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OVERVIEW OF FOREST PESTS

MALAWI

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**Forest Resources Development Service
Forest Management Division
Forestry Department**

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DISCLAIMER

The aim of this document is to give an overview of the forest pest¹ situation in Malawi. It is not intended to be a comprehensive review.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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¹ Pest: Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (FAO, 2004).

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Background

This paper is one of a series of FAO documents on forest-related health and biosecurity issues. The purpose of these papers is to provide early information on on-going activities and programmes, and to stimulate discussion.

In an attempt to quantify the impacts of the many factors that affect the health and vitality of a forest, the Global Forest Resources Assessment 2005 (FRA 2005) asked countries to report on the area of forest affected by disturbances, including forest fires, insects, diseases and other disturbances such as weather-related damage. However, most countries were not able to provide reliable information because they do not systematically monitor these variables.

In order to obtain a more complete picture of forest health, FAO continues to work on several follow-up studies. A review of forest pests in both naturally regenerating forests and planted forests was carried out in 25 countries representing all regions of the world. This *Overview of forest pests* represents one paper resulting from this review. Countries in this present series include Argentina, Belize, Brazil, Chile, China, Cyprus, Colombia, Ghana, Honduras, India, Indonesia, Kenya, Kyrgyz Republic, Malawi, Mauritius, Mexico, Moldova, Mongolia, Morocco, South Africa, Sudan, Thailand, Romania, Russian Federation, Uruguay; this list will be continuously updated.

Comments and feedback are welcome. For further information or if you are interested in participating in this process and providing information on insect pests, diseases and mammals affecting forests and the forest sector in your country, please contact:

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MALAWI

Introduction

At present, forests cover about 3.4 million hectares, or 36.2 percent of the total land area of Malawi (FAO, 2006). The Northern Region is better endowed with woody vegetation than the Southern and Central regions. When the relatively low population of the Northern Region (just 12 percent of national population) is taken into account, the disparity of forest cover is striking, with less than one person per hectare of forest in the North, and five per hectare in the South, with the Central Region not far behind.

Around 15 percent of the forest is in patches of closed broadleaved forest of lowland, submontane and montane types. The remaining forest is mainly open broadleaved forest of 'Miombo' (*Brachystegia-Julbernardia-Isobertia* association) and 'Munga' (*Piliostigma-Acacia-Combretum* association) woodland types. Remnant areas of coniferous forests, *Widdringtonia* and *Juniperus* species are found on the high plateaus.

There are 80 forest reserves which account for around 22 percent of forest cover. Most of these are on hills and mountains and have a crucial role in protecting important water catchment areas. In addition, there are five national parks and four game reserves, distributed throughout the country, and these contain around 27 percent of total forest cover. The forest reserves, which contain the most intact forests of highest biodiversity, are coming under increasing threat from encroachment and illegal harvesting, again driven by hunger and poverty. Customary land forests are owned and traditionally allocated by chiefs and cover about 47 percent of the forest area in Malawi.

Planted forests, which have been the target of much development assistance over the past four decades, account for a mere 6 percent of total forest area (204 000 ha) (FAO, 2006). However, since the data reported for planted forests only included those larger than 100 hectares, the planted forest area is likely to be an underestimate. Most of the plantations are located in the Northern Region. The best known of these are the Viphyia pine plantations which are massive in scale but lack viable markets and are overmature and degraded owing to neglect of fire protection and silvicultural maintenance. Tree planting is also carried out, on a small scale but actively, by the private and informal sector. This includes plantations on tobacco and tea estates, community blocks and smallholder woodlots on private land.

Forest pests

Naturally regenerating forests

Insects

Indigenous insects

***Anaphe panda* (Boisduval, 1828)**

Other scientific names: *Anapha panda nathalia*

Lepidoptera: Thaumetopoeidae

Common names: bagworm; processionary moth

Host type: broadleaf

Hosts: *Pseudolachnostylis maprouneifolia*

<http://www.fao.org/docrep/007/j3463f/j3463f08.htm>

***Ancistrotermes latinotus* (Holmgren 1912)**

Other scientific names:

Isoptera: Termitidae

Common names: termite

Host type: broadleaf

Hosts: *Eucalyptus* spp.; *Casuarina glauca*

http://www.hort.purdue.edu/newcrop/duke_energy/Eucalyptus.html

<http://www.worldagroforestrycentre.org/sea/Products/AFDbases/AF/asp/SpeciesInfo.asp?SpID=479>

***Buzura abruptaria* Walker**

Other scientific names:

Lepidoptera: Geometridae

Common names: pine looper

Host type: conifer

Hosts: *Pinus* spp.

***Cubitermes* spp.**

Other scientific names:

Isoptera: Termitidae

Common names: termite

Host type: broadleaf

Hosts:

***Hodotermes mossambicus* (Hagen 1853)**

Other scientific names:

Isoptera: Hodotermitidae

Common names: termite; Harvester termite

Host type: broadleaf

Hosts:

<http://www.utoronto.ca/forest/termite/hodtpage.htm>

***Macrotermes falciger* (Gerstäcker)**

Other scientific names:

Isoptera: Termitidae

Common names: termite

Host type: broadleaf

Hosts:

***Microtermes* spp.**

Other scientific names:

Isoptera: Termitidae

Common names: termite

Host type: broadleaf

Hosts:

<http://www.utoronto.ca/forest/termite/mcropage.htm>

Nezara robusta

Other scientific names:

Hemiptera: Pentatomidae

Common names: stink bug; green shield bug

Host type: broadleaf

Hosts:

Odontotermes spiniger

Other scientific names:

Isoptera: Termitidae

Common names: termite

Host type: broadleaf

Hosts:

***Plagiotriptus pinivorus* Descamps**

Other scientific names:

Orthoptera: Eumasticidae

Common names: pine grasshopper

Host type: conifer

Hosts: *Pinus* spp.

Plagiotriptus pinivorus is a defoliator of pines in Malawi. This pest has also been reported from Kenya and Tanzania, and probably also occurs in Zambia and Mozambique.

Pseudocanthotermes militaris

Other scientific names:

Isoptera: Termitidae

Common names: termite

Host type: broadleaf

Hosts:

<http://www.utoronto.ca/forest/termite/pseuminpage.html>

***Xanthithisa tarsispina* Warren**

Other scientific names:

Lepidoptera: Geometridae
Common names: pine looper
Host type: conifer
Hosts: *Pinus* spp.

***Zonocerus elegans* Thunberg**

Other scientific names:
Homoptera: Acrididae
Common names: elegant grasshopper
Host type: broadleaf and conifer
Hosts:

Introduced insects

No information was available on introduced insects in naturally regenerating forests of Malawi.

Diseases

Indigenous diseases

No information was available on indigenous diseases of naturally regenerating forests of Malawi.

Introduced diseases

***Armillaria mellea* (Vahl) P. Kumm.**

Other scientific names: *Agaricus melleus* Vahl; *Agaricus sulphureus* Weinm.; *Armillaria mellea* var. *glabra* Gillet; *Armillaria mellea* var. *maxima* Barla; *Armillaria mellea* var. *minor* Barla; *Armillaria mellea* var. *sulphurea* (Weinm.) Fr.; *Armillariella mellea* (Vahl) P. Karst.; *Clitocybe mellea* (Vahl) Ricken; *Lepiota mellea* (Vahl) J.E. Lange
Basidiomycota: Marasmiaceae
Common names: Armillaria root disease; honey mushroom; shoestring root rot
Host type: broadleaf and conifer
Hosts:

Armillaria mellea is a common pathogen of trees, woody shrubs and some herbaceous plants, causing root, root-collar and butt rot. They invade trees through the bark of the major roots, progressively destroying the living root tissues and leading to serious decline and ultimate death of their hosts. Symptoms of infestation are premature autumn coloration and leaf drop, stunting of growth, yellowing or browning of the foliage, a general decline in the vigour of the plant, and twig, branch and main stem dieback. Such a decline usually occurs over several years but may appear to progress very quickly as the tree shows advanced symptoms of decline and death. As decline progresses, decay of the buttress roots and the lower trunk is evident. Small plants die quickly after the first symptoms appear with large trees surviving for a number of years. A severely infected tree also exudes resin, gum or a fermenting watery liquid from the lower trunk.

A. mellea is mainly a pathogen of broadleaved trees in ornamental parklands, natural woodlands, fruit orchards, etc, but it can kill young coniferous trees (pines, spruce, etc.) planted in sites where the broadleaved species were felled.

<http://www.na.fs.fed.us/spfo/pubs/fidls/armillaria/armillaria.htm>

<http://www.forestryimages.org/browse/subimages.cfm?sub=821>

http://www.mykoweb.com/CAF/species/Armillaria_mellea.html

http://www.mushroomexpert.com/armillaria_mellea.html

http://web.aces.uiuc.edu/vista/pdf_pubs/602.pdf

<http://helios.bto.ed.ac.uk/bto/microbes/armill.htm>

***Botryosphaeria* spp.**

Other scientific names:

Ascomycota: Incertae sedis

Common names:

Host type: conifer and broadleaf

Hosts:

Species in this genus are found in all temperate, tropical and subtropical regions of the world. They occur on a wide range of hosts and can cause diebacks, cankers, witches' brooms and leaf blights, or they can be endophytes. They are frequently described as weak or opportunistic pathogens that cause disease in stressed hosts, though certain strains can be primary pathogens.

http://www.crem.fct.unl.pt/botryosphaeria_site/index.htm

***Botrytis cinerea* Pers.:Fr.**

Other scientific names:

Ascomycota: Sclerotiniaceae

Common names: *Botrytis* blight; gray mould

Host type: conifer

Hosts:

Botrytis cinerea is a ubiquitous fungal pathogen that causes gray rot on a large number of economically important agricultural and horticultural crops. It opportunistically infects wounds or senescing tissue and also invades young tissues, causing necrosis. Disease development and spread are favored by moderate temperatures, high moisture, dense foliage, and crowded seedlings. *Botrytis* blight can affect leaves, stems, crowns, flowers, flower buds, seeds, seedlings, bulbs, and just about any other part of a plant with the exception of the roots.

Initial symptoms include watery-moulding and killing of lower needles, or sometimes of the leader, branches, and stem. Tan or brown-watery lesions often develop on affected organs. As the disease progresses, the symptoms move upward and the disease can eventually kill the entire shoot. Frequently, webs or masses of gray-brown mycelium and spores of the pathogen are present on dead tissue, thus the name "gray mould".

http://www.pfc.forestry.ca/diseases/nursery/pests/graymoul_e.html

<http://www.forestpests.org/subject.html?SUB=506>

<http://www.forestpests.org/nursery/graymold.html>

http://plantclinic.cornell.edu/FactSheets/botrytis/botrytis_blight.htm

***Fusarium* spp.**

Other scientific names:

Ascomycota: Nectriaceae

Common names:

Host type: conifer and broadleaf

Hosts:

Other pests

Indigenous other pests

No information was available on indigenous other pests (e.g. mites, nematodes, mammals, etc.) of naturally regenerating forests of Malawi.

Introduced other pests

No information was available on introduced other pests (e.g. mites, nematodes, mammals, etc.) of naturally regenerating forests of Malawi.

Diebacks and other conditions

No information was available on diebacks and other conditions affecting the naturally regenerating forests of Malawi.

Planted forests

Insects

Indigenous insects

No information was available on indigenous insects impacting Malawi's planted forests.

Introduced insects

***Cinara cupressivora* Watson & Voegtlin, 1999**

Other scientific names:

Hemiptera: Aphididae

Common names: giant cypress aphid; cypress aphid

Host type: conifer

Hosts: *Chamaecyparis* spp.; *Cupressus* spp.; *Juniperus* spp.; *Thuja* spp.; *Cupressocyparis* spp.; *Widdringtonia nodiflora*

Cinara cupressivora is a significant pest of cypress species. It was thought to have established first in Africa at Malawi in 1986. Since then it spread rapidly throughout East and southern Africa causing significant damage. It first appeared in Kenya in 1990 and the most recent record is from Ethiopia in 2004. Damage to hosts includes browning and defoliation, which in some cases causes dieback and tree death. A secondary problem

caused by aphid feeding is the copious quantities of honeydew which encourages the growth of sooty mould.

A successful biological control programme by the introduction of *Pauesia* spp. in Kenya and Malawi has significantly reduced the impact and spread of this pest. Exotic conifers attacked include species in the genera *Chamaecyparis*, *Cupressus*, *Juniperus*, *Thuja* and the hybrid genus *Cupressocyparis* (Watson *et al.*, 1999). Heavy foliar damage and tree mortality occurs on *Cupressus macrocarpa*. This insect has also caused extensive damage to planted forests of *Cupressus lusitanica* in eastern and southern Africa. *C. cupressivora* has also been known to attack the indigenous *Widdringtonia nodiflora*, Malawi's national tree.

[Note that numerous references (Web sites and texts) use the name *Cinara cupressi*. These are frequently misidentified specimens of *Cinara cupressivora*. As well, some references incorrectly synonymize these two species.]

<http://www.spfnic.fs.fed.us/exfor/data/pestreports.cfm?pestidval=161&langdisplay=english>

<http://www.issg.org/database/species/ecology.asp?si=121&fr=1&sts=>

<http://www.invasive.org/browse/subimages.cfm?sub=3636>

<http://www.afaef.org/html/98-202.html>

***Eulachnus rileyi* (Williams, 1911)**

Other scientific names: *Lachnus rileyi* Williams

Homoptera: Aphididae

Common names: pine needle aphid

Host type: conifer

Hosts: *Pinus* spp.

Eulachnus rileyi attacks several species of *Pinus*. Typically, this insect causes only minor damage where it has been introduced, however, it has the potential to cause serious damage. Heavy infestations cause needles to turn yellow and drop prematurely, resulting in growth reduction.

All life stages feed on the underside of pine needles. In temperate climates, both sexual and asexual forms exist. Adults are normally wingless, but winged forms are sometimes produced. Populations tend to increase during dry periods.

These insects could be moved with scion material. Once established in a new location, they are subject to wind dispersal.

<http://www.ipgri.cgiar.org/publications/pdf/828.pdf>

<http://www.cabicompendium.org/NamesLists/FC/Full/EULARI.htm>

***Heteropsylla cubana* Crawford**

Other scientific names: *Heteropsylla incisa* (Sulc.)

Hemiptera: Psyllidae

Common names: Leucaena psyllid

Host type: broadleaf

Hosts: *Leucaena* spp.; *Leucaena leucocephala*; *Albizia* spp.; *Mimosa* spp.; *Samanea saman*

Heteropsylla cubana is a significant pest of *Leucaena leucocephala* in several regions of the world. It is native to Central and South America but has spread to Africa, Asia and the Pacific. *H. cubana* feeds on young growth and occasionally older growth and flowers. It causes dieback of terminal shoots and stunting. At times the damage can lead to defoliation and death of plants.

http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

<http://www.forestpests.org/subject.html?SUB=307>

http://www.ento.csiro.au/aicn/name_s/b_1961.htm

<http://www.afaec.org/html/98-201.html>

[http://www.deh.gov.au/cgi-](http://www.deh.gov.au/cgi-bin/abrs/fauna/details.pl?pstrVol=PSYLLOIDEA;pstrTaxa=105;pstrChecklistMode=2)

[bin/abrs/fauna/details.pl?pstrVol=PSYLLOIDEA;pstrTaxa=105;pstrChecklistMode=2](http://www.deh.gov.au/cgi-bin/abrs/fauna/details.pl?pstrVol=PSYLLOIDEA;pstrTaxa=105;pstrChecklistMode=2)

***Phoracantha recurva* Newman, 1840**

Other scientific names:

Coleoptera: Cerambycidae

Common names: longicorn beetle

Host type: broadleaf

Hosts: *Eucalyptus* spp.

Native to Australia, *Phoracantha recurva* was reported from Tunisia in 1999 and has also been recorded in Argentina, Brazil, Chile, Greece, Malawi, New Zealand, South Africa, Spain, the United States, Uruguay and Zambia. This insect is a large black and yellow longicorn beetle that lay eggs under loose bark of *Eucalyptus* spp. It is primarily a pest of stressed trees, particularly water stressed trees or freshly felled timber; it rarely attacks healthy trees. The larvae tunnel under the bark and in the cambium layer and effectively ring barks the trees. Larval feeding can rapidly kill the trees or cause significant damage to the timber of affected trees. Adults live for several weeks and larvae take 2 to 6 months to develop depending on moisture conditions in the logs.

Pathways of introduction include nursery stock, freshly cut timber, and timber and wood with high moisture content. The adults are moderately long lived and are strong fliers that are thus capable of naturally dispersing a fair distance.

<http://www.metla.fi/iufro/iufro95abs/d2pap105.htm>

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7425.html>

<http://www.invasive.org/browse/subject.cfm?sub=394>

http://www.eppo.org/QUARANTINE/Alert_List/insects/phoracantha.htm

***Phoracantha semipunctata* (Fabricius, 1775)**

Other scientific names:

Coleoptera: Cerambycidae

Common names: common eucalypt longhorn; eucalypt longhorn; eucalyptus longhorned borer; longicorn beetle

Host type: broadleaf

Hosts: *Eucalyptus* spp.

Native to Australia, *Phoracantha semipunctata* is a large black and yellow longicorn beetle that lays eggs under loose bark of *Eucalyptus* spp. This species tends to attack unhealthy or stressed trees (particularly drought stressed trees) or freshly felled timber. The larvae tunnel deep into the trees and form galleries. Larval feeding can girdle trees killing them. They cause significant damage to the timber of affected trees, hence affecting the quality of salvaged materials. Adults live for several weeks and larvae take 2 to 6 months to develop depending on moisture conditions in the logs.

The adults of this species are strong fliers, hence can disperse significant distances. However movement over greater distances occurs in infested timber.

http://www.ento.csiro.au/aicn/system/c_616.htm

<http://www.metla.fi/iufro/iufro95abs/d2pap105.htm>

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7425.html>

<http://www.invasive.org/browse/subject.cfm?sub=394>

http://www.eppo.org/QUARANTINE/Alert_List/insects/phoracantha.htm

***Pineus pini* (Gmelin, 1789)**

Other scientific names: *Pineus laevis* (Maskell, 1885) Börner, 1907; *Aphis pini* Gmelin, 1790; *Kermes pini* Macquart, 1819; *Anisophleba pini* Koch, 1857; *Kermaphis pini* var. *laevis* Maskell, 1885; *Pineus pini* (Macquart, 1819) Börner, 1907; *Pineus sylvestris* Annand, 1928; *Pineus havrylenkoi* Blanchard, 1944; *Pineus simmondsi* Yaseen & Ghani, 1971; *Pineus boernerii* Annand, 1928

Hemiptera: Adelgidae

Common names: pine woolly aphid; red pine adelgid

Host type: conifer

Hosts: *Pinus* spp.

A pest of *Pinus* spp., this aphid feeds on shoots at times causing tip dieback. It occurs in Africa, Australia, Europe, New Zealand and North and South America. Control of this pest by biological control is variable - in some areas this method has been highly successful and significantly less so in others. This aphid has been moved into new areas mostly by movement of infested planting stock.

<http://www.cabicompendium.org/NamesLists/FC/Full/PINEPI.htm>

<http://www.fzi.uni-freiburg.de/InsectPestKey-long%20version/pineus.htm>

Diseases

Indigenous diseases

No information was available on indigenous pathogens impacting Malawi's planted forests.

Introduced diseases

No information was available on introduced pathogens impacting Malawi's planted forests.

Other pests

Indigenous other pests

No information was available on indigenous other pests (e.g. mites, nematodes, mammals, etc.) affecting planted forests in Malawi.

Introduced other pests

No information was available on introduced other pests (e.g. mites, nematodes, mammals, etc.) affecting planted forests in Malawi.

Diebacks and other conditions

No records were available for diebacks and other conditions affecting Malawi's planted forests.

Capacity for forest health protection

Government level

The new Forest Policy (1996), put into effect by the Forestry Act in 1997, sets the direction for the future towards greater participatory management of the country's forest resources both in forest reserves and in customary lands.

The Forestry Department, within the Ministry of Natural Resources and Environmental Affairs, is mandated "to promote and facilitate economic management of the country's forest resource base in order to sustain its contribution to the improvement of the quality of life for all Malawians". However, under the National Decentralization Policy (1998), administration and political authority for the implementation of the forestry strategy passes to the districts.

The Forestry Research Institute of Malawi (FRIM) situated in Zomba is the center for most of the forestry research activities in the country.

Monitoring and detection

Some capacity in monitoring and detection exists particularly in certain planted forests such Viphya and Dedza. However, personnel are not properly trained and they lack suitable field equipment.

Data management

Data management in Malawi is considered very poor. There is a lack of trained personnel, data storage facilities are inadequate and the capacity to analyse large quantities of data is low.

Pest management

Most forest managers do not have the appropriate knowledge and capacity in pest management. All trained pest managers are based at FRIM.

Private landowners

Little information is available on the forest health activities of private landowners.

References

Food and Agriculture Organization of the United Nations (FAO). 2004. *International Standards for Phytosanitary Measures #5: Glossary of phytosanitary terms (2004): terms, definitions and supplements (ISPM#5)*. Rome, Italy. Available at: <https://www.ippc.int/id/13399?language=en>
https://www.ippc.int/servlet/BinaryDownloaderServlet/76431_ISPM_05_2004_English.pdf?filename=1118414766488_English_final_c.pdf&refID=76431

FAO. 2006. *Global Forest Resources Assessment 2005 – progress towards sustainable forest management*. Forestry Paper No. 147. Rome, Italy. Available at: <http://www.fao.org/docrep/008/a0400e/a0400e00.htm>

Watson, G.W., Voegtlin, D.J., Murphy, S T. & Footit, R.G. 1999. Biogeography of the *Cinara cupressi* complex (Hemiptera: Aphididae) on Cupressaceae, with description of a pest species introduced into Africa. *Bulletin of Entomological Research*, 89: 271-283.

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^{OSN} = Other Scientific Name (other names, synonyms, other combinations, etc. that have been used for this species)

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