INVASIVES

Newsletter of the Asia-Pacific Forest Invasive Species Network (APFISN)

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Recent books

- Bioinvasions and Globalization: Ecology, Economics, Management, and Policy
- Plant conservation: Invasive species control and forest restoration on Pitcairn Island, South Central Pacific

Forthcoming symposia/workshops

- 14 -17 September 2010. NEOBIOTA – 2010 Conference: Biological invasions in a changing world - From Science to Management, Copenhagen, Denmark

The Asia-Pacific Forest Invasive Species Network (APFISN) has been established as a response to the immense costs and dangers posed by invasive species to the sustainable management of forests in the Asia-Pacific region. APFISN is a cooperative alliance of the 33 member countries in the Asia-Pacific Forestry Commission (APFC) - a statutory body of the Food and Agriculture Organization of the United Nations (FAO). The network focuses on inter-country cooperation that helps to detect, prevent, monitor, eradicate and/or control forest invasive species in the Asia-Pacific region. Specific objectives of the network are: 1) raise awareness of invasive species throughout the Asia-Pacific region; 2) define and develop organizational structures; 3) build capacity within member countries and 4) develop and share databases and information.

Acacia melanoxylon - Habit

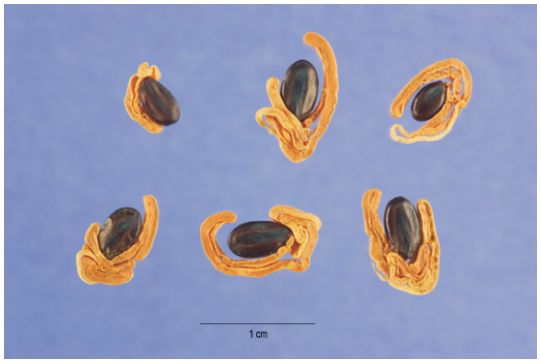
INVASIVES, bimonthly newsletter of the Asia-Pacific Forest Invasive Species Network (AFPISN) is intended to share information among countries in the Asia-Pacific region on Forest Invasive Species(FIS) and the threats they pose in the region. If you have any items of news value on FIS to share between national focal points of APFISN and more widely among foresters, agriculturists, quarantine personnel and policy makers, please pass them on to the editor - Dr. K. V. Sankaran, APFISN Coordinator, Kerala Forest Research Institute, Peechi-680 653, Kerala , India (sankaran@kfri.org). The newsletter is supported by the Food and Agriculture Organization of the United Nations (FAO) and USDA Forest Service.

Australian blackwood (*Acacia melanoxylon*)

Acacia melanoxylon (Mimosaceae), commonly called Australian blackwood, is a perennial, fast-growing tree which can withstand a wide range of soils and climatic conditions. The species was introduced in many countries for forestry purposes, but turned out to be invasive in the long run. A native of Australia, the tree is now widely distributed in Africa, the Asia-Pacific region, Europe, South America and the United States. Australian blackwood is reported as a noxious weed species in South Africa, invading and displacing natural vegetation. Control of its invasion in natural vegetation, forest plantations and farmlands involves huge investment. The tree is a successional species which can fix nitrogen.

Acacia melanoxylon- leaves and flowers

The tree commonly grows 8-15 m (and sometimes up to 45 m) tall. The trunk is straight with the crown being dense and pyramidal/cylindrical. Leaves are bipinnate and those on seedlings and coppice shoots turn into phyllodes. Phyllodes are 7-10 cm long, straight to slightly curved, with 3-7 prominent longitudinal veins and fine net-veins between. Flowers are pale yellow on globular flower heads. Pods are reddish-brown, narrower than the leaves and slightly constricted and twisted. Seeds are flat, roundish, shiny black, 2-3 mm long and encircled by pinkish-red seed stalks. It has a shallow root system with dense, surface feeder roots. The pink-red aril attracts birds which aid in the dispersal of seeds. The dispersal of seeds is also carried out by the nursery trade, in transport and through water currents. *Acacia melanoxylon* reproduces prolifically after fire. Coppice shoots develop from cut and damaged stems and from damaged roots. The tree is tolerant of shade and lives for 15-50 years, regularly producing a large number of well-dispersed seeds. Soil-stored seed banks can remain viable for many years.



Seeds of blackwood tree

This tree weed is commonly found in agricultural areas, coastal lands, estuarine habitats, natural natural forests, planted forests, grasslands, disturbed areas and urban areas. It can tolerate drought, poor drainage, salty soils and cold winds. In its native Australia, it grows at an altitude of up to 2,700 m. Best growth of the tree is observed in cooler, moist and slightly acidic fertile sites. The tree can replace grasslands and shrub land and transform the habitats. It can invade the understoreys of open pine and eucalypt plantations. *Acacia melanoxylon* is reported to cause allergic contact dermatitis and bronchial asthma among wood workers.

Blackwood infestation

Blackwood is an outstanding timber and is extensively used for making cabinets and for other purposes such as panelling, inlays, bent work, boat building and making stringed instruments. Although most timber on the market is harvested from natural stands in Tasmania, the species is now grown as a plantation species for high value timber in southern Australia. It has good pulpwood potential and is especially good for making fine papers.

In general terms, this species can either be an invader or non-invader depending on the type of area where it is introduced. Therefore, care should be taken before it is introduced to new areas. Within Australia, blackwood is not considered a weed, but in high rainfall areas of Western Australia it has become naturalized and is spreading. The tree is difficult to control because of its fast growth and vigorous re-growth from root suckers and regeneration from seed. Mechanical control of the species involves pulling or digging out small seedlings along with the root system before flowering and fruiting. Bio-control is being attempted in South Africa using *Melanterius acacia*, a seed-feeding weevil.

News column

Index of alien impact: An innovative method for evaluating potential ecological impact due to alien plant species

Alien plant species are stressors to ecosystems and indicators of reduced ecosystem integrity. The magnitude of the stress reflects not only the quantity of aliens present, but also the quality of their interactions with native ecosystems. Teresa Magee and fellow researchers in the United States developed an Index of Alien Impact (IAI) to estimate the collective ecological impact of in situ alien species. Their method is apparently innovative in several ways. First, this method differs from the conventional approach of just measuring how the common invasive species are at a site, and also assesses their qualities of invasiveness like their ability to grow in different conditions, their dispersal mechanisms, etc. The traditional approaches sometimes miss out on certain warning signs of future problems because they mainly focus on metrics such as abundance of the species that describe the current extent of invasion. The IAI method takes a cumulative approach in which it calculates a combined invasive impact score for an entire site based on the individual scores of all exotic species present in the entire site. Compared to conventional approaches that just look at individual species, this cumulative metric can give resource managers a better perspective for restoration planning and monitoring. The findings of these researchers are published in the journal 'Environmental Management'.

Invasive plants – the winners of climate change

Changes in climate can make invasive plants more prevalent and destructive. Charles C Davis and colleagues at Harvard University say that non-native plants, especially invasive species, can thrive on climate change by adjusting the annual activities like flowering and fruiting. They analyzed a dataset that began with Henry David Thoreau's cataloguing of plants around Walden Pond in Concord, Massachusetts (USA) in the 1850s. The famed naturalist documented the natural history, occurrence of plant species and flowering times. Since then, the mean annual temperature around Concord has increased by 2.4°C, causing some plants to shift their flowering time by as much as three weeks in response to ever-earlier spring thaws. These results demonstrate for the first time that climate change plays a direct role in promoting non- native plants and also the importance of flowering time as a trait that may facilitate the success of non-native species. They compared various plant traits such as height at maturity to flower diameter to seed weight against species' response to more than a century and a half of climate change. Among all these traits, plants that have fared well share a common phenology, a suite of traits related to the timing of seasonal events such as flowering, leaf growth, germination and migration. The paper showed that some plant families have been hit hardest by climate change at Walden Pond like lilies, orchids, violets, roses and dogwoods. They also reported that some 27% of all species Thoreau recorded from 1851 to 1858 are now locally extinct, and another 36% are so sparse that extinction may be imminent. To summarise, it is evident that non-native and invasive species are climate change winners and they will become more dominant in such situations.

New publications

Gavilan, M.A.C. and M. Vila. 2010. Little evidence of invasion by alien conifers in Europe. Diversity and Distributions, 16: 203 - 213.

Strickland, M.S., Devore, J.L., Maerz, J.C. and M.A. Bradford. 2010. Grass invasion of a hardwood forest is associated with declines in belowground carbon pools. Global Change Biology, 16: 1338 - 1350.

Wolkovich, E.M., Lipson, D.A., Virginia, R.A., Cottingham, K.L. and D.T. Bolger. 2010. Grass invasion causes rapid increases in ecosystem carbon and nitrogen storage in a semiarid shrub land. Global Change Biology, 16: 1351 - 1365.

Hartley, S., Krushelnycky, P.D. and P.J. Lester. 2010. Integrating physiology, population dynamics and climate to make multi-scale predictions for the spread of an invasive insect: the Argentine ant at Haleakala National Park, Hawaii. Ecography, 33: 83 - 94.

Tollenaere, C., Brouat, C., Duplantier, J.M., Rahalison, L., Rahelinirina, S., Pascal, M., Mone, H., Mouahid, G., Leirs, H. and J.F. Cosson. 2010. Phylogeography of the introduced species *Rattus rattus* in the western Indian Ocean, with special emphasis on the colonization history of Madagascar. Journal of Biogeography, 37: 398 - 410.

Smolik, M.G., Dullinger, S., Essl, F., Kleinbauer, I., Leitner, M., Peterseil, J., Stadler, L.M. and G. Vogl. 2010. Integrating species distribution models and interacting particle systems to predict the spread of an invasive alien plant. Journal of Biogeography, 37: 411 - 422.

Iponga, D.M., Milton, S.J. and Richardson, D.M. 2010. Performance of seedlings of the invasive alien tree *Schinus molle* L. under indigenous and alien host trees in semi-arid savanna. African Journal of Ecology, 48: 155 - 158.

Gasso, N., Basnou, C. and M. Vila. 2010. Predicting plant invaders in the Mediterranean through a weed risk assessment system. Biological Invasions, 12: 463 - 476.

Recent books

Bioinvasions and Globalization: Ecology, Economics, Management, and Policy: By Charles Perrings, Hal Mooney and Mark Williamson, Oxford University Press, 2010. This book synthesises our current knowledge of the ecology and economics of biological invasions, providing an in-depth evaluation of the science and its implications for managing the causes and consequences of invasion. The book analyzes the main drivers of bioinvasions – the growth of world trade, global transport and travel, habitat conversion and land use intensification, and climate change – and their consequences for ecosystem functioning. It shows how bioinvasions impose disproportionately high costs on countries where a large proportion of people depend heavily on the exploitation of natural resources. It considers the options for improving assessment and management of invasive species risks, and especially for achieving the international cooperation needed to address bioinvasions as a negative externality of international trade.

Plant conservation: Invasive species control and forest restoration on Pitcairn Island, South Central Pacific: By Noeleen Smyth, Lambert Academic Publishing, 2010. Pitcairn Island is a small volcanic island in the South Central Pacific. The flora of Pitcairn Island is of international interest due to the large ratio of endemic plant species on the island. The islanders imported a timber-producing species called "Roseapple" (*Syzygium jambos*) to the island in the 1800s; it has now spread to cover most of the centre of the island, outcompeting the native forest and its endemic species. The book reports on the results of a research project which investigated ways of controlling Roseapple and developed propagation protocols for many of the native and endemic species, which were used to replant areas where Roseapple was treated. The local community was fully involved with the project and an economic assessment of the cost of control and restoration was carried out. Genetic fingerprints were produced of the most threatened endemic species and recommendations for their ongoing conservation are outlined.

Forthcoming symposia / workshops

14-17 September 2010. NEOBIOTA – 2010 Conference: Biological invasions in a changing world - From Science to Management, Copenhagen, Denmark. The NEOBIOTA 2010 is the first conference focussing on biological invasions in a changing environment. The conference is inviting a number of outstanding experts dealing with different aspects of invasions in a changing environment, and they welcome an international audience with interest in this field. Specialist sessions will allow for in-depth discussions on contrasting methodological approaches to biological invasions, including macro-ecological analyses, population models and molecular methods. There will also be room for applied topics including impact, risk assessment, socio-economic aspects and control of invasive species in a changing world. Contact: lendsleff@snm.ku.dk

Compiled and edited by Dr. K. V. Sankaran, APFISN Co-ordinator on behalf of the Asia-Pacific Forest Invasive Species Network. For more information on the APFISN, please contact your national focal point or the APFISN Co-ordinator or Mr. Patrick Durst, Senior Forestry Officer, FAO Regional Office for Asia and the Pacific, 39 Phra Atit Road, Bangkok. Email: patrick.durst@fao.org