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Ecological restoration in the slipstream of agricultural policy in the old and new world

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Abstract

The restoration of ecosystems to stop biodiversity losses in agricultural landscapes has high priority in many regions of the world. It does not take place in a vacuum but is nested in a socio-historical and agro-political context. Austria and Western Australia (WA) are examples of old and newly impacted agricultural environments, and these are used to examine two contrasting agro-political and agro-economic frameworks within which ecological restoration currently operates. WA is characterised by ancient, nutrient-impoverished, and degraded agricultural landscapes that have been under cultivation for some 100 years and support a low density rural population. In Austria agriculture has been practised for some 7000 years and the European Union (EU) and its extensive funding system largely determine agro-political policies.

The paper concludes that: (1) differences in agro-political priorities have resulted in diverging agro-economic systems where producers are heavily subsidised (EU) or largely unsubsidised (WA); (2) diverging agro-political priorities result from differences in terms of land degradation; demographic characteristics, and duration of respective agriculture; (3) WA failed to develop a financial strategy aimed at ecological restoration for biodiversity conservation while Austria benefits from a EU-driven subsidy system to maintain biodiversity conservation; (4) the Landcare movement plays a significant role in the restoration of biodiversity in WA, but is largely absent in the EU; (5) different environmental and social histories demand different approaches to improve the economic frameworks within which ecological restoration is conducted in each region.

Keywords: Agricultural environments; Agro-economics; Agro-politics; Ecological restoration; European Union; Western Australia

1. Introduction

The discipline of conservation biology attempts to understand the driving forces behind population declines and extinction processes among plants and animals. The aim of restoration ecology, in contrast, is to

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develop strategies to reverse some of these phenomena (Dobson et al., 1997). In spite of the existence of general restoration guidelines (e.g. SER, 2000), restoration ecology currently struggles to provide a coherent theoretical framework (Hobbs and Norton, 1996). Nevertheless, the discipline has amassed a large body of knowledge of considerable generic significance to the restoration of damaged ecosystems. This includes numerous studies of plant and animal recovery and secondary succession on abandoned farmland. However, leaving ecological restoration to natural processes of succession is sub-optimal as the redevelopment of mature communities may take decades or longer. This can be overcome through active restoration by mimicking natural processes.

But there is more to ecological restoration than scientific know-how. Cooperation by the landowners involves the important questions of who pays for restoration and which attitude to nature conservation is held by the public in general. All interest groups need to be brought into the decision-making process, to have restoration goals clearly defined and well integrated into existing land-use systems (Kaule, 1995; Pfadenhauer, 2001). Ecological restoration is therefore determined not only by science but also by social, political and economic factors. A comparison of old and newly impacted agricultural environments is likely to provide valuable insights into the driving forces that influence ecological restoration.

In this paper, *ecological restoration* is defined as any measure specifically aimed at maintaining or enhancing biodiversity for a specified area or region. This may include measures regarded as traditional in a restoration sense (e.g. reducing habitat fragmentation), and in land management strategies such as extensification.

This study was inspired by a Workshop of Austrian and WA scientists about the influence of social and economic factors on ecological restoration (22–23 February 2001, Perth, WA). It uses the central wheatbelt of WA (newly impacted agricultural landscapes) and agricultural lowland of Central Europe (old agricultural landscapes) as examples. The two regions share cultural commonalities and degrading biodiversity of their ecosystems and landscapes, but differ markedly in environmental and social history. Both are lowlands dominated by an agricultural matrix with interspersed remnants of vegetation. The comparison can provide generalisations because both regions are representative of highly impacted agricultural landscapes in industrialised areas. This paper summarises the environmental background of each region and addresses two questions: (1) What are the agro-political policies and associated agro-economic realities in which restoration ecology needs to be conducted? and (2) How can current funding instruments be improved to provide conditions conducive to ecological restoration?

2. Ecological restoration in the old and the new world

2.1. Central Europe

Most lowland of Central Europe has an agricultural history of over 7000 years (Küster, 1996). The change from hunter–gatherer societies to agriculture has been gradual. Before the industrial revolution, landscapes were characterised by grain crops and secondary grassland created by traditional land-use, especially by extensive livestock-grazing on land cleared of its forest (Pott, 1996; Ellenberg, 1996). The long process of agricultural development resulted in a significant diversification of landscape patterns. Newly created habitats, such as secondary grassland, were invaded by species formerly not native to the region, and the landscape patterns thus created by extensive land-use practices were the source of high biodiversity that now represents the primary conservation concern (Pott, 1992). Landscape patterns rapidly changed during the 19th century when human population growth and technological development resulted in land-use intensification. Fertilisers and pesticides increased food production. Landscapes were subjected to more intensive disturbance regimes, resulting in increased habitat fragmentation and degradation (Settele et al., 1996; Pykälä, 2000; Steffan-Dewenter and Tscharntke, 2002). Central European grassland is now regarded as high priority area for biodiversity conservation (e.g. Willems, 2001; Muller et al., 1998; Pykälä, 2000) and will be used here to examine the adequacy of the subsidy system to favour their ecological restoration.

European agriculture is one of the most heavily subsidised economic sectors in the world. In 2001, the EU spent € 44 billion, i.e. 47% of the total budget

Table 1
Expenditures on agriculture in the European Union and Austria for 2001 (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, 2001)

	European Union		Austria	
	Mio. €	%	Mio. €	%
Total budget	93,000		110,500	
Agricultural expenditures	44,000	100	1,400	100
Rural development	4,000	9	830	59
Agro-environmental schemes	1,700	4	540	39

(Table 1), to finance the so-called "European Model of Agriculture" which takes into account agricultural, social and environmental aspects (OECD, 2001). This tremendous effort aims at maintaining agriculture on a small-scale basis, and producing food and amenities according to high environmental and social standards. The long period of time over which agriculture has been practised has resulted in urban and rural populations to closely identify with agricultural landscapes for economic and aesthetic reasons, resulting in a so-called "sense of place" (Seddon, 1972). Local tourism represents an important economic factor in the agricultural lowland.

The Common Agricultural Policy (CAP) and the so-called Agenda 2000 aim at developing "sustainable agriculture" and rural areas as a whole, in addition to subsidising the farming sector (Commission of the European Communities, 2000). Of the EU's total expenditure on CAP, 4% are allocated to agro-environmental schemes, and this is expected to rise in the future. There is still high consensus among EU-citizens that a subsidy system for farming communities is necessary to avoid non-sustainable trends and social break-down of the farming sector. This translates into a strong political will to fund ecological restoration aimed at agricultural sustainability such as soil erosion.

During the 2003 WTO negotiations in Cancun, Mexico, Australia demanded reduced or abandoned agricultural subsidies in the EU to provide effective opportunities for its agricultural produce to compete on European markets. The EU states, however, see price-support subsidies as a measure to ensure social stability and environmental standards, agricultural land being more than areas for agricultural production, but having a multitude of social, ecological and economic benefits such as tourism. Trade liberalisation, as demanded by Australia, would thus harm the multi-functionality of European cultural landscapes.

The environment is increasingly used as a justification to financially support farmers (Bignal, 1998). There is growing concern, however, that the intended environmental issues, such as biodiversity loss, may not be sufficiently addressed (Sutherland, 2002). No evidence was found that agro-environmental schemes are associated with increased species diversity (Kleijn et al., 2001; Donald et al., 2002). These two studies suggest that the assumptions that underpin some agro-environmental schemes warrant examination.

Austria's agriculture is characterised by small- and medium-sized farms, with an average farm size of about 15 ha of utilisable agricultural area. Two-thirds of the farms are run on part-time farming. The economics of a 40 ha crop farm in Eastern Austria from 1997 to 2001 is shown in Table 2 and demonstrates high dependence on subsidies. Subsidisation is likely to be the only financial driving force behind farmer's capacity to carry out any ecological restoration.

Within the EU, each member state is responsible for the development of appropriate measures within the framework of the CAP. In Austria, the so-called ÖPUL (Austrian Program for Environmentally Friendly Agriculture) was established in 1995 and revised in 1998. From 2000 on, ÖPUL was incorporated into the new Austrian Program for the Development of Rural Areas (ÖPELR; EU Regulation 1257/99), and for the year 2001, 39% (€ 540 million) of the overall budget was allocated to agro-environmental schemes, which is approximately tenfold the proportion of the budget allocated to agro-environmental schemes by the EU (Table 1). It demonstrates Austria's high commitment to environmentally friendly farming.

The level of agricultural subsidies remains heavily production-oriented. In agriculturally productive regions, farmer's interest to participate in ÖPELR is low compared to unproductive regions. In the latter, the contribution of contractual conservation and restoration activities through ÖPELR to farm income is of great economic and motivational importance. These measures are part of a regional program which offers contracts for "good practice" in grassland management (mowing wet meadows or mowing meadows on steep slopes by hand) and financial incentives for setting aside arable land. Currently, about 10% of

Table 2
Economics of an intensively managed 40 ha crop farm in the lowland of Eastern Austria (F. Deininger, original data) and a 9300 ha wheat and sheep farm in the central wheatbelt of Western Australia (T. York and B.Y. Main, original data) in €

	Eastern Austria				Southwestern Australia			
	1997/1998	1998/1999	1999/2000	2000/2001	1997/1998	1998/1999	1999/0000	2000/2001
Revenue from farmable land	32,300	33,600	25,400	38,100	935,000	947,778	637,222	1019,444
Operating costs	44,700	43,500	43,700	45,200	827,778	783,333	768,333	938,889
Farm income after deduction of operating costs	−12,400	−9,900	−18,300	−7,100	107,222	164,445	−131,111	80,555
Environmental subsidies	8,600	8,600	8,600	7,000	4,167	4,167	4,167	4,167
Other subsidies	11,700	11,700	11,700	11,600	0	0	0	0
Other earnings (e.g. off farm, lease)	10,400	10,600	10,800	11,000	19,444	19,444	22,222	22,222
Domestic costs	13,400	13,400	13,800	13,800	69,444	72,222	72,222	77,778
Disposable income after deduction of all costs	4,900	7,600	−1,000	8,700	61,389	115,834	−176,944	29,166

cropland on individual farms is set-aside. To date, however, the location of set-aside is not planned by landowners to address nature conservation purposes such as enhancing connectivity or the size of grassland remnants but rather to maximise farm productivity (Donald et al., 2002). National strategies being subject to change, set-aside is generally of limited duration, mostly about 5 years, with obvious limitations in terms of biodiversity conservation. Long-term conservation planning within the EU is also difficult if not impossible (Luick, 1998).

Austria has implemented one of the most comprehensive and differentiated agro-environmental schemes within the EU. It is considered very successful simply because the level of participation in the program exceeded all expectations. Specific measures include reduction in use of chemicals, fertilisers and growth regulators. However, to what extent these measures contribute to biodiversity conservation remains contradictory. No benefits have been detected for mosses (Zechmeister et al., 2003), while preliminary evidence for bird species suggests positive effects (Frühauf, 2003).

Set-aside can decrease fragmentation effects of species dependent on primary and secondary grassland, provided their internal characteristic and geographic situation within the landscape are appropriate (Zulka et al., 2003). Yet, the input of ecological know-how is rarely sought, and general restoration guidelines (SER, 2000) may not be adequate to address specific conservation goals. ÖPUL aims at local improvement but lacks a landscape-scale funding strategy (Abensperg-Traun et al., 2000; Kleijn et al., 2001; Söderström et al., 2001).

If the restoration project is larger in geographic scale, such as the creation of corridors across landscapes, participation of all landowners is a major hurdle because of the small-scale ownership and the number of participants that need to be convinced.

Overall, biodiversity conservation needs to emphasise the maintenance or restoration of traditional landscape patterns and associated land-use practices to favour a return to higher biodiversity patterns (Pott, 1992).

2.2. Western Australia

Few regions of the world have experienced such large-scale and rapid land clearing for agriculture as WA, a recognised centre of biological diversity (Hopper, 1992). Prior to the first exploratory activities by Europeans in the 1830s, human occupation of the region was restricted to nomadic Aboriginal hunter–gatherers. Alteration of the landscape associated with European settlement began with selective grazing by exotic mammals in the 1860s (Main, 1993). Land-use was restricted to pastoralism until the mid-1890s when eucalypt woodlands in lower parts of the landscape were cleared. By the 1960s only 7% of the original vegetation remained in a region of about 14 million ha (Arnold and Weeldenburg, 1991; Abensperg-Traun et al., 2000; Yates et al., 2000). Extensive land clearing for agriculture resulted in the rise of saline groundwaters threatening not

only agricultural enterprises and settlements, but also biological diversity (George et al., 1995).

Land clearance and agricultural development were initially encouraged by government land grant and soldier settlement schemes over the first half of the last century, which can be viewed as a subsidised land settlement (Burvill, 1979a,b). Once on the land, farmers received little further direct support, and this lack of direct subsidy continues today. The political decision not to provide financial subsidies to the farming sector has major implications to what ecological restoration can achieve (Table 2). Average wheat- and sheep farms are about 3000 ha in size and the state's population as a whole, about 75% of which live in a small number of urban centres, lacks close identification with agricultural landscapes (Seddon, 1972) where there is no tourist industry. The political will to fund ecological restoration for agricultural sustainability is low. Nevertheless, farmers need to address land degradation at a large scale, and on a catchment basis in cooperation with other landowners to effectively address soil salinity. The average proportion of central wheatbelt farms planted to crops is 52%, most of which is wheat for human consumption, the remainder being used for sheep-grazing. On average, >90% of farmers' income come from the farm itself (Jenkins, 1996) and farmers depend entirely on productivity rather than subsidies to fund ecological restoration (Table 2).

In the 1996/1997 season, wheat export represented 46% of the value of total agricultural production in the State. Declining world commodity prices between 1980 and 1990 have led the number of wheatbelt farmers to decline by 18% (Lefroy et al., 1993), with an average increase in farm size by about 19% (Jenkins, 1996). Larger farms only can absorb economic setbacks and invest in restoration for nature conservation. Local reduction of population has consolidated family centred farm units involving several generations and this social structure has to be balanced against restoration efforts.

When revenue per ha wheat is adjusted for inflation, real income stayed similar over the 1990–2000 period with high year-to-year fluctuations (Australian Bureau of Statistics, 2000). As a consequence, restoration is especially difficult to plan on average and below-average-sized farms where farm profit is comparatively low. Agro-economic data for an above-average-sized family farm demonstrate high variability in farm income as a result of trade terms and seasonal drought. Big landholders mostly live on bank credits, which are not easily accessible to small farms, and only large farms can "afford" to put money into restoration.

The Landcare movement, which has no European equivalent, is largely responsible for changing attitudes among farmers with regard to land degradation and nature conservation (Campbell, 1994). This is a farmer-first, voluntary, community-based approach to tackling environmental problems and attempts to achieve long-term sustainability of agricultural and natural resources. The term 'Landcare' emerged in the mid-1980s when the movement established as a response by farmers and conservationists to land degradation, particularly in the states of Victoria and WA. The catalyst for government support was an alliance between the Australian Conservation Foundation and the National Farmers Federation. Landcare group number has risen steadily over the past two decades (Hobbs and Saunders, 2001). Landcare receives limited government support through the National Landcare Program, but relies on the activities and good will of locals (Goss and Chatfield, 1993; Curtis and De Lacy, 1996).

Jenkins (1996) surveyed four central/southern WA wheatbelt shires, aimed at gaining information on the change in farmer's attitudes since Coates (1987) reported on the effectiveness of funding schemes for Landcare work. There has been a significant, positive change as reflected in re-vegetation and the proportion of bush that has been fenced off to exclude livestock (Coates, 1987; Jenkins, 1996). Of farmers interviewed 64% were members of Landcare groups. Whereas most Landcare work are general enhancement measures, strategic restoration is increasingly emphasised, driven by activities under the "Living Landscapes" program of Greening Australia, a prominent non-governmental organisation in Australia. The program started in WA and aims to develop community-based strategic restoration projects which target specific nature conservation goals (Lambeck, 1997, 2003; Dilworth et al., 2000). Ecological restoration in WA needs to address the need for sustainable agriculture as well as the restoration of ecosystems as they were prior to European colonisation.

Until recently, restoration work has been directed primarily at productivity through re-vegetation and

soil and topography rehabilitation rather than biodiversity improvement. Re-vegetation reduces salinisation and favours biodiversity related measures (Lefroy et al., 1993). The funding schemes consist of grants to replant and fence off bushland (some 50%), plus 100% tax deduction on financial outlay for Landcare work. Farmers then have to pay for at least half the restoration costs which can be reclaimed through tax incentives. Other schemes, such as Land for Wildlife and Bushcare, also provide conservation support but as Jenkins (1996) suggested only 15% of farmers received grants for replanting and 26% for fencing, compared with 84% who replanted and 78% who fenced off (most of them receiving one grant only per year). Some 60% of the farmers would have done the work without a grant but emphasised that they could only do this during profitable seasons. Farmers also made it clear that tax deduction of 100% for Landcare work was inadequate compensation (Jenkins, 1996). The mean area of replanting per farm has only been about 20 ha, which translates into less than 1% of the average farm size which is negligible to stabilise soil salinity (George et al., 1995).

Funds to protect native vegetation have come mostly from the Natural Heritage Trust (NHT), a federal initiative. However, the NHT program has been criticised for giving many small amounts of money for works in scattered locations with little scientific input. This results in a good return on investment, but no useful conservation outcome (Majer, 2002).The amount of funding going into the NHT program is unlikely to increase. While funding has been allocated to a National Action Plan on Salinity, its level is regarded as far short of the sums needed to effectively tackle the problem (Pannell, 2001a).

Non-governmental organisations such as World Wildlife Fund are investing resources in agreements on areas of native vegetation, while the Bush Heritage Trust has bought blocks to manage and restore them. A revolving fund, the Bush Bank, has also recently been set up in which bush blocks will be bought, placed under covenant and resold. These schemes create alternative nature reserves to those owned by the state and managed by the Department of Conservation and Land Management and increase the amount of vegetation under conservation agreements, but they cannot help solve the larger landscape-scale issues which need to be tackled.

Despite increasing participation in community-based activities such as Landcare, a useful mix of financial instruments has not been developed to facilitate restoration activities in WA (Young et al., 1996; Elix and Lambert, 1997; Denys Slee and Associates, 1998). The change needed will only occur when viable management options become available. Given that large increases in government funding towards rural nature conservation are unlikely, finding viable agricultural alternatives is one of the best ways to invest in the future of agricultural landscapes in WA. Adoption of alternative farming strategies, however, is not without problems (Kubicki et al., 1993), especially with regard to risk-aversion of the farming community, establishment costs and uncertainty of their future profitability (Pannell, 1999, 2001b; Marsh, 2001).

3. Setting priorities for the future

Apparent differences in agro-political priorities have produced diverging agro-economic systems where producers are either heavily subsidised (EU countries) or largely unsubsidised (WA). This divergence is interpreted as being a direct result of three interrelated factors. With regard to WA, the comparatively high level and large scale of land degradation, the short length of time over which agriculture has been practised, and low rural population densities, have resulted in low political will to sustain rural communities. Here, farmer's capacity to fund restoration work depends on world terms of trade, climate and a bottom-up, people-driven Landcare system. This contrasts Austria where an elaborate subsidy system reflects high political will to maintain the stability of rural communities. While WA has failed to develop a financial strategy aimed at ecological restoration for biodiversity conservation, Austria benefited from a subsidy system which makes allowance for environmental schemes partially aimed at biodiversity conservation. The effectiveness of this system needs to be reviewed, and suggest that the different environmental and social histories demand different approaches to implement ecological restoration.

Whether the considerable amounts of money spent by the EU on environmentally friendly farming are reflected in benefits to biodiversity conservation across the region is questionable (Bignal, 1998; Kleijn et al.,

2001; Zechmeister et al., 2003). We suggest that there is a lack of objective criteria about how EU and national funds are used for ecological restoration, and argue that there is an urgent need to change current funding policies and strategies based on:

- A rigorous scientific evaluation of the cost-benefit situation of current environmental programs across the EU, including a comparative evaluation of different member nation's effective use of its own programs. This problem has been acknowledged in the 6th EU Framework for Research and Development and is part of EU Regulation 1257/99 which formulates the need for individual member states to implement an effective monitoring system.
- EU pressure to ensure that member states adopt regional programs maximising conservation benefits (Macdonald and Johnson, 2000). However, unlike other EU-countries, and WA, the UK does not use agro-environmental funds in a spray-can fashion but allocates funding based on clear prioritisation of areas where restoration activities are scientifically supervised. Successful restoration measures for the conservation of the cirl bunting *Emberiza cirlus* Linnaeus, 1766 is a case in point (Ovenden et al., 1998). However, where relevant data are available, a multi-species approach (Lambeck, 1997) to species conservation may be preferable.
- Stabilisation of EU funding which is subject to frequent change, posing a high degree of uncertainty for potential users and prevents long-term planning.
- A discussion about the future role of the rural production systems and their associated systems of subsidisation. This has been initiated with Agenda 2000 and needs to be continued during the CAP reform in 2006, preferably on a broad societal basis. Given the enormous sums the EU spends on agro-environmental schemes, the general public deserves better information on biodiversity, while a Danish evaluation suggests that the political measures of Agenda 2000 have little socio-economic or environmental benefits (Wier et al., 2002).
- Funding to encourage land-use systems providing the basis for high biodiversity in European agricultural landscapes (Pott, 1992; Bignal, 1998). Funding productions that reduce the competitiveness of environmentally friendly forms of agriculture, is counterproductive.

Restoration of biodiversity in WA needs to take the scale and degree of land degradation into account. Based on current land-uses, it is very unlikely that government, NGO's or landowners will carry the costs of large-scale restoration, and to provide effective "piggy-back" opportunities for biodiversity restoration. Some estimates suggest that 70% or more of the agriculturally used land needs to be re-vegetated with trees and to restore the hydrological balance, which is not a realistic option for farmers. The low priority that WA governments have given to maintain social stability of agricultural communities is likely to continue. Increasing the capacity of WA landowners to pay for restoration depends on increasing productivity and economic viability of the land, and this may be achieved through:

- Change from a largely Landcare-driven system of land restoration to one that is driven by both Landcare groups (re-vegetation) as well as commercially oriented strategies. Rather than attempting to reduce salinity at all costs, farmers need to accept that a significant proportion of their lower landscape has become and will continue to be saline. This should translate into adopting land-use strategies that are economically sustainable under saline conditions (George, 2001). Land-use strategies also need to be diversified to provide greater flexibility under the highly variable climatic conditions of the region. State government and associated extension services have a major role to play in promoting alternative land-use strategies.
- Targeted spending to minimise losses to salinity in priority areas rather than the current thinly and evenly spreading of funds (Pannell, 2000). This entails a system of prioritisation as in medical emergencies, and also the recognition that some landscapes are not going to be restored (Kristjanson and Hobbs, 2002; Hobbs and Kristjanson, 2003). While this represents a realistic view, it will not be easy for government to admit, and the full social costs have not been explored.
- Redirecting funds from government incentive schemes to a program paying farmers a salary to act as "land stewards". This scheme would not please farmers, many of whom consider themselves "rugged individualists". If a proportion of farmers switched to this mode of operation, significant

portions of the landscape could be treated more effectively in terms of land and nature conservation.

"Slipstream" refers to the turbulence zone behind moving objects. Whereas following slipstreams a car can substantially reduce energy expenses, unpredictable turbulence makes navigation difficult. Restoration ecology is largely caught in the slipstream of current agricultural policies, and opportunities and goals within reach are not so much determined by ecological necessities than by the existing economic framework and funding schemes. Ecological restoration is further handicapped by political disagreement over the voyager's target, that is, where the agricultural policy should be heading.

From a scientific point of view, conservation goals need to be clarified. The over-arching goal, i.e. the maintenance and restoration of biodiversity, is simply too broad and imprecise to define at appropriate scales. Measurable aspects of biodiversity such as species richness of particular functional groups of high predictive power are required. Though criticised (Lindenmayer et al., 2002), the focal species concept (Lambeck, 1997) is probably the most elaborate approach to measure the success of biodiversity conservation.

As the goals of restoration are difficult to define, so are the methods and means to achieve them. General principles of landscape restoration include habitat networks (e.g. Forman, 1997) and corridors (Hobbs, 1992). A dearth of data and varying opinions about the probability of success of corridors (e.g. Simberloff et al., 1992) preclude resolute action towards re-integration of fragmented landscapes, however. How habitat networks should look like and to what extent they fulfil their role is not clear. In addition, common understanding of conservation problems is restricted to processes operating at the local scale, and excludes the landscape-scale. Preparedness to devise, apply, and accept restoration measures, however, strongly depend on the degree of ecological literacy of local communities. Any ecological restoration project is bound to fail unless it is socially integrated (Dilworth et al., 2000; Pfadenhauer, 2001). What is required is a discussion process at a broad social scale to define what the society wants future landscapes to look like, and what "services" they should provide us with. In other words, a vision is needed which includes both spatial and temporal scales, an inherent flexibility to deal with new opportunities and changes in public demands, and an acceptance that while nature conservation requirements need to be met, agricultural communities must also be maintained (Saunders, 1996; Recher, 2003). Such a discussion process would in part be facilitated by the fact that for both regions, the need for widespread changes in land-use strategies is being recognised. In WA, rethinking current agricultural practices is triggered by extensive land degradation, and in Austria by massive overproduction. Some estimates for EU countries predict that by 2015, the area of agricultural production would be reduced to between 20 and 80% of the currently used area (Dosch and Beckmann, 1999). This would provide enormous potential for nature conservation purposes. In the absence of a broadly based discussion process involving representatives from all sectors of society, we will continue with the piecemeal approach that has so far characterised most ecological restoration work and which, to date, has largely failed to halt biodiversity erosion.

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