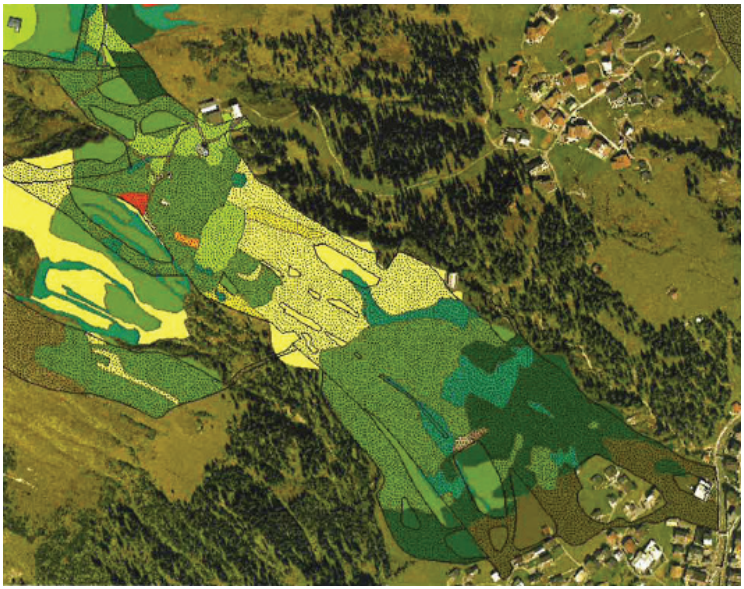

Figure 54:
Taken from the expert report on the time-related beginning of artificial snowmaking and the effects of year-long ski operations. It shows an overlap of the above specified vegetation units with the ski slopes (black dotted).

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