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# Using an ecolabel to promote on-farm conservation: the Wisconsin Healthy Grown experience

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We report on a project to establish a market-based approach for the conservation of lands in an agricultural landscape. It is based on the Wisconsin Healthy Grown potato ecolabel, and the concept of certification. Potatoes produced in certified fields can be marketed under the ecolabel and, it is hoped, sold at a premium that returns to the growers to support the additional costs of environmentally sensitive practices. Although the label was launched on the basis of in-field practices, the growers and supporting conservation non-governmental organizations (NGOs) intended from the beginning to include a component into the certification that would require restoration and ecologically sound management of native communities on non-crop lands owned by participating farmers. We describe here the process by which this 'natural community standard' was developed and included within the certification. The certification requires either a financial or in-kind commitment to land management actions from a list approved by the certifying body. The emphasis has been on restoration of native prairie in marginal cultivated lands and moving wooded areas back towards the open oak-pine barren and savanna communities present at the time of European settlement. At present, grower interest and acceptance of the programme within the Healthy Grown community is high. Sustainability and extension of the programme to other farms and other commodities will require that growers acquire natural lands management skills and apply them in conjunction with private and government conservation entities. We conclude that market-based ecolabels have promise as a means of promoting on-farm conservation for a wide variety of crops and ecological settings.

**Keywords:** agriculture, agroecology, certification, conservation, ecolabel, potato, restoration

## Introduction

It is widely acknowledged that in landscapes in which there is substantial human presence the best conservation outcomes can be achieved only if the remnant and restorable native communities on private lands are preserved (Banks, 2004; Kroeger & Casey, 2007; Macdonald *et al.*, 2007). In heavily exploited agricultural landscapes the dedication of private lands for conservation may be the only near-term hope for biodiversity conservation (Perrings *et al.*, 2006). Although many believe that some degree of government regulatory oversight is essential, self-regulation also has an important role in realizing better environmental outcomes (Jansen, 2004). This suggests that conservation approaches that attract willing participants must be fully exploited. There are two basic motivators for

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participation – ethics and economics, and to be successful a conservation programme must invoke both. In an agricultural setting where livelihoods are dependent on working the land, economics will always be a motivator. But conservationists often distrust purely economic approaches because conservation gains can be lost if market forces reverse (McCauley, 2006). For example, a current concern is that the shift towards grain and biomass-based fuels will be to the detriment of conservation programmes such as the U.S. Conservation Reserve Program (Plieninger & Bens, 2007). Therefore, solutions that engage social as well as economic capital are considered more likely to endure (Burton *et al.*, 2008).

These facts explain the appeal of using an ecolabel as a mechanism to preserve lands within privately owned farms. In the agricultural context an ecolabel is a means of identifying ('branding') a product that has been grown in an ecologically responsible way. The concept is that the additional costs of adopting more ecologically sound practices can be offset by the premium that consumers are willing to pay for foods produced in ways that do minimal damage to the environment (Mason, 2006). There are potentially the additional incentives for consumers that the product may taste better or be better for their health. Although an ecolabel could in theory succeed entirely on the basis of food-based consumer self-interest, evidence from organic marketing suggests that it is more likely to succeed if there is a valid moral and ethical component (Arvola *et al.*, 2008). Dedication to conservation and ecologically based management of non-crop lands can add such a moral dimension to an ecolabel in addition to whatever demonstrable improvements in other ecological services can be obtained.

Ecolabels are a relatively recent concept in agriculture but the generic concept of ecolabeling has received considerable attention. The International Organization for Standardization (ISO) has established generic standards related to ecolabels of which the ISO 14000 series is the most relevant (International Standards Organization, 2000). In ISO 14020: 2000 they identify nine principles for 'environmental labels and declarations' that stress that labels be science-based, verifiable, open and arrived at by a consultative process. In the United States, the Consumers Union has been monitoring ecolabels, and identifies five key elements: an ecolabel must be meaningful, consistent, transparent, independent and open to comment and revision (Consumers Union, 2007).

The extension of generic ecologically based standards to farms is a global phenomenon. The European Union is establishing a uniform agricultural policy that seeks more environmentally friendly production methods, including explicit provisions for lands to support native biodiversity (Galan *et al.*, 2007; Wall *et al.*, 2001). In Australia the use of 'clean and green' as a marketing theme has led to calls for credible evidence to back up the claims. Improving environmental management systems (EMS) on farms is seen as one promising way of doing this (Chang & Kristiansen, 2006). In Ecuador environmental certification is well established among banana producers (Melo & Woit, 2005). Many of these schemes emphasize in-field aspects of farm operation, and therefore are not directly applicable to a non-cropland conservation component. An exception is the study of Ridley *et al.* (2003) which stressed how farms can deal with non-crop land conservation in an EMS context.

There are significant challenges that must be faced in including the conservation of natural lands in an agricultural certification programme. The indicators and measures for in-field components such as pesticides and fertilizers have a longer history and tend to be more portable geographically and across commodities. An ecologically based certification, however, involves a much more complex situation because it must include all of the in-field aspects as well as those of the surrounding natural ecosystems. It must also vary significantly from one region to another, and even from farm to farm within a region. In this paper we report on how these challenges were addressed in adding a non-crop component ecolabel certification for Wisconsin Healthy Grown potatoes.

## The origin of the Healthy-Grown label and the conservation objectives

The Healthy Grown potato ecolabel was launched in 2000 by the Wisconsin Potato and Vegetable Growers Association (WPVGA) commodity group. It emerged from a complex process of collaboration and discussion among Wisconsin potato growers, staff of the WPVGA, the University of Wisconsin – Madison agricultural researchers and extension

specialists, and conservation non-governmental organizations (NGOs) interested in exploring ways of bringing private lands into regional and national conservation planning. (We will use the term 'collaboration' to refer to this informal grouping of persons and organizations that met in various combinations and participated in the evolution of the Healthy Grown ecolabel.) The primary NGOs involved were the International Crane Foundation, the World Wildlife Fund and the Defenders of Wildlife.

The impetus for the creation of the ecolabel was the need for the potato growers to modify their practices to reduce the use of costly and environmentally damaging chemicals, and a general desire to improve their practices. A long period of university research focusing on Integrated Pest Management (IPM) of potatoes (Benbrook *et al.*, 2002; Stevenson *et al.*, 1994) provided the basis for bringing about the necessary in-field changes. Focus group market research sponsored by the WPVGA indicated that consumers were willing to pay more for a greener product, and encouraged the growers to pursue an ecolabel. The initial plan was based on IPM practices, evaluating actions in 10 areas: (1) scouting (in-field monitoring); (2) information sources; (3) pest management; (4) field management; (5) weed management; (6) insect management; (7) disease management; (8) soil and water quality; (9) storage; and (10) chain of custody (excepting those farms that market their produce themselves).

Participation in the Healthy Grown project is voluntary and somewhat fluid, since participation in meetings and discussions does not require that a particular grower be producing certified potatoes. This, and the fact that certification is on a field-by-field basis, means that the acres enrolled and the farms participating fluctuate from year-to-year. At the time of writing, about 10% of the fresh market Wisconsin potato-growing acres are enrolled with Healthy Grown (about 5% of the overall acres in the state which includes fresh, processed and seed potato production). Since Healthy Grown is only sold as a fresh product, there are no processed potatoes involved, although there is interest to expand into those markets, which would greatly increase the number of acres involved.

From the beginning of the collaboration's discussions there was interest in making conservation actions on non-crop lands a component of the ecolabel certification, and in addressing the issue of farm sustainability. The conservation NGOs, although also wishing for pesticide and fertilizer use to be more environmentally sensitive, saw this as an opportunity to improve management practices on private non-crop lands. The growers, most of whom had strong ties to the lands they farmed, were receptive to this objective and gave willing support and encouragement to making non-cropland management an element of the certification. They wanted to manage their farm as a whole rather than solely maximizing production for individual fields. In this respect, the Healthy Grown effort may be unusual, though we suspect that many farmers with an emotional connection to the land have similar views but lack the means to act on this desire because of the economic constraints that exist in a standard agricultural system. The challenge was how to translate these general objectives into a concrete program since there were fewer precedents and less relevant research than for the in-field IPM aspects.

The collaboration's original conservation goals focused on improving on-farm habitat of specific species, to 'expand quality habitat supporting the Sandhill Crane, Karner Blue Butterfly, fish, and other wildlife'. But in 1998 the collaboration, after three years of developing in-field metrics for pesticide use and other in-field activities, convened a meeting that brought together the collaboration partners including the USDA Natural Resource Conservation Service (NRCS) staff experienced in the area of cost-share programs for ecosystem-management related activities. The purpose of this meeting was to discuss the real and perceived barriers to on-farm conservation, to define a guiding philosophy, and to devise a plan to begin conservation work on the farms. At this meeting it was agreed that the conservation focus should shift from single species and game to the more general goal of preservation and restoration of ecological communities, especially wetlands, savannahs and woodlands, and prairie. These plans were on hold until 2003 when funding became available to hire a full-time ecologist/outreach specialist (the second author) as a UW employee. His responsibilities were to work with the participating farmers to test specific management actions, and to work toward a consensus on conservation measures that could be included in the certification for the ecolabel.

The collaboration early recognized that an independent review of their standards was necessary. To meet this need, the Protected Harvest group was established in March of 2001 (Protected Harvest, 2008b). It is charged with the certification of growers and packing sheds that produce, store, package, and ship ecolabel potatoes. Protected Harvest, with offices in California, now has several fulltime staff and a governing board that includes representatives of several major environmental organizations, agricultural and pest management specialists, and others with agricultural expertise. They have since expanded as certifiers of other commodities (Protected Harvest, 2008a)

## The ecological and biogeographic features of the Healthy Grown set of farms

The ecologists participating in the collaboration believed that the regional and local ecological conditions were critical to developing a certifiable and meaningful off-crop conservation component for the ecolabel. They reasoned that the conservation potential of individual farms had to be evaluated in a regional context, and therefore that the eco-region to which each of the participating farms belonged was an important component to be considered in the standard. Grassland bird populations, for example, depend on landscapes larger than individual farms can provide.

The Healthy Grown ecolabel is currently limited to potatoes and to farms in Wisconsin. Within Wisconsin the requirements of potato farming have led to a concentration of farms in a region of the state classified by the Wisconsin DNR as the Central Sand Plains. This region largely corresponds to that of Glacial Lake Wisconsin, and is characterized primarily by coarse sandy soils and other glacial outwash and periglacial features (Clayton & Knox, 2008; Curtis, 1959; Rawling *et al.*, 2008). In its pre-European settlement condition it had many wetlands and extensive areas of pine-oak and oak savannah with pockets of denser forests of variable composition and some open prairie. Most of the larger wetlands were drained and converted to agriculture, a practice which largely fell out of favour after the 1930s (Zedler, 1966). Potatoes are now typically cultivated on pivot-irrigated fields (32–65 ha) in upland sandy soils. The glacial legacy of the landscape as well as historical contingencies in the expansion of the pivot fields have created a complex landscape in which significant remnant natural vegetation with various degrees of past disturbance is present (Figure 1). Some of the Healthy Grown farms occur in other ecological regions. One lies in the glacial floodplain of the Wisconsin River and therefore in a setting ecologically similar to the Central Sand Plains. Two other farms are in substantially different ecological systems, the Wisconsin DNR 'Forest Transition' unit of northern Wisconsin and the 'Southeast Glacial Plains' region (Wisconsin Department of Natural Resources, 2008a). In this report we limit our discussion to the standards for farms of the Central Sand Plains.

## Objectives of the Healthy Grown natural community standard

The broad objectives in establishing a conservation component were to devise a system that would (1) advance generally accepted regional and local

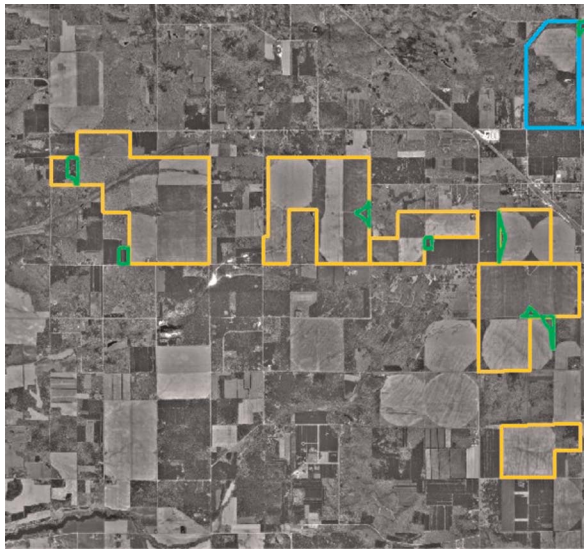

**Figure 1** View of the Healthy Grown landscape. Heavy lines show outlines of two of the participating farms. This agricultural landscape is a complex mosaic of cultivated land, forest plantations, and natural lands in various states of recovery from past disturbance. This photo shows an area approximately 10 × 10 km.

conservation objectives, (2) provide other ecological services of agricultural utility to the extent possible, (3) require specific actions of landowners, but remain within the capacity of the growers to act as managers and monitors, (4) respect the individual circumstances and capacity of each participating farm to insure maximum participation, and (5) be socially and economically sustainable.

Our approach accords well with the 11 guiding principles for conserving biodiversity in agricultural landscapes laid out by Harvey (2007). In particular, we emphasize his principles 9 and 11 which stipulate allowing marginal lands to revert to natural cover where this is possible, and to restore degraded lands where it is not. Most of the conservation actions that are required of the growers relate to restoration that is in keeping with conservation programs in other agricultural systems (e.g. Wade *et al.*, 2008).

Prescribed burning is an important part of restoration in this region. Since European settlement in the middle of the 19th century, wildfire has ceased to be a significant ecological factor. As a result, natural communities have filled in through the increase in the density of woody species formerly ubiquitous but at low density such as *Quercus ellipsoidalis* and *Q. velutina*, and the expansion of more mesic and shade tolerant species such as *Prunus serotina* and *Acer rubrum*. There has also been extensive silvicultural planting of native red and white pines and establishment of species not native to the region (e.g. *Robinia pseudoacacia*). Thus restoration actions to open up these communities and restore the habitat towards the formerly dominant oak savannah and oak-pine (*Q. ellipsoidalis*, *Pinus banksiana*) savannah are priorities in the initial phase of management. A similar situation and management need exists for sedge wetland remnants on these same lands. Another priority activity is to restore abandoned or marginal fields to native prairie. All of these objectives have widespread support among growers and interested members of the local communities.

The control of invasive plant species has also been a priority. Although recent work has shown that invaders do not necessarily push native species to extinction (Stohlgren *et al.*, 2008), they can be locally dominant. In the small areas frequent in agricultural landscapes they pose a significant aesthetic problem and can reduce native biodiversity.

Because of the severe spatial constraint of working within the boundaries of farm ownerships we did not attempt any of the optimization approaches to conservation popular in the academic literature (e.g. McCarthy *et al.*, 2006; Westphal *et al.*, 2007). We acknowledge, however, that if projects like ours succeed in creating a general acceptance of explicit conservation action across a broad range of farms, it may be important to consider applying some of these methods to fine-tune the collective conservation effort.

## Research team and methods

Production of the standard was a joint effort of the growers, UW Extension personnel, UW academics and collaborators from conservation NGOs. A key development was the hiring by UW on behalf of the collaboration of the second author as the ecologist/outreach specialist, with salary support from USDA special project funding (2004–2007). In this capacity he oversaw the field trials of restoration and management methods and met with the growers to produce the initial assessments and management plans, as described below. During this period, there were multiple meetings with the growers and other partners to present the progress on the standards and to assess the feasibility of proposed measures. In 2005 additional support was obtained from a USDA National Research Initiative (NRI) grant which funded, among other things, a detailed assessment of the biological resources on non-crop lands.

## Review of other natural community certification standards

In designing the Healthy Grown ecosystem standard the outreach specialist started by examining other extant schemes to determine whether there were principles or approaches that could be adapted to Wisconsin potato farms. He reviewed programmes listed by Consumers Union on their 'Greenerchoices' website (Consumers Union, 2007) under the heading 'sustainable agriculture'. Two of the labels, Rainforest Alliance and Bird Friendly, were the most quantitative.

The Rainforest Alliance has a standard for shade-grown coffee plantations and has worked with banana growers in Latin America (Jansen, 2004). In coffee plantations measurements of canopy cover and height of the overstory are used to rate the farm's suitability in providing habitat for forest-bird species (International Rainforest Alliance, 2008). This approach is one of two in the Sustainable Agriculture category considered by Consumers Union to be a 'quantitative' versus 'practice-based' standard. The standard is aimed primarily at only two resources, coffee and birds, thus limiting its transportability to situations with more general goals. In addition, by emphasizing canopy structure independent of tree species composition, the standard does not necessarily ensure the preservation of woody plant species diversity. Non-crop areas of a farm not directly associated with coffee production are considered, but in general terms. An auditor certifying an individual farm was directed to give a 'yes' or 'no' answer to the question '[are] ... all existing natural ecosystems, both aquatic and terrestrial ... identified, protected, conserved and restored through a conservation program?' (International Rainforest Alliance, 2008).

In the Bird Friendly scheme (Smithsonian National Zoological Park & Friends of the National Zoo, 2008), the shade-grown coffee standards include direct measurement of some biological attributes within a plantation's canopy structure. This includes numerical requirements for the minimum and maximum percentage of cover within three vertical strata of the canopy. The standard also provides specific recommendations for species that comprise the 'backbone' of the canopy along with species whose exclusion is mandatory. It also stipulates that the non-dominant species include at least 10 taxa with a minimum requirement for each to represent over one per cent of canopy cover. This level of specificity is admirable for the circumstances for which it was devised, but it does not specify management actions that are necessary to sustain biodiversity.

## The Nature Conservancy's 5-S system

The standards presented by the Consumer's Union have good features and appear to be meeting their objectives but it was felt that a more a generic conservation strategy based on functioning ecosystems was needed. The outreach specialist concluded that the Nature Conservancy's (TNC) '5-S' system for site conservation possessed the necessary components. It is designed to '[make] strategic conservation decisions and [measure] conservation success at sites' (The Nature Conservancy, 2000). Because the 5-S system was the end product of a long period of development by an international organization with well-trained staff and numerous collaborators, there was assurance of a system that met the ISO expectation of an open and collaborative process. Another advantage was that it was extensively documented with readily available handbooks, worksheets, and many examples (The Nature Conservancy, 2000).

It is a good match for the farmland conservation situation where there is little scope for selecting among alternative parcels and the objective is to improve the biodiversity support service on as much of the land as can be spared from intensive agriculture. It lays out a systematic approach to identifying the kinds of conservation actions necessary to maximize the contribution of each site to ecological services and especially to the conservation of the native biota in a comprehensive ecological context, which is the most important objective of TNC.

The S's referred to in the name are systems, stresses, sources, strategies and success (The Nature Conservancy, 2000). The essence of the framework is to document the resources that are available or potentially available at a site (system), identify the stresses that imperil the valued resources of the site, determine the primary sources of the stress, and from this devise a conservation strategy to maintain and improve the conservation value of the site. Finally, monitoring to gauge how well the system is doing compared to the desired target (success) is necessary to make adjustments to the strategy as knowledge accumulates and as there are changes in the stresses of concern. We note in passing the objections to the use of the term 'success' especially in a restoration context (Zedler, 2007) but accept it here as meaning that clearly stated goals have been achieved.

To apply the system the online Conservation Action Planning Workbook was used as a guide to develop the details of the regional plan. Since the first implementation of this modified system, TNC

has produced a new version of its online resource, Conservation Action Planning (The Nature Conservancy, 2008) which subsumes the approach laid out in the 2000 5-S publication.

## Application of our modified system

The outreach specialist began with a survey of the participating farms to determine the size and location of the non-crop lands available for conservation purposes. Eleven farms were mapped utilizing ArcView 3.3 and their land use was delineated. This revealed that 12–30% of each could be classified as non-crop and undeveloped land and that the total area of such lands was over 2500 ha. Ground surveys conducted between 2002 and 2006 as part of the USDA NRI project confirmed that collectively these parcels supported a diverse assemblage of remnant native communities (Gaines *et al.*, unpublished data; Nye *et al.*, unpublished data; Werling & Gratton, 2008). Although at present the lands to be managed are limited to those on Healthy Grown farms, the evaluation of the conservation potential of each parcel considered the character and probable future land use of adjacent parcels. This is in accord with the widely accepted principle that when costs of creating larger blocks are minimal (as they are in this case), all other things being equal, larger parcels are preferred (Schwartz, 1999).

Following the TNC process, the outreach specialist, in consultation with university and public agency personnel selected conservation targets within this region by considering those ecosystem types present on the participating farms whose conservation would encompass most of the significant biodiversity and ecological services of the Central Sands region differentiating 'coarse' and 'fine filter'. Fine filter targets are those that require special attention wherever found, such as endangered species. Coarse filter targets are those that encompass larger areas and many species, such as particular ecosystem types (The Nature Conservancy, 2007). This produced a set of five coarse-filter ecosystem targets and one fine-filter target, the Karner blue butterfly (Karner Blue Butterfly Recovery Team, 2003) (Table 1). The TNC conservation approach also places emphasis on the preservation of functional landscapes, that is, collections of ecological systems that together provide services at a larger scale. Because our efforts were directed to particular farms and our management constrained, at least initially, by their ecologically arbitrary boundaries, our capacity to address these issues has been limited. As noted above, however, the land use on adjacent parcels was taken into consideration.

With the regional conservation targets selected, the TNC's Conservation Action Planning Workbook (The Nature Conservancy, 2007) was used as a guide to develop the details of the regional plan. This process roughly mirrored the scheme utilized on the 'Assessment of Target Viability' sheet within the workbook. It involves identifying the 'key attributes' for each target, selecting an 'indicator' for each attribute, and defining a rating scale for each of the indicators based on the understanding of the acceptable range of variation (The Nature Conservancy, 2007). The indicators are selected by taking into account the most important factors necessary to sustain and enhance the biodiversity value of a site, as well as those that threaten to degrade it. Many of these factors can fall on either side of the ledger, acting to sustain and enhance at one level, but to threaten or degrade at another. For example, for the oak-pine barrens in this region fire is a 'key attribute' and the frequency of fire is an 'indicator'. The absence of fire is considered negative in maintaining oak-pine barren habitats and moderate fire recurrence is positive, but annual burning, while possibly better than no fire at all, may also be suboptimal. Studies of butterflies (Coleman & Rieske, 2006; Swengel & Swengel, 2001) have shown marked decreases in abundance with annual burning. Frequent burning may also reduce the carbon storage function (Tilman *et al.*, 2000).

The status of the attribute is qualitatively classified on a four-point scale (poor, fair, good, very good) for different levels of the indicator and the acceptable level that has been designated. These ratings are subjective, and therefore probably not reliably reproducible among practitioners. But the virtue of the approach lies in identifying which attributes are being given consideration and providing a measure of which may require management actions to correct. Thus 'fair' or 'poor' suggest a need for attention, whereas 'good' and 'very good' do not. Following recommendations of the 5-S system, it is understood that this scale and the management

**Table 1** Conservation targets identified for the Healthy Grown farms. In most cases the targets do not exist in a desirable form and will require restoration and management. Nomenclature follows Wetter *et al.* (1998)

| ***Type*[1]** | ***Conservation target*** | ***Characteristic species*** | ***Main current management actions required*** |
|---|---|---|---|
| Combination of two vegetation communities[2] | Pine/oak barren | *Pinus banksiana, Quercus ellipsoidalis*, prairie and forest herbs and shrubs | Thinning of tree cover, burning, invasive species control |
| Vegetation community | Oak savannah | *Q. velutina*, *macrocarpa*, and *ellipsoidalis*, prairie and forest herbs and shrubs | Thinning of tree cover, burning, invasive species control |
| Vegetation community | Southern wet-mesic hardwoods (riverbottom forests) | *Acer rubrum*, *Fraxinus nigra, Ulmus rubra* | Invasive species control, limited restoration |
| Vegetation community | Prairie | *Schizachyrium scoparius*, *Bouteloua curtipendula*, *Lespedeza capitata* | Planting, removal of woody invaders, frequent burning, invasive species control |
| Vegetation community | Southern sedge meadow | *Carex stricta, Calmagrostis canadensis*, *Lysimachia thrysiflorus* | Invasive species control, burning |
| Federally endangered species | Karner blue butterfly | *Lycaeides melissa samuelis* | Thinning, planting of *Lupinus perennis* |

[1]Ecosystem (community) types follow Curtis (1959).
[2]Curtis (1959) describes 'oak barrens' and 'pine barrens' as distinct types characteristic of nutrient poor sandy soils but indicates that they intergrade.

actions that follow from them are hypotheses advanced on the basis of current knowledge with the expectation that both the indicators and the scale will be modified as experience accumulates.

The process may be illustrated by an example. For the target 'oak-pine barrens' four key attributes were identified: (1) fire regime; (2) community architecture; (3) invasive species; and (4) aerial extent. For this ecosystem type, the restoration for fire is considered key to improving the condition and native species composition of the stands (Peterson *et al.*, 2007) Accordingly, fire regime is identified as an attribute of importance with three indicators, extent, frequency, and timing. The acceptable (TNC calls this 'desired') ratings for these were classified as good, very good, and good respectively. That is, we judged that insuring that some parts of the landscape were burned often enough to bring about the desired change was more important than burning the largest areas, or burning at the ideal time. Each of the other indicators was treated in a similar way. The attribute 'invasive species' was treated as wholly negative, with 'presence and abundance' as the indicators. For this, considering the difficulty of extirpating invasive species, a level of 'good' was chosen as an acceptable rating. Finally, the management actions necessary to achieve the desired range of the indicator were selected with consideration for those that could be accomplished by the available staff and technology.

## Creating the action plans for certification

The 5-S part of the certification process was applied to the entire set of Central Sands farms participating in the Healthy Grown project. But since the objective was to involve each of the farms in active management of the non-crop lands, it was necessary to

translate the general recommendations into an annual plan specific to the sites available on participating farms. To harmonize conservation management with the certification process, a window was specified within which the requested actions could be completed to qualify for certification as well as the minimum and maximum dollar equivalents to be expended by each grower. It was decided that the certification for a given growing year would be negotiated in July of the preceding year, with the stipulation that the actions had be completed by 1 August of the following year. This large window was intended to include both the spring and autumn burning seasons so that the growers could fit the conservation management into periods when time-critical farming operations were at a low level. The action plans then considered which targets occurred on each farm and designated actions that would act to bring the specified indicators within the desired (acceptable) range.

## Outcomes for the first year

After field-testing, the 'natural community standard' was presented by the UW team to collaboration partners at a series of meetings during the fall and winter of 2005/2006. It was accepted by the Healthy Grown collaboration on 11 January, 2006 with the idea that the 2006 growing season would be a pilot year for the process, before submission to Protected Harvest. The standard was then submitted to the independent certifying body, Protected Harvest, for review, who approved it on 23 October, 2006 at the annual board of directors meeting. This meant that they formally incorporated the standard into the package, which already included the in-field standards. In keeping with the need for transparency, it has been made available on their website as the 'Natural Community Farm Level Standard' (Protected Harvest, 2008b). There it can be seen that the standard is quantified in terms of hours and/or dollars (1 hour=$10) devoted to management activities on the six targets, with minimums specified as 40 hours and/or $400 per participating farm. For the first year, fall and winter of 2006 and the spring and summer of 2007, approximately 130 ha of land had received one or more management treatments (Table 2). The hectares that have been managed are listed by target and management action. In this year, none of the actions were directed to the Karner blue butterfly target sites. The land area treated is small, but the expectation is that cumulatively most of the non-croplands will be receive attention.

## Sustainability

For the natural community standard to be sustainable there must be quality on-the-ground management and monitoring in addition to the independent oversight by the certifying body. Although persons capable of carrying out the exacting practices that modern farming demands can be

**Table 2** Ecosystem types and treatments applied on participating farms for the 2006–2007 season. Hours and hectares affected are listed

| *Ecosystem type* | *Area treated (ha)* | *Prescribed burn* | | *Mechanical cutting* | | *Invasive species control* | | *Establish native vegetation* | |
|---|---|---|---|---|---|---|---|---|---|
| | | *Hours* | *Hectares* | *Hours* | *Hectares* | *Hours* | *Hectares* | *Hours* | *Hectares* |
| Savannah | 30.4 | 52 | 14.2 | 70 | 20.2 | | 0 | | 0 |
| Prairie | 4.7 | 16 | 4.7 | | 0 | 20 | 4.7 | | 0 |
| Oak/pine barrens | 75.1 | 74 | 20.8 | 80 | 31.6 | | 0 | 200 | 27.5 |
| Sedge meadow | 20.2 | 32 | 6.1 | 10 | 4 | 10 | 10.1 | | 0 |
| Total | 130.4 | 174 | 45.8 | 160 | 55.8 | 30 | 14.8 | 200 | 27.5 |

expected to have the technical skills necessary to conduct conservation actions such as thinning, burning and restoration plantings, they will not necessarily have the time to develop all the expertise needed. Especially in the start-up phase they will require some guidance on long-term conservation planning and on the prescriptions for the actions needed to implement it. The expertise necessary could come through existing extension operations, but we believe that collaborations with the growing number of citizens' groups focused on wildlands management represent another reserve of applied ecological expertise. In Wisconsin, for example, there is the Prairie Enthusiasts organization dedicated to restoration and management (Prairie Enthusiasts, 2007). The expectation is that the monitoring required for the evolution of the management practices will be conducted by the growers themselves with the education, aid and help from the participating NGO and UW specialists.

Monitoring is essential to insure that claims for conservation gains are actually being achieved. It is the most important element of transparency. This component has not yet been fully developed. At present, studies of a USDA sponsored university research project are being conducted on the restoration sites; but at some point the monitoring, like the management, must either be done by the growers or by agents hired by them.

## Discussion

We believe that the collaboration has produced a natural ecosystem certification standard that can contribute to a viable ecolabel. It is (1) science-based with provision for adaptive improvement, (2) beneficial to the objective of local and regional biodiversity support, (3) transparent both with respect to the management actions taken and with their results, and (4) accepted by the independent certifying body, the growers, and the participating conservation NGOs. At present approximately 150 ha of land are under active management according to its provisions, with the expectation that this will increase in coming years.

Challenges remain. Although the restorations that have been launched follow accepted practice, it will be some time before the benefits of the management actions can be fairly judged. Short-term gains may be offset by unexpected future change, and initially slow change may accelerate. Demonstrating progress, or its lack, will require some level of monitoring and the details of exactly who will conduct this or how it will be financed have not been fully developed. Most likely the Protected Harvest certifying body will be responsible for periodic field checks of the natural lands to ensure proper management implementation and programme compliance.

Although at present we have confidence that the moral and ethical arguments for conservation practices may be sufficient to establish them as part of the certification package for the ecolabel, the question of direct benefits to agriculture needs to be addressed. This will require an evaluation of the ecological services other than natural biodiversity support. This is a difficult area, especially when the objective is stated as 'sustainability' (Pretty *et al.*, 2008). If the ecolabel becomes an economic success, funding may be available to study the details of how non-crop lands enhance the natural functions of pest predation, groundwater recharge, and erosion protection.

We are also aware of the need to address the 'greenwashing' issue. This will require transparency. The acceptance by consumers of organic labeling is evidence that an explicit natural community standard is not an absolute requirement for green branding. But if the claim for such a component of an ecolabel is to be made, it must be substantiated.

The participation of conservation NGOs has been a critical element in the process of standards development. The Healthy Grown ecolabel currently benefits from the active interest of at least three prominent conservation NGOs. In their view, the Healthy Grown initiative is an experiment in how conservation might be accomplished on agricultural lands. But NGOs like these pursue broad programs, and generally have more worthy potential projects than money or time to work on them. Currently the World Wildlife Fund–US participates on the Protected Harvest board. If this can be continued and perhaps broadened to include other conservation NGOs, it would provide the most direct way for them to oversee and to a degree guide the certification process. It would also provide a conduit for national

conservation standards to be coordinated with the international standards as discussed below.

It is clear that an ecolabel must be a partnership that includes many stakeholders interested in maintaining a healthy environment. Therefore it is important to recognize the wide range of programmes and initiatives that seek to enlist farmers in conservation efforts. In the United States there is a complex array of national and state programs and policies that either aim at minimizing negative environmental effects by legal or financial disincentives or, more commonly, provide incentives and technical assistance to farmers who are interested in enhancing the conservation potential of their lands. The 'Swampbuster' provisions of the 1985 Farm Bill that stipulated that farmers who drained wetlands would lose other subsidies is an example of the first type, and the Conservation Reserve Program that provided financial incentives for marginal farmlands to be retired and put into perennial cover (often restored prairie) is an example of the second (Gray & Teels, 2006). In Wisconsin, the Managed Forest Law is an example of a state program that requires adherence to forestry management protocols in return for reductions in taxes (Wisconsin Department of Natural Resources, 2008b). There are also farm programmes that are not specific to commodities that include conservation objectives, such as the Environmental Monitoring System guidelines developed under a USDA grant (Hakanson, 2005). It is not intended that the Healthy Grown certification process replace these programmes. This means that the market-based ecolabel conservation efforts must be coordinated with other programs that apply to non-crop lands. Since the details of the various schemes matter, we believe that this will require fine-tuning of the certification standards to each political jurisdiction.

We have stressed that the Healthy Grown ecolabel is market based and argued that this is a positive feature. But to achieve its potential the potatoes produced under it must sell in quantities and for prices that provide the funds necessary to feed back into both the in-field and non-crop practices. We believe that the roll-out of a credible and substantive natural community standard will help to establish the consumer recognition that will be necessary for this to occur. The inclusion of a strong conservation element has added significance to an ecolabel that is based on minimizing the inputs of artificial pesticides and fertilizers. Whatever a particular consumer believes about the relative quality and safety of conventional versus organic production, they are more likely to take a positive view of minimal-input conventional production that is known to be taking steps to preserve the biodiversity of their landscapes.

The degree of consumer acceptance of minimal input ecolabels is important to the spread of the market-driven ecolabel concept. Decreasing the impacts of agriculture will require a range of certified products from those that can be grown in organic systems to those that can achieve only reduced inputs. Conservationists want to see attention to the preservation of natural ecosystems across this entire range so that natural biodiversity is best positioned to survive the predicted bottleneck as human populations rise to the peak expected mid-century (Pimentel, 2006).

The increasing globalization of the agricultural economy makes international standards important. Yet if a range of ecolabels is desired and if our model is followed, which requires knowledge of local and regional ecosystems, there will be a proliferation of labels each specific to a product, a region and a particular cultivation technology. We recognize that the conservation measures of our ecolabel may not be exportable to all regions. For example, in tropical South America, agricultural intensification and the conversion of wildlands to croplands are primary threats, but elsewhere, such as parts of Europe, the abandonment of farmland and the cessation of traditional farming practices also threaten to decrease biodiversity (Henle *et al.*, 2008). Grazing has been reintroduced to high diversity chalk grasslands after it was observed that removing it resulted in losses in biodiversity (Hellstrom *et al.*, 2003). In the case of the central Wisconsin oak-pine savannahs there has been an analogous process of species loss, but in this case the 'disturbance' is the absence of fire. Clearly a system of standards must be developed that can provide a place for each ecolabel. This suggests that third party certifiers such as Protected Harvest must work with international partners to make certain that their procedures and practices are harmonized with those of groups such as the ISO.

As conservationists and university scientists, our experience with Healthy Grown has convinced us that market-based ecolabels that are based on demonstrably effective programs to reduce the impacts of conventional production should have a

place in the array of tools used to reduce the negative results of intensive agriculture. We also applaud the vision of the Healthy Grown growers who believe that there must be a strong commitment to the conservation of the natural lands within the boundaries of their farms. For this vision to be realized, government regulations and consumer attitudes will have to evolve, but it will be evolution towards a more flexible approach to agriculture and better prospects for the preservation of our biological heritage.

We have also considered what the result of this effort will be in the event that the hoped-for establishment of the ecolabel fails. Based on our own observations and on other research (e.g. Santelmann *et al.*, 2004), we believe that the farmers in general are well disposed to undertaking conservation practices and improving the quality of their non-crop lands. Ernst & Wallace (2008) have shown that non-economic factors are more important than profit-loss calculations to landowners. We believe that the projects undertaken by the group of farmers working with the Healthy Grown initiative will not be abandoned if the ecolabel does not deliver the hoped-for benefits. There is value in developing improved systems of conservation-oriented non-cropland management independent of ecolabels.

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