

## Waikato Region: Landscape change and loss of native habitat

By Mairi Jay

The lowlands of central Waikato and the Hauraki Plains were formed largely by alluvial in-filling of pre-existing valleys and depressions over the past 20,000 years, and by deposition of volcanic ash from periodic volcanic activity in adjacent regions. As a consequence, soils throughout the area are a complex mix of different parent materials. Soils and topography have, in turn, influenced the diversity of native vegetation and the biological communities which evolved in the region.

A characteristic of the Waikato landscape are the expanses of bog and swamp. Bogs form in poorly drained hollows where rain is the primary source of water for plant growth. Decay of plant material is slow or incomplete, because of a lack of oxygen in the watery conditions, and standing water becomes highly acidic.

Bogs tend to 'grow' vertically, as peat. 'Raised bogs' or 'peat domes' result from peat accumulation, and may become higher in their centres than at their edges. Swamps are periodically or permanently flooded by through-flowing water. They contain organic matter, minerals and other materials deposited by the floodwaters. They are richer and less acidic than bogs, and their decomposition occurs more rapidly. There is generally a seasonal fluctuation in water level, and plants as well as animals must be able to survive alternating flood and drought.

The pre-human vegetation is thought to have been almost entirely forest, except for extensive areas of bog and swamp. Maori settlement, estimated to have begun about 1300 AD, brought significant changes in vegetation cover, with reduction of forest by fire then conversion of the disturbed land to bracken fern and cultivation. Large areas of wetland remained relatively untouched.

By the time of European arrival, the landscapes of central Waikato and

Hauraki Plains were a jigsaw of bogs, swamps, lakes, rivers and alluvial flood plains; of water and wetland interspersed with forest and fernland. In winter and spring the land became saturated as floodwaters spilled out over adjacent plains to replenish swamps and peatlands. During summer and autumn the floods receded and water from swamps and peat bogs would gradually filter out. During a long dry summer the peat could dry to the point of burning. Fires sometimes started and they might burn slowly for weeks before the returning cycle of rain and flood extinguished them.

These conditions ensured a great diversity of habitats, including lowland kahikatea and cabbage tree forest, gallery forests (on river terraces and old alluvial gravel bars), the many aquatic habitats of river, lake and stream, bogs, and numerous swamp habitats (varying with the length and extent of seasonal flooding and depth of flood water).

Wetlands and forest provided food, shelter and breeding habitat for insects, reptiles and vast numbers of waterfowl and wading birds. Some of this richness and diversity remains in the 4,870 ha Whangamarino wetland, a composite of floodplain, mineralised swamp, and acidic peatbog. Altogether, 239 wetland plant species have been recorded there, of which 60 per cent are native. It also provides seasonal habitat for 30,000 to 50,000 waterfowl.

The peatlands were less diverse biologically, but equally interesting. The plants which grew there were adapted to conditions of high acidity and low nutrient status, for they survive in little more than sunlight and rainwater. Two species of jointed rush (*Sporadanthus traversii* and *Empodisma minor*) were the dominant species, accompanied by a variety of bladderworts, mosses, ferns, and rare orchids.

On higher ground, the predominant vegetation was rainforest, ranging from

kauri-taraire forest in northern parts of the region, through kahikatea, and rimu-tawa forests in central Waikato, and tawa with various broadleaf species (notably titoki, kohekohe, hinau, rewarewa, mangeao and pukatea) elsewhere.

### Current state of native biodiversity in the Waikato region

A modern day traveller in the Waikato lowlands and Hauraki Plains will see almost nothing of the former diversity and richness of native habitat. At the time of European arrival, primary forest was predominant on the hill country south of Auckland, while fire-induced secondary vegetation was found chiefly in the Hauraki Plains, the lowlands of central and south Waikato, and the lower Waipa.

An estimated 110,000 ha of wetland existed in the lower Waikato and Hauraki Plains. Since the beginning of European settlement in 1840, native vegetation (forest and wetland) has been reduced to 18 per cent in the lowlands, with only 6 per cent of the former lowland and coastal forest still unmodified. Most forest remnants are on the higher and steeper parts of old ranges and volcanoes; the rest are in small dispersed fragments. Wetlands have been reduced to about 25 per cent of their former to about 30,000 ha at present.

In the Hamilton and Waipa Ecological Districts, wetlands have been almost entirely drained for agriculture, with less than one per cent now remaining. The health of remaining areas of wetland and forest in the region, as well as their populations of native birds, fish, insects and plants, is compromised by continued agricultural development, particularly dairying. About 100 species of native plants and vertebrate animals are threatened with regional extinction.

Taken from: [http://adt.waikato.ac.nz/uploads/approved/adt-uow20060125\\_120921/public/03\\_Chapter2\\_Landscape\\_Change.pdf](http://adt.waikato.ac.nz/uploads/approved/adt-uow20060125_120921/public/03_Chapter2_Landscape_Change.pdf)

# Project Kahikatea

Issue One, February 2007

## Why Project Kahikatea?

By Gary Blake

Inspiration for Project Kahikatea came from the picturesque, pencil shaped trees that dot the Hauraki Plains in small isolated stands. However, the lack of regeneration may leave you with the impression that one day the trees may no longer be there. The Waikato Branch of the NZ Farm Forestry Association and the Biodiversity Advice Fund decided to survey as many stands as possible throughout the Waikato lowlands to assess the quality of the stands and gain the views of landowners. The ideal would be to expand the forest estate and manage it on a sustainable basis.

The Project adheres to the IUCN definition of conservation in which preservation and protection are a part but so is the sustainable use of resources. "Conservation means harmony between man and land" (Leopold 1939) and conservation thinking has been well to the fore on the Hauraki Plains, where at least a third of stands have been fenced and the trees are greatly appreciated.

The survey will be completed at the end of 2007 when the data will be available and future plans can be formulated. It is coincidental that the Project timing is also that of the Government's latest plans for countering global warming. There is little doubt that we as a Nation have been extremely remiss in not planting more trees over the past 40 years and Government is now prepared to assist a turn around. We could equally plant kahikatea and other natives as well as pine to provide these environmental benefits.

Permaculture have said that one third of a farm can be in trees without affecting stock numbers. Kahikatea grows well and to expand the forest would:

1. Retain a unique ecosystem which includes NZ's tallest tree.
2. Enhance biodiversity and be a wise land use.
3. Provide a sustainable timber supply.
4. Improve stock management and welfare.
5. Enhance farm and regional aesthetics.
6. Provide personal growth and educational opportunities.

## Programme Outline for Project Kahikatea 2007

<b>January</b>	Completed Hauraki fieldwork, started data processing.
<b>February</b>	Prepare for Seminar, data checking, start field work west of SH27 to Pirongia.
<b>1 March</b>	Field day at Turua Hall.
<b>March</b>	Complete second stage fieldwork, data checking, special projects.
<b>April</b>	15-19 April: NZFFA's 51st National Conference in Hamilton, data processing.
<b>May</b>	Prepare newsletter two, start survey in Te Awamutu to Te Kuiti.
<b>June</b>	Complete fieldwork stage three, process data.
<b>July</b>	Seminar/field day at Pirongia, check out Lower Waikato and Franklin District.
<b>August</b>	Team to check and discuss all data.
<b>September</b>	Draft report, which will include recommendations and proposals for advancing the quality of the Kahikatea forest estate.
<b>October</b>	Final report and plan of action.

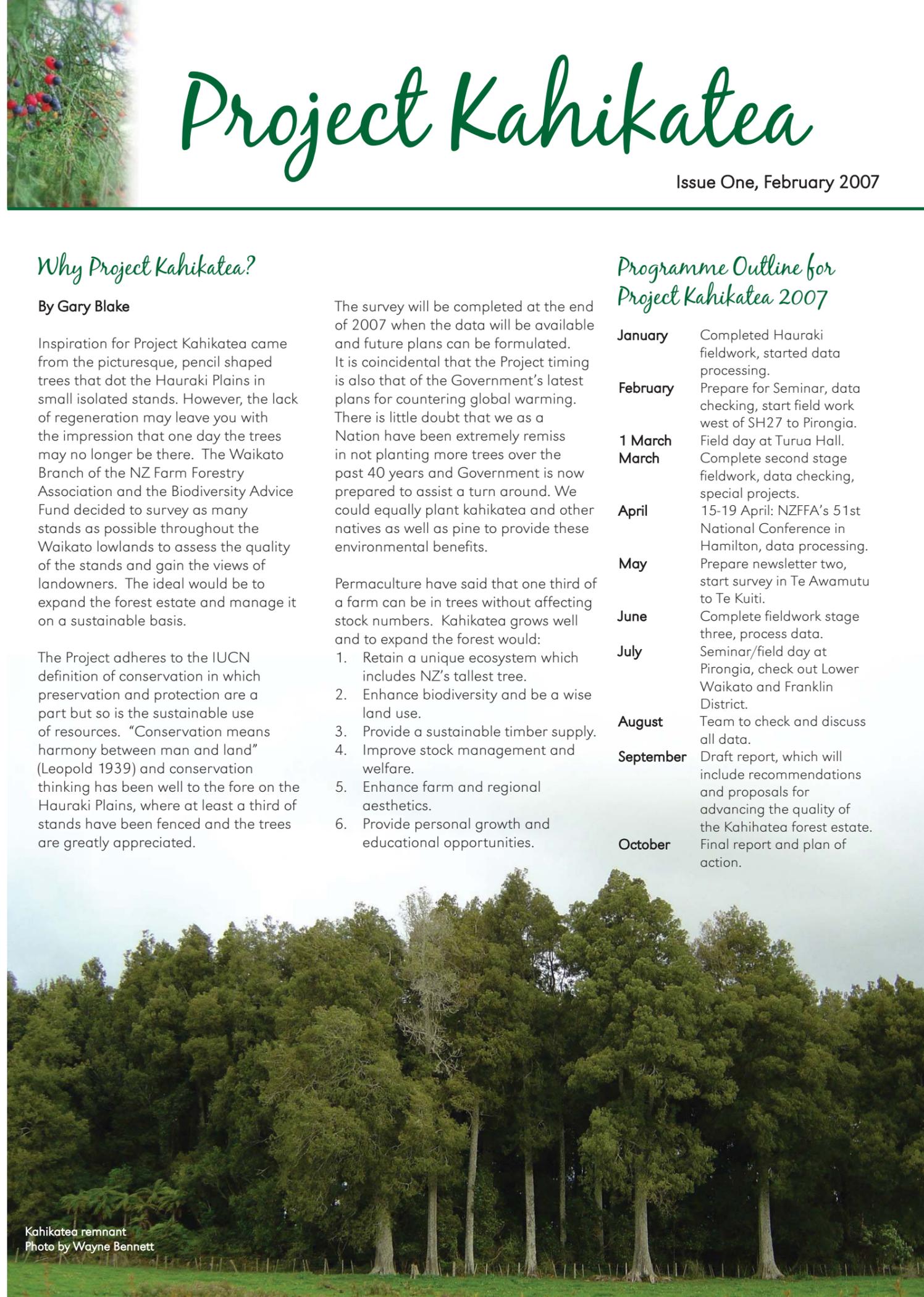
For more information and advice on kahikatea, call 0800 BIODIV (246 348)

Project Kahikatea is supported by the Biodiversity Advice Fund, Waikato Branch of the Farm Forestry Association, Environment Waikato, Biodiversity Advice Waikato, QEII National Trust, Landcare Research, Federated Farmers, Department of Conservation, Hauraki District Council, Fonterra and Waikato Biodiversity Forum. For more information, or to become involved in the Project, please contact Nardene Berry (07 825 9112 or email [nardene@tepahu.co.nz](mailto:nardene@tepahu.co.nz)) or Gary Blake (07 868 2336 or email [gary.blake@clear.net.nz](mailto:gary.blake@clear.net.nz)).



Department of Conservation  
Te Papa Atawhai

Kahikatea remnant  
Photo by Wayne Bennett



## Survey of kahikatea stands on the Hauraki Plains

One of the first jobs for Project Kahikatea has been to assess this resource. How many native forest stands occur on the Plains, and what area do they cover? How are they being managed at the moment and what condition are they in?

To answer these and other questions, the team has started surveying stands across the Hauraki Plains. So far about 44 farms with forest stands have been visited. Although most stands are one to five ha in area, we have identified a sum total of over 200 ha of forest across the Plains so far. The stands at the northern end of the Plains are kahikatea-dominant but from Tahuna south, increasing amounts of totara occur in the stands until they dominate stands to the south. This may reflect a change in soils, from more poorly drained gleyed marine clays and organic peat soils in the north, and better drained brown soils and allophanic clays in the south.

The stands visited have been mostly dominated by kahikatea trees with a mean height of 23 m and a mean trunk diameter of 47 cm. The stands are generally of moderate condition, having intact, dense canopies but a sparse to non-existent understorey and low cover at edges, providing little protection from drying winds. Most stands have diverse and complete groundcover vegetation, but this often also supports a range of weed species. Birds were common within almost all stands, reflecting the role these stands provide as oases of biodiversity on the Plains.

It was encouraging to discover that 40 percent of the stands are already fenced, with another 30 percent partially fenced to some degree. Perhaps of most importance though were the attitudes of landowners interviewed to the values and persistence of their stands. Almost all landowners felt their stands enhanced their properties and were interested in finding out more about how to care for and improve their stands. Once this survey is complete, we will be feeding back more information to stakeholders, and using it to formulate a strategy to maintain and enhance the forests of the Plains.

## You are invited to a field day at Turua

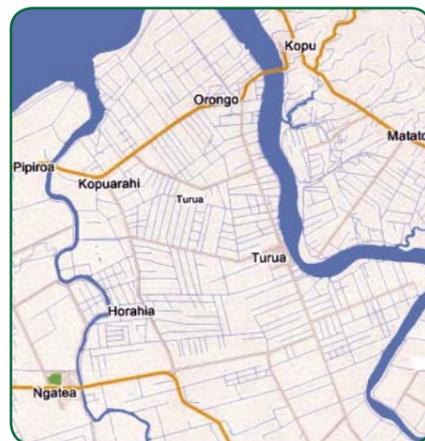
**When:** Thursday 1 March 2007  
from 10.00 am to 4.30 pm

**Where:** Turua Hall, Hauraki Road, Turua (between Kopu Bridge and Netherpton)

**Purpose:** To discuss the kahikatea forest estate in the Waihou and Piako catchments.

### Draft programme:

- Meet at Turua hall at 9.45 am for tea and scones
- Welcome and introduction  
*Jenni Vernon, Environment Waikato/John Tregidga, Hauraki District Council*
- Project scope and outline  
*Gary Blake/Alan White*
- Project results to date  
*Gary Blake/Bruce Burns*
- Future concepts  
*Chris Ingram*
- Lunch at Muddy River Café (on the jetty if fine)
- Field trip to three sites - either buses or vehicles (depends on numbers)
  1. Turua Domain
  2. Cooks Memorial
  3. Morrisons farm



- Field day concludes at Netherpton
- Return to Turua by 4.30 pm

**RSVP:** By 26 February 2007 to Nardene Berry, phone 07 825 9112 or email [nardene@tepahu.co.nz](mailto:nardene@tepahu.co.nz)

*We have endeavoured to send this newsletter to all landowners with kahikatea stands on their properties, but we may have missed some. If you know of these please invite them. Also if you have neighbours that would like to plant kahikatea invite them also.*

## Indigenous Forestry on Private Land

The Ministry of Agriculture and Forestry have set guidelines for the harvesting and milling of timber from indigenous forests. A Sustainable Forest Management Plan is needed for large forests but where timber is required for personal use, 50 cubic metres may be taken. Approval is needed.

The Forest Act 1949 (part IIIA) defines sustainable forest management as "management of an area of indigenous forest land in a way that maintains the ability of the forest growing on that land to continue to provide a full range

of products and amenities in perpetuity while retaining the forest's natural values."

Many of the Hauraki stands surveyed to date are too small for tree removal and for 95 percent of owners it is not a requirement anyway. Two farms are interested in some tree removal to rationalise paddock boundaries.

For information refer to the Indigenous Forestry Publications available on the MAF website: [www.maf.govt.nz](http://www.maf.govt.nz)

## Eco-sourced seed collection in March

By Wayne Bennett

Ecosourcing is the propagation of native plants from a representative sample of the local wild population for ecological restoration. Ecosourcing ensures that your planting reflects the unique diversity of the local population and so preserves biodiversity.

Remember whenever collecting seed, first ask for permission from the land owner, whether it is privately owned, DOC estate or a local council reserve.

Ecosourcing requires the collection of seed from plants known to be naturally occurring where they are growing and preferably from a range of the specimens available.

With dairy cows grazing beneath kahikatea stands, kahikatea will

only regenerate if domestic grazers are fenced out or the seed is sown elsewhere where it is safe.

Wayne Bennett planted a number of Kahikatea in 1986 from the same seed source. Those growing in the shade of other trees are a small fraction the size those planted in the open, suggesting light levels are very important to this species.

Kahikatea tolerate poor, waterlogged soils but also grow on well drained hill slopes when they have to compete with relatives Totora, Rimu, and Miro.

Under some trees only the seed is found, with a small strand remaining where the fruit has been eaten off.

Kahikatea frequently produce copious quantities of seed, which can most efficiently be picked up from the ground or even swept or vacuumed up.

Members of the Te Pahu Landcare group collecting Kahikatea seed  
Photo by Nardene Berry



The seed should be sown fresh and it germinates in two to four months, depending on the protection from winter cold. The seedlings will take several years before they are large enough to be planted out.

Look out for seed this coming March. For more information, check out [www.forestflora.co.nz](http://www.forestflora.co.nz)

## Got weeds?

Weeds are a problem in remnant Kahikatea stands. Here is some information on two weeds that are common in the Hauraki area. For more information on weeds, visit [www.weedbusters.org.nz/weed\\_info/advanced.asp](http://www.weedbusters.org.nz/weed_info/advanced.asp)

### *Ligustrum lucidum*

- Oleaceae (olive) family
- Known as tree privet
- Originally from temperate and tropical regions, China
- Grows through understorey to dominate and replace canopy trees in most forest types. Poisonous berries may impact on native fauna.

### *Solanum pseudocapsicum* and *Solanum diflorum*

- Solanaceae (nightshade) family
- Known as Jerusalem cherry, Madeira winter cherry
- From South America
- Can form dense stands in disturbed (especially grazed) forest and shrubland. Usually succeeded with competition for ground space.

## An interesting fact...

Sawmilling was the first industry to be established in the Hauraki Plains. The Hauraki Sawmilling Co operated at Turua from 1869 until 1877 when Bagnall Brothers leased the mill and the forest of kahikatea along the bank of the Waihou River, and eventually bought them. Their tramlines radiated from Turua, and logs were also floated down river. Sawn timber was sent all over the Dominion and four-masted sailing ships plied between Turua and Melbourne. As the forest was cleared the land was sold for farming.

*Taken from Hauraki Plains Story by Rufus E. Tye, Thames Valley News Ltd, Paeroa, 1974.*



Kahikatea fruit (cones)  
Photo by Graham McBride