4 Phytosanitary concepts simplified

This chapter describes the International Plant Protection Convention (IPPC) and how the International Standards for Phytosanitary Measures (ISPMs)[10] are developed and adopted. Subsequent sections (4.2 to 4.12) describe the guidance contained in the standards that are particularly relevant to forestry and these are listed at the beginning of each of these sections. The standards help support good forestry practices and pest free trade, both in forest commodities and other commodities sent with wood packaging materials. For clarity, the descriptions assume ideal implementation of the standards and follow the IPPC definitions. In some cases, contracting parties (countries who are members of the IPPC) implement the standards differently. Implementation may be limited by scarce resources. Countries may also prescribe stricter phytosanitary import requirements, but they have to provide technical justification for doing so. The IPPC provides a dispute resolution process when countries file claims of unjustified trade restrictions.

4.1 THE INTERNATIONAL PLANT PROTECTION CONVENTION AND INTERNATIONAL PHYTOSANITARY STANDARDS

The IPPC Secretariat, hosted by the Food and Agriculture Organization of the United Nations (FAO), provides for close collaboration with related international organizations and conventions. The IPPC's governing body is the Commission on Phytosanitary Measures (CPM), which among other activities, adopts ISPMs to prevent pest introduction and spread and to facilitate trade. ISPMs are developed and approved through an international consultative process, and are recognized under the World Trade Organization (WTO) through its Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).

The process of developing a new or revised ISPM is managed by the Standards Committee of the IPPC. The Standards Committee is composed of technical experts representing all the regions of FAO. ISPMs are based upon scientific principles, existing trade policies and technical information. Drafts are initially developed by selected technical experts who are members of panels or working groups. The Technical Panel on Forest Quarantine (TPFQ) addresses forestry-related quarantine issues. The TPFQ may require specific technical information for its standard setting work. TPFQ has relied on the International Forestry Quarantine Research Group (IFQRG), an independent body of research scientists

[10] The titles of all existing ISPMs and a short summary are given in Annex 3.

and representatives of national regulatory agencies and the forest sector, to provide this material. The Standards Committee reviews draft standards prepared by the expert drafting groups and finalizes them for "country consultation", a process of international consultation on the standard. Contracting parties of the IPPC may comment and suggest revisions of the draft standard, often after national consultation with affected industries, other government departments, non-governmental organizations, etc. The revisions are negotiated until a draft is developed that is unanimously approved by all contracting parties at an annual meeting of the CPM. The process of developing a new ISPM can take several years.

Contracting parties to the IPPC are required to:

- set up a national plant protection organization (NPPO);[11]
- designate an official IPPC contact point;
- prescribe and adopt phytosanitary measures;
- certify exports;
- regulate imports;
- cooperate internationally;
- share information on pests[12] and regulations;
- cooperate in the development of ISPMs.

NPPOs are the government agencies within the IPPC member countries that implement the phytosanitary standards by developing and enforcing national regulations. They undertake pest risk analyses for the establishment of phytosanitary measures; manage pest surveillance; report to other countries on pest status; coordinate the control of pests; and establish and monitor pest free areas. When required they also issue phytosanitary certificates confirming that consignments have met an importing country's requirements. They also take responsibility for ensuring phytosanitary security of consignments from certification until export; conduct verification inspections and, if necessary, require treatment of consignments or where appropriate, destruction or refusal of entry.

Because pests do not recognize international borders, NPPOs frequently have to work with neighbouring countries to prevent pest entry, establishment and spread. This collaboration may be done through regional plant protection organizations (RPPOs). RPPOs assist in coordinating regulations to deal with regional phytosanitary issues raised by NPPOs. RPPOs gather and disseminate information and may identify priorities for regional standards which may become the basis for new ISPMs. Usually it is an NPPO, or sometimes an RPPO, which requests that the IPPC develop a new ISPM, or revise an existing one, to deal with a particular phytosanitary issue.

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[11] The full list of NPPOs and RPPOs and their contact persons can be found on the IPPC Web site: www.ippc.int.

[12] Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (ISPM No. 05, 2010, *Glossary of phytosanitary terms*).

4.2 PEST RISK ANALYSIS

Framework for pest risk analysis (ISPM No. 02 [2007]);
Guidelines for the export, shipment, import and release of biological control agents and other beneficial organisms (ISPM No. 03 [2005]);
Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms (ISPM No. 11 [2004]);
Pest risk analysis for regulated non-quarantine pests (ISPM No. 21 [2004])

Pest risk involves a wide range of organisms that can potentially be associated with forest commodities such as bacteria, fungi, insects, mites, molluscs, nematodes, viruses and parasitic plants. The pest risk associated with the trade in forest commodities is evaluated by individual countries. Countries must ensure that their phytosanitary import requirements are based on science, are proportional to the pest risks, and have minimal impacts on trade.

Pest risk analysis (PRA) can be carried out for a particular pest, for a commodity (which considers all the potential pests it might carry) from a particular country or region of origin, or even more broadly for a pathway. The evaluation of pest risk for a proposed import commodity has several steps. First, a clear description of the commodity and its level of processing (what processes have been applied) is needed. Then a draft list of pests potentially associated with that commodity is prepared from scientific literature and historical records of pests that have been detected on the commodity in other countries.

Next, each potential pest is assessed as to:

- whether it is present in the exporting country and importing country;
- whether it is associated with the commodity or other pathway;
- whether the pest can enter, find suitable habitats, establish and spread in the importing country;
- whether, and to what extent, it will cause economic damage in the importing country.

This assessment requires an understanding of the ecology and behaviour of each organism, including the range of suitable hosts, its life stages, method and rate of reproduction, length of its life cycle and climatic requirements. Furthermore, the potential impacts of the pest on industry, the environment and international trade are evaluated.

The result of this process is an assessment of the pest risk for each organism. When the risks of pests associated with a particular commodity, group of commodities, or the pest(s) associated with a conveyance are considered, this is referred to as a pathway risk analysis.

This assessment of pest risk is one of the inputs to the completed PRA. The pest risk will determine the need for phytosanitary measures. The PRA also includes consideration of various phytosanitary measures to manage the pest risk.

Lack of information is often a major constraint in assessing the pest risk of forest commodities. There may be insufficient information about the organisms associated with a commodity, including their entry, establishment and spread, or on effective treatments or measures to reduce risk. Other information gathering

problems may arise from: language of publications; limited or no access to databases; and an inability to predict the economic or environmental impacts. Insufficient or inadequate information results in high uncertainty of pest risk assessment and may lead to a more unjustifiably restrictive import requirement.

4.3 REGULATION OF WOOD PACKAGING MATERIAL

Regulation of wood packaging material in international trade (ISPM No. 15 [2009])

Wood packaging material (WPM) is often used to support, protect or carry goods during transport. WPM includes pallets, boxes or dunnage used in a container, aircraft or ship's hold to secure a variety of trade goods. WPM is sometimes made from low quality wood. Untreated WPM can provide a pathway for a number of significant forest pests, such as *Anoplophora glabripennis* (Asian longhorned beetle) and *Bursaphelenchus xylophilus* (pinewood nematode). The pests may occur at the surface of the wood (e.g. bark beetles, moths and other insects, fungi) or deep inside the wood (e.g. boring beetles, nematodes, fungi).

In recognition of this high risk pathway, ISPM No. 15 was developed. This standard requires that wood packaging materials are treated to kill pests existing in or on the wood, before being moved in international trade. The standard recognizes two treatments: heat treatment, in which the wood is heated to a minimum of 56 °C throughout the profile of the wood for a minimum of 30 minutes; and methyl bromide fumigation at specific concentrations, timings and procedures.

The standard requires that wood be debarked. Where fumigation is used, the debarking process must occur before fumigation. Long thin pieces of bark are allowed to remain after the debarking process if these pieces are no wider than 3 cm (regardless of the length). If bark pieces are wider than 3 cm, they must be short enough so that the wood will dry out before bark beetles can develop. Therefore wide pieces of bark cannot have surface area greater than 50 cm^2.

For many countries methyl bromide is the only available treatment to manage pest risks of WPM, and as such it is recognized in ISPM No. 15. The IPPC recognizes that methyl bromide is an ozone-depleting substance and its use should be limited as much as possible. Many countries have, under the Montreal Protocol,[13] already banned its use and others have announced their intention to do so. The urgency of finding alternatives to methyl bromide continues to remain a key priority in the work programme of the IPPC. Private companies and governments are working to identify additional treatments for use in rendering wood packaging material free of pests.

The standard also states that treated wood must be marked according to the ISPM No. 15 requirements. The mark consists of a box containing:

- an ISPM No. 15 symbol;
- a country code;

[13] The Montreal Protocol on Substances that Deplete the Ozone Layer, as adjusted and/or amended in London 1999, Copenhagen 1992, Vienna 1995, Montreal 1997, Beijing 1999.

- a producer/treatment provider code;
- a treatment code (HT for heat treatment or MB for methyl bromide).

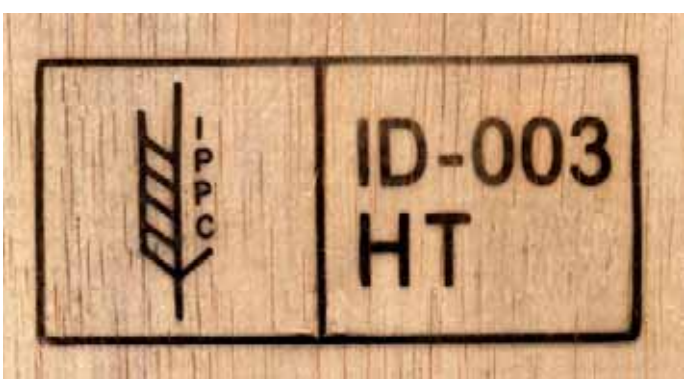
The mark must appear on two opposite sides of the wood packaging unit. WPM that meets all these requirements is said to be "compliant". For more details about the mark, see ISPM No. 15.

The application of treatments and use of the specific identification mark are carried out under the authority of the NPPO in the country of manufacture, to ensure that the treatment providers are actually treating the wood to meet ISPM No. 15 standards. The mark provides the basis for securing entry into countries.

For the working life of the wood packaging unit, it need only be treated once, as long as it remains intact. However, when a unit of wood packaging is repaired (meaning less than one-third of the unit is replaced), the repaired portion of the unit should be made with treated wood and each added component must be individually marked in accordance with ISPM No. 15. Alternatively the entire unit can be retreated and remarked. When a unit is remanufactured (more than one-third of the unit is replaced) the entire unit must be re-treated, old marks removed and a new mark applied.

Note that not all wooden articles that carry trade goods need regulation. Wood packaging made from manufactured wood – such as plywood, fibreboard or oriented strand board – is not regulated as the processes used in the production of these wood products (heat, pressure and glue) assure that they are pest free. Similarly, barrels where sufficient heat is used in processing the staves (i.e. whisky barrels) and wood packaging materials that are made entirely of components less than 6 mm thick are not regulated under ISPM No. 15.

The wood packaging materials standard is a good example of how forest industries and NPPOs have successfully worked together to develop and implement phytosanitary measures.



E. ALLEN

An example of the IPPC mark on wood packaging material including: the ISPM No. 15 symbol, an ISO two letter country code (ID for Indonesia) followed by a unique number assigned by the NPPO to the producer, and the ISPM No. 15 treatment code (HT for heat treatment)

4.4 PEST MANAGEMENT

Guidelines for pest eradication programmes (ISPM No. 09 [1998])

The NPPO or other appropriate regulatory authority should be informed when a new pest has been introduced to an area. The NPPO may arrange for official diagnostic confirmation in order to decide whether a pest management programme is needed. Where local diagnostic expertise is limited, the NPPO may contact other NPPOs to whom specimens can be sent for official identification. Such collaboration can save time. The NPPO is obliged to report new pests to the IPPC (see Section 4.7).

Once establishment of a new pest has been confirmed, the possibility of eradication or containment of the pest should be evaluated. If the pest is new and considered to pose a serious risk, the response must be immediate and effective if eradication is to be successful. The NPPO may wish to regulate the pest and initiate an official control programme to prevent further introductions. Even if the pest is too widespread to be eradicated, preventing further introductions will help keep the genetic diversity of the pest low and/or stop more virulent strains from entering the country.

Having a contingency plan in advance of finding a pest, previously approved by all stakeholders, will help save time in the planning stages. The plan should deal with matters such as what needs to be done, how it will be implemented, who will be responsible and who will pay. In many cases, coordination is needed between the NPPO, other government departments, local government authorities, industry sectors and commercial bodies to implement the plan. The knowledge and expertise of forestry experts is essential for successful application of appropriate management measures. Contingency plans should be reviewed frequently to reflect new data or to take into account new experiences in dealing with a particular pest or one with similar characteristics, both locally and in other countries.

If there is no pest-specific plan available, then referring to a generic all-purpose plan may still be useful. Obviously some elements of a pest-specific plan cannot be included in a generic plan, however, such a general contingency plan may provide an immediate framework for developing an effective action plan quickly if a new or unforeseen pest is detected.

The essential elements of a contingency plan include:

- understanding the biology and possible impacts of the pest;
- defining the objectives of the plan;
- establishing response actions that should be implemented (e.g. surveillance, sampling, registration of pesticides, safeguarding potentially infested sites, regulatory actions and destruction of infested articles);
- identifying who is responsible;
- testing the plan by conducting a trial run;
- identifying the resource limitations of involved agencies;
- developing a communication plan (for stakeholders, partners, other NPPOs, the public and media);

- determining when to end an eradication programme (either due to success or failure).

To make sure eradication measures have the best chance of success, four important questions must be answered:

- What is the current and potential pest distribution?
- What are the pathways for entry in to the area?
- How does the pest spread?
- How can the pest be controlled?

To determine the pest distribution and thus the area within which containment and eradication measures are to be taken, delimiting surveys, i.e. surveys to determine the extent of spread of an introduction, must be conducted (see Section 4.6). It may not be possible to carry out an effective survey until signs or symptoms are most likely to be evident, depending on pest biology.

Good record-keeping of actions undertaken during eradication efforts is essential and will help when considering which elements worked best, which did not (and why not), and therefore what might be done differently in the event of a recurrence in the future.

A way of determining the success of eradication needs to be developed on a case by case basis. For example, eradication might be declared a success if surveys fail to detect signs of the pest at any stage of its existence over a specified period of time. It is suggested that this period should be at least twice as long as the life cycle of the pest.

The efficacy of the measures will need to be monitored on a continuous basis and stakeholders will need to be kept informed, especially if changes in strategy are under consideration. It is also important to share best control practices and related information at the global level; this will assist other NPPOs dealing with similar pests and situations. The criteria for determining when changes are appropriate will also need to be agreed on and communicated in advance to stakeholders, trading partners and neighbouring NPPOs. Ideally, stakeholders should be part of the review process as they may have a better understanding of the impacts of proposed changes on their operations than the NPPO, and may be able to suggest alternative approaches.

Sometimes it may not be possible to eradicate the pest. In this case, a procedure should be developed to help decide when to stop trying to eradicate the pest. It may be necessary to change the strategy to a policy of containment and management of the risk. An example of the evolution of a response strategy is given in Box 13.

The appearance of a new pest, and the measures taken to control it, will inevitably have an impact on a wide range of stakeholders. It is important to ensure that key stakeholders understand the potential impact the pest might have, both in general and on their businesses. It is therefore recommended that key stakeholders are identified and given the opportunity to comment on the pest management options.

It is also important for stakeholders and others to understand the economic and other impacts of eradication measures, including the costs and benefits of all potential actions. Impacts may include for example, destruction of plants, loss of biodiversity, lost business revenues, loss of export markets, or the cost of applying pre-export treatment to regulated commodities. An economic impact assessment will often help to determine when the cost of action becomes more expensive than the losses incurred. If the risks of both the pest and the pest eradication programme are fully understood, then stakeholder support for the measures taken is more likely.

BOX 13

Emergency response and exit strategy for the introduction of *Dendroctonus micans* in the United Kingdom

Dendroctonus micans (great spruce bark beetle) is regarded as a major pest of spruce (*Picea* spp.) from eastern Siberia to the west of Europe. It lives and breeds under the bark, destroying the cambium which weakens and, in extreme cases, kills the tree. This beetle was first discovered in the United Kingdom in 1982. Following confirmation of the introduction of the insect, an outbreak management team was established consisting of NPPO and industry personnel to develop a strategy for pest eradication. The strategy initially focused on surveillance, control of wood movement, and sanitation felling of potentially infested trees.

Initial surveillance showed that only parts of the United Kingdom were infested. The area was brought under regulation so that movement of wood out of the area was only permitted if the wood was bark-free or originated from specifically identified pest free areas. All trees found to be infested were felled, peeled of bark to remove obvious infestation and the wood taken to an approved sawmill for processing. For all logs with bark, movement was only permitted within the regulated area to an approved sawmill. To be approved, a sawmill had to install effective debarking equipment and have facilities available for managing bark debris.

Communication tools regarding the risks and established phytosanitary measures were developed. These included publicity leaflets and vehicle windshield stickers.

An inspector was designated to provide advice and guidance to the industry, to oversee surveillance and to monitor compliance at sawmills and other places. Penalties were imposed on offenders.

In the late 1980s, a fourth element was added to the management strategy. A biological control agent, the predator *Rhizophagus grandis*, was introduced and released. The containment programme was maintained to slow the spread of the beetle until populations of the predator could become widely established.

In 2005 eradication efforts were abandoned. *D. micans* was so widespread that it no longer qualified as a quarantine pest. Any new outbreaks elsewhere in the country

are now routinely treated by the release of the predator and nature is allowed to take its course. The emergency response slowed the spread of the pest while scientists developed this long-term solution. Today, tree mortality has been reduced to less than one percent of infested trees, compared with 10 percent or more prior to the introduction of the biological control agent.

FORESTRY COMMISSION, GREAT BRITAIN

Dendroctonus micans *(great spruce bark beetle) and the predator* Rhizophagus grandis

4.5 SYSTEMS APPROACHES

The use of integrated measures in a systems approach for pest risk management
(ISPM No. 14 [2002])

A systems approach uses at least two independent phytosanitary measures that cumulatively reduce the pest risk in order for the commodity to meet the requirements of the importing country. Systems approaches provide the opportunity to consider many procedures that can help reduce risk from pre-planting to final use. Systems approaches can provide equivalent alternatives to a single more expensive or limiting measure such as pesticide treatments or prohibition of movement. For example, removing all bark from roundwood by squaring the log, combined with sawing the wood into specific dimensions and visual inspection of the wood during processing, may provide the same level of phytosanitary protection as fumigation of the wood. Refer to ISPM No. 24 for more information about equivalency of phytosanitary measures. Systems approaches can be even better than a single measure if that single measure is uncertain or unreliable. A systems approach should be technically justified. An example of a systems approach is provided in Box 14.

A systems approach in forestry manages the risk of pests in wood and wood products by using a combination of independent measures, from selection of genetic material and site preparation activities to post-harvest treatment and handling to transportation and distribution. Many of the practices suggested in Chapter 3 could be used in a systems approach (see Box 10 in Section 3.8). A systems approach

BOX 14

Application of a systems approach for the export of untreated logs

Trading untreated logs internationally is often considered a significant pest risk. While trading more processed logs is the preferred option, in this particular example, two countries developed a bilateral agreement to allow trade in untreated logs under very closely controlled conditions. The importers wanted logs with bark because bark is used as fuel for running the processing mill. Leaving the bark on logs also prevents drying and splitting of wood during transport. Also, fumigation treatments could be done more efficiently in the importing country. Therefore, a bilateral agreement was developed to allow trade.

The bilateral agreement used more than two different independent risk management measures in a systems approach to cumulatively reduce the pest risk. The consignments had to be:

- free of visible pests prior to transport by inspection;
- transported only during a specific low risk window of time;
- unloaded and stored in a special zone that does not have suitable hosts for pests that might come in on the imported logs;
- fumigated within a few days of entry and then processed.

may integrate silvicultural practices such as pruning, thinning and tree salvage as well as field treatment, post-harvest disinfestation, inspection and culling. It might also include risk management measures designed to prevent contamination or re-infestation, such as maintaining the integrity of lots, requiring pest-proof packaging, or screening areas where the commodity is assembled or stored. Likewise, procedures such as pest surveillance, trapping and sampling can also be incorporated.

A systems approach can also include measures that do not kill pests or reduce their presence but do reduce their potential for entry or establishment. Such measures may include designated harvest or shipping periods, restrictions on certain conditions of the commodity (such as requiring that logs be debarked or fumigated or both), the use of resistant hosts, and limited distribution or restricted use at the destination.

Systems approaches range in complexity and rigour. The simplest type could be simply a combination of at least two independent measures. A more complex systems approach would involve a careful analysis of the most effective opportunities to reduce pest risk, followed by selection of critical control points that are monitored to ensure that pest populations remain within acceptable tolerances.

4.6 SURVEILLANCE

Guidelines for surveillance (ISPM No. 06 [1997])

The terms “surveillance” and “survey” are often confused. Survey is only one component of surveillance. According to ISPM No. 06, surveillance is an official process which collects and records data on pest occurrence or absence by survey, monitoring and other procedures such as literature reviews.

A country may engage in pest surveillance to:

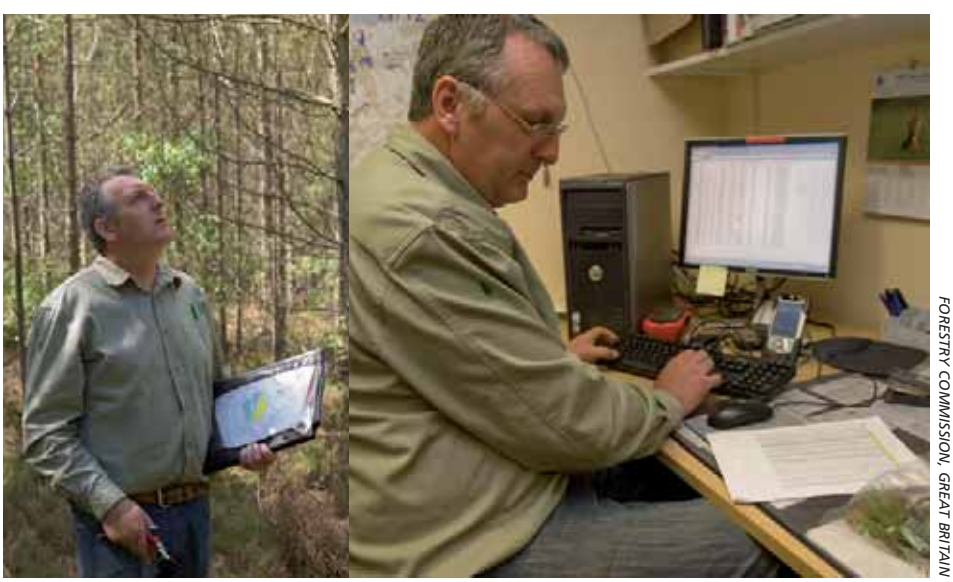
- detect new pests for rapid eradication or containment;
- facilitate trade by providing information about pests and their distribution within the country's territory;
- justify the use of regulations to prevent the entry of a pest that does not occur in the importing country.

Surveillance and survey activities may be required in many locations, especially: storage places where commodities are assembled for export; points of entry and nearby forested areas; and facilities that receive large quantities of imported goods.

There are two major kinds of surveillance: general surveillance and specific surveys. General surveillance is more passive and gathers information on the distribution of pests of concern. Specific surveys are more active and obtain information on pests at a specific site within an area (e.g. a harvest location, the area around exporting sawmills, ports and airports) over a defined period of time. Certain plants and plant products, such as furniture may be included as well.

The NPPO is responsible for gathering and maintaining information for general surveillance. A variety of sources may be used, including FAO, forestry agencies, research institutions, universities, scientific societies (including amateur specialists), land managers, consultants, museums, the general public, scientific and trade journals, pest databases and unpublished material.

To keep these data sources up-to-date, the forestry community can help by monitoring pest situations and reporting to the NPPO or other pest professionals when unusual pests or changes in pest distribution are detected. Monitoring for new pests can also be undertaken by botanical gardens, arboreta and other locations that routinely plant exotic plant materials. A well-organized diagnostic and reporting system is needed to support this effort.



FORESTRY COMMISSION, GREAT BRITAIN

Forester conducting a survey and recording survey data for red band needle blight (Mycosphaerella pini) *in the United Kingdom*

Specific surveys are carried out to detect a particular pest, to identify the extent of the distribution of a pest, to monitor for the presence of a pest in an area or site, or to document the absence of specific pests in order to support the designation of pest free areas (see Section 4.8). These are official surveys that follow a plan that is approved by the NPPO.

Methods for monitoring introduced pests will vary according to the species being monitored and the conditions under which they are monitored. Surveillance and survey activities for introduced pests should emphasize early detection, before major damage occurs and before the pest species has spread over a large area. Effective monitoring tools may include inspections of commodities and packing materials at points of entry, pheromone traps, visual surveys, aerial surveys, planting and monitoring of sentinel or indicator species, and monitoring of artificially stressed trees.

Locations receiving large amounts of imported goods have often proved to be the centre of an infestation, when the establishment of new pests are investigated. Therefore, a survey for pests which are only likely to be present as a result of a recent introduction might focus on possible entry points and pathways of spread (e.g. a specific type of imported nursery plant, a type of sawnwood, or a handicraft such as a wooden birdhouse or carving) and sites where imported commodities are stored, marketed or used as planting material. The survey methodology used must be scientifically based. The selection of survey procedures may be determined by the type of sign or symptom by which the pest can be recognized. Surveys are normally designed to maximize the probability of finding pests.

Personnel involved in surveillance activities should receive periodic training with updates in the identification of pests of concern, especially after agreements are developed with new trading partners or for new forest commodities. These responsible persons should be well-equipped and trained in sampling methods, preservation and transportation of samples for identification, and record keeping. Diagnostic expertise is necessary for verifying the identity of pests. International experts are often available to assist with diagnosis. Samples of identified pest specimens must be kept in safe storage conditions. These are called "voucher specimens or cultures" and are useful in resolving disputes and for confirming identification of further specimens; these should be kept in "reference collections". Maintaining a specimen is also necessary because taxonomic revision can lead to changes in a species definition, i.e. where one species is recognized as a complex of species. When this happens, reference specimens should be re-evaluated to keep records up to date.

For both general surveillance and specific surveys, data quality is important. The records kept should be appropriate for the intended purpose, for example to support specific pest risk analyses, the establishment of pest free areas, or the preparation of pest lists.

Reporting new pests should be encouraged through public education and awareness programmes. Public availability of data and information on the distribution, biology and description of pests may facilitate the reporting of new

pest finds. This information should be shared as early as possible, even for pests that have not yet arrived in a country but which have the potential to enter and establish. A clear structure for reporting new pests should be established.

4.7 PEST REPORTING

Pest reporting (ISPM No. 17 [2002]); *Determination of pest status in an area* (ISPM No. 8 [1998])

Signatories to the IPPC have an obligation to report pests when they are identified as a potential threat to trading partners or neighbouring countries, e.g. a new occurrence or a change in pest status. Official pest reports need to be made by the IPPC contact point (usually the NPPO). The governing body of the IPPC (the CPM) has agreed that pest reporting obligations may be met online at www.ippc.int.

Pest reports are necessary:

- when a new pest is found or there is a sudden increase or decrease in an established or new pest population;
- when the success or failure of eradication of pests is verified;
- in the case of any unexpected situation associated with an established pest, or change in geographical distribution, that increases the pest risk to the reporting country, neighbouring countries or trading partners (e.g. a rapid increase in pest populations, a change in host range or the development of a new, more vigorous strain or biotype).

The detection of a new pathway or the absence of a pest as a result of a specific survey should also be reported.

The rapid expansion of global trade and the small number of taxonomic experts make it difficult to maintain accurate pest lists for all forest commodities. Better international collaboration is needed to overcome this obstacle. The RPPOs of North America and Europe maintain Web-based reporting systems (Box 15) for regional updates, but these RPPO reports are not considered official IPPC pest reports unless the country has requested the Secretariat to accept them as such and they are posted on the IPPC Web site.

Pest reporting allows countries to adjust their phytosanitary requirements, based on PRAs, and to take measures as necessary to respond to any changes in risk. It provides

BOX 15

Examples of pest reporting in Europe and North America

Two regional plant protection organizations publish their pest reports on the Internet. To receive pest alerts regularly by e-mail, anyone may sign up at these Web sites:

- North American Plant Protection Organization (NAPPO): www.pestalert.org
- European and Mediterranean Plant Protection Organization (EPPO): www.eppo.org/QUARANTINE/Alert_List/alert_list.htm

useful current and historical information for the operation of phytosanitary systems. Accurate information on pest status is essential; it provides the technical justification for phytosanitary measures and helps to minimize unjustified interference with trade.

Pest information that might affect planting and marketing choices can also benefit foresters and assist them in working with NPPOs in planning management measures.

4.8 ESTABLISHMENT AND RECOGNITION OF PEST FREE AREAS AND AREAS OF LOW PEST PREVALENCE

Requirements for the establishment of Pest Free Areas (ISPM No. 04 [1995]);
Requirements for the establishment of pest free places of production and pest free production sites (ISPM No. 10 [1999]);
Recognition of pest free areas and areas of low pest prevalence (ISPM No. 29 [2007])

Exporting countries may be able to establish official pest free areas or areas of low pest prevalence. They may then be able to negotiate agreements with importing countries to allow export of regulated commodities from those areas, which may help them gain, maintain or improve market access.

A pest free area (PFA) is defined simply as an area in which a specific pest does not occur. PFAs allow for the export of plants, plant products and other regulated articles without the need for the application of other phytosanitary measures. The official establishment of a PFA must be based on specific survey data. The PFA status must be periodically reviewed by intensive surveys or inspections during the growing season. Documentation should be made available for other regulatory authorities when requested. An example of the use of PFAs is given in Box 16.

A pest free place of production (PFPP) is a place of production where a specific pest does not occur, as determined by the NPPO, even though the pest may be present in the area. The absence of the pest must be demonstrated by scientific evidence such as periodic specific surveys. Trading partners will expect, as a minimum, to see documentation supporting the PFPP declaration.

PFAs and PFPPs are easier to establish in planted forests and more difficult to define in naturally regenerated forests. Naturally regenerated forests have a wider distribution and larger variety of plants and potential pests than planted

BOX 16

The movement of regulated commodities between pest free areas

Lymantria dispar (gypsy moth) is a serious pest of deciduous trees in eastern North America. It lays eggs on many commodities and conveyances. It is not present in western North America or Mexico, nor does it occur in portions of provinces or states in eastern Canada and the United States. NPPOs in North America conduct specific annual surveys to identify the exact distribution of the pest, using a very effective pheromone insect trap. The resulting pest information is used to define pest free areas (PFAs) in eastern North America that permit exporters to move regulated articles to non-infested areas.

forests. Therefore, identifying a specific PFA in a naturally regenerated forest would involve surveillance activities that are often too expensive to be practical. In planted forests, the challenge of undertaking surveillance is much more manageable where the hosts are planted in blocks contained within a non-host environment.

4.9 INSPECTION

NPPOs or personnel authorized by the NPPO perform inspections prior to export and at import.

Guidelines for inspection (ISPM No. 23 [2005]); *Methodologies for sampling of consignments* (ISPM No. 31 [2008])

An export inspection is performed by the exporting country to ensure that a consignment meets the specified phytosanitary requirements of the importing country at the time of inspection. If requirements are met, the inspection may result in the issuance of a phytosanitary certificate by the exporting country's NPPO for the consignment in question.

Import inspection is used to decide whether to accept, detain or reject the imported commodity. Inspection is usually based on visual examination of a commodity. It verifies the identity and integrity of the commodity. It also verifies the effectiveness of phytosanitary measures that have been applied, such as treatments or systems approaches. Visual inspection of wood with the naked eye is very difficult as many pests may be impossible to see, e.g. nematodes. Bundles of wood are obviously difficult to examine. The collection of samples and laboratory analysis can also help to detect pests.

It is extremely useful to keep good records of import pest interceptions. These can help a country decide which commodities need more careful inspection in the future, and which commodities are at lower risk. Good records can also show which countries of origin repeatedly send commodities containing pests, and these records are often the basis for negotiations between countries to help make trade safer. To

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be really useful, it is important also to have a record of the volume of commodities inspected, so that changes in infestation rate over time can be determined.

In cases of repeated non-compliance (see Section 4.11), the intensity and frequency of import inspections for certain consignments may be increased, or import of the commodity may be stopped. The NPPO of the importing country should also contact the NPPO of the exporting country so that it can identify the source of problems and suggest improvements.

4.10 PHYTOSANITARY CERTIFICATION

Export certification system (ISPM No. 07 [1997]);
Guidelines for phytosanitary certificates (ISPM No. 12 [2001]);
Consignments in transit (ISPM No. 25 [2006]);
Categorization of commodities according to their pest risk (ISPM No. 32 [2009])

NPPOs of exporting countries issue phytosanitary certificates to certify that consignments of plants, plant products or other regulated articles meet the specified phytosanitary import requirements of trading partners, such as demonstrating that a treatment has been performed. The IPPC prescribes a model for this certificate in ISPM No. 12. Phytosanitary certificates should not be required by importing countries for wood products that have been processed so that they have no potential for introducing regulated pests. ISPM No. 32 provides guidance on which commodities need or don't need phytosanitary certification. See also Sections 2.2 and 2.3 of this guide for more information on import and export processes.

The basic elements of the phytosanitary certification process include:

- determining the relevant phytosanitary import requirements of the importing country;
- verifying that the consignment conforms to those requirements at the time of certification;
- issuing a phytosanitary certificate that accurately describes the consignment by species and quantity.

The importing country's NPPO should make available official and current information concerning its requirements. The current requirements for the country of destination may also be obtained by the exporter, and supplied to the exporting country's NPPO.

Individuals or organizations authorized by the NPPO may perform some functions, such as commodity inspections or verification of treatment, prior to the NPPO issuing the phytosanitary certificate.

Importing countries frequently specify requirements for phytosanitary certificates, such as: the use of a specific language; completion by typing or handwritten in legible, capital letters; and the use of specified units. There may be a limited period of validity following inspection or treatment before dispatch of the consignment from the country of origin. A phytosanitary certificate may be rejected or additional information may be requested by the importing country if the phytosanitary certificate:

- is illegible, incomplete or is a non-certified copy;
- includes unauthorized alterations or erasures, conflicting or inconsistent information, or wording that is inconsistent with the instructions or model certificates;
- fails to comply with the specified period of validity;
- certifies prohibited products;
- describes the consignment in a way that does not correspond with the material imported.

Fraudulent certificates should never be accepted and the perpetrator should be subject to legal action.

In some cases, international trade may involve the movement of consignments of regulated articles which pass through a country without being formally imported. This kind of consignment is said to be "in transit". Such movements may present a pest risk to the country of transit, especially if consignments are carried in open containers. Countries may apply technically justified phytosanitary measures to consignments in transit through their territories.

4.11 NON-COMPLIANCE NOTIFICATION

Guidelines for the notification of non-compliance and emergency action (ISPM No. 13 [2001])

When consignments do not meet phytosanitary import requirements they are considered to be non-compliant. The NPPO of the importing country notifies the NPPO of the exporting country about the non-compliance. The exporting country's NPPO should then follow up with the exporter to ensure that consignments are not rejected in the future.

Non-compliance notifications are provided when there is:

- failure to comply with phytosanitary import requirements;
- detection of regulated pests;
- failure to comply with documentary requirements (e.g. phytosanitary certificates);
- prohibited consignments or prohibited articles in consignments such as soil;
- evidence of failure of specified treatments;
- repeated instances of prohibited articles in small, non-commercial quantities carried by passengers or sent by mail.

4.12 PHYTOSANITARY IMPORT REGULATORY SYSTEMS

Guidelines for a phytosanitary import regulatory system (ISPM No. 20 [2004])

An import regulatory system should consist of two components:

- a framework of phytosanitary legislation, regulations and procedures;
- an official service, the NPPO, responsible for operation or oversight of the system.

NPPOs have the sovereign right to regulate imports to achieve an acceptable level of protection, taking into account their international obligations, in particular

the IPPC (1997) and the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). When a contracting party implements phytosanitary procedures and regulations, it should try to use measures that reduce risk to an acceptable level with the least negative impacts on trade.

Forest plants (including seeds), wood, wood packaging materials (including dunnage), and used forestry equipment are examples of forestry articles that are regulated in many countries.