

# Who does the work in the forest? Connections between foresters and the forestry workforce

by

Dr. John J. Garland, PE  
Professor and Timber Harvesting Extension Specialist  
Forest Engineering Department  
Oregon State University  
Corvallis, OR 97331  
John.Garland@oregonstate.edu

**Abstract:** Much of the work of foresters is at least one step removed from the forest itself. Silviculture prescriptions are carried out by contractors and forest workers. Harvesting is largely done by logging contractors and much other work in the forest is performed by technicians and forestry services contractors. In fact, many foresters interact with the forest and the operations there via GIS, computer reports, contracts, and verbal information. Forestry education does little to help foresters understand the nature of the forestry workforce. Foresters abdicate leadership for the development of a sufficient and qualified workforce to random social processes at local levels. It would be better if foresters thought of the forestry workforce like they do stand development. The forestry sector needs regeneration of the forestry workforce through recruitment; young workers need the fertilization of education and training; few foresters know how to thin a workforce; and there is age gap currently with many old growth forest workers. The paper addresses these issues and suggests how current professional foresters need to engage in policy processes to help changes in the forestry workforce.

**Key words:** Forestry workforce, logging labor, safety, wages, aging workforce, policy

## Introduction

The European archetypal forester is what framed the early forestry professional education in the United States for the first three quarters of the last century. The ideal was...

A highly respected forester (with the same standing as the mayor of the community) walking the forest marking high value trees grown for over a hundred years. The entourage of junior foresters following and listening to the silviculture prescriptions, plans for horse logging, and the intense cultivation required to get new trees growing. Wildlife and hunting were paramount in the management regimes. Economics (like interest rates) and business concerns were for the sawmillers not the foresters.

It is unlikely such forestry work existed outside of special places like the Biltmore Estate. More often early foresters were in charge of vast areas protecting the land from fire, insects, other natural enemies and outright trespass. Later foresters, both public and private, were charged with forest development of roads, timber operations and even recreational opportunities. For the middle third of the last century, foresters (the greatest generation?) could spend time in the forest overseeing operations and doing “on the ground” management. The areal responsibility for a professional forester was in the 25-50,000 acre range—more than their European counterparts at 2-10,000 acres, but of a size a forester could know rather well.

By the last third of the past century, foresters moved from the forest to the pickup and finally, to the office. Environmental requirements changed the way foresters interacted with the forest. Public foresters were no longer wearing out boots but rather dealing with callouses from writing EIS and other documents. Lawsuits and judges’ directions were telling foresters what they **could** do (sometimes very little). Private sector foresters were changing also as firms followed “business bandwagons” (usually touted through in-flight magazines read by executives) like:

- Management by objectives
- Re-engineering
- Profit centers and zero based budgeting
- Outsourcing & Downsizing
- Supply chain management
- Benchmarking
- Just in time production
- TIMO’s, REIT’s and the like
- Tough minded management & one minute managers
- Lean organizations with “preferred suppliers”
- Stewardship & Entrepreneurship
- Best practices... accounting to environment
- Global connectivity

The bandwagon gained speed with “Certification” of people, products and processes. Foresters, and the work they do, changed dramatically. Private sector foresters now have responsibilities for 100,000 acres and manage the forest through contracts, by computer, and at 25 miles per hour when they do get in the woods!

With much of the forest accessible with roads, people and their problems came to the forester’s world. Innovations in communications from radios, telephones, computers, satellites, and instant internet access made the forester’s tools GIS, GPS, and information management. Other resource specialists from soil scientists to biologists to human resources generalists assumed management of forest lands with foresters typecast into roles involving “trees.” Important business and social forestry decisions were made by other disciplines. A list of forest manager core qualifications needed for public forestry jobs reads like:

1. **LEADING CHANGE:** Ability to develop and implement an organizational vision that integrates key national program goals, priorities, and values to improve customer service and program performance while maintaining an organizational climate that encourages innovation.
2. **LEADING PEOPLE:** Ability to design and implement strategies which maximize employee potential and foster high ethical human standards in meeting the organization’s vision, mission and goals.
3. **RESULTS DRIVEN:** Ability to establish measures that ensure accountability and continuous improvement and to produce results through strategic planning and the implementation and evaluation of programs and policies.
4. **BUSINESS ACUMEN:** Ability to acquire and administer human, financial, material, and information resources in a manner which instills public trust and accomplishes the organization’s mission and to use new technology to enhance decision making.
5. **BUILDING COALITIONS/COMMUNICATION:** Ability to explain, advocate, and express facts and ideas in a convincing manner, negotiate with individuals and groups internally and externally, develop a professional network with other organizations, and identify the internal and external politics that impact the work of the organization.

(Selected from a position description of a recent  
USFS deputy forest supervisor opening  
[www.opm.gov/ses/index.html](http://www.opm.gov/ses/index.html))

The forestry knowledge and skills for forest managers varies by the position and is often more related to GS occupation series classification (eg foresters at occupational series 0460 versus biologists at 0401). From the author’s review of recent managerial job openings in the Forest Service, the higher the management position, the less forestry knowledge is specified. The most specific forestry knowledge is seen in research positions and technician openings. It seems anyone can be forest manager if they have the general background of working in the agency for the requisite time and can convince reviewers of the above core qualifications. What I see missing is the “forestry leadership” needed to carry out the Forest Service resource management mandates of US forests. It may be hard to muster “passion” for forestry activities when your initial career choice was wildlife, fisheries, soils, archeology, and so forth.

Foresters rightly are concerned about their own futures, and with fewer forestry students entering forestry schools there could be an impending forester shortage (Sharik, 2004 and Mooney, 2005) A recent Oregon Forest Resources Institute (2005) publication highlighting “Oregon’s Forestry Professionals” broke out forestry employer and positions

for SAF's 1040 members in the Oregon Society. Largest percentage of employers were: retired (26.3%); private industry (20.6%) and federal government (14.2% while managing more than half of Oregon's forests). Largest percentage of positions were: retired (25.9%); mid, upper managers and staff specialists (13.6%, 13.1%, 9.2%); and field foresters (12.2%). The positions highlighted were field forester, forest supervisor, district recreation coordinator, consultant, process improvement specialist, hydrologist, wood chemist, wilderness trails coordinator, forest engineer, wildlife biologist, lands manager, environmental educator, urban forester, and timberland investor. While many of the above have forestry degrees, only a few have actual contact with forest operations and the contractors who do the work (OFRI, 2005). Significantly, not a harvesting contractor or forestry services worker was identified as one of Oregon's forestry professionals; yet they do the work!

When it comes to actually doing something in the forest, like thinning, foresters are needed. The foresters who are asked to organize the actual operations, however, now work not in the forest themselves but obtain contractors to perform the essential services and conduct the operations. The question can be asked: what do the current and future foresters know about the forestry workforce actually doing the work through contracts? How do you reduce the operator of a harvester making key tree selection decisions for fuel reduction into a GIS overlay? How do foresters judge good or bad operations from their cell phone or Blackberry? Who are these people? Will there be enough workers to do the work? Are they overpaid? Are they working safely? How does the forestry workforce vary by region? The answers are not in the typical forestry curricula loaded with University requirements, biology, silviculture, and social forestry. Strong courses on forest operations are rare, and in those, the workforce may be given little treatment. Foresters abdicate leadership for the development of a sufficient and qualified workforce to random and social processes at local levels.

### One Approach

Who in the forestry profession looks over the people who do the forest work and assesses the directions needed for successful forest operations and the sustainability of the forest itself? It would be better if foresters thought of the forestry workforce more like the trees in their care (stand development). The forestry sector workforce is similar to trees when reviewing Table 1. below.

<b>Table 1. Comparison of People and Trees</b>	
<b>Trees and Stands</b>	<b>People and Workforces</b>
Regeneration	Recruitment
Young Stand Management	Forestry education and job experience
Thinning or Individual Tree Selection	Job selection and placement
Fertilization--periodic	Continuing education & worker development
Middle age Stand Management— protection from insects/disease, fire,	Job and career changes, selection, retention
Old growth Management	Aging workers and managers
Final Harvest	Retirement

The analogy above can be carried further into parallels like protecting the forest (workforce) from invasive species (unqualified workers), nutrition studies (salary surveys), inventories (workforce assessments), and so forth but the point has been made!

### Age Classes in the Forestry Workforce

What about the workforce age class distribution (like tree age classes)? In Figure 1. the time series of Oregon’s logging workforce (1991,1997, 2004) is chronicled compared to recent US male workforce data (2003). Logging used to be a young male occupation but the workforce is shifting toward old growth status. Oregon loggers are older than US male workers now but were younger in the past. Figure 2. shows how the Oregon Logging Workforce has increased in the percentage of workers over 45 years and is now more than the percentage of US male workers. Where is the regeneration coming from, how can the best be retained and what is finite working age of older workers?

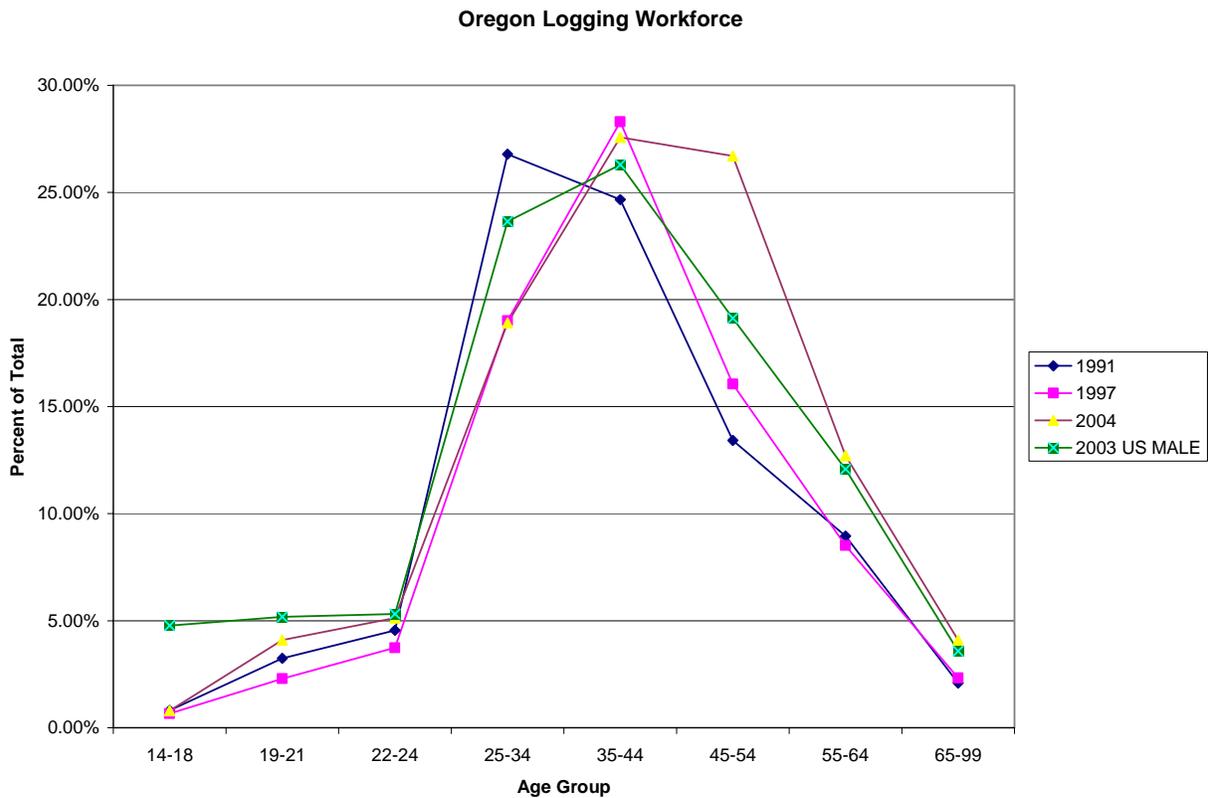


Figure 1. Age Class Distribution of the Oregon Logging Workforce over time and US male population

Oregon Logging Workforce 45 years and older &  
2003 US Male Workforce

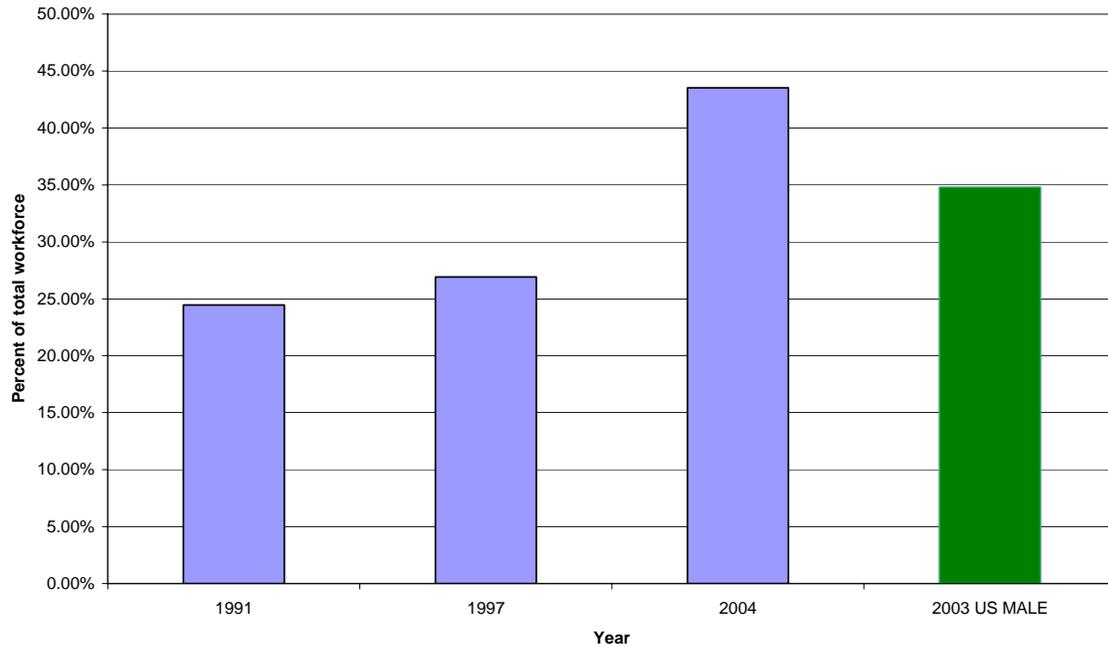


Figure 2. Percentage of Oregon Logging Workforce over 45 years compared to US males over 45 years.

Because of changes in the Standard Industrial Classification system to the North American Industrial Classification system, loggers were “lost” from industry statistics and placed with Agriculture, Natural Resources, and Mining which require special studies to obtain information that was once readily available. However, data for some logging states are interesting. Figure 3. shows how some states are losing loggers while others are gaining slightly or staying the same over time. Figure 4. shows the same states generally losing logging firms. And Figure 5 shows the decline both in Oregon logging firms and firm size for the past 10 years which is a continuing trend from the 1980’s. A common theme of logging industry trade magazines has been the flight of good contractors unwilling to offer their entrepreneurship skills for an unrewarding future.

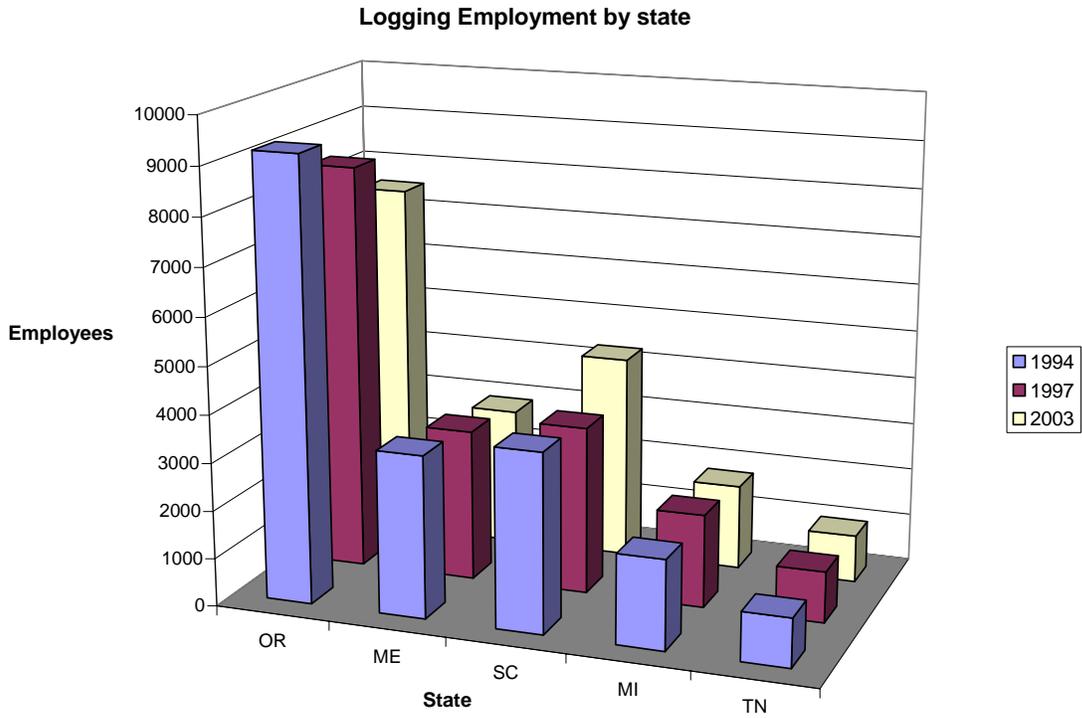


Figure 3. Logging Employment over time in selected states.

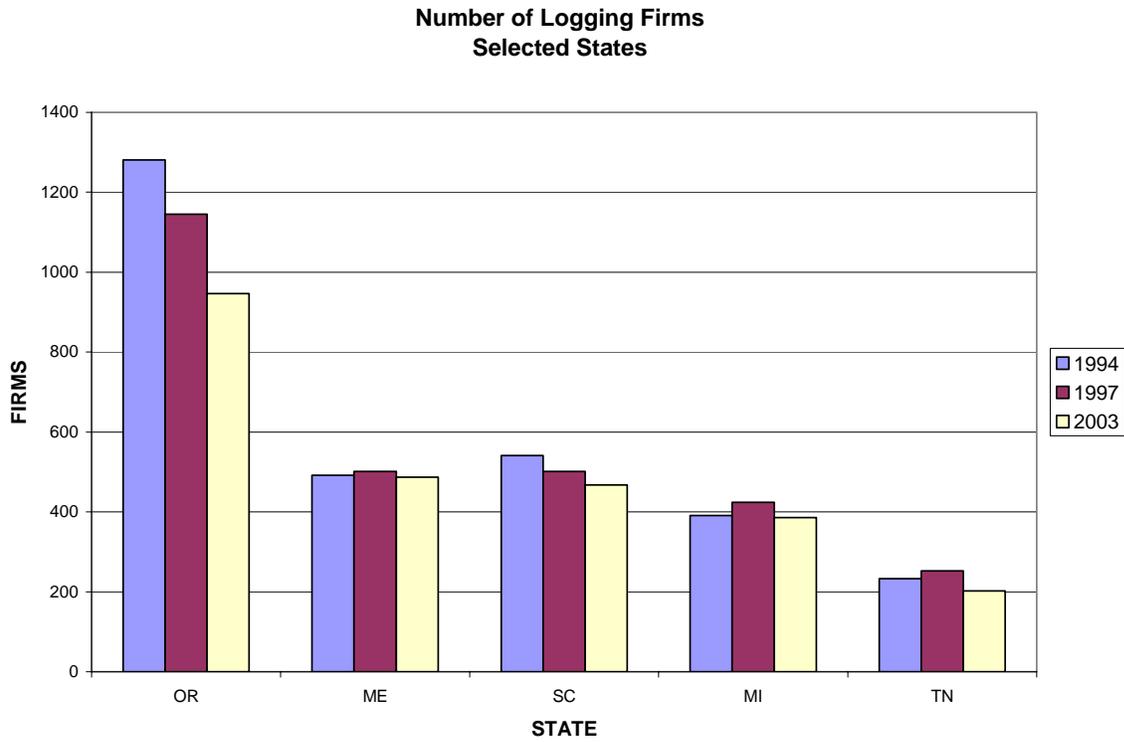


Figure 4. Number of Logging Firms for selected states over time

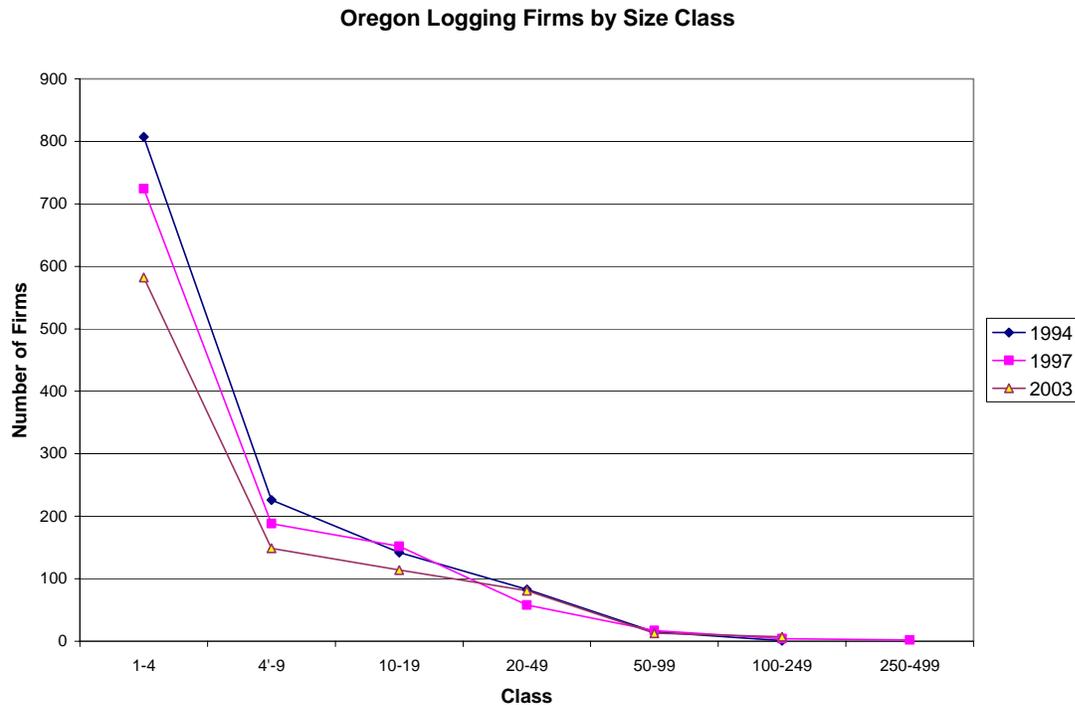


Figure 5. Oregon logging firms by size classes over time

### Wages in the Workforce

One important factor in workforce recruitment and retention is the wage level of workers in the sector. US wage data are difficult to locate for the logging workforce because of differing series but some data points can be seen in the time series for the Oregon Logging workforce in Figure 6. While the Oregon logging workforce seems to have increasing wages, the adjustment for inflation shows the wage level flat for a long period of time. Even more disconcerting for workforce recruiting is the loss in comparative wage rates for Oregon loggers shown in Figure 7. While Oregon loggers have continued to have average wages above all private employers, the differences are declining over time. Once Oregon loggers had average wage rates above the manufacturing workforce but now have average wages less than those in manufacturing. Logging work has typically been seen as “high paying” but difficult, dangerous and dirty.

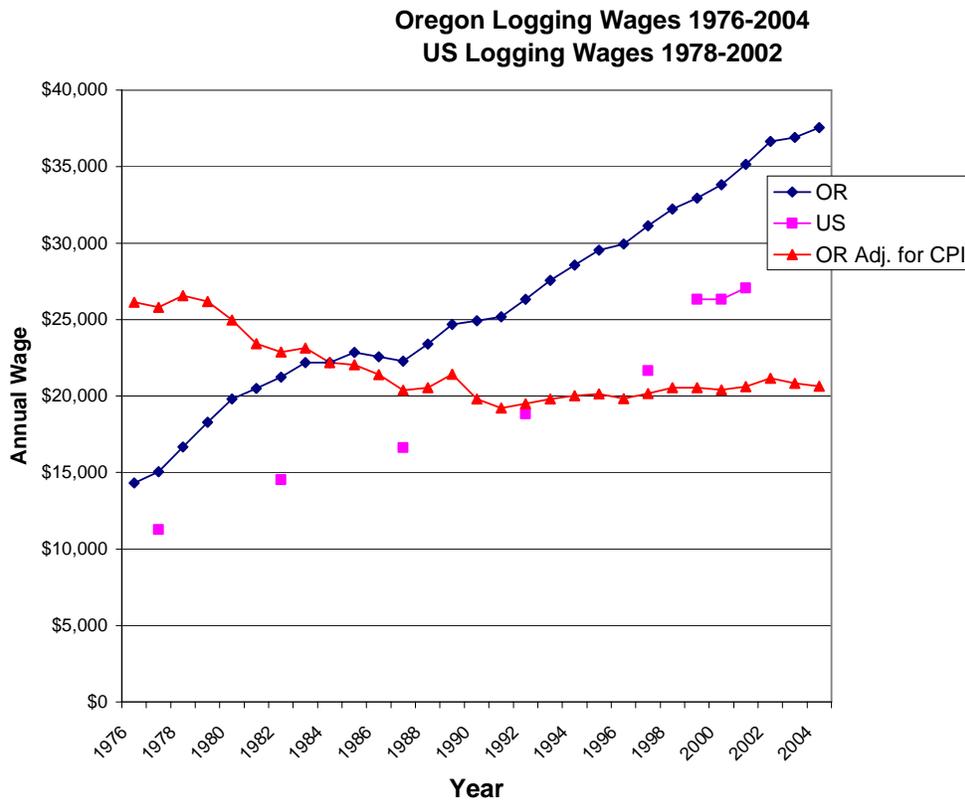


Figure 6. Wages for Oregon logging workforce adjusted by CPI with selected US logging work force data points (US Census data)

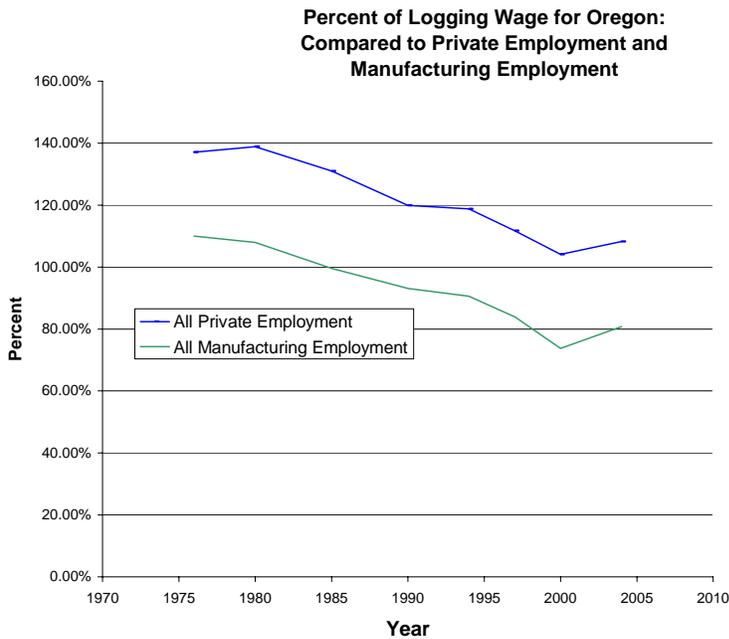


Figure 7. Oregon logging wages compared to private and manufacturing employment (US Census data)

## Danger Jobs

Forest work has a long reputation of being difficult and challenging. Myths are made of logging exploits but the reality of the work is that it is one of the most physically demanding jobs in all industry. Successful loggers relish overcoming difficult terrain, weather, and obstacles to produce important products for society. However, the hazards of forest work that result in fatalities and injuries are not positive for the workforce and pose threats to attracting workers. Logging is among the top three industries for fatalities and injuries almost every year and rates as the most hazardous when all factors are considered (US Department of Health and Human Services, 1999).

What is not told in some cases is that progress is being made in logging safety. Logging fatalities have improved when two periods 1980-88 and 1992-2000 are compared (Scott, 2004). Bell and others (2005) showed use of mechanized felling operations lowered injury claims rates substantially per 100 workers from 16.6 to 5.2 in West Virginia during a five year period. Figure 8. shows how Oregon's fatality rate in logging has declined over the past 60 years. For some years there were no fatalities in logging. Nonetheless, worker safety in forestry is a major concern and foresters may contribute to safety problems by their overt actions or just not taking the issue seriously. Forestry education does little to address safety issues in forestry work (Fosbroke and Myers, 1996). Great effort by the forestry profession is needed to help reduce injuries and fatalities in the forestry workforce.

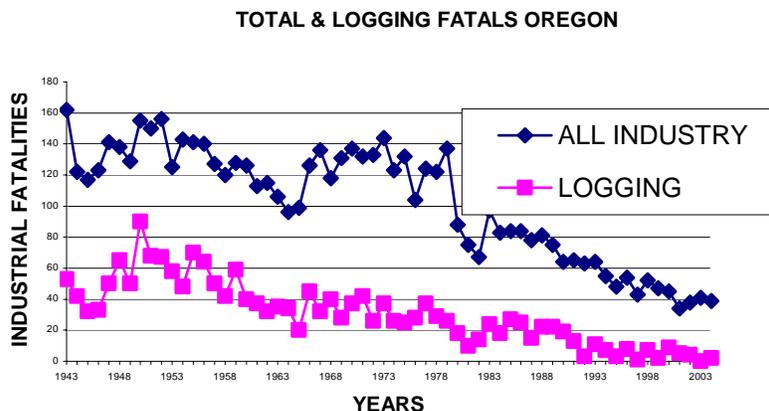


Figure 8. Fatalities in all industries and logging over time (Oregon Compensable Fatality Reports).

### Action Needed by Professional Foresters

The concern for those actually doing the work in the forest is illustrated by the age/participation rates, wage and salary levels, and safety issues above. Additional specific actions are needed to recruit workers in the face of the image presented of loggers in Disney feature cartoons (Fern Gully). Professional forestry and worker education for forest operations needs to be addressed to make operations technically feasible, economically viable and environmentally acceptable to society. Mental

fertilization through continuing education is needed for the workforce and the training stimulated by the Sustainable Forestry Initiative™ with and for loggers needs to be continued and strengthened. Furthermore, the aging of America is affecting both professionals and workers in forestry and dealing with the issue is a responsibility for all professions. How does forestry handle old-growth workers? This question and many others about the forestry workforce are emerging concerns that merit consideration and response.

## **Workforce Issues and the Policy Process**

From my work with policy processes the policy cycle can be identified stepwise:

“ someone raises a concern, interested parties become involved, the issue is defined and alternatives are considered with their consequences, a decision is made and the policy is implemented, then the policy is evaluated...and inevitably new concerns arise.”

(Garland, 1997)

This paper among other writings is at the start of the policy process raising concerns for the forestry profession about workforce issues that need to be addressed. More eloquent appeals and perhaps strident calls for action may be needed before the attention of the forestry profession is raised. The next step in the policy process is for interested parties to become involved. The nature of the involvement depends on the regional character of forestry workforces, who takes leadership, the process of involvement, and of course, who gets involved.

As for a process of initiating involvement on a particular issue, I used the process below in Oregon some years ago to help address logging safety concerns and workers compensation insurance issues. The process included:

- Drafting a “white paper” to bring some concerns to the attention of interested organizations and individuals
- Holding a conference to bring people together to more fully raise issues and outline opportunities, eg, “The Future of the Forestry Workforce”
- Appointing an “ACTION PLANNING COMMITTEE” to identify and evaluate policy and actions to address the concerns.
- Reporting the policy proposals and results of the Action Planning Committee to the Director of Insurance and Finance and the Oregon legislature and all interested parties
- Implementation of policies by changes in laws and regulations, finding funding sources, and various commitments by public agencies and private organizations to address the policy proposals

## **Who Should be Involved?**

There are numerous organizations and individuals interested in the forestry workforce who can contribute to the improvements needed. The partial list in Table 2. below is not

inclusive nor in order of importance but is just suggestive of the organizations needed to address forestry workforce issues.

Society of American Foresters	American Loggers Council
Federal and state safety organizations	Regional and state loggers associations
Forestry Schools and Colleges	Extension programs addressing loggers
Technical Schools providing training	Logger training associations
Consulting foresters	Woodland owner associations
American Forest and Paper Assoc.	Certification organizations
Federal and state education agencies	Federal and state land management orgs.
Federal and state labor agencies	Unions representing forestry workers
Insurance organizations	Forest Resources Association
International cooperators & experts	Motivated and involved experts

Not being listed above should not limit participation by interested organizations and individuals. Policy options are best achieved by the fullest participation of those affected and involved.

### **Possible Outcomes**

It is not easy to predict what policy outcomes might result from addressing forestry workforce issues as described above; however, some possible outcomes might occur such as:

- Greater emphasis on forest operations and the workforce within professional forestry education by SAF Accreditation
- Greater coverage of forest operations within the SAF Certified Forester Examination
- State credentialing emphasis for foresters and the workforce on competencies in forest operations, eg licensing or certification
- Increased hiring of competent foresters in public agencies conducting forest operations
- Improved funding for workforce education efforts by public agencies, insurers, educational institutions, Extension programs, and others.
- Greater cooperation between associations representing loggers and forestry workers, industrial landowners, state and federal landowners, small private owners, and others.
- Others ???

What is clear however, is that few improvements will take place without forestry leadership and foresters involved in the process. The future of the forestry workforce deserves such involvement as much as the forests of the future need a competent workforce.

## Sources

BELL, J.L. and J.C. HELMKAMP. 2003. Non-fatal injuries in the West Virginia logging industry using workers' compensation claims to assess risk from 1995 through 2001. *American Journal of Industrial Medicine* 44(5):502-509.

FOSBROKE, D.E., S.M. KISNER, and J.R. MYERS. 1997. Working lifetime risk of occupational fatal injury. *American Journal of Industrial Medicine* 31(4):459-467.

GARLAND, J. 1997. The players in public policy. *Journal of Forestry* 95 (1):13-15.

HELMKAMP, J.C., J.L. BELL, W.J. LUNDSTROM, W.J. RAMPRASAND, and A. HAQUE. 2004. Assessing safety awareness and knowledge and behavioral change among West Virginia loggers. *Injury Prevention* 10(4):233-238.

LEIGH, J.P. and T.R. MILLER. 1997. Ranking occupations based upon the costs of job-related injuries and diseases. *Journal of Occupational and Environmental Medicine*. 39(2):1170-1182.

MOONEY, J. 2005. Forester shortage: impending crisis? *Timber Harvesting*. September/October. 30-31.

MYERS, J.R. and D.E. FOSBROKE. 1994. Logging fatalities in the United States by region, cause of death, and other factors - 1980 through 1988. *Journal of Safety Research* 25(2):97-105

MYERS, J.R. and D.E. FOSBROKE. 1995. The occupational safety and health administration logging standard: what it means for forest managers. *Journal of Forestry* 93(11):34-37.

OREGON DEPARTMENT OF CONSUMER AND BUSINESS SERVICES. Various dates. Oregon covered employment (series) available at [www.oregon.gov](http://www.oregon.gov) (accessed on 9/29/2005).

OREGON DEPARTMENT OF CONSUMER AND BUSINESS SERVICES. Various dates. Oregon compensable fatality report. [www.cbs.state.or.us/imd/claimfat.html](http://www.cbs.state.or.us/imd/claimfat.html) (accessed on 9/29/2005).

OREGON FOREST RESOURCES INSTITUTE. 2005. Oregon's forestry professionals. Portland, OR. 21p.

SCOTT, D.F. 2004. A study of logger fatalities from 1992-2000. *Injury Prevention* 10(4):239-243.

SHARIK, T. 2004. Trends in undergraduate enrollments in natural resources at NAPFSC institutions 1980-2003. National Association of Forestry Schools and Colleges. Available at [www.napfsc.org/activity.htm](http://www.napfsc.org/activity.htm). (accessed 10/7/2005).

US CENSUS. 2005. Census information available at [www.lehd2.dsd.census.gov](http://www.lehd2.dsd.census.gov) (accessed on 9/29/05)

US CENSUS BUREAU. 2002. Statistical abstract of the United States 2001. available at [www.census.gov](http://www.census.gov) (accessed on 9/29/2005).

US CENSUS BUREAU. Various dates. County business patterns. available at [www.census.gov](http://www.census.gov) (accessed on 9/29/2005).

US DEPARTMENT OF HEALTH AND HUMAN SERVICES, 1999. Identifying High-Risk Small Business Industries. The Basis for Preventing Occupational Injury, Illness, and Fatality. *NIOSH Special Hazard Review*. Public Health Service, Centers for Disease Control and Prevention. National Institute for Occupational Safety and Health. 155 p.