

59th Annual Study Tour

South Africa

May 18-31 2002

Introduction

Forty-four members of the Society departed Dublin Airport at 2 o'clock on the afternoon of Saturday 18 May, and flew to Johannesburg via Amsterdam. We arrived at Johannesburg at 8 o'clock on Sunday morning, where we were met by our tour guide Georg von dem Bussche, a native of Germany and professional forester, who had emigrated to South Africa 34 years ago. Georg proved to be a perfect host and guide for the duration of the tour.

On the journey to our first stop at Pretoria, Georg provided the group with a snapshot of South African life, politics and forestry. Indigenous forests cover only 0.3% or 300,000 ha of the land surface. Savannah woodlands extend to some 12 million ha. Commercial plantations comprise 800,000 ha of pine, 600,000 ha of eucalypts and 100,000 ha of wattle. Around 30% of the plantations are publicly owned, mainly by South African Forestry Company Ltd (SAFCOL). The company utilises plantation forests only. It was in the process of being privatised. In the private sector two companies Mondi (the Anglo American Forestry Company) and Sappi, own half the forests. Private companies and individuals own the remainder.

John Mc Loughlin, Convenor

Sunday 19 May

The group's first stop was at Union Building in Pretoria, a red sandstone masterpiece designed by the famous English architect Sir Herbert Baker. Pretoria has been the seat of successive governments since the Union of South Africa and remains the administrative capital of South Africa. The city, once the capital of the old Boer Republic of Transvaal, contains constant reminders of its Afrikaner past - from its architecture to the massive Voortrekker Monument that dominates the hill in the south west of the city. It is also a reminder of how far South Africa has come politically. It has remained the administrative capital. President Mandela was sworn in here, as was the current president Thabo Mbeki.

One of the distinctive features of Pretoria is the jacaranda tree (*Jacaranda mimosaeifolia*) which lines streets throughout the city.

After our stop at the Union Building, the group travelled north past fields of maize in Gauteng Province. The area is known as highveld, with an altitude of 1600 m. We travelled through tree savannahs where the trees are mainly indigenous. Slowly we descended to the lowveld, to Magoebaskloof at the escarpment of the Northern Limpopo Province, where the treescape changed to a mixture of indigenous forests and pine and eucalypt plantations. We stayed the night in the Magoebaskloof Hotel, near Tzaneen, Northern Province.

Monday 20 May

The group had an early start, departing from the hotel past mango, orange and tea plantations, avocado farms and the occasional roadside spectacularly flowering African flame tree (*Spathodea campanulata*). We arrived at our first stop, the Duiwelskloof Nursery where we were met by the Louis van Zyl, nursery manager and Sonia du Buisson, genet-

ics manager. The nursery is part of the Northern Timbers enterprise which includes forests and sawmills. The company was founded by Dr Hans Merensky who made a fortune in diamond and platinum mining. He used much of his fortune to establish education funds and grants to forestry.

Sonia du Buisson explained the Northern Timber approach to tree improvement where genetic selections are influenced heavily by wood quality as well as growth and yield. Their approach in breeding pines and eucalypts is to increase important strength characteristics such as density and reduce spirality and splitting.

The clonal banks and vegetative propagation nursery was established in 1986 with mainly *Eucalyptus grandis*. There were later selections for tree improvement programmes in *E. saligna*, followed by hybrid breeding, such as *E. grandis x camaldulensis*.

There was a strong emphasis on clonal material but in the forest clones are mixed with seedlings. Northern Timbers does not plant more than 15 ha of clonal material in any one block. While seedling material provided much faster growth in afforestation sites in the first 4 years, clonal material usually passed them out at that stage and provided much better yields. Sonia gave demonstrations of rooted cuttings of *Eucalyptus* and explained the scheduling of plant production from greenhouse to nursery to forest.

The Hans Merensky Holdings forest was at altitude from 800 m, where the average annual rainfall was 1200 mm. This has been as low as 412 mm and as high as 2779 mm. Northern Timbers has 14,000 ha of forest – over 80% plantation (the remainder is indigenous forest). *Pinus patula* sawlog timber is produced on a 25-year rotation, mining timber on 8-year rotations. The density at planting is 816 stems/ha (3.5 x 3.5 m spacing) for sawlog production, while mining timber production is spaced at 2.0 x 3.0 m.

The group visited a site that had been clearfelled in December 2001. All the lop and top was burned: research has shown that a cool burn does not have a deleterious effect on the soil. Reforestation is carried out manually. A good size pit is dug and water is often added, and wood chip mulch to retain moisture and keep the soil cool as the heat from the soil can scorch stem of the seedling. Chemical and mechanical weeding are carried out until the crop is established. A stand of *Pinus patula* eighteen months old had a mean height of three metres. It had already received a weeding and pruning. Pruning is carried thereafter every 2-3 years up to 50% of live crown is pruned. Containerised plants are used and planting is carried out throughout the year. Establishment costs amount to R1800 (€190) per hectare.

Some of the group visited Magoebaskloof Sawmill where the guide was Marius Koch, Production Manager. The mill operates on one shift and produces about 80,000 m³ of *Eucalyptus* and pine annually. It employs 120 people which, compared to an Irish mill, is highly labour intensive. Recovery was around 50%. The main products were mining timber and planked timber for construction, flooring and veneer. The sawn timber was exported or sent to furniture factories. This was air dried to 20% moisture content and then dried down in compartment kilns to 12%, over a period of 20 days. The timber quality was excellent and knot-free (due to pruning). While some of the timber is finished and manufactured in South Africa, most is exported to China and Malaysia through Durban. Surprisingly, we were shown trial exports of mining timber for the UK market.

Lunch was at a giant baobab or Kremetart tree (*Adansonia digitata*). It grows in very dry areas with rainfall as low as 250 mm/annum. The tree grows for about 300 years, after which the interior starts to rot. This causes heat to build up inside the trunk and it eventually combusts spontaneously. Within hours nothing is left except ashes, a dramatic end to a tree that can have a diameter in excess of 10 m and heights of 25 m. The lunch

location tree was about to self-combust some years previously; locals however put the fire out and scooped out the burning interior. The shell had been converted into a very novel pub location.

In the afternoon the location was the Sapekoe Tea Plantation where the owner provided a colourful description of tea growing and harvesting and how to make a good cup of tea. He spoke with scorn of the use of teabags and the indefensible habit of using milk with tea.

After the tea sampling, the group visited the Commonwealth Plantation, established in 1914, which comprised a number of *Eucalyptus* species, in particular *E. microcorys*, *maculata* and *paniculata*. In 1964 the Merensky Trust decided that the plot would be preserved and dedicated to the 1935 Commonwealth Forestry Conference. The tallest tree in the plot when it was measured in 1997 was *E. microcorys*, at a height of 68 m. All the eucalypts were impressive, most with heights in excess of 55 m with breast height diameters up to 87 cm (*E. microcorys*, *maculata*). The group returned to the Magoebaskloof Hotel for the overnight stop.

Donal Magner

Tuesday 21 May

We departed from Magoebaskloof hotel at 8.00 a.m. We took a drive to the Big Forest nature reserve, an area of indigenous forest that once formed part of the large Afro Montane forest. It stretches from the low veld to the high veld and has an annual rainfall of 2000 mm. Settlers began felling timber in 1870 and by 1895 the area had been heavily exploited. The recovery of the woodland began in 1913 when a Conservator for Forests in the Union of South Africa was appointed.

The kloof (valley) was named after Magoeba, a chief of the Ba Tlou people. These peoples were unique in South Africa as they were the only known forest dwellers. Some of the better known indigenous species in the forest were red stinkwood (*Prunus africana*), yellowwood (*Podocarpus falcatus*) and African mahogany (*Khaya nyassica*).

We passed through plantations of *Pinus patula*, the most common pine species, *Pinus taeda* and *Eucalyptus grandis* before reaching plantations owned by SAFCOL, the state-owned South African Forest Company. This plantation contained trial plots of *Eucalyptus saligna* and *Pinus patula*. *Eucalyptus saligna* was introduced here by James O'Connor. The *Eucalyptus saligna* plantation contains what are thought to be the tallest planted trees in the world and the plots are protected. Our first stop was at a memorial erected in his honour.

James O'Connor (1884–1957) was an eminent forester of Irish extraction, who was educated in Scotland. He is remembered for his outstanding work on correlated curve trends derived from the relationship between height and stem diameter, as influenced by thinning intensity and spacing. He was the first to introduce *Eucalyptus sciatica* into this region. Towards the end of his career he turned his attention to the conservation of indigenous species.

Of the introduced pines, *Pinus patula* has been the most successful; *Pinus taeda* is not preferred due to the high content of reaction wood. An interesting fact was the emphasis placed on density in timber grading. Japanese cedar was also planted but was confined mainly to riparian zones.

At the second stop of the day we were met by the local forester John Magoebas who showed us a trial plot of Outeniqua yellowwood (*Podocarpus falcatus*). This is the only

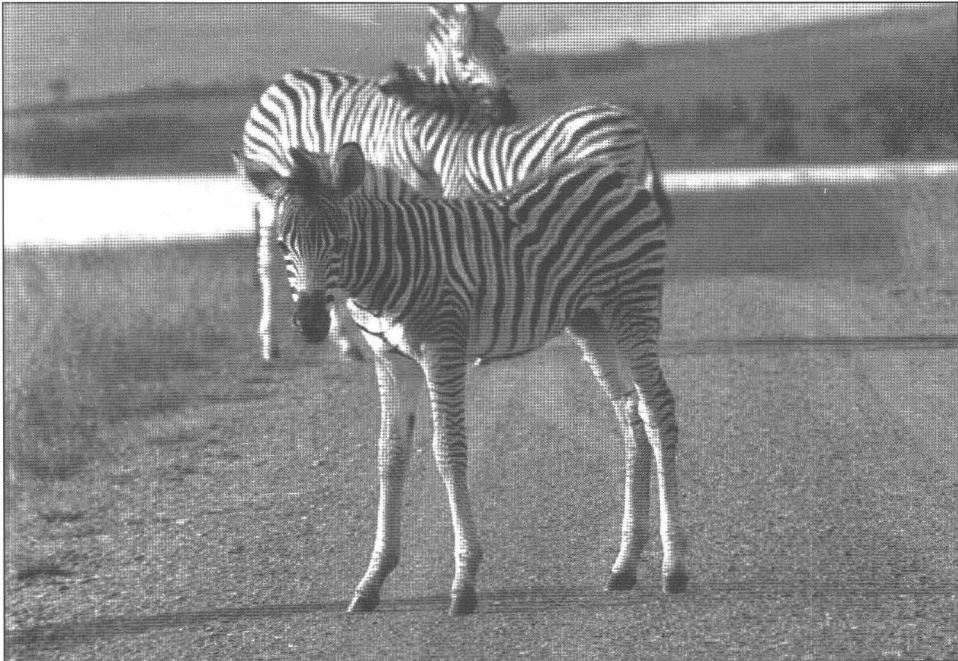
indigenous species with commercial potential. It is capable of growing to heights of over 40 m with an annual increment of 6-8 m³/annum. The trial plot was 20 years old, planted at 3 x 3 m, and had a high percentage of good quality trees. The proposed rotation is 40 years at which time the average DBH will be 40 cm. The timber is high quality, selling at up to 2000 rand/m³ (€220).

The next plot was African mahogany (*Khaya nyassica*). The species is under threat in South Africa and is not planted as a commercial crop. The trial plot was 20 years old, planted at 4 x 4 m. The final crop will have 200 trees/ha. Although the timber is very valuable and can be grown on a 40-year rotation the form was poor – the trees had suffered shoot borer damage. However, as indigenous species only cover 0.3% of the land surface in RSA, the species will continue to be planted for environmental reasons.

We moved on to the final stage of our journey to the Kruger National Park, stopping on the way to look at banana plantations and specimens of the magnificent East African flame tree. This is a very low rainfall area and all crops except mango need irrigation. The Marula trees are grown here commercially for their fruit. We passed through the lowveld area to the savannah bush veldt of the Kruger Park. Mopani is the main tree species in this area, is scrub-like but an important source of food for elephants.

We entered the Kruger Park at Phalabowa and travelled to our destination at Letaba getting our first glimpse of zebra, impala, warthogs, waterbucks and hippopotami. We arrived at Letaba in the late afternoon and had a relaxing evening strolling through the wooded camp-site as we viewed the animals coming to drink in the Letaba river at sunset.

Michael Doyle



South African zebra crossing.

Wednesday 22 May

Having spent the night at Letaba rest-camp located within the central section of the Kruger National Park the party had an early start the following morning. At 5.30 figures were moving purposely among the trees and buildings in the direction of the commotion at the gates.

There was a great atmosphere of anticipation as participants were being directed to jeeps by torch-light. Rugs and blankets were piled on the passenger-seat of the jeep and a rifle was placed along the dashboard. The convoy of four jeeps left the camp swiftly and the gates were slammed closed as the last vehicle went through.

As we drove along the road the reason for the presence of the rugs and blankets became apparent as the cold air engulfed the open jeeps and everyone wrapped a portion of a rug or blanket around them to preserve body heat.

The jeeps abruptly came to a halt and the guide drew our attention to a group of impala which was resting under trees. Their under parts, rump and chin are white which made them noticeable when the guide's search light shone through the trees and undergrowth. Impala are gregarious animals and known for their speed and ability to leap.

A herd of zebra was spotted by a member of the party as it grazed on the grass and browsed on the scrub. They need water daily and rarely wander very far from water sources.

Further along the road an elephant was noticed standing among large scrub. A fully-grown bull can weigh more than six and a half tonnes. Elephants like many other animals of the wild are gregarious and usually live and roam in herds of 10 to 20. Herds are on the move night and day in pursuit of water and fodder. The elephant has special importance for hunting; the Big Five are: elephant, rhino, lion, leopard and buffalo.

As the guide and the party were on alert for additional elephants a pair of giraffes were spotted with heads over the surrounding undergrowth browsing on the acacia trees. Giraffes are out and about in the early morning, they are very vulnerable when drinking water but they are capable of landing a powerful kick which can have fatal consequences for a would-be predator.

The sunrise was spectacular and sudden. The first sighting of the new dawn was a herd of buffalo which was grazing some distance from the road. They never stray far from water especially in dry periods.

What turned out to be the final sighting of the morning were several hippos submerged in the water. Hippos spend most of the day submerged, feeding on bottom vegetation. Only at night do they emerge from the water often wandering long distances from their aquatic haunts to graze.

After the eventful morning and a breakfast cooked in the open, the party adjourned to stroll through the park and study its present day importance and history.

Small groups of African people inhabited the flat plains, but malaria, bilharzias, tsetse flies, and murderous heat kept the wider world at bay. European settlement came late to the region. In 1725 the Dutch East India Company, attracted by rumours of gold, sent an expedition from Baia de Lourenco Marques (modern Maputo) to explore the northern interior. This was the first European expedition to have entered the lowveld. It got as far as Gomondwane, near present-day Crocodile Bridge, before hostile local Africans forced it back. In 1836 two separate Voortrekker parties set out to find a way which would lead from the interior to the east coast. Both expeditions were disastrous: one was slaughtered by Shangaan warriors and the other was almost wiped out by malaria, although a few survivors managed to make it to Delagoa Bay.

The arrival of these survivors alerted a Joao Albasini to the potential for lucrative business between the hinterland and the coast. In the late 1830s he opened a trading post near the present-day Pretoriuskop rest camp, and became the first European resident of the lowveld.

In 1870, gold was discovered in the uplands. Thousands of fortune seekers arrived in the region. As there were no towns, shops or farms, the speculators hunted for their food, and depredation of animals in the area became wholesale.

Eventually, visiting Boer hunters, who shot only what they needed, observed the excessive killing and reported it to the Transvaal Republican authorities in Pretoria. In 1889, as the eastern gold rush fizzled out, President Paul Kruger urged his parliament to create a sanctuary to protect the remaining wildlife of the Lowveld. Eventually, in 1898, some 4600 square kilometres between the Sabie and Crocodile rivers were proclaimed the Sabie Game Reserve.

This was the birth of the Kruger National Park, a project which the British endorsed when they took over the region. In 1902 a Scotsman, James Stevenson-Hamilton was appointed as the first warden of the reserve. During the next 40 years he did more than any other individual to nurture this natural heritage.

In 1903 a second reserve was proclaimed which encompassed land further north between the Letaba and the Limpopo rivers. In 1926 both reserves, and the farmland between them, were consolidated by the South African Parliament into the Kruger National Park. Later still, more land was added and the reserve reached its present size of about 21,000 square kilometres.

Today, the park offers the opportunity to observe, in an area the size of Wales, an unequalled variety of wildlife at close proximity.

In the afternoon the party was taken on a walk through the park to observe and identify the trees growing there. The apple-leaf tree *Lonchocarpus capassa* was described as a tree found on all soil types in the park, the biggest specimens are confined to flood plains elsewhere, but the tree is usually found small. The leaves fall in spring and within a very short period are eaten by elephants. The tree is considered a slow grower.

The Cape ash *Ekebergia capensis* has a very wide-spreading, dense crown and pendent branch terminals. This tree is found within the park but is rare as it prefers moist conditions. The leaves and roots have medicinal properties and are used for this purpose.

The Weeping Boer-bean *Schotia brachypetala* is a deciduous tree, with a round umbrella-shaped crown and drooping branch-ends. It grows on the river banks of the rivers within the park. Nectar, which drips to the ground when a branch is shaken, is eaten by baboons, monkeys, birds and insects. The wood is used for the manufacture of furniture, as it grows slowly.

The Lala palm *Hyphaene natalensis* is a medium sized tree (15 m) and is common in the park. It grows mainly on the basaltic soils along its eastern side. The large fruits are found in pendant clusters (6 cm diameter). The fibres from the leaves are used for the manufacture of mats, hats and ropes.

A common tree throughout the park and the rest centre is the umbrella thorn tree *Acacia heteracantha*. It provides most of the shade around the accommodation units at the rest camp. It has a twisted fruit which is found on the ground at all times of the year.

George von dem Bussche and the local guide who was an authority on trees, concluded the activities for the day that had begun in the cold darkness and ended in bright, warm sunshine.

Frank Nugent

Thursday 23 May

Another early morning safari at 5.30 provided the chance to see more wild game before the tour's long drive south through the Kruger National Park to our next destination Sabie. The highlight of the drive was the sighting of a pride of lions eating a zebra that they had just killed. As the bus progressed southwards large expanses of Mopani bush provided a dramatic backdrop to giraffe and other species. The tour stopped briefly at Sabie Camp for lunch. The camp had an interesting museum explaining the social and natural history of this part of the Kruger Park. On leaving the camp the woody savannah gradually gave way to farmland and extensive pine plantations, as we gradually climbed to 300 m above sea level to a wetter climate.

On arrival at our hotel in Sabie two speakers from SAFCOL, Nic Truter (Regional Manager for the Komatiland Forests in Mpumalanga North Region) and Gerrit Marais gave a presentation on the operations of the company. The salient features of the company in the area were:

<i>Total managed area</i>	113,000 ha
<i>Planted area</i>	61,000 ha
<i>Annual harvest</i>	1,000,000 m ³

Of the harvest approximately 59% enters the sawn timber market. The main species are pine and eucalypt. Pine pulpwood accounts for another 11%, while other uses, including veneer, poles, mining timber and small wood make up the remainder.

The species breakdown by area was as follows:

<i>Species</i>	<i>Area ha</i>
<i>Pinus patula</i>	23,145
<i>Pinus elliottii</i>	17,338
<i>Pinus taeda</i>	7,199
<i>Pinus elliottii x caribaea</i>	4,222
Other pines	1,609
<i>Eucalyptus grandis/saligna</i>	4,555
<i>Eucalyptus cloeziana</i>	714
Other eucalypt species and hybrids	891
Other species	1,347
Total	61,000

The main field activities include an extensive pruning programme of 18,458 ha. Up to seven prunings can take place during a rotation, depending on site productivity. Pruning is important to improve timber quality in fast growing species like pine. Detailed pruning schedules have been established and pruning records are strictly maintained.

The region employs in excess of 900 staff with approximately 1200 contract labour. The main regional focus over the last 8 years has been primarily:

- elimination of unproductive growing stock such as *Pinus taeda*,
- upgrading of nursery and nursery practices,
- establishment of fertiliser programmes,
- refined growing policies and formulation of Best Operating Practices (BOP),
- silvicultural audits,
- genetic improvement,
- development of pole working circles.

Computerisation and the use of Geographic Information Systems ensure that SAFCOL can plan its operations to help maximize revenues and volume production. A fully integrated budgeting system produces detailed monthly financial reports which enable foresters to manage the estate effectively. All forest operations are carried out in conjunction with SAFCOL environmental policy and the standards set out by the Forest Stewardship Council (FSC).

Gerrit Marais, Environmental Manager for the Komatiland Forests North Region, made a presentation on Environmental Policy in plantation forestry and FSC certification.

SAFCOL environmental policy is far reaching and gives guidance on a wide range of areas. An Environmental Management System, based on ISO 14001, is used to measure performance standards, which in turn meet the principles of the Forestry Stewardship Council. Management of Environmental Impacts on soil, water and biodiversity are important in SAFCOL. Forest Certification by FSC was awarded to SAFCOL, Mpumalanga region, in 1996. Certified forests are visited every 6 months to ensure they continue to comply with the principles and criteria of FSC.

SAFCOL have devised an Environmental Policy and continually strives to improve performance in accordance with a number of goals in the following key areas:

- performance standards,
- management of environmental impacts,
- social environment,
- conservation,
- land use,
- R&D,
- training and education,
- contractors, suppliers and customers,
- environmental audits and reports.

SAFCOL conducts environmental audits on all forest operations on a biennial cycle and publishes an annual report on environmental performance. Prior to starting any afforestation environmental impacts are assessed and consultation takes place with relevant bodies. SAFCOL also supports R&D to minimize environmental impacts and to optimise the use of resources on a sustainable basis. The services provided by contractors must comply with environmental standards and include environmental considerations in procurement decisions. The management of biodiversity in natural ecosystems and the protection of rare and endangered species, communities, habitats and archaeological or cultural artefacts is an important aspect of an environmental policy.

The introduction of FSC and the implementation of an Environmental Policy have resulted in a change of mindset in the operation of the forest business. Over 85% of South African forests are now certified by FSC, which has enabled markets to be secured and

maintained abroad. FSC certification is expensive but is necessary if South Africa wants to maintain its market share. Concern is sometimes expressed about the lack of clear instruction and direction given on some aspects of the certification process by certifiers. In general the FSC process has been good for South African forestry and has helped SAFCOL to manage its forests to acceptable environmental standards.

It was concluded from the question and answer session that followed, that there was a need for countries involved in the FSC process to come together and to collectively discuss their experiences. Countries working together and with the FSC would ensure that the FSC branding reflected the aspirations of communities, growers and timber producers.

Fergus Moore

Friday 24 May

As we boarded our coach outside the Floreat Hotel we were joined by Nic Truter the SAFCOL regional manager.

On the outskirts of Sabie we passed a sawmill which processed timber from the SAFCOL owned Tweefontein plantation, this is an extensive area of some 12,700 ha of mainly *Pinus patula* plantations.

The first stop was at Tweefontein Nursery where we were introduced to Nico Olivier, the nursery manager. The necessity for hygiene in all operations was emphasised as disease or fungus can have catastrophic effects on the viability of the whole enterprise and on the profitability of plantations in the region. There was an outbreak of the *Fusarium* fungus as recently as 1998. The consequences of this had brought about a determination by staff that there will not be a reoccurrence. As well as the routine practice of hygienic practices, there is an annual hygiene-day.

The species grown in the nursery were *Pinus patula* and *P. elliottii* and a hybrid of the two that exhibits phenomenal growth rates. The *P. patula* is grown from seed and the hybrid from cuttings. The growing medium is a mixture of composted bark with a pH of 5.5. The fertiliser programme was discussed at some length and the use of the correct amount of nitrogen was stressed. The use of too much nitrogen can promote the growth of *Fusarium*.

The nursery produces eight to nine million plants per annum and has a full time staff of twenty-one. Manual labour is used quite extensively as the labour is available and is currently cheaper than mechanisation.

Departing the nursery we headed for the surrounding countryside to see the terrain which would be forested by the plants from the nursery. As the surface deposits of gold ran out and the shafts and tunnels cut into the hillsides in search of deeper veins mining became uneconomic and the landowners in the area diversified into forestry and created some of the country's largest plantations. *Eucalyptus* and *Pinus patula* now cover much of the regions cool uplands.

We stopped at a 2-year old *Pinus patula* plantation which had been preceded by a *Pinus elliottii* crop. The new crop was fertilised using a slow release fertiliser, applied manually from containers made for the purpose. These crops are grown to a DBH of 42 cm, which is achieved after 25-30 years. Crops are high pruned to a height of 9.5 m. No pruning takes place after the crop reaches an age of eleven years.

The next stop was at a 13-year-old *Pinus patula* plantation. It was planted at 2.7 x 2.7 m spacing, resulting in a stocking of 1372 plants/ha. Crops may be thinned on seven occasions between establishment and maturity. The crop had 649 stems/ha and would receive



Tsitsikamma

two further thinnings, reducing it to a final stocking of 280/ha. The final standing volume being planned for is 575 m³/ha, at about 25 years of age. The monetary value of the crop was in the region of 70,000 rand/ha (about €7800/ha). Pruning is cost effective as pruned material attracts a premium price at harvesting.

The final stop was at an area recently replanted with *Pinus taeda*, canopy closure will be at three years and until then contractors are responsible for vegetation control. There was a history of baboon damage in this area; the problem is alleviated by trapping or shooting. There was a discussion on forest certification and the standards expected by the FSC auditors. SAFCOL is obliged to leave areas extending to 20% of their reforestation programme for biodiversity purposes.

The Chairman for the day thanked Nic Truter of SAFCOL for his time and expertise. The remainder of the day was spent at MacMac Falls, the Pilgrims Rest and God's Window, noted scenic and historical sites. We overnighted at the Sanbonani hotel, Hazyview.

Joe Fenton

Saturday 25 May

We departed Hazyview on the long bus journey to Johannesburg to catch an internal flight to Port Elizabeth on the southern coast. We arrived late in the evening as dusk was falling. We left the city, which is situated on the shores of Algoa Bay, to travel along the Garden Route to Tsitsikamma Lodge, Storms River. The Garden Route backed by the Outeniqua, Tsitsikamma and Langkloof mountain ranges extends from Storms River mouth in the east to Mossel Bay in the west.

Sunday 26 May

On Sunday we travelled to Tsitsikamma National Park. This park was designated in 1964 and extends for 68 km from Nature's Valley to Oubosstrand and stretches seawards for some 5.5 km. The total area is 75,000 ha with 60,000 ha under the control of the State Forest Department. The area we visited was Afro-Montane, evergreen, uneven-aged mixed habitat of native tree species. The forest is divided into three main climatic types. The wet forest type is found along the slopes of the mountain range where high rainfall and generally cool climate is experienced. The moist forest type along the upper plateau constitutes the best developed high-forest, with a high percentage of utilizable trees. The dry forest type is found along the coast with generally a composition of thorny and shrub-like tree species. In all there are 120 indigenous tree species in the area.

Multiple use management principles are applied. These include:

- recreation,
- maintenance of biodiversity and
- sustainable utilisation of the natural resources.

The management of recreation facilities is of increasing importance and a further 20% of the forest will be used for recreational purposes. The facilities offered suit the forest environment and include picnic sites, hiking trails, bike trails and scenic spots and drives. Some 20,000 visitors visit the area annually.

Conservation management includes the eradication of invasive plants, the maintenance and protection of species like elephants and blue duikers and the protection of the natural forests from fires and unauthorised use of forestry resources i.e. theft of ferns and poaching.

Sustainable utilisation management is practised on only 20% of the total natural forest area and is based on a senility criteria yield regulation system to ensure that only those trees are removed that would die naturally in the not so distant future. Horses are used to extract timber as machinery is only allowed to travel on slip paths to ensure continued protection of the area. Timber is auctioned twice yearly, to supply local furniture industry. Annual revenue is 10 m rand (€1.11m).

At the first stop a stinkwood species (*Ocotea bullata*) was seen. It is an evergreen, with a dark brown timber similar to mahogany. The timber is very valuable, making up to 10,000 rand/m³ (€1,100/m³). It regenerates from coppicing. White alder (*Alnus rhombifolia*) is another endemic species to the area. Again it is a valuable timber, which is used for door frames and other outdoor uses. Leather leaf fern and seven-weeks fern also occur in the forest. Twenty percent of the fern used in the world floristry industry comes from South Africa. About 2 million rand worth of ferns are exported to Europe, mainly Holland, annually.

At the second stop Outeniqua yellowwood (*Podocarpus falcatus*) was found. One tree was 800 years old, had a height of 36.6 m, a trunk length 18.3 m, crown spread of 32.9 m, trunk volume of 50.9 m³, with a girth of 8.9 m (equivalent to 8 adults linked with arms outstretched). It has an erratic growth pattern, similar to yew. The less vigorous the growth the more the production of lichens – they are an indication of the health status of the tree. The timber makes 2,000 rand/m³ (€222/m³). The timber can be kiln dried very easily and is used in the manufacture of furniture.

The more energetic members of the group went on 4-5 km walk on the Rattle Trail through tropical forest at its best – hot and humid!

After a short bus ride we stopped at Storms River Mouth Rest Camp for lunch. After a

light lunch, most of the group climbed the steep river mouth trail and descended down to cross the Hangbrug Suspension Bridge.

The next stop was the Paul Sauer Bridge over the Storms river. It is 190 m long, with an arch span of 100 m, and is 123 m above water level. Bungee jumping takes place here – but alas we had no volunteers!

Finally on our journey back to Tsitsikamma Lodge we saw an area destroyed by fire caused by lightening in 1998 in which 3,500 ha of pine was burned in four hours. It has now been replanted with slash pine (*Pinus elliottii*). Back at the Lodge we had time to relax before yet another fantastic culinary experience and end to a most enjoyable day.

Brigit Flynn

Monday 27 May

After leaving our hotel we visited a plantation owned by MTO Forestry (Pty) Ltd. which is a subsidiary of SAFCOL. This plantation was 4,300 ha in size, situated close to the town of Knysna, which is on the Indian Ocean.

SAFCOL commenced business in April 1993, with all shares owned by the central government on behalf of the people of South Africa. SAFCOL directly employs over 2,000 people in its operations and indirectly at least another 3,000 people, through contractors who carry out harvesting, silvicultural and many other activities. Three and a third million cubic metres (under bark) are harvested annually, with a turnover in excess of 500 m rand/annum (€55 m). SAFCOL's forestry division manages 44 plantations and its processing division comprises five sawmills. The company manages in excess of 400,000 ha including 260,000 ha of plantations.

Forest Stewardship Council (FSC) certification of all SAFCOL's operations was achieved in 1995 and has been retained ever since.

SAFCOL is currently in the process of restructuring; being sold off bit-by-bit and the company will ultimately cease to exist. This will however signify the achievement of the original goal in forming the company.

An outline of the Kruisfontein plantation was presented as follows:

Total area forested	4,300 ha
Annual average rainfall	960 mm
Yearly sustainable volume production (under bark)	36,000 m ³
Timber usage	
Saw timber	85%
Poles	10%
Veneer	5%
Species distribution	
<i>Pinus radiata</i>	57%
<i>Pinus pinaster</i>	9%
<i>Pinus elliottii</i>	8%
<i>Acacia mearnsii</i> (wattle)	8%

<i>Eucalyptus diversicolor</i> (karri)	6%
<i>Pinus taeda</i>	2%
Others	10%

Staffing

Area manager ¹	1
Harvesting forester ¹	1
Silvicultural forester ¹	1
Labourers (silviculture + harvesting)	25
Contractors (silviculture + harvesting)	35

¹Manage and harvest Buffelsnek property also (8,000 ha).

Costs

Labourers (per unit per day)	R136 (€15)
Harvesting (per m ³) cable yarding (30% of area)	R65 (€7)
To roadside (per m ³) skidding	R41 (€4.5)
Restocking (per ha)	R2,200 (€244)
Weeding (per ha)	R750 (€83)
Pruning (to 7 m per ha)	R121 (€13)

Main problem areas

Cost of weeding (*E. diversicolor* and *A. melanoxylon*. infestation)

Poor growth (MAI of 9m³/ha/yr)

High labour costs R55 (€6)/day in northern South Africa

Close proximity to town (theft, cattle, fires and off-road bikes)

The present policy objective is the production of high quality saw timber. This will be achieved by having no further regeneration of *Eucalyptus diversicolor* (karri); areas of Kruisfontein will be converted to *Pinus radiata* due to its considerably higher financial returns.

Natural regeneration is not practiced with *Pinus radiata* as better results are achieved by planting with an F2 seed provenance, which originated in New Zealand. All plants are grown from containerised cuttings, which are produced in eight months to an average height of 15 cm at a cost of R350 (€38)/1,000.

When harvesting is completed all slash has to be cut lower than knee height. Planting holes are dug with a mattock-like tool, to a size 25 cm square, 20 cm deep at a spacing of 3.5 x 3.5 m giving 800 trees/ha. A half litre of water containing aquasoil at a mix of 3 g/l of water is added to each planting hole, together with fertilise. Containerised plants are inserted using a special hand operated planting tool with up to 5 cm of the plant collar inserted below ground level.

Reforested sites are kept almost totally free of any competing vegetation with the use of Garlon in particular, but diesel oil is also used to spray coppice shoots, as Garlon is not as effective in killing these.

First thinning is carried out at eight years leaving a stocking of 500 trees/ha. All branches up to 5 m are removed at first thinning to ensure that the knotty core is no more

than 15 cm in diameter. A second thinning is undertaken at 13 years, in which a further 200 stems are removed leaving a final crop of 300 trees/ha. A second lift pruning to 7 m is then undertaken.

Pine poles are produced in 20 to 25 years, while large sawlog 40 cm + under bark and veneer wood is produced on a 30-35-year rotation.

Sawlog timber achieves a price of approximately R100 (€11)/m³ underbark, standing and is cut to 13 cm top diameter.

The provision of fire lines to a width of 20 m is necessary to avoid fire damage because of the dryness of the climate.

No felling permit is necessary for the harvesting of commercial timber but is necessary to fell any timber in the indigenous woodland.

Under FSC rules reforestation is necessary but areas incapable of producing a mean increment greater than 4 m³/ha/year need not be reforested. These areas must be cleared of all exotic vegetation and handed over to the government who may then allow them to be used for agricultural or other purposes.

Species selection is based on soil analysis and the most productive species for that particular soil type is then planted in pure blocks.

No planting is allowed along riparian zones in an effort to conserve water, which is an extremely scarce resource. A water tax is being imposed on forestry, no new planting (afforestation) is allowed.

We made our way to our overnight destination at Santos Beach Hotel, Mossel Bay.

Ted McCarthy

Tuesday 28 May

After a hearty breakfast we left Mossel Bay, where Bartholomew Diaz landed in 1488, followed by Vasco da Gama in 1497, and headed west to Cape Town, one of the jewels of the Garden Route.

The drive took us on a 400 km route passing the Langeberg mountains, the highest peak reaching over 1500 m, with flat rolling fields to the sea and Cape Agulhas where the Indian Ocean meets the Atlantic Ocean. We passed ostrich farms where there had been a thriving ostrich feather industry prior to the World War I, but now the farms have a second life supplying meat and leather, mainly to the North American market. We saw the blue crane, the national bird of South Africa, as we drove west. Large farms were on either side of the road, the main crops being wheat, barley and sheep.

We arrived at Stellenbosch, adjacent to Cape Town, for lunch. Stellenbosch was established on the banks of the Eerste River by Governor van der Stel in 1679. It is the second oldest town in South Africa renowned for its stately oaks (which are preserved national monuments), its Cape Dutch, Victorian and Georgian architecture, stately buildings and the old Afrikaans-language university of Stellenbosch, established in 1918, which now has over 17,000 students.

We had a presentation on education in forestry by John Mortimer, a fifth generation South African forester. After qualifying in forestry John spent seven years in Canada, then came back home to work in the wood processing industry. He rose to be chairperson of the South African Lumber Millers Association and now is the Manager of the Faculty of Forestry at the University. This is a newly created post with responsibility to restructure the Department of Forestry and its courses to the needs of the end market, be they industrial, conservational, silvicultural or other stakeholders.

The university courses covers the full range of activities along the wood value chain:

- silvics and forest management,
- forest engineering,
- community forestry,
- conservation ecology,
- solid wood processing.

They also run a non-research forest masters degree programme where students from any background, be it furniture design, timber frame or game management, are welcome.

John gave us his version of the role of new forester as follows:

In the changing world of the profession and the demands being made on managers of forests, the following definition could well apply: to be able to think strategically about the sustainable forest and its role in society: in the value chain, in its social functions and its ecology. The forester will be equipped to make major decisions and recommendations concerning forests. He/she will be indispensable in this role and will be the first person called upon when such decisions and recommendations are required, be they finely focused at the local level, or be they region, national or global

....it has become clear that there is both a need and an opportunity to explore ways to collaborate together on international forest issues. As it evolves, forestry is redefining itself, and through this redefinition, the very nature of what the term forestry represents is changing. As leaders in forest education we need to communicate the changes we believe are taking place, we need to reach out to those who still hold images of what forestry was and show them all it has become and where we hope in the future to be.

He also quoted Jack Saddler, Dean of Forestry at University of British Columbia, on his view of the role of forestry education.

It is not enough to just educate any longer, we must, through international cooperation and as individual entities, actively share our knowledge and attract the attention of students and the public alike to the range of options available through stewardship of forests and the values they maintain.

The chairperson thanked John for his thought provoking talk on the new approach to forestry education being undertaken in South Africa. There could be lessons learned from the approach being taken in relation to the changing need and demand placed on the Irish forester today and the role of the Irish third level education institutions in supporting him or her.

Overnight accommodation was at the Commodore Hotel in downtown Cape Town where a good evening was had by all at a waterfront restaurant in the Victoria & Albert Wharf area.

Richard Lowe

Wednesday 29 May

We departed Cape Town and headed south for the Cape of Good Hope travelling through the State Nature Reserve.

The Beacon of Hope is situated at the junction of the earth's two most contrasting water masses the Atlantic and the Indian Oceans. Geographically, however, the Indian ocean



Fynbos uerretarion

merges with the Atlantic Ocean at Cape Agulhas

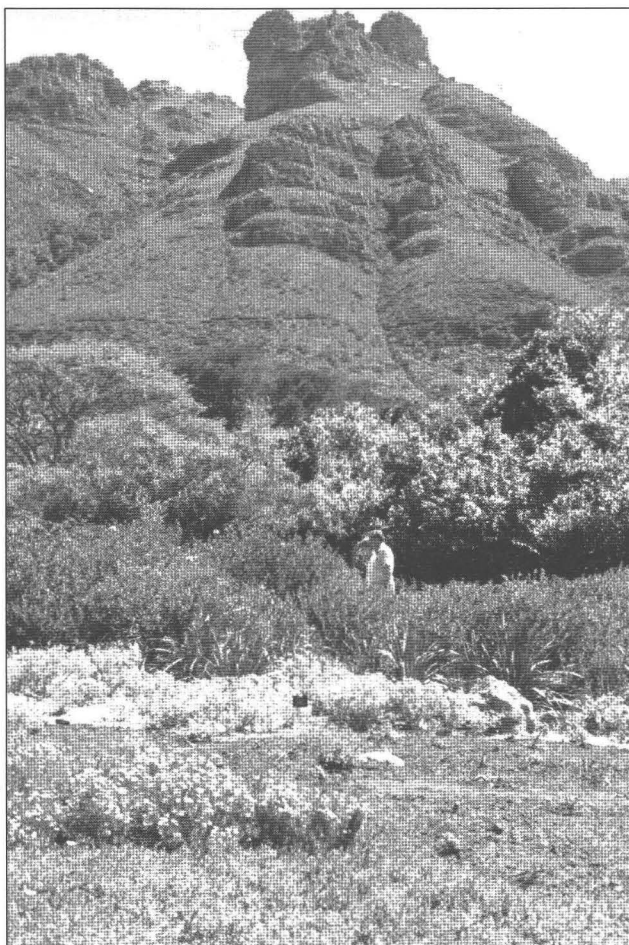
The Cape of Good Hope is home to at least 250 bird species. The flowering vegetation of *Erica* and *Protea* spp. attracts sunbirds, sugarbirds and other species in search of nectar. The cape is an integral part of the Cape Floristic Kingdom, the smallest but richest of the world's six floral kingdoms. This comprises a collection of up to 1,000 plant species, of which a number are endemic. The climate of the south-western and southern cape, with predominantly winter rainfall (between 400-2,000 mm) and hot, dry summers has led to a development of a unique array of plant species known as fynbos. Fynbos is essentially a fire-adapted heathland, consisting of a remarkably rich array of distinctive plants, including *Erica* and *Protea* spp.

The local authority proclaimed the area a nature reserve in 1938 and it was incorporated into the Cape Peninsula National Park in 1998. It encompasses 7,750 ha of rich and varied flora and fauna. Its 40 km coastline stretches from Schuster's Bay in the west, to Smitswinkel Bay in the east.

Large animals are a rare sight on the cape, but there is an abundance of small animals such as lizards, snakes and tortoises. There are some herds of zebra and eland.

The strategic position of the Cape of Good Hope between two major ocean currents ensures a rich diversity of marine life. The marine life east and west of Cape Point is markedly different due to sea temperature - the cold Benguela current to the west contrasts with the warm waters of False Bay to the east. The area offers excellent vantage points for whale viewing. The southern white whale is the species most likely to be seen in False Bay between June and November. Seals and dolphins can be seen occasionally.

After returning from Cape Point we visited Kirstenbosch National Botanical Garden.



*Kirstenbosch National
Botanic Garden*

The National Botanical Institute is an autonomous, state aided organisation whose mission is to promote the sustainable use, conservation, appreciation and enjoyment of the exceptionally rich plant life of South Africa, for the benefit of all people.

The garden is sanctuary to about half of South Africa's indigenous flowering species. It is the best known of South Africa's eight botanical gardens – it was the first in the world to showcase indigenous plants and now shows 6,000 different species. In 1896 Cecil John Rhodes bought Kirstenbosch, a 152 ha farm, as a first step towards preserving Devil's Peak and the eastern slopes of Table Mountain as a National Park. Kirstenbosch was selected for its current role in 1913, when it was officially declared the first national Botanic Park in South Africa. Its aims were to promote the study, preservation and cultivation of indigenous flora.

The continuous work and research that is carried out at Kirstenbosch is critical to the maintenance of the fragile ecological balance of South Africa's environment. In addition scientists are doing valuable exploratory work in the field of the curative properties of many of the indigenous plants and flowers.

After a guided tour of Kirstenbosch we visited Table Mountain. It was partially covered by static cloud – known as the table cloth – which covers it for much of the year. This extraordinary natural feature is a 350-million-year-old massif of sandstone and shale. It has always had a magnetism over the centuries, from sailors weary from months at sea, who saw it as a welcome landmark to twenty first century visitors, thousands of whom each year ascend its 1,086 m summit by cable car.

Records show that about 4,000 years ago, the lower slopes of Table Mountain were covered by groves of silver tree, *Leucadendron argenteum*. The tree, the largest of the *Protea* family, was brought to near extinction by the Dutch settlers, who felled them for firewood.

A century later another threat to the mountain's ecological balance was posed by urban development creeping up its slopes. The mountain was finally declared a national monument in 1957, a decision which pleased ecologists and many South Africans.

Today, numerous organisations protect its welfare. The silver tree has been re-established and is well protected by strict regulation.

The group took the cable-car ascent to the summit and enjoyed the panoramic views.

Overnight accommodation was at the Commodore Hotel, Cape Town. After dinner, the President Trevor Wilson thanked Georg von dem Bussche for his wonderful organising abilities and for the great success he had made of the tour - it would go down as one of the most memorable. He also complimented the Convenor John Mc Loughlin and those associated with organising and planning the tour.



Study Tour participants

Thursday 30 September

On the final morning the group was free to do last minute shopping before commencing the long journey home, a journey made longer because of an airline pilots strike. We departed Cape Town for a short stopover at Johannesburg en route to Amsterdam. The next flight was to Manchester and then a bus to Holyhead and finally, twenty-four hours later, the group arrived at Dunlaoghaire by boat.

Tim O'Regan

Attendance: Peter Alley, John Brady, John Brosnan, PJ Bruton, Michael Carey, Tadhg Collins, John Connelly, Tom Costello, Michael Doyle, Frank Drea, Ken Ellis, Jim Fanning, Joe Fenton, Brigit Flynn, Matt Fogarty, Tony Gallinagh, Sean Galvin, Christy Hanley, George Hipwell, Liam Howe, Jim Hurley, Larry Kelly, Richard Lowe, Donal Magner, Tony Mannion, Fergus Moore, Ned Morrissey, Fergal Mulloy, Liam Murphy, Ted McCarthy, Pat Mc Cluskey Kevin Mc Donald, John Mc Loughlin (Convenor), Jim Mc Namara, Jim Neilan, Frank Nugent, Michael O'Brien, Pat O'Callaghan, Liam O'Flanagan, Tim O'Regan, Joe Treacy, Donal Whelan, Trevor Wilson (President).

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