International Plant Sentinel Network Formal Agreement

The International Plant Sentinel Network (IPSN) is a 3 year funded project which aims to provide a mechanism for botanic gardens and arboreta to contribute to global plant health efforts. Throughout the life of the funded project the IPSN coordinator will be working with member gardens in order to develop a sustainable and viable network that will continue after this initial funding period. Consequently members will be able to help shape the development of the IPSN by trialling materials, assisting in the prioritisation process and providing general guidance and feedback.

1. Background and purpose

i. The majority of the most damaging alien forest pests and pathogens that have had or are having a dramatic impact on temperate forests are considered harmless in their native areas (Brasier, 2008). In their native ranges these pests are either controlled by natural enemies, or their original host plants have evolved a certain degree of resistance. Thus when introduced into a new geographical range, where there is a lack of natural predators and host species have not built up this natural resistance, these organisms can cause untold amounts of damage.

ii. Pest Risk Analysis (PRA) is the conventional tool used to assess the potential impact introductions could have on a country's flora, and is used to identify quarantine organisms. A significant problem for PRAs is that they primarily focus on well-known pests and consequently miss new invaders that appear unexpectedly (Tomoshevitch *et al.,* 2013). A practical approach to try and overcome this problem is the use of sentinel plants. Plants that are situated outside of their natural range can be monitored for susceptibility to damaging pests and pathogens native to their new environment.

iii. The project builds on earlier work undertaken by BGCI who in 2011 carried out an electronic survey which investigated the relevant expertise and policies at botanical institutions around the world. This identified a solid foundation of existing expertise but a need for more formal or regular training, and enhanced communication and coordination on biosecurity issues both locally and internationally (Kramer & Hird, 2011). Alongside this survey, a number of recent studies have been highly successful and have illustrated the potential sentinel plants have in identifying new and emerging plant health risks – see *annex 1*.

iv. The IPSN is part of a EUPHRESCO project led by the UK's Food and Environment Research Agency (Fera) and coordinated by Botanic Gardens Conservation International (BGCI). Other Project Partners are the Netherlands' NPPO, Italy's DIBAF (University of Tuscia), Forest Research UK, the Julius Kühn Institut from Germany and CABI, all of which have extensive experience working within plant health research. For more information please refer to:

http://www.bgci.org/ourwork/ipsn_euphresco_partners

v. The main aim of the IPSN is to enhance activities that provide early warning of new and emerging pest and pathogen risks and to;

- Link botanic gardens and arboreta and plant health scientists at a local, regional and international level;
- Increase botanic gardens and arboreta capacity for plant pest and pathogen identification and awareness through the provision of training materials and standard protocols;
- Create a suitable platform for sharing best practise, information regarding integrated management techniques and potential threats;
- Provide scientific evidence to plant health regulators in order to aid PRA efforts including increased knowledge regarding known quarantine organisms and potential new risks;
- Facilitate access to diagnostic support wherever possible;
- Facilitate access to high level diagnostic network that can be used when local diagnostic centres cannot determine cause of infection or identify the problem organism;
- Facilitate the creation of reciprocal research projects between those gardens with analogous climates and mutually beneficial collections.

2. Agreement

i. Parties agree to be members and cooperate as part of an international network of relevant organizations and institutions to contribute to safeguarding plant health.

ii. Membership shall be open to all organisations and institutions that are botanic gardens and arboreta and institutes involved in plant pests and pathogens at a regional, national or international level.

iii. Parties will help safeguard plant health by sharing information with their National Plant Protection Organisation (NPPO) of any outbreaks of significance and making relevant information available to those included within the network – as depicted in *annex 2*.

iv. The IPSN will support gardens by facilitating access to local diagnostic support.

v. The IPSN will provide a platform for members to share information with other botanic gardens and arboreta as well as local, national and international diagnosticians.

vi. The IPSN will develop and make available guidelines for prioritising which host species to monitor, training materials in order to build pest and pathogen capacity and standard protocols and examples of best practise for monitoring.

vii. The IPSN will promote member garden's participation in the network and thus their commitment to safeguarding global plant health.

3. Activities

Activities may include but will not be limited to:

i. Identify an 'IPSN contact person' who will coordinate IPSN activities within the botanic garden or arboretum and interact with the network coordinator, other member gardens and diagnostic institutes / local contacts.

ii. Upload plant collection records to BGCI's PlantSearch database. This will enable the IPSN to locate member gardens that house host species of interest for reciprocal projects and / or other monitoring purposes. For instructions on how to do this please go to:

http://www.bgci.org/resources/plantsearchuploadinstructions/

(Please note gardens do not need to be a BGCI member in order to upload plant collection information)

iii. Monitoring plants in collections and be willing to share this information according to IPSN guidelines and the process given in *annex 2*.

iv. Participate in local / regional forums in order to network with other member gardens and institutes involved in the IPSN.

v. Promote and make available plant pest and pathogen training materials, standard protocols and other online resources to interested staff members.

vi. Help develop training materials, standard protocols and other online resources by providing suitable feedback (evaluations) on initial drafts.

vii. Champion the network to other botanic gardens and arboreta and the general public

4. Governance

i. Project Partners – these are funded partners from institutes in countries within the European Union contributing in the wider EUPHRESCO project.

ii. International Advisory Group - this group includes invited representatives from selected countries / regions around the world who have an interest in the IPSN but who are not European project partners. Members of the Group will be expected to feedback to their own country / regional group as well as provide guidance to the IPSN.

iii. Project Participants – organisations and institutes who are working to support the network but who are not within the European Union.

iv. Member Gardens – botanic gardens and arboreta willing to participate in the network.

v. Project Management Team - Charles Lane: Project Lead, Ellie Barham: Project Coordinator and Richard Baker: Scientific Advisor.

5. General

i. This agreement does not prevent or hinder members from participating in similar activities with other public or private agencies, organisations or individuals.

ii. This agreement is not intended to be a legally binding document.

References

Brasier C. M. (2008) The biosecurity threat to the UK and global environment from international trade in plants *Plant Pathology* **57** 792-808

Kramer A. & Hird A. (2011) Building an International Sentinel Plant Network *BGjournal* **8**(2) http://www.bgci.org/resources/article/0697/

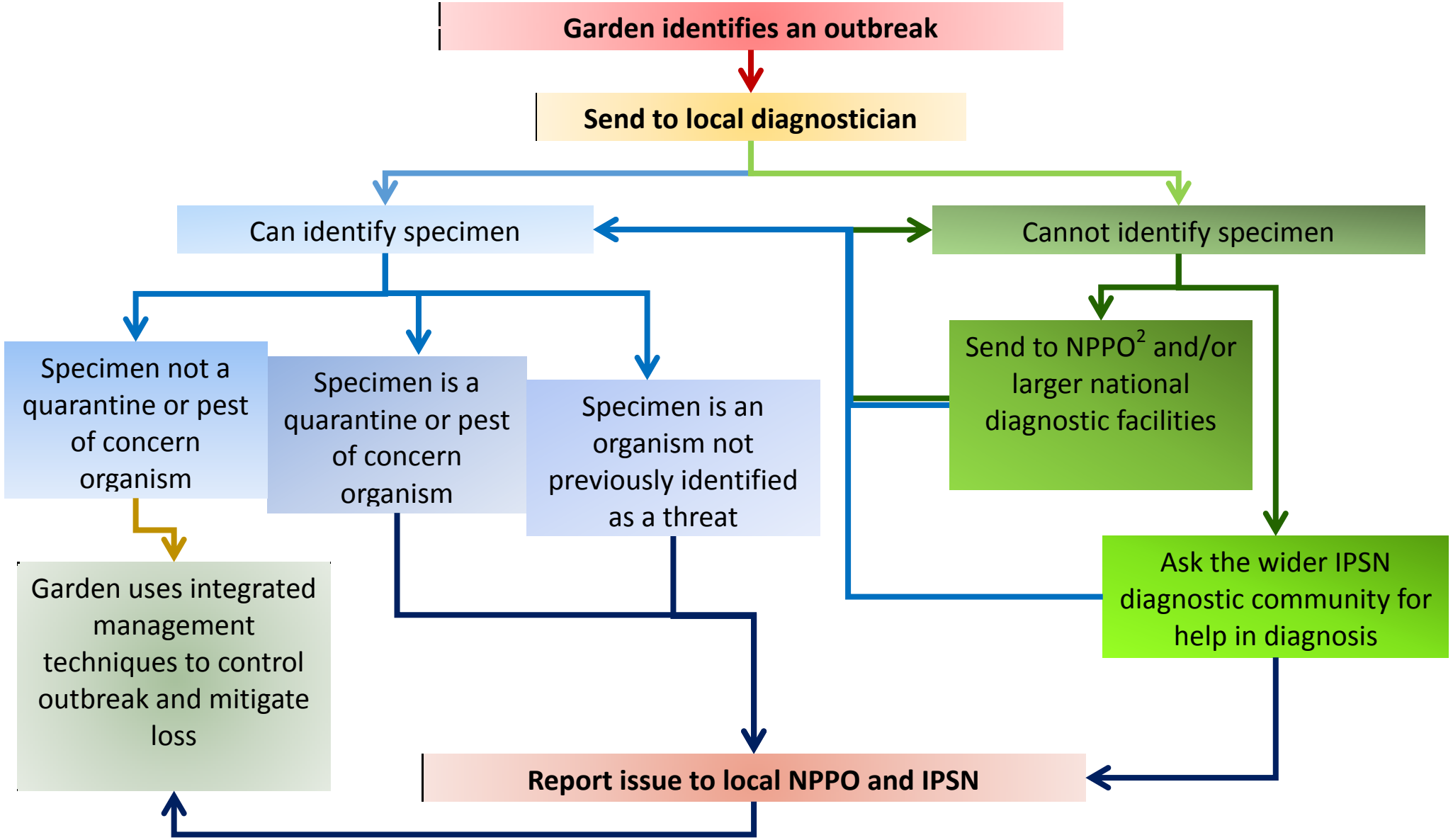
Tomoshevitch M., Kirichenko N., Holmes K. and Kenis M. (2013) Foliar fungal pathogens of European woody plants in Siberia: an early warning of potential threats? *Forest Pathology* **43** 345-359

Annex 1

Links to information about similar sentinel plant research:

- APGA / NPDN Sentinel Plant Network; http://www.publicgardens.org/content/sentinel-plant-network
- B3 Expatriate Plant Pilot Programme; http://b3nz.org/news/international-plant-sentinel-network-helps-identify-potential-invasive-pests
- ISEFOR; http://www.isefor.com/
- PRATIQUE; https://secure.fera.defra.gov.uk/pratique/

Annex 2: Simplified proposed process of reporting



[1]The IPSN aims to develop a platform that member gardens can use to share information regarding management of outbreaks that should be able to help gardens mitigate loss.

[2]National Plant Protection Organisation