

PARDUS

The Insurers' View of Pest & Disease Risk

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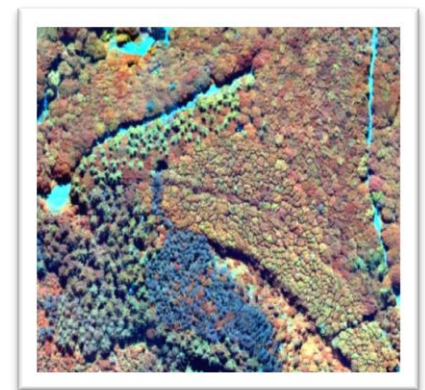
Pardus Underwriting Background

- Launched 2014
- An independent Managing General Agency
- 3 Business lines: US Property: US Trucking; **Global Forestry**
- Underwriting on behalf of Certain Syndicates at Lloyd's – Issue Lloyd's Policies
- Based in the City of London and quote, bind risks and produce policy documentation



Pardus Forestry Team

- The team have built an attractive book of forestry business for Lloyds since 2008 attracting clients from over 30 countries
- Wide expertise in crop and forest risk analysis and its insurance
- Analysis natural hazards impact on commercial forestry basis of cover & **pricing**
- Unparalleled experience of working in diverse territories and with diverse tree species
- Engaged with ForestRe Ltd. on new product development; research in to perils effects; Forest **Loss Assessment** through Remote Evaluation (**FLARE** project).



Agenda

1. Insurance of forests in UK & Ireland
2. Climate hazard risks Trends
3. Pest & Disease Risks – causes and impact on forest values
4. Outlook for Pest and Disease Insurance products
5. Next steps

1. Insurance Available for Forestry Perils

- Fire (Flexa; fire lightning explosion aircraft)
- Hurricane/Typhoon/Tornado/Localized Windstorm and Extra Tropical Storms
- Snow and Ice Storm
- Hail
- Flood
- Strike, riot, malicious damage and civil commotion (SRMDCC)
- Frost



1.1. Insurance Products

- Traditional Gross (full) Value Products: 1980s to today – almost universal
- **New Risk product: (2015)**

1.2. Insurance Programmes UK & Ireland

■ **Scottish Woodland**

- Gross Value product
- Total Insured values approximately £200m

■ **FIM Ltd.**

- Gross Value product
- Total Insured values approximately £350m

■ **UPM Tilhill**

- Gross Value product
- Total Insured values approximately £170m

■ **Independent Insurance 2015 Pardus**

- 2015 product
- Total Insured values approximately £70m since 1st April 2015
- Growers switching from other schemes

Clients

- Small owners
- Corporate owner
- Investment funds
- State owners

Sectors

- Pulp and paper companies
- Precious wood
- Investment / Pension

Values

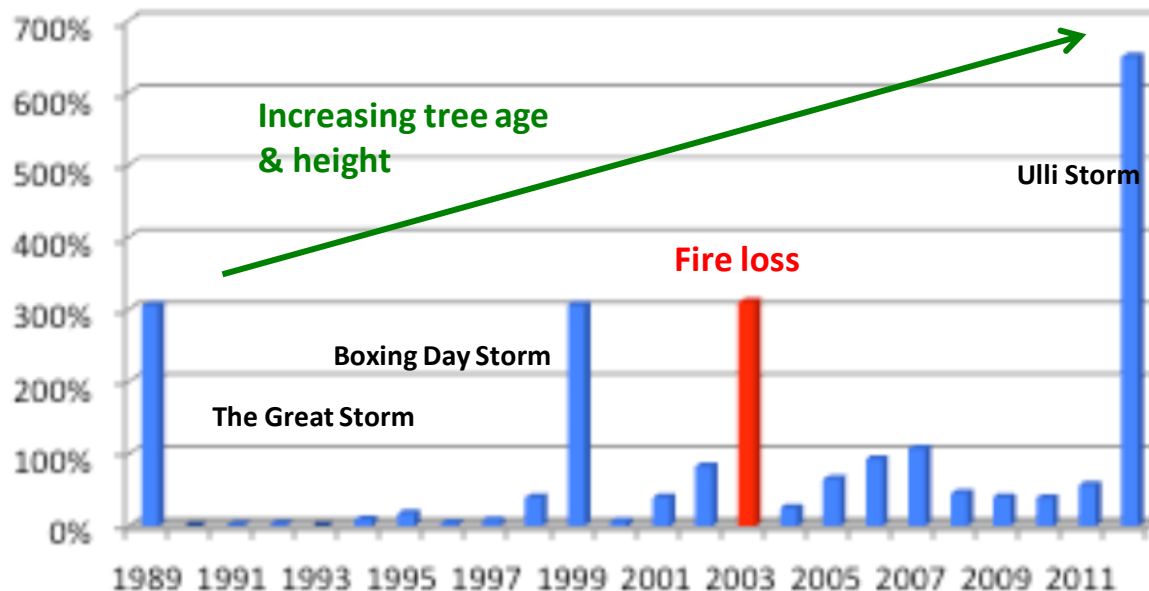
- £100K small owner upwards to
- Funds at £3bn

Peril coverage are the same between schemes; T&Cs differ.

2. Climate Hazard Risks

Loss experience of a major UK insurance programme

Ratio of Claims to Gross Premium (%)



Notes:

1. Ratio of claims to premiums is a function of price.
2. Insurance prices increased 25% after 2012
3. Increasing trend in losses due to wind.
4. This trend is directly related to the height of trees.
5. Pattern of wind loss reflects forest geographic spread
6. The fire loss in 2003 coincided with a strong El Niño cycle

2.1. Significant Windstorms 1987 - 2014

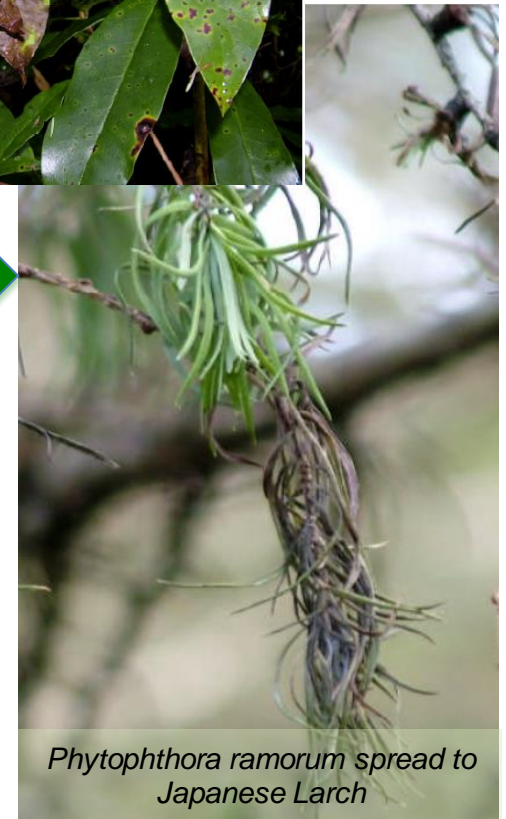
These are the approximate tracks of each major storm.



3. Pest & Disease

Features of an insurable Peril

- Fortuitous – occurrence and severity must be independent of the insured
- Has a start date and an end date and time
- Enough events have occurred in the past that frequency and severity data may be collated by location and a pure risk rate (%) calculated
- Value of the loss may be measured at the end



Phytophthora ramorum spread to Japanese Larch

3.1. Pest & Disease Insurability

Issues with Pest & Disease (P&D)

- A creeping risk from imperceptible, single tree to widespread infestation
- The cause of any outbreak is not well understood
- Total Losses if insured, could be truly catastrophic
- The rate of P&D spread can not be predicted nor its 'footprint'
- Thus there is no parametric indicator directly related to an outbreak such as rainfall for a given period, wind patterns
- A major catastrophic disease outbreaks May or may not affect your commercial species grown

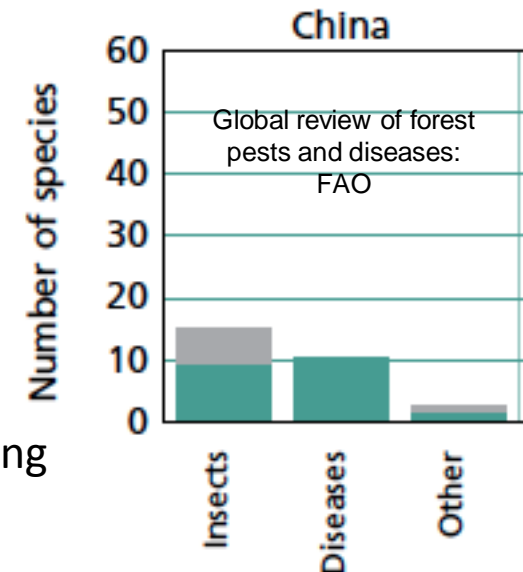


4. Outlook for Pest & Disease Insurance

Current insurance experience 1

4.1. China

- Outstanding P&D data (or so it seems)
- Exceptionally high excess applies (e.g. 300ha)
- Pay for the death of infected trees
- No science – just an entry ‘price’ to the Chinese province forest insurance business
- Premium nominal as infestation has to occur during policy period



4. Outlook for Pest & Disease Insurance

Current insurance experience 2

4.2. UK, New Zealand Commercial forestry

- Provide **Cost of Treatment** cover if infection found in forest after start of policy – We introduced in New Zealand programme 2014, & offer in UK 2015
 - This may be felling costs
 - Biological agents and their application
 - Other phytosanitary activities to mitigate further infection
 - P&D has to occur during policy period and not before
 - Disease status of the forests needs to be known at inception



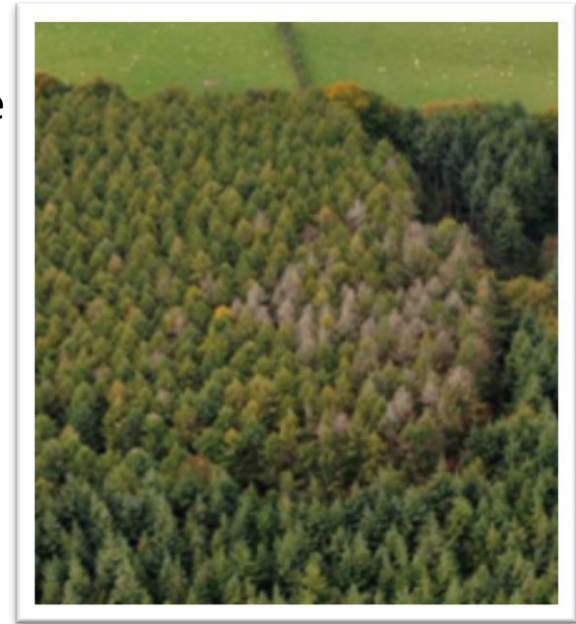
4. Outlook for Pest & Disease Insurance

Current insurance experience 3

4.3. Designing new products – ideas for setting a price

- a) If rate and pattern of disease spread data is available
 - possible to determine probability of infection depending on insured's location,
 - for any one initial infestation location in UK/ Europe / World?
 - E.g. Bee-hole Borer in Burma – probability of it infecting teak in Brazil?

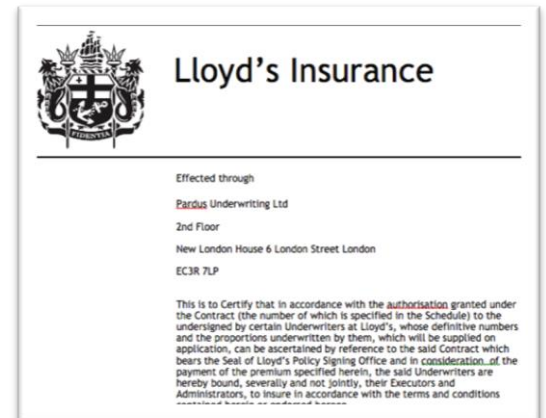
- a) Define an economic threshold of 'infestation' for commercial forests & species
 - Insure for infestation once exceeds this threshold
 - Need data on infestation levels in UK/Ireland forest from year to year by disease / pest type and from forest surveys / satellite images...



5. Next Steps for Pest & Disease Insurance

Data is a prerequisite for an effective insurance product

- a) Can we get frequency data for all serious forest economic P&D infestations?
- a) Do we have any rate of spread data – i.e. for the insured threshold idea?
- b) If we take all major forest diseases in the UK (may be the whole of Europe) can we get severity data
- c) Is there any quality substitute data that would be an indicator for P&D losses?



Armed with such data one can have a sustainable insurance product

PARDUS - FORESTRY CONTACTS

The Insurers' View of Pest & Disease Risk

THANK YOU

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