Wildlife diseases and biodiversity

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Joint Nature Conservation Committee

Wildlife diseases and biodiversity

Paper by Chris Cheffings and Richard Ferris

1. Introduction

1.1 The importance of diseases of wildlife, including both wild plants and animals, has recently been illustrated by the incursion of the fungus causing ash dieback (*Hymenoscyphus pseudoalbidus* (*Chalara fraxinea*)) into the UK, the latest of a series of diseases that have serious implications for biodiversity and ecosystem service provision. Wild animals can play a major role in disease transmission and so they are important when addressing certain diseases in domestic animals or humans.

1.2 Climate change is expected to lead to substantial changes in wildlife disease patterns and frequency. Conflicts between biodiversity conservation, public health and domestic animal health may further intensify as contact between humans, domestic animals and wild animals increases. Initiatives that seek to reduce fragmentation of habitats or to improve access to the countryside may lead to new infection routes emerging for plant and animal diseases, both into and out of the natural environment.

1.3 In terms of policy response, diseases are usually split into those that affect plants and those that affect animals, and these are then dealt with by plant health policy and animal health policy respectively. Plant Health Policy in the UK also covers pests and diseases of fungi and pests of plants, in particular invertebrate pests. The Secretary of State at Defra has recently and repeatedly stated that animal and plant health are particular priorities for Defra, and the response to *Hymenoscyphus pseudoalbidus* demonstrates that this priority is not restricted to diseases of commercial crops (although ash has considerable commercial value, the response to the disease has been much broader). This governmental priority should be viewed as an opportunity to highlight the need for work on diseases that could impact upon biodiversity and ecosystem service provision and not necessarily commercial interests.

1.4 Pests and diseases and their vectors may be native or non-native, with legislation more concerned with whether they are 'established' and hence ineradicable or not. There are particular links to aspects of non-native species policy and response, and indeed there are some grey areas between non-native species policy and plant health policy that need to be clarified. For instance, the Asian Longhorn Beetle (*Anoplophora glabripennis*) is a regulated pest within plant health legislation, and hence has an information sheet and online recording system provided by the Forestry Commission; however, it is also considered an invasive non-native species, and has a species factsheet and online recording system provided by the GB Non-native Species Secretariat, and could be included in Invasive Species Ireland. The recent eradication action for the Asian Longhorn Beetle was completed by plant health authorities. With new EU legislation for invasive non-native species (or invasive alien species) due imminently, there will be potential for some species to be listed on both plant health and invasive species legislation, and hence there will be an urgent need for strong co-operation

and good communication between regulating bodies to establish clear lines of responsibilities.

2. Plant health

2.1 UK legislation and governance

2.1.1 The legislative basis for work on plant health in the UK rests in the Plant Health Act 1967 and the Plant Health Act (Northern Ireland) 1967. Both of these pieces of legislation set out the scope for plant health as being:

"the control of pests and diseases injurious to agricultural or horticultural crops, or to trees or bushes".

2.1.2 The current legislation therefore excludes from consideration pests and diseases that affect native plant diversity, other than native 'trees and bushes'. The impact of this exclusion is probably greatest in terms of the overall focus of plant health policy, but is also important where a disease of native plants occurs, as there is no legislative basis on which to serve Statutory Plant Health Notices, in respect of native species that are not trees or shrubs, in order to achieve eradication.

2.1.3 The two Plant Health Acts and subsequent Orders set out the responsible bodies for plant health. In general, responsibilities are split according to whether the host plant is a forest tree or not. Forest tree health is the responsibility of the Forestry Commissioners in Great Britain, whilst other host species are the responsibility of the agricultural ministers of the relevant government administration. In England and Wales, the Food and Environment Research Agency (Fera) is responsible for implementing plant health policy except for forest trees, in particular inspections of imports and other premises. In Northern Ireland, the Department for Agriculture and Rural Development (DARD) has overall responsibility, including both policy and inspections. Defra represents the UK for EU aspects of plant health. Details of current governance for plant health in the UK are set out in more detail in Annex E of the Tree Health and Plant Biosecurity Expert Taskforce Final Report (included as Annex 1 to this paper).

2.1.4 Responses to pests and diseases within Northern Ireland often need to take into account an 'all-Ireland' response, in addition to being a part of the UK with respect to EU legislation for reporting. This added complexity needs to be taken into account when considering how to improve governance for any particular aspect of work on plant health.

2.1.5 Whilst there is considerable complexity in the governance arrangements in terms of both devolution and the split between forest trees and other plants in some countries of the UK, there is a key governance gap in relation to biodiversity. This governance gap results from the legislative basis for plant health in the UK.

2.2 EU legislation

2.2.1 Within Europe, plant health is covered by the Plant Health Directive (2000/29/EC), within the portfolio of the Directorate General for Health and Consumers (DG SANCO). It is unclear whether this Directive includes pests and diseases of native plants, although the preambular text suggests that the focus is on pests and diseases of commercial crops, as it states:

"protection of plants against such organisms is absolutely necessary not only to avoid reduced yields but also to increase agricultural productivity".

2.2.2 This legislation is currently being reviewed, and a new draft Regulation on protective measures against pests of plants was recently released by the Commission. Annex 2 contains extracts from the draft new EU Regulation. The new Regulation would explicitly include pests and diseases that impact biodiversity and ecosystem service provision, although an earlier proposal to also include invasive plant species was rejected (with the understanding that these would be covered by the legislation being drafted on invasive alien species by DG Environment). There is no explicit inclusion of pests and diseases of fungi.

2.2.3 The current draft Regulation does not achieve parity between native plants and crop plants in terms of the priority given to the various pests and diseases. Criteria for identifying pests that qualify for action within the EU legislation are set out. The criteria for identifying quarantine pests are non-prescriptive regarding the size of the impacts that must be observed. However, the criteria for identifying *priority* quarantine pests are very prescriptive. (Priority pests will be subject to an enhanced level of obligations concerning preparedness and eradication, supplemented by enhanced financial support from the EU for the required actions.) Economic impact criteria are limited solely to commercial crops, without any potential for comparing monetised impacts within the environment. Environmental impacts can only be considered a priority if they involve either habitats or species included within the Habitats Directive or Birds Directive. Earlier drafts from the Commission also included wording on environmental impacts concerning reduction, displacement or elimination of keystone plant species and plant species that are major components of ecosystems. Whilst these concepts may be difficult to define, the deletion of this text seriously weakens the potential for the new legislation to prioritise pests that impact native plant diversity.

2.3 Review of UK tree health and plant biosecurity

2.3.1 Within the UK, tree health policy and implementation have recently been reviewed by the Tree Health and Plant Biosecurity Expert Taskforce. JNCC were a part of the Officials Advisory Group which assisted the Expert Taskforce. The final recommendations from the Expert Taskforce are:

Recommendation 1. Develop a prioritised UK Plant Health Risk Register.
Recommendation 2. Appoint a Chief Plant Health Officer to own the UK Plant Health Risk Register and to provide strategic and tactical leadership for managing those risks.
Recommendation 3. Develop and implement procedures for preparedness and contingency planning to predict, monitor, and control the spread of pests and pathogens.
Recommendation 4. Review, simplify, and strengthen governance and legislation.
Recommendation 5. Improve the use of epidemiological intelligence from EU/other regions and work to improve the EU regulations concerned with tree health and plant biosecurity.
Recommendation 6. Strengthen biosecurity to reduce risks at the border and within the UK.
Recommendation 7. Develop a modern, user-friendly system to provide quick and intelligent access to information about tree health and plant biosecurity.
Recommendation 8. Address key skills shortages.

2.3.2 The Expert Taskforce noted the legislative gap for native plant diversity, and recommended that this should be addressed within their recommendation to "review, simplify, and strengthen governance and legislation".

2.4 Plant health functions

2.4.1 Defra have been considering the range of plant health work within the UK, and have classified this as:

- Horizon scanning
- Risk assessment
- Risk mitigation
- Contingency planning
- Survey and detection
- Eradication
- Containment
- Suppression
- Routine control

2.4.2 Further information on these topics is provided in Annex 3.

2.4.3 A key difference exists between the work that the Forestry Commission undertakes on forest trees in Great Britain (and the Forest Service in Northern Ireland), and the work of Defra and the devolved administrations, in that work on suppression and routine control is usually only considered as part of governmental work on plant health within the Forestry Commission. This difference is further demonstrated by the scope of pests and diseases covered. The Forestry Commission consider that their duty is to deliver healthy forests, and hence include native pests and diseases. Non-forestry plant health is normally restricted to non-native pests and diseases that are not yet established within the UK.

3. Animal health

3.1 Wild animals can play a major role in disease transmission in domestic animals or humans. Animal diseases are also important for biodiversity in their own right, with impacts including native species declines and animal welfare, but these have received comparatively less attention. For example, squirrel poxvirus is contributing to the decline of the red squirrel population, and crayfish plague is considered responsible for declines in native white-clawed crayfish numbers in Great Britain. Diseases also impact on conservation efforts; for example, in 1995 a release of captive-bred field crickets in England was suspended for two years due to infection with a parasite which posed a possible threat to other wild species.

3.2 Surveillance

3.2.1 Surveillance and management schemes are in place in the UK for specific notifiable diseases which impact on human or livestock health. Nationwide reporting mechanisms for wildlife mortalities and surveillance for non-notifiable diseases are limited. The Animal Health and Veterinary Laboratories Agency (AHVLA), an executive agency of Defra, is primarily responsible for livestock diseases. It also heads the GB Wildlife Disease Surveillance Partnership which conducts wildlife disease surveillance in Great Britain. Approximately 2% of the AHVLA's scanning (assessment of carcasses) surveillance budget is spent on wildlife health surveillance. In Northern Ireland, animal health surveys, including in wildlife, are undertaken by the Veterinary Services Division of the Agri-Food and Biosciences Institute (AFBI), a non-departmental public body of DARD.

3.2.2 The UK has no EU surveillance obligations, since there are no EU directives addressing disease monitoring for nature and biodiversity.

3.3 Predicting trends in wildlife disease

3.3.1 Assessing risks posed by future wildlife disease threats, including zoonotic disease risks, has been identified as a weakness in the UK although it does fall under the remit of the GB Wildlife Disease Surveillance Partnership. Whilst diseases that could impact species protected under European legislation or other threatened native species might come to the attention of the country conservation bodies, more general horizon scanning, particularly for diseases that have the potential for major impacts in commoner native species, is likely to be lacking.

3.4 Strengthening policy approaches

3.4.1 Successful wildlife disease management policies require sound scientific evidence with input from a range of specialists. At present, disease policy is reactive and opportunistic as opposed to proactive and structured. When novel diseases emerge in the UK, responses are hampered by disjointed policies and poorly defined responsibilities (e.g. amphibian disease in the UK, see Annex 4). Although much of the necessary expertise and infrastructure to address diseases in

wildlife is in place, issues of coordination and funding remain to be resolved.

3.4.2 There are few regulations concerning exotic disease threats to wild animals, and few systems for surveillance are in place. Current measures for the detection and control of Emerging Infectious Diseases (EIDs) fall under the GB Wildlife Disease Surveillance Partnership and the work of AFBI in Northern Ireland but these may not be adequate.

3.5 The need for research

3.5.1 Future research on wildlife EIDs will need to adopt a multidisciplinary approach to identify underlying causes and to control their spread, as well as improving our understanding of the likely impacts on biodiversity and ecosystem services. Increased efforts are needed to focus surveillance on known pathogens and to identify previously unknown infectious agents. Investigations into the ecology, pathology, and population biology of host-parasite systems need to be approached from individual, population, and environmental perspectives.

4. Recommendations for JNCC's work on wildlife disease

4.1 Means for improving horizon-scanning for pests and diseases of native plants and associated pathways should be considered, in particular the potential for the Cranfield University horizon-scanning project to include this as a deliverable. Pathways for the introduction and spread of plant pests and diseases should be reviewed and re-prioritised in the light of horizon-scanning for pests and diseases likely to affect native plants.

4.2 Formal agreements should be set up between JNCC and other public bodies (including the country conservation bodies, Forestry Commission, Fera and government administrations) regarding roles and responsibilities for risk assessment, contingency planning, survey work, eradication and containment for those pests and diseases that impact native plant diversity. Any new resource requirements to support these agreements should also be explored.

4.3 JNCC should formalise and review data arrangements and requirements to support risk assessment and contingency planning, particularly noting any data issues for Northern Ireland.

4.4 JNCC should investigate with partners any potential synergies between plant health and work on invasive non-native species, particularly once the draft EU legislation becomes available. This work should include consideration of risk assessment, contingency planning, survey, eradication and control, and identify where common mechanisms can be employed effectively.

4.5 Regarding animal health, JNCC should take a role in providing scientific and technical input, when there are possible biodiversity or ecosystem service impacts. This should complement the work of the country conservation bodies in operational management of disease, advice on impacts and licensing issues. There is a need to better understand the existing processes in terms of effectiveness, evidence gaps and the current distribution of

resources and expertise. JNCC should assess what it could do better or differently, and consider how our role should change in the future, and what the key drivers are likely to be.

5. Recommendations for legislation on wildlife disease (in confidence)

5.1 Primary legislation should be reviewed in order to ensure that pests and diseases that impact native plant diversity are included, in support of the recommendation from the Tree Health and Plant Biosecurity Expert Taskforce.

5.2 UK negotiations on the draft EU Plant Health Regulation should recognise the need for there to be parity between economic, social and environmental impacts. In particular, the draft criteria for identifying priority pests need to be modified to reflect this. Explicit inclusion of pests and diseases that affect fungi would also be useful.

Annex 1. Text taken from Annex E of the final report of the Tree Health and Plant Biosecurity Expert Taskforce.

The responsibilities of public agencies for plant health are set out in the Plant Health Act 1967 [1], which splits responsibility in England between the Forestry Commission and Defra (who in 2009 delegated responsibility for plant health to the Food and Environment Research Agency (Fera)). The Plant Health Act 1967 prescribes the Forestry Commissioners as the competent authority in Great Britain for the protection of forest trees and timber, although the Act does not define "forest trees".

The Forestry Commission monitors forest tree health, at a national level, for quarantine pests, in accordance with EC Directive 92/70/EEC. More generally it monitors the condition of woodland trees as part of the National Forest Inventory and through reports to the Tree Health Diagnostic and Advisory Service. Whilst there is no legal definition of "forest trees" the Forestry Commission‘s remit, has through custom and practice, been interpreted as including at least those tree and shrub species for which the Forestry Commission would pay grant aid [2] for woodland creation and regeneration.

Forestry is a devolved matter. The Secretary of State for the Environment, Food and Rural Affairs has responsibility for forestry in England as well as certain activities such as international affairs, which are reserved. Responsibility for forestry in Scotland lies with the Scottish Government and in Wales with Welsh Ministers. Separate arrangements apply in Northern Ireland covered by the Plant Health Act (Northern Ireland) 1967.

The Department for Environment, Food and Rural Affairs (Defra) co-ordinates plant health policy across the UK and Crown Dependencies and represents the UK as the "Single Central Authority" under the EU Plant Health Directive. Defra is also the contact point for the UK "National Plant Protection Organization" under the International Plant Protection Convention. These responsibilities were delegated to Fera, but, as a first step towards improving plant health governance, Defra decided to bring plant health policy closer to the heart of Government. As a result, the Plant Health Policy Team in Fera (which carries out much of the co-ordinating role) transferred to Defra on 31 December 2012.

Fera implements plant health policy (a devolved matter) in England. The Welsh Government is responsible for plant health policy in Wales, but has a concordat with Fera and Defra in relation to plant health and seeds functions in Wales. Fera Inspectors carry out inspections of plants (including trees) and produce imported from non-EU countries, and targeted monitoring of plants (including trees) moving within the Single Market. Fera scientists carry out assessments of risk to plant health (other than forest trees), diagnosis of pests and pathogens, and research on risk assessment, detection, diagnosis and control. A concordat signed in 2011 between Forestry Commission and Fera sets out the way the two organisations work together, including in outbreak situations.

Pest or disease outbreaks are the joint responsibility of Fera and Forestry Commission with roles agreed based on where the sites are and what resources and capability are required to deal with the outbreak. Surveillance for harmful organisms of trees in the wider environment including street trees, public parks and gardens responsibility is shared between Forestry Commission (where there is a threat to forests or woodland), Fera, Local Authority tree officers, landowners and managers, and householders.

Although the statutory plant health services have lead responsibility, a key element of the Tree Health and Plant Biosecurity Action Plan is the engagement of statutory conservation bodies, industry sectors, NGOs, local authorities, landowners and the public in reporting new pest and disease outbreaks and helping to manage them.

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Annex 2. Extracts from draft EU Regulation on protective measures against pests of plants

Extract from criteria to identify pests which qualify as a quarantine pest (Annex II, Section 1). Points of particular importance for biodiversity and ecosystem services are highlighted.

Potential economic, social and environmental impact

The entry, establishment and spread of the pest in the territory in question, or, if present, the part of that territory where it is distributed to a limited extent, shall have unacceptable economic, social and/or environmental impacts for that territory, or the part of that territory where it is distributed to a limited extent, as regards one or more of the following points:

(a) crop losses in terms of yield and quality;
(b) costs of control measures;
(c) costs of replanting and losses due to the necessity of growing substitute crops;
(d) effects on existing production practices;
(e) effects on street trees, parks and public and private green;
(f) effects on native plants, biodiversity and ecosystem services;
(g) effects on the establishment, spread and impact of other pests, due to the capacity of the pest concerned to act as a vector for other pests;
(h) changes to producer costs or input demands, including control costs and costs of eradication and containment;
(i) effects on producer profits that result from changes in production costs, yields or price levels;
(j) changes to domestic or foreign consumer demand for a product resulting from quality changes;
(k) effects on domestic and export markets and prices paid, including effects on export market access and likelihood of phytosanitary restrictions imposed by trading partners;
(l) resources needed for additional research and advice;
(m) environmental and other undesired effects of control measures;
(n) effects on Natura 2000 or other protected areas;
(o) changes in ecological processes and the structure, stability or processes of an ecosystem, including further effects on plant species, erosion, water table changes, fire hazards, nutrient cycling;
(p) costs of environmental restoration;
(q) effects on food security;
(r) effects on employment;
(s) effects on water quality, recreation, tourism, animal grazing, hunting, fishing.

As regards points (a) to (g), direct effects on hosts in the endangered area shall be taken into account. Those effects shall be assessed taking account of the range of the host species, and on the basis of the types, amount and frequency of the damage suffered by those host species.

As regards points (h) to (s), indirect effects within and outside the endangered area shall be taken into account.

Extract from criteria to identify pests which qualify as a priority quarantine pest (Annex II, Section 2).

A Union quarantine pest shall be considered to have most severe economic, social or environmental impact for the Union territory, if its entry, establishment and spread fulfils one or more of the following points:

(a) Economic impacts: the pest has the potential to cause major losses in terms of the direct and indirect effects referred to in point (4) of Section I for crops with a total annual production value for the Union territory of at least EUR 1 billion.

(b) Social impacts: the pest has the potential to cause one or more of the following effects:
   (i) a significant employment decrease in the agriculture, horticulture of forestry sector concerned;
   (ii) risks to food security or food safety;
   (iii) the disappearance of, or permanent large-scale damage to, main tree species growing or cultivated in the Union territory.

(c) Environmental impacts: the pest has the potential to cause one or more of the following effects:
   (i) effects on species and habitats listed under the provisions of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds;
   (ii) major and permanent increases of the use of plant protection products on the crops concerned.

Annex 3. Plant health functions in the UK

Horizon scanning

Intelligence on emerging pests and diseases is shared in the EU, particularly through the work of the Standing Committee on Plant Health and also the European and Mediterranean Plant Protection Organisation. However, there is no particular focus on pests and diseases of native plants, and without the active engagement of Member State environment ministries, and those responsible for maintaining healthy ecosystems, it is possible that problems are missed. Pathways for the introduction and spread of plant pathogens affecting native plants may be different to those normally considered under plant health. The broader issues are also considered within one of the recommendations of the Tree Health and Plant Biosecurity Expert Taskforce, which concluded that there should be improved reporting of data on the spread of emerging pests and pathogens. Questions that could be usefully considered in order to prioritise research into particular pathways or potential new trades include:

- Are particular source countries more likely to harbour pests and diseases that might impact native plant diversity?
- Are particular crop species more likely to host pests and diseases that can transfer to native plant diversity?
- Are there known pests and diseases outside the EU which might impact native plant diversity? Are these currently regulated?

Risk assessment and mitigation

Both Fera and Forestry Commission have staff who specialise in producing pest risk assessments following agreed international standards. Following risk assessment, appropriate mitigation measures including legislation can be identified. One component of these assessments relates to a measure of the likely environmental impact of a particular pest or disease. Currently, the country nature conservation bodies and JNCC are invited to respond during the public consultation phase on pest risk assessments. Our most frequent response is to provide additional information on the scale of the environmental impact, and on appropriate data sources for mapping and assessing host species. Whilst there are legitimate concerns that the pest risk assessment system should not be slowed down by having too many hurdles, it would seem sensible for country conservation bodies and JNCC input to be provided prior to the consultation phase, possibly through inclusion of a relevant representative on the expert review panel. This could be facilitated by appropriate agreements between organisations regarding roles and responsibilities. The need for effective data on environmental impact is likely to increase as the government responds to the Tree Health and Plant Biosecurity Expert Taskforce recommendation on producing a UK risk register.

A further issue relating to risk assessment is the need to ensure that relevant native plants are included in tests for potential host species. Native plants are not excluded from current testing, but they may not be the principal focus, and hence some may be missed. The resource implications of this need to be further explored with Fera and the Forestry Commission.

Risk mitigation work has generally been understood to refer to recommendations on trade restrictions following on from the risk assessment conclusions. However, in future, particularly with more inclusion of the wider environment in plant health, there needs to be greater focus on improving ecosystem resilience.

Contingency planning

Once risks have been prioritised, effective contingency plans are required for high impact risks. The recent experience of *Hymenoscyphus pseudoalbidus* has demonstrated that the country nature conservation bodies and JNCC are capable of responding rapidly and effectively in an emergency, providing staff for rapid surveys, data analysis, development of management options and research funding. It would be helpful to set this out more formally in agreements, showing the ways in which resources can be deployed for particular risks. Of particular interest to JNCC is the Tree Health and Plant Biosecurity Expert Taskforce recommendation on preparedness and contingency planning. The Taskforce report states:

> "Preparedness requires an understanding of the data needs and of the range of possible data sources, as well as the capability for rapid analysis of these data sources. Adequate maps and related resources for identifying where key susceptible host species are located are required. Work by the National Biodiversity Network, for example, is already collating data in an easily accessible form."
>
> "Understanding data requirements is crucial to ensuring development and maintenance of appropriate surveillance and reporting. A 'catalogue' of recommended data sources should be developed that could be called on rapidly (see also Recommendation 7). The catalogue would state which data sources could be used for different types of host (native, non-native, street tree) and degrees of host rarity."

JNCC staff have offered to work with Defra to help produce such a 'catalogue' of recommended data sources for host species, including advice on data gaps and how such a catalogue should be used. In particular, there is a need for JNCC to review, alongside NIEA, the work that was done on mapping ash trees and associated biodiversity, to ensure that in future it will be possible to provide comparable maps for the whole of the UK to the same timescale.

Survey and detection

Official surveys for pests and diseases have normally been undertaken by the Forestry Commission and Fera Plant Health and Seeds Inspectors in England and Wales, DARD in Northern Ireland, and the Scottish Government Plant Health Service in Scotland. These surveys have particularly focussed on trade pathways and commercial premises, in addition to forestry. If more pests and diseases that are of relevance to native plant diversity are included within legislation, then there will be a growing need for surveys to detect these in the wider environment (and responsibility for undertaking such surveys will need to be determined). In particular, the draft new EU Regulation requires a regular cycle of surveillance to ensure that countries are remaining free from regulated pests. Whilst the design of a survey may be fairly pest-specific, it might be useful to consider the extent to which a general assessment of 'health' could be included within ongoing biodiversity monitoring and surveillance, and how effective this could be in providing a component of official survey.

Eradication and containment

Both eradication and containment actions require rapid implementation and effective compliance by stakeholders. A demonstration of effective eradication in the wider environment has recently occurred regarding the Asian Longhorn Beetle incursion in Kent. This eradication was probably successful because the costs of the eradication work and the implementation were not borne by the landowners, although landowners did not receive any compensation for the loss of trees and replacement costs. This contrasts with the

experience of containing *Phytophthora ramorum* and *P. kernoviae* on bilberry, where the lack of agreed mechanisms to support landowners with infected bilberry has delayed containment action. More comprehensive inclusion of pests and diseases of native plants in plant health legislation is likely to require further work to identify appropriate support mechanisms. Similar problems exist when dealing with invasive non-native species, and these issues are also likely to become more prominent as the EU legislation emerges. An exchange of experiences between plant health and invasive non-native species eradications could be helpful in identifying appropriate protocols. The problems are partly due to the shift in focus for plant health from largely private goods (commercial crops) to mixed public and private goods (biodiversity and associated ecosystem services). Where significant public goods are at stake it becomes more appropriate for government and government agencies to agree mechanisms to achieve effective and rapid eradication action, and if there are going to be legislative requirements for the country conservation bodies to undertake eradication work, these requirements will need to be adequately resourced.

Suppression and routine control

It has already been noted that there is a difference between the work of the Forestry Commission and other responsible bodies for plant health in whether work on suppression and routine control is included in scope. The focus on delivering healthy and resilient forests means that suppression and routine control are included within Forestry Commission work, and that native or widely established pests and diseases are also included (for instance Acute Oak Decline). The country conservation bodies are probably best placed to take a view on whether their work on plant health should include these in scope or not. Whilst the country conservation bodies and JNCC have a similar goal to the Forestry Commission in delivering healthy ecosystems, the much greater number of possible host plants and habitat types might make the broad scope unworkable, at least in terms of being the responsibility of staff considering plant health issues. Native pests and diseases are clearly of interest, but control of these might be considered a ‘business as usual’ aspect of habitat management, with the bulk of control achieved by reducing other pressures that might increase susceptibility. There should be a presumption against financial support for suppression and routine control unless there is a clear public interest.

Annex 4. Amphibian disease in the UK

Chytridiomycosis, a fungal disease, is a significant threat to amphibians. In some regions it is estimated that 50% of amphibian species and 80% of individuals disappear within six months of disease introduction. It is likely that human movement of wildlife has resulted in the pandemic of chytridiomycosis. The fungus has been reported in amphibians in the pet trade, food industry, zoo animals, laboratory animals, and those used as bio-control agents. It was first recorded in the UK in 2004; the potential impacts are unknown. In 2006 proposals were sent to the World Organisation on Animal Health (OIE) to list this disease as notifiable. The UK chytridiomycosis surveillance scheme began in early 2008, funded by Natural England and the Zoological Society of London. The surveillance scheme aims to see whether the disease remains isolated in a few populations or whether it is now widespread. If it has spread widely, eradication is unlikely to be viable. The GB Wildlife Disease Surveillance Partnership runs the Amphibian Disease and Mortality Project in conjunction with FrogLife which looks at the invasion dynamics and evolution of ranavirus in Great Britain and the epidemiology of *Batrachochytrium dendrobatidis* (chytrid fungus) in the UK, including its introduction, impact and spread. Under World Trade Organisation agreements, Great Britain is unable to restrict trade in amphibians based on presence of chytridiomycosis without enacting comprehensive eradication programmes. Disease management decisions rely on the surveillance results.