

Challenges in the environmental management of post-military land conversion

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Abstract

In 1994, after nearly 100 years of military use, the last Soviet forces withdrew from the Königsbrücker Heath. Constant artificial disturbance from military activity on this training range in Saxony, Germany, had changed the natural ecosystem from forest into open land. Now, due to the absence of military disturbance, the open lands have begun to reforest. As a result, a host of uncommon open land species face a potential loss of habitat. The Forest for Saxony Foundation (*Stiftung Wald für Sachsen*) owns this land and manages its conversion. The foundation takes on the challenge of disposing the waste from wide-spread ammunition and defusing the conflicts between the landscape's various interest groups including the public, hunters and conservationists. This paper provides a forum to discuss the unique challenges and management tools used in the conversion of the Königsbrücker Heath.

Keywords: conversion, demilitarisation, ecological management, hazardous waste, forest succession, natural preservation, open land management, GIS.

1 Introduction to demilitarisation and conversion

The end of the Cold War signalled an end to the bi-polar weapons race and a start to world-wide disarmament. Both NATO and former Warsaw Pact nations committed to demilitarising many of their bases and properties. Demilitarisation meant dismantling military capabilities. Personnel were decommissioned, radar systems were dismantled, and rockets were taken from storage depots, emptied of their fuels and destroyed. After military potential was removed, military properties entered a stage of conversion. This second stage was essential in order to nullify the possibility of remilitarisation and to establish an alternative peacetime use for the former military property.



Conversion involves transferring the ownership and management responsibilities of military property back into civilian hands. When military property is marketed and sold to a civilian buyer, the new owner takes on full responsibility for the land. Conversion requires an extraordinary amount of time, money, planning and commitment, as well as interdisciplinary cooperation and idea sharing among property owners, scientists, planners, environmentalists and the public.

In what had once been the front lines of the Cold War, the reunified Germany faced the monumental task of demilitarising the properties of the four occupying powers: France, Great Britain, the United States and the Soviet Union. On account of the expanse of land involved and the high level of hazards left after the withdrawal, the impact of the Soviet forces in former East Germany was especially problematic. The Bonn International Center for Conversion [1] reports that in the German Democratic Republic, 450,000 hectares of land were utilized by either the National People's Army or the Soviet Red Army. This made up 4 % of the total land area.

As agreed in Germany's reunification treaty, the Soviet forces were made responsible for the demilitarisation of all occupied properties in eastern Germany. The final Soviet troops withdrew in 1994, leaving the burden of conversion to the newly reunited German government. Since property management was designated as a state matter and not a national concern, the states each determined their own strategy for conversion.

2 Conversion at the Königsbrücker Heath

In 1997, for the ceremonial cost of one Euro, the Free State of Saxony sold the training bases at Königsbrücker Heath and Zeithain to the Forest for Saxony Foundation, or FSF, (German: *Stiftung Wald für Sachsen*). Along with the over 9,500 hectares of land, the state government also endowed the FSF with 25 million German Marks (€ 12.5 million) to invest in conversion and management projects. The FSF accepted the full liability and responsibility for the former military land and committed to dismantling the remaining military infrastructure in order to allow the landscape to return to nature.

The foundation's long-term goal is the proliferation and protection of forests in Saxony. By promoting the growth of healthy and productive forests, the FSF provides a means for combating climate change through the reduction of CO₂ and cares for natural wildlife and ecosystem preservation. With a size of 7,500 hectares, the Königsbrücker Heath is the foundation's largest single territory and also the largest single area of undeveloped land in Saxony. It is an island of wilderness in an area dominated by human-planned agriculture and forestry landscapes. Located in the Upper Lusatia region, the Königsbrücker Heath lies 31 kilometers north of Dresden.

Seven thousand hectares of the former training base had already been declared a nature reserve in 1992. At that time, the land was littered with buried ammunitions and other military waste. In 1998, the FSF [2] reported that over 500 built structures, including barracks, recreation centres and administrative



buildings remained around the edges of the training grounds. According to land manager Roland Schiller [3], masses of garbage remained from the more than 20,000 Russians who had lived and worked on the base during Soviet occupation. After nearly a century of use by German and Russian armies, the landscape was nearly void of forest. Routine explosions and burnings on the training range had replaced the native forest ecosystem with a heather and grass landscape. Areas where tanks conducted driving and shooting exercises had become open sand, barren of nearly all vegetation.



Figure 1: An aerial view of the Königsbrücker Heath reveals that nature is reclaiming with trees what once was kept open by military training activities.

According to Mr. Schiller [4], today the Königsbrücker Heath is the sixth largest nature reserve in Germany. Such an undisturbed habitat is unique in heavily developed and densely populated Germany. This landscape provides habitat for golden eagles, wild boars, deer, beavers and several other wild animal species. In addition to a host of common vegetation such as broom, heather, oak and pine, rare plants have also taken root here such as the medicinal arnica (*Arnica Montana*), the flesh eating round-leaved sundew (*Drosera rotundifolia*) and an orchid species, the speckled knabenkraut (*Dactylorhiza maculate*). From the barren and scorched terrain left by years of military exercises, a diversity of ecosystems and habitats has developed. Along the banks of the Pulsnitz and the Otterbach rivers are natural wetlands and pools resulting from beaver dams. In the marshlands surrounding the ponds and natural lakes roost grey harriers and ducks, and the calls of the cuckoo and magpie echo from the trees. The rapid

degree of recovery and succession is astounding. From atop the landscape's highest point, the *Königshöhe*, Russian officers used to observe the military training exercises below. Today the deserted sandy ground has been populated by a dense pioneering stand of birch and aspen.

Although forest promotion and nature preservation are the two leading objectives on the Königsbrücker Heath, an essential element of conversion is removing dangers from the property and finalizing a sustainable peacetime usage. The nuclear warheads once stored here and the launching areas directed at western Germany have now been removed. What remains today of a former vital military community are empty buildings and an array of hazardous waste. Weathering and wildlife have helped expose unexploded ordinances, UXOs, buried or overlooked during demilitarisation. Upon assuming management responsibilities in 1997, the FSF's [5] first task was to clear 78 kilometres of roadways of all UXOs. A six metre buffer zone on each side of the roadways assures that emergency personnel, managers and conservationists have safe access to the conversion area. Despite these efforts, the innermost sections of the Königsbrücker Heath are still so heavily contaminated by UXOs that all access is forbidden.

3 Interest group challenges

Negotiating the demands and preferences from the range of interest groups on the Königsbrücker Heath is an additional challenge to the conversion process. The interests of the property owners are often in conflict with one or more of the other groups. Such conflicts cause a rift between a group of workers who must cooperate in order to ensure progress. The following examples introduce the key actors in the conversion of Königsbrücker Heath and explain the issues where conflicts arise.

3.1 The property owners

The Forest for Saxony Foundation is based in Leipzig and has an outpost in the town of Königsbrück. At the outpost, the Königsbrücker Heath property manager is joined by an administrative assistant and a professional hunter. The three perform the task of managing the former training range and working with local citizens to further public understanding about the dangers of the conversion site. Due to the heavy degree of UXO pollution, access to the base is granted only with a permit issued by the FSF. Public hunting is strictly prohibited. Both these restrictions frustrate the local citizens.

Mr. Schiller, the land manager at the Königsbrücker Heath, has lived in a village bordering the training range his entire life. He has childhood memories of swimming in the local lakes with the families of Russian officers. During the demilitarisation process, Mr. Schiller was employed by German officials to monitor and report on the completeness of the operation. No one knows this landscape better than he, and no one understands the complexity of managing a landscape of this size better than the manager himself. The natural beauty of the



Königsbrücker Heath makes it a gem in the eyes of many. Hunters salivate at the abundance of game; the public yearns to hike, ride bicycles and picnic in the green nature; foresters see a potential for forest development; and nature conservationists fight to keep the land wild. Mr. Schiller often stands as mediator between the various interest groups.

3.2 The hunter

The FSF hunter, Hartmut Löwe, has the responsibility of preventing animal overpopulation and protecting the diversity and health of the Königsbrücker Heath forest. Mr. Löwe is a certified master hunter and is responsible for one of the most favourable hunting territories in Germany. Foxes, wild bores, roe deer, red deer and hares live in abundance in this undisturbed terrain. Aside from occasional sanctioned hunting events, Mr. Löwe is the only hunter who roams this territory. His enviable hunting range often places him in a difficult position vis-à-vis the local hunters. "Hunters get crazy if someone has a desirable territory where they can't hunt," says Mr. Löwe [6]. "It becomes an almost erotic obsession, as if one man had the most beautiful wife and the rest spite him for it."

Aside from the hostility he receives from other hunters, Mr. Löwe also faces conflict with the conservationists who keep a watchful eye on him, making sure he does not hunt within the prohibited nature reserve.

3.3 The citizen

Nine villages surround the 7,500 hectares of land managed by the FSF. Expansion of the training grounds under the National Socialists in 1938 required the evacuation of nine additional villages. Prior to its military use, the Königsbrücker Heath was a known hiking and recreation area. Current local residents still know the beauty of the landscape and are eager to obtain access to it. Especially beloved is the *Königshöhe*. Although merely 194 metres high, the *Königshöhe* is the highest point between northern Saxony and Sweden. The view from atop this ridge is pure nature and provides a rare opportunity to retreat from urbanization. There is currently no public access to the *Königshöhe*.

Public access onto the Königsbrücker Heath is a hotly debated issue. In the eyes of the public, the transfer from military to civilian property is not complete without a provision for public access. On the other hand, the dangers associated with UXOs and the disturbance public access could have on the developing ecosystem are reasons to prohibit open access.

In May 1999, a 250 hectare section of the Königbrücker Heath was re-opened to the public. Hundreds of citizens gathered to celebrate the end of 92 years of blocked access. The FSF [7] reported the preparation costs for opening the 250 hectares came to nearly €300,000. The majority of the cost went to tearing down military buildings and finding and disposing UXOs. The public celebrated the return of this piece of their homeland and continue to demand more access to the landscape.



3.4 The conservationist

The *Naturbewahrung Westlausitz e.V.* (NBW) is the conservationist society responsible for developing and implementing environmental protection measures in the Königsbrücker Heath. Conservationists routinely deny requests to open areas of the nature reserve for recreation. According to the NBW, the former military terrain should be kept undisturbed and totally protected. The NBW compares their vision for the Königsbrücker Heath with the United States' National Park concept: the land should be allowed to return to nature and remain permanent wilderness. To achieve this, the Königsbrücker Heath must be completely protected from disturbance and development.

Although the FSF agrees that the nature reserve should remain protected, they disagree with the NBW's insistence on complete access prohibition. Instead, they maintain a preference for limited entrance through hiking trails.

4 Environmental management strategies

Over 93% of the Königsbrücker Heath is nature reserve and thus stands under legislation of the German environmental protection laws. Within the reserve, all hunting is prohibited as is the removal of any plant, animal or natural product. Management strategies developed by the FSF must fit within the guidelines of the habitat protection plan as well as meet the other goals of the foundation (i.e. forest propagation, disassembly of military potential and encouragement of public awareness). Such a task requires cooperation from a variety of fields.

4.1 The nature reserve

The 7,000 hectares of nature reserve have been divided into three protection levels. In the largest section, which makes up 80% of the total reserve, the land is to be allowed to develop completely without human interference. This area provides a unique possibility for scientists to research the process of succession in a variety of ecosystems and habitats. Approximately 15% of the reserve has been designated as a managed ecosystem area where measures are taken to control succession and to maintain the current habitat, which is an open landscape. The remaining area forms a border around the nature preserve and serves as a buffer zone from the outside environment. In this area, forest management activities and controlled public access is allowed.

The Beaver Experience Trail is a project developed by the NBW conservationists to encourage public awareness of the flourishing beaver habitat on the Königsbrücker Heath (see Figure 2). The trail is approximately one kilometre long, 400 meters of which are inside the buffer zone of the nature reserve.

This window into the wild is a compromise between the NBW and the FSF to allow public access to the land without the access extending too far into the preservation area. Additional "window" projects are planned for the future.





Figure 2: Signs forbid entrance to the former training area while designating the boundaries of the nature preserve (left). Tenacious beavers make a noticeable impact on the landscape at Königsbrücker Heath (right).

4.2 Wildlife management

Wildlife management sometimes means promoting the life of a certain species while taking the life of another. For most of the large animals on the Königsbrücker Heath, humans are the only natural predators. It is therefore necessary for humans to hunt as a means of wildlife management. Like many German establishments, hunting is a highly regulated and heavily bureaucratic undertaking. A professional hunter has a territory for which he or she is responsible. The hunter must kill a quota of animals yearly to maintain optimal health of the species and of the forest ecosystem. Failure to meet this quota results in a fine. The foundation sells the meat from the animals to local butchers and restaurants.

4.3 Open land management

An end to military activity has allowed nature to recover and succession to begin to take its course. The expansion of forest means the shrinking of the open landscape and thus the shrinking of a habitat supporting valued endangered species. Both conservationists and land managers would like to see the Königsbrücker Heath eventually develop into a mosaic of habitats and

ecosystems, both forested and open. Immediate action is required, however, to preserve the remaining open landscapes.

Heather (*Calluna vulgaris*) and broom (*Cytisus scoparius*) are the most common vegetation species present in the open landscape. Both species depend on periodic disturbances to remove old growth and allow for rejuvenation. The constant explosions and fires caused by military exercises supported the development of this ecosystem, which is uncommon in Upper Lusatia.

Several methods are available for open land management, but not all are suited for the Königsbrücker Heath. The level of UXO pollution rules out the use of fire, although it is easy and inexpensive. When naturally occurring fires do occur on the Königsbrücker Heath, fire fighting personnel must practice extreme caution to avoid possible explosions.

The safest, but most labour-intensive method of open land management is a combination of manual management with a reliance on natural rejuvenation. In this method, a labour force of knowledgeable workers periodically removes unwanted succession species from a given plot of land. Natural rejuvenation can come from natural weathering or from grazing animals. In natural weathering, extreme winter frosts and periods of dryness cause old plant matter to become brittle and drop off. Grazing animals who feed on the living plant matter provide another method of natural disturbance. These natural methods are the most benign options in regard to natural preservation and are, thus, the NBW conservationists' preferred methods for the Königsbrücker Heath.

Another possible method is the use of domesticated grazing animals such as sheep and goats. Sheep and goats have been used on the Zeithain conversion area to keep land open for over ten years with positive results. Grazing animals would be set onto designated land areas where succession is in the earliest stages. This method is currently being tested on a plot outside the natural preservation area at the Königsbrücker Heath. Using domesticated animals to ensure grazing instead of relying on wild animals enables managers to more precisely direct the open land management onto a chosen area.

4.4 Spatial management tools: GIS and remote sensing

In May 2003, a team of environmental engineers from the Brandenburg University of Technology in Cottbus, Germany, completed and put into operation a Geographical Information System (GIS) for the Königsbrücker Heath. The computer-based spatial analysis tool consists of a digital map with several layers of information that can be viewed individually or together as integrated themes. The GIS covers all aspects of the conversion area's natural and anthropogenic elements. Topographical data, road networks, a vegetation map, hazardous area zoning, and nature preserve boundaries are examples of the some 25 available themes. Regular updates to the system ensure the most up-to-date information can be used for planning. A manager might use this tool, for example, when trying to locate a safe, forested place, outside the nature preserve area, on which to develop a visitor information centre. One could use the GIS to layer the hazardous area zones with the nature preserve boundary and vegetation map, and by studying the overlapping and free areas, locate potential sites.



The Königsbrücker Heath GIS is valuable not only to land managers, but also to other administrative groups. By viewing the locations of fire look-out towers, water ways and emergency transportation routes, fire fighters can effectively and safely combat fires. Conservationists can use the vegetation and topographical data to predict the location of ecosystems and form strategies for maintenance and monitoring.

Another form of spatial analysis used on the Königsbrücker Heath is the use of aerial photos (see Figure 3). Comparing historical images with current photos and vegetation patterns can reveal sites of suspected hazardous waste. The Brandenburg University of Technology in Cottbus is currently developing a GIS theme including the historical land use of the Königsbrücker Heath. Once added to the larger GIS, this theme will provide information from the three phases of military occupation: the German Imperial Army, the Third Reich, and the Soviet Armed Forces. Knowing the historical use of a land area helps to predict the types of ammunition or otherwise hazardous waste that might be found there.

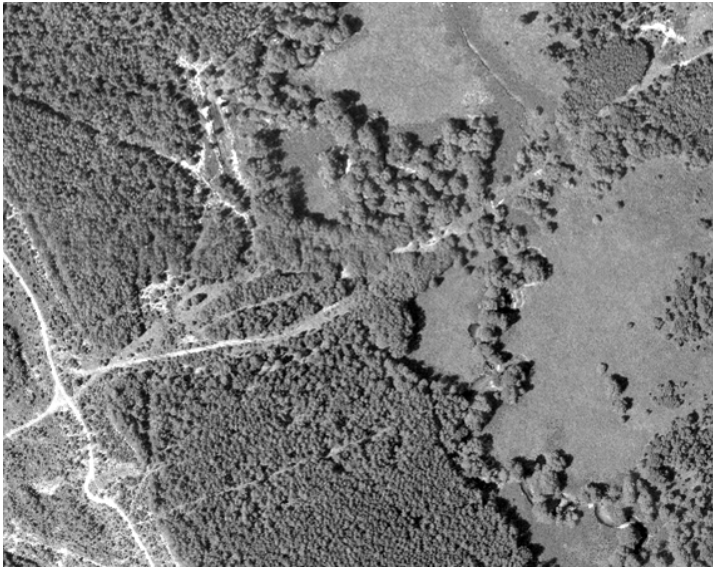


Figure 3: Aerial photos of the Königsbrücker Heath are used to locate water ways and vegetation patterns. This photo shows a military road (bottom left) and a river wetland (right).

The ability to detect hidden waste greatly reduces the risk of damages to humans or the environment. A total hazardous waste clean-up on the Königsbrücker Heath would cost an estimated € 80 million. The resources for a complete clean-up are not available, so the FSF must prioritise and clear the most dangerous areas first. No records of waste burial locations are available for the past 50 years. Without remote sensing capabilities, finding dumping sites will

depend on chance findings such as in 2003, when wallowing wild bores uncovered a dumping site with over 200 tonnes of highly toxic material.

5 Conclusion

Independent of conservationists and land managers, nature continues to re-claim the former training base at the Königsbrücker Heath. This vast terrain is an anomaly in the highly developed and subdivided German cultural landscape. Although the size of the former training range has allowed wilderness to regain its domain, this landscape is still a green island in the midst roadways, industrial parks and villages. The military potential has been taken away, but the lure of forested land in a society eternally hungry for natural resources makes the land on the Königsbrücker Heath tempting to many. Whether this reserve of over 75 square kilometres will remain protected remains a question of political will.

The Forest for Saxony Foundation and its cooperative partners are well on their way to successfully transforming the Königsbrücker Heath. With each demolished building and each destroyed explosive, the process of turning a war preparation zone into a zone of ecological triumph continues. Cooperation between an interdisciplinary group of agencies and experts has made possible the conversion and management of the Königsbrücker Heath. The challenge for the future will be defusing the conflicts among these interest groups to integrate know-how and experience into sustainable solutions.

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