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✓ Management of Mountain Huts Analysis

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History of Huts in the Eastern Alps:
Excerpt from the two-volume book documentation of "HOCH HINAUS! Wege und Hütten in den Alpen", which was published by the German Alpine Club, the Austrian Alpine Club and the Alpine Club South Tyrol.

History of Slovakian Huts:
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Documentation of the history, data collection, evaluation and outlook of huts in the perimeter of EUMA members and Collaborative associations

Index

1 Preface 6
2 Aim of the project 7
3 Overview of the history of the huts and how they came into being 7
4 150 years of mountain hut history in Germany, Austria and South Tyrol 7
4.1 History of Huts in the High Tatras 11
4.2 A brief history of mountain huts construction in Slovenia 19
4.3 Greek Huts History 20
4.4 Project phases and working group 20
5 Definitions 21
5.1 Definition of hut (shelter) 21
5.2 Different types of shelters 21
5.2.1 Accessibility 21
5.2.2 Ownership 21
5.2.3 Types of operation 22
5.3 Special types of huts 22
5.3.1 Winter room/ winter house 22
5.3.2 Bivouac Hut 23
5.3.3 Bivouac 24
5.3.4 Emergency shelter 24
5.4 Main infrastructure elements of a hut: 25
6 Functions of a hut 25
6.1 Infrastructure for mountaineering activities 25
6.2 Point of information and visitor guidance 26
6.3 Offer of food and drinks 26
6.4 Environmental protection 26
6.5 Protection from weather conditions 27
6.6 Emergency alarm point 27
7 Environmental minimum standards of huts 27
7.1 Wastewater treatment and sanitary infrastructure 27
7.2 Waste management at mountain huts 29
7.3 Energy supply systems 30
7.4 Drinking water supply 30
8 Working conditions minimum standards 31
8.1 General 31
8.1.1 Introduction 31
8.1.2 Terms and definitions 31
8.1.3 Terms and definitions for shelters 32
8.2 Workrooms 32

8.2.1 Room heights and ventilation 32
8.2.2 Lighting 32
8.3 Living spaces for employees 32
8.4 Sanitary and social facilities 32
9 Others 32
9.1 Fire protection standards 32
9.1.1 Organizational fire protection on shelters 32
9.1.2 Structural measures 33
9.1.3 Technical measures 33
9.1.4 Organizational measures 34
9.2 Lightning protection standards 35
9.2.1 General 35
9.2.2 Legal basis 36
9.2.3 Special features of lightning protection systems in extreme locations 36
10 Data collection and evaluation 36
10.1 Data collection – general information 36
10.2 Result of the data collection 38
10.2.1 Wastewater treatment 38
10.2.2 Sanitary Infrastructure 39
10.2.3 Waste management 39
10.2.4 Energy supply systems 40
10.2.5 Drinking water supply 41
10.2.6 Kind of area - National Park or other protected area 42
10.2.7 Kitchen Facilities 43
10.3 Evaluation of the data 44
10.3.1 General data 44
10.3.2 Technical equipment data 44
10.3.3 Summary of data evaluation 44
11 Assessments of the associations on the huts' situation in the respective country 45
11.1 Country specific situation 45
11.1.1 FPSM, North Macedonia 45
12 Summary, outlook and next steps for the further project phases 48

1 Preface

The huts in the mountain areas were built as shelters. During more than 150 years, more than 2000 huts were built in the mountains and rocky areas of Europe as shelters for mountaineers and climbers.

The huts are located in mountain and climbing areas at all altitudes between 100m (Trieste) and 4500m (Monte Rosa) above sea level.

In their most important function, huts serve as shelters for overnight stays and in case of bad weather.

With the construction of these huts, a unique infrastructure has been created in extreme locations. The huts are exposed to great weather fluctuations. It is the most benefit for mountaineers to have a protective device, but also a benefit for the valley population to generate added value. In addition to their protective character, huts offer the possibility of serving as a base for on-site alpine training and as an educational facility for living together in a confined space and with simple catering.

In general, the huts are owned by mountaineering associations, but depending on the region, they also belong to national parks, ski resorts, companies, private people, municipalities, other NGOs. The huts are run by tenants or by caretakers only.

The architecture of a hut is usually adapted to the respective mountain area. Equipment and size of the hut is oriented primarily to the intensity of use.

The largest huts can accommodate about 341 mountaineers (Triglavski dom na Kredarici in the Julijske Alpe), the smallest huts, shelters, or bivouac boxes less than 10 people (Kieler Wetterhütte, Verwall with 2 places).

Most of the huts owned by mountain association are open in summer. A part of them is open in winter, too. If huts are closed there is the possibility to use a special shelter all year round, or only in certain months. In the unmanaged huts, cooking facilities and woolen blankets for sleeping are usually available. Huts serve as a rescue centre and a first aid equipment for injured people is usually available.

The further equipment of a hut, besides different fire protection and lightning protection devices, is characterized by the infrastructure found. Many huts can be supplied with spring water from the surrounding area, other huts have only rainwater, melt water from snow, occasionally visitors must bring their own water.

The fuel needed for cooking or heating is either obtained from the nearby surroundings or must be transported to the hut.
The energy is generated locally provided by solar or waterpower, and in many cases, gas or (bio-) diesel powered generators are used as a supplement. Rarely, the hut is connected to the public supply network.

In some cases, drinking water is treated at the hut and, depending on the tourist load and location, wastewater is treated. Waste and sewage sludge are disposed of in the valley.

The huts, depending on their location and equipment, require extremely high volunteers' commitment. The main burden of financing is mostly borne by the mountaineering clubs.

There are remote huts and such that establish a tight network of huts, each according to mountaineering goals.

Huts are attractive to mountaineers, huts perform a guiding function in the open countryside and provide a reliable source of income for the local population. This counteracts the exodus of people from remote areas and contributes to the preservation of the cultural landscape. Huts are meeting places for people from all population groups and nations, which favours cohesion within Europe.

2 Aim of the project

Huts are shelters in different mountain and rocky areas, mostly in extreme locations and therefore with different infrastructures.
The equipment of a hut depends on its location, and huts can be managed, guarded or unattended.

With the following analysis, it is necessary to examine the huts according to their function, their environmental standard, and the respective working conditions.
Significant differences in equipment, which ultimately lead to different requirements, will be presented.
The starting point for this analysis is a collection of data on geographic location, ownership, and homepage information

3 Overview of the history of the huts and how they came into being

The following chapter is an excerpt from the two-volume documentation of "HOCH HINAUS! Wege und Hütten in den Alpen", which was published by the German Alpine Club, the Austrian Alpine Club, and the Alpine Club South Tyrol. An insight is given on the history of the origin and development of mountain refuges in the Alps, using the example of the Alpine Clubs operating there.
This development is certainly transferable to the other refuges in other regions in Europe.

4 150 years of mountain hut history in Germany, Austria and South Tyrol

Preliminary note:
The text below has been translated from the above-mentioned book. The translated wording may be somewhat difficult or awkward to read. This is because the texts are from the past

"On 27 January 1867, Leopold Freiherr von Hofmann presented the idea of a hut to the Austrian Alpine Club (OeAV); Leopold Freiherr von Hofmann proposed the establishment of a hut. Soon, this idea of an association hut in the valley of Kaprun was discussed in more detail by the OeAV. In order to - according to the association statutes - " facilitate travel through the Alps", a stone accommodation hut was to be built" in which the tourist can spend the night without being bothered, as at present, by the smell and commotion of the inhabitants of the goat stable, and in addition, by the smoke from the cooker and without being occasionally disturbed by the raindrops falling from the damaged roof and in which, at the same time, thanks to the presence of a cooking facility, has the opportunity to cook the provisions he has brought with him or obtained from the nearby alpine huts, either by his own cooking skills or those of his guides". Soon, preparations were also made for the construction of another hut on the Schneeberg, the highest mountain in Lower Austria. Although the OeAV did not enter completely new territory with this - the very first documented alpine shelters, which in their function, corresponded to today's function in the broadest sense, were already built at the end of the 18th century (August 2, 1799 Salm hut near the Großglockner) and the The Swiss Alpine Club (SAC) and the Club Alpino Italiano (CAI), although founded at a later date, began building club huts somewhat earlier. The OeAV, however, was opening up a new field of activity for itself. Up to now, it has been content with selective subsidies for private building projects.
[……]

So much for the state of affairs in April 1868. Now action is quickly taken, A few months later, the Erzherzog Rainer Hut is ready for use. The Wiener Zeitung can report: "On 6 August the board of the Alpine Association, Mr. Section Chief [Leopold] v. v. Hofmann climbed the Wasserfallalm; he brought a tourist book with him and was the first to enter his name in it." The hut construction on the "Schneeberg" will be more modest and smaller, more the function of a "house of refuge", "so that the climbers, in the event of a storm that surprises them on the peak or in the vicinity, can find shelter and, as will certainly happen […] even on a clear day, and find a place to rest and recuperate". But it remains the project. In 1885, the Austrian Tourist Club erected the Fischer Hut. This idea drafted in 1867 with the essential features of two fundamentally different types of huts, the more comfortable "accommodation hut" (Rainer-Hütte) and the spartan "refuge house" (Schneeberg project), can still be found today in variations of the buildings of the AVS, DAV and OeAV: furnished AV shelters, unmanaged or managed, on the one hand, and open

shelters and bivouacs on the other side. "In the beginning there was still some uncertainty - there was a lack of experience with - the tasks as well as the paths to be followed. In general, people believed that the Alpine Club only should build in the high regions, and that a true tourist should be unpretentious. Support for valley paths or inns were to be ruled out," summarizes Secretary General Johannes Emmer after a quarter of a century of building experience.
Johann Stüdl, founding member of the German Alpine Club, envisages that Alpine Club accommodations "should not be tourist houses or alpine hotels" or alpine hotels" that "master builders or architects are called upon to build, but rather simple huts, such as huts that correspond to the actual purpose of our association". As a model: the Glockner Hut (the old Stüdl Hut), which he built himself in 1868. At the beginning, the OeAV and DAV, and from 1874 onwards, the German and Austrian Alpine Association (DuOeAV), which was formed by a merger built simple shelters in the mountains out of stone and wood. A ground-level building under a monopitch or gable roof, or gable roof, often leaning directly against the rock provided the basic needs of shelter from the weather, food and sleeping.
[……..]

After only a few years, the simple accommodation propagated is no longer sufficient for the increasing demands, and so the original concept and ideal replaced by the desire to provide not only the tourist shelter, but also to offer tourists more comfort, i.e. to combine the useful with the pleasant - as it were, in a consistent further development of the motto "Utile Dulci", displayed above the entrance door of the first documented shelter built in the high alpine region, the "Hotel" of Charles Blair on the Montenvers near Chamonix. Apart from this, the experiences of the first years have shown that some locations and construction methods are unsuitable for refuge huts, because they have led to manifold damage through moisture, avalanches and weather avalanches and weather. In the early days of hut building, the principle of "trial and error" was often applied out of inexperience. Some shelters had to be abandoned as a result, while others remained in service despite all the hardships. The best example of this is the Schwarzenberg Hut, built in 1882, a hut south of the Wiesbachhorn, which has been damaged or destroyed countless times - mostly by avalanches and rebulilt. Existing huts are thus being further developed in both respects, safety and comfort. The first Carlsbad hut built by the Prague section (Höller hut) and the Untersberg house of the Salzburg section (Zeppezauer House) set new standards in 1883 with their "splendid and opulent" furnishings. Once again, the Alpine Club's hut ownership grows considerably so that the Central Committee, which changes every three years, is once again in danger of losing track of the situation. The progress of building activity leads to the establishment of a "Special Committee" for path and hut questions, which draws up the first hut building regulations in 1879. 1882 a new hut land register is drawn up and presented to the general assembly in Salzburg.
[.....]

Rapid increase in hut attendance
The provisioning of the huts and the careless way in which the supplies are handled is proving a need. On the other hand, the management of the huts by tenants is pushed. In 1894, 44 %of the 134 Alpine Club huts (without open shelters) were already managed, and only 15 years later, over 83% of the 242 huts were managed. The refuges now appeal to a broader public, so that the total attendance of all huts, according to the reported figures rises from 3,528 persons in the year 1878 to 232,176 in the following 3 years. The increased demand is met with extensions.
[.....]

The First World War and the consequences
So, while many sections push ahead with the construction of huts, the development is increasingly seen as problematic by some of the Alpine clubs for at present they are "not building for the high alpinists but for the masses of visitors, and are therefore striving to achieve this for economic reasons alone, choosing, if at all possible, the building site in such a way that the hut can be seen from the valley". The DuOeAV attempts, at first with moderate success, to cap the subsidies. The building activity soon becomes impeded by external circumstances, namely the First World War. The result was stagnation, and many Alpine Club huts can only be used to a very limited extent or not at all used as such, and the necessary renovation work could hardly be carried out. There is a shortage of staff, and some huts are temporarily inaccessible. In some cases, looting and the direct effects of the war lead to (wilful) destruction - as happened, for example, with the huts on the Dolomite front by military use. The Alpine Club magazine of 1919 nevertheless lists 323 current refuges with a total of 8513 camps (beds, mattress camps, etc.) including 22 open shelter huts without camps, 49 huts with year-round camps (self-catering huts), 218 huts managed in summer and 14 huts managed all year round. The figures are approximated because the "now abroad"

huts are also recorded which have been lost through expropriation. After the First World War, a number of huts in the Karawanksand the Bachmountains, in the Steiner Alps and in the Julian Alps to Yugoslavia, for example the Ursulaberg House of the section Klagenfurt near Slovenj Gradec (Vindischgrätz) and the Golica Hut of the section Carniola near Jesenice (Aßling).
[……..]

Above all, however, due to the territorial reorganization of Europe after the First World War, many of the huts of the DuOeAV were suddenly in Italian territory. They were confiscated, and in 1924 most of them were handed over to the Club Alpino Italiano (CAI). - The formal expropriation by the Italian state followed after the Second World War. The South Tyrolean sections, which in an effort to secure their continued existence as a whole in 1920/1921 were dissolved by the fascists in 1923.
After the Second World War, they were re-formed as the Alpine Club South Tyrol (AVS). and built new huts (e.g. Radlsee-Hütte opened in 1956). In 1970, a lump-sum compensation was paid for the expropriated hut property of the former South Tyrolean sections of the DuOeAV. The majority of the expropriated Alpine Club huts in South Tyrol and neighbouring Italian areas were built by German sections. For them, the loss of ownership initially meant bitter setbacks in their efforts to gain a foothold in the high alpine region. For some of them, they were subsequently compensated financially, and for some, they managed to compensate for the losses by building new refuges in Austria.
In 2000, 25 former huts of the DuOeAV were taken over by the province of South Tyrol and their allocation and management were reorganised in 2015. The Province of Bolzano, as the owner, grants the lease and is responsible for financing and management. The hut wardens for 17 of these huts are appointed by AVS sections, and for the others by the CAI. AVS and CAI have a joint advisory function.

Alpine Club Huts around the World
Geographically, the building activity of the Alpine Club - albeit very sporadic - is quite wide-spread. From 1899 the section Tsingtau, the easternmost branch of the DuOeAV, set up several Alpine Club huts in China. Today's metropolis of Qingdao (Tsingtau), located in the Chinese province of Shandong, was the center of the "German protectorate of Kiautschou" until 1914. The DuOeAV even reached out to Africa at the same time. For example, the foundation of a Section Cameroon was discussed, and in 1914 the section Hannover built an accommodation at the Kilimanjaro in 1914, which was, however, never inaugurated as an Alpine due to the outbreak of war. From the 1930s onwards, sections were also founded in South America. The section Peru builds a shelter in the Peruvian Andes, the Dr. Hans Kinzl Hut, and the section Chile even builds several huts. The latter Alpine Club branch is still alive today within the framework of the "Club Aleman Andino - DAV Chile" (German Andean Association Chile) and continues operation of one of its former Alpine Club refuges, the Refugio Lo Valdds..

Hostels and ski huts
In the 1920s, the association as a whole promoted - at first with moderate success - the establishment of so-called valley hostels, which were finally established in many places towards the end of the decade, in order to "provide cheap accommodation in the valleys for the Alpine Club members" and become increasingly populari. Located in valley villages, they are welcome bases on the way to the high mountains. In addition, during that time, the section. Austria, to "care for its own members and for those of other Alpine Club sections, Alpine Club hostels were established which receive a beautiful metal plaque with the edelweiss and the inscription: 'Alpenvereinsheim des Zweigs Austria des D. u. Ö. A. V. [Alpine Club hostel of the section Austria of the DuOeAV] The valley hostels sometimes also serve as Alpine Club youth hostels.
[…….]

When building new shelters, the association as a whole of that time [1922] take special care to meet the needs of both, summer and winter tourism. In addition, the winter opening of existing Alpine club refuges is recommended: "It will be to the advantage of the sections to open suitably situated huts in winter and to provide them with supervision. We are convinced that the all the members of the association enjoying winter tourism will support the erection of freely accessible winter huts in popular skiing areas and would not see any contradiction to the Tölz guidelines." The General Assembly of the DuOeAV finally voted in favour of these guidelines in 1923. A clear demarcation against the hotel and restaurant industry by returning to the modesty and simplicity of the early Alpine Club accommodation is postulated.

[.....]

ÖGV and ÖTK join the Alpine Club

In the 1929 journal, 284 refuges are listed _- excluding the expropriated buildings _. With the accession of the Austrian Tourist Club (ÖTK), which has been independent again since 1945, and the Austrian Mountain Club (ÖGV), which now (again) belongs to the Alpine Club as a section, the number of huts owned increased considerably again at the beginning of 1931; high time for the DuOeAV to draw up a new overview. For this purpose, so-called "Standblätter" are drawn up in 1932. In the same year, the book "The Shelters of the German and Austrian Alpine Associations", edited by the Main Committee of the Alpine Club is published. The timing is considered favourable, as "in the near future there will be no substantial increase in the number of huts, because there is hardly any need for new huts, building huts has become very expensive, and the available funds must be used primarily for the maintenance of the existing huts." All in all, the book describes 429 Alpine Club huts, 170 of which, i.e. the vast majority, being at least temporarily managed, as well as 93 huts lost to the association as a result of the new borders". According to Josef Moriggl, the total number of huts owned of the DuoeAV and its sections at the time the book went to press amounted to 529. This also includes 25 weather protection huts and 75 section huts.

Despite the above-mentioned bitter losses of time-honoured huts, the number of visitors had risen to almost one million per year by the beginning of 1931, taking into account also the ÖGV and ÖTK huts. 20,266 sleeping places, divided into 6,591 beds, 10,951 mattress places and 2,724 emergency places are available. Moriggl estimates the number of places available in the excluded section huts to be well over a thousand, and the number of visitors to these club accommodation facilities to be 60,000 per year!
[.....]

Development after 1945

[.....]
Some of the accommodations have, of course - for example through provision of infrastructure, like roads or cable cars, the building of other huts and houses - lost their original purpose long ago, which is why, as in the case of the Alpincenter Glockner-Haus, a certain change of function has taken place. However, if the preservation is no longer in any reasonable relation to its usefulness, accommodations are sold or demolished. For example, in recent times the Erich Sulke Hut in the middle of the skiing region of Saalbach-Hinterglemm and the Rudolf Hut in the High Tauern National Park, now a mountain hotel, have been sold. Also, the Hofmanns Hut, which was built in its original form in 1834 by Archduke Johann on the Pasterze, was renovated in 1869/1870 by Stüdl and Carl Hofmann and subsequently repeatedly extended and modified; ehas been abandoned and its demolition is scheduled for 2016. As a result, the number of Alpine Club refuges in categories I-III has fallen slightly in recent years. Alpine Club huts are no longer built at new high alpine locations, and several huts have been declared historic monuments because of their cultural and historical significance, individual shelters, such as the Stüdl Hut, have been replaced by new buildings on the same site in recent decades. In this process, importance is increasingly placed on architecturally appealing solutions, sometimes even resorting to architectural competitions for quality assurance.
In the 21st century, the coverage of the Eastern Alps with Alpine huts - with the exception of one or two bivouacs, such as the Josef-Pixner bivouac near the Rauhjoch in the Ötztal Alps - can be regarded as complete."

The two-volume publication with the title "HOCH HINAUS! Wege und Hütten in den Alpen"*, published by Böhlau-Verlag, is available in bookshops at € 49.90 or in the DAV shop .*
https://www.dav-shop.de/productdetails.aspx?id=10000134&itemno=312030

4.1 History of Huts in the High Tatras

View of the High Tatras from Kežmark

The oldest predecessors of the huts were simple shelters made of natural material, in which the prehistoric settlers from the Tatra settlements protected themselves from the night and bad weather on longer expeditions. Lumberjacks and coal miners contented themselves with shelters made of spruce bark, shepherds built wooden huts, and built moss-sealed stone huts near the mines. In the 16th century, members of local intelligence - priests, doctors, some landowners, but above all professors of the Lyceum in Kežmarok - began to be interested in exploring the area of the High Tatras. These were the beginnings of scientific exploration of the High Tatras and the activities that we now call tourism.

The students of the lyceum in Kežmarok went on excursions to the High Tatras with their professors, collected plants for their school cabinet and also had a lesson in the construction of emergency shelters from dwarf pines.

In the alpine zone, there were rocks from which treasure hunters and gold diggers, later tourists, built protective walls under massive overhanging boulders, so-called fire pits. The name comes from ancient times, when fires were burning at their entrances to protect the people from the cold and wild animals. To make the places around the fireplaces more comfortable, visitors gradually lined them with dwarf pine twigs, grass, and moss. They gradually insulated the stone protective walls on the sides. In the pioneering Tatra literature, shelters with fires are mentioned mainly in connection with the expeditions of scientists who explored and described the High Tatras in the 18th century. Even the authors of significantly newer works, in the context of the first ascends to the Tatra Mountains, often mentioned the nights spent under the protection of fires. We can rightly call these shelters the predecessors of today's alpine huts.

A significant event for the development of tourism, mountaineering and making mountain terrain accessible was the founding of the Hungarian Carpathian Association on August 15, 1873, in Stary Smokovec. The headquarters of the association became Kežmarok. Its existence lasted until 1945. One of its main contents was the layout, appearance, and capacity of the designed cottages. The association was also an investor to a large extent. The financial means, thanks to which the basic network of tourist cottages grew up, were collected mainly from various donations and collections. In the 1870s, simple, one-room buildings without housekeepers were designed. Hikers

collected the keys in hotels in Tatra settlements or from the officials of the Hungarian-Carpathian Association in Kežmark. Fees for overnight stays were not set, but hikers were happy to contribute with a voluntary donation or purchase of a "brick", a symbolic action for the maintenance of existing huts and the construction of more new cottages. The first huts were not managed, later retired mountain guides became their seasonal managers.
Under the patronage of the Hungarian Carpathian Association, the Club of Czechoslovak Tourists and Skiers and, especially in the interwar period, even private owners built a relatively dense network of cozy cottages and cottages grew up even in places where they no longer exist, either because of improved communication conditions or ecological criteria. Most of the cottages were extended due to current needs.
After the Second World War, the cottages were nationalized and came under state administration. The former hut manager gradually became employees of several companies: Slovakotura, Turist, Tatra Hotels, Interhotels, Restaurant and Dining Halls and the Tatra Administration of Special Purpose Facilities of the Slovak Organization of the Czechoslovak Association of Physical Education.
On May 1, 1991, the succession associations (Club of Slovak Tourists, Slovak Mountaineering Association JAMES, and Slovak Ski Association) of the former Club of Slovak Tourists and Skiers founded the company Slovenské Karpaty s.r.o. /Ltd./, which took over the management of cottages: Chata pod Rysmi, Zbojnícka chata, Téryho chata, Chata pri Zelenom plese and Zamkovského chata. Later, Zamkovský's cottage was returned as part of restitution to the heirs of Štefan Zamkovský. In 2005, the Slovak Tourist Club bought all shares from the Slovak Ski Association which occurred in financial need.
The Slovak Tourist Club and the Slovak Mountaineering Association JAMES, when signing new lease contracts with tenants in 2005, decided to manage their property together, directly through a joint property commission, which decides on all important issues related to the management of alpine huts, while rents are paid directly by the tenants on behalf of the owners based on valid rental agreements. Expenses are covered by the owners according to their property conditions.
Each of the cottages experienced a different fate. They were created under different circumstances, their appearance, use, sometimes even their name has changed, and some were even relocated. All of them had to withstand demanding climatic conditions and natural elements.

Chata pri Zelenom plese (The Hut near Green lake) – 1,551 m.a.s.l. Vysoké Tatry – Dolina Kežmarskej Bielej vody (High Tatras - White Water Valley Kežmarská)

In the 16th century, the surroundings of Green lake were known not only to shepherds, poachers and treasure hunters, but also to tourists. The professors from the Lyceum in Kežmarok took their students here on educational excursions, and in June 1565 they were probably the guides for the lady Beata Lásky-Koščelecka from the Castle of Kežmarok, the first non-anonymous visitor to the White Water Valley. In 1876 already, near the access road to the Green lake in Predné Meďodoly, the Hungarian Carpathian Association in Kežmark, under the chairmanship of Egid Berzevicky, built the first shelter, the so-called Egid's cottage at an altitude of 1,520 m. Its existence was very short, the herdsmen from the surrounding shepherd huts damaged it, so the management of the association dismantled it and moved it to the northern bank of Green lake. It served tourists for three years, but finally it burned down. During the year, the Hungarian Carpathian Association built a new cottage with two rooms and some utility rooms on the mountain. It was soon moved to the southern shore of the lake, where the climatic conditions were better. After two consecutive fires in 1890, this cottage also disappeared. From 1894, for almost three years, under the patronage of the Hungarian Carpathian Association, they built a luxurious building with a kitchen, a warehouse and five rooms, and named it Friedrich's cottage after Archduke Friedrich, who also supported it financially.

High Tatras - White Water Valley Kežmarská

After the First World War, the number of visitors to the High Tatras increased, so in 1926 the hut was repaired and expanded, and it received a permanent lodger and staff for year-round operation. In the summer, it was supplied with the help of horses, in the winter the goods were brought by porters from the Tatra villages of Rakúsy, Mlynčeky and Lendak.

Until 1945, the cottage belonged to the Karpathenverein, a tourist organization of Spiš Germans, which rented it exclusively to its members.
After 1945, the cottage became the property of the Club of Slovak Tourists and Skiers.
The cottage near Green lake was nationalized in 1948 and the newly created organisation Tatranské hotely became its owner. In 1950, it was renamed to Brnčal's hut, in memory of Albert Brnčal, the former chairman of the Slovak Mountaineering Association, who died that year while descending the tower Jastrabia veža. In 1992, the name of the cottage returned to its original name Chata pri Zelenom plese.
After the restitution in 1991, the cottage was taken over by the Slovak Tourist Club, the Slovak Mountaineering Association JAMES, and the Slovak Ski Association.

Téryho chata (Téry's hut) – 2,015 m.a.s.l. Vysoké Tatry – Malá Studená dolina (High Tatras – Small Cold Valley)

Small Cold Valley was often visited by treasure hunters, herbalists, hunters, but also by travellers. The first tourists came here only accompanied by guides and some even riding horses. The first hiking trail was built in 1875, following the routes of older farm roads.
An important pioneer of Tatra mountaineering, a doctor from Banská Štiavnica and later a health advisor at the Ministry of the Interior in Budapest, Dr. Ödön Téry proposed in 1889 at a committee meeting of the Budapest branch of the Hungarian Carpathian Association (UKS) to build a cottage near Five Spiš lakes.

In May 1898, a construction commission was created under the leadership of Dr. Ödön Téry, composed of professor Ľudovíta Petrík, engineer Jozef Pfinn, builder Gedeon Majunke and representatives of Stará Lesná village, which owned the valley at that time.
Soon after inspecting the site, the builder Gedeon Majunke presented a construction project adapted to the given conditions and terrain configuration. There were no reservations against the project, the association also agreed to the necessary funds for its construction, and construction began already in mid-June 1898.
The construction of the highest located chalet in the High Tatras at that time was also associated with a lengthy and arduous hauling of material. All material was brought from Poprad to Hrebienok by horse-drawn carriages. Workers from Veľký Slavkov, Stará Lesná and a few Roma from distant villages had to carry the material from Hrebienk on their own backs, it was an extraordinary performance.
Many workers took turns on the construction site, the builder Majunke wrote down their names in his memorial book, however, it's a pity that it has not been preserved. If the builder's presence at the cottage was needed, the workers signalled it by reflecting sunlight off a mirror. Alike, Majunke also signalled to his wife in Spišská Sobota that he had arrived safely at the construction site.
On August 21, 1899, the cottage was ceremonially handed over to the public. Despite the unfavorable weather, many people attended the opening ceremony. According to the proposal of the secretary of the Hungarian Tourist Association, the cottage was named after its creator - Téry's cottage. They made the right decision, no one has tried to change the name so far. The original budget was exceeded in the interest of safety, quality, and durability of the building, so that it would not have to be constantly modified and repaired. Part of the costs associated with the construction of the cottage was covered by Gedeon Majunke out of pocket.
Since it was put into operation, the cottage has had a permanent tenant - a hut keeper.
Téry's cottage was gradually modernized. After the summer season in 1935, solid fuel central heating was installed. In 1936, the cottage received a telephone connection, in 1937 the accommodation was improved, and since then, year-round operation began. During the reconstruction in 1955, the interior spaces were modified and the exterior architecture was supplemented. It was expanded with a wooden extension in front of the entrance.
Over the last years, Téry's cottage has undergone various modifications. With significant financial assistance from the owners of the cottage, the Club of Slovak Tourists and the Slovak Mountaineering Association JAMES, many improvements were made, a photovoltaic island system and a water tank were built there, which also significantly influenced the reconstruction of sanitary facilities for visitors to the cottage. Reconstruction of the central heating meant that the solid fuel boiler was replaced by a more ecological pellet boiler.

Zbojnícka chata (Robber´s hut) – 1,960 m.a.s.l. Vysoké Tatry – Veľká Studená dolina (High Tatras – Large Cold Valley)

Large Cold Valley somehow stayed away from the attention at the time of the construction of cottages by the Hungarian Carpathian Association. In 1901, the Hungarian forest property became the owner of the valley, and it built a hunting lodge there in 1907, which, after certain modifications, was handed over to the tourist public free of charge three years later. After 1918, the owner of the land in Large Cold Valley changed and the Czechoslovak state rented the cabin for a symbolic rent to the Club of Czechoslovak Tourists. However, the cottage was still cold and staying in it was extremely unpleasant in bad weather. Polish climbers therefore called it "morgue". The new operator improved the technical condition of the building and built an extension in the same year. The cottage got a permanent tenant. Since poachers were considered to be a kind of bandits and Veľká Studená dolina was a well-known poaching terrain in the past, they named the group of meadows on the upper terrace Robbers lakes and the name Zbojnícka chata – Robber´s hut was given to it in 1924, and the cottage has retained this name to this day.
In the spring of 1983, the reconstruction of the cottage began. It was terminated in June 1985. The grand opening took place on November 8, 1986.
After the reconstruction, the Robber's cottage had a large dining room, a spacious kitchen, comfortable accommodation for guests and staff, storage rooms, a boiler room and central heating. After the reconstruction, the cottage became the best equipped cottage in the High Tatras.
The renovated cottage did not last long. On the night of June 14-15, 1998, it was completely destroyed by fire. Already on the following day, the representatives of Slovenské Karpaty, s.r.o. /Ltd./ along with the hut keeper and other enthusiasts arranged everything necessary for the restoration of the cottage. It was not an easy task, many enthusiasts helped selflessly. A year after the fire, on June 30, 1999, after all the formalities had been completed, the construction began on the old foundations. The project documentation was prepared by engineer Bruno Boroš from Poprad and the main construction contractor was engineer Ľubomír Malina from Kežmark.
At the end of 1999, the cottage was roofed and put into trial operation on December 21, 1999, before approval. In December of the following year, the approval was held, which allowed partial operation, including guest accommodation. The full approval was held on August 20, 2001. The ceremonial opening of the cottage on the old foundations was on October 20, 2001.

Chata pod Rysmi (Hut near the peak of Rysy) – 2,250 m.a.s.l. Vysoké Tatry – Mengusovská dolina – Dolinka pod Váhou. (High Tatras – Mengusovská Valley – Valley near Váha.)

The discussion about the need for a hut near the peak of Rysy began at the end of the 19th century, when the Austrian mountaineer Ubald Felbinger started promoting it, who also decided to financially support this project. In 1929, the Poprad branch of the Czechoslovak Tourists' Club decided to build the tenth jubilee chalet according to idyllic ideas and models from the Alps right in the saddle of Váha. The concrete proposal for the construction of a cottage in the saddle of Váha came out in 1930 during the Tatra Exhibition in Veľká. The cottage project underwent several changes. The proponents and supporters of the construction were not even united in the location of the cottage. The area around Frog lakes was also considered as an alternative. Shortly before the beginning of the construction of the cottage in the saddle of Váha, the Ministry of Education ordered, in view of one of the points of the Krakow Protocol on the creation of the Polish-Czechoslovak National Park, according to which it was not allowed to build in the border zone, the cottage to be located in the Valley near Váha, about 100 meters below the saddle, on the south-eastern slope of Rysy. The main initiators of the construction were engineer Róbert Vosika and Lt. Col. Václav Dusil, members of the Poprad branch of the KČST. The idea was supported by other important individuals and organizations.

They planned the construction for three years. In the first stage in 1930, they modified the hiking trail with the cooperation of the Second mountain brigade up to the Váh saddle. The construction was entrusted to the construction company Šašinka from Poprad, which started the construction in the spring of 1931.

Due to the poor financial situation, the KČST headquarters asked companies for financial or material assistance. Material and workers were transported by the railway Tatranská vicinalna železnica to Popradské lake stop for free. Further transportation was provided by the army to Popradské lake by horse-drawn carriages, from where the material was carried by soldiers and civilian workers. Cement was donated by the cement factory Slovenské cementárne. Stone was quarried right next to the construction site, sand in the Váha saddle, and water was obtained mainly from the snowfields.

The construction itself began on August 3, 1931. The workers came from Spiš and Liptov. They lived in a makeshift hut and fed on the supplies they had brought for the whole week. The workers were not only troubled by the difficult terrain, but also by the bad weather. After two years of construction under difficult, almost dramatic conditions, Poprad builder Jozef Šašinka could announce the fulfillment of these ideas.

On July 15, 1933, with the ceremonial opening of the cottage, its history began to be written. The hut was ceremoniously opened by the chairman of the Smokovec branch of the KČST, Gustáv Nedobry.

In 1948, the cottage was severely damaged by an avalanche for the first time. Also in 1962 and 1982, the cottage was repeatedly damaged by avalanches.

Despite the efforts to operate the cottage year-round, it was only open in summer. With minor modifications, it served until 1977, when, especially during mass ascends to Rysy, all the shortcomings became apparent. The Tatra administration of ÚZ ČSZTV closed it down and did a complete reconstruction within one year.

After some time, it was again confirmed that the decision on the construction site was not correct. Sometime at the turn of January and February 2000, a snow avalanche destroyed a significant part of the cottage. Already in spring, part-timers helped the hut manager with the collection of material and its gradual restoration and operation. At the end of February 2001, a snow avalanche tore off the roof again. The cottage building was temporarily repaired again, but at the same time, a debate arose about whether to restore it properly in its original place, or to move it to a safer place. The staff of the Avalanche Prevention Center in Jasná recommended building a hut outside the avalanche tracks.

In its opinion, the TANAP report recommended the reconstruction of the cottage in its original location with the requirement to build effective anti-avalanche protection.

On June 15, 2010, after the end of the winter closure of the trails, the owners of the cottage KST and SHS JAMES handed over the construction site to the competitive construction contractor - the company Stavunion s.r.o. /Ltd./ from Tatranská Lomnica. This moment came after ten long years of various meetings, negotiations and discussions, the conclusion of which resulted in its current form. The new cottage provides a high level of comfort for guests and staff. The cost of rebuilding the cottage was approximately €630,000.00. Part of it, €265,000.00, was a state subsidy, and other costs were covered by investors (KST and SHS JAMES). We cannot forget the voluntary contributors, their contributions paid for the tiled stove in the dining room, furniture, and equipment of the cottage. Although the appearance of the cottage may not be to everyone's liking, the sheeting serves its purpose. A visitor who enters the cottage gets a different feeling. The furniture is dominated by wood. The cottage is equipped with a photovoltaic system for the production of electricity, which is enough to operate the necessary equipment. The whole cottage has a central heating and a modern pellet boiler for central heating with programming.

The atmosphere of the old cottage is difficult to replace, but the current cottage owner and his team do everything to ensure that the cottage continues to have a unique atmosphere.

Conclusion

A lot has changed since the time when the first tourists began to discover the High Tatras. The mountain huts have changed beyond recognition with their equipment. The generations of tourists and climbers who visit them have something in common. They like to spend evenings in their premises discussing their experiences and dreams together.

Even today, the supply of alpine huts is largely carried out traditionally by alpine porters. The work of a high-altitude porter is registered in the List of Cultural Heritage of the Ministry of Culture of the Slovak Republic and there is an effort to register it in the UNESCO World Cultural Heritage.

Carrier with supplies.

A typical inhabitant of the High Tatras - endemic Rupicapra rupicapra tatrica.

4.2 A brief history of mountain huts construction in Slovenia

Until 1893, when the Slovenian Mountaineering Society (SPD) was founded, the first huts in the Slovenian mountains were built by the Carniola branch of DuOeAV, as Slovenia was an integral part of the Austrian monarchy at that time. The branch was founded in Ljubljana in 1874 but was soon revived in 1881. During its operation, Deschmannhütte (today's Staničev dom) was built on Gubah above Pekel - Kot valley, a year later Maria Teresiahütte under Triglav (present Planika), in 1897 Zoiss hut (now Cojz's cottage on the Kokrško sedlo) and in 1900 Vosshütte (today's Erjavčeva koča na Vršič pass.) was built. In addition to the Carniola branch of the DuOeAV, the Austrian Tourist Club (ÖTC) was also active in Slovenia. This club also built some mountain huts. Some of them are gone today, among the most famous ones were (Frischauf's home in Okrešelj) and a cottage on Korošica.

Due to the distinctly pro-German activity of the mainly Carniolan branch of the DuOeAV, the Slovenian mountaineering association was established in the ranks of the nationally conscious Slovenian mountaineers. After several previous experiments in 1893, the Slovenian Mountaineering Society was founded in Ljubljana. One of the first tasks of the newly formed society was to build huts to resist German dominance in the mountains. Therefore, a year after its establishment, the Orožnova hut under Lisec and the Kocbek cottage under Ojstrica was built. In 1895, the famous priest from Dovje Jakob Aljaž bought the top of Triglav from the Municipality of Dovje Jakob Aljaž and set up a shelter-Aljaž turret, which is still one of the most recognizable symbols of Slovenes. In 1904 he built the first Aljaž cottage in Vrata valley and in the following year the first hut on Kredarica, in 1904 the first Aljaž home in Vrata valley (it was demolished by an avalanche in 1907), so in 1910 a new Aljažev dom was built, which still stands today.

Until the beginning of the First World War, the ethnic struggle between Slovenes and Germans continued in the Slovenian mountains, which was also shown in the competition in the construction of huts and the fight to take over the mountain trails.
After the First World War, the political map of Europe changed significantly and the Slovenian territory became part of the Kingdom of Yugoslavia, while the Western part fell to the Kingdom of Italy under the Rapallo Treaty, and Carinthia fell to Austria after the plebiscite. 15 of the huts were destroyed after the end of the war and 5 remained in foreign territories under the new state regime. The total assets of DuOeAV and ÖTC were purchased by the SPD. All this caused the SPD to work very intensively on the construction and renovation of huts, rather than developing other activities - which were at the forefront in other Alpine countries – alpinism, mountaineering, ski mountaineering, mountain photography, etc. As a result, in 1921 there was the establishment of a second mountaineering organization, which was engaged in precisely these activities – the Slovenian Tourist Club Skala. Therefore, during the interwar period among the top Slovenian mountaineers we find mainly members of this association, some of whom were also members of the SPD at the same time.

The aftermath of the Second World War was similar in the area of mountain huts, many of which were burned and demolished during the war by German occupiers to ensure that they did not offer place to resistance partisans. The general conception of the restoration of the demolished homeland also included mountaineers who, under the auspices of the Alpine Federation of Slovenia -PZS (thus renamed SPD) with a great deal of enthusiasm, voluntary work and with modest material possibilities, and with great ingenuity began the renovation and construction of mountain huts. In the decades after the Second World War, mountaineering was the main sports and recreation activity in addition to skiing, so much attention and material support was received by both, administrative and political authorities at the level of the State of Yugoslavia and the Government of the Republic of Slovenia. For the period until Slovenia’s independence in 1991, the number of mountaineers and, consequently, the number of mountain huts (mainly in the lower areas) rapidly increased, since each new society was built as an external sign of the success of the association' performance. As a result, there are now over 290 associations operating 165 huts under the PZS.

Since 2000, the situation in the area of material support for the country has changed significantly and has only been reduced to the occasional minimum support from EU cohesion funds. However, major changes in the economy resulting from changes in social order, privatization and globalization have also resulted in significantly less donor support - as mountain huts are not exactly facilities for promoting them. Generations of mountaineers who have

operated mountain huts for years on the basis of volunteering are also leaving. Adding to this, climate change and ecological requirements can also be expected in the future in the management of mountain huts in Slovenia.

4.3 Greek Huts History

In the late 1920s, when the nature-loving and mountaineering movement began to grow and the nature-loving and mountaineering associations were founded one after the other, the first proposals for building mountain hostels or shelters in Greek mountains began to be formulated. Until then, Greek and foreign climbers spent the night in houses of mountain settlements, or in monasteries, or in hospitable valleys, or in tents, while in the winter months or overnight was quite difficult and problematic, due to the minimal means of transport, but also condition of the road network.

From the beginning, the need of shelters, mountain hostels, mountain tourism, became clear to everyone, as well as the various mountain sports, such as e.g. skiing with the creation of respectively ski resorts.

In September 1927, on Mount Olympus peak, 24 Greek, French and Swiss mountaineers decided to establish a Mountaineering Association in Greece. Thus, on March 7, 1928, the Athens Mountaineering Association was created by the unofficial mountaineering club «The Cuckoos». Soon afterwards, on June 27, 1928, the Patras Mountaineering Association was established. Those 2 mountaineering associations proceeded to the establishment of the Hellenic Mountaineering Association on February 20, 1930, which initially acted as a federation of the new mountaineering associations being established throughout the country at that time.

The E.O.O.A. (the Hellenic Federation of Mountaineering and Climbing) expanded its activities and the popularisation of skiing and mountaineering and also supported the protection mountain areas. Moreover, the E.O.O.A. recommended to governments in power the need to build mountain refuges so as to facilitate access to mountains for mountaineers and skiers, and all the efforts made at that time resulted in the building of refuges in the 1930s. The first mountain refuge was built on Mount Olympus between 1930 and 1931. The Hellenic Federation owns 11 mountain refuges and another 70 are owned by member associations.

The first mountaineering shelters which were built in Greece in order to serve climbers and skiers, such as Mount Olympus (1930), Parnassos (1931), Panacheikos (1931), Helmos (1932), Oiti (1932), Ziria (1933), Parnitha (1937), Taygeto (1937), Panachaiko (1937), Mitsikeli (1937), Olympus (1938), Chortiatis (1938), Paggaio (1939) and Ossa (1939).

In the line of mountaineering activities since 1935, the E.O.O.A. organised expeditions to great mountain ranges and trained climbers in high mountain camps. From 1956 and onwards rock climbers were trained abroad and later they took part in alpine camps organised for them. The members have been trained in ski mountaineering, alpinism, and mountain rescue since 1964. At the same time, rock climbing seminars and mountaineering seminars were organised throughout the country from 1959 and 1963, respectively.

4.4 Project phases and working group

The project is divided into three phases, which build on each other:
<u>Initial phase:</u>
The purpose of this phase is to describe and analyse the actual situation for huts. That means identifying the EU scale of the issues, experience, good and better practice, identify possible ways of solution.

<u>Strategy phase:</u>
The aim of this phase is to define a policy and strategy plan for improvement of governance of huts as well as communication and decision-making structure.

<u>Implementation phase:</u>
Make strategy and policy plan widely known, among EUMA members as well as among other important stakeholders and make it also functional. That is why it is important to establish a basic structure for committees /working groups which will continue to be active in the concrete issues.

EUMA members are working on the topic of huts under the leadership of DAV. They are supported by a representative of Charles University in EU policy analysis. In detail, these are (in alphabetical order):

Chairman		
Mair, Hanspeter	DAV	German Alpine Club
Members		
Aschaber, Andreas	OeAV	Austrian Alpine Club
Erzen, Miro	PZS	Alpine Association of Slovenia
Gancarčík, Ladislav	JAMES	Alpine Association of Slovakia
Havelka, Vit	CUNI	Charles University Prague
Kotsina, Olga	ERA	European Ramblers' Association
Nikoloski, Goran	FPSM	Mountaineering Federation of North Macedonia
Stierle, Roland	EUMA	European Union of Mountaineering Associations
Temelkovski, Zivko	FPSM	Mountaineering Federation of North Macedonia
Trpevska, Snezana	FPSM	Mountaineering Federation of North Macedonia

5 Definitions

5.1 Definition of hut (shelter)

Huts differ from ordinary accommodation mainly by limited accessibility or their location in remote areas. They primarily serve the needs of mountaineers usually as a starting point for mountain tours. The huts may offer food, accommodation, or a temporary place to stay overnight. Remote accessibility limits the ability of staff to maintain and supply a hut and to use public utility networks.
There are different categories of huts depending on how accessible they are, who the owner is, and the type of operation.

5.2 Different types of shelters

5.2.1 Accessibility

5.2.1.1 Huts accessible on public roads

In valley locations, a small number of huts can be reached by vehicles on public roads. But these huts are **still called** hut because they were not connected to the road when they were built. And a hut is a building not connected by public road

5.2.1.2 Huts accessible only on paths or forest tracks

The vast majority of EUMA members' huts are only accessible via trails, non-public paths, and forest roads. Thus, the huts can only be reached on foot, by ski or by mountain bike.

5.2.2 Ownership

5.2.2.1 Huts of Alpine clubs

Most huts in the perimeter of the EUMA are owned by the national mountaineering associations or their clubs (sections). The Alpine associations in the European states are predominantly organized in such a way that independent mountaineering associations (clubs) have been founded in towns across the country over the last 150 years or more, joined in the Alpine clubs.
The support of the huts, for example the planning of building measures, repairs, maintenance, negotiations with authorities, etc. is characterized by the fact that this activity is carried out by volunteers from the clubs.

5.2.2.2 Privately owned huts

In addition to the large number of huts owned by the Alpine clubs, there are also some privately owned huts. The owners are either valley residents, mountain farmers who manage their alpine pastures, or mountain guide associations of the valley communities or other organizations.

5.2.3 Types of operation

For the huts in the mountain regions, there are basically two different types of hut operation or management. On the one hand there are the managed huts and on the other hand the unmanaged huts. The characteristics and differences are described in detail below.

5.2.3.1 Managed Huts

The main characteristic of managed huts is that one or more responsible persons appointed by the owner section are present at the hut on opening days. This person is called the hut warden or tenant. His or her main tasks are to cater for the guests and to manage the hut. This includes cooking and providing hot and cold food and drinks. A very important part is the organization of the overnight accommodation. In advance, reservations must be accepted and handled at most of the huts.
In addition, the hut warden is responsible for the service and of the hut equipment during operation.
A special form of the managed hut is the guarded hut. In this form of hut, one person is present at the hut during the period of management and organizes the operation of the hut without providing food. The guest brings their own food and the host or hostess prepares the food. However, this form of management is rather rare.

5.2.3.2 Non-serviced huts

The non-serviced huts are also called self-catering huts. The characteristic feature is that the guests bring all their own food and cook in the hut themselves. They organise their stay in the hut completely independently. It is important to note that in most cases the huts in the Eastern aAps are only accessible with a key, which must be collected from the owner's section.
However, there is also a special form. These are the winter rooms. They are available to mountaineers as accommodation outside the operating time in winter. They are either open or accessible with a key that is standardized throughout the Eastern Alps. In other countries (France), it is forbidden to lock the winter room.

5.3 Special types of huts

5.3.1 Winter room/ winter house

A winter room is a very different variant of a Bivouac box. It is a usually a separate place in or attached to a guarded hut with a separate entrance. It offers shelter and accommodation outside the operating hours and thus enables mountain trips outside the hut season. Usually, one has to pay for using the facility. If the place is separated from the main hut and a bigger alone standing building it is often referred as winter house. The comfort varies and can be similar to a rudimentary bivouac box up to a fully equipped hut with many amenities. In principle, there are beds, mattresses, blankets, cushions, an oven, cooking equipment, firewood, a table and seating. The more luxury ones have even electricity, running water, a tiled stove. Apart from the increased amenities the same rules as for good bivouac box manner should apply.

Source: OeAV, DAV, CAI

5.3.2 Bivouac Hut

The typical bivouac hut or box is made from metal, wood, plastic or high-tech composite material. It contains many sleeping places in one small room and the building is mostly visible from distance. It has a small entrance turned away from the windward side. It usually has a basic insulation and few windows. Equipment and comfort can vary extremely. In most cases it is equipped with mattresses, blankets, candles, snow shovel, some emergency supplies and a hut book, more rarely with an emergency telephone, a cooker, cooking fuel cushion and almost never with an oven. The shelter has neither running water nor a toilet. A bivouac box is an emergency accommodation at exposed places in high alpine regions at typical spots where mountaineers get stranded or serves as a high starting point for complex and time-consuming mountain routes. Bivouac boxes are in most cases far away from any serviced hut and in most countries in the alps they are only used in case of an emergency and shall not serve as a cheap alternative to guarded huts.

Main characteristics of a Bivouac box:

- reduced
- spartan
- remote

Bivouac boxes are often located at starting points for high alpine summit tours or on long-distance hiking trails where there are no managed huts over long distances. These bivouac huts are not meant for a comfortable night; they are primarily intended for those mountaineers who are on correspondingly demanding tours. The bivouac culture in Italy and England differs a little bit. In these countries, the bivouacs are used as a self-catered alternative to guarded huts and usually are part of the trip planning.
In the high mountains, the bivouac boxes are usually set up in wind sheltered depressions, close to saddles, prominent passages or close to avalanche proof rock-wall. Only a few are located on mountain peaks. More frequently they are found on highly frequented routes either in the middle or towards the end. In the Western Alps, bivouac boxes are often located at the beginning of ridge ascents. The entrance door, which is usually unlocked, is so high that it can be opened even when there is snow.

Source: OeAV, DAV

History

In the early phases of the conquest of the Alpine regions, there was no particular distinction between different types of buildings. All kind of accommodations in the high mountains were spartan emergency shelters that offered only makeshift protection from wind and weather. Bivouac-like shelters were built for the conquest of Mont Blanc as early as in 1785. Bishop Salm did the same for the ascent of the Grossglockner in 1800 and Friedrich Simony built an emergency shelter on the Dachstein in 1843.

Gradually, due to the increased number of mountaineers, the first huts with catering and basic facilities were developed. These were founded in favourable locations. The shelters located in less spectacular locations or in difficult terrain remained correspondingly rudimentary which are the forerunners of today's bivouac boxes.

The following is an example of user recommendations from the Austrian Alpine Club for bivouac boxes:

- Use bivouac boxes only in emergency cases.
- They are not a destination for romantic nights in the mountains!
- They serve as emergency shelters or for resting on a long mountain tour and meant for alpinists who really need them.
- Observe the principle: "Leave the bivouac box exactly as you found it".
- Take your rubbish back to the valley, there is no one who disposes the rubbish, it just piles up.
- Close doors and windows properly! If they are left open, they can get damaged, and the interior will get ruined by wind, rain, and snow.
- Use common sense when going to the toilet. Don't do it in the proximity of the shelter, bury it and take the toilet paper down to the valley.
- Inform yourself about the standard at the bivouac box and bring all the necessary equipment.
- Take care when cooking and avoid any contamination with hazardous substances.
- Don't post your perfect night in the bivouac box on social media. It could find imitators and soon the place suffers from over crowdedness by people who are using it as touristic destination.

5.3.3 Bivouac

A bivouac box should not be confused with a bivouac although most of the time they are called the same name, that's why it's confusing. Basically, a bivouac is an emergency overnight sleep in the open wild with no shelter-like installation. It only serves the purpose to overcome (survive) the night without any additional equipment. A bivouac sack or even a sleeping bag increases the comfort and decreases the probability of serious health damage.

5.3.4 Emergency shelter

An emergency shelter usually is a small primitive building or covered place with limited comfort and little space. It can be manmade or natural e.g., a rock, cave, or doline. In the most cases, it allows no bearable overnight stay in the long run due to its limited space, missing beds, or the lack of a sealed floor. An emergency shelter serves as protection from adverse weather conditions or in case of imminent danger. It purely preserves a person from any serious casualties. Historically, these places were typically used by herders and shepherds to get protection from the cold, wind, rain, snow or even thunderstorms.

Small hut

Source: OeAV

Open shelter

Source: alpintouren.com

Natural shelter

Source: outdooractive.com

5.4 Main infrastructure elements of a hut:

Huts or shelters are an infrastructure facility built in the mountain environment. They have the basic purpose of providing basic supplies and accommodation when visiting the mountains.

The huts were originally built from materials that were available in the immediate surroundings (rock, wood) and could be transported by simple means. Their furnishings were very simple - a seating area with a wood stove, a few tables and wooden benches, and a smaller bedroom with wooden bunk beds and dormitories mostly in the attic. The huts were uncomfortable, so it was quite unpleasant to stay longer, but our predecessors had no choice.

Over the decades, both, the means of transport and the choice of materials used in the reconstruction and construction of mountain huts have changed considerably, so that modern mountain huts are built from materials that are energy-efficient and durable. However, there have been even greater changes in interiors and their furnishings. Of course, it is necessary to distinguish between huts located in high mountains, which can only be reached after a climb of several hours, and those located in lower areas. The latter huts are accessible to a wider range of visitors, the higher ones are the starting point for high altitude tours.

As a rule, the huts in the high mountains are smaller, more modest in equipment and simpler in sanitary standards (depending on the amount of water and energy available for sewage treatment). The typical range of available space includes:

- storage space for shoes and equipment
- living room
- kitchen
- bedroom/storage for guests
- bedroom for staff
- toilets for guests
- toilets for staff
- storage rooms for food, beverages, wood, cleaning materials and waste
- space for technical equipment for the hut operation
- winter room either integrated into the building or located outside the building

Depending on the type of supply using a ropeway for material transport huts have a material store in the valley so that supplies can be temporarily stored for transport. In addition, depending on the type and size of the wastewater treatment facilities, technical rooms are available either in the building or mostly outside.

6 Functions of a hut

6.1 Infrastructure for mountaineering activities

The huts in the mountain regions have a history of over 150 years. They were built in the first place to shorten the long climbs or to make the summit ascents possible. There is a great deal of literature on the history of mountain huts. The decisive factor for the construction of huts was the endeavour of the alpine associations to create bases in the Alps or mountain regions in order to climb the peaks. This has changed somewhat in the meantime because the starting points of the huts can be reached much more quickly than in the past. Nevertheless, the huts still exert a fascination. Magnificent views of the mountain world and life in a certain simplicity far away from urban bustle continue to exert a great fascination on hut visitors.

Thus, the huts continue to have a very important function as a starting point for all activities related to mountain sports. Whether climbing and alpine tours in summer or ski tours in winter, whether as a starting point for hikes, the huts represent the most extensive infrastructure in the mountains.

6.2 Point of information and visitor guidance

The mountain world is fundamentally subject to rapid weather changes, which are increasingly accelerated by climate change, so that despite careful planning of mountain tours and increasingly reliable weather forecasts, weather events cannot always be predicted. In this case, the mountain refuge is a very safe place. Because of their very good knowledge of the local microclimate, hut keepers can often give more reliable forecasts for short-term weather conditions. This is a very valuable service for guests.

Climate change also has a profound impact on mountain conditions. Permafrost is melting, heavy rainfall and storms are influencing the increasing extent of avalanches and landslides. These influences mean that paths or even entire valleys must be closed. Much of this information, which changes daily, is provided to guests by the hut keepers. They also advise on alternatives.

Despite extensive information about the special features of the mountain environment and its vulnerability provided by the alpine associations, in schools and other institutions in the valley, visitors to mountain huts should be reminded to treat the mountain environment with sensitivity. In mountain huts, visitors can obtain information in the field of nature conservation, especially with regard to individual locally protected plants, animals, water resources, etc.

6.3 Offer of food and drinks

Food and drinks are generally offered at the managed huts. This starts with breakfast, which can be quite substantial. The offer ranges from butter, bread and jam to muesli, cheese, sausage, and fresh fruit. Of course, coffee and tea and served, too. At most huts, you can also get tea for the tour. A special feature is that members of the alpine associations in the Eastern Alps are entitled to tea water. This is a right, which is pronounced in the rules of huts. Non-members do not enjoy this offer.

The lunch and dinner offer can be very varied. There are meat, fish, and egg dishes as well as vegetarian dishes. Here too, a member of alpine associations has the privilege of ordering a mountaineer's meal at the maximum price of nine euros in the Eastern Alps. Half-board is often offered for dinner as well because it simplifies the hut logistics. At the huts of the DAV, OeAV and AVS there is an initiative called "*So schmecken die Berge*" (This is how the mountains taste). The aim of this initiative is to use local and regional products for the huts and thus to strengthen agriculture, bakeries, butchers and breweries in the valley. Only huts that meet the relevant criteria are accepted and allowed to carry the corresponding quality label.

The range of drinks is usually very large and regional. The offer ranges from beer, wine, lemonades, mixed drinks to local specialties.

Overall, the offer is characterized by specialties from the regions.

6.4 Environmental protection

This aspect has two sides, which are described below.

On the one hand, huts strongly contribute to the protection of nature from the influences of human presence. The huts have a control function in that they provide guests with a protected space. This prevents wild overnight stays in nature and limits the impact on nature to a few square meters.

On the other hand, the hut sites ensure that the impact on nature is minimised by their management. This is done, for example, through wastewater purification systems, regenerative energy generation systems, economical use of resources, etc.

6.5 Protection from weather conditions

The huts in the mountain regions also have a protective function regarding the weather conditions. They protect against heat, rain, snow, wind, storms, and lightning. The huts are built and equipped accordingly.

6.6 Emergency alarm point

Despite the exceptionally rapid development of communication technology, especially in the field of mobile phones, there are still areas in the mountains where there is no mobile phone network. Especially in climbing areas, the hut keepers can recognize accidents very quickly. In case of an accident or emergency, the refuges are the first point of contact to report the accident to the mountain rescue service and start a rescue operation. In this case, the hut keeper can usually take immediate action, for example, in the case of avalanche accidents. Some huts have a radio set so they can call the rescue service even if there is no mobile network.

Emergency equipment is available in many huts. However, it is rather rarely used because accident victims are often rescued by helicopter, which carries the necessary rescue equipment.

7 Environmental minimum standards of huts

7.1 Wastewater treatment and sanitary infrastructure

Wastewater treatment at mountains and mountain refuges serves to protect the groundwater in the refuge area and underlying deposits. The required degree of purification is determined by the respective legal regulations. Due to the usually difficult transport conditions and unfavorable weather conditions at mountain huts, the construction and operation of wastewater treatment plants at mountain huts is very expensive. Generally, a biological waste treatment plant is installed.

The local framework conditions are a very important factor for the planning and construction of wastewater treatment plants at mountain refuges.

Main factors which influence the system are:

- transport effort (type of supply)
- altitude above sea level
- geology
- summer and winter operation
- cost-intensive energy supply
- drinking/utility water supply scarce
- terrain topography (steep/rocky subsoil)
- legal requirements
- design size of the system
- dry toilets
- yield of the water supply
- maintenance effort
- third-party maintenance

The composition of the wastewater from mountain huts and shelters can be very different. In particular, the availability of water, the consumption of hot water and the type of management have a very strong influence on the dirt load. In addition, strong fluctuations in the amount of wastewater and its composition occur in the course of a year or a season due to varying occupancy.

Huts with many single-day visitors and only a few or no overnight stays usually have a significantly lower concentration of organic substances, but above-average ammonium loads (mainly from grey and yellow waters), than huts with mainly overnight visitors.

In general, the concentration of pollutants in the wastewater of mountain huts and refuges is significantly higher than in comparable objects in the valley. This must be taken into account when dimensioning the wastewater treatment plant.

Wastewater from mountain huts generally has a much lower temperature than that in the valley.

As a rule, objects in isolated locations are characterized by the fact that their supply and disposal systems must function self-sufficiently. This is referred to as an island location. It is therefore important that the individual systems are coordinated with each other; an integral approach reveals the mutual interrelationships.

Process steps of wastewater treatment
Pre-treatment: Pre-treatment serves to eliminate the solids. Mechanical processes (e.g., settling or screening) are used for this purpose. It is used before the main treatment and relieves the latter.

Main treatment: The main treatment serves to eliminate the dissolved substances. Biological and physical processes are used for this purpose.

Advanced purification: Advanced purification is used to eliminate constituents that could not be removed in the main purification.

Sludge treatment: The term sludge treatment refers to the treatment of the separated wastewater ingredients (the solid, pasty, or sludge-like substances removed from the wastewater = sewage sludge) using mechanical and biological processes.

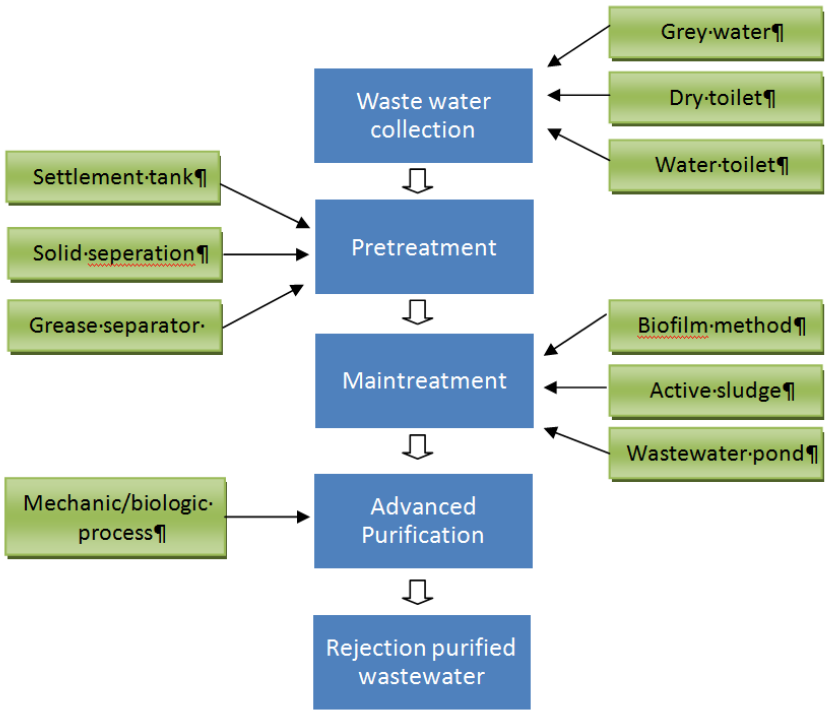

Filter bag plant Ostpreußen Hut


Filter bed, Göppinger Hut


Trickling filter, Watzmannhaus


Wastewater treatment plant, Württemberger Haus

Schematic representation of a wastewater treatment plant



7.2 Waste management at mountain huts

The following reflects the basic assumptions on waste management which apply in Europe.

Waste can be solid, liquid, or gaseous and is managed and disposed differently according to its unique properties.

For the EU members, the directive of the European Parliament of 19 November 2008 on waste and repealing certain directives are the basis for any assumptions concerning waste.

According to the directive 2008/98/EC the main aim is to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use.

Definition of waste
The concept of waste has two dimensions, one is a self-perspective and the other one concerns a broader perspective from a public interest approach.

Personal dimension: Waste in the subjective sense is any substance or movable object which the holder discards or intends or is required to discard.

Societal dimension: Waste in the objective sense is a movable object whose collection, storage, transport and treatment as waste is necessary in order not to impair public interests which generally addresses the protection of the environment and health, safety and public order.

In particular, the public interest is impaired if:

- The health of people may be endangered, or unacceptable nuisances may be caused,
- dangers to water, air, soil, animals or plants and their natural living conditions may be caused,
- the sustainable use of water or soil may be impaired,
- the environment may be polluted beyond the unavoidable extent,
- fire or explosion hazards may be caused,

- noise or sound may be caused to an excessive extent,
- the occurrence or proliferation of pathogens can be promoted,
- public order and safety may be disturbed, or
- the townscape, landscape or cultural assets may be significantly impaired.

Situation at the huts:
In the cities and villages, there are a variety of waste types for which there are also corresponding disposal paths. These are e.g., residual waste, bulky waste, municipal waste, biological waste, recyclable waste.

All these types of waste are also generated at the shelters or huts. The only difference is that there is no waste collection service that picks up the waste at regular intervals. The tenant of the hut must separate the waste, store it separately and bring it to the valley. This can be done by ropeway for material transport, helicopter, or vehicle. This special situation requires that storage space for waste must be available at the huts. This is associated with additional costs for the hut-owning club.

Fundamental approach
The waste directive takes the waste hierarchy 2008/98/EC as its basic measure in order to entail waste prevention as its prior principle. Its main aim is to reduce waste and make waste streams transparent under the general "polluter pays principle" and the "extended producer responsibility".

Source: EU Commission

The hut keepers are, of course, also confronted with the fact that visitors bring material that they want to dispose of at the hut. For this reason, there are no waste containers at most huts. In addition, biodegradable waste bags are provided at many huts so that guests can take their waste back to the valley.

Above all, it is important that the waste generated at the hut is neither burned on site nor dumped in the landscape.

7.3 Energy supply systems

There is a wide range of energy supply systems at the huts. The main goal for the supply is the use of renewable energy sources. Many huts have photovoltaic systems for power supply with storage systems from batteries and for heat generation. In addition, there is the energy source of hydropower. Sometimes there are already many combined heat and power plants with rapeseed oil as the energy source on the huts, which serve to supply both, electricity and heat. In addition to these technical plants, wood heating systems are still used both, for cooking and as a space heating system. Bottled gas is also often used for cooking, sometimes from steel tanks.

Unfortunately, many huts still have diesel generators. These are to be replaced in the medium term.

7.4 Drinking water supply

Drinking water is essential for the supply and operation of the huts. Without drinking water, regular operation of the huts is not possible.

The drinking water supply of mountain huts is a great challenge for the operators. Guests have high expectations. From his point of view, the demand for clean air, clean water and a clean environment in the region concerned is particularly high. Against the background of climate change, the supply of drinking water will become one of the greatest challenges for the management of mountain huts.

For drinking water to be free of pathogenic germs with a high degree of certainty, the dwell time of the water underground should be at least 60 days. In the mountains, there is at best meltwater that flows through a moraine gravel, for example, or precipitation water that seeps into a crevice and emerges after a few hours. There are also shelters that collect part of the drinking/ service water on the roof and store it in a cistern.

However, the legal framework applies to all who use drinking water, external circumstances are not considered.

In most cases, water disinfection systems in the form of UV systems are installed on the huts. In addition, the drinking water must be regularly sampled and tested by a certified body.

If safe drinking water is not available, measures must be taken. This can occur if the suitability as drinking water is not confirmed in the expert opinion or, for example, if surface water enters, if the water is turbid, but also if the UV system fails.

- The competent authority must be informed.
- The guests must be informed.
- Attach the notice "No drinking water" to the outlets.
- Water must be boiled.
- Drinking water must be available in the kitchen area.
- The operator must solve the problem within 30 days at most.
- It is not a permanent solution.

If people suffer damage to their health due to contaminated drinking water, this can lead to legal consequences for the operator. Therefore, utmost importance must be attached to clean drinking water.

8 Working conditions minimum standards

8.1 General

8.1.1 Introduction

If workers are employed in refuges, the relevant occupational health and safety regulations must be applied. These regulations primarily include requirements for the refuge as a place of work. Places of work must meet certain requirements in order for the employment of workers to be permissible.

For huts, for obvious reasons, these requirements cannot always be met in their entirety, because for instance according to Swiss law, employees must have a rest outside the working place which is, of course, impossible in a hut. It is therefore necessary to develop guidelines with the alpine associations and the authorities in order to preserve the typical character of mountain refuges, but on the other hand also to ensure adequate protection of workers through appropriate measures.

8.1.2 Terms and definitions

Workplaces in buildings are structural installations and parts of structural installations to which workers have access in the course of their work: e.g. workrooms, corridors, stairwells, storerooms, machine rooms, sanitary rooms and rooms for resting during work breaks. Work rooms are all those rooms in which workers have access according to the purpose of the room, during the regular working hours.

8.1.3 Terms and definitions for shelters

In relation to refuges, the terms and definitions are greatly simplified by the size of the refuges. Almost all traffic routes will also be considered escape routes. The entrance or exit to the refuge usually serves as the emergency exit.

8.2 Workrooms

For work rooms, basic regulations apply to room height, ventilation, and natural lighting (windows). Work rooms are the kitchen and the guest room.

8.2.1 Room heights and ventilation

Room heights of less than 2.5 m are accepted for existing huts, smoking is strictly prohibited in the guest room in the huts of the Eastern Alps.

8.2.2 Lighting

In principle, natural lighting of work rooms must be provided by light-intake areas (windows or skylights) to the extent of 10% of the floor area. However, due to the location and the associated wind and weather conditions of shelters in extreme locations and due to the time-related working circumstances, an exception may be made for natural lighting. For the exception, however, the exposure area must not be smaller than 5 % of the floor area.

8.3 Living spaces for employees

There must be a space of at least 10 m^3 per worker. Each room must be ventilated and have at least one window leading into the open air. A lockable box and a bed with bedding shall be provided. Bunk beds are not permitted. A room height of at least 2.5 m must be maintained in new buildings. A room height of 2.3 m is permissible if there is a space of at least 12 m^3 per worker.

In huts that are also operated between 1 October and 31 May, the living rooms must be heatable. Facilities for drying wet clothes must be available. Unless smokers and non-smokers are accommodated in separate rooms, smoking must be prohibited.

8.4 Sanitary and social facilities

Showers with hot water and toilets (flush or non-flush) shall be available to workers in sufficient numbers. Separate lounges are not required if a suitable area is provided for workers to take meals and stay during breaks.

9 Others

9.1 Fire protection standards

9.1.1 Organizational fire protection on shelters

The basic protection target specifications from the building laws of the federal states or states are almost identical and they require that all structural installations are planned, executed, and maintained in such a way that life and health are not endangered. They also stipulate that the spread of fire must be restricted, and safe escape ensured.

Only the measures otherwise required with regard to extinguishing work and rescue measures by fire brigade emergency services must be omitted in the case of shelters due to their location. The general requirement to take

measures that enable building occupants to fight an incipient fire, provided they do not endanger themselves, remains in place.

Thus, if in "normal" buildings in the valley, in addition to preventive fire protection, defensive fire protection is also available as a reliable "pillar", the fire protection safety in a refuge in an extreme location is limited to the measures of preventive fire protection - structural, technical, and organizational measures. Nevertheless, the basic requirements must be ensured.

9.1.2 Structural measures

The possibilities to realize structural measures according to the standards of today's building regulations are limited. Most of the huts were built many decades ago, and what they all have in common is that several conversions and additions have taken place over the years, which were often not documented.

The required fire protection measures were usually not carried out in such cases.

Even if a high value is always placed on fire protection and expert implementation in accordance with regulations in all current building measures, the residual risk of the old building fabric cannot be completely eliminated, as is ultimately also known from experience with historical buildings in the valley.

The special location, use and the fact that rescue and fire-fighting measures by the fire brigade are not possible are partly considered in the current regulations - however, even if these requirements are less stringent than those for buildings in the valley, their implementation in the shelters is not easy. A balanced fire protection concept tailored to the refuge is necessary and its preparation is also recommended for measures that do not require approval, as this planning instrument can record and evaluate the special structural features so that the possible measures can be taken in a targeted, justified, and comprehensible manner.

For example, the opening of escape doors to the outside can rarely be realized due to the exposed location, as this would make it impossible to open the door in snowy conditions, the door could be torn off its hinges in an uncontrolled manner during extremely strong gusts of wind in the mountains, or an entrance door opening to the outside would result in an increased risk of injury in daily use.

However, this requires both knowledge of the building regulations and an understanding of the actual value of the proposed measures.

Escape route lengths and escape route widths are based on the respective legal provisions.

9.1.3 Technical measures

In case of fire, it is imperative that the overnight guests are warned in good time and can leave the common rooms, especially the sleeping quarters, and find shelter outside the hut.

Depending on the detailed regulations, smoke alarms, a hazard alarm system (networked smoke alarms with an alarm control centre) and/or a fire alarm system must not be missing in a shelter, as such technical equipment represents an essential personal protection measure.

Both, fire detectors (smoke detectors) and smoke warning detectors can detect smoke particles in the air and sound an alarm at a certain concentration and density.

It is possible to add push-button detectors to the system to manually trigger an alarm in case of danger.

Since non-converted attics are used as storage rooms, these areas must also be equipped with automatic detectors.
Safety lighting

Backlit escape signs are required in the shelters to mark escape routes. In special cases, safety lighting may also be required in the escape routes.

Smoke extraction
In multi-storey shelters with interior stairwells, openings for smoke ventilation must be provided in the stairwells. It must be ensured that the openable windows can be opened without the use of aids. In special cases, in multi-storey shelters with interior stairwells and a very large number of guests, it may also be required that the smoke outlet can be opened from each storey.

Operational safety and effectiveness of the systems
Since refuges in extreme locations are not operated all year round, the commissioning of the technical installations and the inspection of their effectiveness and operational safety are particularly important. Even if the acceptance tests and regular inspections are carried out by independent bodies, it is important that the tenants or the refuge staff have the necessary expertise and are trained to operate the facilities.

9.1.4 Organizational measures

Since in extreme situations refuges are not accessible for the rescue forces, or only with a considerable delay, organizational measures are of particular importance. In this context, the tenants and the refuge staff are particularly challenged, as they not only have to take care of the refuge operation, but also have to take the first measures in an emergency and guide the evacuation of the refuge.

While trained and instructed personnel can assume that the fire brigade will quickly take over the management of the refuge in the valley, the refuge personnel and the refuge guests have to rely on self-help.

Since, as a rule, neither the hut staff nor the guests have fire-fighting training and appropriate equipment and, ultimately, no extinguishing water is available, if an attempt to extinguish the fire is unsuccessful, the only possibility of self-rescue is to safely leave the building.

This means that suitable fire extinguishers must be available in the refuge in sufficient numbers and size according to the respective country-specific standard.

In the guest area of the shelter, solid, ember-forming substances of fire class A are assumed to be present for which foam or water extinguishers can be used. In the area of the sleeping and guest rooms, the use of ABC powder extinguishers is not considered suitable due to the obstruction of vision by extinguishing powder.

Due to the high risk of fire and smoke, fire extinguishers can only be used to fight a fire in its initial phase.

The locations of fire extinguishers on each floor should be clearly visible and located at central points on the escape routes (e.g., at the exit to the outside, at the entrance to the stairwell, at intersections of corridors, etc.).

A grease fire extinguisher and a fire blanket shall be kept available in the kitchen.

In technical and storage rooms, powder, CO_2 or foam extinguishers can be used depending on the equipment.

In any case, the hut staff should be trained in the use of fire extinguishers. A fire extinguishing exercise is a compulsory part of the training for fire protection wardens that the Alpine clubs offer for hut wardens and tenants as part of the hut technology seminar.

An important instrument of organizational fire protection are the fire protection regulations.

In the fire protection regulations, the relevant rules for fire prevention and for behavior in case of fire are compiled and adapted to the building.

In addition to the measures against the development and spread of fire, the fire protection regulations should also describe information on how to behave in the event of a fire – in particular on alerting and evacuating the refuge as well as alerting the rescue services in the valley, etc.

Brief information on fire protection measures in the refuge and on how to behave (e.g., prohibition of putting smoke alarms out of operation, information on the correct behavior in the event of an alarm - check the situation, attempt to extinguish the fire, help comrades, get to safety, etc.) should also be included in the refuge rules and posted in a clearly visible place.

The installation of escape route plans in the rooms, the area-wide marking of escape routes with backlit or self-illuminating or fluorescent escape signs, depending on the structural situation, is mandatory. It must be ensured that exits to the outside can be opened from the inside at any time and without tools (a key box to secure emergency exits is not suitable!). It is forbidden to store objects in corridors and staircases. Regular inspection of the technical systems is one of the minimum measures.

Especially in larger huts, it is recommended to carry out evacuation drills and to document the process. However, the aim of this exercise should not be to get the climbers or the school class out of bed during the night, but to give the hut staff the opportunity to practice what to do in an emergency.

9.2 Lightning protection standards

9.2.1 General

Persons who are outdoors are in any case exposed to the risk of a close or direct lightning strike. All commonly given advice, such as leaving exposed areas or crouching with closed legs, serves to reduce the risk, but does not provide protection against a lightning strike in the open. Therefore, especially in the high mountains, shelters equipped with a lightning protection system are often the only really safe places within a larger radius during thunderstorms.

The general thunderstorm occurrence is determined by the occurrence of negative (~90 %) and positive downward lightning (~10 %), whereby in the alpine region average lightning density values of 2 to 5 lightning bolts per km^2 and year can be expected, and the impact points are largely determined by chance. A multiple of these lightning flashes occurs within the thundercloud (without ground contact) and usually poses no immediate danger to persons and objects.

In the case of structures in exposed locations, the lightning strike frequency in these objects can be significantly higher than in the local surroundings due to the occurrence of so-called upward lightning flashes. These upward flashes are triggered at the top or by superstructures on high structures and would not occur without the presence of the structure. In flat terrain, upward flashes are observed at structures higher than 100 metres. At exposed locations in the mountains, upward flashes may also be triggered by objects with a significantly lower height (antenna mast on the roof, etc.).

Since 2008, there has been a uniform series of regulations for lightning protection throughout Europe, EN 62305 Parts 1 to 4, which meet the current requirements of modern lightning protection.

Lightning protection system: For modern lightning protection, both, "external lightning protection", consisting of interception system, arrestor system and earthing system, and "internal lightning protection" (equipotential bonding and surge protection) must be implemented. The external lightning protection, formerly often referred to as lightning protection system, serves to reduce physical damage (fire, explosion, etc.) and the risk to life in the building structure, whereas the internal lightning protection serves to protect the electrical equipment and to avoid dangerous step and touch voltages.

9.2.2 Legal basis

The necessity for the installation of a lightning protection system on shelters arises from their exposed location.

9.2.3 Special features of lightning protection systems in extreme locations

In general, lightning protection systems for shelters are constructed in the same way as those for ordinary buildings. Due to the exposed location, some special features may have to be considered when installing the lightning protection system. For example, large amounts of snow on the roof can lead to increased mechanical stresses on the fastenings of the interception and down conductors of the lightning protection system. The exposed location can result in poor earthing conditions (due to the usually very high specific ground resistance, earth electrodes cannot be buried or can only be buried partially) and thus complete equipotential bonding (internal lightning protection system) is of particular importance.

In terms of lightning protection for shelters, the entire system must be considered, including all associated or nearby objects or technical equipment (possibly existing photovoltaic systems, remote diesel generators, cable car systems, antenna systems, weather stations, etc.). It is not only important to prevent a fire in the event of a lightning strike, but also to protect the people in the shelter from dangerous step and touch voltages and to keep the technical infrastructure functional.

Regular inspection of the lightning protection system should not only ensure that the parts of the lightning protection system are in good condition and can fulfil their intended functions (no corrosion, good electrical connections, etc.), but also ensure that any newly added utilities or structural changes have been correctly incorporated into the lightning protection system.

10 Data collection and evaluation

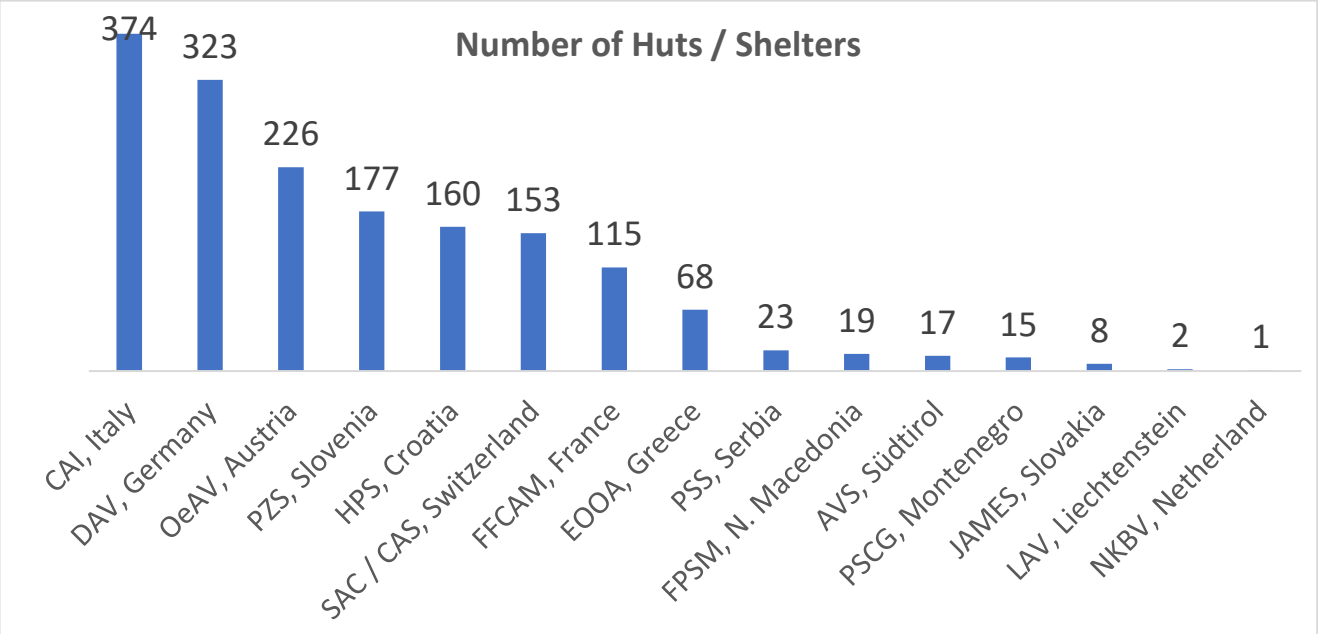
10.1 Data collection – general information

Associations which submitted data:

- Mountaineering Association of Italy (CAI)
- Mountaineering Association of Germany (DAV)
- Mountaineering Association of Austria (OeAV)
- Mountaineering Association of Slovenia (PZS)
- Mountaineering Association of Croatia (HPS)
- Mountaineering Association of Switzerland (SAC/CAS)
- Mountaineering Association of France (FFCAM)
- Mountaineering Association of Greece (EOOA)
- Mountaineering Association of Serbia (PSS)
- Mountaineering Association of North Macedonia (FPSM)
- Mountaineering Association of South Tyrol (AVS)
- Mountaineering Association of Montenegro (PSCG)
- Mountaineering Association of Slovakia (JAMES)
- Mountaineering Association of Liechtenstein (LAV)
- Mountaineering Association of Netherland (NKBV)

Number of huts / shelters: 1681

Association	Number of huts and shelters
CAI, Italy*	374
DAV, Germany	323
OeAV, Austria	226
PZS, Slovenia	177
HPS, Croatia	160
SAC/CAS Switzerland	153
FFCAM, France	115
EOOA, Greece	68
PSS, Serbia	23
FPSM, North Macedonia	19
AVS, South Tyrol	17
PSCG, Montenegro	15
JAMES, Slovakia	8
LAV, Liechtenstein	2
NKBV, Netherland	1
Total	**1681**



Data collected:

1. Hut/Shelter
2. Name of the Mountain Hut or Shelter
3. Country
4. District/ State
5. Mountain/ Location
6. GPS coordinates in decimal, WGS 80
7. Elevation
8. https link to hut
9. Picture URL (generic URL)
10. Managed/non-managed
11. Operating Organization
12. Owner of the hut
13. Wastewater treatment
14. Waste management systems

15. Water supply
16. Source of energy, electricity, and heating
17. Kind of area (National Park, or protected area)
18. Sanitary facilities
19. Kitchen facilities.

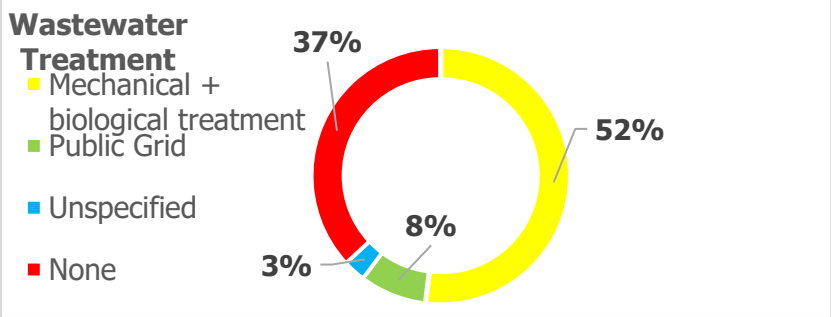
Note: CAI (Italy) and SAC/CAS (Switzerland) have not submitted technical data for the chapters 13 – 19. It is sometimes very difficult to obtain the data of the huts. For this purpose, the support of the individual sections on site is needed. The recording is all voluntary work. At the DAV, there are 70 self-catering huts in the low mountain ranges, data of which is only available from a certain part.

10.2 Result of the data collection

10.2.1 Wastewater treatment

Analyzed data for 956 huts/shelters:

Type	%
mech. + bio treatment	52
none	37
public grid connection	8
Other	3



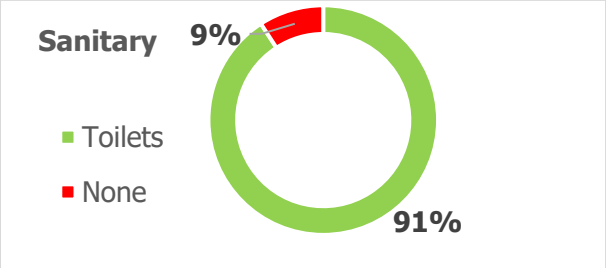
Analysis per Association

	Mechanical + biological treatment	Public Grid	Unspecified	None
HPS, Croatia	0 %	0 %	2 %	98 %
DAV, Germany	65 %	26 %	0 %	10 %
EOOA, Greece	0 %	0 %	0 %	100 %
FPSM, N. Macedonia	0 %	0 %	0 %	100 %
NKBV, Netherlands	100 %	0 %	0 %	0 %
PSS, Serbia	0 %	0 %	0 %	100 %
JAMES, Slovakia	100 %	0 %	0 %	0 %
FFCAM, France	74 %	0 %	0 %	26 %
OeAV, Austria	71 %	12 %	16 %	1 %
CAI, Italy	no information	no information	no information	no information
PZS, Slovenia	88 %	0 %	0 %	12 %
SAC, Switzerland	no information	no information	no information	no information
AVS, South Tyrol	65 %	0 %	0 %	35 %
LAV, Liechtenstein	100 %	0 %	0 %	0 %
PSCG, Montenegro	0 %	0 %	0 %	100 %

10.2.2 Sanitary Infrastructure

Analyzed data for 996 huts / shelters:

Type	%
toilets	91
none	9

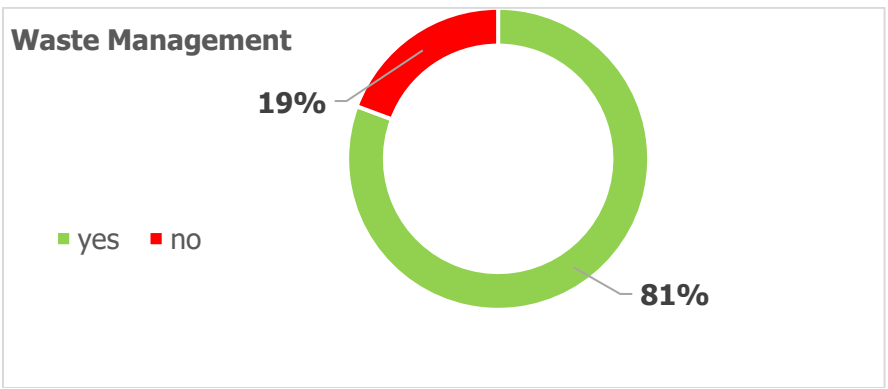


Analysis per Association

	Toilets	None
HPS, Croatia	84 %	16 %
DAV, Germany	93 %	7 %
EOOA, Greece	100 %	0 %
FPSM, N. Macedonia	63 %	37 %
NKBV, Netherlands	100 %	0 %
PSS, Serbia	96 %	4 %
JAMES, Slovakia	100 %	0 %
FFCAM, France	91 %	9 %
OeAV, Austria	99 %	1 %
CAI, Italy	no information	no information
PZS, Slovenia	90 %	10 %
SAC, Switzerland	no information	no information
AVS, South Tyrol	71 %	29 %
LAV, Liechtenstein	50 %	50 %
PSCG, Montenegro	57 %	43 %

10.2.3 Waste management

Analyzed data for 912 huts/shelters. 81% of all huts / shelters have a waste management system.



Analysis per Association

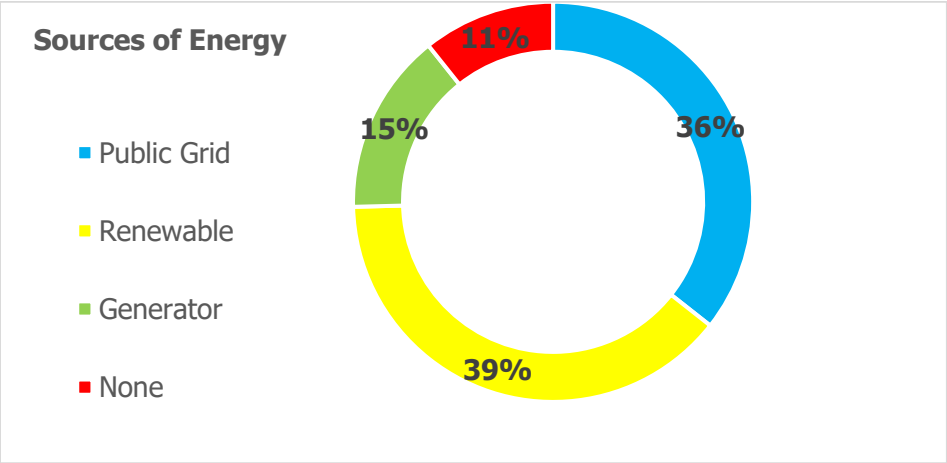
	yes	none
HPS, Croatia	100 %	0 %
DAV, Germany	90 %	10 %
EOOA, Greece	0 %	100 %
FPSM, N. Macedonia	no information	no information
NKBV, Netherlands	100 %	0 %
PSS, Serbia	0 %	100 %
JAMES, Slovakia	100 %	0 %
FFCAM, France	63 %	38 %
OeAV, Austria	97 %	3 %
CAI, Italy	no information	no information
PZS, Slovenia	90 %	10 %
SAC, Switzerland	no information	no information
AVS, South Tyrol	65 %	35 %
LAV, Liechtenstein	50 %	50 %
PSCG, Montenegro	79 %	21 %

10.2.4 Energy supply systems

Analyzed data for 1008 huts / shelters:

Type	**%**
public grid connection	36
renewable energy	39
generator	15
none	11

The four categories represent a summary and there are many combinations of energy production plants. The following are examples: accumulator, electric energy+generator, electric energy+photovoltaics+generator, gas lamps, hydropower+generator, photovoltaics+generator, photovoltaics+generator+renewable energy, photovoltaics+off grid system, renewable and fossil energy, photovoltaics, hydropower and fossil energy, fossil fuels, hydropower and photovoltaics.
In total, associations have submitted 18 categories of sources of energy. EOOA (Greece) has the most diverse sources of energy in the huts / shelters - 12 categories.



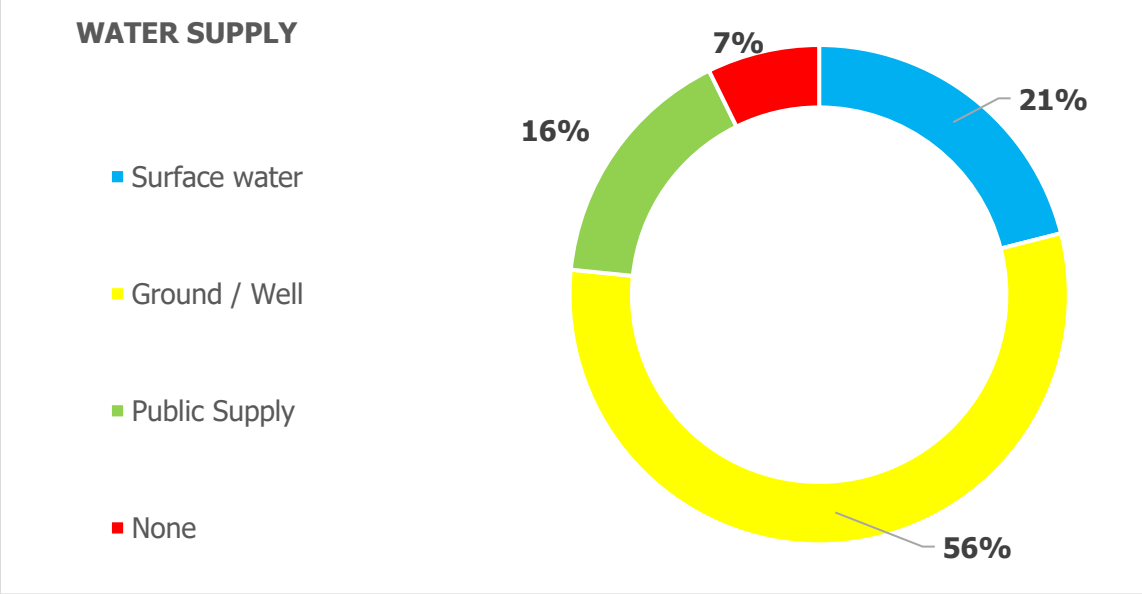
Analysis per Association

	Generator	Renewable	Public Grid	None
HPS, Croatia	11 %	22 %	41 %	26%
DAV, Germany	0 %	52 %	40 %	7 %
EOOA, Greece	50 %	18 %	31 %	1 %
FPSM, N. Macedonia	21 %	74 %	0 %	5 %
NKBV, Netherlands	0 %	100 %	0 %	0 %
PSS, Serbia	0 %	100 %	0 %	0 %
JAMES, Slovakia	38 %	63 %	0 %	0 %
FFCAM, France	7 %	77 %	0 %	16 %
OeAV, Austria	31 %	35 %	32 %	2 %
CAI, Italy	no information	no information	no information	no information
PZS, Slovenia	12 %	15 %	63 %	10 %
SAC, Switzerland	no information	no information	no information	no information
AVS, South Tyrol	18 %	47 %	6 %	29 %
LAV, Liechtenstein	33 %	67 %	0 %	0 %
PSCG, Montenegro	21 %	14 %	29 %	36 %

10.2.5 Drinking water supply

Analyzed data for 1017 huts / shelters:

Type	**%**
Surface water	21
Ground / well	56
Public supply	16
None	7



Analysis per Association

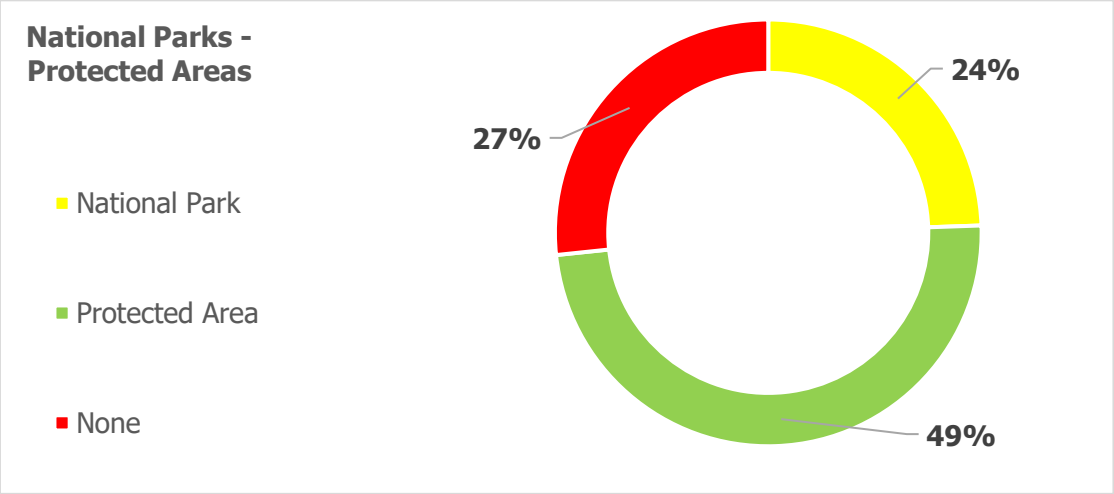
	Surface water	Ground / Well	Public Supply	None
HPS, Croatia	49 %	18 %	24 %	8 %
DAV, Germany	7 %	74 %	10 %	9 %
EOOA, Greece	35 %	43 %	19 %	3 %
FPSM, N. Macedonia	0 %	63 %	26 %	11 %
NKBV, Netherlands	0 %	0 %	100 %	0 %
PSS, Serbia	0 %	4 %	91 %	4 %
JAMES, Slovakia	13 %	88 %	0 %	0 %
FFCAM, France	3 %	76 %	12 %	8 %
OeAV, Austria	16 %	74 %	8 %	2 %
CAI, Italy	no information	no information	no information	no information
PZS, Slovenia	31 %	40 %	19 %	10 %
SAC, Switzerland	no information	no information	no information	no information
AVS, South Tyrol	0 %	71 %	0 %	29 %
LAV, Liechtenstein	0 %	100 %	0 %	0 %
PSCG, Montenegro	36 %	57 %	0 %	7 %

10.2.6 Kind of area - National Park or other protected area

Analyzed data for 778 huts / shelters.:

Type	%
National Park	24
None	27
protected area	49

*Other: Landscape conservation area, National Park Peripheral Zone, Natura 2000, Natura network, Parnassos National Forest, unspecified, Protected Area Sopotnica Waterfalls, protected landscape, SR Bijele i Samarske stijene, strict reservat, significant landscape, SR Rožanski i Hajdučki kukovi, NP Sjeverni Velebit, strict reservat, Parc Naturel Régional du Queyras, PNRPA, PNP, Parc National de la Vanoise, Massif du Mont Blanc, Game reserve, Spring reserve, Special protected area



Analysis per Association

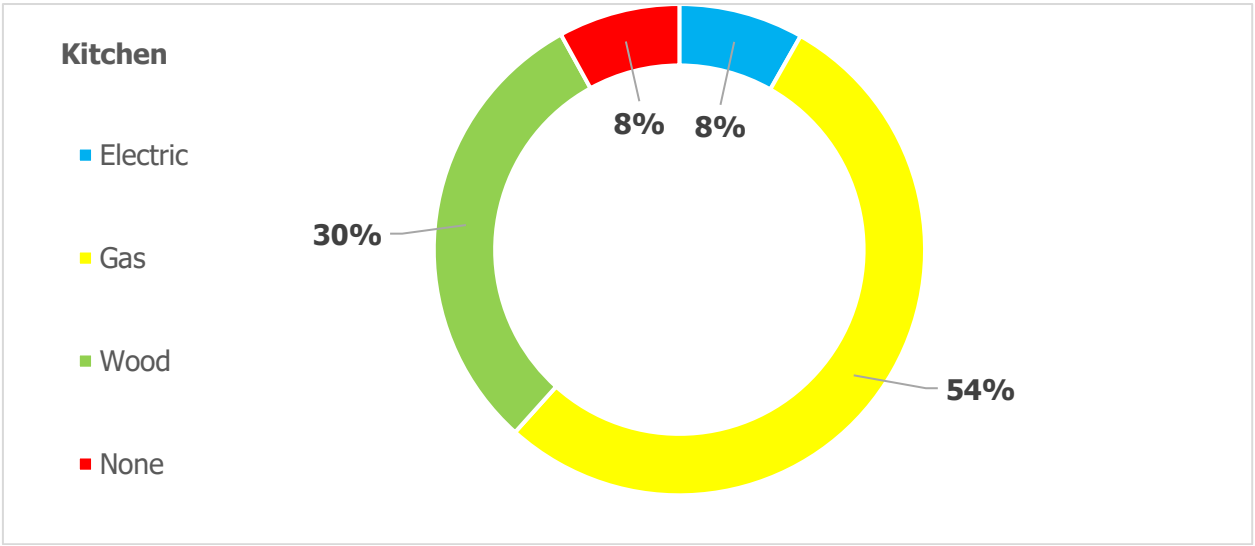
	National Park	Protected Area	None
HPS, Croatia	5 %	38 %	57 %
DAV, Germany	23 %	77 %	0 %
EOOA, Greece	10 %	10 %	79 %
FPSM, N. Macedonia	37 %	11 %	53 %
NKBV, Netherlands	0 %	0 %	100 %
PSS, Serbia	22 %	4 %	74 %
JAMES, Slovakia	100 %	0 %	0 %
FFCAM, France	71 %	29 %	0 %
OeAV, Austria	24 %	76 %	0 %
CAI, Italy	no information	no information	no information
PZS, Slovenia	25 %	40 %	34 %
SAC, Switzerland	no information	no information	no information
AVS, South Tyrol	6 %	71 %	24 %
LAV, Liechtenstein	0 %	0 %	100 %
PSCG, Montenegro	43 %	21 %	36 %

10.2.7 Kitchen Facilities

Analysed data for 986 huts / shelters:

Type	**%**
Electric	8
Gas	54
wood	30
none	8

*Other: electric, electric stove+ wood stove



Analysis per Association

	Electric	Gas	Wood	None
HPS, Croatia	0 %	0 %	99 %	1 %
DAV, Germany	5 %	81 %	9 %	5 %
EOOA, Greece	28 %	59 %	12 %	1 %
FPSM, N. Macedonia	26 %	21 %	37 %	16 %
NKBV, Netherlands	0 %	100 %	0 %	0 %
PSS, Serbia	100 %	0 %	0 %	0 %
JAMES, Slovakia	0 %	100 %	0 %	0 %
FFCAM, France	0 %	74 %	0 %	26 %
OeAV, Austria	11 %	26 %	56 %	7 %
CAI, Italy	no information	no information	no information	no information
PZS, Slovenia	0 %	85 %	5 %	10 %
SAC, Switzerland	no information	no information	no information	no information
AVS, South Tyrol	29 %	29 %	12 %	29 %
LAV, Liechtenstein	33 %	33 %	33 %	0 %
PSCG, Montenegro	0 %	8 %	77 %	15 %

10.3 Evaluation of the data

10.3.1 General data

During the analysis phase, it was possible for 15 associations to provide general hut data. The associations were contacted and asked to provide data. They were provided with an Excel table. This is an excellent basis for further developments and for demonstrating the importance of mountain huts for tourism and their steering function.
The hut data are presented in the web-based map mapunto https://mapunto.org. This allows users to select their destinations throughout Europe.

Our aim is to obtain hut data from other associations so that the gaps that still exist in Northern Europe in particular can be filled, for example Norway.

10.3.2 Technical equipment data

The collection of data for the technical equipment of huts is very time-consuming. This is mainly due to the fact that the data must be collected by the volunteer hut wardens.

It is therefore really astonishing and cannot be valued highly enough that so much data has been made available.

The data collection showed that there are very different systems and therefore the results were summarised in the evaluation for reasons of clarity. The evaluations according to the individual associations give an overview of the technical status and where there is a need to catch up.

10.3.3 Summary of data evaluation

The background for collecting the data was to first gain knowledge about the current state. This will allow us to determine what further requirements exist for the technical equipment and what measures need to be taken. We want to achieve the goal of establishing a Europe-wide minimum environmental standard for our huts, for example, regarding drinking water supply, waste disposal and wastewater treatment

11 Assessments of the associations on the huts' situation in the respective country

In a further step, the participating associations will use the collected data to document the future challenges to their authorities and call for support.

11.1 Country specific situation

The partner associations were asked to describe their country-specific situation. The following example from the Republic of North Macedonia illustrates the problems that mountaineering associations have to deal with. These descriptions will be supplemented during the project.

11.1.1 FPSM, North Macedonia

11.1.1.1 Number and situation with the huts and shelters

There are up to 30 mountain huts and shelters in North Macedonia, but in the Erasmus+ matrix only those owned by FPSM or mountaineering clubs and associations are registered. Most of them are in a bad condition or not functional because they are old or repurposed buildings (military, police, schools etc.) from the period between the 1950s-1960s. Since the independence of the country (1990s) the huts and shelters were abandoned and without regulated ownership. At end of the 1990s when many new mountain clubs were established, part of the huts and shelters were restored with minimal investment, but since then, almost nothing was done for their renovation. Hence, their present condition is still very bad, because they are old buildings, with outdated equipment that does not meet even the basic criteria for these types of constructions. Without consultation, the previous Government has taken the huts and shelters into governments' protection, which added to their further decline.

The total number of huts and shelters in the Erasmus + matrix for North Macedonia is 19. The first 11 huts are functional huts offering some services to mountaineers (accommodation and food) and two are shelters. The rest of the six huts are not functional or do not fulfil minimal standards for accommodation.

11.1.1.2 Ownership status and management of huts

Out of the total number, 6 buildings are owned or given (by the state) to the Mountaineering Federation (FPSM), 5 are owned by mountaineering clubs, 3 are owned by municipalities, 2 are owned by private companies and 2 have unresolved ownership status.

Owned by:	Name of the Hut/Mountain:	Managed by:	Note:
FPSM	Dare Dzambaz (Vodno)	MC „H2O“, Skopje	
FPSM	Tower-Shelter (Toto Vrv)	MC „Argentus“, Tetovo	
FPSM [1]	Karadzica (Jakupica)	MC „Drachevo“, Skopje	
FPSM [2]	Cheples (Dautica)	MC „ Cheples“, Veles	The hut was illegally confiscated from FPSM. A lawsuit is currently pending.

[1] Formally, the facility was assigned for the permanent use to FPSM, by a government's decision from 2018.
[2] The hut was built with funds from FPSM and formally belongs to FPSM, but in an illegal procedure it was "taken over" and then privatized by the mayor of the municipality of Chashka. A lawsuit is currently being filed against the mayor, after which a procedure for restitution of the ownership of FPSM should be initiated.
[3]The hut was built with funds from MC "Pelister" from Bitola, which conducted a legalization procedure. However, the mayor of Bitola disputed the legalization procedure and passed an act by which the ownership of the hut was taken over by the municipality. The ownership status of the hut is currently unresolved.

FPSM	Shest Chesmi (Vodno)	Private entity	Doesn't offer full services as mountaineering facility
FPSM	Josif Stancik (Vodno)	Doesn't offer full services as mountaineering facility	Doesn't offer full services as mountaineering facility
FPSM / MC „Ljuboten"	Ljuboten (Shara Mountain, Staro selo)	MC "Ljuboten", Tetovo	Shared ownership with MC "Ljuboten" (50 %)

Owned by:	**Name of the Hut/Mountain:**	**Managed by:**	**Note:**
MC „Pelister"[3]	Dimitar Ilievski Murato (Pelister)	MC „Pelister" Bitola	
MC „Ljuboten"	Ljuboten (Popova Shapka)	MC „Ljuboten" Tetovo	
MC „Ljuboten" and FPSM	Ljuboten (Shara Mountain, Staro selo)	MC „Ljuboten" Tetovo	Shared ownership with FPSM (50 %)
MC „Entuzijast"	Sharena Chesma (Belasica)	MC „Entuzijast" Strumica	
MC „Bel Kamen"	Dzumaja (Plachkovica)	MC „Bel Kamen" Radovish	
MC „Skopska Crna Gora"	Shelter Spirova Koliba (Skopska Crna Gora)	MC „Skopska Crna Gora" Skopje	

Owned by:	**Name of the Hut/Mountain:**	**Managed by:**	**Note:**
Municipality of Chashka	Papradishte (Dautica)	Ecology group Green Power	Former primary school
Municipality of Karbinci	Vrteshka (Plachkovica)	MC „Lisec" Shtip	
Municipality of Gevgelija	Tome Shutov Krotki (Kozuf)	MC „Kozuf" Gevgelija	
Owned by:	**Name of the Hut/Mountain:**	**Managed by:**	**Note:**
Private company	Smreka (Popova Shapka)	MC „Transverzalec" Skopje	
Private company	Crn Kamen (Jablanica)	MC „Zakamen" Struga	

Owned by:	**Name of the Hut/Mountain:**	**Managed by:**	**Note:**
Unresolved	Neolica (Baba)	MC „Gjorgi Naumov" Bitola	
Unresolved [3]	Kopanki (Pelister)	The hut is burnt	

Out of a total of 19 buildings listed in the database, 17 are managed by mountaineering clubs, while two are managed by private entities (they offer only catering facilities).

11.1.1.3 Internal equipment and environment protection

As stated in the introduction, the general condition of the mountain huts in North Macedonia is very bad because they do not meet even the basic standards for this type of constructions applied in the countries with developed mountaineering culture.

Buildings and accommodation: Almost all huts are old buildings on which only minor repairs have been made to make them functional. There have been some exemptions in the recent years - several investments in reconstruction were done (The Tower-Shelter on Titov Vrv, Vrteshka Hut, Sharena Cheshma Hut, Dare Dzambaz) Sleeping rooms are with old furniture and mattresses, kitchens are equipped with accessories brought from the mountaineers, toilets are old, and in several huts, there is no heating, water, or electricity.

Sources of energy: Most of the huts have electricity supply (hydropower), except for a few that have their own generators. None of the huts has the equipment for using renewable energy sources, except for one or two that have built-in solar panels that are used only as an additional energy source. Electricity is mainly used for lighting, and for heating, stoves on wood or gas are used.
In the kitchens, wood stoves are used in almost all huts, some of the huts also use gas stoves and in extraordinary situations, electricity is used for cooking. In general, due to costs, cheaper sources of energy are used.

Water Supply: Being located outside populated areas, most huts are supplied with water from ground/well systems built either for their needs or for buildings located on the same site. Some of those well systems, as well as the huts themselves, are very old and need to be renovated. Only a few huts have access to a local public water supply.

Wastewater treatment: None of the huts has any wastewater treatment system, either mechanical or biological. In most cases, the wastewater is discharged into a septic tank built near the hut, or pipes are discharged into the land at a certain distance from the hut.

Waste management system: in general, mountain huts gather the waste collected in the hut or outside the hut and dispose it in the nearby garbage dump. However, none of the huts is connected to a waste management system, either from the municipality or from the wider region, in terms of a regulated and organized collection, transportation, selection, treatment and disposal of the solid waste.

11.1.1.4 Main problems: lack of financial resources, management problems, poor infrastructure

Almost all mountain huts, apart from a few that are in more attractive locations, face a lack of funding, primarily because the overall costs of maintaining the huts (electricity, heating, hygiene, communications, consumables, hut keeper salary etc.) are high while the income from overnight stays and other guest services is insufficient to cover all those costs. In addition, many mountaineers are rarely willing to spend the night in a mountain hut due to their low standard of living and/or due to the actual poor conditions of the huts. As a result, most mountain huts are unable to hire a hut keeper or tenant to take care of the hut and are only open on weekends.

Another problem that contributes to the weak financial situation of the mountain huts is the poor infrastructure of roads leading to most of the huts. This contributes to the huts having fewer visitors at different times of the year, as only a certain number of mountaineers are able to reach the hut by their own means of transport or by foot. If the infrastructure were better, the huts could probably accommodate visitors who are not mountaineers but who want to visit the site.

The management of a large number of huts is left to several volunteers from the mountaineering associations or clubs. In this regard, another problem is the lack of culture or incentives for volunteer work among mountaineers, but also the lack of specific knowledge of how huts can be successfully managed.

11.1.1.5 Absence of a national strategy and support from central and local government institutions

The state, i.e., the competent institutions do not have a comprehensive strategy for the development of mountain huts and/or, in general, for the development of mountaineering tourism, so this issue is completely left on the sidelines. The support of state institutions, especially the Government, the Ministry of Economy, the Agency for Promotion and Support of Tourism and the Agency for Youth and Sports is crucial for improving the general situation in mountaineering in the country, and especially for the reconstruction and revitalization of mountain huts.

In addition to the Government's support for the final settlement of ownership status of the mountain huts which belong the Mountaineering Federation, it is important to adopt an appropriate strategy for the development of mountain huts and mountain tourism in general, and to provide funding for investment in mountaineering infrastructure, including the reconstruction of the existing and building of new mountain huts. Currently, there is a lack of vision, coordination, and cooperation between state-level institutions regarding the promotion of mountaineering, the maintenance of mountaineering facilities and infrastructure, and the construction of new facilities in locations where they are lacking.

Furthermore, for the successful functioning of the mountaineering associations and the mountaineering huts at the local level, the support and cooperation with the units of the local self-government are of great importance. At present, there is a lack of such cooperation, and there are even a few municipalities that work against the interests of the mountaineering clubs, so they have either appropriated the mountaineering huts or completely hinder their work.

12 Summary, outlook and next steps for the further project phases

With this analysis report, a very good overview of the mountain huts in Europe is now available. The report is a good starting point for the development of the future strategy of the huts. It is now necessary to obtain further data from the other EUMA members in order to complete the overall picture.

Finally, we would like to thank all the participating associations for the sometimes very laborious data collection. Special thanks go to the working group on huts, without which such a survey would not have been possible, and above all to Goran Nikoloski, who summarized and analysed the data collection.

EUMA, November 2022, Hanspeter Mair, Chairman of Working group Huts

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Partner associations:

- ✓ Alpine Association of Slovenia
- ✓ Austrian Alpine Club
- ✓ Charles University
- ✓ Czech Mountaineering Federation
- ✓ European Ramblers' Association
- ✓ German Alpine Club
- ✓ Hellenic Federation of Mountaineering and Climbing
- ✓ Mountaineering Federation of North Macedonia

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