

Why students choose to study for a forestry degree and implications for the forestry profession

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Summary

This paper is concerned with university undergraduate science students; their sources of information and the influences acting upon them regarding their degree choice, including communication with members of the forestry profession. In a study of responses from 119 students studying forestry units at The Australian National University it became clear that students felt that what foresters do, and the nature of the discipline, could be better communicated. When professional foresters had communicated with potential students, however, they had an important and positive influence on students' degree choice. Work experience in resource management, personal acquaintance with forestry professionals, and environmental or forestry management issues also had a strong influence on the degree choice of the students. The premise that university students reject forestry as a degree or a profession because of adverse community perceptions was not strongly supported.

Keywords: forestry; recruitment; career choice; employment opportunities; professional education; students; communication; information; work

Introduction

The forestry profession in Australia has been criticised for its management of Australia's forest resources for at least four decades. In response, the profession has been defensive, believing it has often been misrepresented. At the same time, however, there has been recognition within the profession that it has not communicated effectively with the public (Kentish and Fawns 1995). Forestry educators and employers of forestry professionals are increasingly concerned that this failure is affecting the future of forestry education and the profession in Australia.

Recent government and professional initiatives address communication with potential forestry students but little research to support these initiatives has been published. This paper has been written to help all those in forestry in Australia who wish for their profession to survive and thrive.

Declining enrolments in forestry degrees

The number of students at Australian universities choosing to study to become professional foresters has decreased over the

last 15 years (NAFI and A3P (National Association of Forest Industries (Australia) and Australian Plantation Products and Paper Industry Council) 2006; Kanowski 2008). In 1999, for example, The Australian National University (ANU), the University of Melbourne (UMelb) and Southern Cross University (SCU) together produced about 80 graduates. By 2005, even with the addition of graduates from a fourth university (University of Queensland), graduate numbers were falling. Kanowski (2008) noted that over the five-year period to 2005, the number of students in Australia graduating in forestry, aggregated over four universities, had halved.

Many factors have contributed to this decline. They include the closure of the Australian Forestry School in the sixties, the perceived need for forestry to become more 'relevant' to the needs of society at the end of the 20th century, the restructuring of university courses, the gradual shift of employment opportunities for foresters away from the public to the private sector, and the increasing cost of gaining a university qualification.

The decline in the number of people seeking to study for a traditional forestry degree, despite the availability of jobs, is also occurring in Canada, USA, the United Kingdom and New Zealand, and has been described as part of a global crisis facing the professional education of foresters (Innes and Ward 2007; Kanowski 2008).

At present, the number of students graduating in Australia is about 30 annually and diminishing. This is estimated as half the number of tertiary-trained foresters required to meet the demand from employers in the Australian wood and paper products industry (Australian Forestry Education Partnership 2007). As a result, employers are recruiting foresters from overseas (Kanowski 2004; NAFI and A3P 2006).

It is worth noting that an equally worrying decline has also occurred in enrolments in agricultural courses in Australian universities 'indicating that agriculture is not perceived as a desired career' (Pratley 2008). The supply of agriculture graduates is also well short of the market requirement. As a result, job 'vacancies are being filled by less qualified professionals and the industry is less well serviced' (Pratley and Copeland 2008).

Continuing but changing demand for foresters

In 2004 Kanowski noted that the demand for professional foresters was continuing but changing. Demand reflected 'both relatively buoyant economic growth, and the expansion of private plantation forestry and the roles of trees on farms' and disguised 'the shift, associated with fundamental changes in both the public and private sectors, from salaried to self-employment, and to shorter average periods of employment with any particular employer'. 'As a consequence', he stated, 'there is probably now a higher proportion of Australian professional foresters working outside 'traditional forestry' roles than at any time' (Kanowski 2004).

Evidence of the shift from public to private employers in Australia over the last 30 years can be seen in Figure 1, which compares the employers of foresters in 1977 with those in 2006. Cremer (1977) surveyed the employment of a thousand foresters in Australia and the 2006 Census of Population and Housing¹ surveyed 1574 foresters, of whom 84% were men.

The major employers of foresters in 1977 were state, territory and local governments, which accounted for 74%. This figure had fallen to about 40% in 2006. The greatest change, however, is seen in the private sector. From just over 10% in 1977, the private sector employed 55% of available foresters in 2006.

The job market for professional foresters in Australia is now supplied by six universities: ANU and SCU continue to offer four-year undergraduate science (forestry) degrees; UMelb offers graduate degrees only, having phased out its undergraduate forestry degree; Edith Cowan University established a new program in 2005; and the University of Queensland (UQ) and the University of Tasmania (UTas) both offer forestry units. Five of these universities (ANU, UMelb, SCU, UTas and UQ) have also formed a consortium that offers the National Forestry Masters (NFM) program.

Forestry at the ANU

The experience of the ANU Forestry Department, created in 1965 when the Australian Forestry School became part of the ANU, is instructive. It has, since its inception, offered a four-year Bachelor of Science (Forestry). Undergraduate enrolments in forestry rose from a low of just over 100 in 1967 to a never-to-be-repeated high of about 277 in 1976. A decade later enrolments had collapsed back to the 1967 figure (Searle 2000).

At this point, the failure to attract students was deemed so critical by the ANU Department of Forestry that talks began about ways to reshape the image of the forestry degree. The department also linked with the Departments of Geography and Geology, and the Centre for Resource and Environmental Studies, to form the ANU School of Resource Management and Environmental Science (SRMES). In 2001, this became the School of Resources, Environment and Society (SRES) which was 'the merger and associated disestablishment of the former Departments of Forestry and Geography and Human Ecology' (Kanowski 2008). SRES

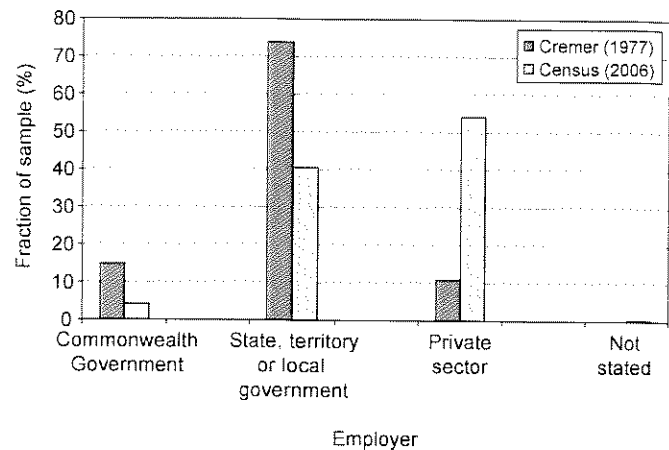


Figure 1. Employers of foresters in Australia in 1977 and 2006

evolved into the Fenner School of Environment and Society in August 2008.

Enrolments in the forestry degree drifted lower and lower, however, until in 1999 fewer than 100 students were enrolled in accredited courses. By 2005 only 12 or so students graduated with forestry degrees from ANU (Kanowski 2008). The 2001 initiative, however, was successful in increasing science student enrolments.

Other universities and government agencies in Australia have also adopted name changes that exclude the word 'forestry', possibly to counteract adverse connotations associated with the terms 'forestry' and 'foresters' but also to reflect the fact that forest management no longer exists in isolation but interacts with other disciplines and forms of land use outside the forests, as well as with society at large.

Skills shortage in the forestry profession

In 2008 the Institute of Foresters of Australia hosted the Tertiary Forestry Education Summit at The Australian National University to explore ways and means of addressing the skills shortage in the forestry profession.

Those at the Summit were aware of the recommendations of the 2007 House of Representatives Standing Committee on Agriculture, Fisheries and Forestry Inquiry into Rural Skills Training and Research; of these five were concerned with the need to improve the efficacy of communication between the profession, potential students, potential employers and the wider community (House of Representatives Standing Committee on Agriculture, Fisheries and Forestry 2007).

At the Summit, as these issues of communication were discussed and anecdotal information was shared, Searle, who was present, realised that her unpublished research findings about university students' attitudes in 1998 were still relevant, despite the passage of a decade. This paper therefore has been written to present evidence that will hopefully encourage Australia's foresters to communicate more widely about their profession with potential students and the broader community.

¹ Australian Bureau of Statistics (2006) Census of population and housing 2006, occupation data for ANZCO (2006) code no. 234113 for 'forester' provided by ACT Office Client Services.

1998 survey of ANU Science undergraduates

In 2000, Searle submitted a sub-thesis for the degree of Master entitled *Why Study Forestry?* In the *Introduction* she wrote:

There are foresters who believe that their profession has failed to communicate effectively with the Australian public. Foresters have also expressed their concerns about the effect of such failure on the future of the profession, and more specifically, on those who may want to join it.

She posed four questions:

- Is the decline (in forestry enrolments) a symptom of the decline in demand for science courses?
- Is there a lessening of student awareness and/or desire for a qualification in forestry?
- Have the forestry debates of the second half of the twentieth century adversely affected people's perceptions of forestry and the role of foresters?
- Or is it a failure of the forestry profession to communicate effectively with the public?

Methods

Searle's (2000) study was based on a hard-copy questionnaire completed by 119 students studying forestry units in 1998 at the ANU in first- or second-year undergraduate Forestry, Resource and Environmental Management (REM) and Science courses. It was assumed for this study that the sample was representative of all the students in the cohort. It should be noted that not all students proceed through their degrees at the same rate and starting dates ranged from 1994 to 1998. There were 63 students in first-year and 56 in second-year courses; men and women were included in the sample in almost equal numbers (60 men and 59 women). By far the greatest number (103) of students were 'locals' from the ACT and NSW. Sixteen came from other states and there were six overseas students.

The questionnaire was based on 19, mostly 'open', questions. If more than one comment was made in answer to a question, only the first comment was analysed.

Questions 1 to 4 collected demographic information about the respondents. In question 5, the students were asked to 'write the story of how you came to be studying for your current degree'. There followed a set of questions designed to elicit specific information:

- Why are you studying for a university degree at the ANU?
- What degree are you studying and when did you start it?
- Are you studying full- or part-time?

They were then asked a further series of questions designed to determine the extent to which the forestry profession had been successful in communicating its message:

- How did you find out about the Forestry/Resource and Environmental Management (REM) degrees or units at ANU?
- Were there other ways that you would have liked to receive this information?
- Do you have any suggestions how to encourage people to enrol in forestry at ANU?

- Did you have work experience in resource management of any kind (other than on the family farm), and did this influence your choice of degree?
- Did you know anyone who worked in the forestry profession, and did they influence your decision?
- Have environmental and resource management issues influenced your choice of degree?
- Why did you choose your present degree from among those offered and how has it lived up to your expectations?

The results were analysed using qualitative research methods, more specifically a grounded theory approach to 'build theory that is faithful to and illuminates the area under study' (Strauss and Corbin 1990). The original thesis should be consulted for details not presented in this paper.

This research did not attempt to examine directly all the influences that affect students' degree choices, such as the increasing cost of tertiary education to students. Nor did it examine the reasons for the general decline in enrolments in science degrees that has occurred in Australia. The results represent only part of the picture: they represent the views of those who had already chosen to study forestry, science or resource management at the ANU. They do not represent the views of college or high school students yet to make a choice of university degree.

Results and discussion

Choice of a degree and the ANU

As the students surveyed were all first- or second-year students enrolled in ANU courses (Forestry, REM, Combined Forestry, Science, Combined Science degrees (excluding Forestry)), the first questions they were asked concerned the reasons for their choice of ANU (Table 1).

When asked why they specifically chose the ANU, the largest group (60) stated that they had made an academic choice, noting that ANU had an excellent reputation and offered the course they wanted. Many others (46) responded pragmatically — the ANU was closer to home, they couldn't afford to or didn't want to move to another state, or it was much easier or cheaper to study while living at home or with relatives.

Only one student (REM) of the 119 wrote that they chose ANU because of an ANU-linked scholarship and an overseas student (Forestry) said they had no choice but to go to ANU.

Table 1. Respondents' reasons for choosing ANU

Reasons	No. of responses
ANU offered the course they wanted and it had a good reputation	60
Nearer to home. Couldn't afford to or didn't want to move interstate	46
Preferred ANU and its environs to other options	7
Other	6

The students were then asked a series of preliminary questions to explore their motivation for undertaking a university degree. Most (65) responses concerned employment — students considered that a degree would give them a better chance of getting employment that was interesting, and would provide job satisfaction and a professional future.

The second largest grouping of responses (27 out of 119) specified learning, personal achievement and interest as their motivation for studying for a university degree. Eight other responses were from students who wanted 'to be involved in management'; 'to be in a position to make a difference'; 'to help save the environment'. Many students gave more than one reason for undertaking a degree but, commonly, they were concerned with extending their knowledge and creating job opportunities for themselves, thus:

...to acquire knowledge about something I like and to be able to get a job in the same field.

Ten students specifically wanted to be either foresters, rangers or wildlife managers. Most of the remainder, eight, were indentured to overseas institutions, and two were 'just filling in time'.

Those who chose forestry were either attracted by its specialisation and structure, or believed they had better job prospects with a forestry degree than with a more general resource management degree.

Searle (2000) explored this latter point with the then three heads of the forestry schools in Australia (Professors Ian Ferguson, Peter Kanowski and Jerry Vanclay). She also raised the issue with a senior executive in the Federal Government department responsible for forestry (Mr Peter Yuile) and the then President of the Institute of Foresters in Australia (Mrs Heather Crompton). None foresaw any long-term decline in opportunities or demand for foresters, but all foresaw changes in the practice of forestry.

There was consensus amongst the senior forestry academics and bureaucrats that there would be increased commercialisation, increased private sector investment, and diversification of organisations involved in forestry. The future would see the area of forestry plantations increased and a greater emphasis on farm forestry. Graduates would be needed for extension work, management of native forests for conservation values, production of non-wood forest products and improvements in the solid-wood processing industry. These changes were seen as part of a forest industry that was buoyant at the end of the twentieth century and would continue to employ foresters at least at the same level.

They felt, however, that what foresters do and how they do it would change. They believed that forestry graduates competed well with graduates with more general resource management degrees and had a competitive advantage with the extra year of management training and the work experience they gained during their degree. Foresters also had an historical advantage because of linkages with national park services and state forest agencies.

There were differences in responses from students studying different degrees. Students choosing REM generally (38%) liked the broader choice of subjects in that degree and either did not want to specialise or were more specifically interested in subjects other than forestry (e.g. wildlife, mining, water resources, geography, soils). Three students (6%) specifically did not want to

study forestry, become foresters or work in the forestry industry and four (8%) thought forestry was exploitative. Only two students mentioned that the forestry degree took four years, implying that they considered this to be negative factor.

Choice of a forestry degree

A quarter of those specifically studying for forestry degrees did so because they believed they would have better job prospects than those studying for a degree in Resource and Environmental Management:

Too much competition for a job at the end of the [REM] degree and you're not necessarily employable when you finish.

Three students who had changed from a REM to forestry degree remarked:

- I did start in SREM as it was a shorter degree and the extra year put me off, but I have now transferred as I have seen the benefits.
- Wanted to do environmental science. Started a REM degree. Found it too much into conservation for me and was worried about job prospects after the degree. I changed to forestry in my first year.
- I started doing REM and then changed to forestry when I realised REM wouldn't get me where I wanted to go.

Sources of information

Of considerable importance, in view of the continuing decline in interest in forestry as a career, are the sources of information to which students had access when making their choices of university degree. Most students first found out about their ANU degree and units while in their final year of college.

Table 2 shows that most (55) cited official publications, such as the *University Admissions Centre (NSW and ACT) (UAC) Guide* or the *ANU Handbook*, as their most useful source of information. (Since the study, the *UAC Guide* has become available online and it is much easier to search for and locate forestry courses, if a student is looking for forestry in the first place). High school or college resources, a category that presumably includes careers advisers, were listed by a further 17 students.

A somewhat surprising observation was the relatively small impact of career days and career events. A variety of external

Table 2. Sources of information about forestry/REM degree or units at ANU

Information sources	No. of responses
Official tertiary education handbooks	55
Word of mouth (parents, friends, neighbours, relatives including those in the profession and those already enrolled in the course)	26
High school, colleges	17
Careers events	12
Other	9

careers events were considered to be significant sources of information for only 12 of the sample. Word of mouth and family influence was nearly twice as effective (26).

Other ways students would have liked to have received information

When asked about whether they thought other sources of information might have helped them choose (Table 3), 75 students considered themselves sufficiently well informed but 28 felt they would have liked more information from their own school and from the ANU (staff and graduates) about pre-requisites and what is involved in the courses or units.

Three students (two REM students; one forestry student) would have liked to have been able to find information on the ANU website. The subsequent decade has seen rapid development in information technology and the Internet has been more extensively used for student recruitment. Therefore it would be interesting to canvass opinion among present forestry students about how important the Internet was as a source of information leading to their degree choice.

Influences upon degree choice

Table 4 illustrates the value of work experience in resource management in students' degree choices. Students were asked if they had any work experience in any kind of resource management before deciding to enrol in their current degree and if this work in any way affected their choice of degree.

Table 3. Other ways students would have liked to receive information about the Forestry and or REM degree or units at ANU

Student suggestions	No. of responses
Greater emphasis on communication in schools	28
More informative ads in brochures, newspapers and magazines	8
More information on the Internet, especially ANU website	3
Other	5

Table 4. Influence of particular experiences and issues in making degree choice

Experience and issues	No. of students	No. who were influenced by this
Work experience in resource management (other than family farm)	43	33
Personal acquaintance with forestry professionals	60	34
Environmental or forestry management issues		88

A number of the students gave examples of their experience and wrote that it had positively influenced their decisions to enrol in forestry units:

- helping with a wildlife survey
- two weeks with State Forests of NSW
- one week at Cumberland State Forest (NSW) in Year 10
- one week with State Forests at Wauchope NSW
- field work with CSIRO forestry in Year 12
- CSIRO student research scheme
- one week with CALM (WA)
- employment with WD Contracting and Auspine Forests
- summer employment with a mine revegetation company
- work on farms and in nurseries.

A number also commented they had already made up their minds before their work experience and the work experience confirmed their choice.

'It just made me want to do it more', wrote a second-year forestry student.

About half of the 119 students surveyed had personal acquaintance with forestry professionals and just over half of these reported that this contact influenced their decision.

Twenty of 33 students (first- and second-year) studying forestry either as a single or combined degree were influenced in their degree choice by someone in the forestry profession. When asked in what way foresters influenced their decision, forestry students gave a wide range of answers:

- When they told me what it was like it sounded like what I wanted to do and made my decision easier.
- Just asked a few questions on what it was about — sounded interesting.
- They introduced me to their field of work, this was the main influence.
- I like where and or the way they work.
- They explained to me that it wasn't all just going in and chopping trees down all over the shop.
- By changing the impression that a forestry degree is for rednecks and yobbos.
- They explained to me that in order to maintain natural diversity ... study forests.
- Lifestyle they led, but times have since changed, so things will be totally different for me.
- That there are job opportunities available.
- Very challenging and rewarding. Well paid.

Nearly three-quarters all the students surveyed wrote that environmental or forestry management issues had influenced their choice of degree course.

The following quotes from first- and second-year forestry students show the range of issues that influenced them to study for a forestry degree:

- Interested in conservation and native forest management, and 'loggers vs greens' debate. Also particularly interested in wildlife management and extinction of species.

- Yes media coverage of problems encountered with forestry and environment [sic] made me want to learn more about the real problems.
- I am concerned about the logging of old-growth forests and the predominance of *Pinus radiata* plantation systems.
- Important to manage the resource better as I see some problems in current forest management.
- I'd like to see some of the borderline forestry practices stopped i.e. clear-felling — more emphasis on plantations and transition of agricultural lands.
- REM issues depressed me because I thought it was so hard to manage them while still producing for the human race. Forestry teaches how to manage REM issues while production can still go on.
- I believe these [forestry and environment issues] to be very important for our future. I would love to be a part of managing our precious resources.

After being specifically asked about the influences of work experience, environmental or forestry management issues, or whether they knew somebody in the forestry profession, the students were then asked what else influenced their decision. Of the 92 (77%) who gave an answer, by far the most frequent response (41%) was word of mouth; encouragement, support and information provided by parents, relatives and or spouses, work-mates, friends, and past and current students. Of these sources of information, family had the biggest influence.

The next most frequent response (15%) in answer to this question was enjoyment of the bush, forest and outdoors, and practical and or outside work. Eleven per cent (ten students) wrote that the ability to study in Canberra was an important influence.

Expectations of a forestry degree

Often the expectations that university students carry into their courses do not match the reality. When asked whether the courses they were undertaking met their expectations, however, a great majority (93/119 students) of the students surveyed declared they were satisfied. Of the forestry students (single and combined degrees), 80% said their expectations had been met so far.

One forestry student, however, had the reservation that:

They still can't truly justify logging native forests when there is potential in plantations...

Others had no reservations:

- Even more so, as it has created options that I was originally unaware of.
- It has given me an insight and understanding of environmental issues and ways to correct them.
- I didn't really know what to expect but am enjoying it so far. It is structured well and encourages work experience which I feel is essential for finding job opportunities.

A general observation about student expectations was presented by ANU academic Dr Ann Gibson (Student Adviser in the ANU Department of Forestry in 1998). Dr Gibson, in an informal interview for this study, commented on the motivating influence of the perceived outdoors forestry lifestyle on degree choice. So also did Kanowski (1995) when commenting that most of the

20th century surveys of forestry students revealed rationales for their choice of career that emphasised themes such as 'love of the outdoors' and 'the romantic appeal of forest life'.

Dr Gibson noted, however, that this caused problems for some students when they discovered they had to pass core subjects, such as statistics and chemistry (Searle 2000). Some forestry students in this study did feel that somehow they had been asked to take courses in which they had no interest. For example, two forestry students did not want to study statistics or economics. This, however, must be a common concern for all interdisciplinary subjects such as forestry and REM. For example a first-year REM student wrote:

I did not expect to do geology and biological subjects. I was more looking forward to doing more geography-based subjects.

A few second-year forestry students were disappointed that 'green' issues had not yet been addressed in their course.

- I'd like to see some sort of direction at (sic) revegetation and rehabilitation work for tropical forest.
- I thought there would be more emphasis on 'green' issues and forest products than there has been so far. A bit disappointing.
- I had expected the degree to focus not just on harvesting, and maintaining, native and plantation forests.

There was evidence that a small number of students surveyed had rejected the idea of a forestry degree because of their negative perceptions about logging and woodchipping in native forests. Six students of the 119 students — none of them forestry majors — wrote that they considered that forestry was exploitative.

The stronger evidence, however, was that the awareness of and concern about environmental or forestry management issues had in fact positively influenced nearly three-quarters of the surveyed students to study for their respective degrees.

There were those who wanted to do something for the environment (mostly REM students) and those who were more concerned about specific agricultural and forestry issues (mostly forestry students). They wanted either to contribute to forestry policy or were concerned about policy regarding environmental problems, the impact of humans on the natural environment, deforestation, tree harvesting, land degradation caused by farming, conservation issues and pollution.

More forestry students mentioned specific forestry issues such as logging and wood-chipping than students studying for REM or Science degrees. Typical answers given by three forestry students were:

- Being from Eden I am interested in the conflicts between wood chipping and the conservation movement. I have seen how the timber industry has suffered in my town where the large sawmill was closed. I wanted to do something to stop this happening.
- I know a lot of older foresters who are in the mindset that trees grow to be chopped down. I disagree with this, but the only way to change things is to do it yourself.
- I've also previously attended protest rallies at various forests in Australia but never really felt comfortable with the lack of knowledge or information regarding the actual 'reasons'

behind various logging operations. I guess I've always wanted to know the 'why' behind various forestry policies, 'how' they are implemented and 'who' follows them through.

Perhaps some of the specific issues about their degree courses have been addressed in the intervening time since Searle wrote in 2000. For example statistics and chemistry are apparently no longer required courses for the ANU undergraduate forestry degree (Dr Brian Turner, ANU, *pers. comm.*, 2009). One thing that emerged is that, however enjoyable many students found the course to be, some were poorly prepared for the demands of an applied science that draws upon concepts from a wide range of disciplines.

Students' suggestions to recruit potential forestry undergraduates

Most answers given to the question about encouraging others to enrol in forestry or REM degrees or units at ANU focused on making information available to students at college and high school. The most frequent suggestion, made by 22 people, was for enthusiastic tertiary students, graduates and professionals to go into high schools and colleges to talk to senior classes (Years 10, 11 and 12). The second most frequent suggestion, made by 13 people, was to publicise the benefits of the course and future career prospects.

A few mentioned that fees (without specifying which fees) could be a problem and they should be reduced. It is interesting to note that from 1926 — when the Australian Forestry School opened — until 1969 practically all forestry undergraduates were sponsored by the Commonwealth and state governments and a few private forestry organisations. However, with the general increase in the number of forestry graduates — encouraged by the abolition of university fees for 15 years (1974–1989) and the availability of financial assistance from the federal government — the percentage of unsponsored students increased and, by the late 1970s, sponsoring by scholarship specifically for forestry had itself been gradually phased out (Carron 1985). Employers must have felt there was no longer the need to sponsor undergraduates as they could pick and choose from amongst the increasing numbers of uncommitted graduates.

Other suggestions from the students focused on the general public and a perceived lack of accurate information about what forestry is and what foresters do:

- Promote the ecological and conservation aspects of the degree and the environmental benefits of forestry...
- Not many people realise many of the environmental benefits of forestry — need to be educated.
- Make people aware that studying a forestry degree does not mean that you are interested in destroying forests!

The negative perception of forestry described in the previous quotation was also found in the following reflection:

I guess I used to think that all foresters did was cut down trees, so perhaps people need to be made more aware of what's involved.

One first-year forestry student suggested people could be encouraged to enrol in forestry or REM degrees and units at ANU,

'through work experience, interests, community groups, talking to professionals'.

The positive effect that foresters can have on potential students was expressed by a second-year forestry student:

After spending much of the day in the forest talking to contractors and foresters [I] decided that forestry was an extremely important job with an excellent cause.

Two students commented that those who study for environmental management qualifications, including forestry degrees, are attracted to the degrees because they are 'passionate people':

I think people are interested in these subjects or they're not — environmental degrees seem to attract passionate people to the courses. (Second-year forestry student)

Perhaps they were implying that people who choose to find out more about or obtain a qualification in forestry or REM do not need encouragement because they are already motivated by strong feelings and particular values.

Recent government and forestry profession initiatives

A number of reasons for shortages of critical skills in tertiary-trained foresters and many others across the wood and paper products industry in Australia were identified in June 2006 by the Wood and Paper Products Industry Skills Shortage Audit (NAFI and A3P 2006). Amongst these was the increased cost to students of acquiring a four-year tertiary qualification (compared with a three-year degree) that has coincided with the increased commercialisation of Australian tertiary education over the last 20 years (Kanowski 2004).

To encourage undergraduate and postgraduate study in agriculture and forestry, the House of Representatives Standing Committee on Agriculture, Fisheries and Forestry Inquiry into Rural Skills Training and Research made 29 recommendations, of which the first five are relevant here, together with recommendation 14. Recommendations 1 to 3 are concerned with communication about the requirements of the profession of forestry and the career opportunities it affords students. Recommendations 4 and 5 are concerned with promoting forestry within primary and secondary schools and among girls and young women. Recommendation 14 states that:

The committee recommends that the Australian Government review higher education in agriculture and forestry, with a view to:

- increasing student numbers through scholarships and or HECS exemptions
- rationalising the number of institutions providing courses in agriculture and forestry, and facilitating inter-campus cooperation and coordination; and
- increasing the overall level of funding for courses in agriculture and forestry, and placing it on a sustained basis. (House of Representatives Standing Committee on Agriculture, Fisheries and Forestry 2007).

The Tertiary Forestry Education Summit, hosted in May 2008 by the Institute of Foresters of Australia (IFA), brought together representatives of employer groups and members of the IFA

to meet with tertiary educators to discuss the crisis in forestry education. 'All present acknowledged the critical situation regarding the difficulty in employing professional foresters and the need to seriously address the problem of low enrolments in tertiary forestry courses' (Institute of Foresters of Australia 2008).

At the summit, students and professionals presented anecdotal evidence to illustrate the failure of the forestry profession to engage the minds of young people. As stated earlier, this is not solely an Australian problem. Kanowski (2008) showed that similar problems beset forestry in the US and Canada. For example, figures for undergraduate enrolments, aggregated across seven Canadian universities, show that undergraduate enrolments in both accredited and associated courses had, by the end of 2007, halved over a period of six years. The USA is in a slightly better position, enrolments in accredited courses showing a linear decline of 11% over the five-year period from 2002 to 2006.

A summary of the agreed issues and actions proposed at the summit included:

- IFA will establish a scholarship program to support students commencing in 2009. Industry has agreed to support this scholarship program on a sustaining basis and some companies may offer their own scholarships.
- Industry and government agencies will offer vacation employment to forestry students and students from related disciplines to give them an introduction to forestry careers. (Institute of Foresters of Australia 2008).

Conclusion

The results from Searle's (2000) study shed light on one aspect of the decline of interest in studying forestry — lack of public awareness of what forestry is and what foresters do. The decline in undergraduate enrolments in forestry at ANU did not appear to be a symptom of a general decline in demand for forestry graduates nor did it appear to have resulted from a strong negative perception of forestry and the role of foresters.

In fact, half those students who had met and talked with foresters and were aware of what they do, chose to study forestry as a result. Therefore the decline in enrolments may have been due more to a lack of awareness among potential students of the forestry degree and the forestry profession. The forestry profession's failure to communicate effectively with the public has contributed to this lack of awareness.

Turner (1996) observed that communicating with the general public was yet to become an integral part of the culture of the forestry profession in Australia:

Foresters have never perceived a need until recently to communicate with the general public about professional practices. Neither have doctors but they're changing. Many professions, forestry included, are now finding that the public is demanding to know what is going on.

The forestry profession's traditional one-way delivery of technical knowledge has also been criticised as inadequate to engage effectively in the environmental debates of the last forty years. However, individual foresters have had an important influence on prospective forestry students and should continue to become

involved in recruitment, including giving work experience opportunities to high school and college students.

Given the importance of personal contact and word of mouth as a source of information and influence upon students' degree choices, all in the forestry profession should be encouraged to take every opportunity to speak with school students (and their parents and other family members in particular), before the students decide on the subjects they will study in their final years.

Discussions, both formal and informal, should emphasise for prospective students the importance of forestry in Australia, the experience of studying for a forestry degree, the technical, social and management skills they will learn and the employment opportunities and diversity of jobs that await them when they have a professional forestry degree.

Lifestyle aspects should also be discussed with those who enjoy working outdoors or in regional Australia, or being part of rural communities. The opportunities to make a contribution or a difference to the management of Australia's forests should be emphasised in order to appeal to people's values and passions.

Relevant work experience was also found to be an effective influence upon prospective students. Initiatives such as the proposed IFA action (Institute of Foresters of Australia 2008) to arrange such experience as one of the benefits offered by the profession for both prospective and undergraduate forestry students should be a high priority and strongly supported.

If those in Australia's forestry profession do not make a concerted and sustained long-term effort to communicate with prospective students, their families and the wider community about what forestry is and what foresters do, who will?

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