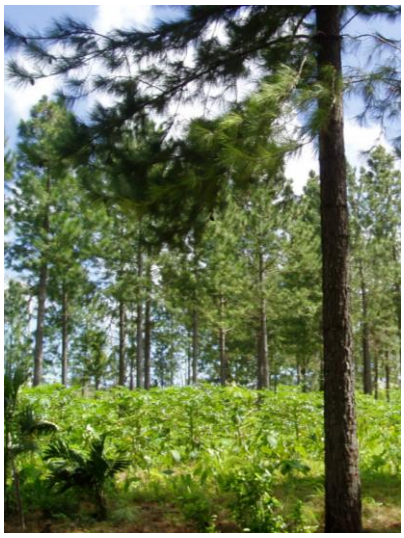
Government of Tonga

Code of Practice for the Sustainable Management of the Forests and Tree Resources of Tonga

2010





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Ministry of Agriculture, Food, Forestry and Fisheries

ACKNOWLEDGEMENTS

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Introduction

Forests and trees make a significant contribution to the economic, environmental and social well-being of all Tongans. Forests and trees enhance the natural beauty of our islands and provide many benefits, including providing shade and shelter for our crops, protecting our coastline and sensitive areas from erosion, providing habitat for many species of plants and animals and supplying us with timber, food, medicines and other traditional products for economic, social and cultural use. Forests and trees store carbon and have an important role to play in mitigating the effects of global climate change. It is therefore important that they are managed in a sustainable manner for both current and future generations.

This Code of Practice provides practical guidelines for the sustainable management of the forests and tree resources of Tonga. Separate guidelines are available for the forestry plantations on the island of ‘Eua.

The Code was developed though consultations with landholders, timber processors and government officials. The implementation of the Code will be supported by ongoing education programs and technical support from the Forestry Division. I have great pleasure in releasing this Code on behalf of the Government of Tonga.

HRH Prince Tu’ipelehake

Minister for Agriculture, Food, Forestry and Fisheries

Contents

1. Clearing and harvesting trees

1.1. Vegetation in Reserves and Mangrove Forests

Principle

- Reserves and mangrove forests are important for providing shelter, protecting coastal areas and other land from erosion, and providing habitat for the conservation of native species of plants and animals.

Guidelines

- No trees or vegetation should be cut or removed in reserves and mangrove forests
- Trees or vegetation that are damaged by natural events such as hurricanes may be cut and removed only if authorised by a permit issued by the Forestry Division
- Any trees removed from reserves should be replaced by replanting or promoting the natural regeneration of local species (see section 2).

Coastal fringes and reserves must be protected from the removal of trees and vegetation

Vegetation in reserves that is damaged by hurricanes may only be salvaged if authorised by the Forestry Division. Rehabilitation must be carried out over the affected area.

1.2. Secondary growth of native species in allotments

Principle

- The natural regeneration of native species in disused allotments provides an important resource of trees for timber and conservation purposes. Some species have very high commercial values, especially if allowed to grow to large stem sizes.

Guidelines

- Landholders who wish to clear secondary growth trees from allotments should first note the type and size of the species present and seek advice from the Forestry Division on the potential commercial or conservation value of the trees.
- High value timber species should be utilised for timber production where possible. In some cases, it may be worthwhile retaining individual trees to maximise their future commercial value.
- Only low value species and residues should be used for firewood.
- After trees have been harvested or cleared consideration should be given to replanting of high value species along boundary rows or under agroforestry systems (see section 2).

Some allotments contain secondary growth that has very high conservation and timber values

1.3. Coconut trees

Principle

- Coconut trees, as they age and their fruit crops decline are a potentially commercial source of timber.

Guidelines

- Check with the Forestry Division for the marketing opportunities for your coconut wood.
- Consider replanting new coconut seedlings after any harvesting of old trees.

Old coconut trees are a potentially important source of timber

1.4. Trees planted in allotments

Principle

- Many trees that were previously planted in allotments are now important sources of timber.

Guidelines

- Landholders who wish to cut trees from allotments should first note the type and size of the species present and seek advice from the Forestry Division on the potential commercial or conservation value of the trees. Some local and introduced species, such as Australian Red Cedar, Mahogany, Teak and Kauri

Pine, have very high commercial value if sold to a professional timber merchant.

- After harvesting consider replanting to provide an ongoing source of trees for shelter, timber and firewood.

Many allotments have useful timber resources, such as pines planted in single or double rows along boundaries

Single trees such as red cedar can have very high timber value

1.5. Sandalwood

Principle

- Sandalwood is a very high value timber. Young seedlings will greatly appreciate in value if left to grow to larger piece sizes.

Guidelines

- Sandalwood trees may not be cut unless authorised by the Forestry Division as follows-
  - Stems must be greater than 20cm in diameter
  - All stems or sections of stems and branches must have a sandalwood tag affixed immediately after cutting. The tag must remain affixed at all times during the transportation of the sandalwood from the harvesting area to the manufacturer.
  - Sequentially numbered tags will be issued by the Forestry Division upon payment of a fee by the person who holds a current permit for sandalwood harvesting, providing that the consent in writing of the landholder who owns the sandalwood is obtained and submitted to the Forestry Division.
  - The permit holder will maintain a docket system that records for each numbered tag: the name and address of the landholder from whom the sandalwood was cut; the date of cutting; and the person and address to whom the sandalwood was sold. A copy of each docket will be provided to the Forestry Division.
  - Any person who cuts sandalwood shall be responsible for the replanting of seedlings at a rate of a minimum of ten seedlings for each stem that has been harvested.

Notch cuts must not be made in young sandalwood trees. The cut severely reduces the growth of the tree. Small trees should be left to grow into larger, more valuable size classes

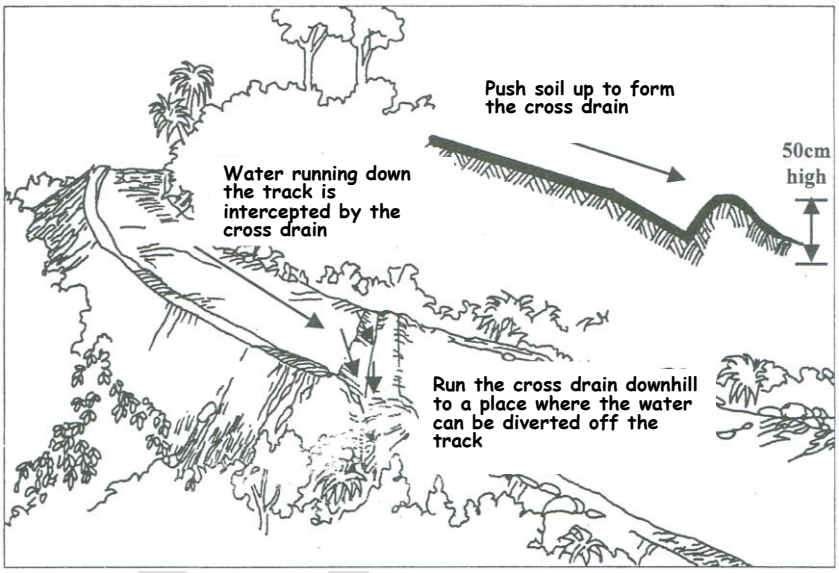
1.6. Extraction of logs

Principle

- Logs should be extracted in a safe and efficient manner that minimises the impact on soils and other retained vegetation.

Guidelines

- Use low ground impact machines to minimise soil disturbance.
- Minimize the area covered by skid tracks, reduce skid track grades and avoid box cuts and excessive side cuts
- Avoid unnecessary damage to retained trees and crops by the skidding machine.
- Do not skid logs when soils are saturated and likely to be rutted. Where necessary, logging slash should be evenly distributed on major skid tracks to protect the soil surface from rutting.
- Do not skid logs along or across roads or streambeds.



In steep areas, extraction tracks should have cross-drains constructed to divert water away from the track into adjoining vegetation

1.7. Haulage of logs

Principle

- Log haulage should be carefully planned and conducted so as to ensure the safe and efficient transportation of logs without damage to the road assets.

Guidelines

- Vehicles used for the haulage of logs must be registered and loaded according to load limits.
- Loads must be secured with appropriate bolsters and bindings.
- Haulage should cease when roads are unsafe due to slippery conditions or if there is a risk of rutting or damage to the road surface.

2. Planting and managing trees

2.1. Selection of species

Principle

- Tree planting is a medium to long term investment, with most species taking 15 to 30 years to reach full maturity. Careful selection of species is necessary to ensure that species are suitable for the site to be planted and for the desired purpose. Fast growing species such as pine will rapidly provide shade, shelter and good quality wood for general construction. Species such as sandalwood and red cedar have slower growth rates but produce much higher value timber.

Guidelines

- Landholders should seek advice from the Forestry Division on the selection of suitable species for their sites and purposes.

2.2. Nursery stock

Principle

- Good quality seedlings will maximise the survival and early growth of tree plantings. Improved seed should be used where available to ensure high growth rates and good form of trees.

Guidelines

- Landholders should obtain good quality nursery seedlings for their tree planting programs.
- Seedlings should be carefully transported from the nursery with care to prevent damage due to excessive heat or windburn.
- Seedlings should be well watered and planted as soon as possible after receipt from the nursery.

Good quality seedlings from a forest nursery are important for high rates of survival and growth after planting

2.3. Planting

Principle

- Good site preparation, careful planting and tending will maximise the survival and growth of the seedlings.

Guidelines

- Planting should be carried out in the wet season when soils are moist and follow-up rains are expected.
- Seedling spacing will vary depending upon the species and reasons for planting. Timber species are generally planted about three metres apart. The Forestry Division can provide advice on optimal spacing for specific sites and species.
- Species such as sandalwood need to be planted in combination with host plants such as pines or citrus. Red cedar is often planted with nurse crops such as pine to encourage the development of straight, clear stems rather than poorly formed and heavily-branched trees that may develop in open-grown situations.
- Seedlings should be planted into friable soil and firmed into the soil. Seedlings should be watered in if soils are dry and no rain is expected.
- All vegetation must be removed from around the seedling, preferably to a radius of one metre. Weeding should be carried out regularly until the growing tip of the seedling is at least one metre above competing vegetation.
- Seedlings must be protected from uprooting or browsing damage by animals. Row plantings may be fenced or individual seedlings enclosed within cages.

Healthy sandalwood seedling with host plant, ready for planting

Tree seedlings need the same planting conditions as other crops – cultivated, moist soil with no competing vegetation and protection from browsing animals

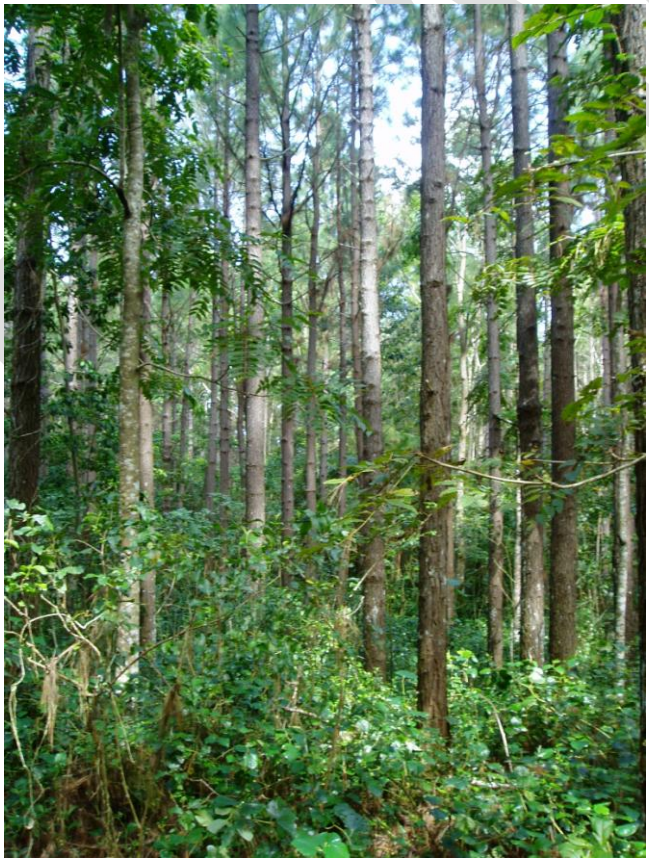
2.4. Management of trees

Principle

- Active and timely management of trees during their rotation will maximise their health, growth and value.

Guidelines

- Trees planted for timber production may be pruned to remove lower branches and encourage the growth of clear, straight stems.
- Planted rows or woodlots should be thinned after 5 to 10 years to remove the smaller stems and concentrate growth on the most vigorous trees.
- Trees planted for shelter are generally left unpruned and unthinned.
- Avoid damaging trees as this can affect health and growth and lead to rot, which can significantly downgrade the timber values. Damage includes burning near the base of trees, damage to the bark, stem or branches from machines, axes, bush knives or by the felling of other trees.
- Advice on the management of trees can be obtained from the Forestry Division.



This stand of pines and red cedar has been maintained at high stocking, resulting in straight trees and good branch shedding. Thinning of the stand to remove the smaller trees will allow faster growth of the retained trees, including more volume and value increment on the red cedar

3. Construction and maintenance of roads

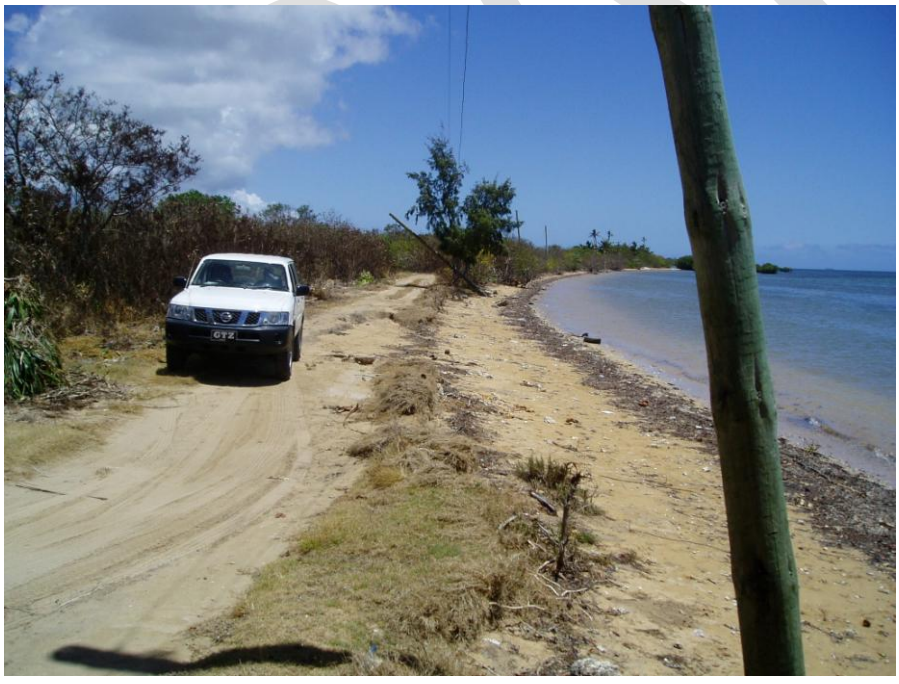
3.1. Construction of new roads

Principle

- Well constructed roads will provide safe and efficient access to the forest without undue impact on the environment. Poorly designed and constructed roads can have significant, long term impacts on environmental values and public safety.

Guidelines

- New roads must be designed and located to avoid sensitive environments such as coastal dunes, waterbodies, steep areas, erodible soils, karst depressions and sites containing threatened species or other conservation values.
- Roads in areas with surface drainage such as mangroves and swamps must be constructed with adequate drainage systems to minimise any impact on natural drainage flows.
- New roads should be constructed and drained in accordance with the guidelines contained in the *Code of Harvesting Practice for the 'Eua Forestry Plantations 2009.*



Roads should not be built in sensitive environments such as coastal dunes

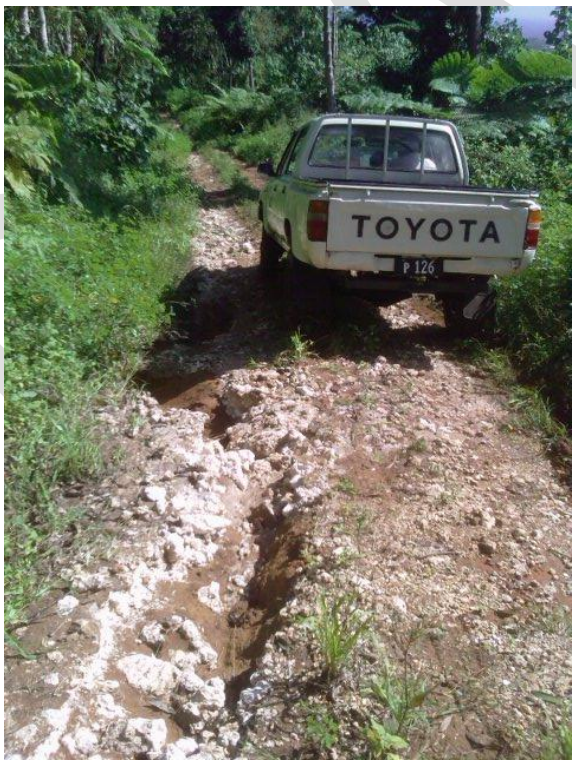
3.2. Maintenance and use of existing roads

Principle

- Roads are an important asset and regular maintenance will avoid expensive, major repairs. Poorly maintained roads can cause erosion, damage to vehicles, inconvenience and safety risk to landholders and the public.

Guidelines

- Ensure that roads are adequately drained, by constructing simple diversions to minimise water scouring and erosion on road surfaces. Often this can be done with a spade or mattock.
- Avoid using uncompacted roads when soils are saturated to prevent rutting.
- Prune or slash roadside vegetation to provide safe sight distances for vehicles.
- Close and rehabilitate roads or sections of road that are too badly rutted or damaged for ongoing use. These sections must be drained and revegetated to prevent ongoing erosion.
- Further guidelines are contained in the *Code of Harvesting Practice for the 'Eua Forestry Plantations 2009.* Advice can be obtained from the Forestry Division.



Regular maintenance will avoid road failure and costly repairs. In this case, the erosion and damage to the road could have been avoided by a simple side drain to divert run-off into the adjoining vegetation.

4. Mining and the removal of sand and other materials

Principle

- Sand and other minerals are important materials for construction projects. However, the mining and removal of these materials can have significant local environmental impacts unless carefully planned and implemented.

Guidelines

- Sand mining and associated road access should not occur in dunes along coastal fringes or adjacent to mangrove forests.
- Where mining is approved, the area must be progressively rehabilitated during operations and upon the completion of operations to restore natural drainage patterns and promote rapid revegetation with native species.
- Sand should not be taken from beaches and coastal dunes as even small quantities can lead to accelerated beach erosion.

Sand mining has removed the coastal dunes and resulted in waterlogging and altered drainage patterns.

Coastal dunes should be protected as they form an important line of defence against storm surges and coastal erosion.

5. Rubbish

Principle

- Rubbish that is dumped in the forest or allotments can attract vermin and cause locally significant contamination of soils, water resources and air quality (if burnt). It is also unsightly and lowers the aesthetic and amenity qualities of many otherwise attractive and productive areas.

Guidelines

- Rubbish should not be dumped or burnt in the forest.
- Spillage during refuelling or machine maintenance must be avoided by locating maintenance areas on level ground well away from streams and drains.
- Used oil filters, empty grease gun cartridges, drums, and other rubbish should be removed to an approved disposal area.

6. Fire protection

Principle

- Trees are damaged or killed by fire, through the effect of radiant heat on their stems, branches and leaves.

Guidelines

- Burning should be avoided near trees that are to be retained. In particular, avoid heaping and burning debris against the butts of retained trees.
- Landholders should not light vegetation fires under conditions that could lead to the fire escaping onto other land.

Avoid burning around the base of retained trees

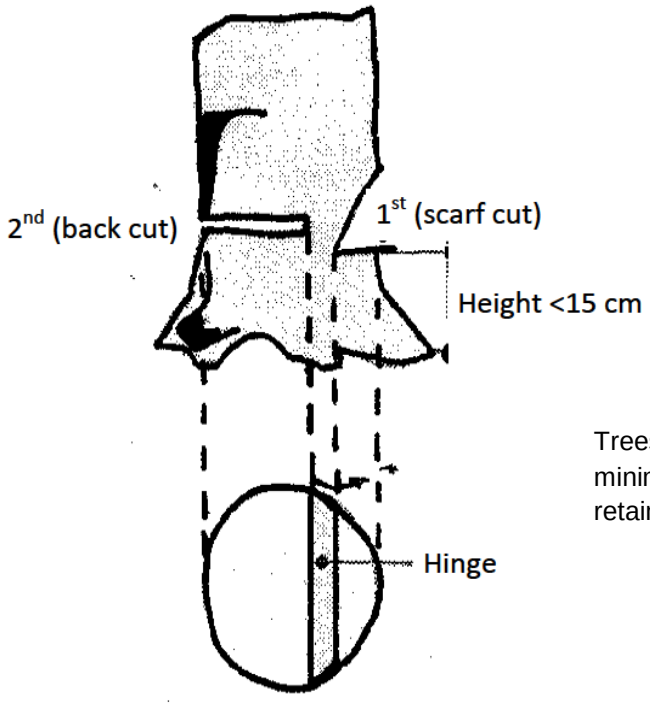
7. Safety

Principle

- Forestry and tree management operations should be conducted in a manner that minimises the risk of injury to workers and the general public.

Guidelines

- Trees should be directionally felled by using the proper techniques of scarf cuts and backcuts.
- Trees should not be felled by burning at the base of trees.
- Tree felling should not be carried out in windy conditions.
- Damage to retained trees must be avoided.
- Suitable signboards and precautions should be taken, such as the temporary closure of roads and walking tracks, to warn other workers and the public of potential hazards.
- The stump height should be as low as practicable (less than 15 cm) to maximize merchantable volume providing that appropriate health and safety requirements are met.
- Where a tree is 'hung up' it must be brought to the ground as soon as possible. If this is not immediately possible the area should be clearly flagged to warn other people of the danger.



Trees must be directionally felled to minimise damage to the log and to the retained trees

Correct felling technique with directional scarf cut, hinge (holding wood) and horizontal back cut

Incorrect felling technique with no directional control

- All persons should wear the relevant Personal Protective Equipment (as listed in Annex 1) at all times whilst working within a harvesting area.
- All chainsaws must have safety features (e.g. chain-breaks) in working order.
- All machines are to be fitted with seat belts, which must be worn during the operation of the machine.
- All machines must be fitted with a fully charged fire extinguisher and a First Aid Kit.
- All machines must be fitted with Roll Over Protection Structure (R.O.P.S). The cabin of the machine must have a safe and securely mounted seat.
- The machine must be fitted with an efficient spark arrestor and this must be maintained in working order.
- All pulleys, shafts, belts and fan blades must be securely guarded.
- Machines must not have any fuel or oil leaks.

Annex 1

Personal protective equipment (PPE) appropriate for forestry operations

(Adapted from the ILO Code of Practice: Safety and Health in Forestry Work)

Parts of the body to be protected	**Trunk**	**Feet**	**Legs**	**Hands**	**Head**	**Eyes/ face**	**Hearing**
Required PPE	**High visibility clothing**	**Safety boots or shoes**[1]	**Safety trousers**[2]	**Gloves**	**Safety helmet**	**Visor (mesh)**	**Eaf muffs**[3]
Manual Felling	✓	✓	✓	✓	✓	✓	✓
Extraction	✓	✓		✓[4]	✓		✓

Notes-

1. Safety boots or shoes with integrated steel toe for medium or heavy loads
2. In hot weather chain saw leggings or chaps may be used. Safety trousers and chaps contain fibres that are inflammable and will melt and should not be worn during fire fighting
3. Ear plugs and ear valves are not generally suitable for forestry because of the risk of infection
4. Gloves with heavy-duty palm required if handling wire chocker rope or tether line.

Further reading

Code of Harvesting Practice for the 'Eua Forestry Plantations 2009, available from the Forestry Division, Ministry of Agriculture, Food, Forestry and Fisheries, Tonga