Chapter 20
Sustainable Coexistence of Ungulates and Trees: A Stakeholder Platform for Resource Use Negotiations

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Abstract Browsing by ungulates is broadly seen as a major problem for tree regeneration in Alpine forests. At the regional or local level, a resource management problem arises because there is still a lack of scientific knowledge about the long-term importance of herbivore impact on forest dynamics and because conflicting interests between different stakeholders such as foresters, hunters, farmers and nature conservationists persist. A common understanding of the problem and an agreement on the management aims are needed before an effective and broadly accepted wildlife and forest management strategy can be established.

Within the framework of the Swiss National Research Programme 48 (NRP 48, Landscapes and Habitats of the Alps) we developed instruments and procedures for solving a regional forest–wildlife conflict in a mountainous environment by means of a 'platform for resource use negotiation' and collaborative learning. A management concept has been developed, in consultation with all the relevant stakeholders, defining the most appropriate measures for improving the situation and based on a common understanding and common objectives. Particular emphasis has been given to involving the scientists of two projects of the NRP 48 as stakeholders in the platform. The active involvement of scientists, and mutual learning between scientists and practitioners, facilitated the conflict-solving process and produced an added value as revealed by an external evaluation of the learning process. The platform project was carried out in four conceptual phases and contributes new transdisciplinary knowledge about how to structure and implement a process of problem solving in the field of resource use negotiations.

Keywords: Forest–wildlife–conflict · Learning process · Collaborative learning · Mental modelling · Integrated management strategy

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20.1 Background

20.1.1 The Mountain Forest–Ungulate Conflict

Ecosystem management and in particular forest landscape management has emerged as a new challenge to resource managers (Baskent and Yolasigmaz, 1999). Landscape management entails a demanding choice between alternatives, which can lead to conflicts between resource user groups who claim a stake in the outcome (Staehelin-Witt et al., 2005). One such resource management conflict exists between forest managers and other interest groups. The browsing of young trees by wild ungulates, in particular red deer (*Cervus elaphus*) and chamois (*Rupicapra rupicapra*), is widely considered by forest managers to be the most important problem affecting the future of Swiss Alpine forests (Brändli, 1995). Although there are few precise ideas on how forests will develop under the influence of browsing ungulates over the next century (Senn and Suter, 2003; Wehrli et al., 2005; Weisberg et al., 2005), a general agreement exists among forest managers that tree regeneration is insufficient to ensure the continuous existence of mountain forests and that the protective function of the forests will, at least locally, be severely compromised (Kupferschmid, 2005). Hunters and conservationists disagree about the importance of ungulate browsing for tree regeneration. This leads to fruitless disputes on silvicultural practices, hunting schemes and yearly hunting quota, and a general feeling of helplessness among local stakeholders involved in forest management or biodiversity conservation. Such forest–wildlife conflicts have increased in parallel with the increase in populations of game species during the 20th century, in response to their protection, and there is still a lack of scientific knowledge about the long-term importance of herbivore impact on forest dynamics. Therefore, wildlife management in terms of forest–wildlife conflict management has become an emerging field for forest and wildlife conservation agencies, private organisations and professionals (Messmer, 2000).

20.1.2 Stakeholder Involvement in Conflict Resolution Processes

Various approaches have been used in attempting to solve conflicts associated with the use of natural resources in landscape and wildlife management (Skutsch, 2000). They can be grouped in two general categories: 'Conflict management' focuses on controlling the conflict and recognises the positive effects that conflicts can provoke between different user groups; and 'Conflict resolution' attempts to terminate the conflict by facilitating a consensus decision. In the following we will focus on a conflict resolution process. Public participation and stakeholder involvement are tools used in both conflict management and conflict resolution. A wide range of techniques exist, differing in the degree of stakeholder participation from public information and public hearings, collaborative problem solving, assisted negotiation and mediation, to joint decision-making. In Switzerland, the federal forest legislation of 1991 demands public participation in the sustainable management aspect of forest

development planning. The regional planners are encouraged to inform the public, accept suggestions, release draft development plans for public scrutiny and answer objections.

Solutions to conflicts associated with the use of natural resources such as the forest–ungulate conflict are often hampered by a lack of scientific understanding (e.g. how herbivory by ungulates interacts with other factors driving forest dynamics) and by the fact that stakeholders often fail to discriminate between scientific facts, value judgements and intention. Successful conflict resolution in forest and wildlife management requires a detailed assessment of the particular situation, a common understanding of the situation and an agreement on the management aims, before an effective and broadly accepted management strategy can be established. Thus arises the demand for a systemic approach, social learning, and the active engagement of stakeholders and authorised management agencies in the conflict resolution process. The establishment of 'platforms for resource use negotiation' is a way of dealing with complex natural resource management problems (Buck, 1999; Steins and Edwards, 1999). Therein applied collaborative methods put special emphasis on joint learning between the concerned stakeholders. Forest management agencies increasingly implement collaborative methods of public participation (LeMaster and Huebner, 1997; Selin et al., 2000) but the effectiveness of these collaborative processes is rarely evaluated.

20.1.3 Solving a Regional Mountain Forest–Ungulate Conflict by Means of a Communication Platform

Within the framework of the Swiss National Research Programme 48 (NRP 48 Landscapes and Habitats of the Alps, www.nfp48.ch) we developed instruments and procedures for solving a regional forest–ungulate conflict in an mountainous environment by means of a 'platform for resource use negotiation' and collaborative learning. Engaging all the relevant stakeholders, an integrated management concept was built, which is based on a common understanding and common aims and defines the most appropriate measures to improve the situation in concern. In order to amplify the general understanding of the system and to promote better acceptance of scientific results in practice, two scientists, leaders of two NRP 48 research projects (Brang et al., 2001; Senn et al., 2001), have been involved as stakeholders in the platform. The following questions were addressed by the transdisciplinary project:

- Which instruments and procedures, developed by different stakeholders associated in a platform for resource use negotiation, are appropriate for solving a regional mountain forest–ungulate conflict and establish a successful forest and wildlife management strategy?
- Can mutual learning between scientists and practitioners facilitate the conflict-solving process in a platform for resource use negotiation and ensure the implementation of scientific results?

The case study is located in Gurtnellen, Canton Uri, Switzerland, where the 'Stotzigwald' forest protects the A2 motorway, a major regional road and the railway from natural hazards such as rockfall and avalanches. The forest is part of a federal game reserve and is used by chamois (*Rupicapra rupicapra*) as winter habitat. The protective function of the forest is negatively affected by a severe lack of tree regeneration, particularly of *Abies alba*, due to unfavourable local environmental conditions and ungulate browsing. Protective structures against falling rocks have been established along the motorway but can never replace the protection of the forest for economic reasons. Various attempts to mitigate the problem of lack of regeneration have been made (e.g. restricted hunting and silvicultural measures) but have not succeeded. Furthermore, the perceptions of various stakeholders (e.g. foresters, hunters, civil engineers) about how to deal with the situation differed widely. Therefore, the communication platform 'Stotzigwald' was established in 2002 involving 27 stakeholders from various user groups: land and forest owners, hunters and game wardens, foresters, nature conservationists, transport and tourism officers, responsible authorities and researchers from the Swiss Federal Institute for Forest, Snow and Landscape Research WSL. They agreed to develop common goals and measures in order to ensure the protective function of the Stotzigwald into the future. Within the project period of $2\frac{1}{2}$ years the learning process has been evaluated twice.

20.2 Collaborative Learning on Platforms for Resource Use Negotiation

The concept of *Collaborative Learning* was used in the platform 'Stotzigwald' to facilitate the conflict-solving process. Collaborative Learning actively involves people in discussion, learning and decision making about land management. It is a hybrid approach developed from soft systems analysis (Checkland and Scholes, 1990) and conflict management (Wilson and Morren, 1990). Collaborative learning does not stress consensus between the different user groups, but emphasises learning, understanding and developing improvements for a particular problem. It focuses on the concerns and interests of the stakeholders, encourages systemic thinking and takes into account that considerable learning about different values and scientific results must occur before management improvements can be implemented. Communication and negotiation-interaction are the means by which learning and progress in a particular situation occur. Collaborative learning processes require skill, commitment and perseverance by the participants. In complex natural resource controversies, facilitation of collaborative learning usually requires help from an outside party. This involves a mixture of mediation and process consultation strategies and tactics applied by skilled facilitators (Wilson and Morren, 1990). Collaborative learning design is based on Soft Systems Methodology (SSM) and aims to create a temporarily shared culture, in which conflicts can be accommodated in a way that allows action to be be taken (Flood and Jackson, 1991). SSM aims to improve situations of social concern by activating a hopefully long-lasting learning cycle in
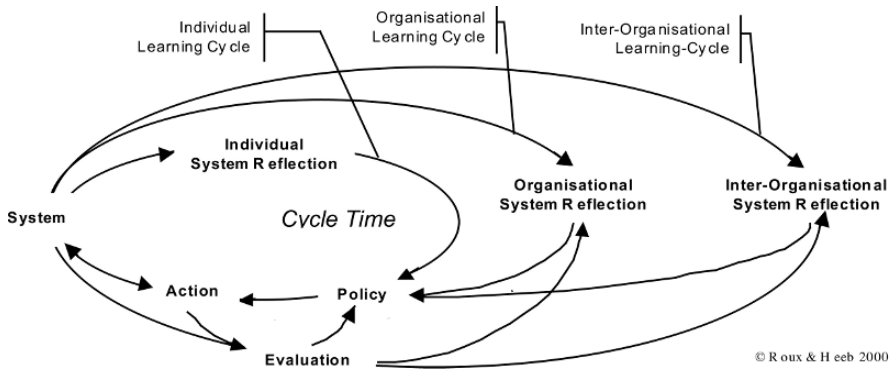
Fig. 20.1 Concept for collaborative learning in platforms for resource use negotiation (Heeb and Roux, 2002; Roux and Heeb, 2002)

the people involved. The learning works through an iterative process using model concepts to reflect and debate the problem situation and its perception (Fig. 20.1, Heeb and Roux, 2002).

In this context, *platforms* are understood as loosely structured social networks in which representatives of a particular actions system are brought together for a particular purpose such as a landscape management concept. Platforms create a space for communication that is based on confidence. By applying collaborative learning methods, such as the elaboration and discussion of the mental models of the involved stakeholders, platforms allow:

- for achieving a joint understanding of the problem system
- for developing a set of goals as the basis for system development
- for designing concrete project ideas and measures
- for assessing the actions taken, by applying suitable evaluation tools.

20.3 Participatory Elaboration of Target and Transformation Knowledge on the Platform 'Stotzigwald'

The platform project 'Stotzigwald' was carried out in four conceptual and temporal phases relating to problem investigation, problem structuring and implementation:

1. Preparation phase (2002): formation of the platform including all relevant stakeholders; formulating basic principles and rules for collaboration and communication;
2. System Reflection phase (2002): elaborating a common understanding of the system and objectives – the first evaluation of the learning process;
3. System Development phase (2003, 2004): elaborating a common strategy and appropriate measures in order to achieve the objectives – second evaluation of the learning process;

4. Knowledge Transfer phase (from 2005 ongoing): application of the measures in the field and the establishment of a control system for measuring success.

From February 2002 to September 2005 ten daylong meetings have so far taken place. A local forestry consultant was in charge of the moderation of the meetings and an expert in change management and platform processes monitored the working programme.

20.3.1 Formation of the Platform

In the *Preparation Phase* 27 stakeholders from all relevant interest groups (forest managers, hunters, farmers, nature conservationists, tourist officers, road planners, community representatives, cantonal and federal administrative bodies, researchers) participated at a kick off meeting in February 2002 where the authors presented the goals and methods of the platform process. The participants agreed on several principles of cooperation, which defined the general aim of the platform process, the duration of collaboration and the transparent and nondiscriminatory communication between the members of the platform.

20.3.2 Developing a Common Understanding

At the beginning of the *System Reflection Phase* an inventory of perceptions of the problem situation in Stotzigwald was created. On this baseline 13 different *mental models* were built by interviewing individual actors (Fig. 20.2). The interviewed stakeholders put forward their individual problem perceptions, their goals and suggestions for approriate measures with respect to the forest–wildlife conflict in Stotzigwald following the procedure of Model Moderation (Heeb and Roux, 2002; Hindenlang et al., 2005):

1. 10–15 most important key terms regarding the system were quoted for each stakeholder.
2. The key terms were structured according to their causal interrelations. It is advisable to classify the terms into groups such as restricted framework conditions, steering factors, system inherent factors and control factors.
3. The stakeholders explained their model and gave it a short and concise title.

Each stakeholder presented his own mental model in the plenum of the platform, emphasising his perception of the key factors for steering the system in question and the most relevant causal interrelations and external factors that influence the system. The individual mental models were discussed in the platform, compared with each other and complemented. Similarities and deviations were marked in order to develop a common functional understanding. The individual models were then combined to form a synthesis model in September 2002 allowing each stakeholder to recognise his or her individual perception within the synthesis model. Such procedure facilitates the relief of existing fears and inhibitions. The synthesis
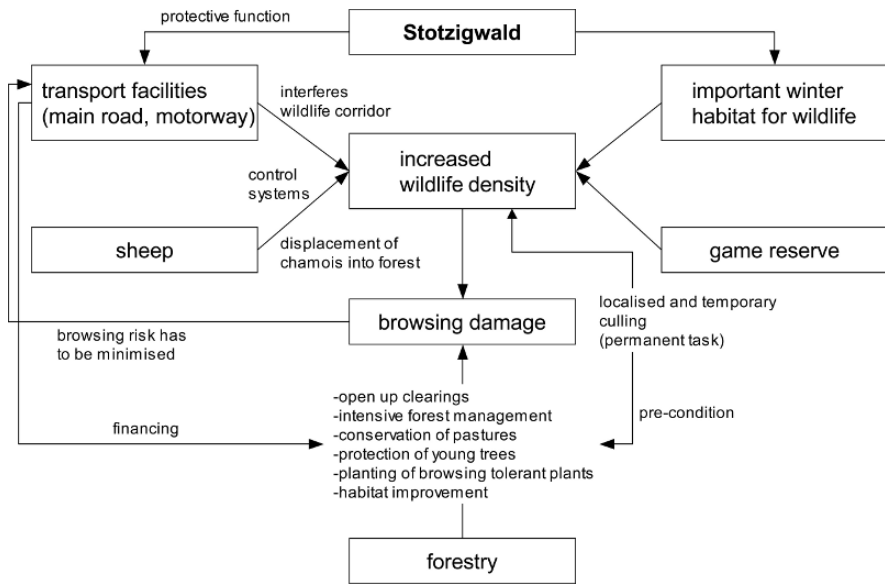
Fig. 20.2 Visualised Mental Model of an individual actor participating in the platform 'Stotzigwald' (graphic by J. Heeb)

model represents the jointly developed common understanding of interrelations and interdependencies of physical factors and management measures on which all further working steps are based. It includes restricted framework conditions (such as historical and environmental conditions), system inherent factors (such as wildlife density and natural hazards) and steering parameters (such as current management measures and legal obligations). Objectives and appropriate control parameters have been defined in order to assess the effect of future measures.

20.3.3 Elaborating Common Objectives and Measures – An Integrated Management Strategy

Within the different working groups (forestry, agriculture, wildlife and nature management, public relations) detailed strategies and measures for meeting the formulated objectives, aimed at sustainable habitat management, were compiled during the *System Development Phase* in 2003. The results were presented in the plenum of the platform and discussed. The participants prioritised the suggested measures and actions and defined impact related objectives and target values for each strategy. The thematic working groups were further responsible for scrutinising the technical and political feasibility of the selected measures. The suggestions were verified during a joint excursion to the Stotzigwald. Furthermore, in the phase of system development, selected members of the platform and researchers from the NRP 48 projects gave thematic input-presentations referring to specific questions, which had

Table 20.1 Measures and activities on which the platform 'Stotzigwald' agreed in the integrated action plan

Subject and objectives	Measures	In coordination with
Forestry: Improvement of tree regeneration in order to ensure protection function of the forest 'Stotzigwald'	Management measures (thinning, fostering) to facilitate tree regeneration and ensure manifold forest structure, establishing monitoring plot	Agriculture, Wildlife and Nature Management, Public Relations
Agriculture: Stabilisation of traditional cultivation in the area in order to improve forage availability and quality for wildlife	Promotion of traditional cultivation of meadows and pastures by integral concepts and financial incentives	Forestry, Wildlife and Nature Management, Public Relations
Wildlife and Nature Management: Reduction of wildlife population until tree regeneration has been restored and contemporaneous improvement of wildlife habitat quality	Localised and temporary culling of chamois in tree regeneration plots, amelioration of wildlife habitat inside and at the edge of the forest by means of structural forestry measures	Forestry, Agriculture, Public Relations
Public Relations: Increase of the awareness in the parties involved and in the public for the problem and for the proposed solutions	Informative meetings with all parties involved (land owners, beneficiaries, politicians, broader public), periodical reporting in print media	Forestry, Agriculture, Wildlife and Nature Management

arisen during discussions thereby further amplifying the common knowledge in the platform and stimulating the exchange of information between practitioners and scientists. In June 2004 a first draft of the integrated action plan 'Stotzigwald' for sustainable forest and wildlife management, which included financial perspectives, was presented and discussed in the platform. By combining different measures belonging to different sectors the platform members succeeded in overcoming sectoral thinking and operation (Table 20.1). All members of the platform agreed on the final version of the integrated action plan in November 2004. They further confirmed their willingness to continue their work in the platform 'Stotzigwald' promoting the implementation of the suggested actions and initiating the development of an appropriate control system for success.

In order to assess the effect of the applied collaborative learning methods on the progress of the platform process, the learning process was evaluated twice during the first three conceptual phases by means of questionnaires; once at the end of the System Reflection Phase in summer 2002; and once at the end of the System Development Phase in autumn 2004. After the first evaluation the recommendations made by the external evaluators were implemented and improved the platform process in the System Development Phase.

20.3.4 Presentation and Implementation of the Action Plan

The fourth and final *Knowledge Transfer Phase* of the process was and still is dedicated to the implementation of the action plan and to its performance control. The goal was to establish a governing body which will press ahead with the execution of the actions proposed by the platform 'Stotzigwald' on its own initiative and without the support of our project (Fig. 20.3). The required knowledge transfer was initiated in February 2005 at a press conference when the platform achievements so far and the action plan were presented to the public (Hindenlang et al., 2005). Since summer 2005 a task force including local actors belonging to the platform, together with cantonal representatives, started to implement the action plan within their own sphere of authority. In parallel an evaluation system is being developed in the platform providing appropriate indicators and methods for monitoring the changes in Stotzigwald in response to the management measures taken.

20.3.5 Evaluation of the Management Strategy with Respect to New System Knowledge

The adopted management plan integrates objectives and measures relating to forestry, farming, wildlife management, habitat management, and public relations (Table 20.1). The objectives and measures were developed by means of a dialogue between practitioners and scientists. The practitioners mainly contributed traditional
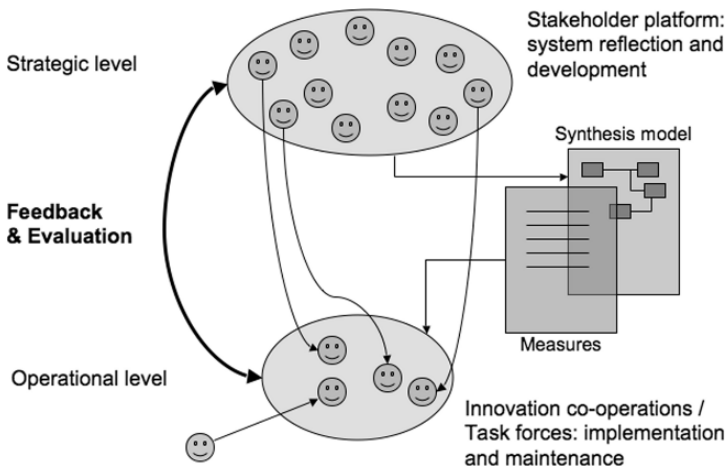

Fig. 20.3 Organisational design of the platform 'Stotzigwald'. The development of a common understanding of the situation (system reflection) and the elaboration of common objectives and the appropriate measures (system development) occur at the strategic level of the stakeholder platform. The implementation of the suggested measures and the evaluation of their success occur at the operational level by innovation cooperations or task forces

knowledge during the process, whereas the scientists brought in their experience from former and current projects, e.g. NRP 48.

New scientific knowledge mainly contributed to the development of an evaluation strategy. This included the development of measurable indicators for assessing the changes in forest structure, tree regeneration, wildlife density and forage quality in response to the management measures taken. The scientists of the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) assisted with the establishment of indicator plots in the forest in order to observe changes in detail. A modelling study contributed new knowledge about the period over which the changes can be expected, and have to be monitored. In addition new methodological knowledge, of the assessment of wildlife densities and their relationship to browsing intensity, contributed to the selection of appropriate indicators for monitoring habitat development in Stotzigwald.

20.4 Recommendations

20.4.1 External Evaluation of the Platform Process

The platform process and the resulting management strategy were evaluated by an external partner using criteria from political science. The materials used for the analysis were the integrated management concept, the protocols of the platform meetings and the results from two questionnaires, which were conducted during the platform process in 2002 (end of System Reflection Phase) and 2004 (end of System Development Phase). The following conclusions can be drawn with respect to the questions addressed by the project:

- Conflict solving: The platform process allowed for a common understanding of the situation and for the elaboration of common solutions (integrated action plan). All participants were treated as co-equal during the learning process and communicated factually. Knowledge gaps were detected and could be filled. The facilitation by a moderator and the neutral position of the scientists positively influenced the process. The only criticism concerned the high expenditure of time and the lack of obligation to implement the suggested measures.
- Mutual learning: The applied methods of collaborative learning and mental modelling on a platform for resource use negotiation proved of value. The exchange of different opinions and mutual learning between practitioners and scientists contributed to a better understanding of causal interrelations and to a better appreciation of the perceptions of the other stakeholders resulting in a generally broader understanding of the situation.

20.4.2 Successful Formation of a Stakeholder Platform

The following preconditions should be fulfilled when initiating a platform process for resource use negotiation and conflict solving:

- There is an approved conflict situation.
- The concerned stakeholders have a strong interest in solving the existing conflict.
- The platform participants are legitimate representatives of their interest/stakeholder groups.
- The platform participants show willingness to participate in the platform over an extended time period.
- The platform participants agree on certain principles of cooperation and rules of communication.

20.4.3 Process Related Success Factors

The following aspects represent requisites for a successful platform process:

- The engagement of a locally accepted moderator creates a trustful atmosphere and allows for an open dialogue between the platform participants.
- The information and documentation of the system in question have to be sufficient to create a common knowledge basis.
- A common understanding of the system in question is the precondition to successfully formulating common goals and measures. Mental modelling is a valuable way to create a common understanding.
- Mutual learning between practitioners and scientists facilitates the conflict-solving process and amplifies the knowledge basis.
- Sufficient time has to be available to ensure a successful collaborative learning process.
- A transparent procedure and periodical evaluation of the platform process and its results motivate the platform participants to further cooperate, e.g. to implement the suggested measures.

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