

Technical Forester Training in Tasmania

Graham Wilkinson
Forestry Commission, Tasmania

Abstract

In Tasmania, technical foresters provide the vital functions of operational supervision and planning in both the public and private forestry sectors. The Forestry Commission has maintained a formal in-service training programme for technical foresters since 1952. The programme has been progressively updated in response to continuing changes in the duties and responsibilities of technical foresters. In recent years, there has also been a need to expand the programme to formally include trainees from forest industry and to ensure that uniform standards of training and accreditation apply throughout the State. The new training course is a four-year competency-based programme with structured on-the-job and off-the-job training components. It is administered by an Accreditation Panel comprising representatives from the Forestry Commission, APPM Forest Products, Forest Resources, ANM Forest Management and the Tasmanian Forest Industries Training Board Inc.

Introduction

It is 41 years since the Forestry Commission, Tasmania, commenced a programme to recruit and train technical foresters. During this time, technical foresters have provided the link between the professional level of strategic planning and policy formulation, and the operational level of forest works. Their basic role has remained one of implementing policy, collecting resource information, and planning and supervising forest operations. However, in recent years, technical foresters have been faced with the challenges of new technology, higher responsibilities and modified work practices. Some of the important changes include:

- The introduction of the Forest Practices Code in 1985 and associated increased

emphasis on the management of non-wood values.

- Structural changes have resulted in the creation of Deputy District Forester (DDF) positions in each forestry district. These positions are the respective functional heads of sales, operations and planning activities reporting directly to the District Forester. Currently, District Forester positions are occupied by graduate foresters and all DDF positions are occupied by technical foresters.
- There has been greater community and political interest in forest management, accompanied by several major reviews and conflict at both the State and local levels.

The Tasmanian technical forester training programme has been progressively updated and refined to meet the needs of the Commission and forest industry. Technical forestry training is also conducted in other States, usually as courses offered by various Technical and Further Education (TAFE) or university programmes. In contrast to forestry graduate training which is nationally based (at the Australian National University and Melbourne University), technical forestry training has traditionally been undertaken at a State level, probably because of the importance given to on-the-job training and practical experience of local conditions.

This paper describes the history of technical forester training in Tasmania and recent changes to the programme.

History of technical forester training

A shortage of trained forestry staff was recognised as a major problem by the newly

Table 1. Initial training programme for technical trainees (1952–1964).

| 1st Year | 2nd Year | 3rd Year |
|---------------------------------|---|-----------------|
| Surveying and timber assessment | Fire protection | Fire protection |
| Nursery work | Road location, construction and maintenance | Timber sales |
| Plantation work | Tools and equipment | Tree-marking |
| | | Survey |
| | | Motorised tools |

created Forestry Department in 1921 (Irby 1921). During its early years, the Department recruited trained foresters from interstate and overseas. Some officers were sent to interstate forestry departments, the CSIRO or the Australian Forestry School in Canberra for various periods of training (Steane 1932). In the 1930s, the positions of Forest Guard and Forest Ranger were created, probably based on the British and Indian systems experienced by the Conservator for Forests, Mr S.W. Steane (P.T. Unwin, pers. comm.).

Forest Guards were usually recruited direct from the forest gangs. Forest Guards with higher potential or experience were promoted to Forest Rangers. Some training was provided by the 'Unemployed Youth Camps' at Mawbanna and Taranna during the mid-1930s. However, the majority of these officers were recruited with no formal training.

During the later 1930s and 1940s, technical staff continued to be promoted 'through the ranks'. Formal training was limited to the professional cadets who generally attended the University of Tasmania followed by the Australian Forestry School.

The post-war planning era following World War II created interest in training programmes for ex-servicemen. A small number of Tasmanians was sent to a one-year training course run by the Victorian Forest Service. However, this scheme was not judged to have been a success and was discontinued.

Following the advent of the Forestry Commission in 1947, there was increasing

recognition that the organisation needed technical staff with high quality formal training. A training programme was developed by Commission officers Paul Unwin and Harold Payne and the first intake of three trainee forest rangers commenced in 1952. The training programme was largely 'on-the-job' and was designed to cover basic forest management as detailed in Table 1. Training was carried out over a four-year period which was followed by practical examinations on native forests and plantation management.

The early programme was not a great success due to a number of factors (P.T. Unwin, pers. comm.), including poor initial selection of trainees, poor living conditions in the field, lack of supervision and lack of commitment to formal training by older field officers.

By the late 1950s, the Commission expressed concern about the difficulty in attracting applicants for technical positions. A major problem was that the social attitudes of the era gave higher status to office jobs than to outdoor positions. A report by the Legislative Council in 1959 recommended that the Commission should 'take steps through secondary schools to attract students to careers in forestry' (Legislative Council 1959).

In 1963, the Commission introduced formal off-the-job training courses. Each trainee was required to attend an initial course of basic subjects and a later course of advanced theory. Instruction was given by specialists and practitioners, largely employed by the Commission. During on-the-job training,

trainees were transferred between various forestry districts to ensure that they were exposed to the full range of forest types and management activities. Postings in each district were from three to six months and trainees were required to complete a report following each posting.

During the 1980s, the training programme became progressively more formal and structured. A separate Technical Foresters Award was introduced in 1981, providing a formal basis for accreditation and training. Under the Award, trainees had to successfully pass examinations conducted after the fourth and sixth years of training. In 1986, a School of Forest Industries was established at the TAFE campus in Devonport. The School provided a 13-week course in forest technology, with lecturers primarily drawn from the Forestry Commission and forest industries. Courses were conducted in 1986 and 1989, with students attending from both the Commission and industry. Problems with the organisation of these courses resulted in the cessation of TAFE involvement after 1989.

In 1990, a review of the training programme identified a number of important future training requirements:

- the need for industry to adopt a formal training programme;
- the need for the training programme to be 'competency-based', with better structuring and integration between on-the-job and off-the-job components to ensure that the critical skills were achieved by all trainees;
- the need to improve the efficiency of the training programme to allow a reduction in the length of training from six to four years;
- the desirability of a uniform, externally recognised accreditation;
- the need to maintain the high standards of technical forester competence;

- the need to respond to changes in technical forester work, particularly in terms of increased levels of responsibility, the challenges of new technology and more complex decision-making processes involving non-wood values and community participation.

Recent changes

Major changes to the training programme commenced in 1991, with the introduction of a new four-year course. Key features of the course are described below.

1. Joint Forestry Commission/industry course

The new course is conducted under the Tasmanian Forest Industries Training Board Inc. (TFITB) and is administered by a Technical Forester Accreditation Panel (TFAP) which includes representatives from the Forestry Commission, APPM Forest Products, ANM Forest Management, Forest Resources and TFITB. The course is open to suitable applicants employed in the public or private forestry sectors. However, the large on-the-job training component effectively precludes non-forestry employees and private individuals.

The role of the TFAP is to co-ordinate the training programmes and maintain uniform standards. The Panel is currently seeking national accreditation of the course at Associate Diploma level. The benefits of the collaborative approach to training are that it:

- ensures that uniform standards of training and accreditation apply throughout the industry;
- optimises the opportunities for combining on-the-job training provided by the employers with the systematic approach to training provided by the TFITB;
- provides a central focus for funding and resource allocation.

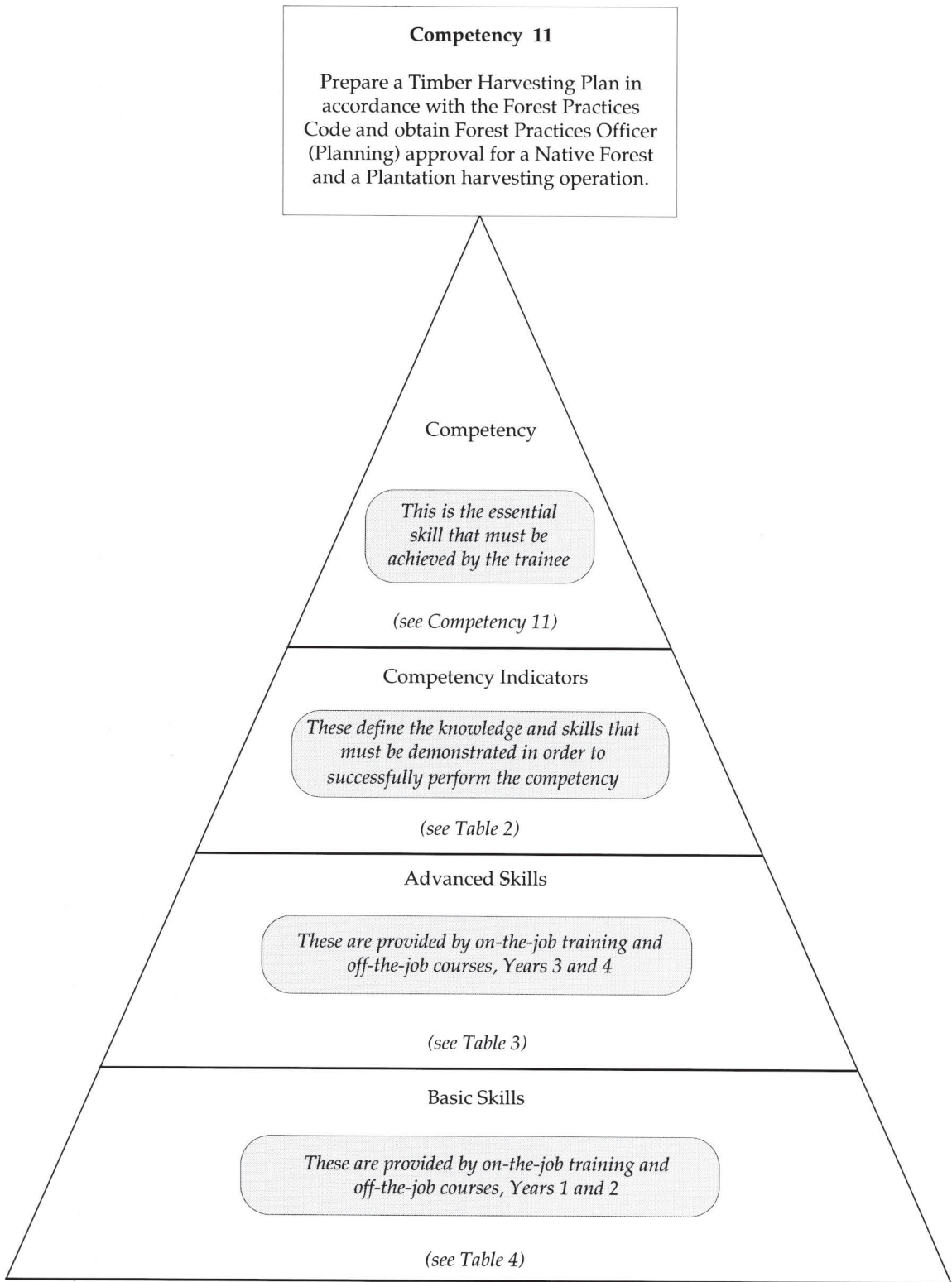


Figure 1. Example of competency-based training for the preparation of a Timber Harvesting Plan (Competency 11).

2. Competency-based training

The new training programme is competency-based. Competency is simply the combination of knowledge, attitude and skills necessary to undertake a work task to a pre-determined standard. *Critical competencies* are the essential skills which must be achieved successfully by the trainee.

Competency-based training has the following advantages:

- training effort is focussed on the skills and knowledge identified as being essential for the successful performance of the nominated work tasks;
- training performance can be measured against a pre-determined standard;
- successful achievement of the competency provides a basis for the formal accreditation of the skill.

Currently, 34 critical competencies are identified for trainee rangers and 20 for trainee assessors (13 competencies are common to each programme). Critical competencies are listed in Appendix 1. Each competency is defined by *competency indicators* (i.e. the description of what is required to demonstrate that the skills and knowledge have been achieved).

An example of the approach to competency training is given in Figure 1.

3. Structured four-year training programme

The course covers two years of general training followed by two years of specialist training in one of two streams:

- ranger stream (district administration and operations supervision);
- assessor stream (resource inventory and planning).

Trainees are generally stationed in at least three districts during the four-year course to ensure that a full range of training opportunities is provided. Off-the-job training comprises a minimum of 16 weeks instruction spread over four years. Trainees attend two blocks of two to three weeks per year. Subjects covered are listed in Appendix 2. Instruction is provided by Forestry Commission, industry and external instructors. Courses are generally held at the Hollybank Forest Training Centre. The objective of the off-the-job training is to provide the theory component necessary to complement the more practical, on-the-job training. The course syllabus is reviewed each year to ensure that it remains up-to-date and relevant.

On-the-job training is detailed in a series of training manuals. During the four-year course, the trainee must progressively complete the competencies prescribed in three manuals:

Manual 1—contains the basic skills which will prepare the trainee for more advanced training. These skills should be gained during the first two years of training.

Manual 2—contains the specific skills required for streaming either as an assessor or as a ranger. These skills should be achieved during the final two years of the training programme, in preparation for the competency tests.

Manual 3—contains the critical competencies and competency indicators (i.e. the definition of what is required to demonstrate that the competency has been achieved).

Evaluation procedures are as follows:

- the basic and specific skills listed in Manuals 1 and 2 are progressively evaluated by the trainee's supervisor;
- the critical competencies are evaluated by Forestry Commission and industry examiners accredited by the TFAP. Evaluation can be requested at any time during the last two years of the training

Table 2. Competency indicators for the preparation of a Timber Harvesting Plan (THP). These must be achieved for both pine plantations and native forests.

-
- Considered overall land classification and future land use.
 - Correctly selected appropriate map, located and drew in boundaries, streams etc.
 - Prepared field map to appropriate scale.
 - Planned field check (using photographs, PI-type maps).
 - Arranged field inspection involving interested parties.
 - Conducted field inspection along pre-determined routes and recorded notes on coupe.
 - Located, inspected and confirmed landing sites, boundaries, classified streams and reserves.
 - Identified and assessed special values and possible constraints to logging (water, soil, slope, visual etc.).
 - Determined roading adequacy and requirements.
 - Confirmed by visual assessment, stated volumes of products.
 - Negotiated with interested parties appropriate logging strategy (i.e. machinery, time of year, snig track direction etc.).
 - Determined restoration and rehabilitation requirements.
 - Completed THP Section A accurately.
 - Completed THP Section B according to agreed logging methods.
 - Completed THP Section C according to recommended silvicultural and fire management prescriptions.
 - Correctly prepared a map (in accordance with guidelines).
-

programme when the trainee and training supervisor are confident that the required standard of competency has been achieved.

4. Trainee/trainer responsibilities

The training manuals provide the framework for training and accreditation. Each forestry district has a training supervisor who is responsible for the supervision of the trainee's training programme. Using the manuals, work programmes can be made more relevant to specific training needs. This should provide trainees with the incentive to pursue training opportunities so that they can gain the skills in preparation for competency testing. Successful attainment of a competency provides recognition and gives the trainee a sense of achievement.

Within the Forestry Commission, the co-ordination of the training programme is undertaken by the Training Officer. Strategic

planning for the programme has been provided by the Technical Forester Training Committee. More recently, the TFAP has provided the strategic overview for both the Commission and industry.

5. More flexible approach to recruitment, training and accreditation

(a) Previous recruitment

Prior to the introduction of the new course, the typical profile for a trainee recruit was a young (predominantly male) school leaver with Level III passes in Higher School Certificate English and Maths, and a demonstrated aptitude for outdoor work. In recent years, the competition for traineeships has been very keen, with over 400 applicants for the four to six positions offered by the Forestry Commission and industry every two years. However, the successful retention rate for trainees was unacceptably low, with

Table 3. An example of the advanced skills to be achieved in preparation for competency testing.

| | |
|---------------|---------------------|
| Subject Area: | Harvesting |
| Task: | Harvesting Planning |
| No: | R7.1 |

7.1.1 Describe the general principles for the conservation of the following values during harvesting planning:

- Flora
- Fauna
- Landscape
- Archaeology
- Karst/Geomorphology

7.1.2 Describe the planning considerations for cable logging.

7.1.3 Complete Section B of a Timber Harvesting Plan (THP).

7.1.4 List the major factors affecting harvesting economics.

7.1.5 List and describe reforestation techniques available for even and uneven-aged eucalypt forests.

7.1.6 Prepare a THP and obtain plan approval from a Forest Practices Officer (Planning).

7.1.7 Complete a Cutting Approval Advice.

Table 4. An example of the basic skills to be achieved prior to more advanced training.

| | |
|---------------|------------------------------------|
| Subject Area: | Harvesting |
| Task: | Native Forest Operational Planning |
| No: | G9.1 |

9.1.1 Describe the general principles and basic approach for Native Forest Harvest planning as given in the *Forest Practices Code*.

9.1.2 Describe, identify and define the functions of:

- (a) a ground-based conventional logging system, including safety considerations;
- (b) a basic cable logging system.

9.1.3 Describe/define the following terms:

- (a) non-integrated operation;
- (b) partially integrated operation;
- (c) fully integrated operation

9.1.4 Describe the purpose of a Timber Harvesting Plan (THP) and the major stages and processes involved in a THP.

9.1.5 Complete Section A of a THP and prepare a large-scale map to accompany Section A.

30–40% of each intake leaving prior to the completion of the training programme.

The success rate for females in the training programme has been very disappointing. Initially, the low ratio of female to male

applicants suggests a fundamental problem in attracting females to this type of work—females average only 12% of applicants for traineeships. Secondly, the low retention rate of female trainees indicates further difficulties experienced by females in a working

environment dominated by males. Of the last four female trainees, two completed their training but left shortly afterwards, one resigned after three years of training and one works as a field-based silvicultural officer. There are currently no female ranger or assessor technical foresters working for the Forestry Commission.

No mature-age trainees (i.e. older than 21 years) were recruited to the previous training programme because of perceived problems with rates of pay and with providing accommodation for married trainees, and concerns that mature trainees may be less receptive or less adaptable to new ideas. This strategy had one important drawback in that non-qualified employees with outstanding potential for further development and a demonstrated commitment to forestry work were denied the opportunity for advancement in the organisation. In addition, the changing nature of technical forestry work has confirmed the need to have a range of profiles within the organisation to meet the future range of functions and responsibilities.

(b) *Current recruitment*

The new training course provides a more flexible approach to the questions of technical recruitment, training and accreditation.

- Trainees with different backgrounds/skills can be recruited and accommodated at the appropriate level in the training programme. People with relevant skills can gain accreditation for appropriate competencies and direct future training effort to completing the outstanding programme. In this way, not all trainees will require the full four-year training period. The most recent intake of trainees includes one with tertiary qualifications (Applied Science degree) and one with extensive practical experience, in addition to others with the more typical profiles of young school-leavers.
- The current programme provides a mechanism for the accreditation of people

from outside the training programme, for example interstate and overseas technical foresters or existing *de facto* technical foresters who do not hold formal qualifications. It is unlikely that these people would successfully complete the critical competencies without further training, particularly in the case of non-Tasmanian applicants, since knowledge of local conditions is an important facet of many competencies. Nevertheless, the programme can provide a clear indication of what training/skills are required to achieve accreditation.

The benefits of a more flexible approach to recruitment and training have been identified by other forestry organisations. The New Zealand Forest Service recognised the importance of providing a diversity of entry points to the industry for people of different qualifications and aspirations (McKelvey and Chapman 1981). More recently, the New Zealand Forest Industry Training and Education Council has recognised the need to have effective 'staircasing' of skills to provide for progression from basic training through to tertiary education (McGowan 1991). The advantages of continuing adult education form the basis of a programme of an inservice forestry course in Queensland (Costantini *et al.* 1988; Shepherd 1991).

Future directions

The changing role of technical foresters in Tasmania has highlighted two separate technical training needs. Firstly, senior technical foresters are faced with increasingly complex technical subjects, particularly in the areas of forest practices and resource planning. Specialist forest practices courses have made a substantial contribution to training. Continuing development of inservice advanced technical training courses will be required to ensure that staff remain up-to-date with changes in policy and technology. A successful approach to

continuing technical training in the Queensland Forest Service is described by Shepherd (1991). The Queensland system applies the principles of adult learning to a large organisation spread over considerable distances, thereby necessitating the use of 'distance' (correspondence style) education. The 'tyranny of distance' is not so great in Tasmania and training programmes can often be centralised successfully. Continuing access to well-designed courses remains the fundamental requirement for effective inservice training.

The second technical training need is at the forest gang level. Whilst some excellent training courses have been developed for specific work tasks such as fire fighting, the majority of work is carried out without access to formal training courses. In particular, the changing role of technical foresters has meant that many tasks previously undertaken by trained technical staff are now carried out by workers who have not had the benefit of relevant formal training.

A more integrated approach to training at all technical levels within the forest industry is a likely consequence of future change. At the organisational level, work tasks and functions will continue to be reviewed critically to ensure that the future needs of the industry can be met in a cost-effective manner. Uniform standards of training and accreditation will give managers greater flexibility in deciding whether to recruit and train for specific work tasks, or to use qualified people from elsewhere. At the individual worker level, training courses need to be structured to provide opportunities for personal development and career progression.

A move towards integrated forest industry training has occurred in the wake of extensive structural changes to the forest industry in New Zealand (McGowan 1991). The New Zealand system is based on the *identification* of required skills (training needs) and the *provision* of competency-based training and accreditation. Similar developments are

occurring in Tasmania and recent legislative requirements are providing a formal framework for change.

- The *Training Guarantee (Administration) Act 1990* requires large organisations to spend at least 1.5% of annual payroll on training.
- Under *Award Re-structuring*, it is necessary for skills and training requirements to be clearly defined and provision made for formal progression from one level to another.

In any process of change, there is always the valid fear of 'too much needless change simply for the sake of change', particularly when changes appear to be prompted by pressure groups with only superficial knowledge (Whyte 1991). Nevertheless, the future success of any organisation depends upon its ability to recognise and effectively respond to change (McMahon and Carter 1990). In terms of broad changes to forest management, the Resource Assessment Commission Forest and Timber Inquiry found:

'Community attitudes towards forests have changed significantly in the last two decades. The Inquiry expects that attitudes will continue to change.....It is vitally important for governments to recognise these trends....and to establish flexible decision-making institutions and processes that can anticipate and adapt to change (RAC 1992, p. 12).....The rapid changes in community attitudes and values and changing economic pressures for the use of Australia's forest and timber resources require new directions in education, research and training programs in forest management.' (RAC 1992, p. 461).

The greatest challenge to technical training will be the need to remain flexible and able to respond dynamically to these changes. Future directions are likely to include:

- the need to maintain an understanding and appreciation of basic skills and knowledge in addition to the more advanced, specialist skills;

- the need to provide continuing training programmes so that individuals can respond to work changes;
- the need to integrate all technical training to optimise training effort and ensure that the changing technical needs of the organisation are being satisfied at all levels;
- the need to formalise all training and accreditation programmes to ensure that uniform standards apply throughout the industry.

Acknowledgements

Many dedicated staff have made valuable contributions to the training programme over

the last 40 years. In recent years, Ken Felton, Dick Chuter and Mike Bigg provided the formal basis for training, in addition to upgrading the status of trainees' welfare and development. The competency programme was initially developed by training consultant Frank McMahon and (former) Forestry Commission training officer Ross Andrewartha. Present training officer Rod Smith completed the production of the training manuals. The important and valuable roles played by the training supervisors and members of the Forestry Commission Training Committee and TFITB Accreditation Panel are gratefully acknowledged. Lastly, thanks go to Paul Unwin and Rod Smith for providing much of the historical information used in this paper.

References

- Costantini, A., Bryne, P.J. and Gilmour, D.A. (1988). Forestry technical education in Queensland 1930–1987. *Aust. For.* 51(4): 232–237.
- Irby, L.G. (1921). *Report of the Forestry Department for the year ending 30th June 1921*. Government Printer, Hobart.
- Legislative Council (1959). *Regeneration of Eucalypt Forests - Report of the Select Committee of the Legislative Council, Parliament of Tasmania*.
- McKelvey, P.J. and Chapman, W.A. (1981). The state and status of education and training in New Zealand Forestry. In: *Proceedings of the 3rd New Zealand Forestry Conference*, Part II, 7–8 September 1991. New Zealand Forestry Council, Wellington.
- McGowan, R.M. (1991). Recent directional changes in forestry education and training in New Zealand. In: *New Directions in Forestry: Costs and Benefits of Change*, pp. 301–303. Proceedings of the Australia and New Zealand Institutes of Forestry Conference, 30 September–5 October 1991. Christchurch, New Zealand.
- MacMahon, F.A. and Carter, E.M.A. (1990). *The Great Training Robbery: A Guide to the Purchase of Quality Training*. The Falmer Press, U.K.
- RAC (1992). *Resource Assessment Commission Forest and Timber Inquiry*, Final Report, Vol 1. Australian Government Publishing Service, Canberra.
- Steane, S.W. (1932). *Report of the Forestry Department for the year ending 30th June, 1931*. Government Printer, Tasmania.
- Shepherd, P.J. (1991). Training in an inservice forestry context. In: *New Directions in Forestry: Costs and Benefits of Change*, pp. 304–310. Proceedings of the Australia and New Zealand Institutes of Forestry Conference, 30 September–5 October 1991. Christchurch, New Zealand.
- Whyte, A.G.D. (1991). Costs and benefits of changes in New Zealand forestry education. In: *New Directions in Forestry: Costs and Benefits of Change*, pp. 318–326. Proceedings of the Australia and New Zealand Institutes of Forestry Conference, 30 September–5 October 1991. Christchurch, New Zealand.

Appendix 1. List of critical competencies to be achieved by technical foresters under the current training programme.

| Competency | Ranger stream | Assessor stream |
|---|------------------|--------------------|
| Conduct an ocular assessment, using standard procedure, in a native forest. | + | |
| Start a personal computer, enter a table in a spreadsheet package involving row/column totals and headings. Save the table and print it out. | + | + |
| Produce a large-scale, burning/sowing map from aerial photographs for use in a forest operation, showing all critical information. | + | + |
| Execute a 3 km cross-country traverse in a forest setting, using appropriate navigational aids (e.g. maps, compass etc.). | + | + |
| In a forest setting, re-locate a cadastral property boundary using prescribed re-location procedures and appropriate survey navigational aids. | + | |
| Locate a spur road-line (including a Class 2 or 3 stream crossing and landing sites) in accordance with the <i>Forest Practices Code</i> roading specification, in a forest environment. | + | + |
| In a forest environment, plan and supervise the building of a spur road in accordance with the <i>Forest Practices Code</i> roading specification. | + | |
| Conduct a seen-area mapping project for a significant view-point, in accordance with <i>A Manual for Forest Landscape Management</i> . | + | + |
| Prepare and supervise a road-maintenance programme, on a suitable roading system, in accordance with the <i>Forest Practices Code</i> roading specification. | + | |
| Prepare and supervise a quarry rehabilitation project in a suitable quarry, in accordance with specifications in the current <i>Rehabilitation Guidelines for Forest Construction</i> . | + | |
| Prepare a Timber Harvesting Plan (THP) in accordance with the <i>Forest Practices Code</i> and obtain Forest Practices Officer (Planning) approval for a native-forest and a plantation-harvesting operation. | + | + |
| Segregate on a forest landing site, 10 run-of-the-bush eucalypt and <i>Pinus radiata</i> tree lengths into correct categories, in accordance with current industry log specifications. | + | + |
| Conduct a native forest and a <i>Pinus radiata</i> logging residue assessment for a recently completed logging coupe, in accordance with the current log specification standards. | + | + |
| Conduct a thinning damage assessment in a forest plantation, in accordance with the current damage-limit specifications. | + | + |
| From a local office, issue major and minor forest product licences in accordance with the procedures contained in the <i>Marketing Manual</i> . | + | |

| Competency | Ranger stream | Assessor stream |
|--|------------------|--------------------|
| Update a Fire Management Plan, using an existing area plan, in an office setting, in accordance with the <i>Fire Management Manual</i> prescriptions. | + | |
| Update an annual fire action plan, using local resources in a local District Office, in accordance with the local fire plan requirements. | + | |
| Arrange fire fighting resources relevant to predicted forecast fire behaviour in accordance with local procedures. | + | |
| Assess, deploy and supervise a fire-fighting activity on a small-scale, low-medium intensity wildfire, in accordance with all safety and tactical procedures stated in the <i>Fire Management Manual</i> . | + | |
| Conduct a fuel reduction burn in a suitable forest type, in accordance with the stated reduction-burning weather prescriptions for that forest type. | + | |
| Recommend a silvicultural treatment/prescription for a given forest type and block, in accordance with the <i>Forest Practices Code</i> , silvicultural prescriptions and relevant technical references. | + | + |
| Plan and conduct a high intensity regeneration burn in a suitable forest type and block, in accordance with the <i>Fire Management Manual</i> prescriptions for the forest type, under close supervision. | + | |
| Plan and conduct a eucalypt seed collection programme in suitable forest types in accordance with the technical prescription, and conduct an aerial sowing operation on a coupe in accordance with the <i>Aerial Operations Manual</i> requirements. | + | |
| Plan and conduct a regeneration survey on young eucalypt regeneration (less than two years old), in accordance with the Native Forest Silviculture Technical Bulletin No. 6, <i>Regeneration Surveys and Stocking Standards</i> . | + | |
| Conduct a native forest re-stocking programme for an understocked regeneration area, in accordance with the Native Forest Silviculture Technical Bulletin No. 7, <i>Remedial Treatments</i> . | + | |
| Demonstrate ability to identify plant species with a botanical key. Collect from appropriate sources, store and maintain 40 plant species listed in Appendix II of the training manual. | + | + |
| Plan and conduct a site preparation programme for recently harvested areas, in accordance with the <i>Forest Practices Code</i> and the <i>Plantation Handbook</i> . | + | |
| Plan and conduct a tree planting programme of suitable species on a prepared site, in accordance with the <i>Plantation Handbook</i> stocking rate and standards. | + | |
| Plan and conduct a fertilizing programme in accordance with the <i>Plantation Handbook</i> application rates. | + | |

| Competency | Ranger stream | Assessor stream |
|--|------------------|--------------------|
| Plan and conduct a game-control programme for a newly planted forest block, in accordance with <i>Plantation Handbook</i> procedures and statutory/legal requirements. | + | |
| Plan and conduct a pest or weed control programme on a relevant forest type, in accordance with the <i>Plantation Handbook</i> or <i>Pests and Diseases Management Plan</i> . | + | |
| Plan and conduct a <i>Pinus radiata</i> pruning and thinning programme in a suitable forest stand, in accordance with the <i>Plantation Handbook</i> and local prescriptions. | + | |
| Identify and investigate in a forest environment a breach of the Forestry, Forest Practices or Fire Service Act, in accordance with stated investigation procedures. | + | + |
| Investigate and report on an accident in a forest environment, in accordance with procedures in the <i>Safety Procedures Manual</i> . | + | + |
| Under supervision, conduct a resource permanent plot measurement programme in a suitable forest block, in accordance with the field manual for Continuous Forest Inventory (CFI) prescriptions and techniques. | | + |
| Under supervision, conduct a Plantation Growth Plot (PGP) measurement programme in a suitable forest block, in accordance with growth plot establishment and measurement prescriptions. | | + |
| Under supervision, conduct a mature forest assessment programme in a suitable forest type, in accordance with the manual for Mature Forest Assessment prescriptions and techniques. | | + |
| Under supervision, conduct a temporary plot measurement programme in a suitable forest type/stand, in accordance with stated assessment techniques and procedures. | | + |
| Develop a tactical plan using local resource and data, based on Working Plan constraints. | | + |
| Produce year 1 of a 5-Year plan for a native forest cutting schedule, using appropriate resources and data. | | + |

Appendix 2. Off-the-job training courses for the Technical Forester Programme.

| Year | Block no. | Contents | Month | Number of days |
|--------------------------------------|---------------|--|-----------------------|----------------|
| 1 | 1 (Induction) | Internal: Forestry Commission structure | February | 5 |
| | | Combined Industry: Defensive Driving Basic First Aid Introduction to Forests and Forest Industry Emergency Procedures 2-way Radio Use Basic Map Reading | February | |
| 1 | 2 | Botany | September/ October | 2 |
| | | Silviculture I | | |
| | | Native Forest Silviculture | | 2 |
| | | Rainforest Silviculture | | 1 |
| | | Native Forest Regeneration Evaluation | | 1 |
| | | Soils | | 1 |
| | | Wood Properties | | 1 |
| | | Mapping and Photo Interpretation | | 2 |
| | | Fire Management I – Suppression | | 1 |
| | | Management Planning I | | |
| Introduction to Planning | | 1 | | |
| Native Forest Mensuration/Assessment | | 4 | | |
| 2 | 3 | Silviculture II | May | |
| | | Plantations | | 2 |
| | | Entomology/Pests and Diseases | | 1 |
| | | Management Planning II | | |
| | | Computers – Personal, field | | 2 |
| | | Plantation Measurement | | 3 |
| Management Planning | | 1 | | |
| 2 | 4 | Surveying | September | 2 |
| | | Road Location | | 2 |
| | | Boundary Line Re-location | | 1 |
| | | Harvesting I | | |
| | | Introduction to Conventional Harvesting | | 1 |
| | | Fire Management II | | |
| | | High Intensity Burning | | |
| | | Hazard Reduction | | 2 |
| | | Computers I | | |
| | | Mainframe – Access Sales System | | 2 |
| HP 41 Use and Programming | | | | |
| Road Construction | | 4 | | |

Appendix 2. Cont'd.

| Year | Block no. | Contents | Month | Number of days |
|--|---|--|-------|----------------|
| 3 | 5 | Special Values Planning | May | |
| | | Archaeology | | 1 |
| | | Geomorphology | | 1 |
| | | Fauna and Flora | | 1 |
| | | Landscape | 1 | |
| | | Management Planning III | May | |
| | | Operational Planning (5-Year Plans, Timber Harvesting Plans) | | 3 |
| | | Computers II | May | |
| | | Mainframe Operation | | 2 |
| | | GIS Operation | | 2 |
| | | Occupational Health and Safety I | May | 2 |
| Law I | | 2 | | |
| Harvesting II | | | | |
| Marketing | | 2 | | |
| Acts, Royalties, Produce, Specifications | | | | |
| 4 | 6 (A) (Combined) | Occupational Health and Safety II | May | 2 |
| | | Harvesting III | | |
| | | Economics | | 2 |
| | | Cable/Mechanical Harvesting Systems | | 2 |
| | | Industrial Relations and Law II | | 2 |
| | | Communication and Supervision | | 2 |
| | Recreational Planning/Maintenance | | 2 | |
| | 6 (B) (Assessor/ planning) | Management Planning IV | | |
| | | Tactical Planning | | 3 |
| | | Advanced Computer Usage | | 2 |
| | 6 (C) (Operations) | Fire Management III | | |
| | Planning, Administration and Supervision of Fires | | 3 | |
| | Silviculture III | | | |
| | Advanced Silvicultural Systems | | 2 | |