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Watershed Restoration, Jobs-in-the-Woods, and Community Assistance: Redwood National Park and the Northwest Forest Plan

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Abstract

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There are many parallels between the 1978 legislation to expand Redwood National Park and the Northwest Forest Plan, which together with the Northwest Economic Adjustment Initiative formed the 1993 Pacific Northwest Initiative. In both situations, the Federal Government sought to promote retraining for displaced workers, to undertake watershed assessment and restoration work, and to assist communities with economic planning, grants, and transitions. Both of these efforts point out the inherent conflicts between the economic and ecological objectives of watershed restoration. No one wants to have to choose between reducing sediment and reducing unemployment in coastal forests.

Keywords: Watershed restoration, community assistance, Redwood National Park.

Contents

Introduction

There are many parallels between the 1978 legislation to expand Redwood National Park (RNP) and the Northwest Forest Plan (NWFP), which together with the Northwest Economic Adjustment Initiative formed the 1993 Pacific Northwest Initiative. Though 15 years apart, both tried to remedy localized reductions in timber harvests and dislocation of woods workers. In both situations, the Federal Government sought to promote retraining for displaced workers, to undertake watershed assessment and restoration work, and to assist communities with economic planning, grants, and transitions. In both cases, the legislation or executive orders sought to rescue both human communities and degraded and imperiled ecosystems. Under the RNP legislation, the ecosystem focus was on old-growth redwood forests—restoring damage and protecting the ancient stands from drowning by sediments and flooding. Under NWFP, the ecosystem focus was on old-growth forests and the northern spotted owl (*Strix occidentalis caurina*), and increasingly, on salmon (The Oregonian 1997).

This study distills the legacies of the RNP expansion legislation and compares them with the NWFP. The two situations involved different agencies, agendas, and philosophies about the scope of government. This study also highlights information gaps about the efficacy of watershed restoration, worker retraining, and community redevelopment funding—all are difficult to target, conduct, and evaluate over any period. This study compares the economic assistance approach used in the RNP and NWFP, and tracks lessons in watershed restoration learned from the RNP effort now used and advocated in watershed restoration in the NWFP. Increasingly, watershed restoration involves political and social expectations, as well as economic and ecological criteria.

Redwood National Park Expansion

Genesis

Congress authorized a major expansion of RNP in 1978 with passage of Public Law 95-250, which involved the purchase of 48,000 acres of timberland contiguous to the park, 75 percent of it cutover and with over 300 miles of logging roads (see fig.1 for general location of RNP). Congress also earmarked $33 million for watershed restoration work on the lands to be acquired for the park, with the work to be done by displaced timber workers to the extent possible. Another section of the law titled the "Redwood Employee Protection Plan" (REPP) was authorized to receive $25 million. All of the park expansion, and most of the economic assistance, was in Humboldt and Del Norte Counties in coastal northern California.

Schrepfer (1983) chronicles the political events that led to creation of the 28,000-acre RNP in 1968, and then to the expansion a decade later. Dissatisfied with the protection of RNP afforded by the original legislation, the Sierra Club, Save-the-Redwoods-League, and other powerful environmental groups immediately began pressing to expand the park. The struggle quickly became a national one, and several interest groups testified at House and Senate hearings on the costs and benefits of expanding the park. The Society of American Foresters opposed the loss of private timberlands and timber harvests, and argued that environmental problems could be solved by more professional management of private timberland near the park (Craig 1977, Craig 1978).

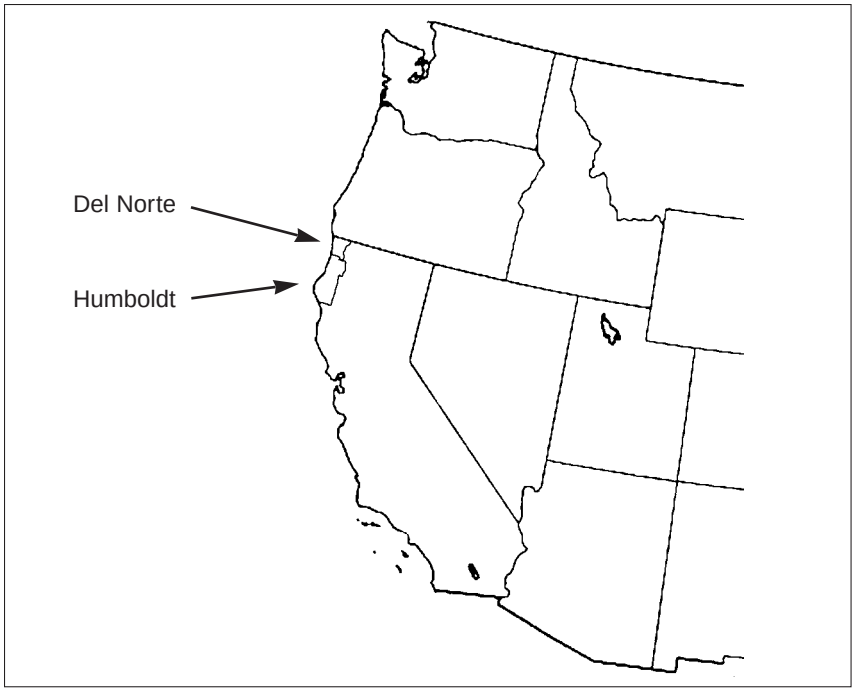

Figure 1—General location of Redwood National Park, Del Norte and Humboldt Counties.

Hudson (1979) provides a summary of the legal battles that forced the National Park Service to take stronger measures to protect the park. As in the spotted owl debate during the 1980s and 1990s, a Federal court found that the Federal agency responsible had failed to uphold the public trust by failing to provide the park with the necessary level of protection. Redwood National Park was threatened by upstream and upslope logging and sedimentation, just as the Forest Service and U.S. Department of the Interior, Bureau of Land Management (BLM) were found to have inadequate plans and protections for the endangered northern spotted owl in northern California, Oregon, and Washington.

Claire Dedrick (in Pincetl 1990), the late 1970s Secretary of Resources for the State of California, describes the genesis of the legislative language that broke the deadlock over how much additional acreage to purchase. Congressman Philip Burton had introduced park expansion bills for several Congresses, but they had languished because of opposition from labor, the timber industry, and local governments. In an interview, Dedrick said “So I thought . . . let’s put together a program; we’ll have a rehabilitation program, a jobs program, and a park acquisition program. Let’s start putting the act together.” Dedrick prepared a legislative proposal for Congressman Leo Ryan’s committee, and recommended the following: “expansion of Park boundaries around the worm [the Tall Trees Grove], regulation of new logging and reduction in upstream erosion sources, and a program to provide full employment to Humboldt County.” Congressman Burton bought into the plan, and as the bill picked up support in Congress, the timber industry relaxed its opposition and sought to steer revisions of the legislation.

The machinations of crafting and passing the legislation are a study in building coalitions, winning key supporters, and making promises generous enough to win over enough opponents. The upshot is Public Law 95-250; a section by section summary follows. President Carter sounded a cautionary note about the labor provisions of the bill as he signed it into law on March 7, 1978 (Carter 1978). After applauding the environmental benefits of the legislation, he added:

> At the same time, however, I must express my serious concerns with the extraordinary worker protection provisions contained in HR 3813. During the consideration of this bill, this administration repeatedly stated its firm resolve to ensure that the full range of existing Federal assistance benefits would be made available to individuals and communities adversely affected by the park expansion. I believe that in the absence of overriding national policy considerations, all workers who have lost jobs through no fault of their own should be treated equally by the Federal Government. While I am signing HR 3813 for the purpose of providing needed protection for Redwood National Park, this action in no way constitutes an endorsement by this administration of special worker benefits programs in future legislation.

It seems from the House Minority Report (House Committee on Interior and Insular Affairs 1978, p. 53) that the Administration never testified on Title II, the Redwood Employee Protection Act. Title II was developed after the hearings had already been completed.

Mechanisms

Redwood National Park Legislation

"Public Law 95-250: An Act to amend the Act of October 2, 1968 (Public Law 90-545), an Act to establish a Redwood National Park in the State of California, and for other purposes" is the legislation that set forth several programs to achieve the multiple purposes of the legislation. In brief, the effect of the law was to expand the park, protect more old-growth adjacent to "the worm," restore cutover watersheds, retrain displaced loggers and millworkers, employ exloggers as RNP workers on restoration, and provide funds to Del Norte and Humboldt Counties. The law sought to revive and sustain the human communities in the region, and to rescue degraded and imperiled redwood ecosystems.

Legislative Purpose

Section 101 of Public Law 95-250 describes the park protection and expansion intents of the legislation:

> In order to protect existing irreplaceable Redwood National Park resources from damaging upslope and upstream land uses, to provide a land base sufficient to ensure preservation of significant examples of the coastal redwood in accordance with the original intent of Congress, and to establish a more meaningful Redwood National Park for the use and enjoyment of visitors.

The statute outlines land acquisition methods, land rehabilitation contracts, and cooperative agreements. It also directs the Secretary of the Interior to provide employment opportunities to people affected by the taking of land, and to contribute to the economic revival of Del Norte and Humboldt Counties in northern California.

Section 102—Economic Impacts—directs the Secretary of the Interior, in consultation with the Secretaries of Labor, Commerce, and Agriculture, to analyze appropriate Federal actions that may be necessary or desirable to mitigate any adverse impacts to public and private segments of the local economy. The Secretaries are urged to pursue any available ways to mitigate local employment impacts. This includes a directive to the Secretary of Agriculture to study timber harvest scheduling alternatives [increases] on the nearby Six Rivers National Forest (USDA Forest Service 1979). This section was included to offer hope of offsetting timber tied up in the park expansion. Yet there was great leeway: "In developing the Alternatives, the Secretary shall take into consideration economic, silvicultural, environmental, and social factors."

Section 103—Preferential Hiring—directs the Secretary of the Interior to create some 60 new staff positions at RNP, and to fill them with people displaced by the legislation. All other Federal agencies operating in Del Norte, Humboldt, or adjacent counties were ordered to give preference in hiring to affected workers as well, and to use contractors who hired affected workers.

Section 104—Annual Reports—requires annual reports for 10 years on the status of land acquisition, watershed rehabilitation, mitigation of adverse economic impacts, National Park Service hiring of affected workers, and the overall management plan for the park. These reports document the effectiveness in meeting congressional intent and will be reviewed at greater length below. Curiously, only the first seven annual reports are in the archives. Reports 8-11 have never been released to the public, and reports 9-11 were never cleared by the Department of the Interior to be sent on to Congress (Redwood National Park 1979-85).

Section 105 appropriates $33 million to carry out the rehabilitation provisions of the act. Sections 106-109 are technical provisions.

Title II covers the REPP. The sections in this title lay out the program and define affected employer and affected employee, for purposes of benefits under the REPP. The broadness of these definitions is addressed below in the U.S. General Accounting Office (GAO) reviews of the REPP (GAO 1980, 1993). Section 203 states that the total or partial layoff of a covered employee is conclusively presumed to be attributable to the expansion of RNP, over a specified period. Sections 204-208 state the formula for the duration of the protection period, amount of severance pay and weekly layoff benefits, and creditable service. Section 210 covers worker retraining at government expense, job search allowances, relocation allowances, and moving expense benefits for affected workers.

Agee (1980) tallied the major legislative options that were considered in Congress, covering the issues of economic impacts, land acquisition, watershed rehabilitation, and protection from economic impacts (table 1). He also compiled contemporary estimates of the net job losses of the RNP expansion (table 2) and concluded that the law seemed to be neither creating nor solving as many problems as predicted by advocates on both sides of the issue.

Table 1—Summary of major legislative options for Redwood National Park expansion

	Economic impacts			
Land acquisition	Direct impact (employees)	Indirect impact (community)	Watershed rehabilitation	Protection from adjacent forest practices
1. No acquisition	1. No assistance	1. No assistance	1. None	1. Rely on state forest practices regulation
2. 21,500 acres (1976 NPS[a] proposed min imum)	*2. Direct subsidies of salaries and benefits plus retraining opportunities	2. Legislate increased public timber cut	2. Rehabilitate park lands only	2. Cooperative agreements with major industry, plus (1)
3. 37,000 acres (no. 2 plus tributary watersheds)		*3. Provide funds for economic diversification and tax reimbursements	3. Watershed-wide rehabilitation ($12 million level)	*3. Authorization to acquire land near park if (1) and (2) fail to solve a specific problem
4. 48,000 acres (A) (from 1975 NPS[a] environmental assessment)			*4. Watershed-wide rehabilitation ($33 million level)	4. Federal regulation of private forest practices over entire watershed if (1) insufficient.
*5. 48,000 acres (boundaries modified from no. 4)				
6. 57,000 acres (no. 2 plus tributary watersheds)				
7. 74,000 acres (Rep. Philip Burton bill)				

* Options incorporated in Public Law 95-250.

[a] NPS = National Park Service.

Source: Agee 1980.

Table 2—Comparative estimates of job losses because of Redwood National Park expansion

Analysis conponents	McKillop[a]	Greenacres[b]	Task force[c]	NPS[d]	QRC[e]	QRC[e]
Date of estimation	April 1977	June 1977	June 1977	Oct. 1977	Feb. 1978	Feb. 1978
Impact timeframe	20 years	20 years	First 2 years	First 2 years	10 years	15 years
Direct jobs (annual)	695	715	894	921	1,328	888
Indirect jobs (annual)	279	653	815	not est.	581	388
Total jobs (annual)	974	1,368	1,709	not est.	1,909	1,276

[a] McKillop, W. 1977. Agee note: "McKillop's 48,000-acre option was a slightly different area. His figures were adjusted here to conform to the estimated timber volume in the final proposal, but using the same assumptions otherwise."

[b] Greenacres Consulting Corporation 1977.

[c] Redwoods Interagency Task Force 1977.

[d] U.S. Department of the Interior, National Park Service 1977.

[e] QRC Research Corporation 1978.

Source: Agee 1980.

Results

Redwood Employee Protection Plan

In a 1980 report to Congress, the GAO found many faults in the design and administration of the REPP. The GAO found that "workers whose layoffs are not related to the park expansion also qualify for the benefits" because the law presumed that any layoffs within a specified period were related to the park expansion. Consequently, "about 88 percent more employees than originally estimated have established program eligibility during the first 18 months of the program." The GAO also found that "the program's exceptional benefits reduce incentives to work, and the Department of Labor's (DOL's) poor management creates problems in program operations." The GAO recommended that Congress delete the "presumptive layoff" provision and disqualify workers who did not fit the tightened criterion. The GAO estimated that 30 percent or more of the employees who had established REPP eligibility had done so through temporary work curtailments such as maintenance shutdowns, adverse weather, and temporary road closures—all reasons not related to park expansion. The GAO also faulted California Employment Development Department procedures that delayed health insurance, pension payments, and retraining programs for 18 months or longer after passage of Public Law 95-250.

The DOL and the California Employment Development Department acknowledged problems in administrating the REPP but noted that the statutory language was clear as far as Congress' intent for the program. The DOL lacked authority to tighten the eligibility requirements or the payout formulas. The GAO compared the benefits provided under REPP to those from other instances where the Federal Government provided special compensation to workers affected by legislation. The comparison is shown in table 3.

Several articles in journals and in the business press complained that the REPP was excessively generous. They argued from the standpoint that the Federal Government had no special obligation to the timber workers. They also said the REPP was inefficient at bestowing benefits and that it was inequitable in creating a special class of the unemployed who received exceptional benefits. The Vice President of Resource Management for Simpson Timber Company severely criticized the REPP, saying that the RNP expansion law had understated the social costs of the park expansion and loss of timberland, overestimated the social benefits from the park expansion, and had created "an expensive new entitlement program to defuse the opposition of labor" (Walker 1984). Walker stated that the work disincentives embodied in REPP were enormous and that it was impossible to distinguish between employees who lost their jobs from the park expansion from people laid off from an early 1980s recession that severely affected the entire U.S. timber industry.

Kroger (1979) described the REPP as having a too-generous benefits formula, and being too broad in who qualified as an affected employee. He said that the RNP expansion law approved by Congress had been a liberal benefits payoff for laid-off loggers, and in describing the spate of special interest groups receiving targeted Federal payments, said, "Never have so many given so much for so few." In signing the conference report on HR 3813, Senator Mark Hatfield said he had agreed to the compromise legislation and signed the report with reservations about including Title II in the bill (House Report 95-931 1977). Senator Henry Jackson of Washington, Congressman Phillip Burton of California, and Congressman Morris Udall of Utah were also among the 10 conferees.

Table 3—Comparison of Federal programs for worker assistance[a]

Program	Monetary benefits[b]	Duration of benefits	Health, welfare, pension payments	Training	Job search allowance	Relocation allowance
Redwood Employee Protection Act. Public Law 95-250	Weekly benefit equivalent to 100 percent of previous earnings with no dollar maximum; or lump sum equivalent to weekly benefit times length of creditable service not to exceed 72 weeks (no dollar maximum)	Weekly for up to 11 years if affected employee reaches age 60 on or before 9/30/84. Lump sum terminates benefits for certain employee categories but not for all employees	Yes, during protection period	Yes	Yes; 80 percent of allowable cost with $500 maximum	Yes; reasonable expenses
Regional Rail Reorganization Act of 1973. Public Law 93-236	Monthly allowance based on previous 12-month gross average ($2,500 monthly maximum), or a lump sum separation allowance not >$20,000. Provides termination allowance for employees with <3 years service	Monthly allowance until age 65 for employees with 5+ years continues for a period equal to the prior years of service. All other benefits cease with taking of lump-sum severance payment	Yes	No	No	Yes
Trade Act of 1974. Public Law 93-618	Weekly allowance equal to 70 percent of average gross weekly wage previously reported	Weekly allowance for 52 weeks except workers who reach age 60 when affected or workers in an approved training program are eligible for 26 additional weeks (78 week maximum)	No	Yes	Yes; 80 percent of allowable cost with $500 maximum	Yes; 80 percent of reasonable cost, and lump sum equivalent to three times weekly average with $500 maximum
Airline Deregulation Act of 1978. Public Law 95-504	Secy. of Labor to determine monthly amounts for each class and craft through regs. Proposed regs. indicate monthly assistance equivalent to 70 percent of average monthly wage, with $1,200 maximum	Monthly until recipient obtains employment, but no longer than 6 years	No	No	No	Yes; reasonable cost

[a] In addition to these targeted programs, as of 1980 there were three other programs that provided compensation to unemployed workers. These were (1) the unemployment insurance program established in 1915 as part of the Federal-state employment security program; (2) unemployment compensation programs for Federal civilian employees and veterans; and (3) disaster unemployment assistance for people whose employment was terminated because of a natural disaster.

[b] Monetary benefits generally are reduced by the full amount of unemployment compensation and a percentage of any earnings during the period benefits are paid. Redwood and Rail Act payments are reduced by estimated Federal-state income taxes. Redwood benefits are further reduced by applicable Social Security taxes, and Rail benefits are reduced by contributions to the Railroad Retirement fund.

Source: U.S. Government Accounting Office 1980.

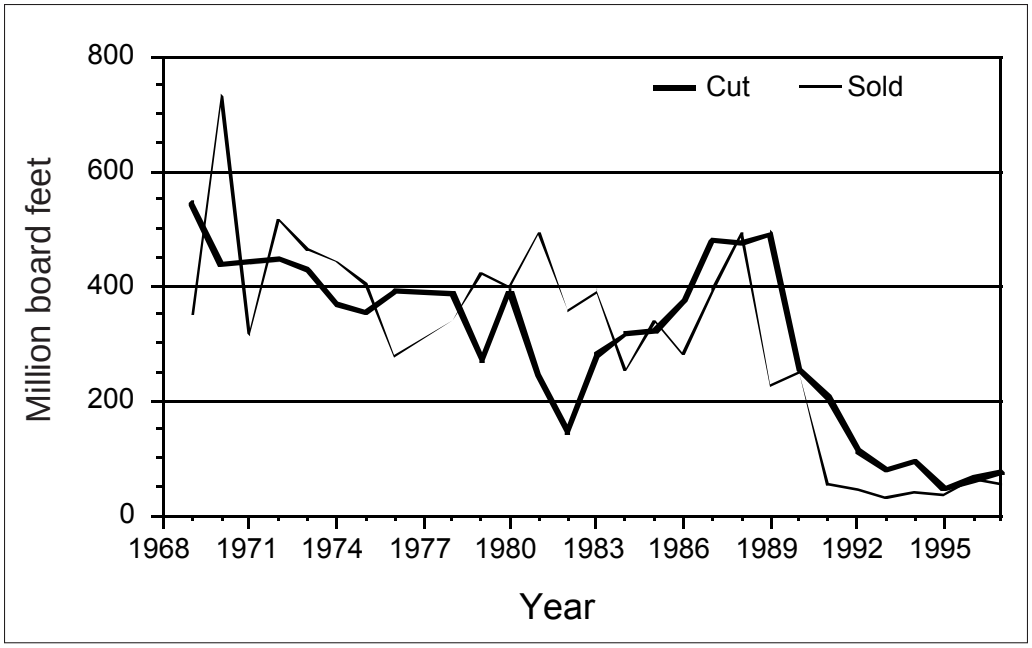

Figure 2—Total volume of timber cut and sold from Klamath and Six Rivers National Forests (no data available for 1977).

Millen (1979) provided a more impartial appraisal of the various job protection mechanisms and layoff aid for displaced workers, while advocating a more informed weighing of the economic, social, and political costs of those benefits. Millen notes, in referring to the RNP legislation and similar legislation affecting transportation workers, that "the recent record indicates that the Congress is sympathetic to the special needs of the claimants for extraordinary relief as the quid pro quo necessary to gain support for necessary legislation." Burton and Alpert (1982) sympathize with the redwood communities and advocate Federal assistance beyond what was provided in the legislation, including the REPP, economic aid to communities, and hiring mandates to Federal agencies. They question choosing more efficient capital-intensive restoration work over labor-intensive methods, and recommend benign neglect on enforcing laws against the marijuana industry. Socioecological planning is seen as the appropriate cure for the "cultural schizophrenia" of the conversion from a frontier culture to one of conservation and management.

Finally, the increases in timber flows from the adjacent National Forests mentioned in Section 102 never really materialized (see fig. 2), although there was an increase in the sales programs of both the Six Rivers and Klamath National Forests during the late 1970s. After that period, sales programs fell during the early 1980s recession and did not recover until the late 1980s before falling again during the northern spotted owl controversy.

Community Assistance and Transitions

In 1993, the GAO briefed House Republicans Robert Michel, Newt Gingrich, Don Young, and others on the long-term effects of the Redwood Employment Training Programs. Michel and his colleagues had requested the information as a way to evaluate President Clinton's proposals for a Northwest Forest Plan, containing as it did parallels in timberland withdrawals and dislocation of timber workers and economic impacts on their communities. The GAO reported on the effects of the RNP expansion legislation on the workers who received assistance, and how the affected communities had changed. The legislation had provided affected workers with weekly or lump sum wage replacement payments, continuation of health and pension benefits, and retraining and employment assistance. Other forms of assistance included economic development loans to communities, a promise of preferential hiring in RNP, and study of increased timber harvests in the Six Rivers National Forest (GAO 1993). The GAOs results (in brief) and lessons learned seem to be well reasoned and substantiated, and are presented below.

Workers—The benefits provided to workers under REPP were generous. As of December 1988, REPP had spent about $104 million on 3,500 individuals. Some workers received as much as $45,000 in severance payments. However, less than 13 percent of these individuals enrolled in retraining. Of those workers who participated in retraining, officials estimate that about 95 percent completed their training and 25 percent of those relocated. Because program records were no longer available, however, we could not determine what happened to individual workers after they received benefits or retraining.

The assistance provided to workers dislocated by the expansion of RNP was extensive, but few workers enrolled in retraining programs. Many workers received wage replacement benefits or severance payments, but these benefits were not tied to retraining. In addition, because DOL regulations for retraining were delayed until 14 months after program implementation, educational service providers were reluctant to develop retraining programs, and officials lost contact with many of the dislocated workers before they could be provided with retraining.

Communities—Although we cannot identify what happened to the individual workers, we were able to analyze some changes in the affected communities during the period of the park's expansion. It seems that Humboldt County remained relatively stable during the transition, whereas Del Norte County experienced more fluctuations. For example, per capita income dropped dramatically in both counties, but the decline was deeper and longer in Del Norte County. Further, average new housing values fluctuated more severely in Del Norte County.

We could not measure the impact of Federal assistance on either community (or county), however, because other factors also affected these communities during this period. For instance, officials in Humboldt County said that a recent influx of retirees to the area helped stabilize property values and retail sales. Likewise, officials in Del Norte County said that the state prison built in September 1989, created 1,800 direct and indirect jobs in Del Norte County.

Lessons learned—The GAO (1993) investigators pointed up REPP issues relevant to assisting dislocated timber workers in the 1990s:

If the program is to assist workers in obtaining new skills so they can reenter the workforce, receipt of benefits needs to be closely tied to participation in training.

Efforts to provide retraining and income support cannot sustain workers or the communities in which they live without the creation of new job opportunities. Del Norte County's economy did not stabilize until the state prison was built.

Helping dislocated workers before or at the time of job loss increases the likelihood that they will participate in assistance programs, which in turn facilitates their transition to new employment. Unless retraining programs are implemented quickly, program officials may lose contact with dislocated workers.

Other economic assistance—The GAO also found that the U.S. Economic Development Administration (EDA) gave community agencies about $13.4 million for high-risk business loans and infrastructure development that, according to local officials, created over 600 jobs. In addition, RNP was required to give preferential hiring to dislocated workers wherever possible. Park advocates projected that 2 million annual visitors to the park would stimulate the growth of tourism-related jobs, but few dislocated workers qualified for long-term park jobs, and the number of annual visitors was below original estimates. The government also designated Six Rivers National Forest as an alternative timber harvest area, but one county official said that the harvest had been reduced significantly because of environmental restrictions (see fig. 2).

General Accounting Office's findings are borne out by an analysis of the RNP annual reports, though the final four reports were not available. The reports show that RNP was successful in spending watershed restoration contract money on local firms, who in turn gave "full consideration" to hiring affected woods workers though the park published no data on how many were actually hired. As of the 1984 annual report, there were only four permanent RNP employees who had been affected woods workers, plus several workers hired into temporary positions. From 1978 to 1984, in no year were there more than 13 RNP positions (temporary, term, or permanent) filled by affected workers. The USDA Forest Service hired "a number" of displaced woods workers for seasonal work in the Humboldt nursery, but again, the park reports no numbers. Timber harvests from the Six Rivers rose briefly but plummeted as USDA FS officials scaled harvests down to protect habitat for the spotted owl and marbled murrelet *(Brachyramphus marmoratus)*. On the nearby Klamath National Forest, the 350,000-acre Happy Camp district harvest went from 50 million board feet annually in the mid-1980s to 8 million as of 1993, leading to headlines such as "the slow death of Happy Camp" (Paddock 1995). As described above, the expansion legislation made possible scientific advances in doing watershed restoration work, but the benefits to affected workers and communities were limited.

Figures 3 and 4 show aggregate measures for income and employment in Del Norte and Humboldt Counties. The economic impacts were more severe for Del Norte County, and Humboldt County recovered more quickly. The Humboldt County economy was more diversified, and its residents were more highly educated (McGinnis and

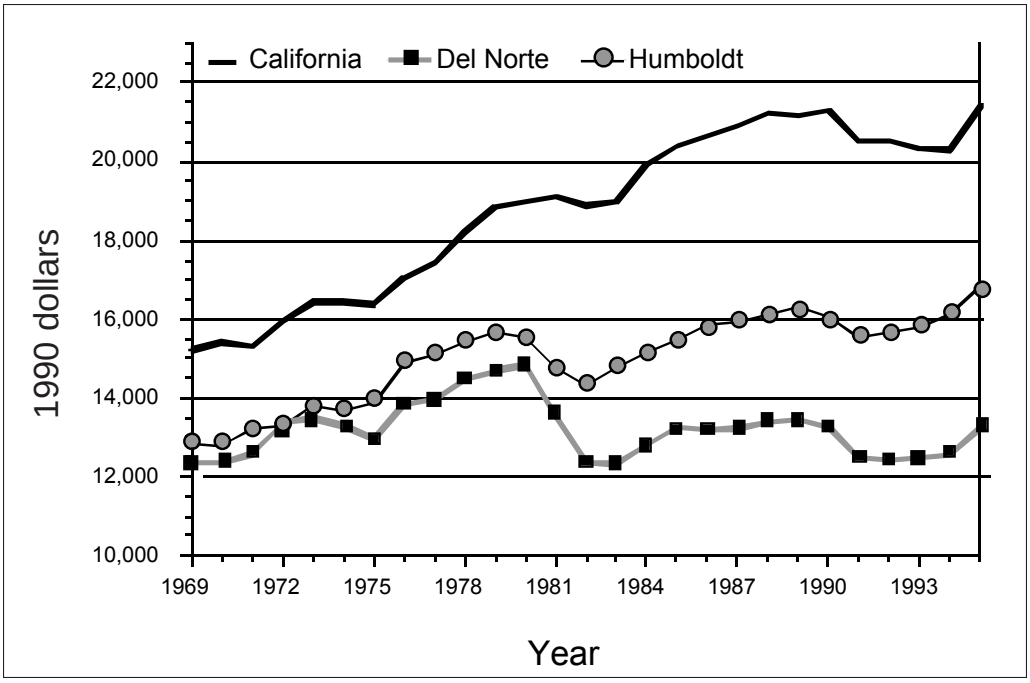

Figure 3—Per capita income for the State of California, Del Norte and Humboldt Counties.

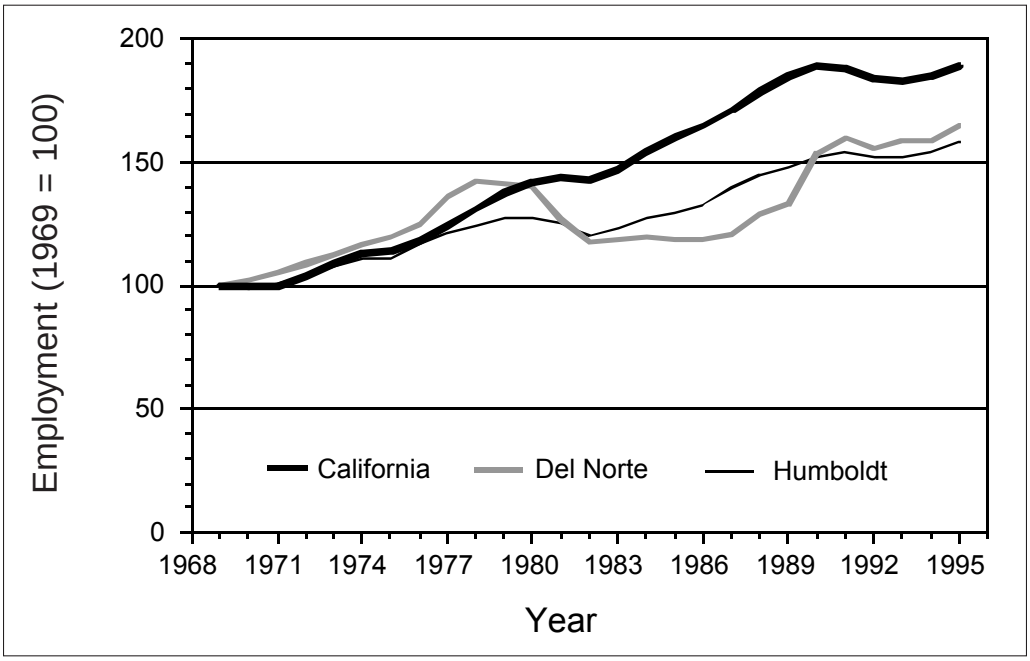

Figure 4—Employment index of total employment.

others 1996). Timber harvests from private lands rebounded more quickly and more strongly in Humboldt County. The size of the Del Norte government sector (including the state prison employment and income) is double the state average, and agriculture is a relatively large sector, whereas manufacturing and trade and finance are small. As of 1993, Del Norte County ranked last in the state for per capita income, whereas Humboldt was 34th of the 58 California counties.

The GAO showed that in both counties, the number of timber industry workers declined from 1978 to 1992 even as the rest of the county economy grew, so the timber shrank in absolute and relative size. In Humboldt County, 6,700 timber industry workers were 17 percent of all workers in 1978; by 1992 there were 4,200 timber workers comprising less than 10 percent of the workforce. In Del Norte County, 1,475 timber industry workers were almost 25 percent of the 1978 work force; by 1992, there were 350 timber industry workers comprising under 5 percent of the work force.

As with the McGinnis and GAO findings, an assessment of California's forests and rangelands by the California Department of Forestry (1988) does not isolate strictly the effects of the RNP expansion on the north coast economy. It chronicled several long-term trends in the timber industry, including declining mills, increasing efficiency in conversion, and concentration in terms of scale, location, and type of product. The analysis points up the dynamic nature of local and regional economies, and the difficulty of attributing change to a specific factor (such as RNP acquisition of 48,000 acres of timberland, most of which was cutover) against a changing baseline. Thus it is difficult if not impossible to say whose economic forecasts (Agee 1980) were closest to the mark.

Watershed Restoration and Jobs-in-the-Woods Program

Redwood National Park scientists quickly found, and confirmed through subsequent studies, that hiring dozens of former mill workers and saw hands to do manual labor restoring roads and streams was problematic and inefficient. Because Congress had granted generous unemployment benefits to a broad class of displaced workers, with no requirement for seeking or accepting work (GAO 1980, 1993), it proved difficult to recruit enough labor for the work crews, and more skilled jobs within the park failed to materialize. It is not clear how well the Jobs-in-the-Woods (JITW) Program worked, because the state DOL did not track displaced timber workers long term to see if retraining, relocation money, and hiring on at the National Park Service had worked.

The RNP scientists discovered that using heavy equipment (large excavators, bulldozers, and dump trucks) to restore sideslope roadbeds and fix major stream drainage problems was far less expensive (in dollars per cubic yard of sediment avoided) and far more effective than hand labor crews at preventing erosion and keeping sediment out of streams (Spreiter 1992). They found that reclaiming original stream channels, restoring hillslope morphology, and recovering sidecasted topsoil were the most cost-effective ways to achieve the objectives of reducing management-related erosion and encouraging natural patterns of revegetation; "these treatments are permanent, long term, and maintenance free" (Steenson and Spreiter 1992). Between 1977 and 1990, about $10 million was spent on site-specific watershed rehabilitation, and 175 miles of road were treated.

The RNP scientists concentrated their efforts on the ecosystem restoration aspects of the park expansion—protecting the old-growth redwoods from upslope and upstream erosion, through retiring roads and revegetating cutover lands. The mandate to retrain and employ laid-off loggers was much weaker. The Watershed Restoration Manual (Spreiter 1992) states that in the erosion-control work, "cost effectiveness is determined by considering cost per cubic yard of sediment saved from entering the stream system." This is the same criterion recommended currently by the Pacific Rivers Council, as discussed below. The NWFP attempts to prevent sediment and create jobs. Information on erosion control treatments and rehabilitation costs is in tables 4 and 5.

After some 15 years of trying out watershed restoration techniques in coastal northern California, RNP scientists have expanded their work to cover watersheds farther north along the coast. Two of the RNP scientists formed a consulting firm, Pacific Watershed Associates (PWA), in Arcata. Their firm has done watershed restoration work for state and Federal agencies, for private forest land owners, tribes, and nonprofits such as the Pacific Rivers Council. The most current findings are described in the "Forest Management and Economic Development—Mechanisms" and "Watershed Restoration and Jobs-in-the-Woods Program—Mechanisms" sections.

Effects on Timber Supplies

The effect of RNP expansion on timber supplies and prices is beyond the scope of this paper. Timber resource statistics are available from the Pacific Northwest Research Station of the USDA Forest Service. Current reports include Waddell and Bassett (1996), Bolsinger and Waddell (1993), and Beardsley and Warbington (1996). Oswald's (1978) report on sharply declining prospects for sawtimber output from California's north coast (1975-2000) was sharply criticized by timber industry economists who disagreed with the timber supply trends (e.g., McKillop 1977). Loggers in a convoy of logging trucks protested the draft legislation and Oswald's forecast, in a demonstration in Washington, DC, in 1977 (Craig 1977). Olson and others (1988) addressed the stumpage price effects of the legislation on old-growth redwood, and found that "significant price enhancement occurred, somewhat in advance of passage of the authorizing legislation" as the park expansion "reduced the existing merchantable stock of old-growth redwood by 15 percent."

Conclusion

Redwood National Park Expansion Legislation

According to the literature, GAO reviews, and the park's own annual reports, the legislation was a clear success in adding acreage and protecting the redwoods, albeit at a much higher cost than had been anticipated. The legislation was successful in funding watershed restoration work; resultant improved restoration methods in ways that are now in use across western Oregon and Washington in areas affected by the NWFP, and on state and private lands. The track record on mitigating economic effects on workers and communities is mixed. The RNP experience provided information about what does and does not work in watershed assessment and restoration techniques, what different techniques cost, and yield in sediment reductions. The experience served as an early model for the JITW program for displaced timber workers, albeit a flawed model, illustrating the effects of poorly anticipated (Congress) or operated (California Employment Department) programs and incentives.

Table 4—Cost-effectiveness of primary erosion-control treatments used to minimize sediment yield in Redwood National Park

Treatment	Average cost	Cost-effectiveness range
	Dollars	*Dollar/yd³ "saved"*[a]
Correction of stream diversions	125-4,000 each[b]	0.1-0.5[c]
Excavation of haul road stream crossings:[d]		
Under 750 cubic yards	About 2,000 each	1-10
750-1,000 cubic yards	3,000-3,500 each	1-10
Endhauling required	About 4,000 each	1-10
Excavation[d] of skid-trail stream crossings	125-1,350 each	1-10
Road outsloping	2,500-9,500 per mile	1-10[e]
Removal of perched debris from perimeter of yarder pads	1,000-5,000 each	1-10
Large landslide excavations[f]	20,000-30,000 each	1-10
Decompaction	350-450 per mile	unquantified[h]
Construction of cross-road drains[g]	1,000-3,000 per mile	unquantified[h]
Waterbar construction:		
Equipment construction	5-50 each[i]	unquantified[h]
Hand-labor construction	30-300 each[j]	unquantified[h]

[a] Goal is to minimize sediment production and yield (i.e., to "save" soil from entering the stream system). Complete loss of the excavated material is anticipated in a period of 10 to 100 years. Cost-effectiveness assumes total loss without reference to time.

[b] Cost of diversion correction is associated with stream crossing excavations at the point of diversion.

[c] Assumes diverted flow would continue to cause erosion and had not yet created a stable, noneroding channel.

[d] Excavations usually performed by bulldozer and hydraulic excavator combination.

[e] Assumes erosion would have occurred had the work not been performed, and it would have been translated into sediment yield in adjacent stream channels. Benefits from the prevention of diversions and associated gully erosion are not accounted for.

[f] Treatment increases success of revegetation and decreases surface runoff. There is an unquantifiable decrease in road surface, ditch, gully, and downslope stream channel erosion.

[g] Drains are constructed every 50 to 150 feet.

[h] Treatment results in reduced concentration of surface runoff, which produces an unquantifiable decrease in road surface, ditch, gully, and downslope erosion.

[i] Range in cost is related to accessibility of work site.

[j] Average cost is $60 each; range in cost is dependent on length and substrate hardness.

Source: Steenson and Spreiter 1992.

Table 5—Summary of rehabilitation costs in Redwood National Park

General description of treatment[a]	Range typical cost per mile
	Dollars per mile
Small road, gentle terrain, few stream crossings	10-20,000[b]
Medium sized road, frequent small to medium sized stream crossings	20-40,000[b]
Major, mid-slope road, frequent large stream crossings	40-70,000[b]
Major road, low on slope, frequent large stream crossings, unstable terrain	100-250,000[b]
Rock quarries[c]	1-2,000 per acre[b]
Straw application at 63 bales per acre	600-950 per acre[d]
Tree planting, about 400 per acre	300-1,200 per acre[d]

[a] A standard array of treatments is as follows:

1. Outsloping (fill against cutback) averages $10,000 per mile or $1 per cubic yard along a 30-foot wide, 8-foot deep cut along the outboard edge, finished slopes of 3:1, that removes 1.7 cubic yards per linear foot of road.
2. Exported outsloping (fill moved some distance to a stable fill site) averages $1.50 cubic yard but differs with distance to fill site.
3. Decompaction (to a 2-foot depth) averages $800 per mile or $0.15 per linear foot for a 30-foot wider area.
4. Cross road drains (large waterbars) average $1 per linear foot of drain.
5. Skid trail stream crossings average $2 per cubic yard (includes 20 percent for gaining access to sites).
6. Haul road stream crossings vary with size, amount of organic debris, amount of stream flow, fill saturation, et. cetera. Relative straight forward crossings average $1 to $2 per cubic yard.
7. Truck endhauling, if required for exported outslopes or stream crossings, ranges from $3 to $5 per cubic yard for hauling distances up to 2 miles.

[b] Cost range is for heavy equipment only.

[c] Includes mineral materials and common borrow.

[d] Cost variation is related to density of application and how remote the site is.

Source: Steenson and Spreiter 1992.

Northwest Forest Plan

Genesis

A series of injunctions and litigation against Forest Service and BLM timber harvests within the range of the northern spotted owl led President Clinton to convene a Forest Summit in Portland, Oregon, on April 2, 1993. In July 1993, he released the Administration's "Forest Plan for a Sustainable Economy and Sustainable Environment," better known as the Northwest Forest Plan. The following sections and information are drawn largely from the Tuchmann and others (1996) interim report on the Northwest Forest Plan, and from other agency and administration documents (e.g., Lyons 1996, 1997; Rheiner and others 1996).

Administration officials were careful to prepare a NWFP that would meet judicial muster on forest management and endangered species grounds, and have economic development and agency coordination angles to make the transition to lower Federal timber harvests less painful. The GAO "Lessons Learned from the Redwood Employment Training Programs" may have been in mind. It is clear from the summary report, and from interim documents, that the NWFP sought to target assistance to workers and communities that needed help, while meeting a handful of other objectives including "ecosystems investments" such as watershed restoration.

Mechanisms

Forest Management and Economic Development

The NWFP has three main components: forest management, economic development, and agency coordination. To address the forest management component, Clinton formed a Forest Ecosystem Management Assessment Team (FEMAT 1993), headed by Jack Ward Thomas. The task of FEMAT was to "identify [forest] management alternatives that attain the greatest economic and social contribution from the forests of the region and meet the requirements of the applicable laws and regulations." Forest Ecosystem Management Assessment Team produced 10 options; Clinton chose Option Nine, which formed the basis of the forest management component. Information on the FEMAT findings and background is in the supplemental environmental impact statement (USDA and USDI BLM 1994a), in the FEMAT report titled "Forest Ecosystem Management: An Ecological, Economic, and Social Assessment" (1993), and in the Forest Service's final environmental impact statement (EIS) on management for the northern spotted owl in the National Forests. The 1994 Record of Decision (USDA and USDI BLM 1994b) amends the planning documents for 19 National Forests and 7 Bureau of Land Management Districts to redesignate land into late-successional reserves, adaptive management areas, managed late-successional areas, administratively withdrawn areas, riparian reserves, and matrix lands.

The economic development component involved another administration team, including representatives from the Council of Economic Advisors; Office of Management and Budget; Domestic Policy Council; the Departments of Agriculture, Commerce, Interior, and Labor; and the Environmental Protection Agency and the Small Business Administration. A director of the National Economic Council chaired the team, which consulted with the Washington, California, and Oregon Governors' offices, non-Federal elected officials, tribes, and the public to develop assistance programs. The economic assistance program focused on providing financial and technical assistance to workers, businesses, and communities that had been affected by reductions in Federal timber supply, and recommended ways of forming Federal, state, and local partnerships.

The NWFP operated through many Federal agencies and existing and new programs, with an overlay of coordination through Community Economic Revitalization Teams (RCERTs 1996) and the Office of Forestry and Economic Development.

Tuchmann and others (1996) provide an explanation of the NWFP mechanisms and funding amounts (tables 12, 14-19 in Tuchmann and others 1996) for the various assistance programs. Assistance came through various Federal agencies, through existing and new mechanisms. Total Federal funds spent in the region totaled $126.6 million in fiscal year 1994, $217.8 million in fiscal year 1995, and $215.8 million in fiscal year 1996. Tables 6-8 show the funding by initiative: ecosystem investment, communities and infrastructure, business and industry, and workers and families.

Table 6—Northwest Forest Plan expenditures in California, Oregon and Washington under the Northwest Economic Adjustment Initiative fiscal year 1994-96

	Funds spent in the region		
Program by category of assistance	FY 1994	FY 1995	FY 1996
Ecosystem investment	31,999,000	33,536,664	31,510,000
Communities and infrastructure	47,404,000	115,283,653	108,200,000
Workers and families	8,400,000	19,200,000	12,970,000
Business and industry	38,801,900	49,823,827	63,150,000
Total	126,604,500	217,844,144	215,830,000

Source: Tuchmann and others 1996.

Table 7—Agency spending on watershed restoration/Jobs-in-the-Woods under the Northwest Economic Adjustment Initiative

	Funds spent in the region		
Department	FY 1994	FY 1995	FY 1996
Forest Service	20,000,000	12,145,100	13,510,000
Bureau of Land Management	10,869,305	5,000,000	7,580,000
Fish and Wildlife Service	3,264,978	1,000,000	2,100,000
Bureau of Indian Affairs	2,988,281	1,000,000	3,000,000
Total	37,122,564	19,145,100	26,190,000

Source: Tuchmann and others 1996.

Table 8—USDA Forest Service spending on the Northwest Economic Adjustment Initiative, by program

	Funds spent in the region		
Program	FY 1994	FY 1995	FY 1996
Watershed restoration/Jobs-in-the-Woods	20,000,000	12,145,100	13,510,000
Old-growth diversification	4,800,000	6,348,000	2,890,000
Community assistance	9,306,977	9,598,000	10,900,000
Total	34,106,977	28,091,100	27,300,000

Source: Tuchmann and others 1996.

Watershed Restoration and Jobs-in-the-Woods Program

The Final Supplemental EIS (USDA Forest Service and USDI BLM 1994a) describes what the Administration had in mind for ecological investments, as far as marrying ecological restoration with worker retraining, including the Jobs-in-the-Woods Program:

> Ecological investments—Short-term ecological investments are expected to focus on existing or proposed "off the shelf" restoration projects that can be quickly implemented. Intermediate efforts will focus on watershed restoration by the BLM, Forest Service, Fish and Wildlife Service, and the Environmental Protection Agency to provide family wage jobs with local hiring preferences. Included in this effort will be expansion of the Forest Service's stewardship projects and coordination with the Oregon resource trust. Restoration through watershed maintenance, ecosystem restoration and research, environmental monitoring, and forest stewardship will improve the condition of the region's ecosystems, create jobs in timber-dependent areas, improve water quality, and increase salmon stocks to avoid salmon listings and improve commercial fishing.

The standards and guidelines in the EIS (1994b) emphasized that watershed restoration will be a way to recover fish habitat, riparian habitat, and water quality, and that restoration will be based on watershed analysis. The purpose of the watershed-level analysis was "to identify areas of greatest benefit to cost relationships for restoration opportunities and greatest likelihood of success." The nine Aquatic Conservation Strategy objectives do not include an objective of retraining or employing timber workers.

Despite the Administration's desire to solve the coastal Northwest's ecological, economic, and social problems simultaneously, the appropriations language for the Jobs-in-the-Woods Program targets watershed restoration, and gave specific watershed restoration guidelines coming from FEMAT's Aquatic Conservation Strategy (as highlighted in Tarnow 1995):

- an interagency preliminary watershed analysis will be completed before any project is undertaken.
- an interagency-interdisciplinary scientific review team should be established to review and approve projects.
- projects which help secure key watersheds will have the highest priority, particularly those watersheds where more indepth analyses and planning have been done.
- funds are to be used for both road projects (closure, obliteration, revegetation, and drainage) and watershed projects (riparian revegetation, erosion control, and slide stabilization).
- projects selected should be those with the greatest impact on factors limiting salmon, and those favoring long- over short-term impacts.

The Administration's subsequent desire to maximize ecological restoration and maximize employment of displaced workers is borne out in internal and public documents. Opinions differ, then and now, on which objective took priority. Agency officials openly admitted to tensions between the objectives, and kept stating that the program would accomplish all objectives. For example, a Regional Ecosystem Office "White

Paper" (Ochs 1995) observes that "Since the creation of the watershed restoration/ Jobs-in-the-Woods Program in fiscal year 1994, there has been variety of interpretations as to the intent and focus of this program . . . . The program should not be viewed as restoration or jobs but rather as restoration and jobs." The Administration developed procedures for setting priorities for restoration work, based on improvements to fish and riparian habitat and water quality; it developed another set of procedures for the Jobs-in-the-Woods Program, based on levels of unemployment, available skills, diversity of industry, and several other nonecological criteria. Statements for "linking economic strategy with restoration priorities" gave no real guidance on how to rank projects, beyond the idea of creating separate economic and ecological indices and summing them to rank projects. Ochs observes that "Clearly the intent is to do the most ecologically sound projects . . . . [but] In some cases projects are being selected based on financial capability rather than ecological merit." There was also the issue that some felt that different agencies had differing purposes and goals regarding ecosystem restoration and training.

The Ecosystem Investment Team's 1996-98 Action Plan shows the same eagerness to assert that ecosystem stewardship and work force training are being equally well accomplished. Many goals, objectives, and action items are enumerated and assigned. The objectives are lofty, but there is little mention that yards of sediment avoided do not necessarily equate to numbers of new permanent family wage jobs. Objective A under goal 1 is an example: "Design and package projects in a way that leads to long-term employment with family wages and benefits, logical career paths, sustainable communities, healthy ecosystems, and viable businesses."

Watershed Restoration and Jobs-in-the-Woods Program—Southwest Washington Province

The tension between those two objectives also surfaced in late 1995 and early 1996 on the Advisory Committee to the southwest Washington province, which consisted primarily of the Gifford Pinchot National Forest. The Forest Supervisor, Ted Stubblefield, presented the advisory committee with a ranked list of ecosystem restoration projects and a half-million dollar budget. The committee included representatives of industry, environmental groups, utilities, and local government. Everyone took turns commenting on how they would choose among the projects. Some people wanted to select projects that provided the greatest number of jobs; others wanted such projects as restored trout fishing areas, road work, and improved campgrounds. The guidance given by Stubblefield was to go with how his staff had initially ranked projects, and the advisory committee eventually agreed with all his recommendations, with a couple of minor rerankings and expressing a desire to allocate money for monitoring. Stubblefield did not explain how his staff arrived at their rankings, except that these were all "do-able" projects that were ready to go. During the same period, $17 million came to the forest to repair flood-damaged roads, yet the advisory committee was told they had no say over how the money was spent—some wanted to decommission roads, others to divert the money to stream restoration work, and still others to fund nurseries and hatcheries.

Results

Watershed Restoration and Jobs-in-the-Woods Program

The Pacific Rivers Council has long been involved in promoting watershed restoration to benefit native fish species. The Pacific Rivers Council commissioned a first-year review of the Jobs-in-the-Woods Program. Tarnow (1995) found that the program was falling far short of ensuring that the rural communities and forest ecosystems got the greatest possible benefit from the program, and she made several general as well as specific recommendations. Tarnow noted that the selection process for restoration projects was supposed to include a preliminary watershed analysis, local interagency team review, and a provincial team review; and that this process was supposed to ensure that projects had high ecological value and fit the priority restoration needs of the basin as a whole. Instead, she found that most projects were "shelf stock" from before FEMAT, and so were likely to fall short of addressing the Aquatic Conservation Strategy's goals. That strategy was a key part of FEMAT and the NWFP, and Judge Dwyer's ongoing approval hinged on it being carried out. Further, Tarnow found that it was not feasible to evaluate the ecological merits of the restoration projects that had been undertaken.

Tarnow reviewed the employment aspects of the Jobs-in-the-Woods Program and found good success in directing contract money to target counties, thanks to waivers of competitive bidding requirements. The program failed to provide significant employment opportunities for dislocated workers, "creating frustration and pessimism among community leaders and those hoping to gain from the program." Specific roadblocks to program success were:

- There was no certainty that the local dislocated workers would be hired or paid family wages.
- There were no incentives for employers to train the workers and contribute to workforce development.
- The lack of consideration given to employment opportunities when drafting contracts made it unlikely that much success would be achieved in creating longer term, stable employment for the workers.
- Program funding was tied to congressional appropriations and hence was limited and unstable.
- The contracting waiver was also subject to congressional whims.

Tarnow and the Pacific Rivers Council recommended that the project move to multiobjective, multiyear, stewardship contracts as a way to meet both ecological and employment objectives. With respect to smoothing the economic transition for dislocated timber workers, she said that the program had been oversold, that in reality there was no way that the program could replace all the jobs that had been lost in the timber industry.

The Effects of the Redwood National Park Experience on Watershed Restoration Techniques

The field of restoration ecology is "aggrading," in that it is building on lessons learned over the past several decades. One such thread extends from the hydrologists, geologists, and other scientists who worked on RNP restoration, to a modern-day consulting firm, (Pacific Watershed Associates [PWA] 1993), and to the Pacific Rivers Council. Pacific Watershed Associates has developed several papers on watershed

Table 9—Sample techniques and costs for decommissioning forest roads

Treatment	Typical use of application	General cost[a]
Ripping or decompaction	Improve infiltration; decrease runoff; assist revegetation	$500-1,600 per mile
Construction of cross-road drains	Drain springs; drain insloped roads; drain landings	$1 per foot ($25-$50 each)
Partial outsloping (local spoil site; fill against the cutbank)	Remove minor unstable fills; disperse cutbank seeps and runoff	$1 per cubic yard; $2,500-9,500 per mile
Complete outsloping (local spoil site; fill against cutbank)	Used for removing unstable fill material where nearby cutbank is dry and stable	Averages $10,000+ per mile ($1 /yd^3)
Exported outsloping (fill pushed away and stored down-road)	Used for removing unstable road fills where cutbanks have springs and cannot be buried	$1-$4 per cubic yard, depending on push distance
Landing excavations (with local spoil storage)	Used to remove unstable material around landing perimeter	$1-$2 per cubic yard; high organics can increase cost
Stream crossing excavations (with local spoil storage)	Complete removal of stream crossing fills (not just culvert removal)	Averages $1.50-$3.50 per cubic yard but can vary considerably
Truck endhauling (dump truck)	Hauling excavated spoil to stable, permanent storage location where it will not discharge to a stream	$3-$5 per cubic yard on top of basic excavation work

[a] There are direct treatment costs for equipment working at a site. They do not include transportation, moving from site to site, overhead, supervision, layout, or any other costs. Costs will differ from site to site and watershed to watershed. Heavy equipment treatments performed by using D-7 and D-8 size tractors and hydraulic excavators with average 2 cubic yards bucket size. Costs will differ with equipment types and operator experience. Data from PWA and NPS (1992).

Source: Pacific Rivers Council 1996.

assessments, road closure techniques, and methods for choosing and implementing watershed restoration[1] [2] (Weaver and Hagans 1996) in coastal forests. Pacific Watershed Associates has also contributed to a series of technical reports published by the Pacific Rivers Council (Bradbury and others 1994, Pacific Rivers Council 1996) as guides to restoration of watersheds and native fish in the West.

Chapter four of the 1996 Pacific Rivers Council handbook is by Weaver and Hagans, covering watershed restoration with a focus on roads and sediments. Their findings on road treatments are reproduced in table 9, drawing on National Park Service data and their own work as consultants to private and public land owners. They conclude that:

> It is now generally recognized that if upper watershed areas are managed properly, and managed for sediment control, streams will eventually recover to a self-sustaining, productive condition. In combination with protective management of the watershed, other risk reducing actions can be implemented to lessen the

[1] Weaver, William; Hagans, Danny. [n.d.] Techniques and costs for effective road closure. Unpublished report. On file with: Redwood National Park, 1125 16th Street, Arcata, CA 95521.
[2] Weaver, William; Hagans, Danny. [n.d.] Watershed assessments and drainage basin restoration to protect and restore fisheries. On file with: Redwood National Park, 1125 16th Street, Arcata, CA 95521.

threat from existing and potential sources of erosion and sedimentation. These include road decommissioning and road upgrading, as well as changes in current land management practices.

In looking back at the RNP experience, the Pacific Rivers Council noted advances in watershed restoration techniques, as well as shortcomings:

In general, the effective techniques in RNP were found to be a careful survey and assessment of road drainage and diversion problems, obliteration of problem road surfaces and fills, "deconstruction" of road crossings, and recontouring of disturbed slopes, by using heavy equipment. The use of techniques such as removing culverts, recontouring disturbed slopes, and elimination of fill by using heavy equipment addressed the largest potential sources of sediment in the basin (exclusion of large, natural landslides, which are difficult to control). A range of other techniques that focused on treatment of the more visually troubling sources of erosion such as surface and rill erosion and ravel of exposed soil surfaces, were judged to be more cosmetic than ecologically significant, at least in terms of overall sediment input into the basin.

The Redwood Creek program was a major step forward in that it addressed causal processes on a large scale. Nevertheless, it suffered from drawbacks. The strategy focused on the goal of reducing sediment yield park-wide, but did not provide a rationale to focus restoration activities in parts of the watershed that play crucial ecological roles, such as, refugia for native fish and other aquatic organisms. The expanded park boundaries did not include the headwater portions of Redwood Creek, and logging and other development of private lands in the upper basin have continued even as millions of dollars were spent on restoration of the lower basin. "The result . . . has been that the new effects of logging the upper basin appear to have offset the gains made by restoration made within the park" (Pacific Rivers Council 1996).

The solution advocated by the Pacific Rivers Council is summed up in the phrase "Protect the best, then restore and reconnect the rest." The report outlines planning and assessment processes (such as in fig. 5 for riparian-stream ecosystems), along with findings about how to set priorities, carry out the work, and monitor the results. It is important to note that the Pacific Rivers Council priority is restoring native fish; employment or retraining of displaced woods workers, or reviving timber-dependent communities, are distant considerations.

In terms of watershed assessments that are advocated as part of watershed restoration, they have turned out to be voluminous, technical documents. One example is the watershed assessment conducted by PWA. The 1993 report, "Budd Creek and Vicinity Watershed Assessment Report: An Erosion Inventory and Plan of Action for Erosion Prevention and Erosion Control in the Budd Creek Watershed, and Vicinity, Umpqua National Forest, Oregon," identified the most important sediment sources, ranked the most cost-effective control projects, and analyzed the effects of past and current land management practices. The favored solution is "erosion-proofing" unneeded logging roads, as opposed to just closing and abandoning them. The consultants recommended a 2- to 3-week slate of projects using heavy equipment, specifically an excavator and D-7 tractor, plus some hand labor for seeding and mulching.

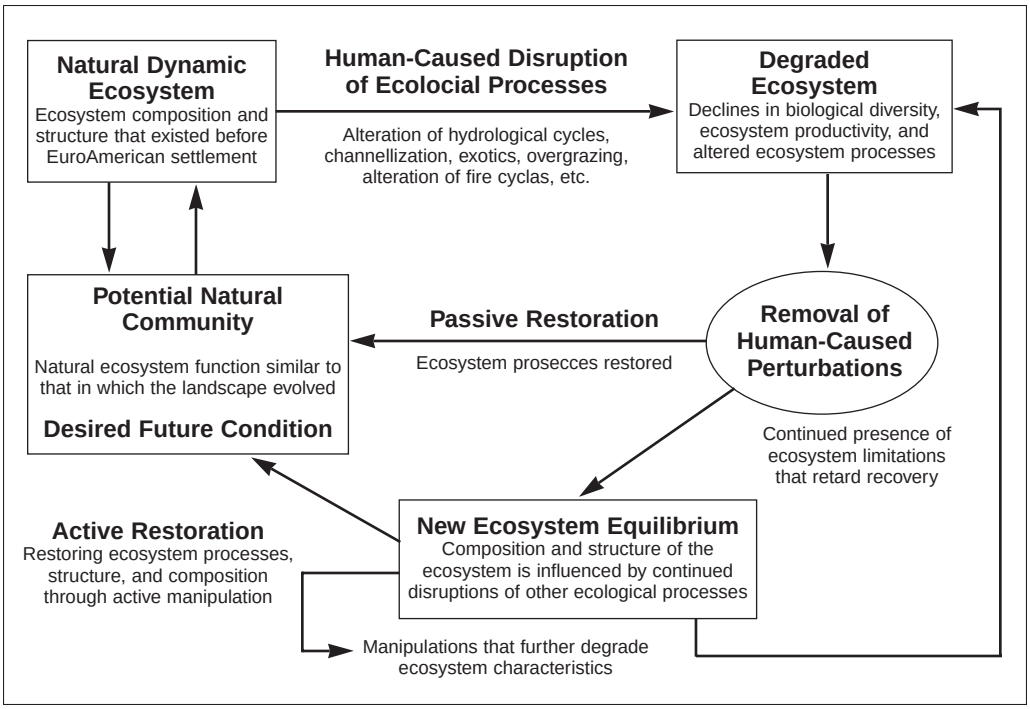

Figure 5—Conceptual approaches for the ecological restoration of western North America riparian-stream ecosystems. Source is Pacific Rivers Council Healing the Watershed Workbook II.

What is clear from these recommendations is that the most effective way of protecting and restoring watersheds is not to employ armies of unskilled laborers. Pacific Watershed Associates does not discuss establishing training programs to teach unemployed woods workers new skills; the PWA makes site-specific recommendations on how to do the best possible job, and concludes that skilled heavy equipment operators and their expensive machines are the most cost-effective way to do it. It may be worth repeating that the principals in PWA were scientists on the RNP payroll for many years who had worked on restoration projects.

The timber industry also has undertaken its own versions of watershed analysis, ecosystem restoration, and habitat conservation. By and large the industry has focused on stabilizing forest roads, and ensuring that landowners retain as much flexibility as possible in their on-the-ground forest management. The National Council of the Pulp and Paper Industry for Air and Stream Improvement (NCASI), in Corvallis, Oregon, has been a clearinghouse for information on forestry nonpoint source control, and has formed a forest watershed task group, held symposia (NCASI 1995, 1996), and called on hydrology and forestry experts. Professional foresters have been active in

promoting new methods of analysis and management (Haak 1995, O'Hara 1996, Phillips 1994, Toth 1996). The literature on watershed restoration has expanded greatly (e.g., Harr and Nichols 1993, Megahan and King 1985)[3] as has the related study of road closing, decommissioning, and obliteration (Moll 1996) and riparian area management (Phillips 1995).

Worker Retraining and Community Assistance

The whole story is not in on the effectiveness of the NWFP in meeting the Administration's goals to ease the transitions for workers, businesses, and communities within the area covered by the plan. There are interim reports on the Northwest Economic Adjustment Initiative, on the CERTS and regional CERT, on payments to counties, and assistance to small business (Tuchmann and others 1996, USDA 1995, USDA Forest Service 1996a, 1996b). Tuchmann headed the Administration's western office overseeing the NWFP. He asserts successes and opportunities in ecosystem-based forest management and in moving toward a new equilibrium between the economy and the environment (Tuchmann and others 1996). He also notes that implementation has been slower than expected, and that "making decisions that attempt to integrate economic objectives is difficult and controversial." Finally, he acknowledges that the plan's benefits and challenges will devolve over time, and assessing the plan's effects will require long-term study.

Christensen and others (1994, 1995) are undertaking a study of just how the Economic Adjustment Initiative is playing out, in terms of effects on social and economic indicators. This work is needed to evaluate, and isolate, how effective the plan actually is in aiding timber workers and communities. As seen earlier in retrospectives on RNP programs, it is difficult to determine direct effects given the dynamic nature of the economy. Christensen's report will better answer the questions concerning the effectiveness of plan spending than can this report, which has focused on observations from the RNP experience on watershed restoration and worker assistance.

Conclusions

Watershed restoration and employing displaced workers in "Jobs-in-the-Woods" program have benefited from the RNP experience but in different and differently quantifiable ways. The two objectives, though twinned in the NWFP, still are at odds.

Watershed restoration techniques have improved, as knowledge has accumulated and the frameworks for conducting restoration have expanded. Methods for treating roads, crossings, riparian and upland areas, and choosing equipment and labor substitution, have been refined. The purposes also have expanded beyond RNPs straightforward mandate to prevent sediment from choking the old-growth groves. Modern issues include agency or landowner desires to restrict or assure human access, revegetate roads, employ out of work loggers and millhands, and channel Federal funds into local communities and contractors. These were incorporated in the RNP legislation but given little attention compared to the NWFP efforts.

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[3] Personal communication. 1996. Walt Megahan, scientist-consultant, National Council of the Paper Industry for Air and Stream Improvement, Inc., 615 W Street, Port Townsend, WA 98368.

The Federal Government also has improved the efficiency of targeting aid to displaced workers and affected communities. It has streamlined administrative roadblocks and provided a coordinated approach to doing ecosystem-based forest management and economic assistance in the wake of spotted owl rulings and forest plan revisions. Studies are in place to track the social and economic effects of the NWFP, in contrast to the REPP, where GAO found it could not discern the effectiveness of the program once it was in place.

No one has resolved the conflicts between the economic and ecological objectives of watershed restoration, however, no matter how many times the phrase "watershed restoration" or "ecosystem restoration" is catenated to the phrase "Jobs-in-the-Woods." The evidence is that the choice of project location and method depends on whether the objective is to restore salmon runs, stop sediment, employ the greatest number of exloggers for the shortest period, or to set people up in restoration businesses. Advocates for native fish (such as the Pacific Rivers Council or Oregon Trout) want to maximize habitat restoration and protect remaining runs. Because fish neither vote nor attend advisory council meetings (though they have their advocates in interest groups and the courts), watershed restoration money often is allocated on economic rather than ecological criteria. This is not necessarily a bad thing, but it highlights that it may simply not be possible to maximize every objective simultaneously. Alternatively, no one wants to have to choose between reducing sediment and reducing employment in coastal forests.

The various Jobs-in-the-Woods programs were never meant to be sufficient to employ all of the unemployed timber workers. They were meant to ease the transition of workers and to demonstrate the possibility of one type of restoration activity.

One reason why the National Park Service emphasized restoration over employment lies in the agency's mission, and in the Public Law 95-250 mandates. Redwood National Park has no mandate or tradition of worrying about transitions for affected communities, whereas the Forest Service and BLM have an institutional mythology around "timber-dependent communities." Redwood National Park got money to expand the park and repair damage to the land, whereas employment responsibilities were largely delegated to the state. In contrast, President Clinton held a high profile "Forest Summit" and urged his executive branch to work cooperatively, coordinately, and swiftly to reduce all the downsides of scaling back Federal timber harvests to protect the spotted owl. Clinton created a "Western White House" to keep a high profile; Redwood National Park wrote annual reports, which got little attention and were not widely circulated.

Finally, the NWFP is doing a much better job of targeting economic assistance, coordinating Federal efforts, and at least wrestling with the conflicts between watershed restoration and Jobs-in-the-Woods Program. Some of this attention is probably due to a watchful Congress, which ordered the 1993 GAO review of the RNP programs, and has compelled Administration officials to document and justify Federal spending on

the NWFP (e.g., Lyons 1995, 1996). It is also true that the NWFP covers an area, and an economy, that is orders of magnitude larger than was impacted by the 48,000-acre RNP expansion in 1978. The effectiveness of the NWFP will be told in reports from the Pacific Northwest Research Station; the popularity will be seen in electoral results. The sufficiency of the watershed restoration will take longer to be known, and will likely be decided in the courts. Parallel dramas about watershed restoration, affected communities, and endangered species are taking place with the Oregon and Washington salmon recovery efforts, and on the Forest Service-BLM EIS for the interior Columbia basin.

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There are many parallels between the 1978 legislation to expand Redwood National Park and the Northwest Forest Plan, which together with the Northwest Economic Adjustment Initiative formed the 1993 Pacific Northwest Initiative. In both situations, the Federal Government sought to promote retraining for displaced workers, to undertake watershed assessment and restoration work, and to assist communities with economic planning, grants, and transitions. Both of these efforts point out the inherent conflicts between the economic and ecological objectives of watershed restoration. No one wants to have to choose between reducing sediment and reducing unemployment in coastal forests.

Keywords: Watershed restoration, community assistance, Redwood National Park.

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