Food and Agriculture Organization of the United Nations

International Plant Protection Convention

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Plant Health, Climate and Biodiversity: Seeking solutions for Ash Trees

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International Plant Health Conference

PROTECTING PLANTS PROTECTING LIFE

Biodiversity Crisis

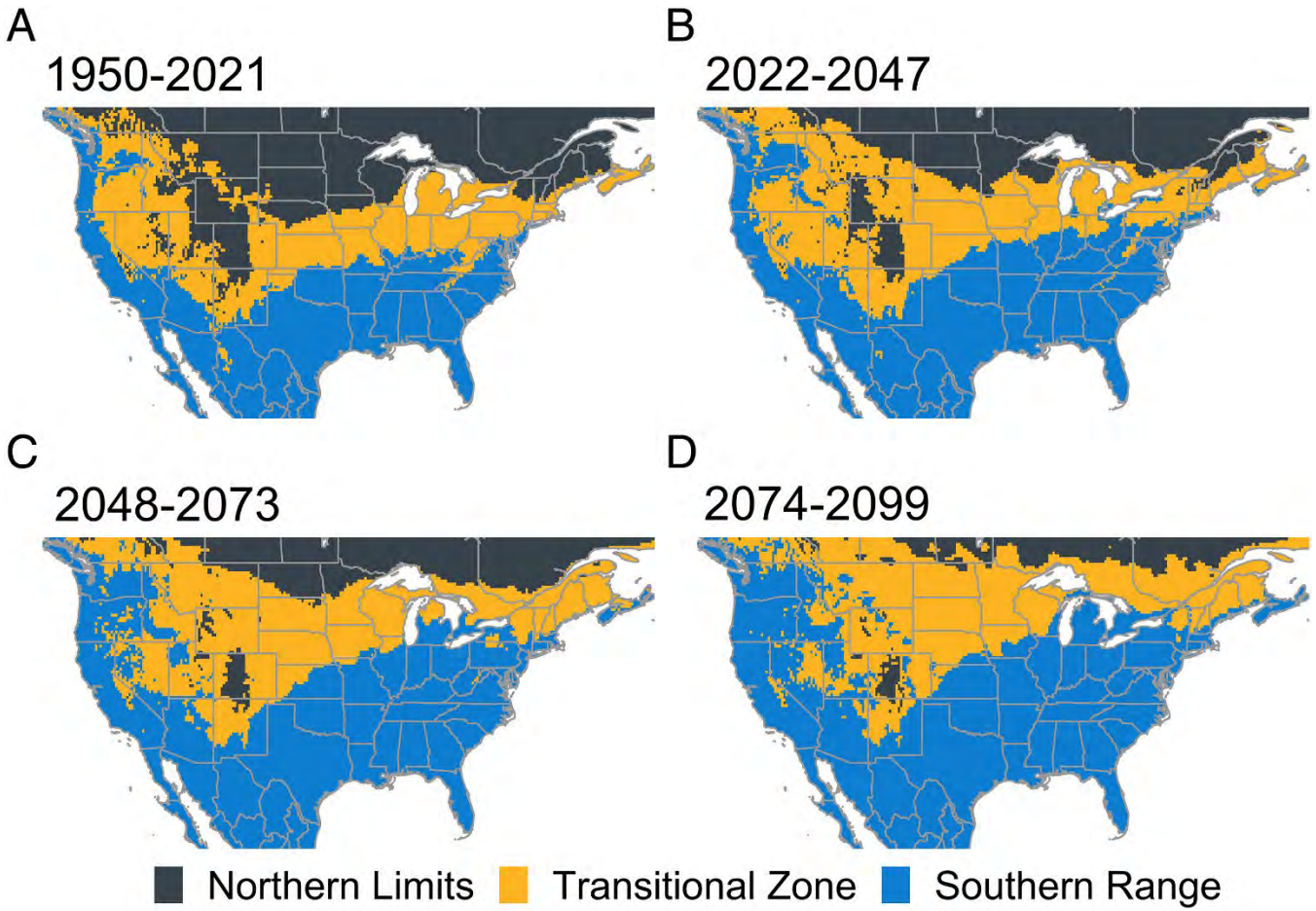
Climate Crisis

Plant Health Crisis

Climate

Plant Health

Corn earworm overwintering zone area 1950-2099

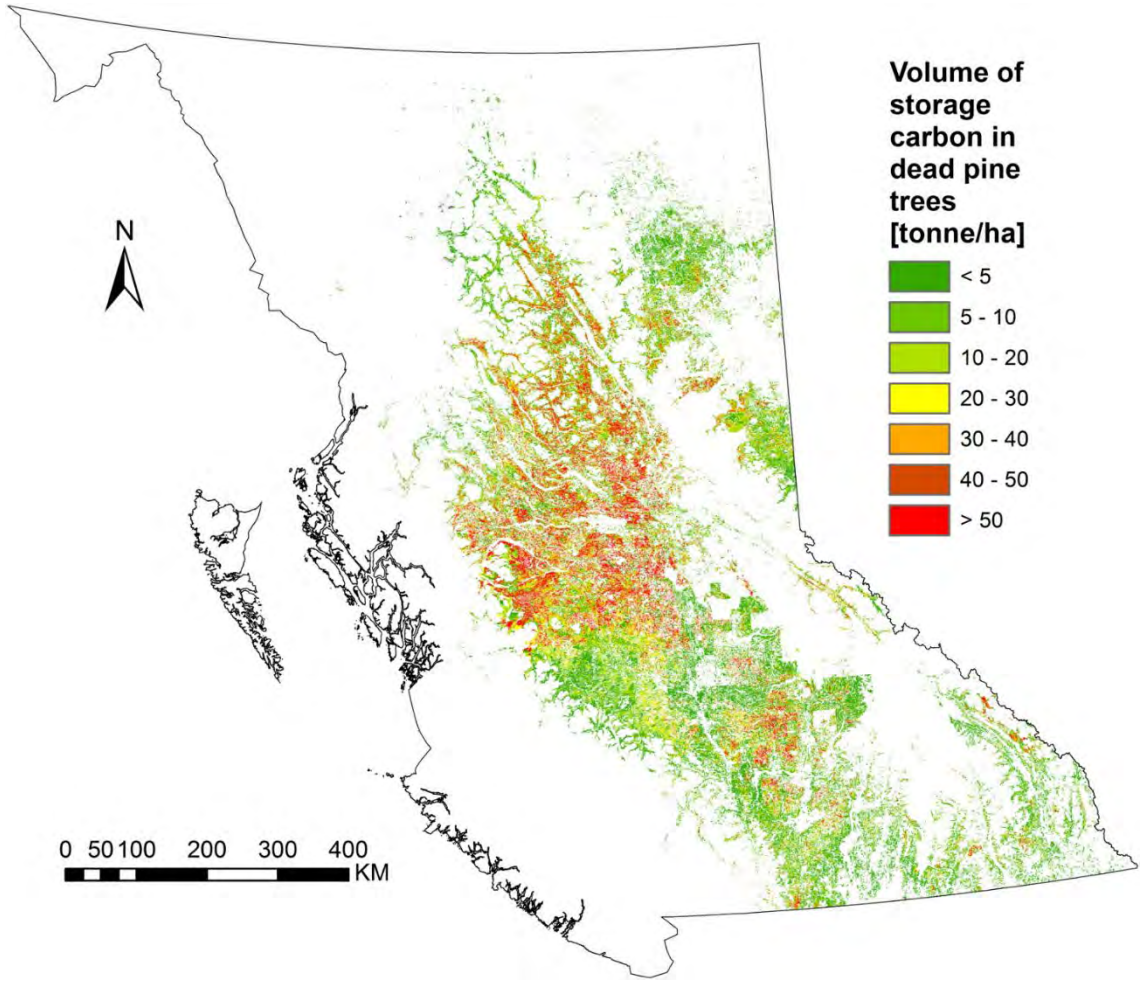


Lawton et al. (2022) PNAS

Climate

Plant Health

Mountain pine beetle (MPB) outbreak in Canada



Release of 263.73 Mt carbon to the atmosphere.

Comparable to 5.8 years of emissions from Canada's transport sector

Dhar et al. (2018) Scan. J .For. Res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Examples of plant pests and pathogens introduced by humans

Ash dieback

Emerald ash borer

Myrtle rust

Fall army worm

Red turpentine beetle

Tomato leaf miner

Chestnut blight

Dutch elm disease

Phytophthora spp.

Brown marmorated stink bug

Butternut canker

Colorado potato beetle

Cotton Bollworm

Spotted wing *Drosophila*

Asian longhorn beetle

Asian citrus psyllid

Papaya mealybug

Potato psyllid

Box tree moth

European wood wasp

Beech bark disease

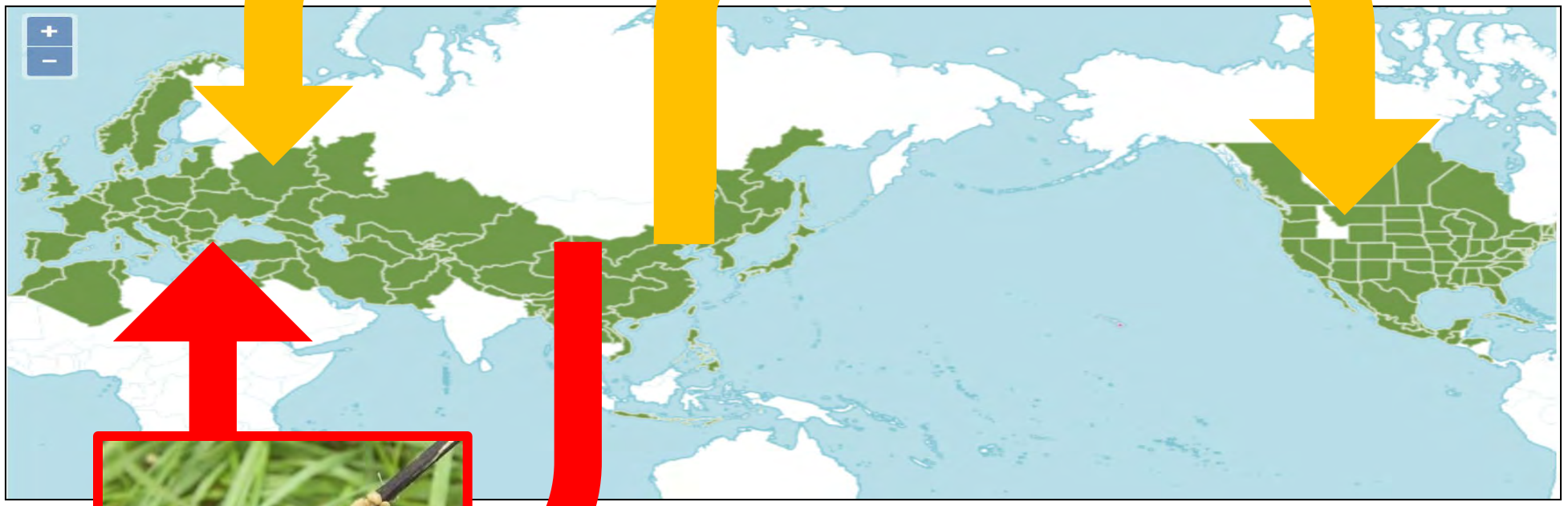
European gypsy moth

Hemlock woolly adelgid

Laurel wilt disease

The genus *Fraxinus* (ash trees)

Emerald ash borer



Ash dieback

Biodiversity: 955 species associated with UK ash

Table 2. Number of species and level of association with ash for six types of organism

	Level of Association					
Organism	Obligate	High	Partial	Cosmopolitan	Uses	**Total**
Birds			7	5	2	**12**
Mammals			1	2	25	**28**
Bryophytes		6	30	10	12	**58**
Fungi	11	19	38			**68**
Lichens	4	13	231	294	6	**548**
Invertebrates	30	24	37	19	131	**241**
Total	**45**	**62**	**344**	**330**	**174**	**955**

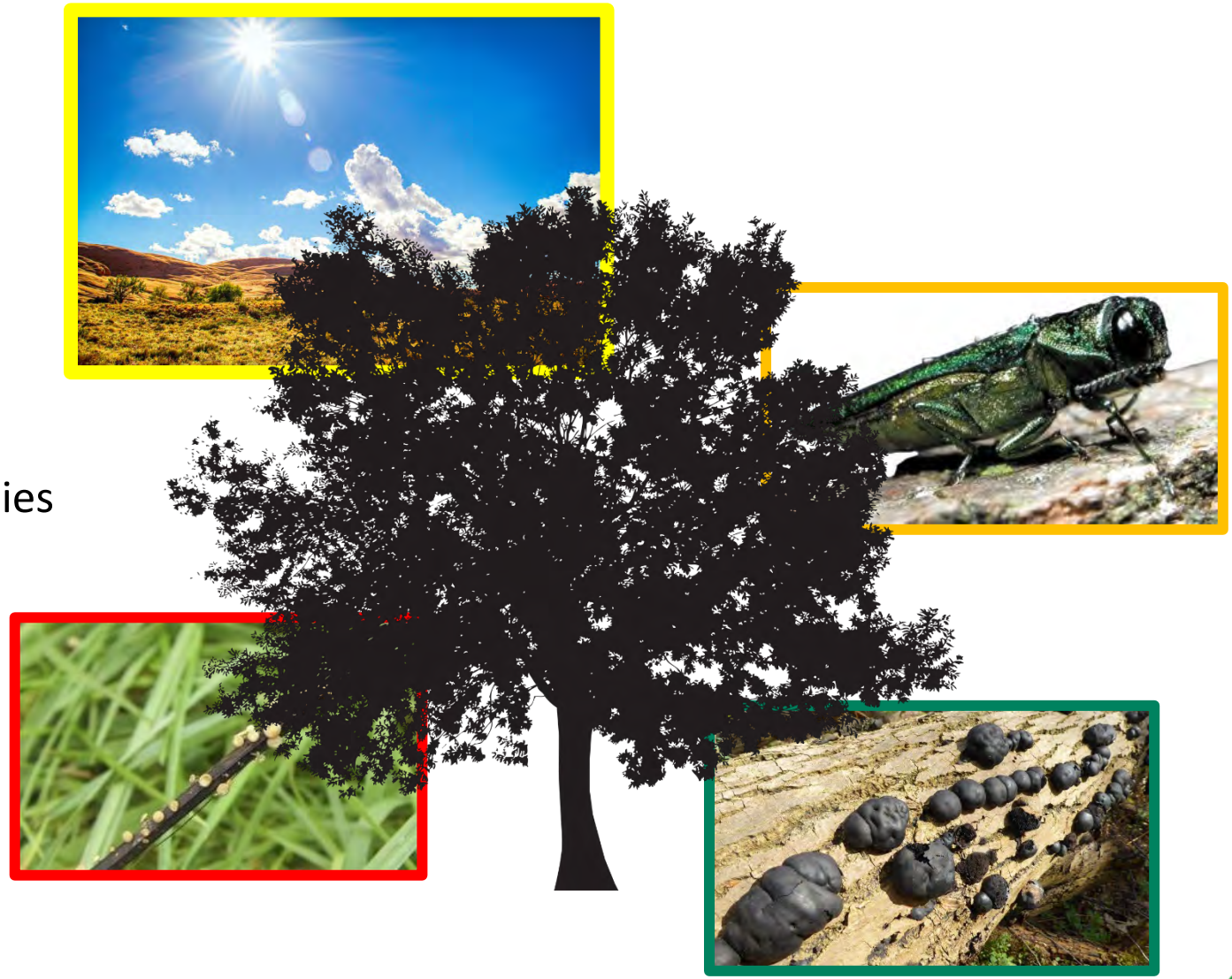
Level of association – five different categories of association describing the strength of dependency of species that use ash on ash trees. Five levels are: 'Obligate'= Unknown from other tree species; 'High' = Rarely uses other tree species; 'Partial' = Uses ash more frequently than expected; 'Cosmopolitan' = Uses ash as frequently, or less frequently than expected; 'Uses' = Uses ash but the importance of ash for this species is unknown.

Broome et al. (2014) Quart. J. For.

Future ash trees

We need ash trees adapted to:

1. A changing UK climate
2. An invasive Asian fungus
3. An invasive Asian insect
4. The support of UK native species



How can we do this?