

Pine-tree Lappet Moth & *Hylobius* MSS

Forest Health Day 10 Sept 2009

Roger Moore

Northern Research Station

Forestry & Climate Change Centre

Forest Research, UK



Pine-tree Lappet Moth (*Dendrolimus pini*)- is one of the most serious defoliators in Europe

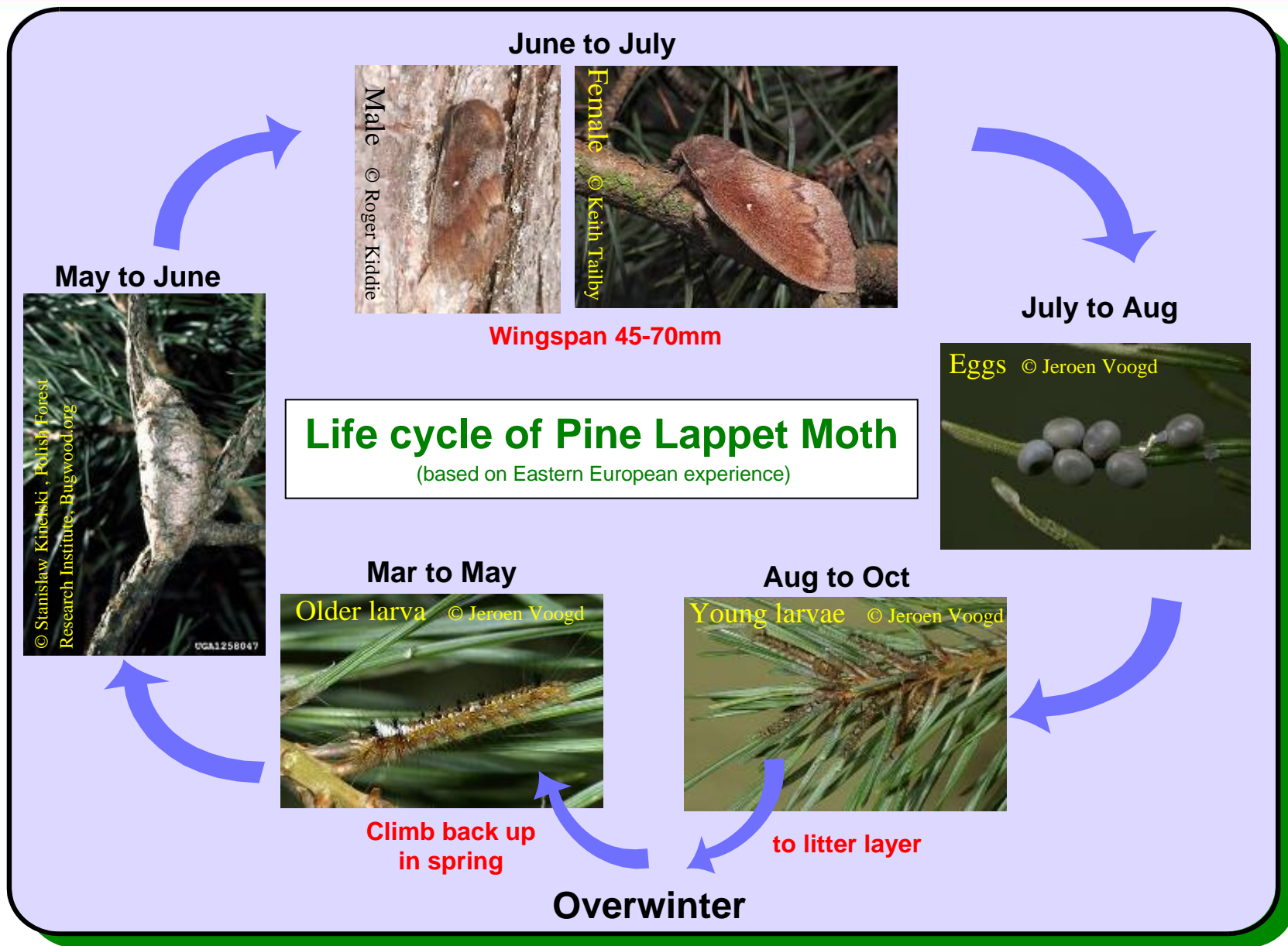


- A very damaging pest of pine forests in C&E Europe (not native to British Isles)
- Feeds on various *Pinus* species- causes severe conifer defoliation & death
- *D.pini* outbreaks can cover 000's ha of pine forests esp. Poland & Germany
- 233,000ha of Polish forests required **direct control** to reduce damage (1946-95)
- 170,000ha damaged in northern Germany (1782-92 & 1869-72)
- 83,700ha damaged in NE Germany (1993-96)
- Genus *Dendrolimus* (c 30 spp).....*many others v. damaging* -->
- The closely related *D.superans sibiricus* is a widespread pest of conifers in Asia
- 13- 32,000 ha fir, pine & larch attacked in South Korea (1984-86, 1996-97 & 2002)

Table 1. Pine moth outbreaks in Poland, 1791-1996

Years		Outbreak duration	Between Outbreaks
1791 - 1792	West Pomerania	2	69
1863 - 1872	from Saxony to Masuria	10	31
1905 - 1909	Zagan Forest	5	15
1925 - 1927	Pomerania and Mazovia	3	9
1936 - 1937	Kurp Forest, Tuchola Coniferous Forest	2	8
1946 - 1952	West Pomerania, Zagan Forest, Kurp Forest	7	3
1956 - 1957	Poznan and Tarnow provinces	2	6
1964 - 1975	from Notec Forest on the west to Augustow Forest	12	6
1982 - 1985	Pomerania and Zielona Gora province	4	6
1992 - 1996	Zielona Gora province, Tuchola Coniferous Forest	5	

Source: Sierpiska 1988





Pine Lappet Moth (*Dendrolimus pini*)

British Records (excl. Scotland)

- Until recently, only a rare migrant to south coast & Channel Islands (Jul/Aug)
 - Surrey- 1748
 - Norfolk- 1809
 - Isle of White- 1996
 - Cornwall- 2003
 - Kent- 2004
 - Guernsey- 1989 to 2004 (5 records)
 - Jersey- 2005 to 2008 (3 records)
- Migrants have all been male moths
- Larva on imported pine tree from Italy- bred out to produce a female (Essex 1999)

Pine Lappet Moth (*Dendrolimus pini*)

British Records (Scotland)

- First record in Scotland- 1 male moth caught in light trap (Inverness- Jul 2004)
- 2 male moths caught in light trap by amateur Entomologist (near Kiltarlity- Jun 2007)
- 6 male moths caught in light trap by the same Entomologist (near Kiltarlity - Jun 2008)
3x as many moths caught in 2008 cf 2007 using same technique/ location



- 2007 captures initiated a small FC pheromone trap survey in summer 2008
- 4 male moths caught in pheromone traps (3 near Kiltarlity, 1 at new site in Boblainy Forest)

Trees at a suspected infestation site nr Kiltarlity



- Between 2004-08: 13 males moths captured in Scotland
- 11 from one location (*almost all sampling at this site*)
- No obvious signs of damage yet at this or any other site

Why is it here? : (i) migrant males,

(ii) plant debris (on used forest machinery),

(iii) plants for planting

(iv) accidental or deliberate release



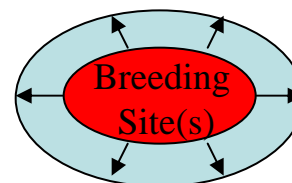
If only migrant males (no threat- no breeding popⁿ)

Surveys: to determine if PtLM has established

Survey Objectives in 2009

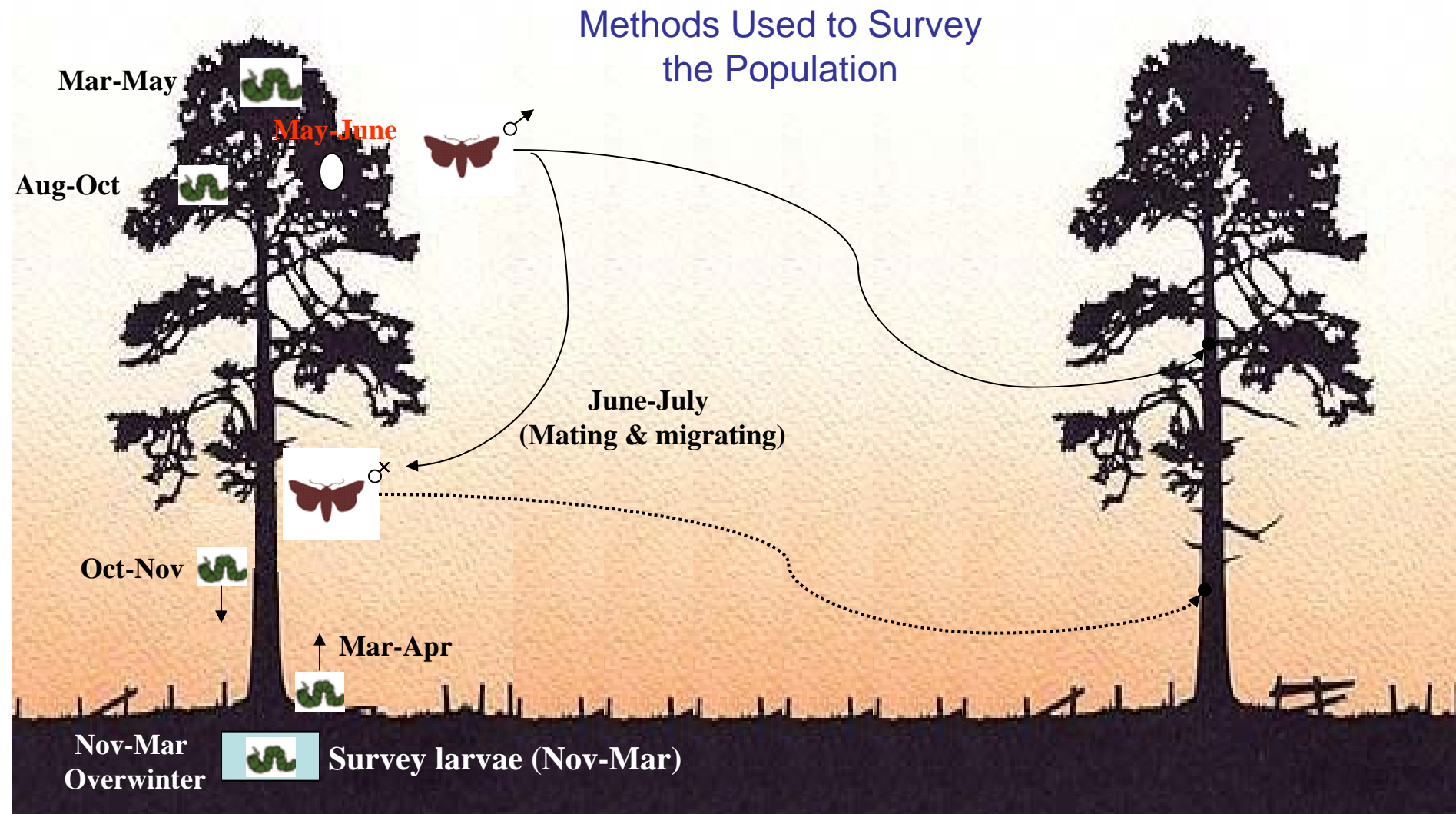
IF PtLM is Established in Scotland it is Important to:-

- Locate Breeding Site(s)
(indicated by all life stages esp. caterpillars)
- Determine the Current Extent of PtLM's Distribution
*(moths disperse from breeding sites to **expand** range)*
- Determine if PtLM is Native or Non-native
- Determine PtLM's Potential Rate of Spread



**How will our surveys fit into the
Pine-tree Lappet moths life cycle
& what have we
& what will we be doing?**

Methods Used to Survey the Population

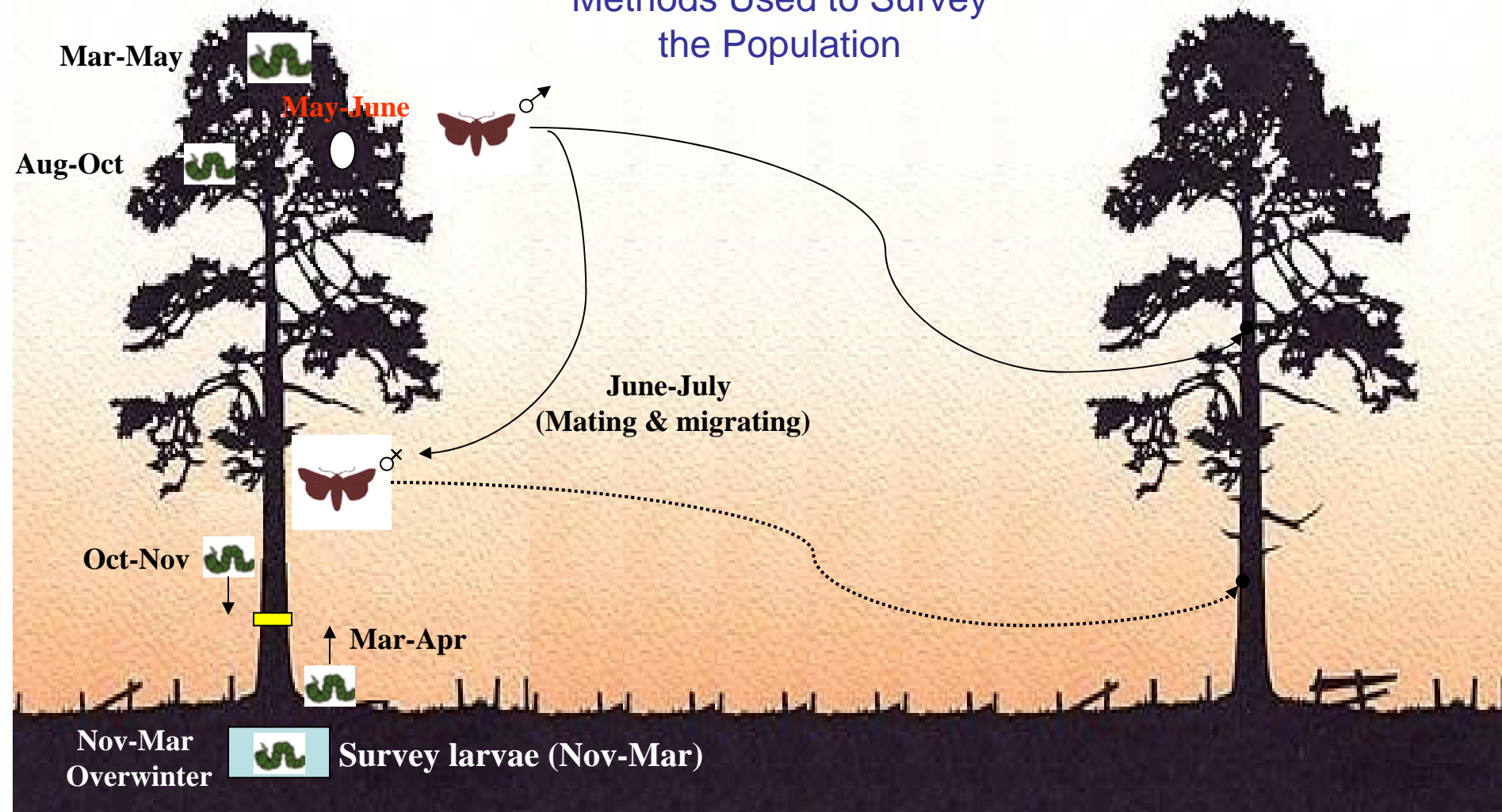


Surveys of 'Inactive' Larvae (Nov '08 - Mar '09)

**A preliminary survey
last winter did NOT locate
any over wintering larvae**



Methods Used to Survey the Population



Surveys of 'Active' Larvae (Mar-May 2009)

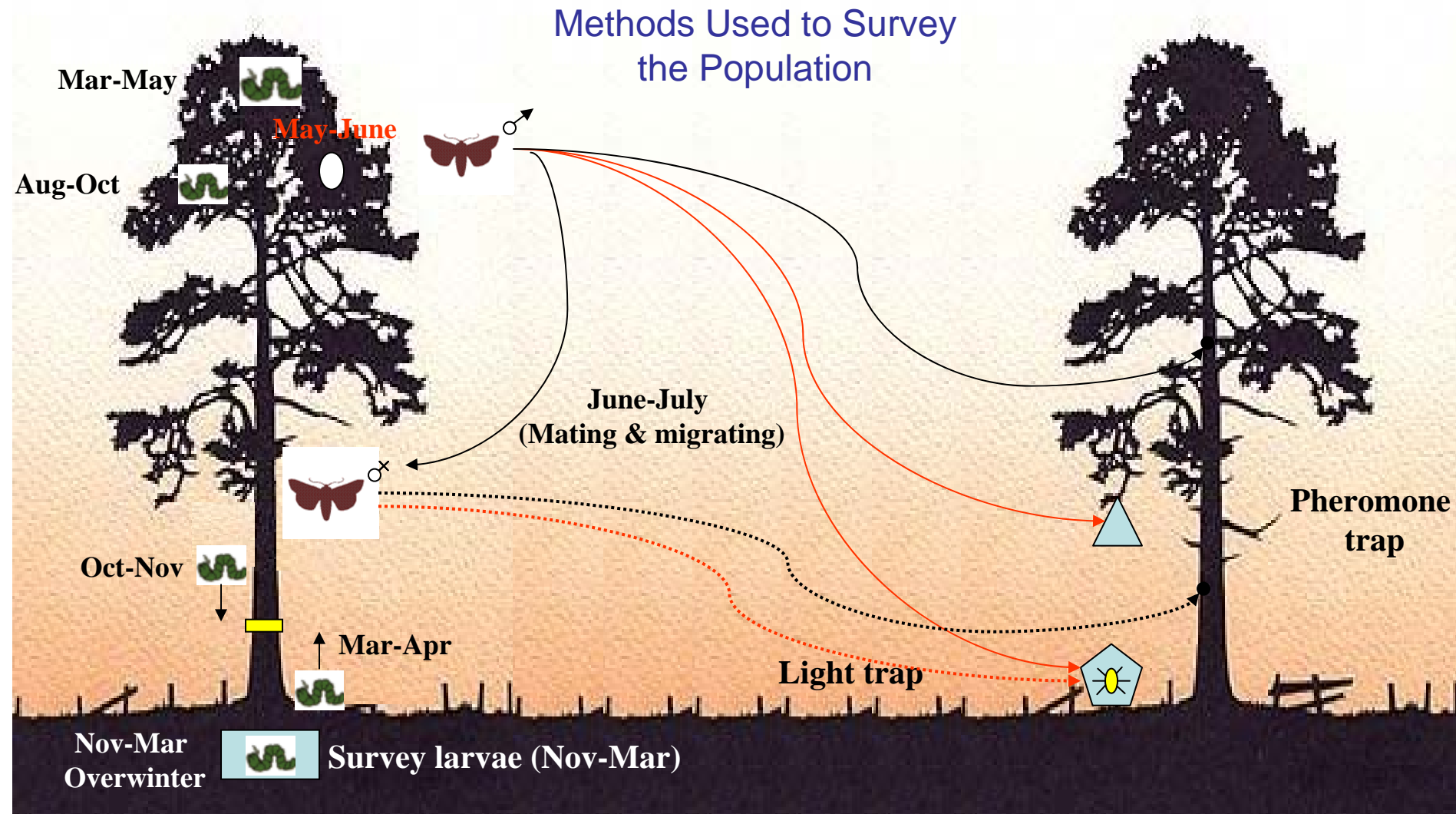
Glue bands to detect larvae moving back *up* into the canopy

1000 glue bands put out at 3 sites where moths previously caught



No caterpillars were found

Methods Used to Survey the Population



Surveys of Adult Moths (late Jun- early Aug 2009)



- An extensive FC pheromone trap network to catch male moths (47 sites & 282 traps)
continuous monitoring- 22 Jun to 7 Aug



- Light traps- put out by amateur entomologists, co-ordinated by FR & Plant Health (8 sites)
2 short monitoring periods- 22 to 26 Jun & 11 Jul

● Pheromone Trap Locations

★ Light Trap Locations

47 sites- up to 50km from
suspected area of infestation

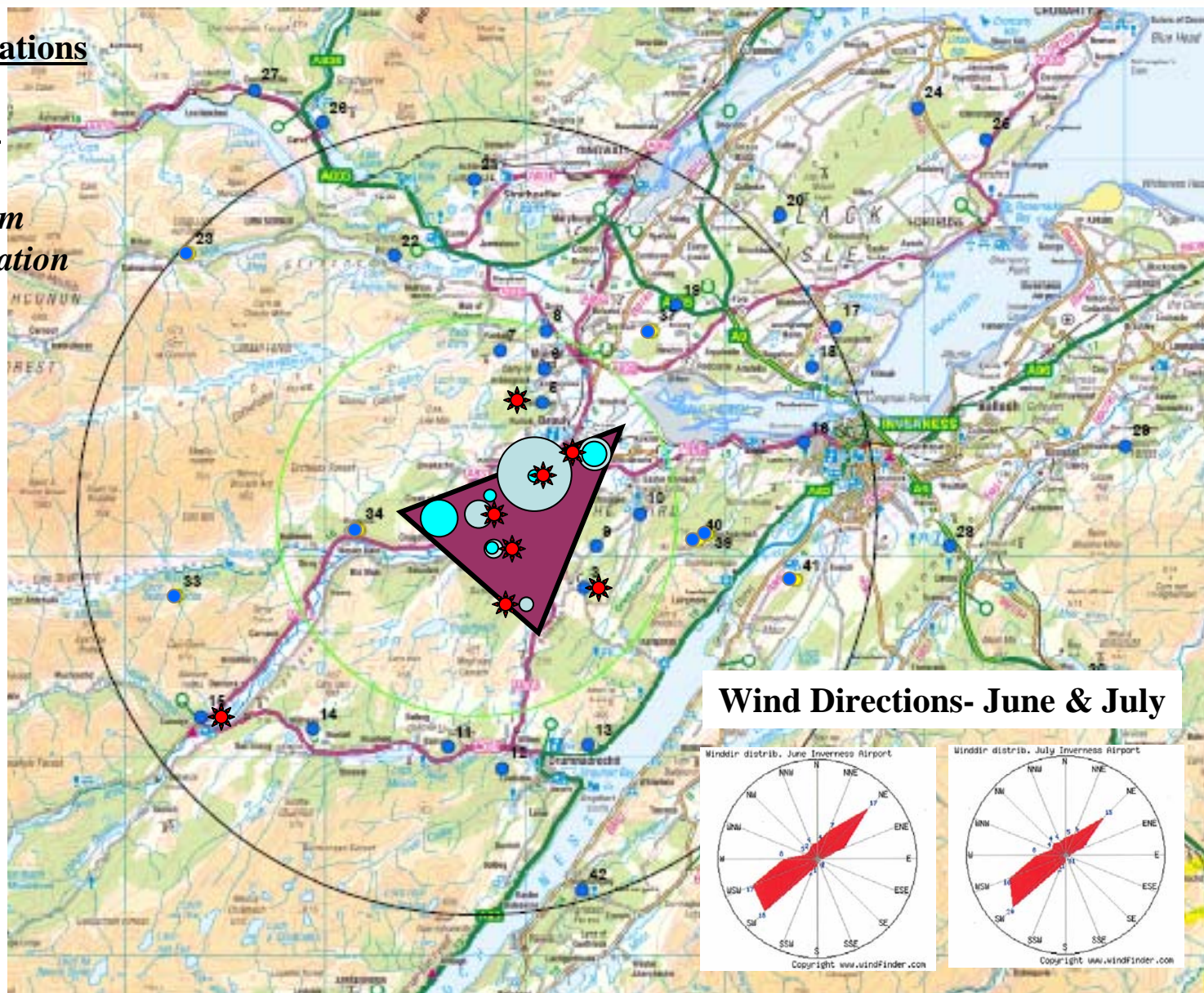
◀ Male captures-
90 in light traps
8 in pheromones

c. 1400ha forest

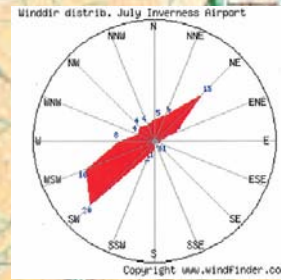
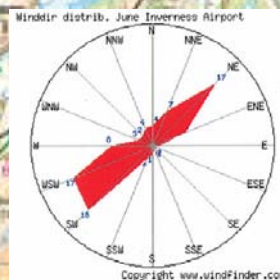
○ Nos. caught/ light
trap/ night

● Total no. caught
in pheromone traps

Captures at 7 Sites



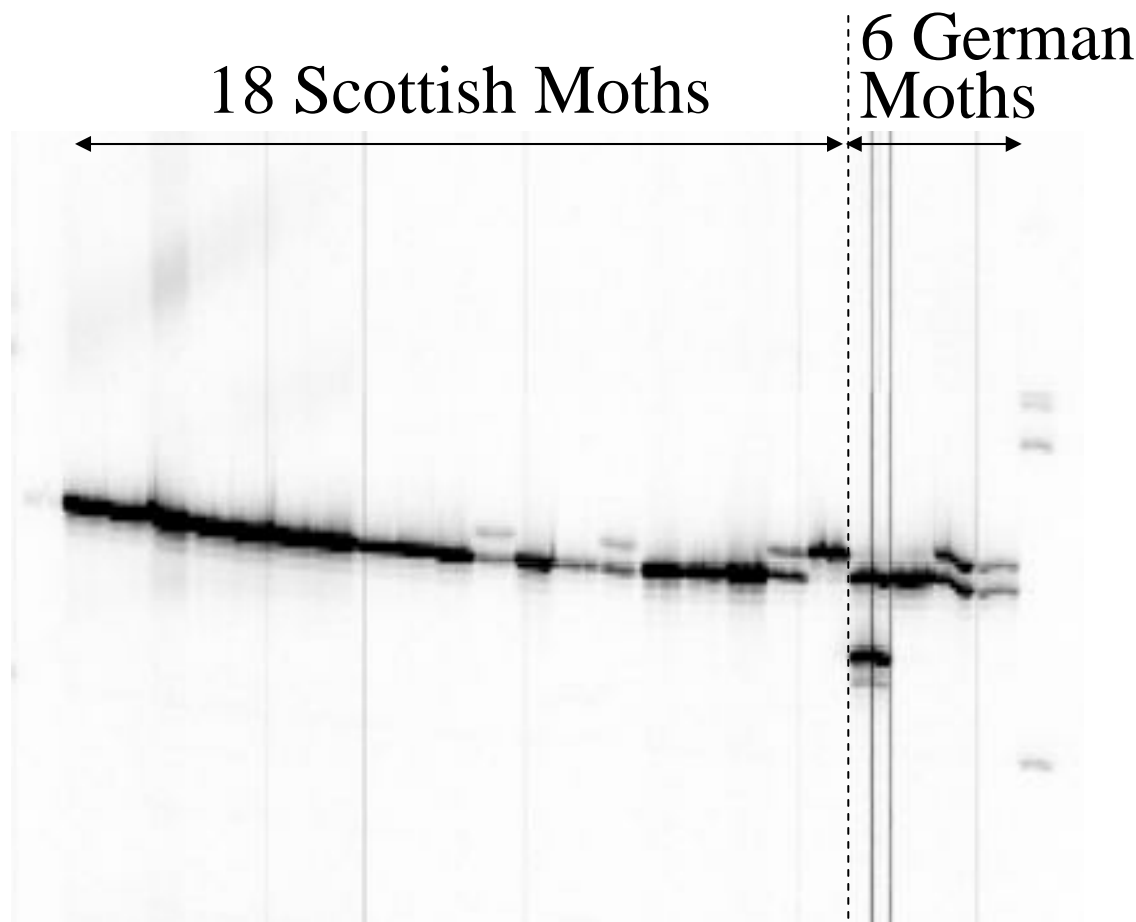
Wind Directions- June & July



Survey Objective Progress . ..and Next Steps

- Determine the Current Extent of PtLM's Distribution ✓
(*moths disperse from breeding sites to **expand** range*)
- Determine PtLM's Potential Rate of Spread **Ongoing**
- Determine if PtLM is Native or Non-native **Progress**

DNA Analysis



Survey Objective Progress . ..and Next Steps

- Determine the Current Extent of PtLM's Distribution ✓
(*moths disperse from breeding sites to **expand** range*)
- Determine PtLM's Potential Rate of Spread **Ongoing**
- Determine if PtLM is Native or Non-native **Progress**
- Locate Breeding Site(s) X
(*indicated by all life stages esp. caterpillars*) **Next Steps**

Next Step....Surveys of 'Active' Larvae (Sept-Nov 09)

Glue bands to detect larvae moving *down* trunks to overwinter

2000 glue bands to be put out on the 7 sites where adult moths caught



We will start putting these out next week- Sept 14th onwards

Glue bands will also have grease added to them

The *Hylobius* Management Support System

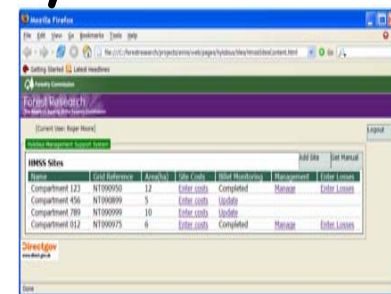


FSC Pesticide Derogation (15/6/09): Key Points Summarised

- Alpha-cypermethrin, cypermethrin & zeta- cypermethrin may be used for *Hylobius* control until 30/4/2011 as long as....
- Adopt the methods of integrated weevil management recommended by the FC & subscribe to the *Hylobius* Management Support System (MSS)
- Monitor the population densities of *Hylobius* and in the case of outbreaks use nematodes
- Limit the use of....and use insecticides only as a last resort

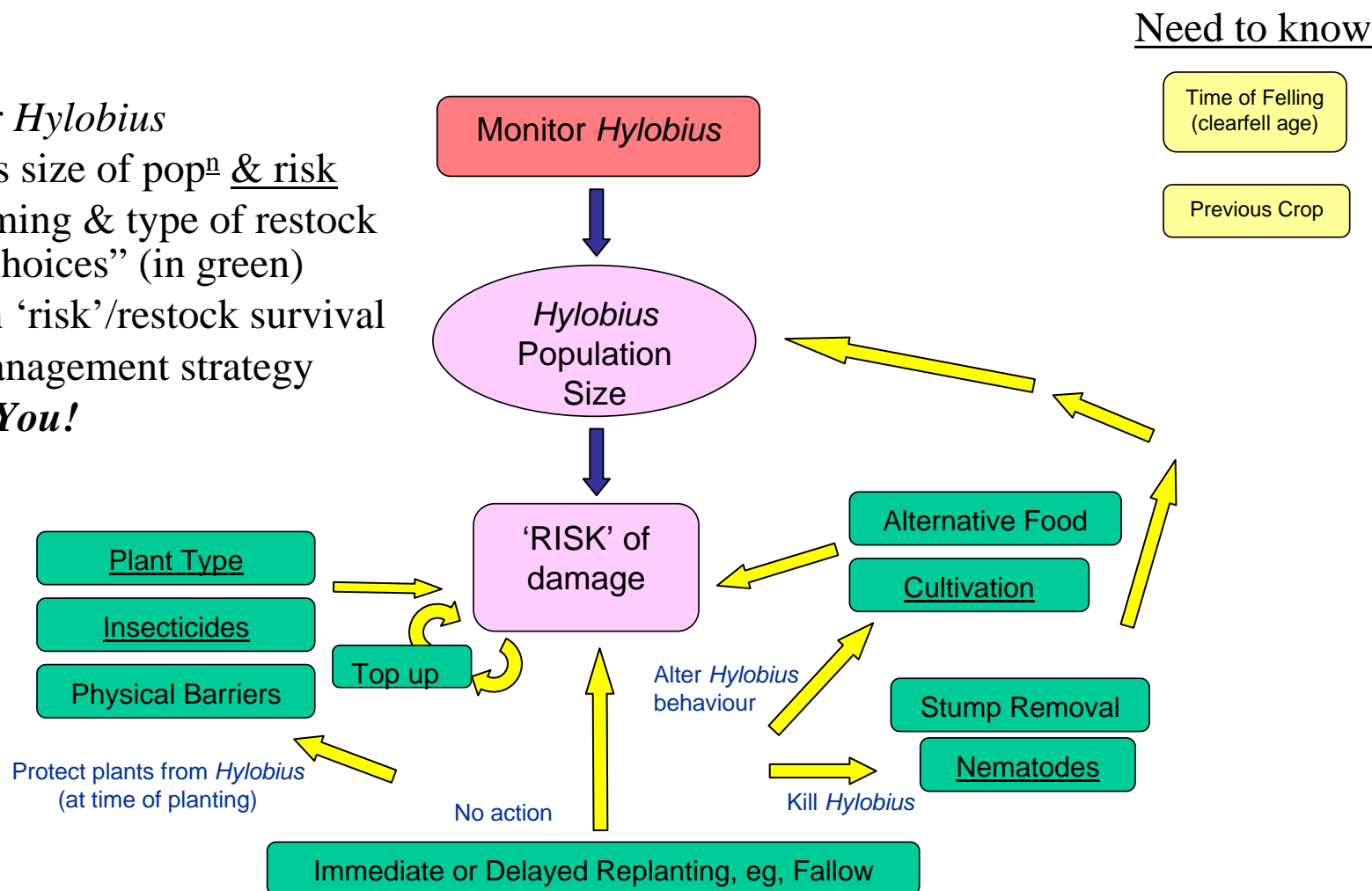
What is the *Hylobius* MSS?

- User friendly on-line web software.
- Simple system integrating all current knowledge on *Hylobius*.
- A Decision Support System for Foresters to predict attack by *Hylobius*
- Available to FE and non FC customers by low cost subscription..... after training.
- FE subs pre-paid by SLA with FR
(senior management buy-in)



What is the *Hylobius* MSS ?a 'site-specific' DSS

- **You..** Monitor *Hylobius*
- System predicts size of popⁿ & risk
- **You..** Alter timing & type of restock management "choices" (in green)
....see effect on 'risk'/restock survival
- Decide on a management strategy that's right for **You!**

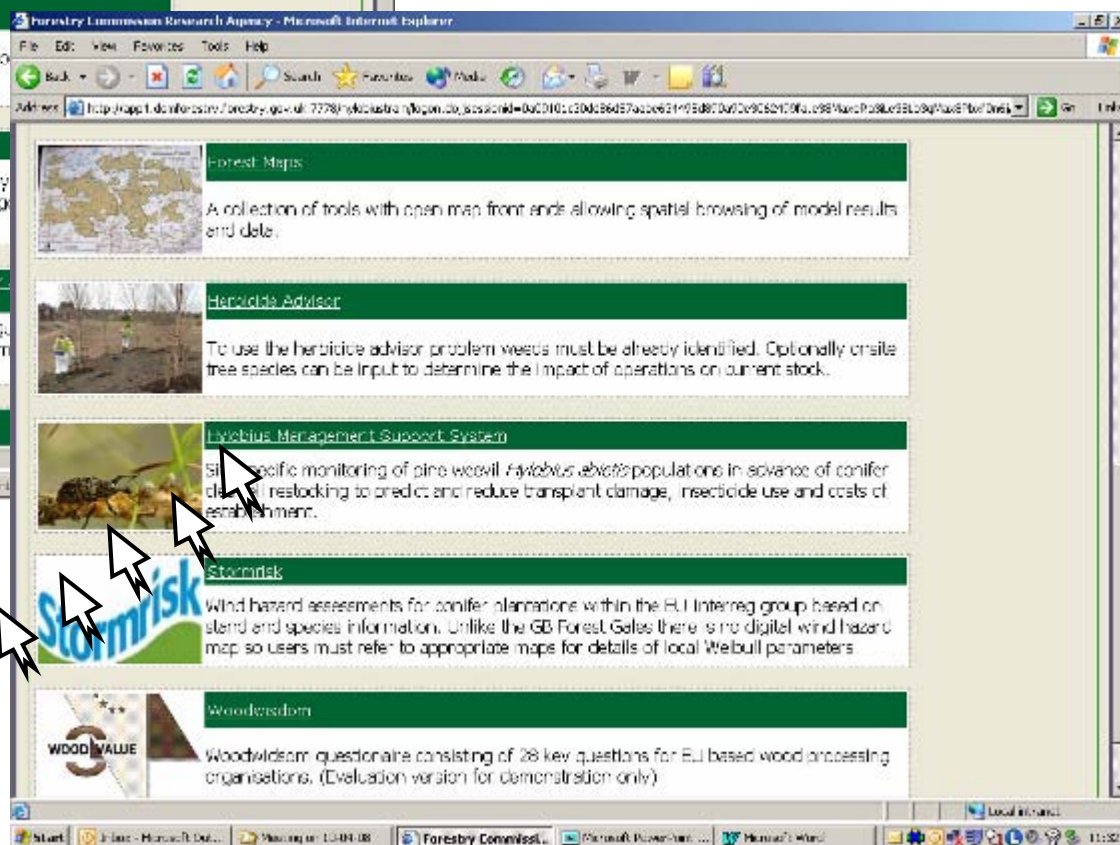
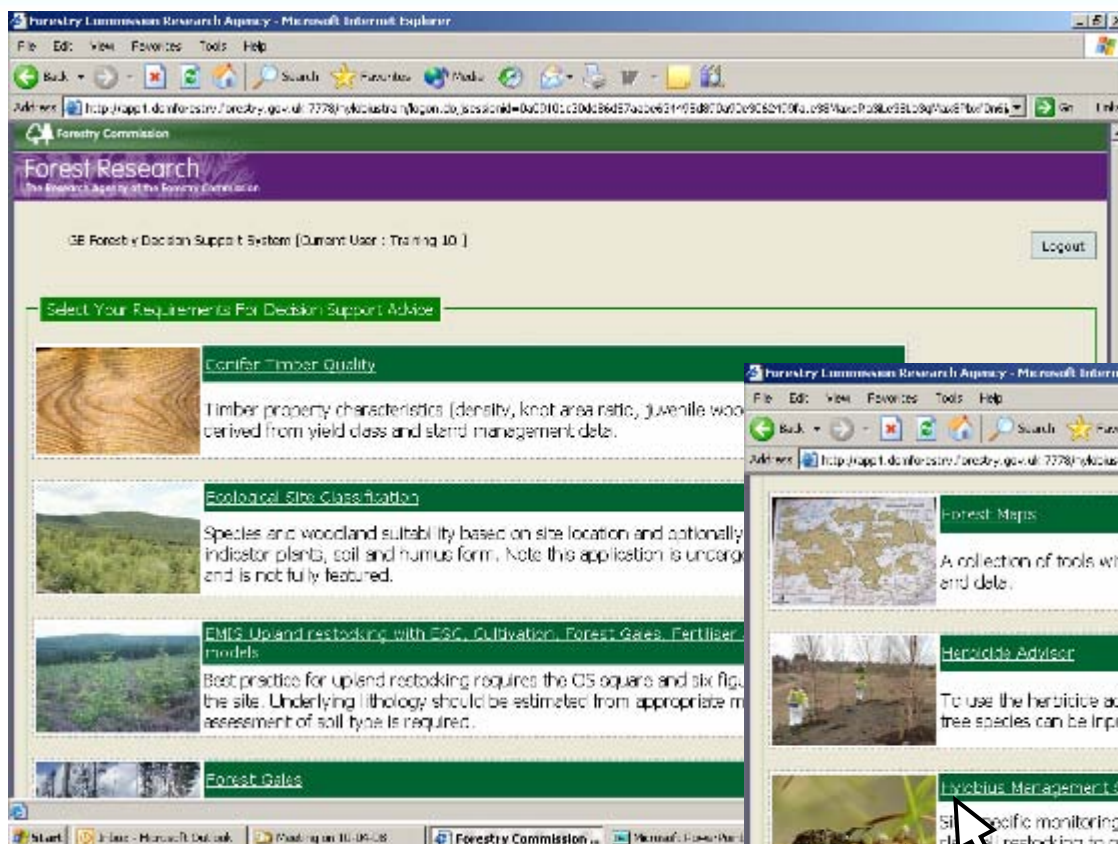


The Software

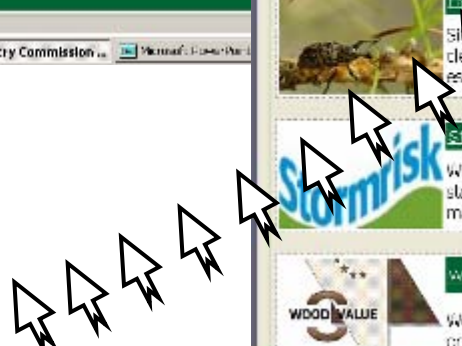
Once you have a username and password (issued after training).
Insert the following link into your web browser
to access the 'Login Screen'

<https://www.eforestry.gov.uk/forestdss/>

Program Selection Screen



Select '*Hylobius* Management Support System'



GB Forestry Decision Support System [Current User : Training 10]

[Logout](#)[HMSS](#) > Hylobius Sites

Hylobius Management Support System : Site Manager

[View/Edit Default Site Costs](#) | [Add Site](#)

HMSS Sites

Name/Coupe	Grid Reference	Restock Area(ha)	Felling Period	Site Costs*	Billet Cut & Site	Billet Monitoring	Management
Caplich Wood 1807	NC383014	18.0	01.01.2008-03.04.2008	Enter Costs	11.08.2008	Completed	Manage
Einig Wood 1765	NH367987	15.0	02.02.2008-26.05.2008	Enter Costs	14.08.2008	Enter Billet Count	-
Jock's Knowe 5457	NY013926	23.0	05.03.2008-19.06.2008	Enter Costs	Select dates	-	-
Muir Hill 5554	NY001970	26.0	04.02.2008-29.05.2008	Enter Costs	Select dates	-	-
Pumro Fell 5459	NY016922	14.0	12.02.2008-25.04.2008	Enter Costs	Select dates	-	-

* can override defaults and enter additional site specific establishment costs

The *Hylobius* MSS can determine the most effective restock management strategy to:-

- reduce insecticide use (pre-treatment & top-ups)
- improve the timing & prioritisation of top-ups
- reduce restock failure (beat ups)
- reduce overall costs of restocking

Protect your investment !!

Use the *Hylobius* MSS

Hylobius MSS Training Courses on FR 'Events'
pages- www.forestresearch.gov.uk/fr/INFD-5ZM9UN



Contact: roger.moore@forestry.gsi.gov.uk
www.forestresearch.gov.uk/hylobiusmss

Great Spruce Bark Beetle-

Dendroctonus micans

***Dendroctonus micans*- Update**

- Found in southern Scotland
- Towards the southern end of Newton Stewart FD
- 3 Sites, 2 blocks south of A74
- Probably present for 7-8 years
- *Rhizophagous* (the predator) already present but in low nos.
- *Rhizophagous* breeding programme over winter for spring release
- May effect trade from Mull of Kintyre to Ireland
- Abandonment of protected zone, control and other info at -
- <http://www.forestry.gov.uk/website/forestry.nsf/byunique/infd-6abl5v>
- Contact Nick Fielding if find infested trees
- Limited booklets available today