Alien Invasive Species and International Trade,
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Alien invasive species entering Africa in the last 25 years; A threat to agriculture, the natural ecosystems, and international trade ,

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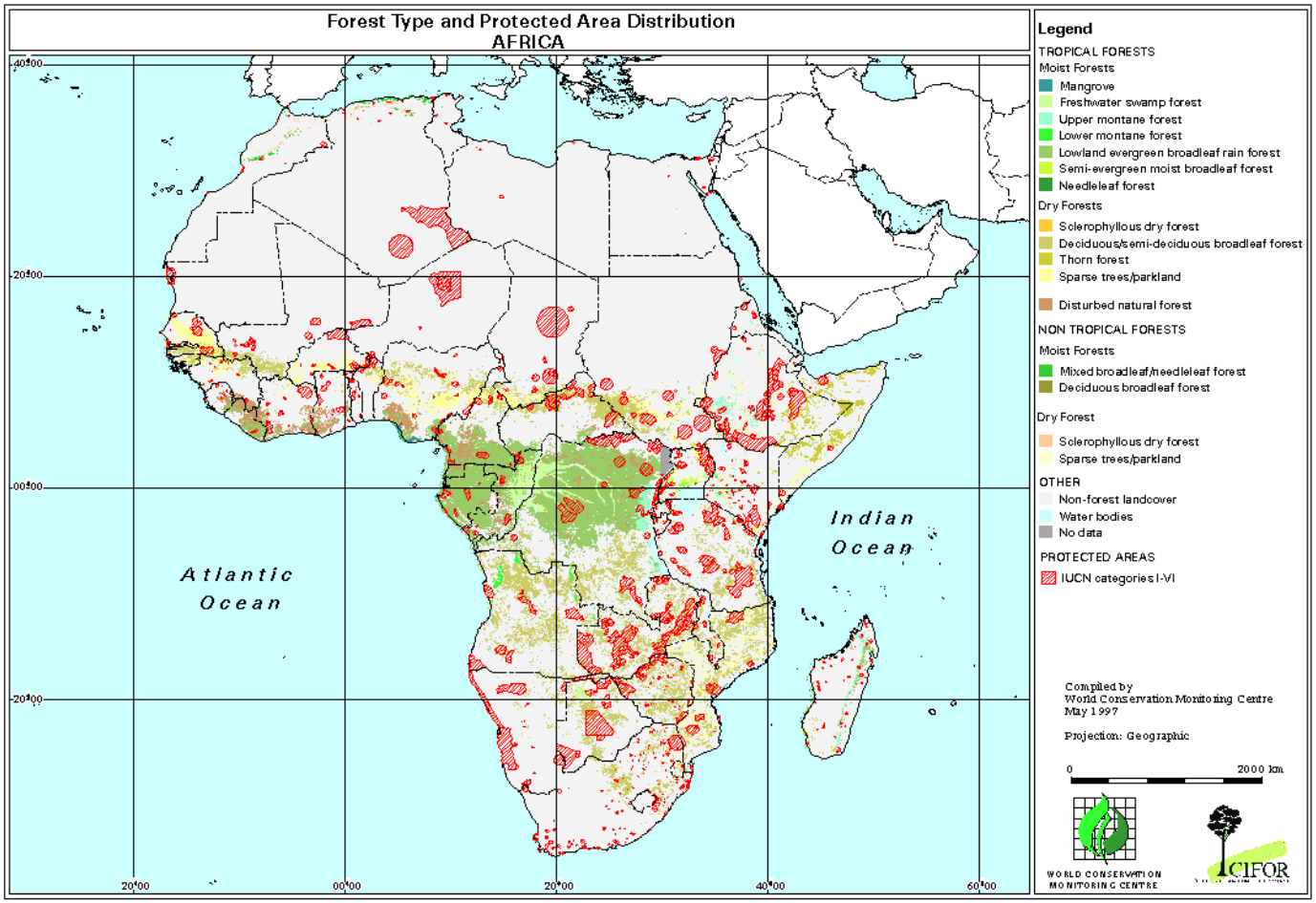
IUFRO Conference May 25-30

Appreciation

- **IUFRO Working Group and specifically Kerry Britton for the logistical arrangements and also for inviting the African Union Commission to be part of the important decisions that will come out of this meeting**

1. INTRODUCTION-Africa and its forest cover



2.SOURCES OF INFORMATION

- A key note address on the worldwide introductions of forest pests, William M. Ciesla Forest Protection Officer FAO, Rome, Italy;

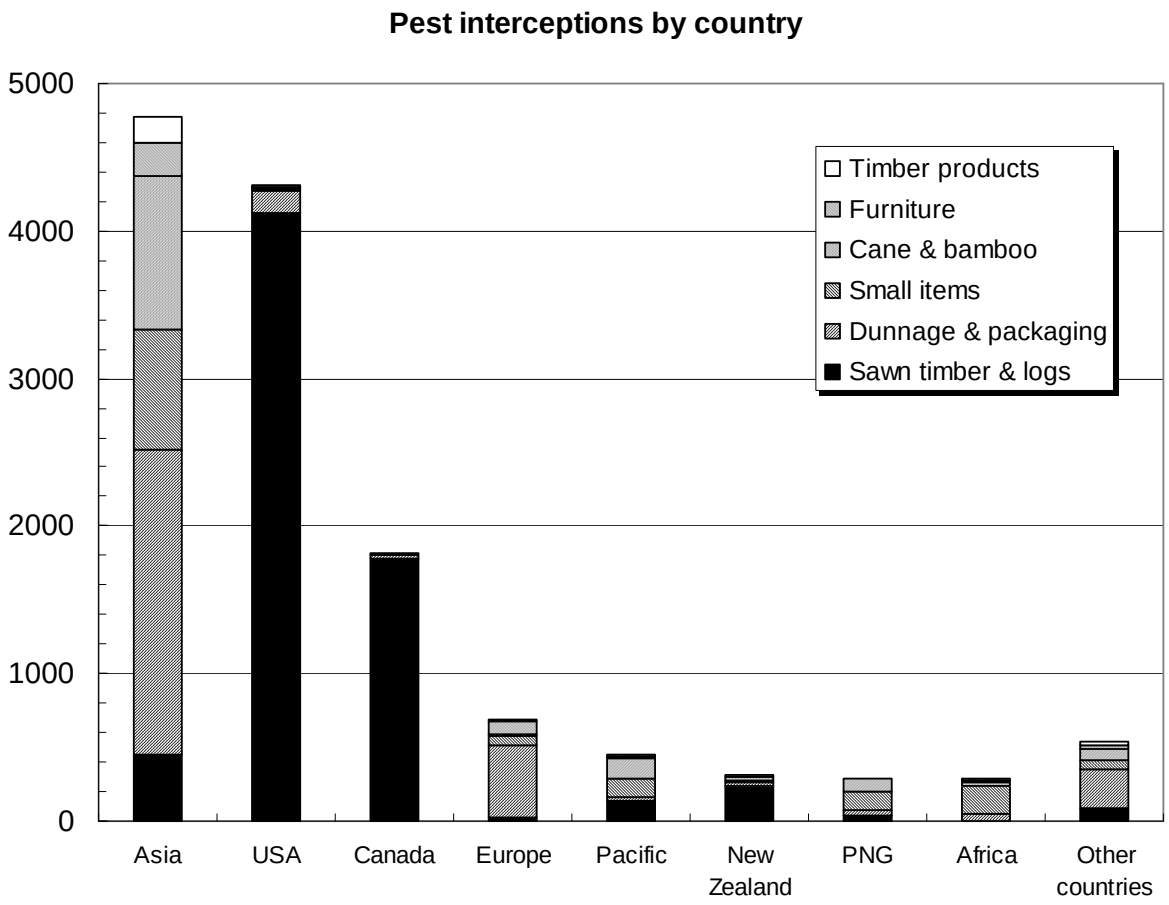
For Africa, he lists :

  - The oriental scale, Aonidiella orientalis -West Africa
  - Leucaena psyllid, and Heteropsylla cubana, -Africa (?)

- Country Reports on Leucaenia psyllid in Africa.

- An Import Risk Analysis (IRA) carried out by Biosecurity, Australia for sawn coniferous timber from Canada, New Zealand and the United States, and the possibility of pests entering Australia from other countries besides Canada, New Zealand and the United States .

- Crop Protection Compendium –CABI, 2005



Source and frequency of pest interceptions on bulk timber imports during 1997-98 and 1996-97

3. CASE HISTORIES AND LESSONS LEARNED

- **<u>Case Study 1</u> : Assessing the impact of introduced conifer aphid pests in Africa**

the pine woolly aphid, *Pineus boerneri* Annand (Adelgidae) (first found in 1968);

the pine needle aphid, *Eulachnus rileyi* (Williams) (Aphididae) (first found in the 1970s);

the cypress aphid, *Cinara cupressivora* Watson and Voegtlin (Aphididae) (first found in 1986).

The first two species attack *Pinus* spp. while the third attacks *Cupressus* spp. as well as indigenous cedars and junipers.

- Loss estimates up to 1990, *C. cupressivora* had killed trees worth UK£27.5 million (approx US$44 million) and was causing an additional loss of a further UK£9.1 million (approx US$14.6 million) per year through reduction in annual growth increment (including that from dead trees).
- The two pine aphids caused a further loss of UK£1.5 million (approx US$2.4 million) per year due to reductions in the annual growth increment in the region's pine plantations. These figures are clearly conservative, since they do not include the impact of the aphids on indigenous junipers and cedars, or allow for any subsequent mortality due to *C. cupressivora*.

A second study, conducted by the Kenya Forestry Institute, estimated that in Kenya the latter species might kill as many as 50 percent of all cypress trees during the 30-year harvest cycle.

These economic data were instrumental in securing the resources needed to mount a biological control programme against the three aphids, which has resulted in substantial reductions in the incidence of the cypress aphid and possibly the others, although this has not been established with certainty.Sources: *Murphy (1996). See also Watson et al. (1999).*

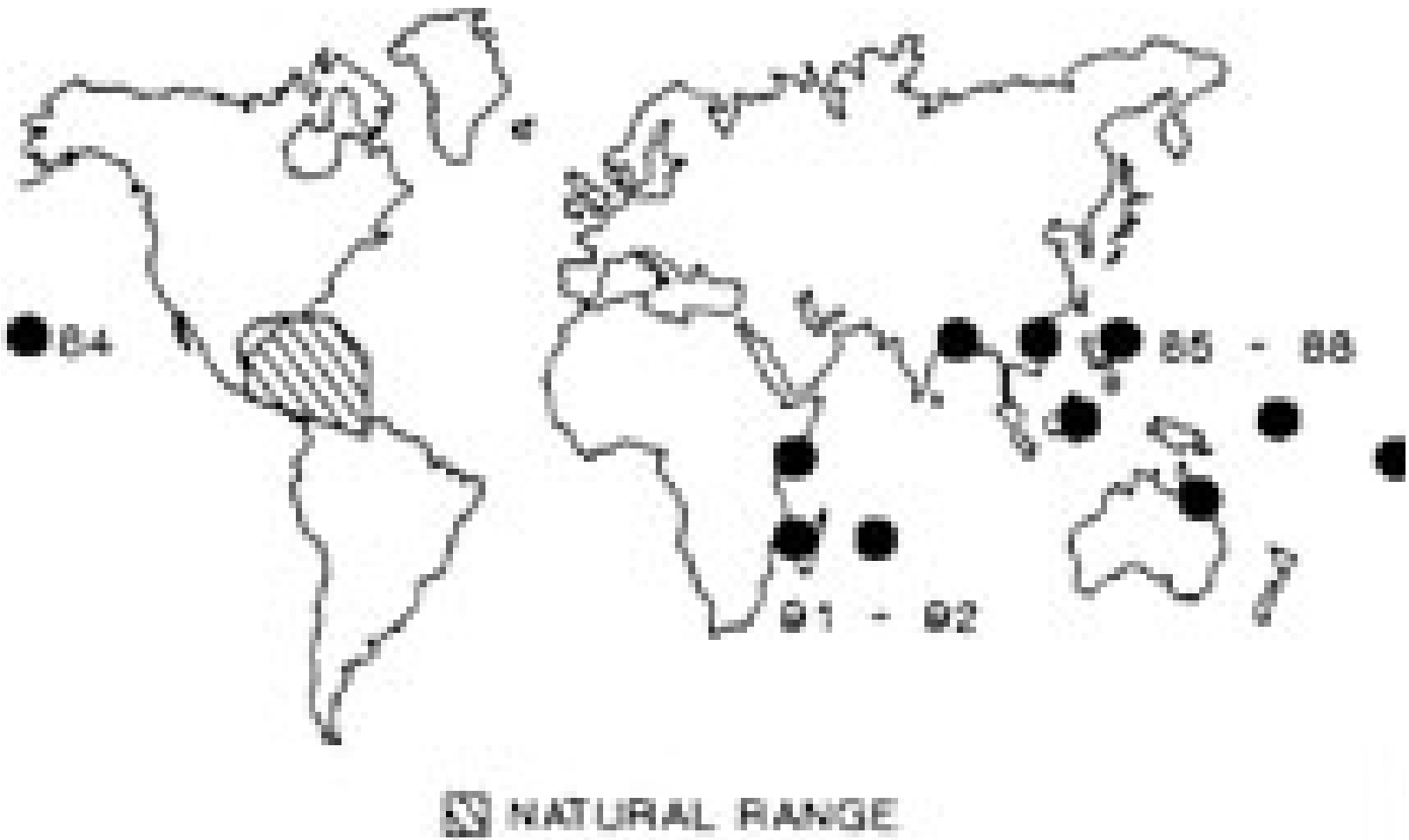
Should economic data be the only indicator?

- *Rhyncosphaeria cupressi*

Led to the replacement of *Cupressus macrocarpa* by *Cupressus lusitanica*, which subsequently came under threat from the introduced cypress aphid, *Cinara cupressivora*

- **Leucaena leucocephala and the Leucaena psyllid - East Africa**

With the leucaena psyllid (*Heteropsylla cubana)* having gained a foothold on the African continent in 1992, infestations are spreading rapidly. Populations of this insect can now be found wherever Leucaena occurs in Kenya, Uganda, Sudan, Malawi, Mauritius, Zambia, Mozambique, Zimbabwe and Tanzania. The psylid is on its way to Burundi and Ethiopia. LEUCAENA PSYLLID IS an Example of SERIOUS THREAT TO AGROFORESTRY IN AFRICA and calls for a concerted action to control and prevent any further spread.



Map showing spread of the leucaena psyllid from North America to Africa from 1984 to 1992

Complete defoliation of leucaena plants by leucaena psyllid nymphs and adults

Adult leucaena psyllid

- **Eucalyptus beetles, Phoracantha semipunctata and P. recurva:** These long horned beetles are native to Eucalyptus spp. from Australia.They turned up in southern Africa in the early 1990s. They are usually attracted to freshly cut wood, dying limbs, and trees suffering from stress, especially drought stress.
- Reports indicate that they have recently spread to central Africa(Adlbauer, 1995).

Eucalyptus longhorned borer adults, *Phoracantha semipunctata* (left), *P. recurva* (right), on eucalyptus bark.

Photo by Jack Kelly Clark.

MANAGEMENT

- The same methods are used to manage both *Phoracantha* species. Control eucalyptus longhorned borers by reducing tree stress, properly handling eucalyptus wood, planting resistant species, and avoiding activities that disrupt biological control. Pesticide applications generally are not effective in managing these pests.

Aoinidiella orientalis- The Oriental scale - West Africa

- *Aonidiella orientalis,* native to India, this insect first appeared in the Cameroon during the mid-1970's and has caused widespread damage to neem trees planted in the region including loss of foliage, branch dieback and tree mortality (Ciesla 1993c). Infestations were detected on neem in Nigeria in 1987 along the border with the Cameroon where it is believed to have been initially introduced. The insect is now known to be present in varying degrees in at least seven states in Nigeria

The threat of South American leaf blight to rubber –as rubber is also important in some West African countries this case study applies

- The rubber tree (*Hevea brasiliensis*) is grown extensively in South-East Asia, especially in Malaysia, for the production of natural rubber and, increasingly, timber. Malaysia is one of the main South-East Asian rubber producers: in 1997, a total area of 1.564 million ha was planted with rubber, predominantly by smallholders. In 1999, the total rubber production for Malaysia was 0.9 million tonnes and its export value was 3115 million Malaysian Ringgit (approx. US$0.8 million; 2 percent of total Malaysian exports).
- In Malaysia, rubber is relatively free from attack by indigenous pests or diseases, and no such species accompanied the plant from its area of origin in the Amazon. In South America, the most damaging disease of rubber is South American leaf blight (SALB, *Dothidella ulei*), which is so virulent that the commercial planting of rubber in the continent is not viable . Since resistant varieties are not available, Malaysia has a substantial programme aimed at preventing the entry of leaf blight, which R.E. Schultes, Director Emeritus of the Harvard Botanical Museum, has suggested would overrun the Asian plantations in five years, reducing yields, killing trees and compromising the entire industry.
- *The first and principal line of defence against the disease is prevention. Quarantine regulations in Malaysia, Thailand and some other rubber producing countries have been strengthened to prevent an accidental introduction of leaf blight. The importation of rubber tree planting materials directly from the American tropics is prohibited except for research purposes, and relevant national and industry research institutions and universities are well aware of the potential risks. Airport posters are used to alert airline passengers to the hazard and travellers from tropical South America are requested to stopover in another country en route for at least two days; those arriving on direct flights are required to complete plant quarantine declaration cards and upon arrival are subjected to quarantine treatments, e.g. showering and changing their clothing and exposing their baggage to ultraviolet irradiation.*

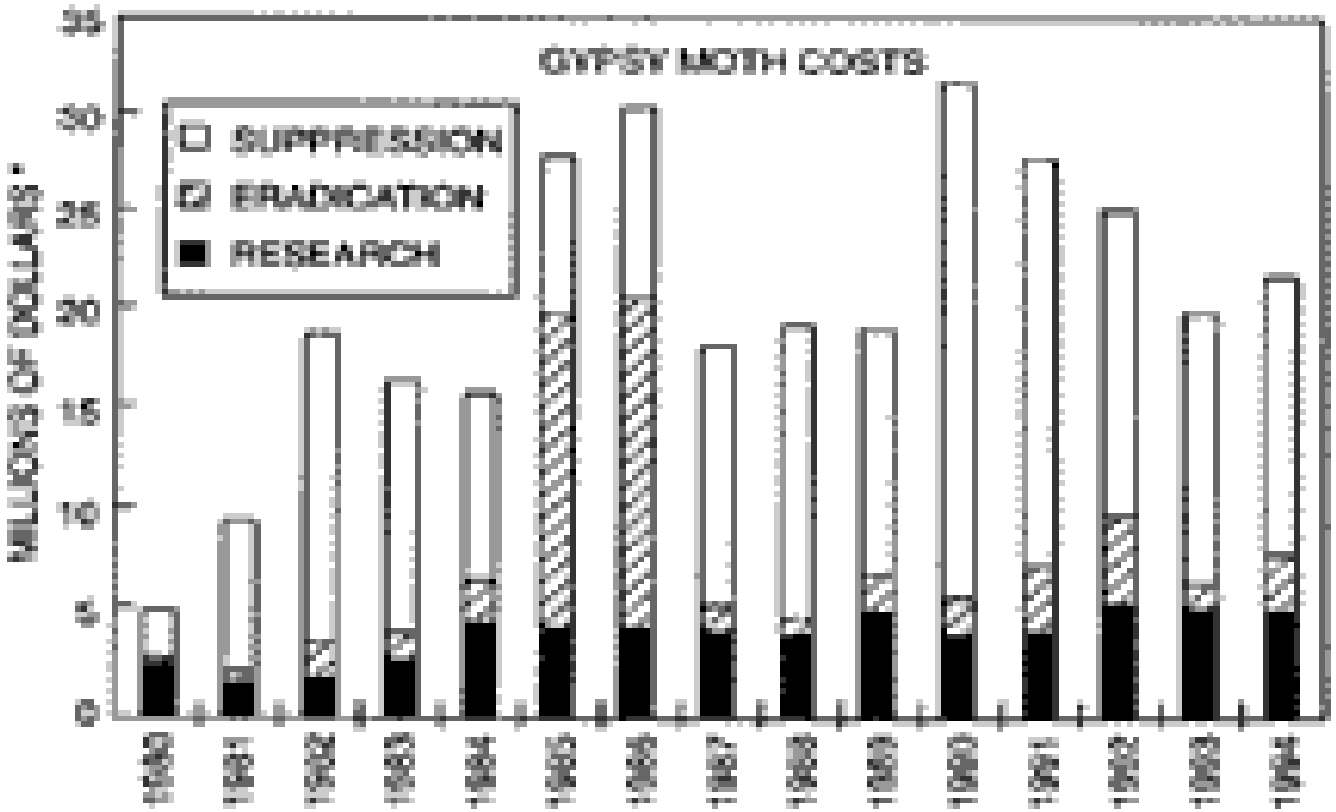
- In comparison, investment in early warning systems is quite limited. Staff from the Rubber Research Institute of Malaysia and the Department of Agriculture carry out regular surveys of rubber diseases every two to three years. These are primarily intended to identify indigenous disease problems, so that recommendations for suitable clones may be made for different areas. However, a watch is also kept for symptoms of other diseases, especially South American leaf blight. A contingency plan has been prepared in the event of leaf blight being found in Malaysia, but by that stage it may well be too late for the South-East Asian rubber industry.
- Source: *Wittenberg and Cock (2001*

4. COSTS OF INVASIVE ALIEN SPECIES TO NATURAL ECOSYSTEMS

A learning experience

- Average annual expenditures for gypsy moth eradication, suppression, and research in United States from 1980 to 1994 totaled $30 million (1995 dollars) (Fig. 1). This figure does not include $8 million for deploying 400,000 pheromone traps for monitoring ($20/trap). These yearly costs will increase as gypsy moth reaches the highly susceptible forests of the South, mid-South, and West, which contain high proportions of preferred host trees. Similar estimates of economic and environmental costs for other invasive organisms may be difficult (Wallner 1996), but accurate assessments will be critical in gaining political and economic support to establish programs to eradicate and/or control exotic insect pests (Wallner in **Figure 1.** Yearly costs for gypsy moth eradication, suppression, and research programs in the United States, 1980-94.

Figure 1. Yearly costs for gypsy moth eradication, suppression, and research programs in the United States, 1980-94



5. FACTORS INFLUENCING INTRODUCTION AND ESTABLISHMENT

5.1 Humans as vectors of insects

5.2 International trade

5.3 Movement of plant materials

6. MANAGING INTRODUCED FOREST PESTS

- *Inspection of incoming materials at international ports of entry.*
- *Restrictions on imports from high risk areas.*
- *Proper treatment of infested plant materials and wood products* .

These procedures are regulatory in nature, and will not work without strict monitoring, eradication as well as cooperation from governments.

6.1 NOTIFICATIONS FROM AFRICA (53 member States)!

6.1.1 Egypt

G/SPS/N/EGY/2

(Unofficial Text) Egypt has notified the WTO that as of October 1, 2005 it is adopting the ISPM 15 standard for imports of wood packaging materials . According to the Egyptian regulations, imported wood packaging materials must be either fumigated with methyl bromide or heat treated. Such products must be stamped with the international IPPC stamp (under authorized country programs) on two sides and carrying either H (heat treated) or B (methyl bromide) treatment.

6.1.2 South Africa

-G/SPS/N/ZAF/18/Add.1 (updated)

Implementing Guidelines for Regulating Wood Packaging Material in International Trade (SPM 15)

-G/SPS/N/ZAF/18 Text verison

Wood Packing Material

Committee on Sanitary and Phytosanitary Measures Original: English

NOTIFICATION

Addendum

- The following communication, dated 26 November 2004, is being circulated at the request of the Delegation of South Africa

- Implementing Guidelines for Regulating Wood Packaging material in International Trade (ISPM 15)
- Guidelines for Regulating Wood Packaging material in International Trade (ISPM 15) will be fully implemented on 1 January 2005, requiring that all wood packaging material entering South Africa should be treated and marked in accordance with ISPM 15. Enforcement of ISPM 15 will be from 1 March 2005.
- Further information may be obtained through:
- Ms A.P. BaxterManager: International Plant Health Matters Private Bag X 258 Pretoria, 0001 South Africa Tel: (09 27 12) 319 6114 Fax : (9 27 12) 319 6580 E-mail: AliceB@nda.agric.za

7. Where do we go from here?

1. AWARENESS AND NETWORKING

Sub regional networks

- **Forest Invasive Species Network for Africa (FISNA)**
- **African Forest Forum**
- **African network for Agriculture, Agro forestry and natural resources education (ANAFE)**
- **African Forest research network (AFORNET)**
- **Reseau des institutions de formation forestiere et environnmentale d'Afrique central (FIFFEAC**
- **National Environmental authorities vs NPPOs**

International networks

GLOBAL invasive species
FAO
IUFRO-International union of forest research Organizations
UNFF-United nations Forum on Forests
IITO-Tropical Timber organization

2. Could collective capacity building for EMERGENCY RESPONSES offer some solutions?

STATEMENT OF COMMITMENT TO COMBAT INVASIVE SPECIES

- WHEREAS, COUNTRY X holds treasures of globally unique cultural and biological diversity; and
- WHEREAS, we, the people of COUNTRY X, must protect our natural resources for ourselves and for future generations so that others may appreciate and enjoy the beauty and culture that we have today; and
- WHEREAS, invasive alien species have been shown in the last decade to be second only to habitat loss as the greatest cause of species extinctions around the globe, and have already caused significant adverse impacts … are the number one cause of extinctions in island ecosystems … or other language appropriate to the national context; and
- WHEREAS, without sustained, coordinated efforts nationally, regionally and internationally, COUNTRY or REGION X will succumb to invasions of plants, animals, and microorganisms that will continue to destroy our precious ecosystems and damage our economies, cultural resources and the health of our people; and
- WHEREAS, the UN Convention on Biological Diversity has adopted numerous decisions related to the prevention and control of invasive alien species, which require implementation by Parties and which will be reviewed by the Ninth Conference of the Parties in May 2008; and
- THEREFORE, we, COUNTRY X, do hereby declare and commit ourselves to the international effort to combat invasive alien species, including the prevention, detection, management, and eradication of invasive alien species wherever and whenever possible through the development and use of international, regional and national mechanisms.
- COMMITMENTS AND RESPONSIBILITIES
- Specific actions undertaken by the MINISTRY OF X include:
- Creation and funding of a National Invasive Species Council;
- Promulgation of a national invasive alien species reference list;
- Creation and funding of a National Invasive Alien Species Strategy;
- Creation and staffing of Invasive Species Coordinator positions;
- Implementation of control work in protected area systems;
- Information sharing to prevent the impacts of invasive alien species;
- Strengthening and harmonization of biosecurity frameworks and staffing to prevent the introduction or movement of invasive alien species, especially using risk and pathways assessments;
- Development of a National Early Detection and Rapid Response plan;
- Co-operation with international and regional regimes, conventions, and agreements governing the movement of living organisms;
- Coordination with other major regional initiatives to achieve mutually supportive conservation and social development goals.
- TIMEFRAME AND REPORTING
- These actions will be implemented over the course of the next two years. Regular updates on progress made in achieving these commitments to the CBD Secretariat and other appropriate national, regional and international bodies.
- **SO COMMITTED, *this* _____ *day of* _____*, 2008, in***
- **CITY, COUNTRY.**
- **-------**_____
- **NAME, Deputy Minister of X**
- **COUNTRY X**
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7. CONCLUSIONS

Africa, The precautionary principle, PFA and longitude 60E, ISPM 15

The precautionary principle, while subject to varying interpretations and having over 12 different definitions in international treaties and declarations, is fast becoming a fundamental principle of international environmental law. In the late 1980s and 1990s, the principle was quickly incorporated into numerous multilateral treaties and international declarations, including the 1992 Convention on Biological Diversity. In essence, the principle implies that where an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if certain cause and effect relationships are not fully established. Variations in terminology have emerged, reflecting the considerable controversy surrounding the principle. To avoid the more extreme versions of the precautionary principle that press for absolute environmental protection, some prefer to use the term `precautionary approach'. James Cameron, Director of the Foundation for International Environmental Law and Development (FIELD) at King's College, London, has articulated the conceptual core of the principle as follows:"

The precautionary principle stipulates that where the environmental risks being run by regulatory inaction are in some way a) uncertain but b) non-negligible, regulatory inaction is unjustified." A number of fundamental elements or key directions have also been identified, among them:

- being proactive - a willingness to take action in advance of formal scientific proof;
- any action taken should be cost-effective, that is, some consideration should be given to the proportionality of costs
- *the onus of proof should be placed on those who propose change*;
- decisions should be made with concern for future generations; and
- strict/absolute liability regimes should be used to identify ecological debts.

Source: *Wittenberg and Cock (2001), edited from VanderZwaag (1999)*

- There are many challenges and opportunities associated with protecting forests from damage by insects, diseases and other pests. These challenges will increase in the future as the risk of new pest introductions increases. Pests and diseases do not respect international boundaries. Consequently neighboring countries and international organizations must work together to help prevent the spread and resultant resource damage caused by these destructive agents.
- For Africa, the need to bridge the existing gaps between the national plant protection services and the departments of forestry and natural resources must be pursued. Perhaps contributing effectively in the activities of the National Environmental Authorities could contribute to keeping at bay the introduction of these pests before they enter Africa.

- Thank you for your attention