Community-Based Ecosystem Restoration
Workforce Development

A Discussion of National Policy Issues

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I. INTRODUCTION

Decades after the passage of the Endangered Species Act and the National Environmental Protection Act, American society continues to search for more sustainable strategies for natural resource based economic development. Jobs are considered one of the most important indicators of economic progress, in particular because they have the most direct impact on families and communities. Employment is frequently placed at odds with environmental protection in political discourse, and continues to be one of the most powerful arguments used to limit the reach of environmental laws. Research has demonstrated that even in the best-known cases that pit employment and the environment against one another are generally simplistic reductions of a much more complex story of economic decline involving resource depletion, technology change, and fluctuations in markets and prices. (Sample and LeMaster, 1992).

Also compelling, is a body of thought that environmental protection and restoration may promote economic growth and expand employment opportunities. During the 1990's in the Pacific Northwest, in order to find new opportunities for loggers and mill workers displaced by the decline in timber output on federal lands, government and communities looked toward ecosystem restoration on public lands that faced a backlog of restorative maintenance. Could restoration of fire-adapted forests, streams, and watersheds replace timber as a steady source of income for workers who were used to being outside and already had many of relevant skills that they could apply in new ways? The answer has turned out to be quite complex, requiring a look at issues of land management policy, contracting systems, training strategies, and the capacity of communities to adapt to changes. The lessons learned define important strategies for communities looking to develop workforce opportunities in ecosystem restoration. Workforce development also provides a distinct lens for examining federal government policy in public land management and community development assistance. Through this lens, restoration as an industry can be analyzed in terms of its potential to raise the standard of living of workers and to promote sustainable economic development. It is clear that for this potential to be achieved, there are important roles for government, businesses, non-profits, and workers to play in finding funding for restoration opportunities, setting improved standards for wages and working conditions, and supporting policies that support workers engaged in remediating environmental problems.

Throughout the United States, ecosystem restoration is becoming an important part of land management goals with large economic importance. Whereas restoration used to be primarily concerned with replacing resources following their depletion for commercial purposes, it has grown to encompass multiple goals and objectives. Restoration is now widely recognized to be fundamental to strategies to reduce wildfire risk, protect fisheries, enhance recreation potential, and improve air and water quality. In many communities, these the rise in importance of these new restoration foci has coincided with a decline in economic importance of traditional extractive industries. While the
potential opportunities in this field are significant, there are key questions about how the industry will look in the future, how the workforce will be structured, and what the demand for restoration services will be. An examination of these issues will provide valuable information and ideas for forest dependent communities throughout the country that are struggling to adapt to immense changes in their economic outlooks.
II. LESSONS FROM THE NORTHWEST FOREST PLAN

Discussions of the challenges and potential for workforce development in ecosystem restoration often begin with the Pacific Northwest region of the United States. It was in this part of the country where jobs and the environment first became politicized as one response to a dramatic decline in a timber-heavy economy. In the early 1990’s, the timber industry in the Northwest was facing declining timber prices and a backlash from environmentalists concerned with protecting remaining stands of old-growth forest in the region. In 1991, a Federal District court injunction on the harvesting of old-growth timber in 17 national forests throughout the region, capped a heated political standoff that had enveloped the region and had been captured by the national media as conflict between Pacific Northwest timber workers and endangered spotted owls. The Clinton administration tried to calm the dispute with its Northwest Forest Plan, which was intended to protect spotted owl and other endangered species habitat through ecosystem management, provide federal aid to the declining, timber-dominated economies of the region, and demonstrate, through training and restoration projects, that environmental protection and jobs were not mutually exclusive goals.

The Northwest Economic Adjustment Initiative (NEAI) was an economic aid package that accompanied the Northwest Forest Plan settlement. The settlement effectively placed most of the remaining old growth timber in the region off limits to harvest, threatening to change the economic base of the region. Prior to the settlement, a steady decline of large timber in the Northwest had already led to significant changes in natural resource extraction and had placed greater economic importance on forest restoration and utilization of smaller diameter species. The NEAI provided resources, coordination, and direction for federal, state, and local governments to assist communities in the Pacific Northwest make the transition away from an economy dependent on timber harvesting and processing.

Jobs in the Woods

One of the programmatic tools of the NEAI intended to help displaced timber workers was a set of programs collectively referred to as Jobs in the Woods. The purpose of these programs was to provide job training and placement in forest and ecosystem restoration that would create employment opportunities for workers already accustomed to working outdoors. Additionally, Jobs in the Woods attempted to forge a connection between workforce development and the increase in funding authorized under the Northwest Forest Plan for restoration on public lands managed by the Forest Service and the Department of the Interior’s Bureau of Land Management (BLM), Fish and Wildlife Service (FWS), and Bureau of Indian Affairs (BIA). The goal of the program was to train high-skill, high-wage ecosystem management workers who were employed doing a variety of work that was watershed-based, multi-task oriented, and multi-season.
A combination of additional restoration contracts and demonstration training programs, Jobs in the Woods began with modest goals. In 1994, during the first year of the program, the federal government spent $27 million on 600 restoration contracts in Washington, Oregon, and California (Tarnow, 1995). The following year saw a slight increase in ($27.8 million for 602 contracts) (USDA/DOI 1996). During that year, the program created more than 2,200 jobs, of which at least 1,000 were directed toward displaced workers. These jobs were estimated to have represented a combined 59,000 person days of work, with the average duration of a project lasting 26.7 days. Through the demonstration programs, training was provided to 74 workers in Oregon, 35 workers in California, and 77 displaced forest products workers and fishers in the Washington during 1995. In Washington, the federal program provided additional support to the state’s already existing Jobs for the Environment program, which brought in additional resources for training and contracts. The demonstration projects were implemented by partner organizations, most of them non-profit organizations, which typically combined federal funding with other grants to provide displaced workers with a combination of restoration training and contract work.

Training provided in the Jobs in the Woods programs was developed by non-profits and academic institutions, such as community colleges, in cooperation with state and federal agencies. The pilot programs developed curriculum for workers to learn a diverse set of topics including watershed processes and ecology, safety and technical knowledge, and business development and management (Labor Education and Research Center, 1998). Most of these training programs followed an apprenticeship model that combined classroom instruction with paid hands-on work outside, often on service contracts on public lands. One curriculum, which catered to recent immigrants in the forest industry, was offered in Spanish.

In addition to the workforce training provided under the demonstration projects, agencies changed their contracting procedures in order to prove more work opportunities for displaced timber workers. Agencies kept bidding lists of local contractors and their skills, and a waiver was put on advertising federal contracts, in order for the local contractors to capture more business. There was more use of the best value contracting provision to allow agencies greater discretion in awarding to contractors that were providing additional training and employment to displaced workers. Through the influx of funds for restoration under the Northwest Forest Plan, significant additional opportunities for employment were possible. Many of the contracts were targeted specifically at displaced forest products industry workers. Multi-agency partnerships allowed for the development of creative contracts that covered multiple jurisdictions and combined different tasks to extend the duration of work and take advantage of the versatility of skills that trainees were learning.
Lessons and Recommendations from Jobs in the Woods

The demonstration workforce projects carried out in the 1990’s taught communities and agencies important lessons about building capacity in a changing industry. The approach of target contracting and employment development was an effective approach, but there were still significant hurdles to overcome. First, despite additional appropriations, Jobs in the Woods contracts represented only a third of the total contracting dollars for agencies in the region and they were still insufficient to meet great demand for restoration projects on and off of federal lands. Those projects that received funding in the early years of the program tended to be projects that the agencies had previously developed but had lacked the resources to implement. These additional restoration funds and the waiver on contract advertising were also tied to annual Congressional appropriations, which were subject to shifts in the political will and priorities of Washington, DC.

Despite the additional funds that were appropriated for restoration activities, there were few additional resources available to cover the increased administrative costs of preparing complex ecological restoration projects. Agency contracting specialists were overwhelmed with the Jobs in the Woods projects being added to their already long list of ongoing projects. In addition to their existing workload, they were suddenly given the responsibilities of identifying local contractors, assessing their skills, and involving them in the contract development process. These additional responsibilities were critical to making the program work, but the agencies did not start out with enough capacity to approach procurement in a new way. As a result, funding limitations dictated which projects agencies were ultimately able to implement, and they were not always the projects that demonstrated the greatest ecological or workforce benefits (DOI/USDA, 1996).

The concept of Jobs in the Woods raised expectations about the extent to which restoration would lead to job creation for dislocated workers. Unfortunately the actually number of jobs created fell short of these expectations. The contracting portion of the program was based upon an assumption that local contractors would hire local, displaced workers, but empirically, this was not necessarily the case. In fact, there was no formal mechanism to link dislocated timber workers with firms bidding on restoration contracts. In the most successful examples, a third party organization served as a go-between to connect workers with contracting firms that had won contracts and were willing to hire these local employees. There was also no mechanism to guarantee that dislocated workers would be paid the high wages originally envisioned by the programs and few additional incentives for contractors to train workers. Meanwhile the organizations and community colleges that had received federal funds to carry out pilot training and job placement programs found themselves up against burdensome requirements of eligibility and performance evaluation. Program eligibility was narrowly defined and many unemployed candidates were turned away because they did not fit the target group.
Many of those who did receive training found themselves emerging into a relatively undeveloped industry where the demand for their skills was not firmly established. Work tended to be inconsistent and short-lived. They discovered that the restoration industry required a different set of business, planning, and bidding skills than those needed in the timber harvest industry. There was also a disconnect between the kinds of skills that the workers were learning and the types of contracts being developed on Federal Lands. Training tended to be geared toward the most pressing restoration needs of the region, but the administrative and financial limitations of land management agencies put priorities on tasks that were not always the most important. Linkages between the Jobs in the Woods employment development and the restoration agenda of the Northwest Forest Plan were not institutionalized within the agencies and thus non-profit organizations found themselves increasingly responsible for creating this connection. Local interagency teams were provided a forum where the public could participate in identifying restoration priorities, but these teams generally were not able to offer effective input into the decisions made by the agencies. Problems included limits on their roles under the Federal Advisory Committee Act, as well as a certain degree of unwillingness on the part of some agency staff to deter from internally decided priorities. Finally, there was no monitoring strategy in place at the beginning of the program, so it was difficult to measure the impacts that the program had on employment development.

A variety of reports have been written on Jobs in the Woods by government and non-governmental sources. One of the most revealing of them was produced in 1995 after only the first year of the program by Tarnow and published by the Pacific Rivers Council, Inc. In Tarnow’s *Analysis and Recommendations for the Federal Land Jobs in the Woods Program*, the following recommendations are given for the employment aspects of the program:

1. Continue and expand contractor assistance programs to empower local contractors to effectively compete for agency contracts, and to ensure contractors are committed to both high quality work and family-wage job paths.

2. Secure agency cooperation to move workforce development demonstration projects out into the private market place, and to remove barriers to innovative partnerships.

3. Reform project design and packaging to ensure the development of a larger multi-objective, multi-year contracting program.

4. Monitor and evaluate employment impacts of the Jobs in the Woods program.

5. Develop a mechanism for assessing ecological and socioeconomic values of restoration projects, and a means for making decisions that balance these values across a basin.

6. Improve developing contractor access to bonding through programs like the Small Business Administration’s “Surety Bond Guarantee Program.”

7. Provide business development support to expand contractors’ business capacity for doing aquatic ecosystem management and restoration work.

8. Provide and coordinate wage and hour enforcement for compliance with the goal of “high wages for high quality work.”
The University of Oregon’s Ecosystem Workforce Program, which provides research, policy direction, and technical assistance for ecosystem workforce development, ran one of the first Jobs in the Woods demonstration projects and continues to help communities develop ecosystem management capacity. The Program’s 1998 report, Improving Jobs, Community, and the Environment: Lessons from the Ecosystem Workforce Project, concludes that there continues to be a large need for watershed restoration on both public and private lands, but that the industry is still lacking development and the demand for labor lags behind the supply. The report finds that the majority of graduates of Jobs in the Woods training programs eventually leave the industry because there are no immediate opportunities available to them. It also suggests some lessons for future workforce development, which include a certification scheme for the ecosystem management industry and a focus on community-based strategies in which restoration is carried out by local restoration partnerships with an awareness of workforce issues through a process that is driven by watershed councils. The report finds that Jobs in the Woods has required some cultural changes on the part of communities and land management agencies. Community organizations have learned much from the program, as have agencies, for which the most important lessons have been about finding new ways of doing business under existing regulations. Of great importance has been the institutionalization of interagency collaboration through partnership agreements.

Broader Lessons From the NEAI

The Forest Service’s Pacific Northwest Research Station’s 1999 report on the NEAI, Northwest Forest Plan: Outcomes and Lessons Learned From the Northwest Economic Adjustment Initiative concluded that communities in the Northwest responded to unemployment in diverse ways. In the process of assessing economic opportunity and diversifying their economies communities chose different pathways for recovery. While some jobs were created in the ecological restoration industry, many other displaced workers found employment in healthcare, manufacturing, and other non-resource industries. Those who did receive training in ecosystem management improved their skills and found longer jobs with higher wages; but there were not very many of those jobs. This was in part because investment in the restoration industry did not match investment in the workforce. While training programs were busy training ecosystem workers, the economic restructuring funding of the NEAI went to support different types of infrastructure, ranging from bottling plants to boat marinas. There was little coordination between the workforce retraining programs and the funding for economic development. Land management agencies thus bore much of the responsibility for supporting ecosystem workforce development, but they did so while other agencies concerned with economic development focused on different goals.
These findings were reinforced in a comprehensive report on the social impacts of the NEAI produced by the non-profit organization, Forest Community Research (FCR). According to this report, communities in this region have adjusted in very different ways to the decline of large timber production and that some changes are very hard to measure, especially over the short time that has passed since the decline. The report focuses on community capacity as a measure of success and highlights a variety of kinds of capacity — social, economic, human, and institutional — that are all crucial components of community development (Forest Community Research, 2002).

In their review of the economic development programs that were introduced to the region, the FCR researchers found that demand for retraining and employment programs surpassed the government’s predictions. The need for employment services was estimated based upon the closure of large mills, but did not factor in the eventual closure of numerous small mills. Therefore, resources for retraining programs were scarce in comparison to demand and the NEAI was unable to serve many of those who needed assistance.

In rural communities, the report suggests, the assistance programs relied too much on markets to produce jobs that never formed. Although funding was directed into ecological restoration under the Northwest Forest Plan, this funding was administered separately from the NEAI and there was inadequate coordination between the two related programs. There was also a need for greater partnerships among lending institutions and business support services to provide loans to community businesses.

Looking beyond the impacts of the program on employment, the study examined community’s capacity or ability to recover from shock or instability. Those communities that exhibited a high capacity to recover from the timber decline had a combination of physical and financial resources as well as the collaborative infrastructure to work together. The communities that benefited most from the economic development programs of the NEAI were those that already had developed strategic community plans for diversification and were thus able to quickly advance to the processes of prioritizing and designing projects. In communities where there were deeply seeded social or cultural divisions, infrastructure projects tended to be less successful. Findings from nearly all evaluations of the NEAI indicated that community economic recovery depended on local participation in program design and implementation and good coordination between the supporting agencies involved.
III. FOREST SERVICE POLICIES THAT INFLUENCE DEMAND FOR ECOSYSTEM RESTORATION WORK

While Jobs in the Woods concentrated attention and resources on the need for increased training and opportunities for workers in ecosystem restoration, there are a number of federal policies that have fueled demand for the restoration industry. While some policies are older and more closely tied to the Forest Service’s former timber management focus, others have emerged under the paradigm of ecosystem management and take a collaborative or partnership approach to restoration, focusing on the ecological, social, and economic benefits of this work.

Federal land management policies are relevant in anticipating the potential scope of ecosystem restoration work because they drive much of the current restoration demand. Those policies that have been historically tied to post harvest restoration have tended to focus on tree planting and thinning. More recently, while the legacy of timber harvesting still necessitates a large amount of forest restoration, a number of additional factors are also driving ecosystem restoration policy. These include catastrophic wildfire, invasive species, degraded streams and fisheries, endangered species habitat depletion, and mining contamination. This large scope of environmental management issues would appear to provide a nearly endless range of opportunities for the ecosystem restoration industry, but the quantity of projects has typically lagged behind potential demand due to a lack of resources, scientific knowledge, and political will. The following sections touch on some of ways in which federal policy has shaped the demand for ecosystem restoration and is changing way in which the work is being carried out.

Early Forest Restoration: Reforestation and Brush Disposal Trust Funds

Throughout the Forest Service’s history, a series of accounts have been established to ensure that there is sufficient money to pay for management activities not directly tied to the timber program. These funds are maintained by the Forest Service, and are used primarily for restoration or stewardship on lands that have been harvested. In 1916, Congress passed an act requiring that purchasers of federal timber pay a brush disposal fee that would be used to treat the leftover brush or slash left in the woods after logging. These funds are placed in a separate account, for the Forest Service to use for this purpose, independent of appropriations. Funds paid to the brush disposal fund are estimated for each sale, and the Forest Service can decide if the buyer can perform required services or simply pay into the account, which is kept on the sale District.

Similarly, the Knutson-Vandenberg Act of 1930 created a special account, supplied through the deposit of revenues from timber sales, to be used for the site preparation, replanting, fertilization, precommercial thinning, and other improvements of timber sale
areas. These funds are applied to within the boundaries of the timber sale, must be spent within 5 years or returned to treasury, and can be used for multiple year contracts.

Although the administration of both of these funds has faced controversy over time, they represent the first efforts to fund forest restoration activities, following the harvest of timber on federal lands. They directly gave rise to contractors that specialize in tree planting and slash piling, and which rely on a steady supply of contracts in the aftermath of the federal timber sale program. However, the linkage of funding for this type of restoration to the agency’s declining timber sale program, that industry has also experienced a decline.

**Stewardship Contracting**

With restoration needs on public lands exceeding the limits of these restoration funds both geographically and economically, a variety of policies have arisen that demonstrate a priority among federal agencies and lawmakers to find mechanisms to fund a backlog of ecosystem management activities. Stewardship contracting has shown promise as one tool that may enable the Forest Service to more easily procure and pay for restoration services. The term actually refers to a host of different contracting tools, some of which are already established within the agency’s authority and others currently being tested throughout the country on a pilot basis, that were authorized by Congress in 1999 and later expanded in 2001. Under this authorization, the Forest Service using and testing the efficiency of several contracting tools, which include the exchange of goods for services; the retention of receipts; the designation of timber for cutting by prescription or description; the awarding of contracts on a “best value” basis; and multi-year contracts. These tools have been selected for testing because they are believed to offer some potential to help National Forests improve their ability to fund and administrate otherwise neglected stewardship activities. Many of the pilot projects have a restoration component including work with roads, aquatic habitat, and terrestrial habitat, and a large proportion focused on reducing hazardous fuels for fire prevention.

From a workforce development perspective, stewardship contracts hold considerable promise for businesses and workers with the experience to accomplish several ecological restoration goals during a single entry into the forest. The combination of timber extraction and ecosystem restoration service activities contained in some stewardship contracts requires business to cross traditional sectoral barriers of harvester and restoration worker. Successful contractors need to know how to evaluate the costs and benefits of combined activities, develop a competitive bid, and assemble and manage crews that are able to carry out multiple activities.

Stewardship contracting has attained considerable recent political attention with expanded authorities for the Forest Service and BLM provided under the FY2003 federal
budget appropriations. Much of their political popularity stems from a hope that they will provide the agencies with a way to advance more rapidly with a program of hazardous fuels reduction and to pay for this by allowing contractors to extract small diameter material. Further monitoring is needed to better evaluate the impact that stewardship contracts have on workforce development and to measure whether or not these kinds of contracts are leading to longer-term and higher paid employment.

**Wyden Amendment**

As federal land management agencies have found mechanisms for funding restoration activities on their lands, an increasing interest in taking a landscape or watershed approach to ecosystem management has led the government to look for more flexible ways to deploy its resources throughout ecosystems and to partner with neighbors and communities in doing so. Since 1999, the Wyden Amendment (P.L. 105-277) has provided agencies with new authorities to enhance opportunities for cooperative agreements between federal agencies, tribal, state and local governments, private and non-profit entities and landowners for watershed restoration. These agreements can be established for the purpose of collaborating on biological, social, or economic needs or interests within the ecosystem, making them useful for forming partnerships around the issue of restoration workforce development. A further benefit is that these agreements can be used to carry out work on public and private lands.

Because the Wyden Amendment does not carry with it any additional funding for land management agencies, the resources to carry out collaborative projects under the amendment must come from existing funds, which may have their own limits on how they can be applied. The real utility of the Wyden Amendment, however, is that it empowers agencies to find new and creative ways to work with local governments and non-profits to merge the dual needs of workforce development and restoration throughout a watershed. It can also be a mechanism for leveraging private and state funds to complement federal dollars in increasing the amount of restoration work that can be carried out in a given watershed. Conceivably, the Wyden Amendment could be used as authorization for a land management agency to enter into a cooperative agreement with a watershed council for the purposes of training workers to carry out a range of high-priority restoration projects throughout a watershed. The agency would have to show that the agreement would provide a benefit to the public in terms of employment and ecosystem health.

**The National Fire Plan**

In 2000, in response to a catastrophic wildfire season, the USDA and USDOI issued its report, “Managing the Impact of Wildfire on the Communities and the Environment,
which became the basis for the interagency, ten year National Fire Plan. In addition to its focus on fire suppression and readiness, the National Fire Plan has delivered an important source of funding to forest restoration, particularly to forest thinning and hazardous fuels reduction. Hazardous fuels reduction is a catchall phrase referring to a variety of strategies employed to reduce the density of closely stocked stands of trees that have been associated by land managers with catastrophic wildfires that are costly and dangerous to suppress. Since 2000, hundreds of millions of dollars have been appropriated each year for hazardous fuels reduction, representing an important source of funding for employment in this particular type of ecosystem restoration. Much of this budget is distributed through state forestry agencies, which fund hazardous fuels reduction on public and private lands in the wildland-urban interface through grant and cost-share programs. Depending on conditions, some fuels reduction can be done by machine, while in other places it is a very labor-intensive activity, performed with chainsaws by laborers. In some cases, prescribed burns are also used to reduce fuel loads. There are isolated examples of contractors applying prescribed burning techniques, but this work is typically carried out by agency staff owing to the liability, limited temporal windows, and high level of experience needed.

Though much smaller than the funds available for fuels reduction, a portion of National Fire Plan funds have been reserved each year for rehabilitation and restoration of burned areas following catastrophic fire, (an appropriation that has been cut from the Forest Service’s budget request for FY2004). This work includes activities such as tree planting, erosion control, and stream bank stabilization, all of which are frequently contracted out to the private sector. It is estimated that following the fires of the summer of 2002, more than 7.1 million acres of burned area (NIFC, 2002), much of that potentially in need of some type of rehabilitation. There are enormous workforce development opportunities associated with this task, but the work is costly and will not proceed at a significant pace without targeted funding or the will of land managers to make it a priority.

The ecosystem restoration focus of the National Fire Plan has clearly been focused on hazardous fuels reduction, particularly near settled areas. The federal land management agencies estimate that at least 70 million acres of forest need treatment to reduce hazardous fuels reduction. In 2002, over 2 million acres, most of them in western states, were treated, primarily by mechanical thinning. Hazardous fuels reduction is also being carried out on state and private forestlands, made possible through grants from the National Fire Plan. Many fuels reduction projects are targeted to the Wildland-Urban Interface, areas where human development comes in close contact with forested ecosystems.

Throughout the western states, innovative workforce training programs have been emerging to meet the fuels reduction demand of the Fire Plan. With ambitious targets set for the number of acres treated, however, questions have arisen about whether this
funding will lead to high quality employment for those involved. The accountability measures of the National Fire Plan are concerned more with the costs and speed of treatment than they are in skills or development of the workforce. While highly trained restoration crews may be more expensive in the short term, they may be less costly over the long run if they improve conditions on the land and increase the time between management efforts.

**Community Based Forest and Public Lands Restoration Bill**

Introduced to the 107th Congress in 2002, the Community Based Forest and Public Lands Restoration Bill (S. 2672) was not completed before the close of the session, but its bi-partisan support suggests that it will likely reappear in a future session. This bill would establish new authorities for federal agencies to form partnerships with tribal governments, non-profit organizations, conservation groups, small and micro-enterprises, cooperatives, and conservation corps for the purposes of restoration on public lands. The proposed legislation would also establish value-added centers in New Mexico, Idaho, Montana, California, Oregon, and Washington states for the purposes of developing profitable ways to process small diameter timber and other by-products of forest restoration. The western focus and the provision for value-added processing suggest that the restoration emphasis of this proposed bill is the removal of small trees for the purposes of reducing fuel loads.

The provisions for contracting with community non-profits and small businesses are also significant. The bill would have federal agencies increase the portion of their restoration contracts and agreements (including salvage and other timber sale contracts, service contracts, construction contracts, supply contracts, emergency equipment rental agreements, architectural and engineering contracts, challenge cost-share agreements, cooperative agreements, and participating agreements) to these types of organizations to 50 percent of the total dollar value over five years. If passed, this may influence the structure of the restoration industry by increasing the importance of non-profits and small businesses in carrying out this work. In the Pacific Northwest, the NEAI has helped develop the capacity of a number of community-based non-profits to work with federal agencies through contracts, grants, and a variety of agreements. Similar organizations are already working elsewhere in the country. In the event of passage of the Collaborative Restoration Act, there will be greater need for this type of institutional capacity in rural areas.
Ecosystem restoration work involves a cross-section of skills, some unique to the industry and others that cross over from more established industries, such as timber and construction. In the past, the dynamics of this industry have been closely tied to natural resource extraction, but they have also become more subject to influences from public policies, concern over the risks of natural disaster such as wildfire, and societal values of maintaining functioning ecosystems. To understand how the industry is evolving, it is instructive to look a number of trends affecting it, ranging from a move toward greater complexity in skills changes in the workforce, changes in the structure and operations of federal agencies, and influences of restoration contracting systems. The following sections explore some of these trends in order to highlight some of the salient policy issues affecting workforce development.

*Changing Face of Restoration*

The ecosystem restoration industry is under constant pressure to adapt to changes in land management practices. The workforce, in turn, has adjusted to meet these changes, adopting new skills, techniques, and equipment to meet restoration priorities. For example, in the past, when its demand and funding were was driven by timber harvesting, forest restoration consisted primarily of tree planting, brush disposal and stand improvement, which occurred primarily in forests that had been logged. Throughout the 1980’s as public forest managers shifted the primary focus of their management away from timber and toward the ecosystem, the demand for different restoration activities rapidly increased. Now, ecosystem restoration work involves a cross-section of skills, which may include:

- Reforestation
- Forest stand improvement
- Terrestrial and aquatic surveys
- Watershed/habitat enhancement
- Fuels management
- Wildfire suppression
- Timber harvest
- Recreation management

Restoration work has expanded to involve creating wildlife habitat, controlling invasive species, managing recreation areas, and reducing the build-up of hazardous fuels. These new approaches have required the restoration industry to develop different expertise, adopt new technology, and find new uses for old technology.

Overall, the trend in restoration work is toward greater complexity. Even tree planting and brush thinning have become more complex with specific management prescriptions that require workers to be prepared to make decisions about spacing and density based
upon species type and ecological microsite. Forest restoration workers must increasingly be familiar with scientific principles of ecology, hydrology, biology, and silviculture. Their work requires familiarity with species, communities, and the structure and function of ecosystems. In addition, restoration workers must understand a growing number of state and federal regulations that govern work in the woods.

A variety of restoration activities such as road decommissioning, culvert replacement, and erosion control require the use heavy equipment. Equipment operators have developed new techniques for using the same types of tractors and backhoes required to build forest roads in order to now remove roads that are causing erosion and sedimentation. Fuels reduction has increased the demand for mechanical small tree and biomass harvesting systems including cut-to-length harvesters, feller-bunchers, chippers, and mulchers capable of mechanically clearing small trees and brush. A focus on extracting value in small diameter from forest management has led some contractors to invest in smaller versions of forestry equipment such as skidders and forwarders that are better suited for the resource and cause less soil compaction.

Ecosystem restoration has also become increasingly technically complex. Survey work frequently involves the use of Global Positioning Systems (GPS) receivers and electronic dataloggers. Instruments to measure soil and water conditions are now practical ecosystem management tools and no longer used exclusively by research scientists. Ecosystem management may also involve data analysis using computers. Natural resource companies in the private sector have been quick to recognize the business potential in the information and measurement needs required for ecosystem management.

For many companies, the key to success in a competitive natural resource industry is specialization. The advantages are lower investment and training costs, but disadvantages tend to be the need to find work over a larger geography and limited seasonal windows for performing certain types of work. Some firms are also successful with a generalist approach, which requires that they be more adept at finding diverse funding sources and particularly good at securing a variety of contracts and grants (RCAA, 2002).

Changes in Workforce Demographics

As the ecosystem restoration industry takes on new types of work, the demographics of the people who work in the woods is also changing. People engaged in ecosystem restoration work are employed by government, private industry, and by non-profit organizations. Throughout much of the country, the number of workers involved in timber harvesting has decreased due to changes in demand and the mechanization of the industry. Although the decline in timber harvesting has been accompanied to a small
degree by a decline in employment in tree planting, overall, the number of workers in forestry services has stayed relatively stable.

During the 1970’s in the timber-rich Northwest, forest restoration was primarily performed by mobile cooperatives. Today, reforestation it is done by businesses specialized in forestry services, most with mobile crews that can do a variety of labor-intensive tasks over a large geographic area. Immigrant and minority workers now comprise the majority of these crews. A trend toward employing crews with temporary foreign labor certification for labor-intensive tree planting is occurring in the Northeast and on the timber plantations of the South. According to the New York Times, an estimated 15,000 workers, the majority of them from Mexico, enter the US each year on temporary visas to plant trees for large forestry companies, often employed by an intermediate labor contractor. Some close to the industry express a concern that the trends toward increasingly technical ecosystem restoration work is forcing a divergence in the structure of the workforce to where workers currently doing labor-intensive activities may have difficulty accessing the higher-paying technical jobs.

Currently, there is a quota of 66,000 temporary H-2B visas granted each year in the United States. A shift in land management emphasis toward fuels management and wildfire suppression in fire prone forests requires a workforce that can adapt to shorter work seasons, limited by periods of severe wildfire risk. The economics of this work tend also to favor a contingent labor system in which workers must be flexible geographically and occupationally in order to stay employed. This trend, coupled with poor economic conditions in Mexico and Central America, will probably lead to an expansion in the number of temporary visa holders working in forest restoration. Because there are few protections for workers under the H-2B temporary visa program, it has arguably lowered the cost of labor for tree planting, reportedly, in some cases, below minimum wage. Despite having to pay a set hourly wage for these workers, some employers circumvent this by making employees work more hours than they are compensated and pay for food, lodging, and supplies. Temporary visa holders are less likely to confront these abuses because their permit to work in the country is tied to their employment to a particular company. Several class action suits against major forest products corporations have tried to address this issue, without much success.

*Trends in Wages and Benefits*

Despite the fact that restoration work has increased in skill requirements and technical difficulty, no corresponding increase in real wages has accompanied this trend. In Oregon, the average real wage for workers in the forestry services sector has declined almost 3% over the last nine years (Ecosystem Workforce Program, 2002). This trend is consistent elsewhere in the nation, but statistics tell little about what is really happening because the industry is difficult to regulate.
Employment in the forest industry is notoriously unstable, low paying, and wrought with inherent physical risk. Workers in these industries are rarely unionized and the dispersed nature of the work inhibits organization. Because the restoration industry tends to be labor intensive, labor costs often comprise the bulk of a business's expenses. To stay competitive in the industry, many employers look for ways to reduce wages, benefits, taxes, and other employment-related expenses. Keeping gross wages down reduces employers' employment tax liability and worker's compensation premiums. It is also common in the restoration industry for prime contractors to hire subcontractors rather than employees, relieving them of having to pay employment tax and workers compensation. Although minimum wage and workers compensation laws provide some protection for workers, there are documented abuses of these laws in restoration laws.

Federally funded service contracts for restoration work are subject to Service Contract Act (SCA) wage determinations that set the minimum wage and fringe benefits for workers performing certain types of work. SCA wage determinations have no provisions for per diem or travel costs when workers are away from home and many employers do not compensate workers for these costs nor for the time taken to travel to remote work sites. Workers often must also pay their food and lodging expenses if they are working far from home and must stay in a motel.

A weakness in the enforcement of the SCA is that the contractor is not required to submit certified payroll documentation to the contracting agency as evidence of compliance. Instead, the Department of Labor is responsible for interviewing contract employees to determine if SCA wages have been paid. This type of inspection is limited by the resources that the Department of Labor has to send inspectors into the field and the ability of those inspectors to communicate effectively with workers where language barriers and the workers' fear of losing their jobs often stand in the way. In some states, such as Oregon, the state government also plays a role in enforcing labor practices, and employers may be required to submit certified payroll documentation to the state. However, these agencies only have authority to enforce state prevailing wage laws and do not have jurisdiction over enforcement of federal laws such as the SCA.

The Davis-Bacon Act, a prevailing wage law that applies to federal construction contracts, authorizes the Department of Labor and the contracting agency to enforce wages and mandates certified payroll documentation. The Service Contract Act, however, does not require such documentation and does not give the contracting agency authority to enforce it. Even with adequate payroll documentation, employers can avoid document deductions from employee paychecks for food, lodging, and transportation incurred while working in remote locations, thus obscuring the actual wages paid to workers. The number of hours worked is also frequently misrepresented, commonly discounting travel time from payment. Without certified payroll requirements, it may be difficult to enforce service contract law. The contracting agencies do not consider it their
responsibility to police the wages paid out by contractors, nor do they have the time or resources to enforce these laws. The lack of protections for wages and working conditions make the ecosystem restoration industry particularly difficult for workers and limit its potential to contribute to community stability and economic development.

**Competitive Sourcing of the Federal Workforce**

Government outsourcing represents another important significant trend affecting the structure of the ecosystem restoration workforce in complex ways. For years, the federal government has been reducing its payroll and contracting land management work to the private sector. Between the years 1992 to 1999, the USDA Forest Service reduced its permanent workforce from 35,301 to 28,194 workers. The agency is currently studying the efficiency of outsourcing thousands of positions and is expected to competitively outsource approximately 12,000 positions over the next several years (National Academy of Public Administration, 1999). The most obvious effect of competitive sourcing is expanded opportunity for private enterprise to perform the land management responsibilities of federal agencies. But the effect that this trend will have on the quality of the private sector employment created is less obvious. Several factors need to be considered including the types of positions that are being outsourced (e.g., technical, managerial, administrative), the stability and compensation of jobs created in the private sector, and the potential effects of a pool of displaced government workers that may be competing for those jobs.

There may also be more subtle effects on the structure and design of contracts. As the government increases the volume of competitively contracted work, individual contract size will likely increase in order to keep the fixed costs of contract design and administration at a minimum. Likewise, restoration contracts will probably become simpler in terms of their structure and prescriptions because fewer staff and agency resources will be available to develop and monitor those contracts. Currently, some important forest restoration is made possible because agency staff members have worked hard to creatively navigate a complex set of authorities, funding sources, and contracting models. As fewer people manage larger contract portfolios, or if these positions themselves are competitively sourced, restoration contracting will favor more generalized, easily replicable solutions. Challenge cost-share, participatory, and cooperative agreements; embedded contracts; and best-value contracts that provide incentives for training and workforce investment may prove too costly to administrate and be used with less frequency. Capacity within the Forest Service to fully employ its contracting and partnership authorities is crucial to developing the capacity within communities and businesses that can help the agency achieve its land management objectives.
Workforce Training and Investment

Nationwide, the amount of Federal money available for training and employment programs has increased rather steadily over the past two decades. Dislocated Worker Assistance programs of the U.S. Department of Labor's Employment and Training Administration (ETA) received about $222 million in appropriations in FY1995, which rose to more than $1.5 billion in FY2001 under passage of the Federal Job Training Partnership Act and later the Workforce Investment Act. This trend appears to be leveling off as evidenced by cutbacks in the DOL's Budget for FY2003. Despite rising unemployment across the economy, overall funding for employment training will increase only marginally. The primary focus of federal unemployment programs has become getting workers into new jobs as quickly as possible. This may be effective in places where there are many different opportunities for workers, but does not offer much hope in communities where there is structural unemployment caused by declining industry, an economically depressed geographical area, or a workforce that lacks the skills to keep up with a changing job market. Workers in these communities may need more than basic job placement services. Because most training in the forest industry requires opportunities to work in the field, restoration training takes more time. Much of it is on-the-job and informal, and thus not well suited to many of the employment programs and resources offered by the government. For state and federal workforce investment dollars to be relevant in helping people earn a livelihood in restoration, job training must be linked to the needs of the market and be sufficient to prepare workers with the large set of skills required for success in this industry.
V. CONSIDERATIONS AND POTENTIAL FOR ECOSYSTEM RESTORATION WORKFORCE DEVELOPMENT: TWO REGIONAL EXAMPLES

The Southwest

Facing a similar restructuring of the timber industry as experienced in the Pacific Northwest, the Southwest has also seen a shift in forest management from large timber harvesting to watershed restoration. Throughout this region, where the link between forests and water supply is unmistakable, the benefits of restoring natural ecosystems are dramatic. In recent years forest fires have threatened towns and infrastructure and there is a large demand for the preventative measures of hazardous fuels reduction, both on public and private lands. The National Fire Plan has increased the funding available through federal and state agencies to conduct fuels reduction work. There are a number of examples where community organizations are using this opportunity to train crews to do this work and develop a viable workforce capable of thinning small diameter trees.

The Las Humanas Cooperative, in the Manzano Mountains is one example of such an organization. This cooperative, made up of members of six Hispanic land grant communities neighboring the Mountain Air Ranger District of the Cibola National Forest has been working in partnership with the National Forest since 1998 on several stewardship projects intended to reduce stem density in the overstocked forests. The crews are trained to mark and cut trees and the wood is removed by community members who use it for cooking and heating their homes. Through securing contracts on public and private land, the cooperative has trained and provided employment to three ten-person crews. However, lack of funding to pay for more hazardous fuels reduction as well as some of the Forest Service’s plans being challenged in court on environmental grounds has made it difficult for the cooperative to maintain a steady supply of work for its crews. With grant money, the cooperative has purchased a log peeler and trained some of the community members to make vigas out of small timber, which can be used in home construction. The intent is to obtain more economic value from thinning contracts and to provide additional employment for the restoration workers when they do not have contracts to fulfill in the woods.

One challenge facing the Las Humanas Cooperative and other restoration businesses in the region is competition with prison labor crews that are also trained to do hazardous fuels reduction and can do so at a much lower cost per acre because of the low wages paid to laborers. In New Mexico and Arizona some prison labor crews have received State Fire Assistance funding to thin forests at a fraction of the cost per acre that it would cost a private contractor. Minimum wage laws do not apply to prison workers who are sometimes paid as little as 50 cents an hour for their labor. Some prisoners are also trained as wildland firefighters, which generally pays more money, but still does not entitle them to federal death or disability benefits. The enormity of the task of forest restoration and the lack of funding to do so make prison labor an attractive option for
states with tight budgets, and there are additional rehabilitative benefits for prisoners, but there has been insufficient analysis of the impact that this practice has on competition with other businesses working in ecosystem restoration. More care must be taken on the part of states to ensure that such programs do not limit the opportunities for other citizens to get fully compensated jobs in forest restoration and protection.

On the Gila National Forest, the Mill Forest Restoration Project, in Grant County, NM, is another example of how community organizations are building workforce capacity to participate in the ecological restoration on public lands. This 1,400-acre demonstration project is being carried out by Gila WoodNet, in partnership with the Center for Biological Diversity and the Catron County Citizen’s Group to restore ecosystem function and reduce wildfire risk. Local businesses are involved in the transport and processing of restoration byproducts, which are being turned into furniture and pellets for wood-burning stoves.

Both Gila WoodNet and the Las Humanas Cooperative have received critical support for their organizational capacity in the form of federal grants made possible through U.S. Senator Jeff Bingaman’s Community Forest Restoration Act (P.L. 106-3930). The Collaborative Forest Restoration Program authorized under this bill provides funds to community-based enterprises that are collaborating with federal agencies and local communities to undertake restoration work. State, local and tribal governments, educational institutions, landowners, conservation organizations, and other public and private entities are eligible to receive grants from the program for the implementation of restoration projects on federal, tribal, state, county, or municipal forestlands. The grants can also be used for processing facilities that can use small the trees produced in forest thinning. One of the criteria for program eligibility is that projects create local employment or training opportunities within the context of accomplishing the restoration objectives. The grants offer a needed boost to community organizations throughout New Mexico trying to find ways of restoring forestland while training workers on projects on public lands. Now in its third year, this project has sparked interest in many other states where seed money is needed to get collaborative restoration projects off the ground and providing benefits to workers, forests, and communities.

Central Appalachia

In the Central Appalachians, natural resources, along with farming and mining, continue to be an important mainstay in the rural economy. However, as in many other regions of the country, these sectors are undergoing drastic transformation in response to changes in public demand and increased concern over the environmental impacts of resource extraction. Because of this region’s rich base of natural resources and a long legacy of their exploitation, there is great potential for ecosystem restoration to grow as an industry. Political will is now needed to examine policies that would make it easier for
businesses development; greater coordination between non-profit, government, and academic institutions in the creation of workforce development programs; and more federal funding for mining reclamation and watershed enhancement. One of the most pressing ecosystem needs in Central Appalachia is the restoration of streams that have been acidified and contaminated because of coal mining. Throughout Appalachia, there is also a need for restoration and improved sustainable forest management on millions of acres of private forestland.

The Appalachian region has facing a difficult period of economic decline and joblessness in response to the decreasing importance of some of its major industries. This region, according to the Appalachian Regional Coalition, has poverty rates close to twice the national average. The unemployment rate, though declining, is still consistently higher than the national average. Many of the most distressed counties in the region are dependent on either coal or tobacco, which are both facing a severe economic decline. This decline, accompanied by a below average high school completion rate in these communities, has contributed to a growing economic disparity between rural and urban areas in the region.

Coal remains an important industry and employer in the region, but the majority of recent growth in the industry is occurring in the West. Western coal seams are wider and closer to the surface, making them less expensive to exploit. Western coal also tends to be lower in sulfur content and thus fetches a higher price from utilities that are required to reduce their SO₂ emissions under the Clean Air Act. In Appalachia, the industry, facing a decline in the price of local coal and an increased ability to ascribe the environmental costs of coal production to the cost of production has responded in many cases, by cutting jobs and investing in labor-saving technology. But even as the number of jobs decline, coal mining’s legacy has left the Central Appalachians with a monumental environmental clean-up task. Thousands of abandoned mines have not been properly remediated and continue to affect the ecology, health, and economies of neighboring communities.

The 1977 Surface Mining and Control Act placed bonding requirements on mines to ensure the clean-up of mines upon abandonment. It also put a per ton fee on coal in order to generate income to pay for the remediation of mines abandoned prior to the act and as well as pay medical costs for the emerging health crisis of black lung in retired miners. The $1.5 billion Abandoned Mine Land Fund is administered by the US DOI’s Office of Surface Mining (OSM). About $300 million is added to the fund each year, and about $250 million is spent annual, which is divided between Tribal and State programs and special funds for emergency and federal programs administered federally by the OSM. Miners’ health and abandoned mine safety costs are the top priorities for these funds, but states are allowed to set aside up to ten percent of their accounts for restoration related to acid mine drainage, which is the contamination of surface and ground water by acidity, iron, manganese, aluminum and other metals that are exposed as a result of surface or underground mining. Another portion of the Abandoned Mine Land Fund is
reserved for the Appalachian Clean Streams Initiative, a program targeted at restoring watersheds that have been impacted by acid mine drainage. There are some proven methods for cleaning up acid mine affected watersheds, but funding is still insufficient to meet the magnitude of the problem in Appalachia. Those sources that do exist may offer some opportunities for workforce development in mine mitigation, but watershed organizations and local non-profits express frustration that funds have been tied up and are not reaching areas most affected. A further worry is that the fees that contribute to this fund are set to expire in 2004 unless extended Congress. If contributions are not extended, the fund will be depleted long before it has the opportunity to sufficiently restore the affected watersheds.

With the coal industry shifting its operations west and some rural communities taking a hit from the tobacco decline in south and central Appalachia, patterns of land use in Appalachian states are also beginning to change. Small landowners do not have the same economic options that they once had, making it difficult to keep their land without an alternative source of income. State trust funds coming from tobacco settlements are being used in some states to promote economic development in regions that were economically dependent of tobacco production. Some states have developed programs that deliver these resources to the rural communities hit hardest by a decline in production. In Virginia, for example, funds are being used to promote sustainable forestry and organic agriculture. Past forestry practices in the region have liquidated most of the profitable timber, leaving little behind for local residents. And yet restoration forestry practices that emphasize small-scale harvests, diverse products including non-timber forest products such as fruits and medicinal herbs, and value added processing within the region, may provide rural residents with new sources of employment and income from previously degraded forestlands. Because of the cut-and-run nature of past forestry practices and the inability of many landowners to invest resources into stand improvement, the need for restorative forestry in the Appalachians is immense. Forest fires, though not as large as the western blazes that make the front pages, have also had detrimental economic and ecological impacts on Appalachian forests. Overabundance of vines such as grape and kudzu are a common problem in Appalachian forests, and although they may have some value in crafts, they can be damaging to smaller trees and prevent forests from re-establishing after harvest. Landowners in this region need help developing forest management plans, conducting resource inventories, and carrying out forest enhancement treatments. Unfortunately, most landowners do not have the financial resources to pay for this work. Nor does it pay very well for workers. Forest and conservation workers in the central and southern Appalachian states rank along with their colleagues in the Pacific Northwest as the lowest paid in their labor class.

The Appalachian region is rich both in natural resources and community organization. There are active networks that are forging new alliances between government, industry, and non-profits to find ways of turning around the past economic and ecological exploitation of these resources. Rural communities and service providers in this region
frequently express frustration that government programs have not made much difference in their situation. They have not seen adequate clean up of mines, although money exists in federal accounts. The money obtained by some states in tobacco lawsuit settlements is more often spent creating jobs in urban areas rather than the rural areas that have been hardest hit by the tobacco decline. Unlike the West, this region has not received the attention of programs for jobs and the environment or much of the forest restoration funding associated with the National Fire Plan. However, local governments and non-profit organizations may find some support for restoration work through the Abandoned Mine Land Fund and the Environmental Protection Agency’s Sec. 319 grants. Ideally, restoration projects could be an integral part of a workforce training program that focuses on acid mine remediation and watershed restoration. The economic benefits from restoring streams for fishing, recreation, and tourism, will magnify the employment effects and help this region in many ways.
IV. GENERAL LESSONS FOR DEVELOPING ECOSYSTEM RESTORATION WORKFORCE CAPACITY

Considerations for Federal Land Management Agencies

Federal agencies recognize that there is potential for workforce development in the restoration sector. Realizing this potential will require additional investment from landowners, both public and private, to cover some of the costs of prior mismanagement. While in some cases, there may be by-products of restoration that have a market value, such as small diameter timber, much restoration work typically will not produce marketable economic outputs. The benefits of functioning ecosystems such as maintenance of air and water quality, waste assimilation, soil regeneration, habitat, and biodiversity may offset the benefits from marketable products extracted from the land.

Many of the major restoration problems facing our nation’s ecosystems are the result of the relatively unregulated extractive practices of the past. In many cases a decline in the markets and productivity of these resources has resulted in a dual loss of jobs and ecological integrity. Although restoration may be one answer that can help to remediate both unemployment and environmental degradation, it must also be considered within the context of other strategies such as reducing damage in the first place. With the government cutting back on funding for environmental remediation and the Forest Service planning on paying for restoration of fire adapted ecosystems by selling more timber, it brings to question whether or not the proper incentives are being put in place to avoid repeating the mistakes that originally created forests in need of restoration. If the restoration industry is going to provide stable employment for some, then it must not be solely dependent on material extraction for its survival. This type of dependence is unsustainable for any industry, particularly in a society that, more than ever, values reducing environmental damage, particularly on public lands. The incomplete choice that was presented to loggers in the Pacific Northwest – cut the forest or face unemployment – could now resurface only slightly changed as – cut the forest or lose opportunities for restoration and employment.

Although hazardous fuels reduction has been considered by proponents as a windfall for restoration employment, the realities of the current program suggest many yet unanswered questions. The economics of fuels reduction require that the cost of disposal or removal of the material not be prohibitive. This may be the case in areas that are close to processing or biomass energy facilities, but these industries are still developing and are limited in the volume that they can accept. With more than 70 million acres of forestland that are Class 3 or high fire risk, federal agencies recognize that it will take large sums of money and many years to treat all of this land. Fuels reduction tends to be most cost effective near homes where both the costs of fire suppression and the costs of fire impacts are the largest. Treatments in this area, much of which may be on private land will not
have much timber value, but they should be the top priority for land managers. More resources that are not administratively tied to controversial timber harvests should be directed toward dealing with these areas and providing jobs in the process.

In many states, minorities, primarily Latino, as well as Asian and Native American, comprise the majority of the contingent forest workforce. A large proportion of this workforce is made up of recent immigrants, many of whom are undocumented workers. A growing number of "guest workers" with temporary work visas issued under the U.S. Department of Labor's H2-B visa program are also working in the forestry sector in several areas of the country. Workforce development in this industry thus needs to be targeted to a very diverse group of individuals, many of whom face potential disadvantages because of poverty, language barriers, race, and immigration status. To be effective, programs intended to support workers in this industry need to reach a highly diverse constituency.

Sustained investment in worker capacity and skill development in ecosystem restoration will require important changes in the way that the government contracts work in order to ensure that workers are fairly compensated. Without some assurance that employers are complying with prevailing wage lays, contractors will compete on the basis of how low they can keep labor costs and not on the quality of the work that they perform. Reducing the value of labor discourages investment in human capital and skill development. Greater investment in the workforce keeps trained and ambitious individuals in the industry. This in turn provides a higher value to the taxpayer because restoration work is better and can be carried out with minimal supervision on the part of the agency. Further dialogue between workers, businesses, and contracting agencies is needed to begin to develop strategies that will ensure that this industry complies with the law and competes on the quality of work performed and not on how much labor costs can be reduced.

The diverse ways that communities have adapted to the timber decline in the Northwest also show that restoration can lead to expanded economic opportunities for regions and communities. Tourism, recreation, fishing, and sustainable forestry are just some of additional direct economic benefits that are generated or enhanced by these activities. Restoration itself is diversifying to keep up with new opportunities including biological monitoring, surveying, wildlife management, urban watershed work, and recreational trail construction. As the potential for economic activity grows, so must the capacity of communities to engage in these industries. Therefore, government can also assist communities in creating the business and organizational capacity needed to expand their economic base. Grants, cost share agreements, and revolving loan programs have been useful tools in directly helping local organizations develop and grow. Education in starting and running small businesses and non-profits may also be useful, particularly in communities that are adjusting to the collapse or withdrawal of a major company. Programs aimed at addressing capacity should be flexible and allow communities to set their own goals for change. If community organization is only beginning, support should
consist of resources that enable communities to pull together partners and begin a planning process.

Considerations for Communities

Although the environmental and industry battles seem to be growing hotter than ever, there are inspiring examples of communities that have managed to find common ground fertile enough to plant some new economic strategies. Ecosystem restoration is one of those strategies, which has led to some significant changes in how forests and watersheds play a role in the livelihoods of communities. Restoration is not a new idea or a new industry, but it is changing rapidly and has grown to address a variety of environmental quality problems. However, those who have struggled to make a living in the field acknowledge that there are critical obstacles and risks. Among the challenges are generally low wages, limited resources and opportunities, and high costs to businesses and individuals associated with investing in workforce development. It may be a combination of these factors that has limited ecosystem restoration as an economic strategy in the Pacific Northwest following the Northwest Forest Plan, but important lessons are starting to emerge. The first and often easiest step for communities is to recognize the needs and opportunities for restoration. Forests, rivers, watersheds, abandoned mines or industrial sites, wetlands all present projects and learning opportunities. The real issue for communities, however, is securing financing for this work so that the investment in training, equipment, and employment will pay off.

Lessons from the Northwest Economic Adjustment Initiative suggest that community organization is one of the most important variables for success. Workforce development has been strongest in communities in which local government, businesses, training providers, and land management agencies have sat down to agree on priorities for community economic development and worked out a collaborative plan to accomplish goals in a coordinated fashion. For these communities, coordination broadened funding sources and increased employment opportunities because stakeholders were able to combine resources, projects, and land bases to meet restoration objectives.

These communities also found that field opportunities were necessary for development of ecosystem workforce capacity. Most skills can be learned in the field, but doing this also requires some understanding and support on the part of the landowner or forest manager that project time scales may be slightly longer as a result. In addition to teaching workers to understand the natural landscape differently, workforce training must also train workers how to excel in a different type of business where the products are measured in non-traditional ways and where contracts are awarded through a different process. With few relatively few resources available for restoration, competition tends to be stiff and creative solutions are rewarded. Specialized equipment, or new methods of using old equipment can be advantageous, as is a comprehensive understanding of ecosystem
processes and the ability to make decisions and design treatments that will be cost effective over the long run.

In addition to being highly competitive, ecosystem restoration work often provides relatively little compensation for workers. High costs associated with transportation and equipment lead many contractors to reduce wages, per diem, and other labor costs. Federal land management agencies that contract for restoration services are beginning to recognize that the bids should also be evaluated upon whether or contracted crews receive adequate wages, and they can use best value contracting rules to encourage this, but they are generally powerless to investigate and enforce Service Contract Act provisions.

Ecosystem restoration workforce development is a multi-disciplinary endeavor and there are a variety of sources that communities need to look to for support. Depending on the resource issue, there are many state and federal agencies that may have funding available. Work on public lands will generally be funded by the agency managing that jurisdiction, but there are non-profit foundations associated with many of these agencies that may fund restoration work or projects with a training or capacity building component. Federal programs such as the National Fire Plan may present contracting opportunities, but the magnitude of agency hazardous fuels reduction goals and the incentive that agencies have to get out contracts before funds are diverted to fight fires ensures that most of these contracts are large, low-bid, and lacking complexity – not an ideal combination for developing workforce capacity. Furthermore, disposal of such large quantities of small diameter trees may be difficult if there are not convenient markets for the material or proper technology available to dispose of it. Grants and agreements offered through the National Fire Plan for community assistance may be better suited to creating an innovative workforce development program.

Many communities have also used grants and cost share agreements through the Forest Service’s State and Private Forestry’s Rural Community Assistance program to generate basic investment in workforce, non-profit, and business development. There are also several programs under the Farm Bill that provide financial incentives for private landowners to undertake land improvement and natural resource stewardship activities on their lands. The Forest Land Enhancement Program provides financial and technical assistance through state agencies for sustainable management activities on non-industrial private forestland. The Environmental Quality Incentives Program, administered by the USDA Natural Resources Conservation Service (NRCS), has resources for farmers who wish to improve conditions of soil, water, and natural resources on their lands. NRCS’s Wildlife Habitat Incentives Program provides financial incentive to agricultural producers to create wildlife habitat. The USDA’s Cooperative State Research, Education, and Extension Service (CSREES) also provides grants for small business and non-profits, including the Small Business Innovation Research (SBIR) program and the Rural Business Enterprise Grants (RBEG).
In addition to land management agencies, other branches of government offer resources and services that can enhance workforce development. The Department of Labor offers grants for training programs, which are administered through local Workforce Investment Boards. The agency also provides unemployed individuals with training accounts that can be used to defray the costs of recognized training programs. The EPA also funds watershed restoration through the Clean Water Act Section 319 grants as well as job training associated with brownfield restoration. The agency hosts a lengthy, though somewhat dated catalogue of federal funding sources for watershed protection on its website at: http://www.epa.gov/owow/watershed/wacademy/fund.html. The EPA also funds the Five-Star Restoration Program through the National Association of Counties, National Association of Service and Conservation Corps, the National Fish and Wildlife Foundation, and the Wildlife Habitat Council, which make subgrants to community-based wetland and riparian restoration projects that involve multiple partners, each contributing funding, land, technical assistance, and workforce support. The National Oceanic and Atmospheric Administration (NOAA) has a Community-Based Restoration Program, which provides financial support for restoration projects in fish habitat in coastal or river areas. Additionally state natural resource agencies have their own grants and programs that should be explored fully.

**Importance of Partnerships**

Partnerships are more than just the latest buzzword being tossed around these days by government agencies. Facing tight budgets, many state and federal programs are now being executed as partnerships to combine resources and share the benefits of success. Ecosystem restoration workforce development is a ripe theme for the formation of partnerships because a variety of resources are needed for it to occur – funding, training capacity, business capability, land, labor, and organizational skills. Local leaders have a responsibility to bring together partners from the public, business, non-profit, and academic sectors to discuss opportunities, needs, and priorities for their communities. Communities that have been successful in building ecosystem restoration workforce capacity have found that coordination takes a great deal of time, but is a significant factor in creating lasting programs and opportunities. Non-profit partners can play the key role of obtaining grants that might not be available directly to businesses. Some watershed associations, which have formed to pull together resources and citizen support for restoration activities, have initiated powerful workforce development partnerships. The Forest Service and National Forest Foundation’s Partnership Resource Center (www.partnershipresourcecenter.org) offers an extensive list of news, resources, and toolkits for organizations looking for help in designing and sustaining natural resource partnerships.
Conclusion

It is unrealistic to expect the all of the economic and environmental challenges of communities will be swiftly resolved through the development of a trained ecosystem restoration workforce, but it can be an important component of community-based development. In order to create this type of win-win approach to economic development, communities need to be organized, land management agencies have to change the way they do business, and a collective will to recognize and appreciate the value importance of restoring degraded forests, streams and watersheds. Many communities have made important strides in bringing together the themes of employment and ecological restoration and their success stems from their ability to affect change in these three areas. The original Jobs in the Woods projects demonstrated that it is difficult to make a living in the ecosystem restoration industry due to competition, low wages, difficult working conditions, and inconsistent contract offerings. Trends in land management activity indicate that objectives have become more complex without an associated increase in compensation. Ambitious plans to restore fire-adapted ecosystems throughout the West are under funded and poorly designed to create quality jobs for restoration workers.

Forest dependent communities should not be expected to substitute the exploitation of forest with the exploitation of workers. Their wellbeing depends on developing the capacity to exercise control over how restoration is carried out and how they will benefit from it. Government agencies have a responsibility to provide communities with the tools to do this. They must view all of their land management activities through the lens of community capacity building and seek ways to encourage workforce investment as they work to restore degraded lands. On public lands, there is a vast amount of restoration work waiting to be performed; of which hazardous fuels is only one example. Workers will be better served if communities take an active part in the design and prioritization of the restoration projects. This will ensure that projects are developed that take advantage of community assets and reduce the likelihood that they will face opposition as they proceed. Finally, land management agencies are starting to recognize that a trained crew, that is paid appropriate wages for good quality work, will ultimately be cost effective because treatments will be better suited to the needs of the site, less project explanation and supervision will be required, and the time between entries into the site will be longer. Facing enormous barriers, communities throughout the country are showing that ecosystem restoration can be an important tool in diversifying economics and creating employment, but investment and support are needed in this industry to sustain a workforce that is competitive, well-compensated, and skilled enough to meet nature’s critical restoration needs.
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http://www.nifc.gov/fireinfo/nfnmap.html


