

RURAL DEVELOPMENT FORESTRY NETWORK

Developing Institutions for Community Forestry in Northern California

Cecilia Danks

Building Capacity for a Sustainable Non-Timber Forest Products Industry in the Trinity Bioregion: lessons drawn from international models

Yvonne Everett

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Building Capacity for a Sustainable Non-Timber Forest Products Industry in the Trinity Bioregion: lessons drawn from international models

Yvonne Everett

Background

As demand for alternative herbal medicines, foliage for floral displays ('floral greens') and forest mushrooms and berries grows in urban North America, Europe and Japan, the harvesting, processing and marketing of these non-timber forest products (NTFPs) is emerging as a booming industry with potential to diversify many timber-dependent rural economies in the Pacific Northwest (PNW).

If diversified economies tend to be more insulated from boom and bust cycles, there is potential for NTFP harvesting to lead to more economically stable forest communities. Furthermore, forest management for, and the harvest of, multiple forest species will require significant advances in institutionalised silvicultural knowledge. Both of these outcomes would be highly desirable. However, it is also possible that the development of the NTFP industry in the PNW may simply be the next stage (after the gold rush and logging) in the mining of resources and exploitation of communities. Current indicators of the latter trend in the PNW which replicate the experience of many less industrialised nations include the following:

- 1) Large proportions of NTFPs of PNW origin enter global markets as raw materials and not as value-added products that would keep a greater portion of profits at or near their forest origin (Schlosser and Blattner 1994).
- 2) Over a period of 50 years, the oldest branch of the NTFP industry in the PNW, the US\$ 100 million plus floral greens industry, has consolidated from a wide range of networked small producers and buyers into the hands of nine well-capitalised, urban-based companies that now control the trade (Freed 1994).

- 3) Boom and bust cycles haunt segments of the industry and are often internationally controlled. For example, the industrial-scale harvest of Pacific Yew (*Taxus brevifolia*) bark from public land for the phytomedicinal compound, taxol, came to the PNW in the early 1990s and then moved on to cheaper international sources within five years – at great cost to the US government and local industry, while multinational pharmaceutical companies profited (Nan Vance, pers. comm.). Now the mycorrhizal matsutake mushroom draws thousands of pickers, many following the seasonal mushroom trail from British Columbia to Northern California, to scour the forest (some literally with rakes) for the prize that brings up to US\$ 300/lb at its peak and averages over US\$ 70/lb (if the weather brings a good yield and the Japanese market cannot satisfy its demand from Korea).
- 4) Wasteful exploitation of ecologically sensitive and/or potentially high value products is common. Slow growing, ecosystem-sustaining mosses, loaded with potentially medicinal chemical compounds, are stripped from trees and shipped in bulk by the container load to nationwide chain stores as low cost craft materials (Schlosser and Blattner, 1994; Nan Vance, pers. comm.).
- 5) Exploitation of labour continues in the new industries. The victims are often recent immigrants from Central America or South East Asia who are unorganised, have little access to information about their rights in the United States, and who may be exploited by labour contractors, and by gangs from within their own communities.
- 6) Communication barriers and conflicts are emerging between harvesters of Anglo, Native American, Latino or South East Asian ethnicities, and between harvesters and law enforcement officers, especially regarding permitted harvesting on public lands (Beverly Brown pers. comm; Tom Hamilton, pers. comm.).
- 7) Native American tribes, already largely pushed out of their ancestral lands (which are now often under management as National Forests by the US government), are concerned that this next wave of exploitation will further desecrate their spiritual home and limit their access to, and ability to harvest, subsistence foods and materials needed to maintain their lifestyles and cultural integrity (Renee Stauffer, pers. comm.).

- 8) The government institutional capacity is ill equipped to address the emerging land management problem due to large gaps in information about NTFPs; budget cuts, agency ‘downsizing’; and constantly changing policy directions given by Congress just as the tremendous new task of implementing Ecosystem Management has been mandated.

The tide of NTFP exploitation that will further destabilise local economies and continue to destroy forest ecosystems is rising quickly in the PNW. Each of the factors listed above is worthy of more in depth discussion. However, this article focuses instead on an emerging counter-trend. There are voices emerging throughout the region that argue and demonstrate a different vision for the future, often based upon models of forest management and community forestry from around the world that are being adapted and tested locally.

The Trinity Bioregion

The Trinity Bioregion has a generally drier climate and somewhat less productive soil types (such as serpentine) than much of the rest of the PNW. This means that many of the well known NTFPs of the PNW floral greens and mushroom trade are less plentiful or of lower quality than elsewhere in the area. As a result, and perhaps to its long term advantage, the NTFP industry is in its infancy and may have time to develop a deliberate avoidance of some of the mistakes made elsewhere. Gatherers and young marketing cooperatives are seeking local products, especially medicinal herbs, for which the region’s environment provides a competitive advantage. In the remote mountains with their low human population density of less than four people per square mile, a culture of networking and interdependence has evolved in which relatively few people working together can make visible change occur comparatively quickly.

With the goal of developing economically and ecologically viable livelihoods, combining a mix of NTFP gathering and small scale farming, a diverse group of people in this region began working together in the late 1980s. They seek to develop or tap into some of the emerging markets with a combination of wildcrafted products (that is, products gathered from the forest) and cultivated (often organically certified) medicinal herbs and native plants. Over the last few years, participants in the process have grown to include two local NTFP cooperatives, USFS management staff, USFS Pacific Southwest and PNW

Research Station scientists, members of the Hupa tribe, and local non-governmental organisations – among them, the Watershed Research and Training Center, where the author is a researcher.

Building Capacity for a Sustainable NTFP Industry

NTFP harvesting as a basis for sustainable livelihoods will require the development of three interrelated capacities, which are discussed here for the case of the Trinity Bioregion:

- 1) Location-specific ecological knowledge about the forests and the NTFP species, the roles they play in the forest ecosystem (e.g. food for wildlife), their habitat requirements, sensitivity to harvest, and how to grow them *ex situ* or enhance their growth within forest ecosystems (a holistic silviculture).
- 2) Diversified and cooperative market linkages, monitoring and adjustment to market demand, certification systems and the production of value-added goods from locally gathered materials
- 3) Building cultural and institutional capacity for communication, learning, trust and stewardship among harvesters and forest management agency staff based on the linkage between ecological and economic management. This means developing ‘buy in’ (agreement and participation) by the majority of people involved with NTFPs to the goals of building and sustaining forest-based livelihoods, and avoiding short term over-exploitation.

The three capacities are interwoven in many ways, one of which is that time efficient and ecologically sensitive wildcrafting (NTFP gathering from the forest) produces comparatively small volumes of a range of products which change with the seasons. Given the distances and volumes involved, it has not been worthwhile for individual buyers to operate in the area, except for the brief Matsutake mushroom season at the northern end of the region. It is difficult for individual wildcrafters in remote locations to link into markets which demand comparatively large volumes of unvarying quality, unless they work together in some form of economic partnership, for example a marketing cooperative, in which products from a group of harvesters are sold to buyers. Encouraging wildcrafters to cooperate, given that they are often very independent in their ways and for good reason

jealously guard their gathering locations and practices, is a slow process with many stumbling blocks. One impetus for them to work together is to present a stronger voice to USFS managers whose decisions about National Forest management, ranging from NTFP permit policies to closures of access roads, are crucial to wildcrafters operating on public land. A more visible contact group can benefit land managers as well, by providing a channel for informing or sounding out wildcrafters on NTFP policies, and for ensuring wildcrafter contributions to the building of agency knowledge of local ecosystems and NTFPs.

Developing Location-specific Ecological Knowledge and Management Skills

Developing knowledge of NTFPs is a major challenge in the Trinity Bioregion for several reasons. Most of decades-worth of institutionally based, scientific research in silviculture has focused on maximising the growth of merchantable trees – in the PNW, a handful of conifers. Now research is needed on the physiology, biology and ecology of numerous new species, and it will take considerable time and funding to address some of the most basic questions. In the Trinity area, with funding from the Pacific Southwest Research Station of the USFS, a local NGO, the Watershed Research and Training Center, and Trinity Alps Botanicals, a cooperative, are taking steps to begin to understand the impacts of harvesting, using, for example, controlled regeneration trials. The WRTC is using existing USFS digital data and geographic information systems (GIS) to model the expected distribution of NTFP species in the region and begin to assess the variability in their populations. Yet, traditional biological/silvicultural science and new technological approaches alone are unlikely to be enough to fill the knowledge gaps before market demand leads to overharvesting.

A second source of information are people from the area with close ties to the forest. The majority of the people now living in the Trinity Bioregion are of recent (at most three generations) European descent. While some of the more knowledgeable residents have been loggers and tree planters or avidly hunt and fish, it is a rare individual who can name the plants they see around them when standing in the woods, much less describe their habits or rattle off a list of uses for them. For the most part, people buy food, medicine and household wares in stores.

However, a number of Native American tribes have lived in the region for many thousands of years. The forested mountains and rivers are their world. The Hupa, Karuk and Wintu people developed a high degree of sophistication in their management and use of plant materials for food, fibre, basketry and medicine. Yet, as in other parts of the United States, the history of often violent colonisation by European immigrants, forced relocation, and continuing discrimination, loss of identity and lack of or disregard for formal agreements and treaties protecting Native rights in the United States today, means that it has been difficult for the tribes to carry on their traditions. Much of the human evolutionary cultural heritage of the North American continent has been lost. The loss to humanity of this detailed and locally experienced understanding of the natural environment, its variability, and how cultures adapted to it and managed within it is immeasurable. Today, in efforts to better understand landscape and ecosystem scale processes of change, ethnobotanists, ecologists and archaeologists are painstakingly piecing together images of what past Californian landscapes must have looked like under Native management, particularly in view of their need for large quantities of currently rare basketry materials and plant-based food and medicinal products (Blackburn and Anderson, 1993). The importance of Native Americans' extensive use of fire, for example, is becoming increasingly apparent. This is in direct contradiction to the increasingly problematic fire suppressing land management practices of the dominant European culture for the last century.

A few tribes in California, such as the Hoopa, have retained a portion of their ancestral territory and are still intimately connected with it. The current Hoopa Tribal Natural Resources Division's land management practices are documented in forest plans available to the public. The Karuk provide increasingly well received input to the USFS and Bureau of Land Management (BLM) on forest management for portions of their ancestral territory now managed by the federal government. Both tribes take an active part in policy discussions regarding local and regional management issues. The Wintu tribal government is seeking recognition by the US government today, a status that would grant the now landless tribe some portion of its traditional territory. California tribes are working together in fora such as the California Indian Basketweavers Association to reinvigorate their cultures, and are finding new ways to pass down the skills and memories of the elders. In view of their history of interactions with the dominant European culture and especially due to concerns over further forest exploitation, only some Native Americans are willing to share their portions of their knowledge of forest ecosystems and plant gathering with non-Native Americans; many are not.

Intellectual property rights of individuals, communities and tribes are a complex issue of concern. Any sharing of NTFP-related information should be based on the United Nations Council for Environment and Development Convention on Biological Diversity (1992) and the principle of 'just exchange' in which suppliers of cultural knowledge receive a reciprocal flow of benefits (Kloppenburg and Balick, 1996). If these ethical concerns can be addressed to the satisfaction of local tribes, their experiential information and joint cooperative experimentation on such topics as when to harvest and how to harvest to maintain or enhance plant populations, could help local wildcrafters and management agencies considerably in their efforts to develop a more comprehensive silviculture which includes sustainable harvest practices for local NTFPs. In the Trinity Bioregion, individual members of the Hupa tribe and the Hoopa tribal nursery staff are participating in local NTFP fora and are providing guidance to local wildcrafters. Their contacts with local non-Indian grass roots organisations are bringing them computing and marketing skills as well as participation in the cooperatives.

Other, international sources of indigenous experience with NTFPs and long term management of forests have much to contribute. The primary lesson that comes from other nations long-settled by indigenous people is simply the knowledge that far greater ecological sophistication in forest management than currently practised is possible. Even though such systems of forest management are today under pressure from population growth, tenurial disputes, deforestation, conversion to monocultures or agricultural land use and industrialisation, there are existing models of ecologically sustainable, highly productive, indigenous forest and forest garden management systems in Asia (e.g. Mayer, 1996; Wickramasinghe, 1990) Latin America (e.g. Alcorn, 1984; Gomez-Pompa *et al*, 1987); and Africa (e.g. Fernandes *et al*, 1984). Many of these systems are already linked to global markets; others are in transition from subsistence to cash-oriented production.

Lessons to be Drawn from Intensive Land Management Elsewhere

The case of Sri Lanka

One example of drawing upon principles from such systems for initiating agroforestry/silvicultural work in the Trinity area stems from the author's experiences with research on forest gardens in Sri Lanka. Sri Lanka's forest gardens are ancient examples of small scale intensive silviculture/horticulture. Sri Lankan

farmers, most living in areas of high human population density (e.g. 235 per km²) manage multiple species of native and non-native trees, shrubs and herbs in these forest gardens. The gardens resemble natural forest in structure (for example, canopy closure of 70% or greater) and function, while emphasising species with subsistence or cash cropping value. Depending on the local microclimates, on an average acre (about 0.4 ha), farmers mix and manipulate 35-50 different tree species with additional shrubs and herbs in understory layers. Neighbouring gardens blend together in patches of forest-like vegetation. In the village-centred regions of the Sri Lankan highlands studied by the author (Everett, 1991; 1993), forest gardens represent 24% of the land use/vegetation cover. Many forest garden trees are natural forest species finding a last refuge in an otherwise densely settled and deforested landscape. Many wildlife species also live in the gardens. Farmers understand the habitat and growth requirements of species, which trees are compatible with one another and which are not, and adjust plant placement according to their ecological understanding and harvest needs. To name one example, a jackfruit tree (*Artocarpus heterophyllus*) will be planted (or as is often the case, if self-seeded, then left to grow) in an opening if it is to provide fruit, or in shade if it is to grow tall for timber. Many species have multiple purposes. Beside timber and fruit, for example, the jack leaves provide fodder for goats and medicine to treat diabetes. The jack tree also provides shade for coffee, cardamom, ginger and other shade loving understory species. The gardens provide most of the fuelwood, still the dominant source of cooking fuel in rural areas, and more than half of the nation's saw logs. Cash crops are important. Sri Lankan cinnamon, a centuries old trade item, is drawn almost exclusively from small holder forest gardens. Farmer knowledge extends into biological controls for pests and diseases, and most forest gardens remain free of chemical fertiliser or biocide applications. Once a garden is established (many are centuries old), monitoring is frequent but physical labour inputs, other than harvesting, are minimal.

Forest gardens suggest an approach to management based on ecosystems and vegetation community, which takes into account multi-functional, as well as economic, values of species in the system, based on a sophisticated understanding of their ecological interactions. They are an applied example of the theory of Ecosystem Management which forest managers in the PNW of the US seek to implement. Principles drawn from the Sri Lanka gardens and from examples in other parts of the tropics that can extend into the temperate zone include the following:

- ! the importance and possibility of maintaining biodiversity and ecosystem structures analogous to natural systems (e.g. Senanayake, 1987);
- ! successional change over time can be built into management (e.g. Denevan *et al.* 1984);
- ! every species has an ecological role to play, and most plant species will have utility for people (e.g. Posey, 1984); and finally,
- ! even in a cash economy, knowledge of intensive management of a diversified system can replace energy and labour-intensive efforts to simplify ecosystems and limit production to one or two crops, if cooperative social structures for marketing diverse products can be developed.

In the Trinity area, efforts to apply these principles of what Senanayake calls ‘analog forestry’ (1987), as well as techniques applied by Native Americans in the area, are just beginning with experimental trials on private land. Based on WRTC research, a typical 100 acre (about 40 hectare) parcel of land in the area will have 10-20 known NTFP species with market value. The objectives of agroforestry/silvicultural manipulations are to enhance the growth of existing trees, shrubs and herbs of economic interest, and reduce exotic weedy species in order to develop an economically more productive analogue of the natural forest system. Researchers will work with existing forest, woodland and meadow ecosystem structure and species, and experiment with fire, limited irrigation, selective felling, thinning, pruning, interplanting and the like. Care will be taken to maintain all native species in the system and to preserve key elements such as snags for wildlife habitat.

Buffer zone management

For public lands, buffer zone management, another concept drawn from international sources, might be a useful approach in the Trinity area. With its extensive landbase and low population density, people are already limited in commercial gathering opportunities by road access. If they have to walk too far from vehicles to carry loads of NTFPs, the cost of harvesting soon becomes prohibitive. Thus, intensification of forest ecosystem management to include NTFPs along existing access routes would allow for prioritisation and the concentration of efforts in more easily managed locations, while relieving pressure beyond the road buffer area.

Developing Institutional and Economic Structures for Sustainable NTFP Harvest

The development of the socio-cultural, economic and institutional capacity to manage and market a range of products from small producers is a second challenge for the residents of the Trinity Bioregion. Issues that need to be addressed include the following:

1) Finding markets

The demand for herbal products in the United States is booming, with sales of medicinal herb products up by over 20% in the natural health food store, health food chain and mass markets in 1995 (Mater, 1996). The Pacific region, including California, Oregon, Washington and Alaska, had 34% of the natural health food store market in 1995, with sales of over US\$ 2.08 billion (Mater, 1996). All economic indicators suggest that markets are expanding and diversifying. Though located in a remote area, Trinity entrepreneurs are literate, have access to and are using state-of-the-art communications equipment, telephones, fax machines and the Internet to tap into these markets with growing success.

2) Cooperative marketing

Economically viable wildcrafting and silvicultural management for NTFPs in biologically diverse ecosystems on public or private land requires innovative harvest and marketing strategies. When products are harvested from biodiverse ecosystems, there will be more products gathered and less volume of each product per unit area. In order for a wildcrafter to market small amounts of several products, s/he will need to cooperate with other wildcrafters or private forest managers to fill the typical orders of wholesale or retail marketers. All will have to work together to become reliable suppliers and meet the quality control standards of the NTFP marketing industry. Over the past five years two marketing cooperatives have emerged at two geographical ends of the region; and two other centres of activity, one with the Hoopa tribe and one in the town of Hayfork, are growing.

3) Workforce development

Trinity residents are finding that the marketing structures influence who participates in the NTFP industry, with important implications for long term sustainability (Lynn Jungwirth, pers. comm.). The marketing cooperatives pay their harvesters 30- 60 days after delivery, when they in turn receive payment from larger herb

buyers. The long wait for a return on labour expended, fuel for cars and other costs reduces local worker interest in participation in commercial NTFP harvesting, and leads to self-selection of people who either have no other options, who can afford to wait, or who really enjoy this type of work and are ready to help build the industry locally. The cooperatives are concerned about the long term viability of the ecosystems and the industry and are beginning to instruct their harvesters in sustainable harvest methods. Most of their products come from private forest lands. In the Hayfork case, with the recent mill closure and high unemployment (Danks, joint paper), the WRTC received an order through a local buyer for a product, and put up the capital for two local entrepreneurs to organise a drying and packaging process and to pay NTFP gatherers on a weekly basis for their product. Word of an economic opportunity spread quickly and numerous gatherers, after applying for and receiving permits from the local Forest Service Ranger District, rapidly harvested the species of interest on National Forest lands until the standing order of a few thousand pounds was filled. In this case, the species was mullein (*Verbascum thapsus*), a weedy, very abundant naturalised exotic, not likely to be severely affected by the volumes harvested. Numerous lessons are being drawn from the experience:

- a) There is interest among workers in the area to participate in NTFP gathering if it can pay reliably.
- b) Workers need training and access to information on plant identification, basic ecology, sustainable harvest methods and ethics if NTFP harvesting is to be a long term economically and ecologically viable industry. In a joint effort, Trinity area cooperatives, the Watershed Research and Training Center and the USFS Pacific Southwest Research Station will provide training for wildcrafters beginning in Spring, 1997. In addition, an informational pamphlet focusing on local NTFPs of relatively low sensitivity to harvest (exotics and abundant natives from which plant parts but not the whole plant are taken), including information on how and how much to harvest to avoid over-harvesting, is in its final production stages. The pamphlet, to be published by the Pacific Southwest Research Station, is a joint effort of the parties above to which all have contributed local knowledge and experience. It will be distributed free of charge to wildcrafters seeking permits for harvest from local National Forests. Development of colour photographs of these species for display at the Ranger Districts, and of informational videos

demonstrating sustainable harvest techniques, are projects proposed by local wildcrafters for the coming year.

- c) Buyers have significant leverage. By determining what quality product they will buy and from whom they will buy, buyers can influence sustainable harvesting. Local buyers buy only from wildcrafters who can demonstrate permission from the landowner or a USFS permit for gathering; they are increasingly providing training or requesting evidence of training in harvest methods.

4) Value-added processing

Another realm of developing the industry is product diversification and value-added processing, through which a greater share of the end value of resource use stays close to the initial source of the resource. Local investigations are currently taking place into alternative wood products for small diameter log processing and product development, e.g. for the construction and furniture industry. Some herbalists from the area market salves, tinctures and herbal teas. There is much potential for the sharing of ideas and further diversification here, and the cooperatives are taking the lead in this effort.

5) Certification

An important aspect of market development for sustainable NTFP harvesting is certification through a third party organisation that monitors management and harvest practices according to their ecological and social sustainability. Certified products command higher prices in the market place and greater returns to harvesters. Certification models are already developed for agriculture (e.g. IFOAM internationally, and locally, e.g. the California Certified Organic Farmers) and for timber harvesting (e.g. Forest Stewardship Council internationally, and locally e.g. the Institute for Sustainable Forestry). However, while efforts are underway to certify certain NTFPs from forest gardens or forests in the tropics, no more comprehensive model for NTFP certification has yet been developed. Trinity area NTFP collaborators are beginning to address these issues.

6) Stewardship

Part of the difficulty in developing ecologically responsible wildcrafters is the current impossibility of ensuring on public land that if one wildcrafter harvests carefully, leaving a plentiful supply for further regeneration, that the next

wildcrafter will not find the patch and simply take everything in sight. In the future, it will be important to have some form of longer term preferential access right, perhaps a stewardship contract, based on NTFP harvesting qualifications, past performance and the like, which is allocated by the land management agency. One form of stewardship contract, for example, might make the contractor responsible for a range of management and maintenance activities in return for the right to harvest NTFPs, while leaving specified quantities of NTFPs behind.

Building Cultural and Institutional Capacity for Communication

All of the capacity development discussed above depends on the development of strong, trusting communication and information sharing among members of cooperatives; between cooperatives; among local buyers and with local land managers, especially the US Forest Service. Already, the fundamental rule of social forestry often reported from other parts of the world is being learned in forests only 50 to 100 miles (80 to 160 km) further north in the Matsutake mushroom belt. Police forces alone cannot keep people out of the woods or control harvesting when market demand is high enough. The harvesters and buyers themselves must have a vested interest in returning the following year.

Interaction between wildcrafters and National Forest managers varies by Ranger District. In many National Forests NTFPs are hardly a priority issue and few resources are allocated to their management. The situation can change dramatically when demand for an NTFP becomes a problem, as has been the case with commercial mushroom harvesting in Oregon and Washington states. In one case in the Trinity area on the Six Rivers National Forest, the District has allocated a half-time position to NTFPs, and communications between the agency and the wildcrafters are excellent. Wildcrafters are aware of permitting policies and are heard when they complain that the process is too complex or the price too high. The District warns wildcrafters when timber harvests are planned and allows them to pre-harvest in areas that will be affected or to post harvest valuable species such as *Usnea* spp. (lichens) from trees that have been felled and will be taken to the saw mills anyway. In other cases in the Trinity area, wildcrafters may have to wait a week or two to get a permit and must pay for separate permits for each species and for each month of harvesting.

The Pacific Southwest Research Station and the WRTC have collaborated to increase communications through a series of meetings and workshops with wildcrafters, buyers and agency staff. As a result of the networking efforts, participants in these workshops have cooperated in developing the educational materials and training plans described above, and have decided to organise formally in 1997. As the NTFP industry grows in the Trinity area, continuing efforts by people in the NTFP industry to communicate with one another and with the public land management agencies will be vital for moving towards an NTFP industry based upon a sound ecological, economic and social foundation.

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Acronyms

BLM	Bureau of Land Management
GIS	Geographic Information Systems
IFOAM	International Federation of Organic Agriculture Movements
NGO	Non-Governmental Organisation
NTFPs	Non-Timber Forest Products
PNW	Pacific Northwest
PSW	Pacific Southwest
US	United States (of America)
USDA	United States Department of Agriculture
USFS	United States Forest Service
WRTC	Watershed Research and Training Center

Note

When the Hoopa Tribe is named officially, it is spelled as such. When the ethnicity of one individual is concerned, the spelling is Hupa.

Please send comments on this paper to:

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