IMPORTANT INFORMATION ABOUT THIS WORKBOOK
Risk Map Workbook

Please Select Your Area (e.g. Northeastern Area): Northeastern Area

There are four general worksheets followed by 15 empty model sheets. Fill out the empty sheets. If you need additional sheets, please start a new file to keep the number of model worksheets to 15 in each file.

If more than 1 file is needed, please update this secton with the correct numbers: This is file 1 of 1

Worksheets:

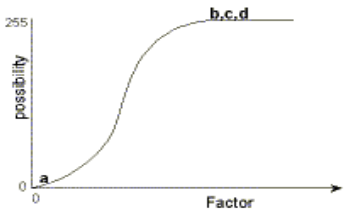
README	This worksheet
Curves	Curve graphics
Risk Rankings	Tool for assisting in developing scales
Citations	Listing and status of models for interior west
Base Sheet	Empty base sheet

Filling out the Model Worksheets

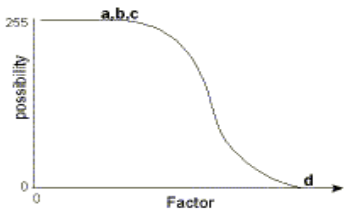
The area in blue on the top of the worksheet is for your use and is not printed. The format has changed slightly from the previous versions.

Risk Agent(s):	Common name of the risk agent, e.g. Spruce budworm
Host(s):	Host tree species, e.g. Balsam fir
Model Extent:	Extent, e.g. Northeastern or list certain ecoregions If the list of ecoregions is too long for this field, enter them in the comments and put a note in the model extent, such as "Certain IW ecoregions - see comments".
Max Percent Mortality:	Maximum threshold expected (in percent)
Susceptibility/Vulnerability	Enter the Rank for each (or one if only one used) and the Weights will calculate.
Criteria	Enter the criteria following the same rules as the previous worksheets. *Note for rare exceptions (such as the inverse S-3 and S-4) where two sets of A,B,C,D risk values are needed for one criteria, delete the "Criteria X" from the cell. You will have to renumber the remaining criteria.
Criteria Rank/Weight	Enter the Rank value, the Weight will calculate automatically.
Constraints	List any model constraints, if applicable
Comments	Area for information not covered in other fields
Citations	Enter the full citation details (publication, communication, model developer, etc) on the **Citations** worksheet and assign a number. On the model spreadsheet, enter the citation number in this area. Two example citations are shown, replace with your citations.
Model Certainity	Select the model certainity/source from the dropdown list.

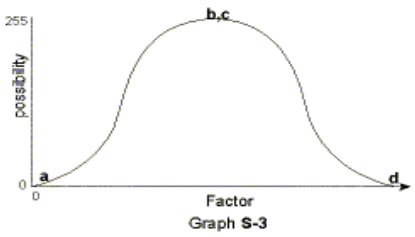
Sigmoidal Membership Functions



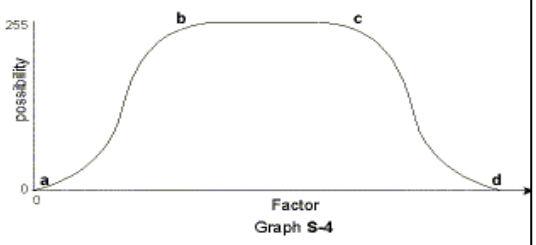
Graph **S-1**



Graph **S-2**

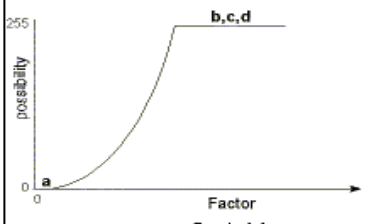


Graph **S-3**

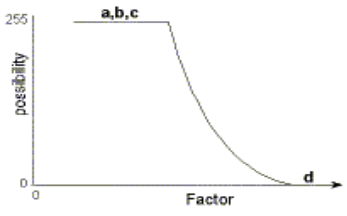


Graph **S-4**

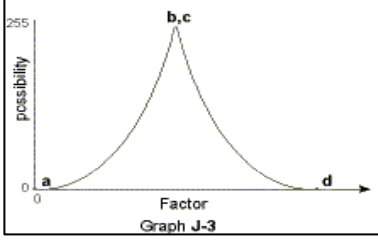
J-Shaped Membership Functions



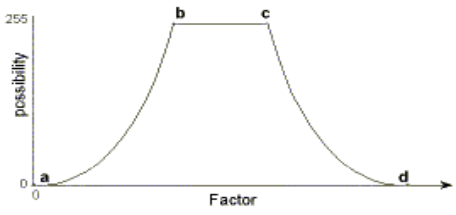
Graph **J-1**



Graph **J-2**



Graph **J-3**



Graph **J-4**

Risk/Mortality Scaling Tool

To obtain eleven class values (for risk values, mortality thresholds), enter the risk begins and risk peaks values. Equal interval classes will be calculated.

	Input Value	Classes	Scaled Value
Risk Begins (0):	***20***	20	0
		28	1
		36	2
		44	3
		52	4
		60	5
		68	6
		76	7
		84	8
		92	9
Risk Peaks (10):	***100***	100	10

Citation List - Northeastern Area

No.	Citation
1	

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Ash (Hardwood) Decline	**Host(s):**	Ash Species
Model Extent:	Easterm U.S.	**Max Percent Mortality:**	50%

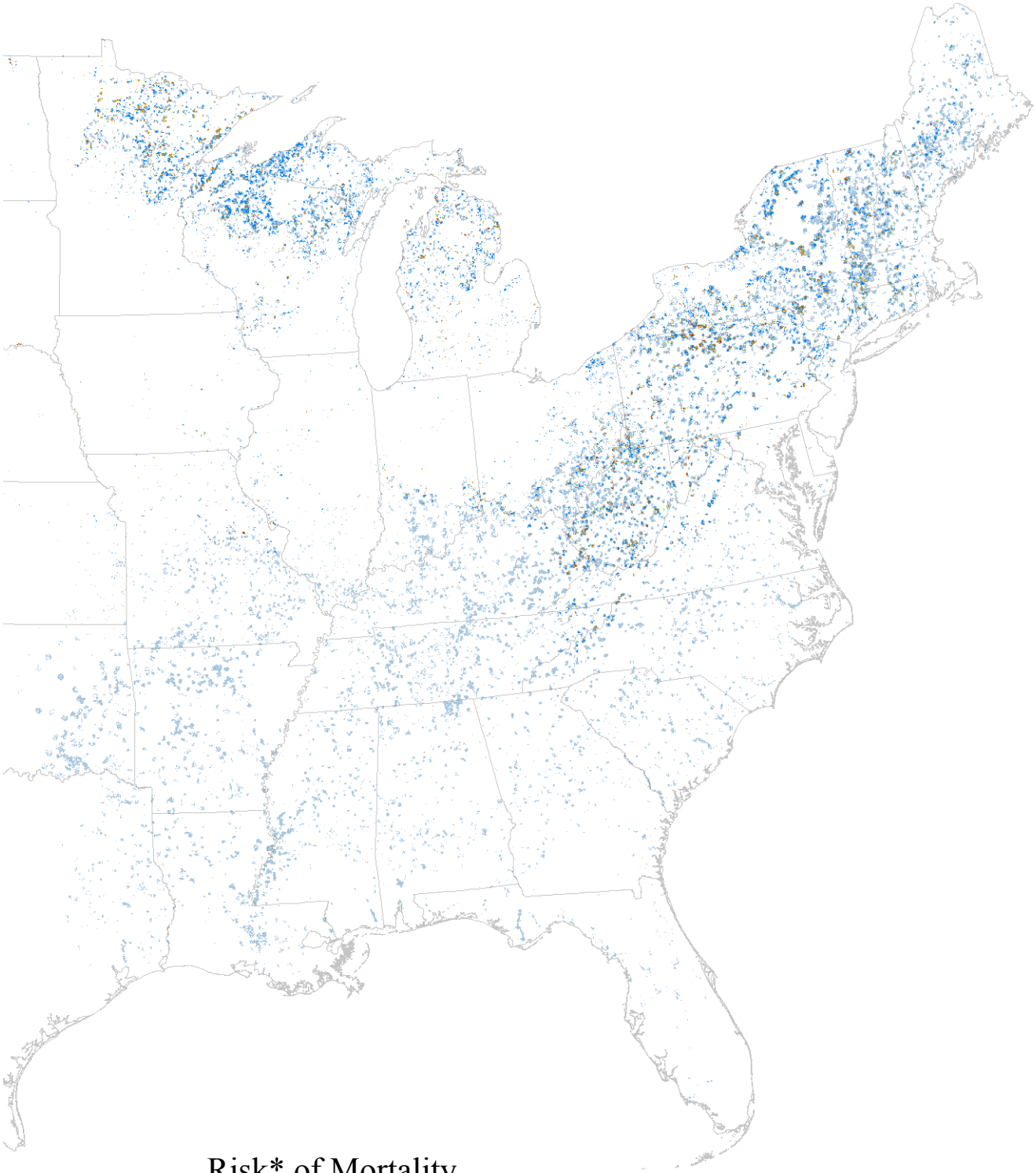
Susceptibility

Rank/Weight 1	50%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		% Host	10	90	90	90	J 1	1	50%
Criteria 2		Aspect	113	180	240	360	S 4	1	50%
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight 1	50%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Soil Dryness	0	45	45	85	S 5	1	25%
Criteria 2		Annual Precipitation	9	13	13	46	J 2	1	25%
Criteria 3		Host DBH	4	16	16	16	J 1	1	25%
Criteria 4		Pest Range	0	0	10	10	J 2	1	25%
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Select Ecoregions	**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Ash (Hardwood) Decline on Ash

Mortality Ceiling of 50%

0 50 100 200 300
Miles

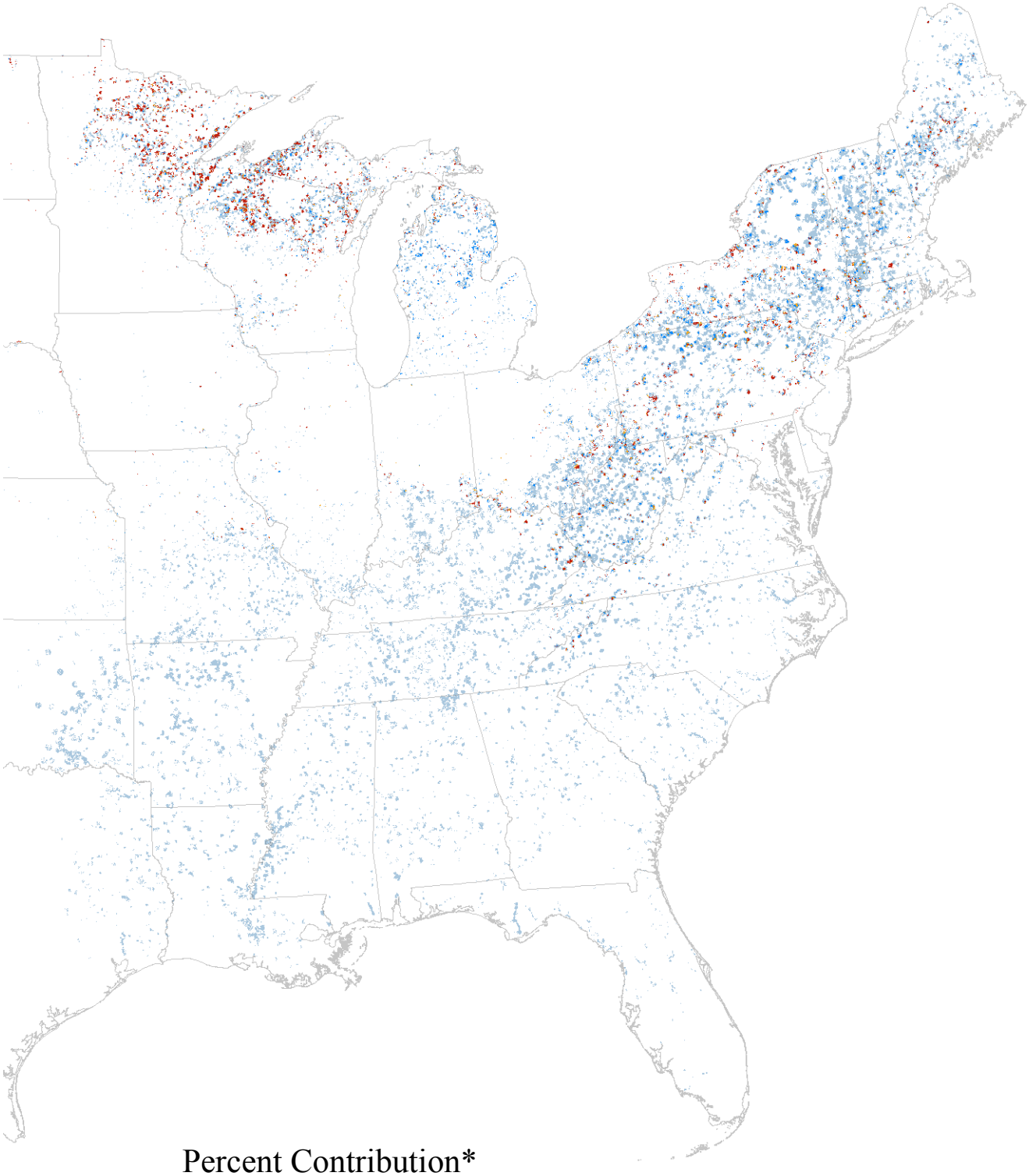
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Ash (Hardwood) Decline on Ash

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

0 50 100 200 300

Miles

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Asian Longhorned Beetle (ALB)	**Host(s):**	Red and Sugar Maple
Model Extent:	Northeastern Area	**Max Percent Mortality:**	75%

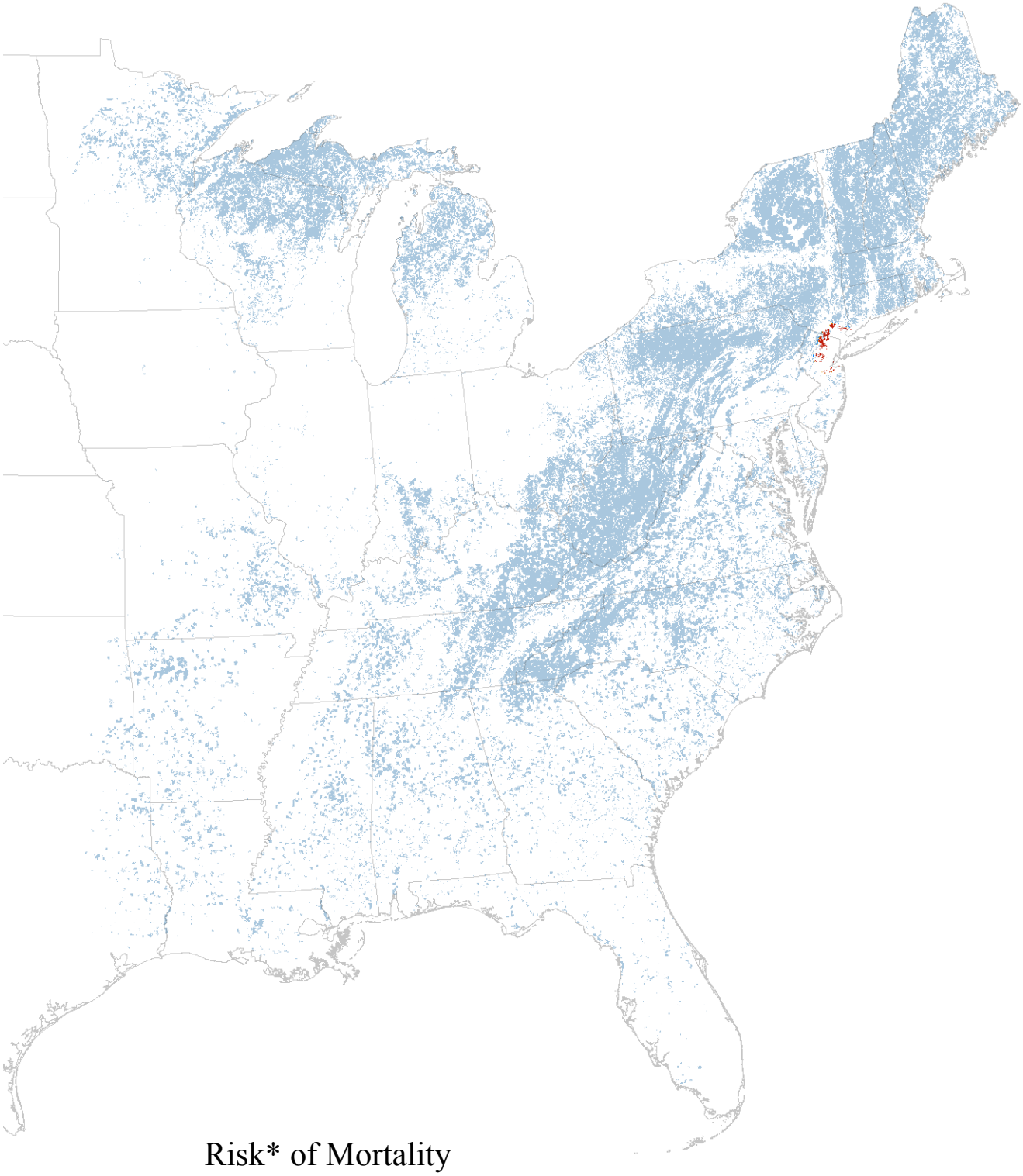
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host BA	0	1	1	1	J-1	1	50%
Criteria 2		Distance from Pest	0	0	5	15	S-2	1	50%
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
0	0%								
Criteria 1									
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Asian Longhorned Beetle on Red and Sugar Maple

Mortality Ceiling of 75%

0 50 100 200 300

Miles

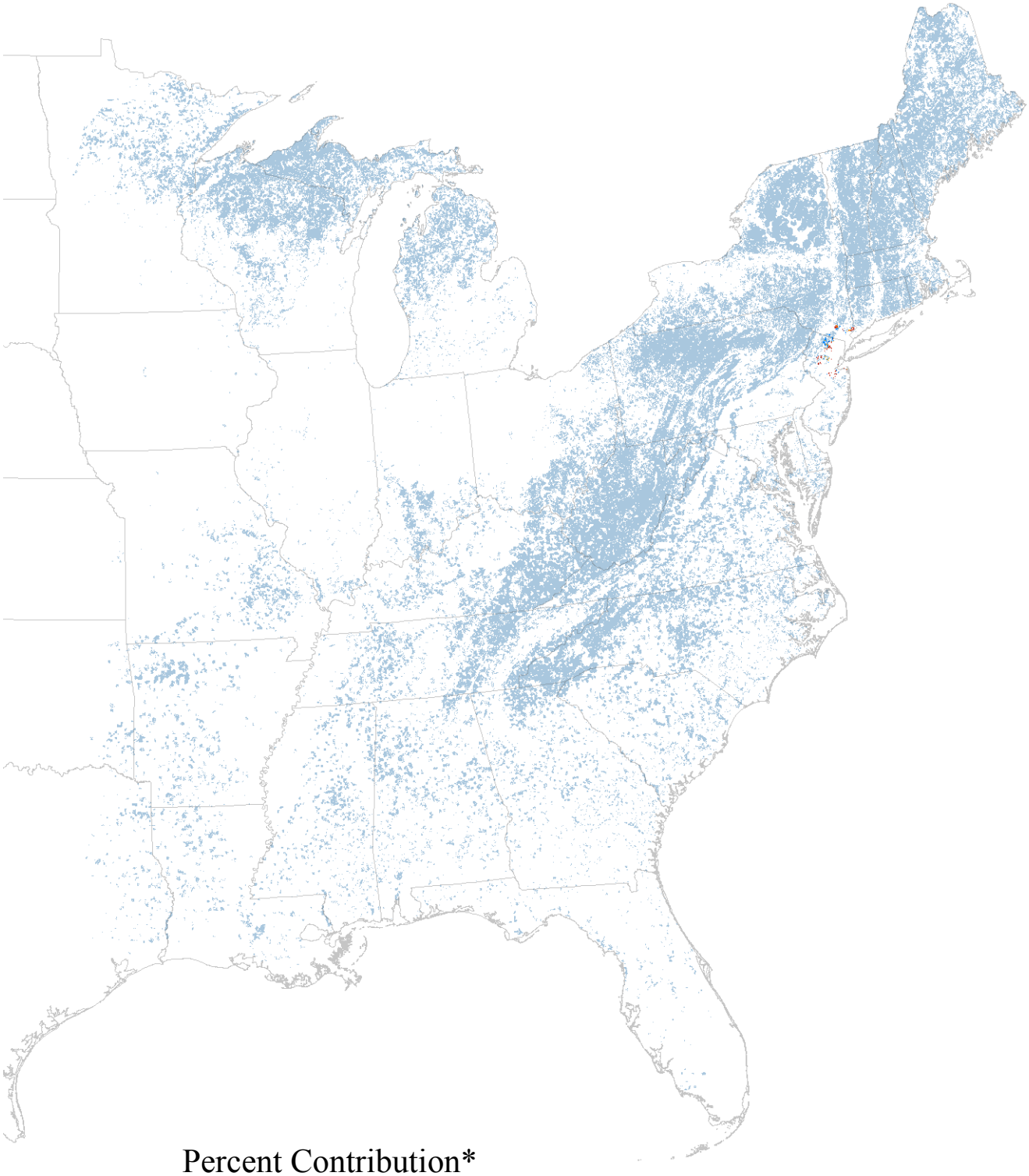
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Asian Longhorned Beetle on Red and Sugar Maple

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Balsam Woolly Adelgid (BWA)	**Host(s):**	Balsam and Fraser Fir
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	50%

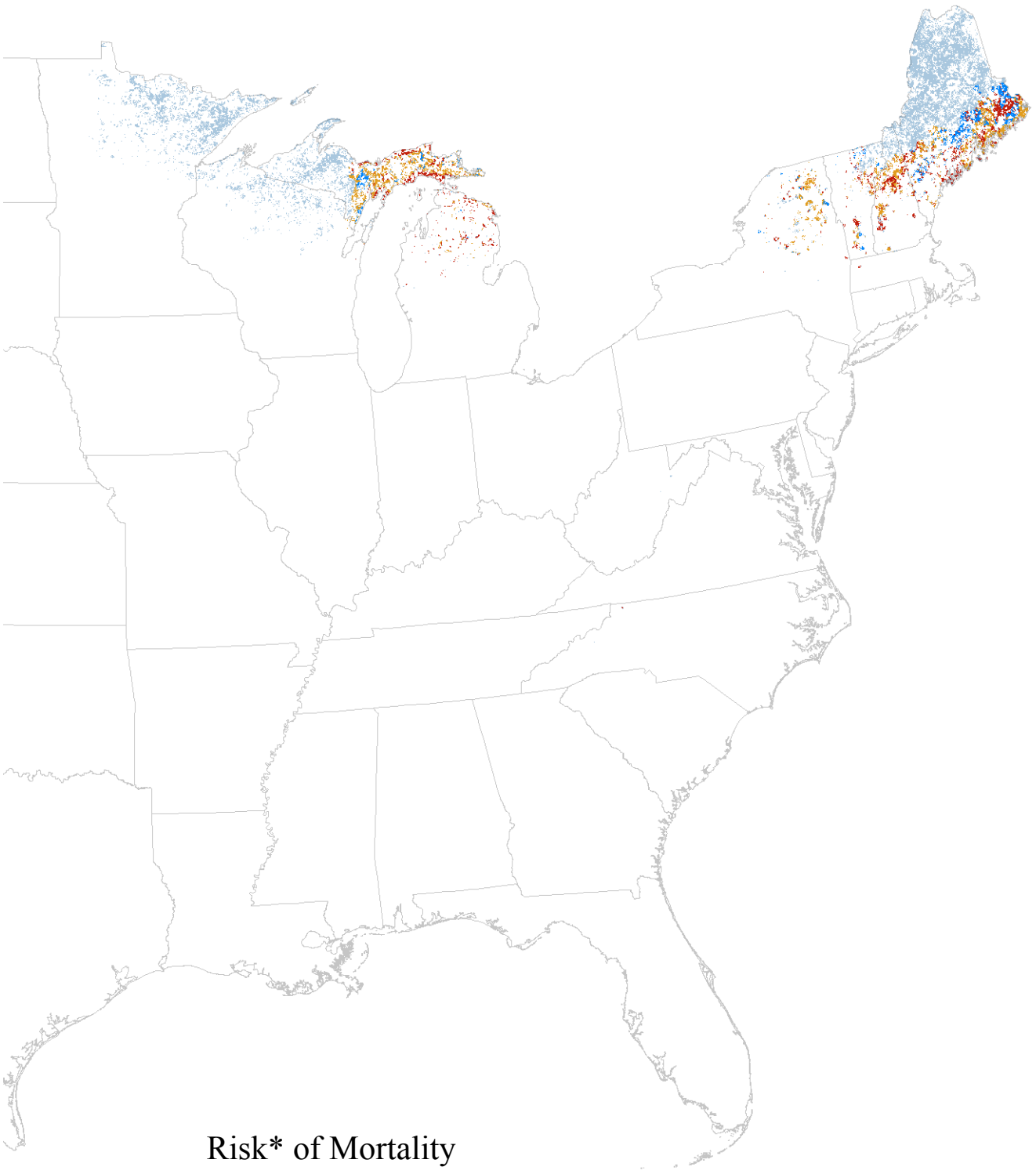
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Soil Dryness Index	0	45	45	85	S 5	1/3	40%
Criteria 2		Avg Min. Jan. Temp. (F)	2	8	8	8	S 1	1/2	60%
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
	0%								
Criteria 1									
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Contain risk within BWA ecological zone and where balsam and fraser fir are present	**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality
Balsam Woolly Adelgid on Balsam and Fraser Fir
Mortality Ceiling of 50%

0 50 100 200 300
Miles

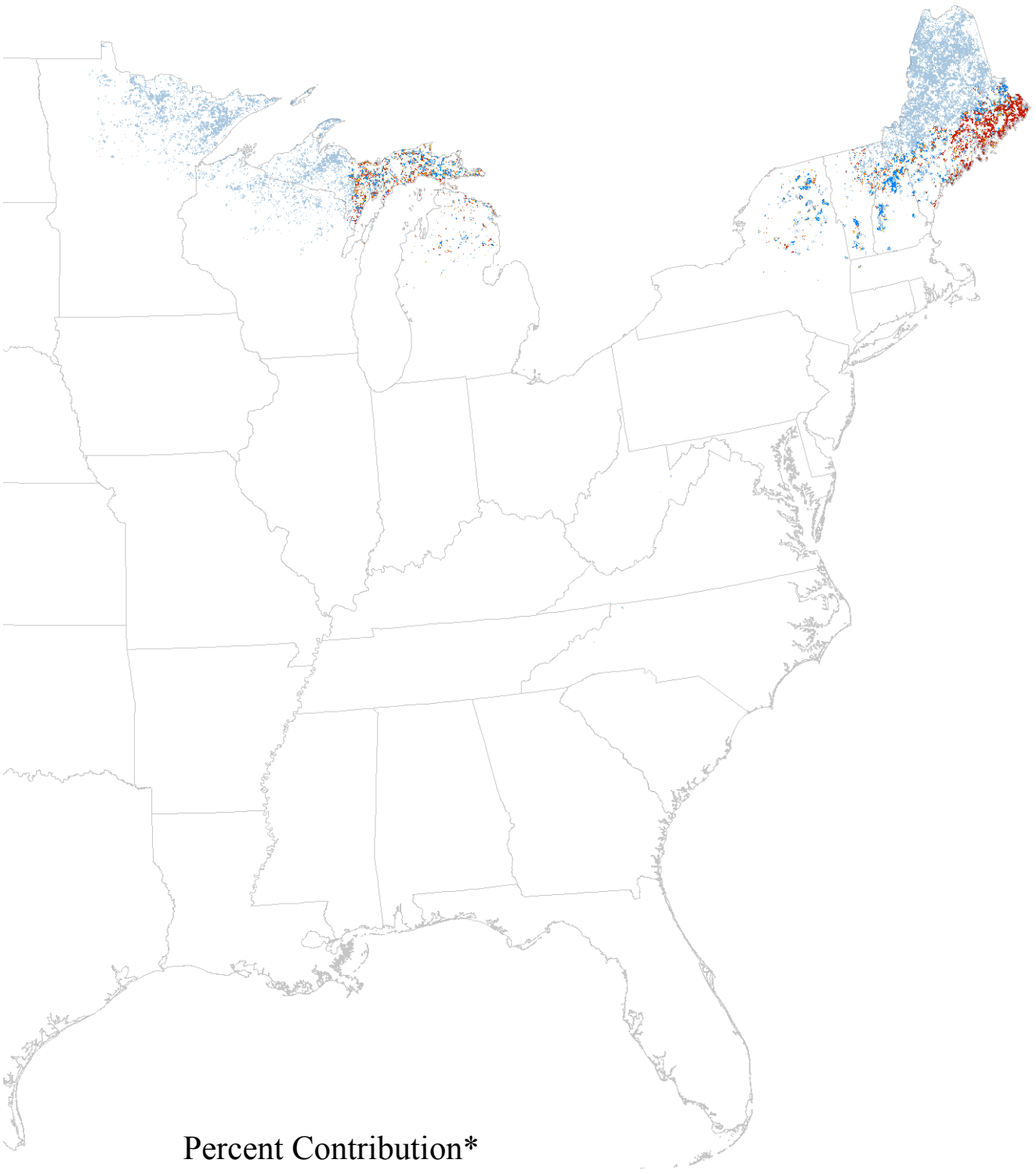
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Balsam Woolly Adelgid on Balsam and Fraser Fir

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Bronze Birch Borer	**Host(s):**	Paper / Gray Birch
Model Extent:	Northeastern Area	**Max Percent Mortality:**	50%

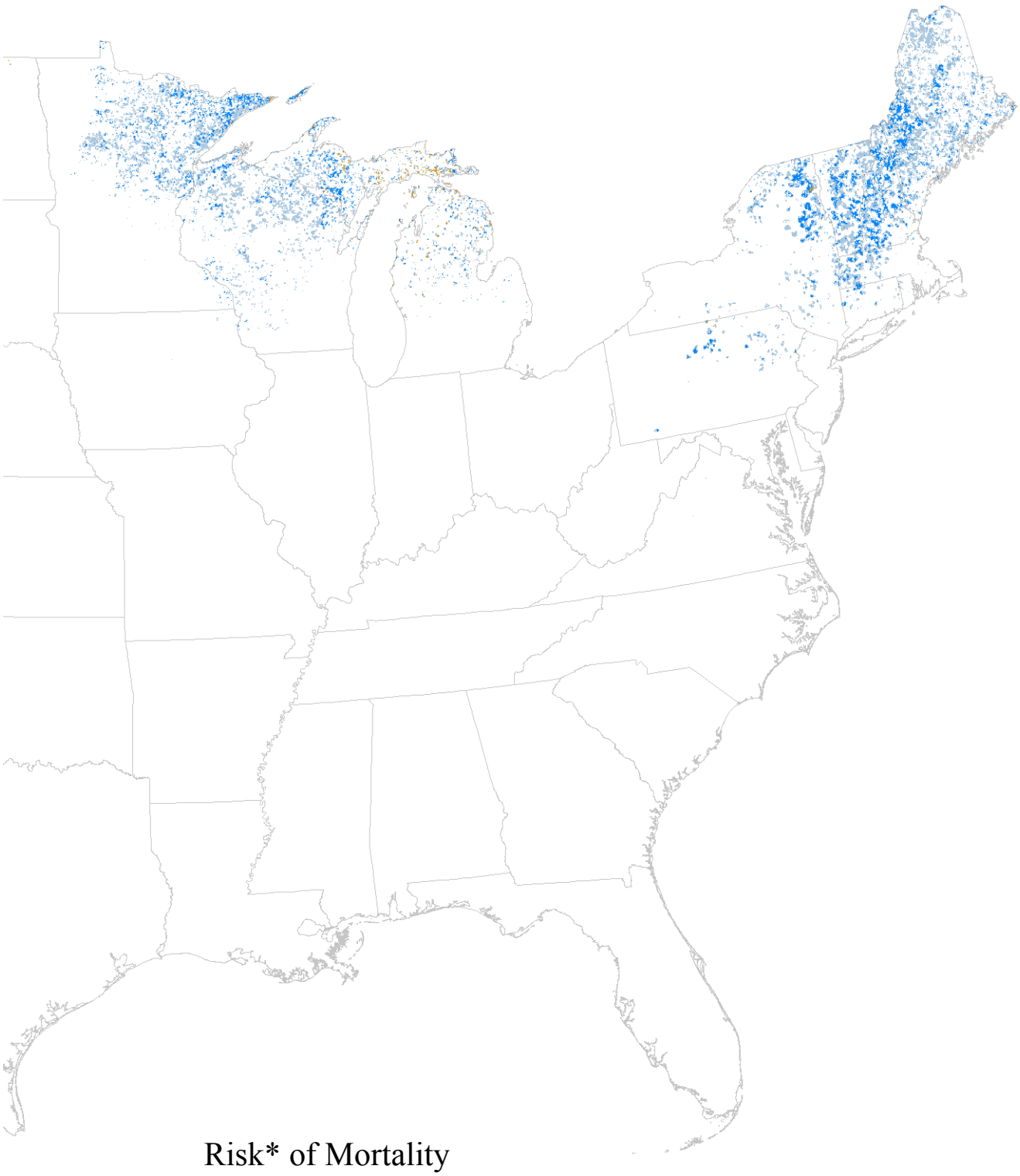
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1/4	20%								
Criteria 1		Host BA	0	60	100	110	S 5	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	80%								
Criteria 1		Soil Dryness	0	45	45	85	S 5	70	70%
Criteria 2		Host DBH	3	7	7	7	J 1	15	15%
Criteria 3		Elevation	800	1200	1200	1200	J 1	15	15%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Bronze Birch Borer on Paper/Gray Birch

Mortality Ceiling of 50%

0 50 100 200 300

Miles

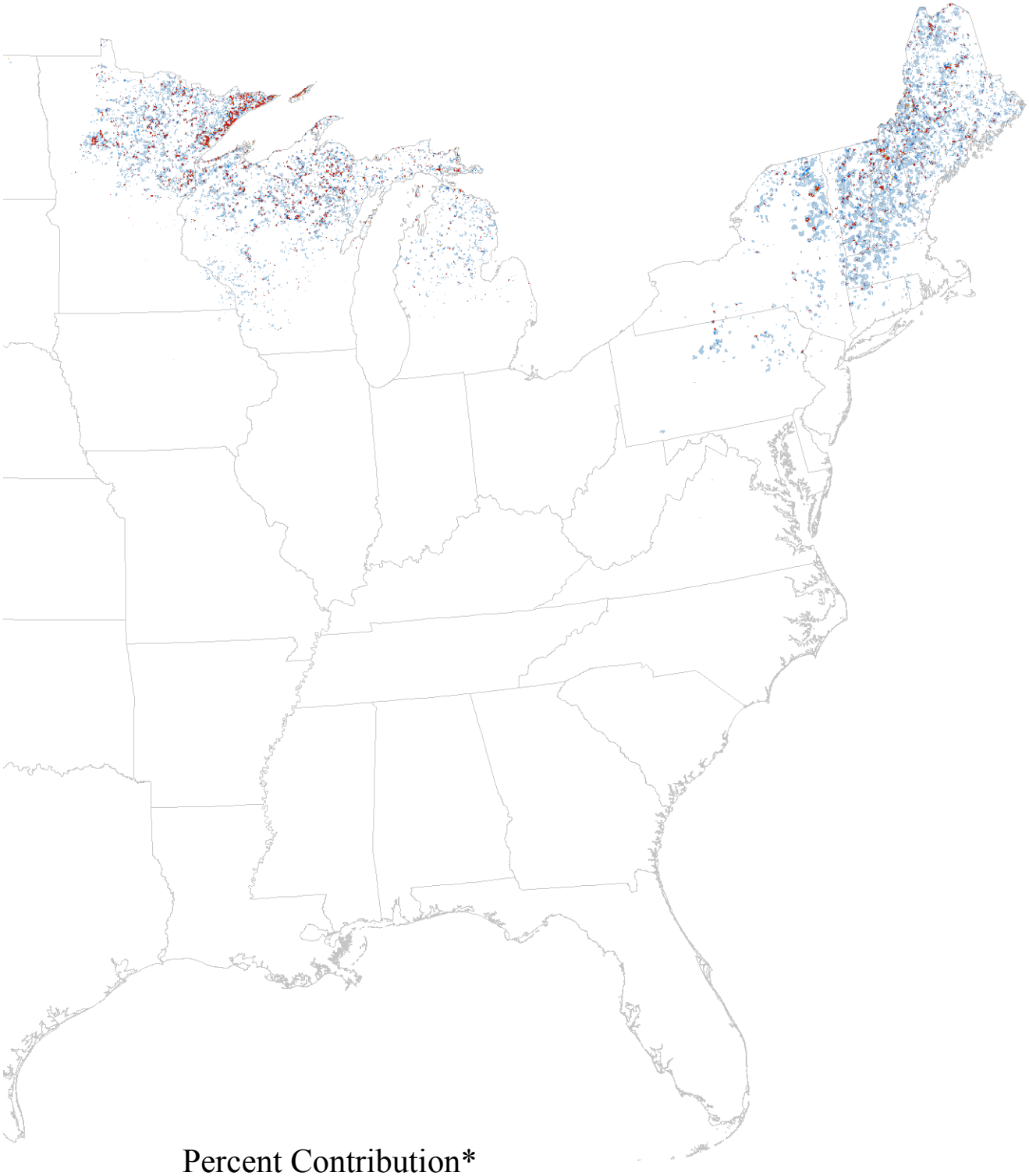
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*
Bronze Birch Borer on Paper/Gray Birch

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Beech Bark Disease	**Host(s):**	American Beech
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	75%

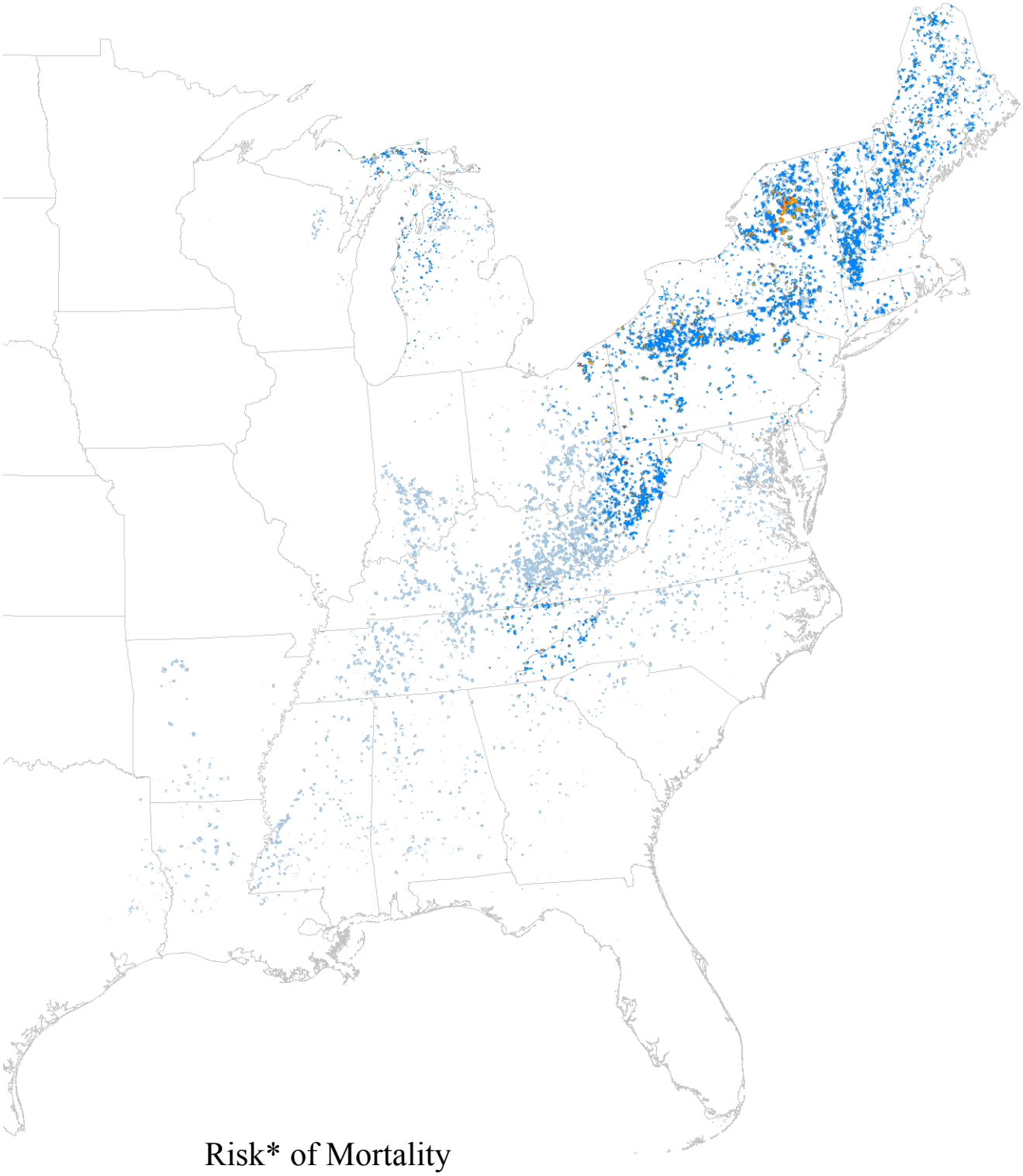
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		% Host Stocking	15	70	70	70	J 1	1/3	33%
Criteria 2		Host DBH	4	16	16	16	J 1	1/3	33%
Criteria 3		Distance from Pest	0	0	10	75	J 2	1/3	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
	0%								
Criteria 1									
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Beech Bark Disease on American Beech

Mortality Ceiling of 75%

0 50 100 200 300

Miles

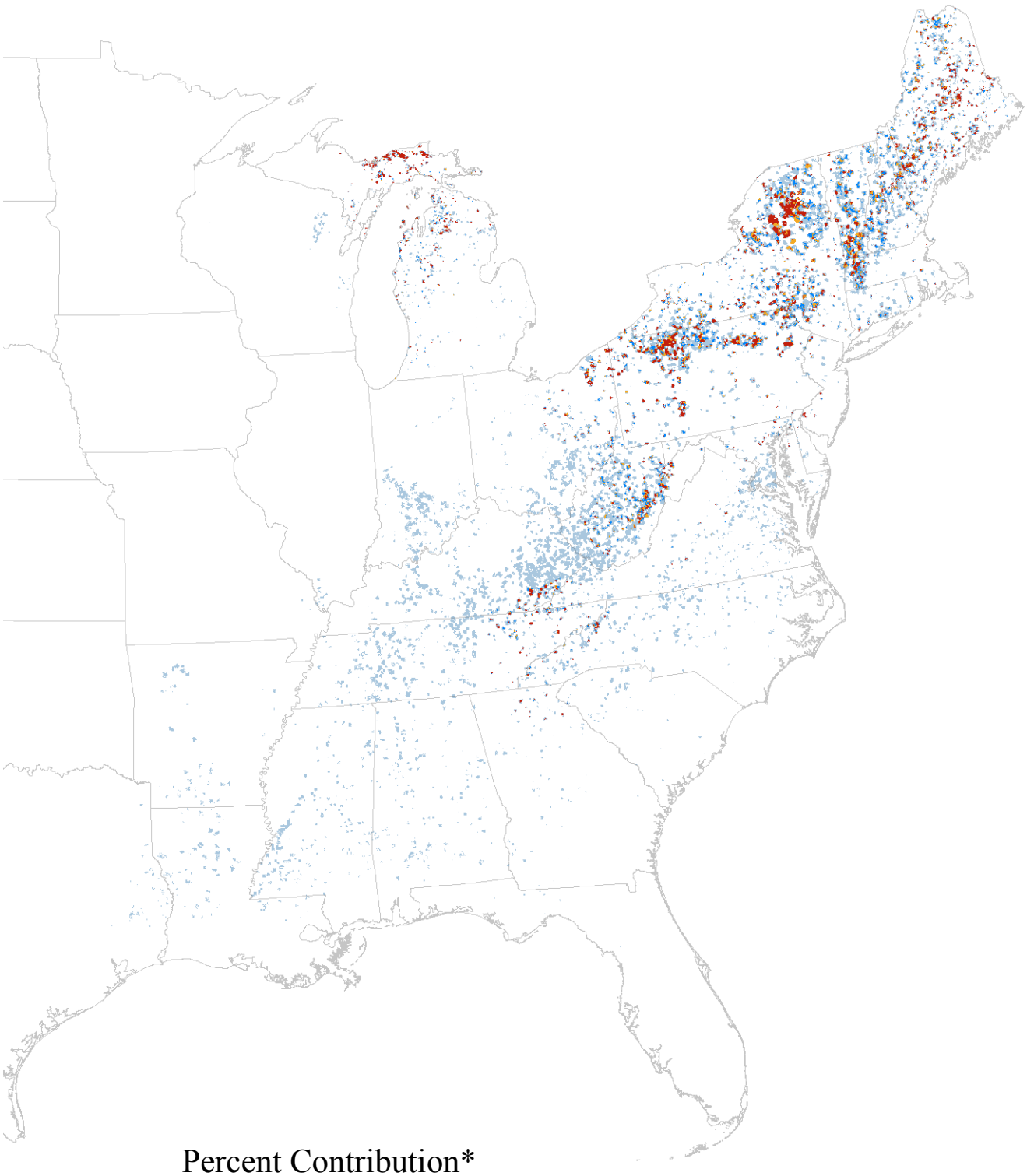
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Beech Bark Disease on American Beech

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

0 50 100 200 300 Miles

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Butternut Canker	**Host(s):**	Butternut
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	100%

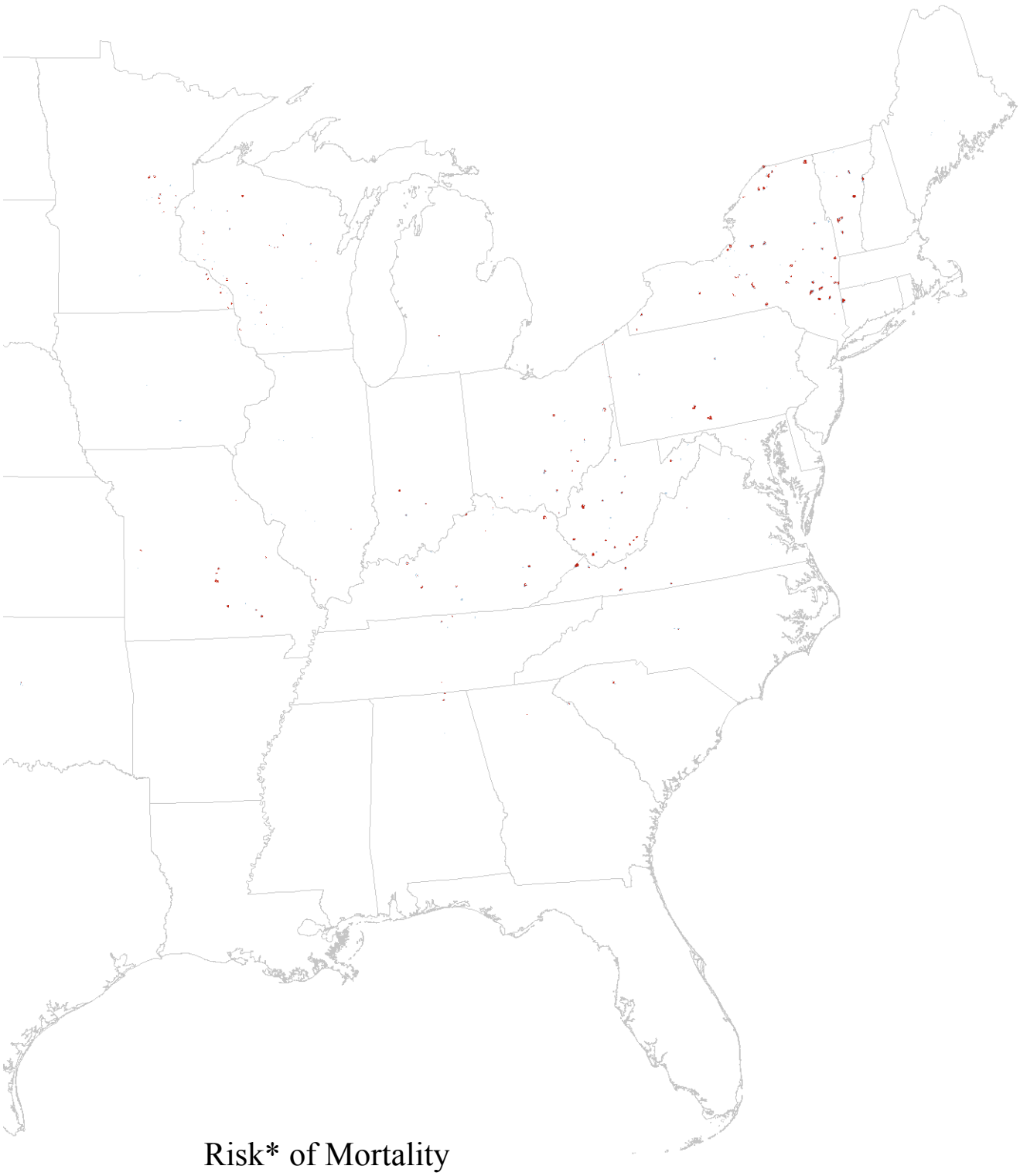
Susceptibility

Rank/Weight										
1	100%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Host BA	1	1	1	1	J 1	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight									
	0%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1									
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Butternut Canker on Butternut

Mortality Ceiling of 100%

0 50 100 200 300

Miles

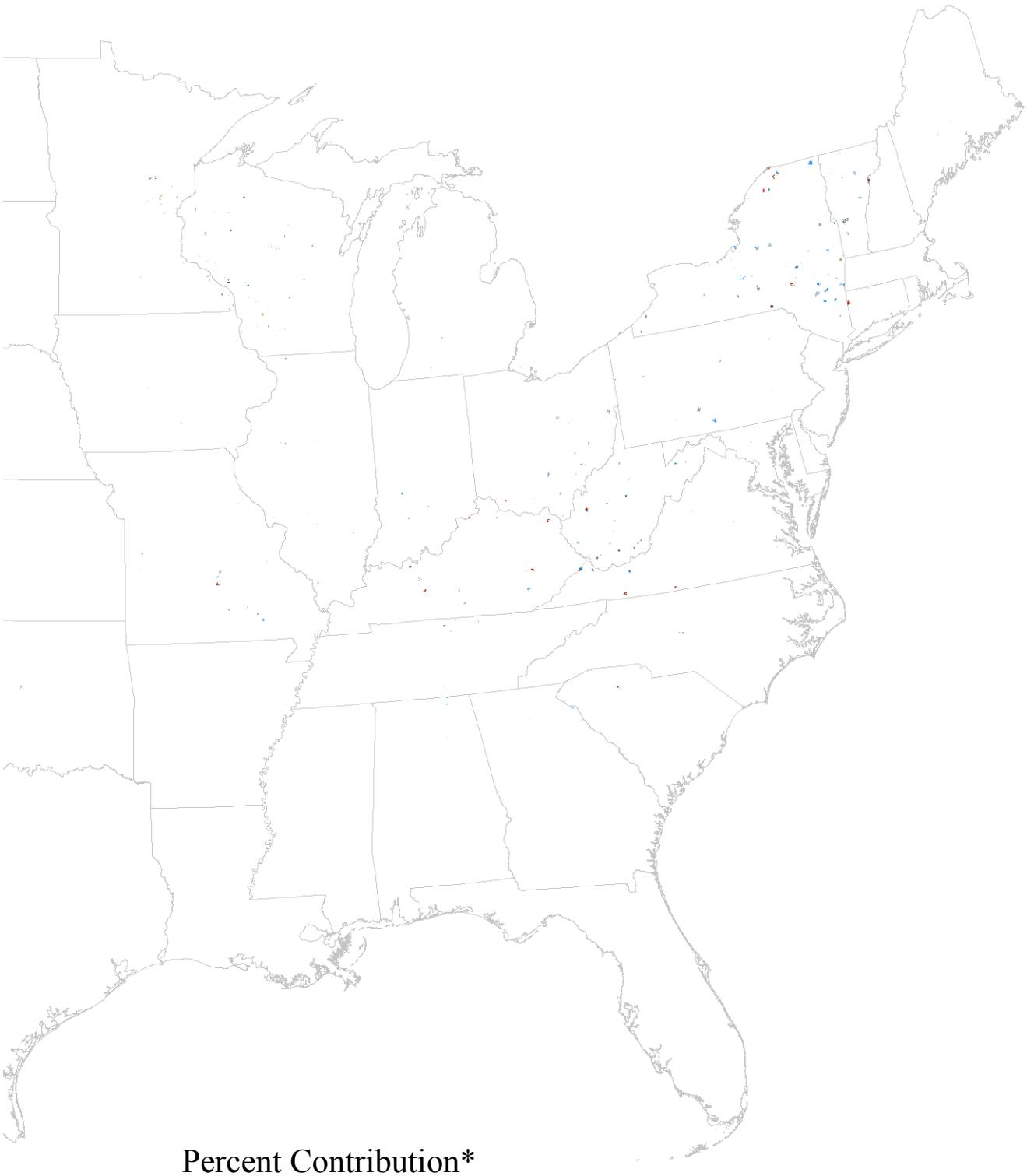
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Butternut Canker on Butternut

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Basswood (Hardwood) Decline	**Host(s):**	Basswood
Model Extent:	Easterm U.S.	**Max Percent Mortality:**	50%

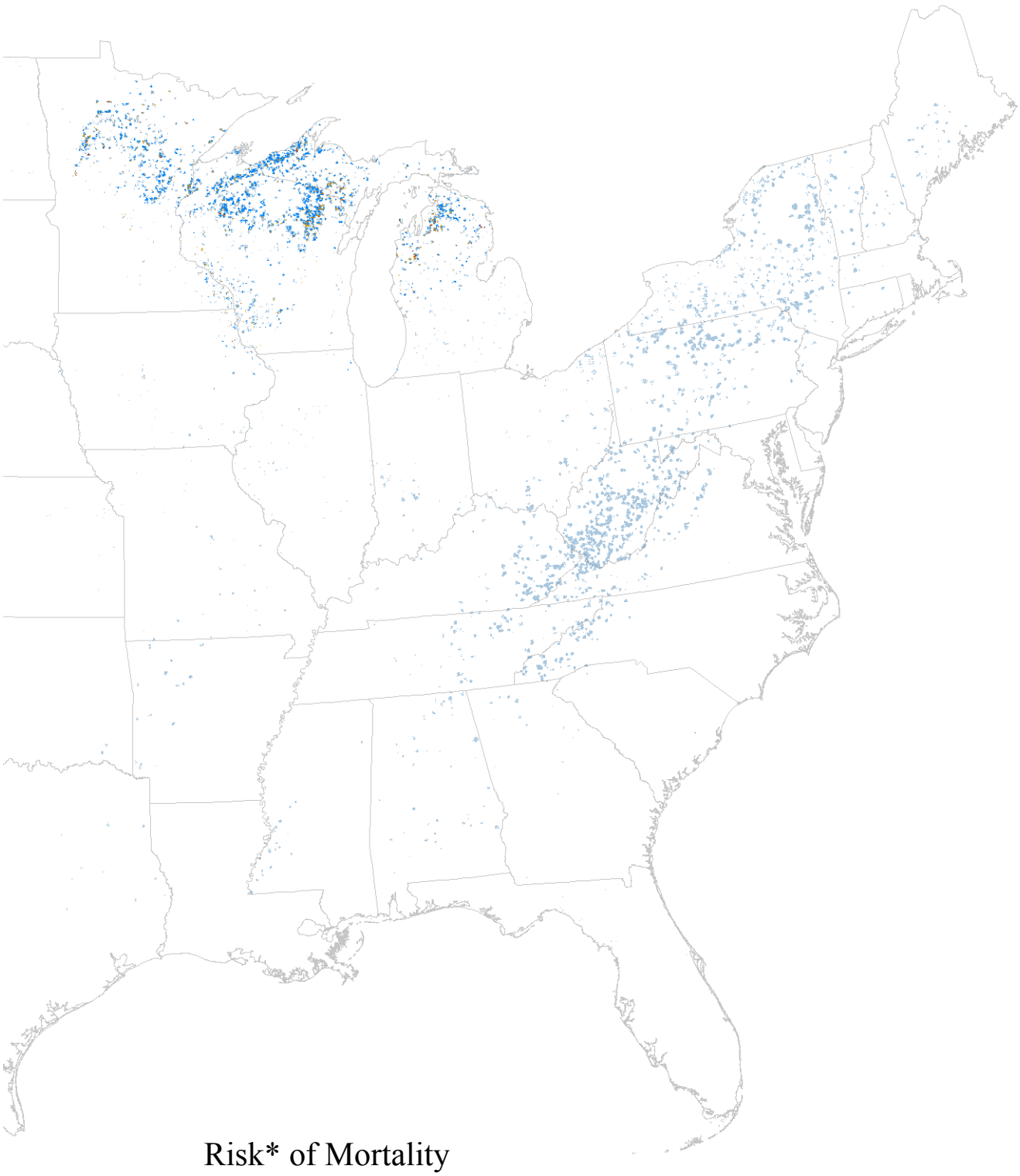
Susceptibility

Rank/Weight 1	50%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		% Host	10	90	90	90	J 1	1	50%
Criteria 2		Aspect	113	180	240	360	S 4	1	50%
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight 1	50%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Soil Dryness	0	45	45	85	S 5	1	25%
Criteria 2		Annual Precipitation	9	13	13	46	J 2	1	25%
Criteria 3		Host DBH	4	16	16	16	J 1	1	25%
Criteria 4		Pest Range	0	0	10	10	J 2	1	25%
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Select Ecoregions	**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Basswood (Hardwood) Decline on Basswood

Mortality Ceiling of 50%

0 50 100 200 300
Miles

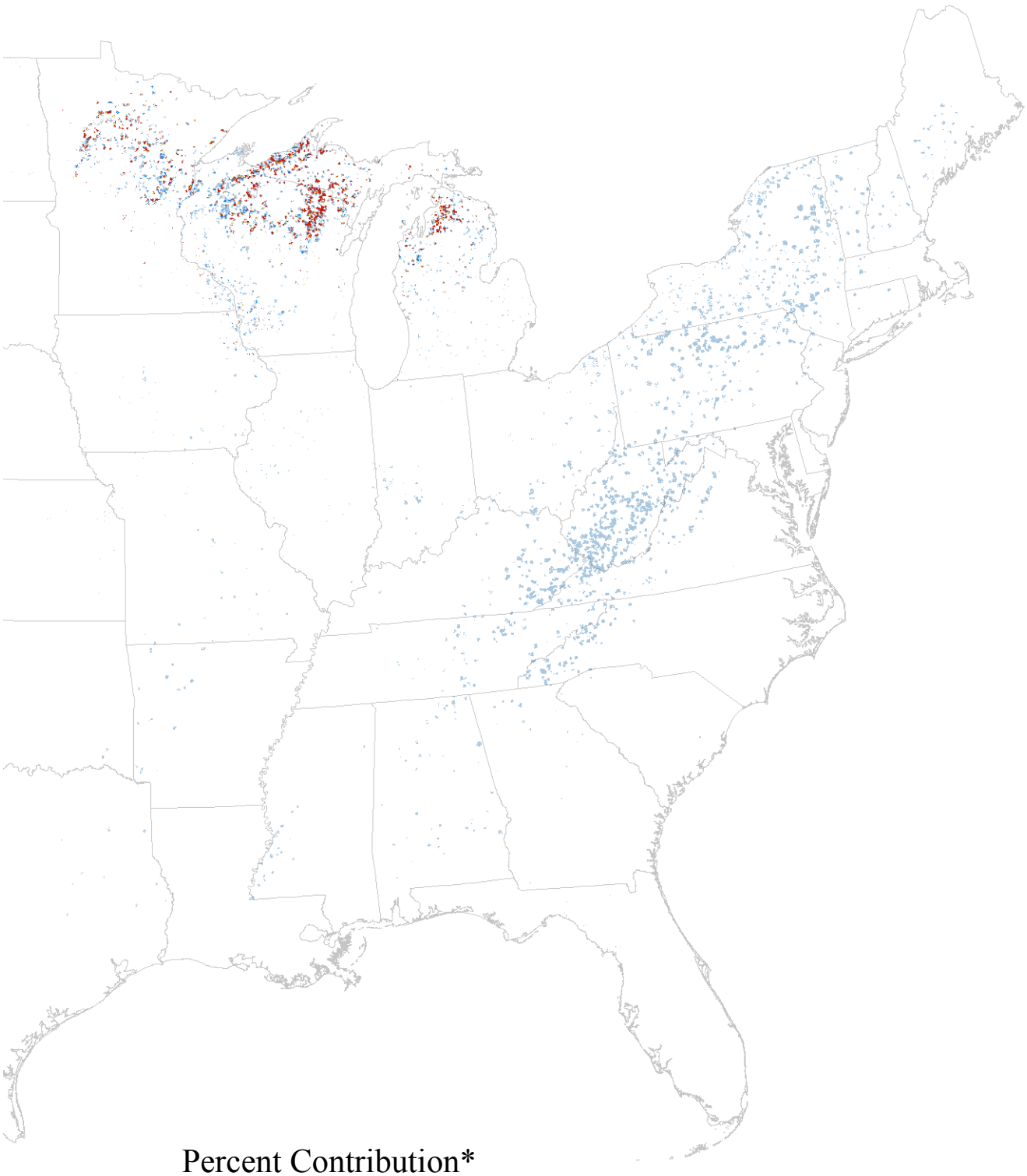
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Basswood (Hardwood) Decline on Basswood

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Oak Decline	**Host(s):**	Red Oak Species
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	75%

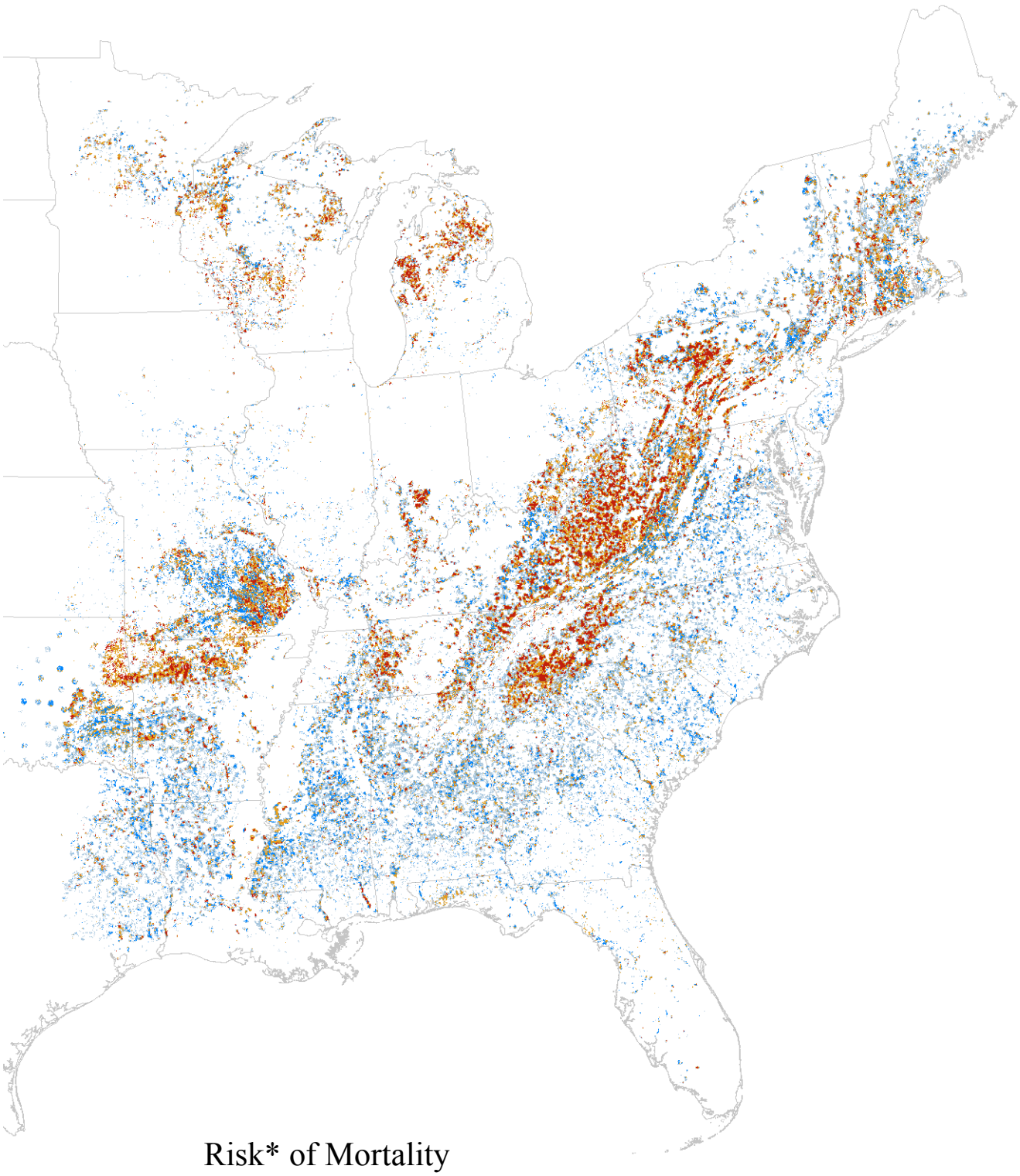
Susceptibility

Rank/Weight									
1/4	20%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Aspect	113	180	240	360	S 4	60	60%
Criteria 2		% Host	0	90	90	90	Linear	40	40%
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight									
1	80%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Host DBH	6	12	12	12	J 1	30	30%
Criteria 2		Soil Dryness	0	45	45	85	S 5	30	30%
Criteria 3		Annual Precipitation	9	24	24	38	S 2	30	30%
Criteria 4		Pest Range						10	10%
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Oak Decline on Red Oaks

Mortality Ceiling of 75%

0 50 100 200 300
Miles

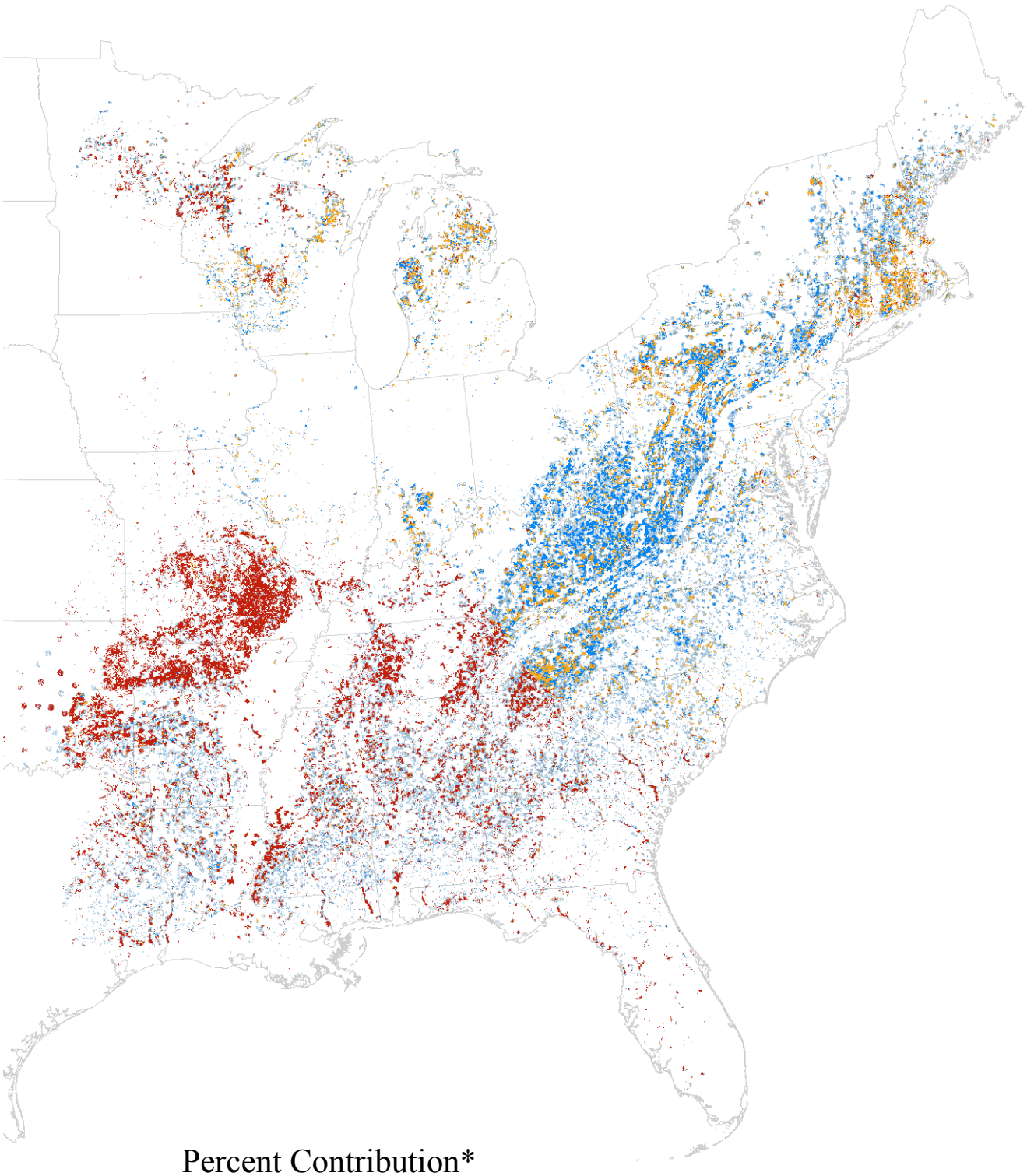
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: October 26, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Oak Decline on Red Oaks

0 50 100 200 300

Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: October 26, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s): Sugar Maple (Hardwood) Decline

Host(s): Sugar Maple

Model Extent: Easterm U.S.

Max Percent Mortality: 50%

Susceptibility

Rank/Weight 1	50%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		% Host	10	90	90	90	J 1	1	50%
Criteria 2		Aspect	113	180	240	360	S 4	1	50%
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

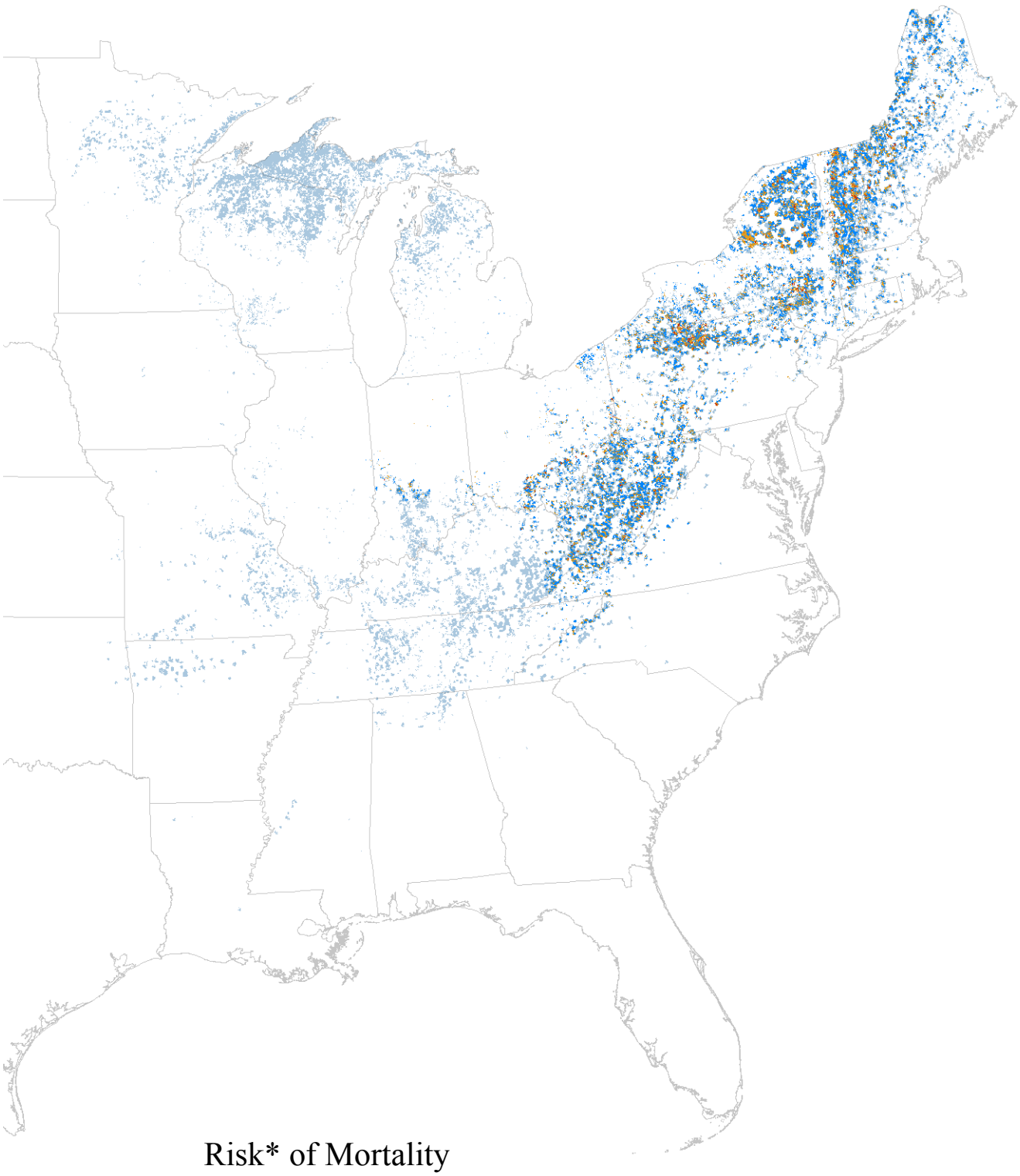
Rank/Weight 1	50%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Soil Dryness	0	45	45	85	S 5	1	25%
Criteria 2		Annual Precipitation	9	13	13	46	J 2	1	25%
Criteria 3		Host DBH	4	16	16	16	J 1	1	25%
Criteria 4		Pest Range	0	0	10	10	J 2	1	25%
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints: Select Ecoregions

Comments:

Citations:

Model Certainity: 3 - Informed Professional Judgement



Risk* of Mortality

Sugar Maple (Hardwood) Decline on Sugar Maple

Mortality Ceiling of 50%

0 50 100 200 300

Miles

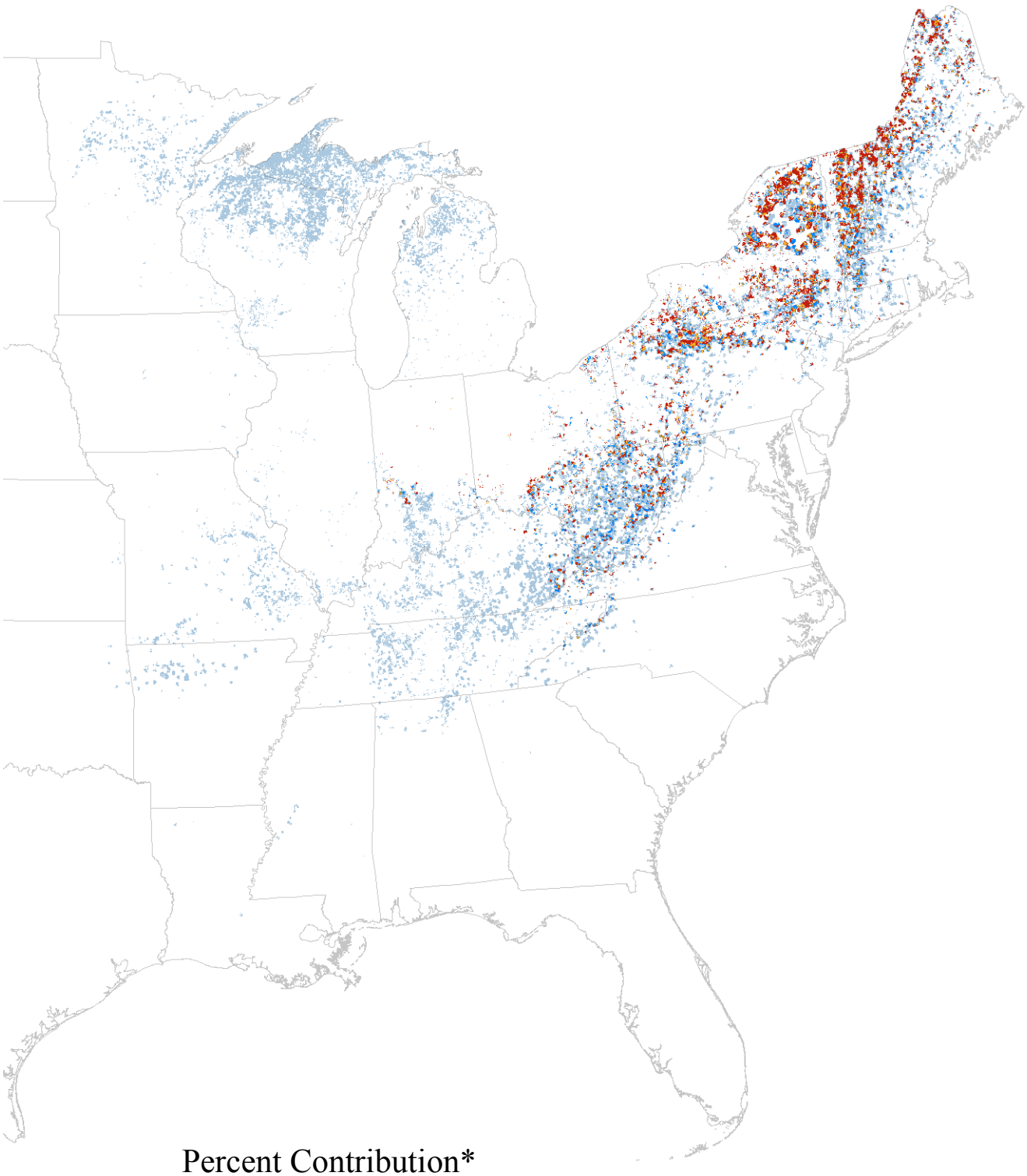
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Sugar Maple (Hardwood) Decline on Sugar Maple

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Dutch Elm Disease	**Host(s):**	Elm Species
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	50%

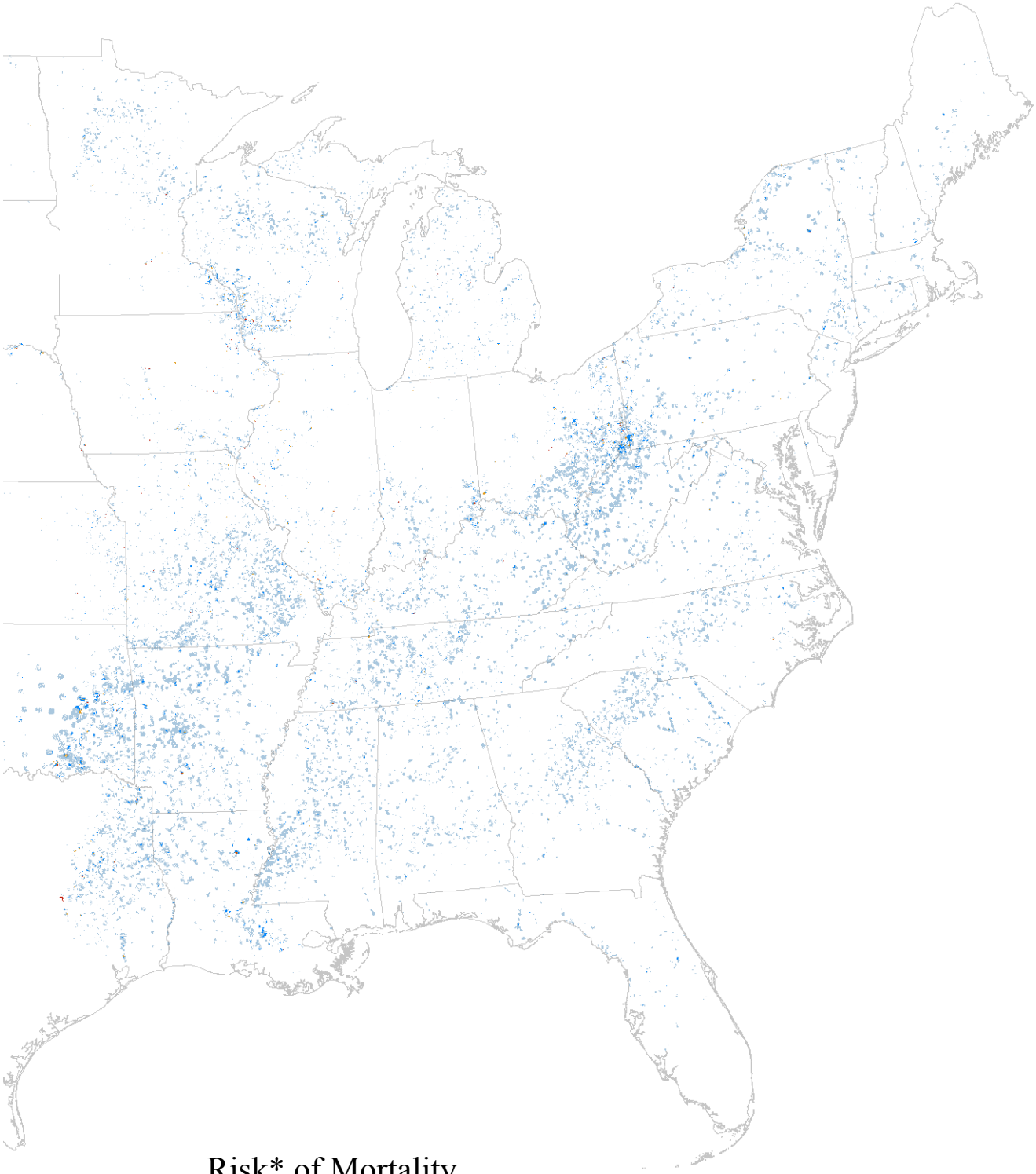
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host BA	0	90	90	90	J 1	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
	0%								
Criteria 1									
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality
Dutch Elm Disease on Elm

Mortality Ceiling of 50%

0 50 100 200 300
Miles

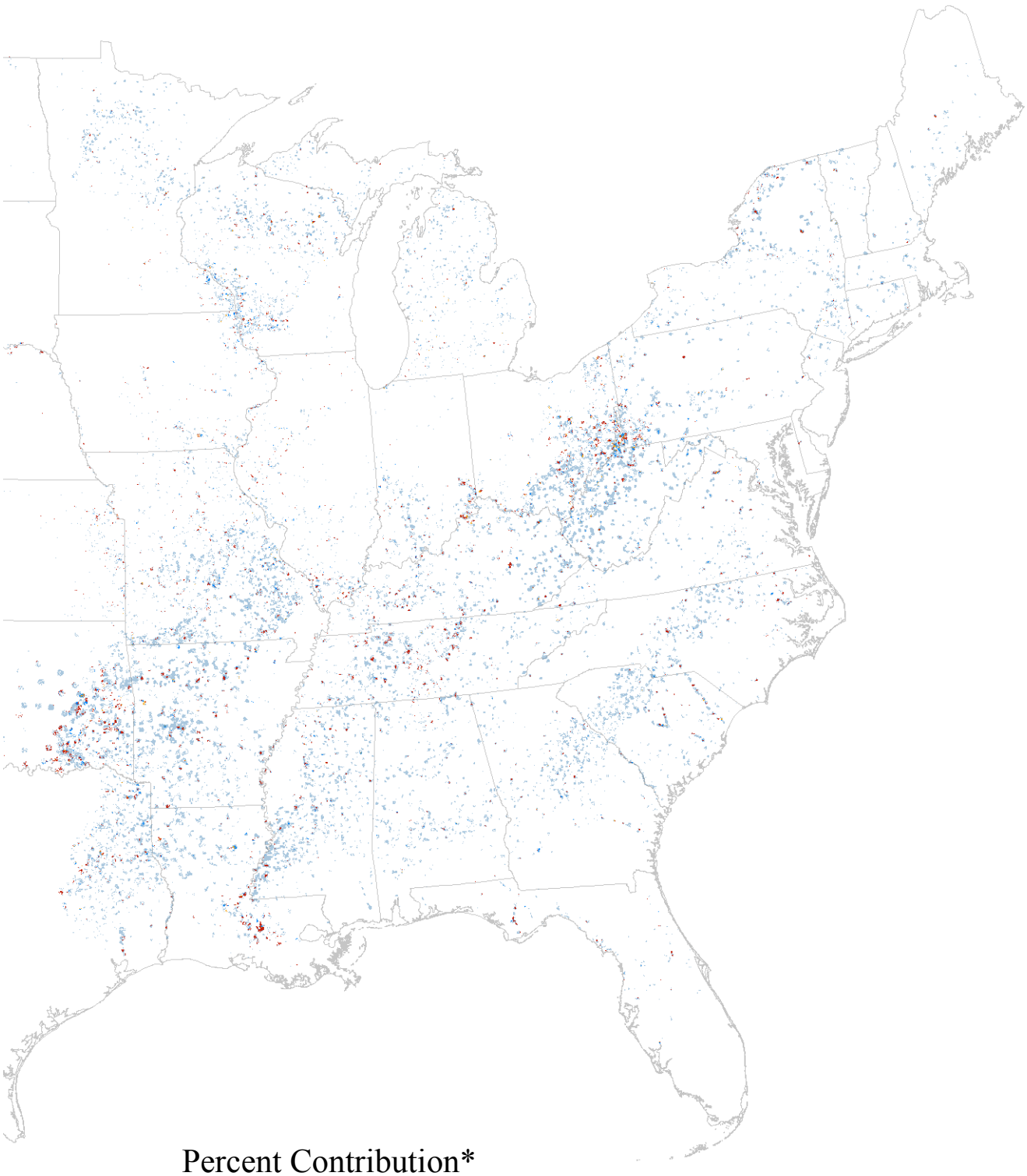
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Dutch Elm Disease on Elm

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: February 15, 2006

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Eastern Larch Beetle	**Host(s):**	Tamarack
Model Extent:	Northeastern Area	**Max Percent Mortality:**	50%

Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	50%								
Criteria 1		% Host	50	95	95	95	J 1	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	50%								
Criteria 1		Soil Dryness	0	40	40	80	S 2	44	44%
Criteria 2		Host DBH	4	9	9	9	S 1	44	44%
Criteria 3		Host Basal Area	100	145	145	145	S 1	12	12%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement

Risk* of Mortality
Eastern Larch Beetle on Tamarack
Mortality Ceiling of 50%

0 50 100 200 300
Miles

Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

*Risk of experiencing mortality at a given threshold over a 15 year period.

Printing Date: November 8, 2007

Percent Contribution*
Eastern Larch Beetle on Tamarack

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Emerald Ash Borer	**Host(s):**	Ash Species
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	75%

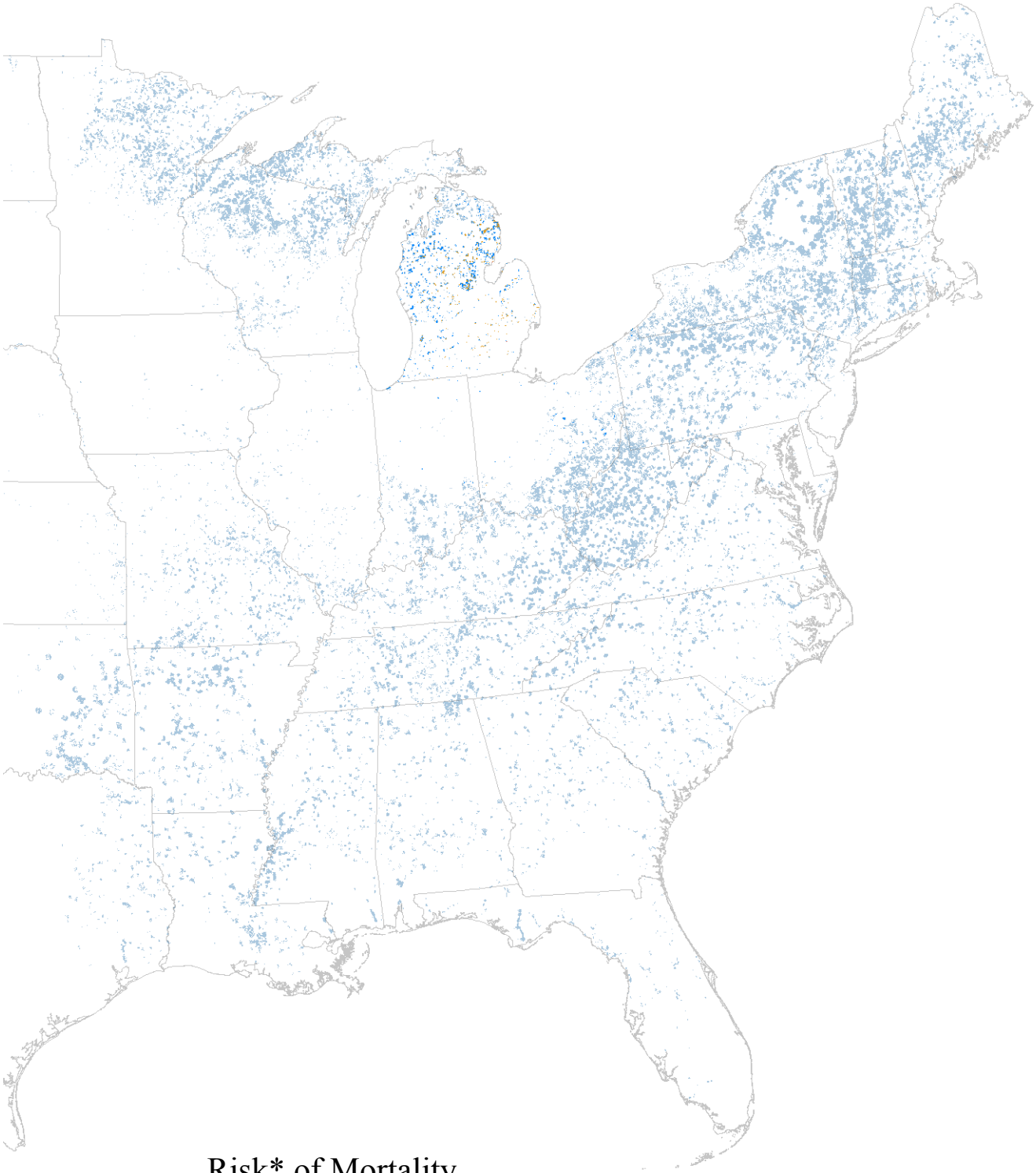
Susceptibility

Rank/Weight									
1	50%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Population Density	500	2000	2000	2000	J 1	1	40%
Criteria 2		Distance to Infestation	0	0	0	100	S 2	1	40%
Criteria 3		% Host	1	90	90	90	S 1	1/2	20%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight									
1	50%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Ash QMD	1	10	10	10	J 1	1	33%
Criteria 2		Soil Dryness	0	45	45	85	S 5	1	33%
Criteria 3		Annual Precipitation	10	27	27	35	S 2	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Emerald Ash Borer on Ash

Mortality Ceiling of 75%

0 50 100 200 300

Miles

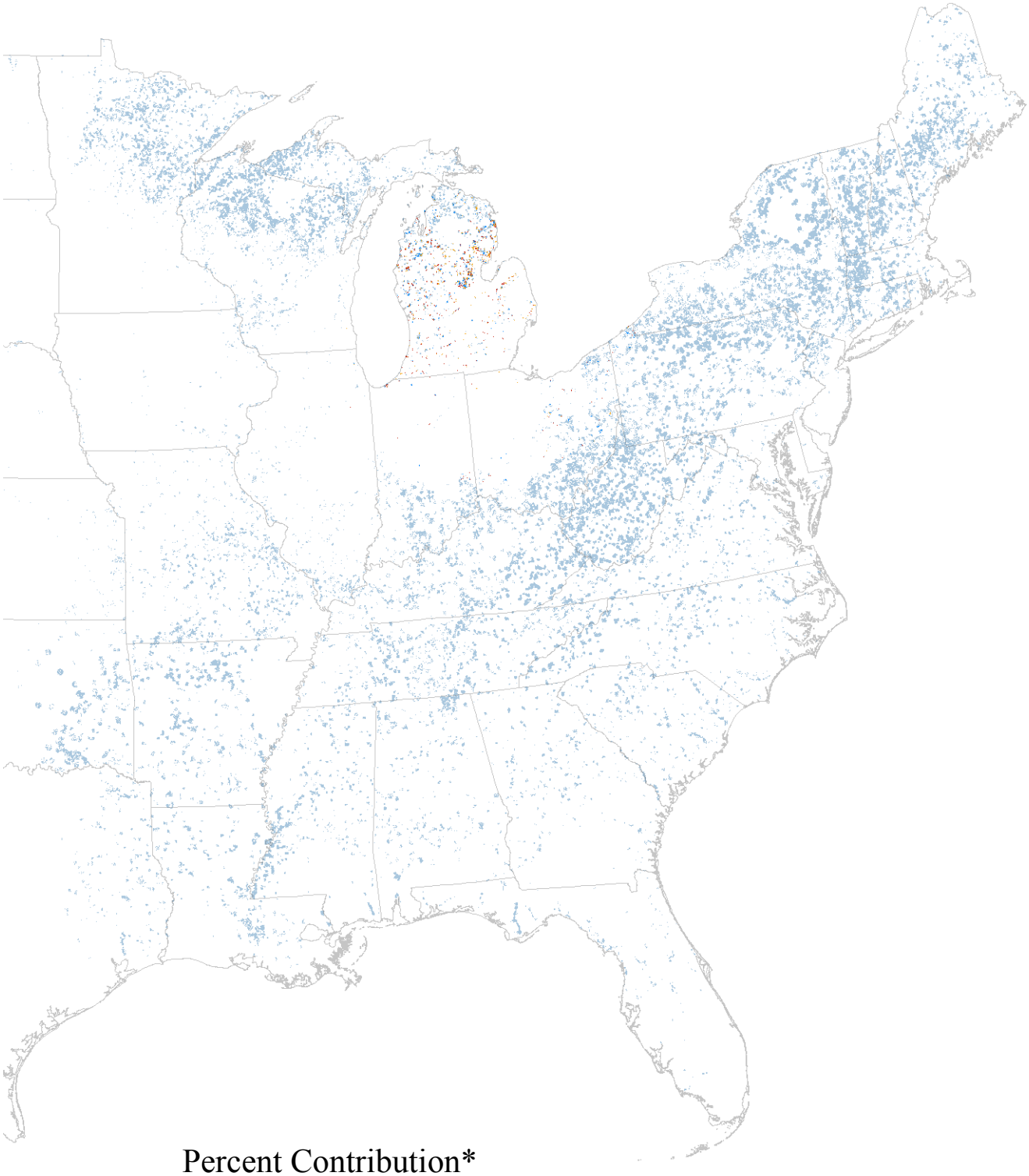
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*
Emerald Ash Borer on Ash

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s): Forest Tent Caterpillar

Host(s): Aspen Species

Model Extent: Northeastern Area

Max Percent Mortality: 25%

Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	75%								
Criteria 1		% Host Stocking	50	70	70	70	J 1	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

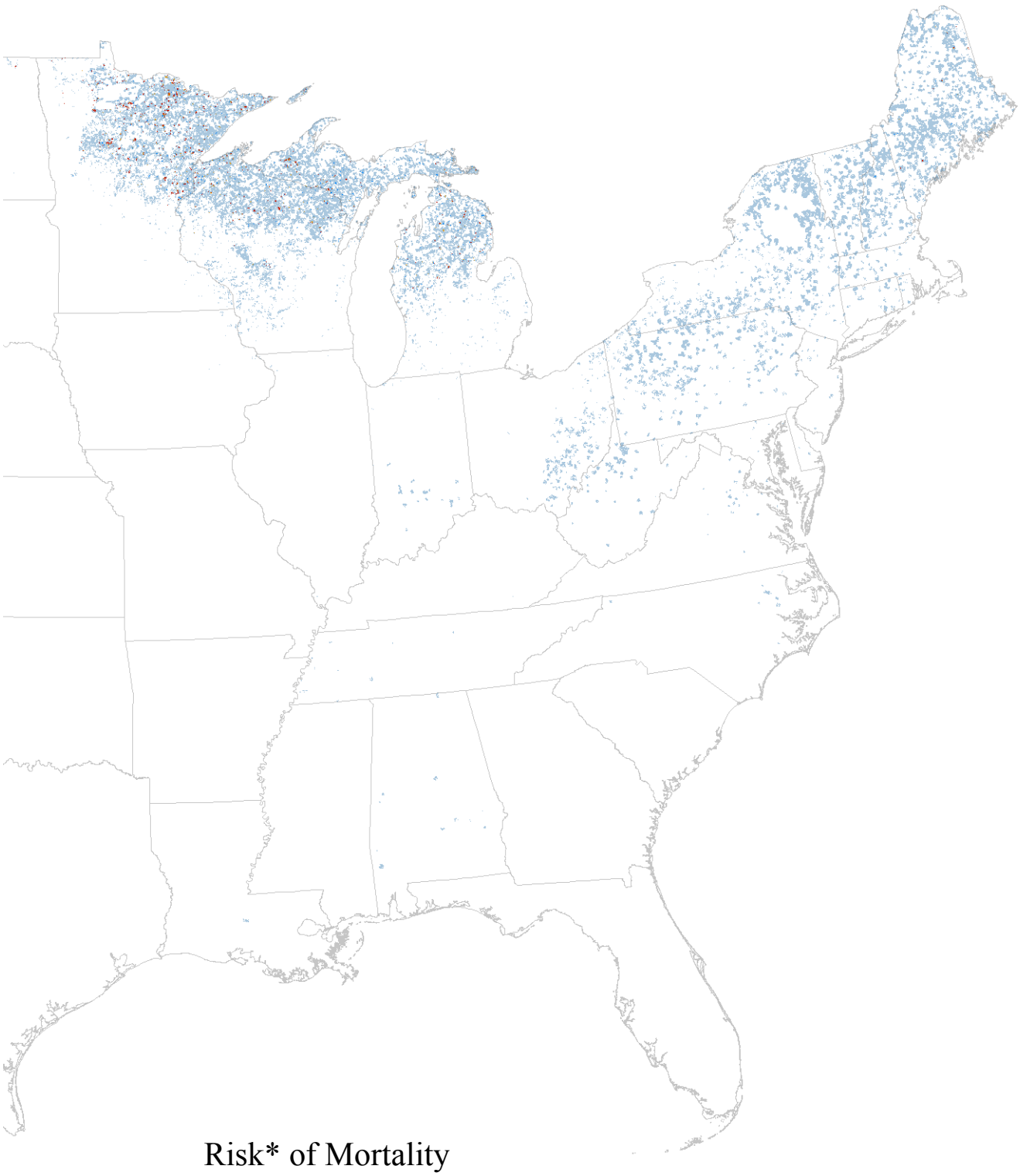
Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1/3	25%								
Criteria 1		Host DBH	5	13	13	13	J 1	25	25%
Criteria 2		Soil Dryness	0	45	45	85	S 5	75	75%
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Pest Range

Comments	

Citations	

Model Certainity	3 - Informed Professional Judgement



Risk* of Mortality

Forest Tent Caterpillar on Aspen

Mortality Ceiling of 25%

0 50 100 200 300

Miles

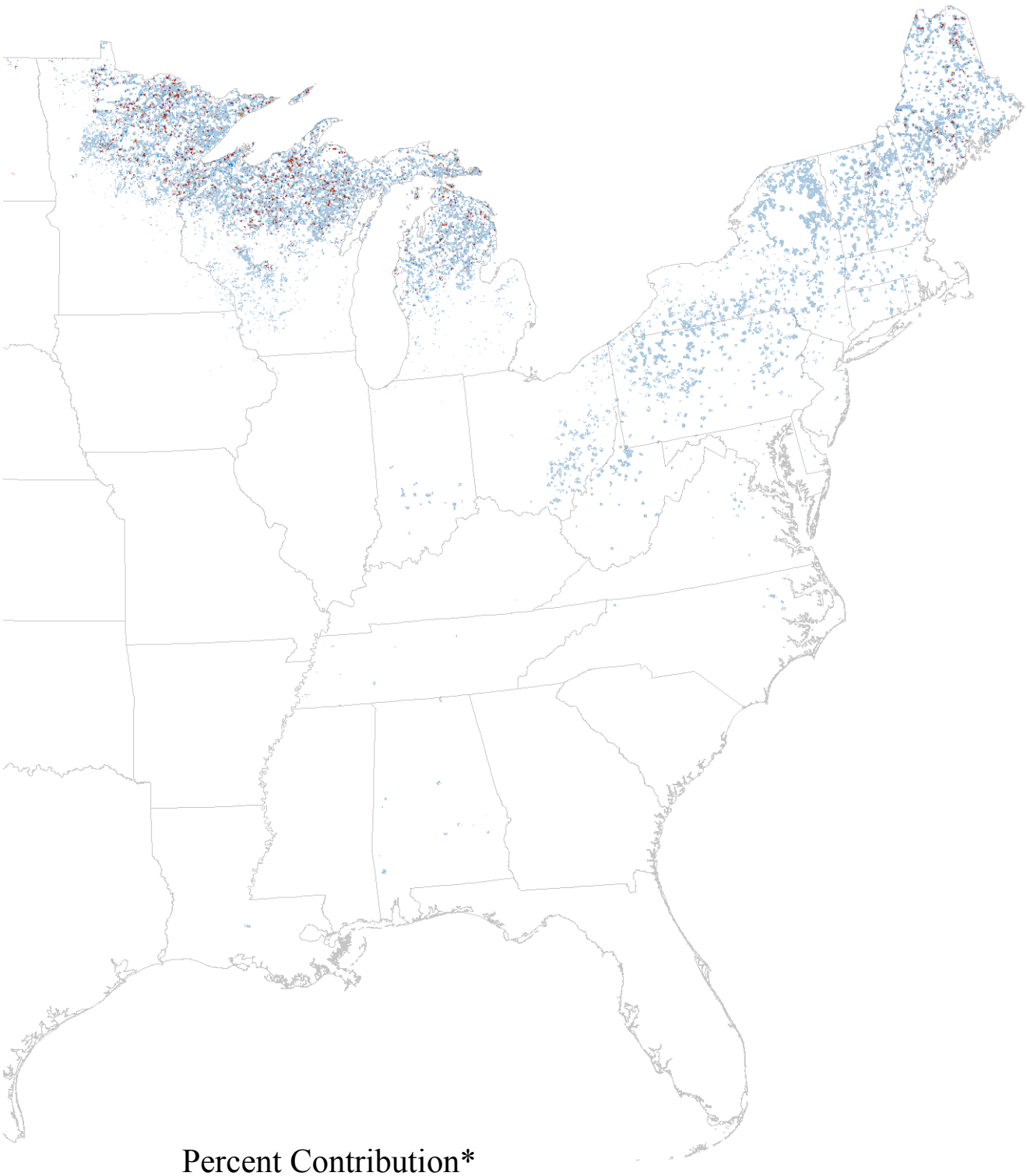
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Forest Tent Caterpillar on Aspen

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Gypsy Moth	**Host(s):**	Red Oak Species
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	50%

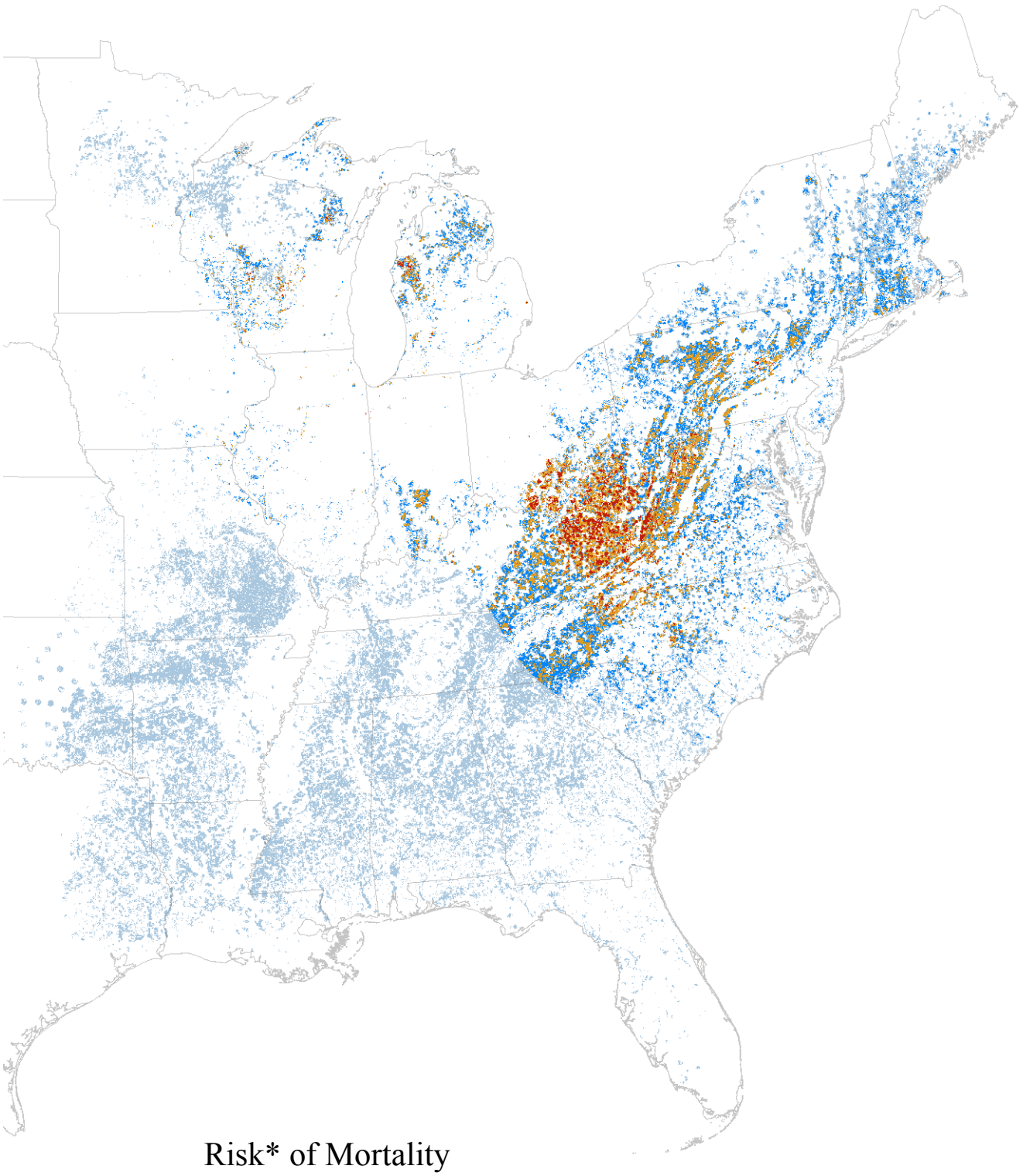
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1/2	33%								
Criteria 1		Proximity to Infestation	0	30	60	200	S 4	20	20%
Criteria 2		Avg Min Jan Temp (F)	5	12	12	12	S 1	20	20%
Criteria 3		% slope	0	1	1	1	S 1	10	10%
Criteria 4		Host basal area	10	50	50	50	S 1	50	50%
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	67%								
Criteria 1		Site quality	0	11	11	17	S 5	1	20%
Criteria 2		Host basal area	10	50	50	50	S 1	1	20%
Criteria 3		Annual precipitation	9	9	26	38	S 2	1	20%
Criteria 4		Soil Dryness	0	45	45	85	S 5	1	20%
Criteria 5		Proximity to Infestation	0	30	30	200	S 2	1	20%
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Gypsy Moth on Red Oaks

Mortality Ceiling of 50%

0 50 100 200 300

Miles

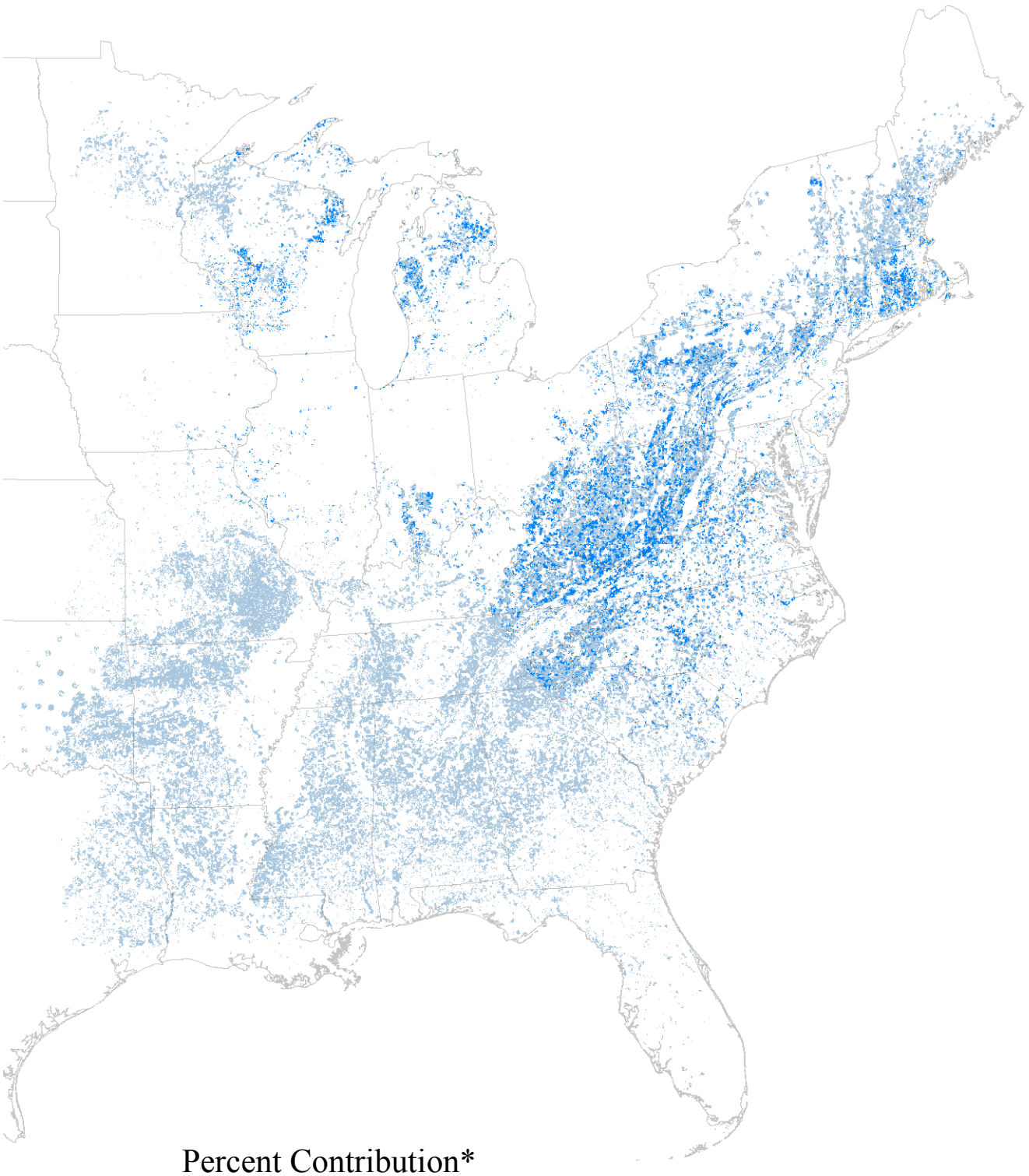
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*
Gypsy Moth on Red Oaks

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Gypsy Moth	**Host(s):**	White Oak Species
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	50%

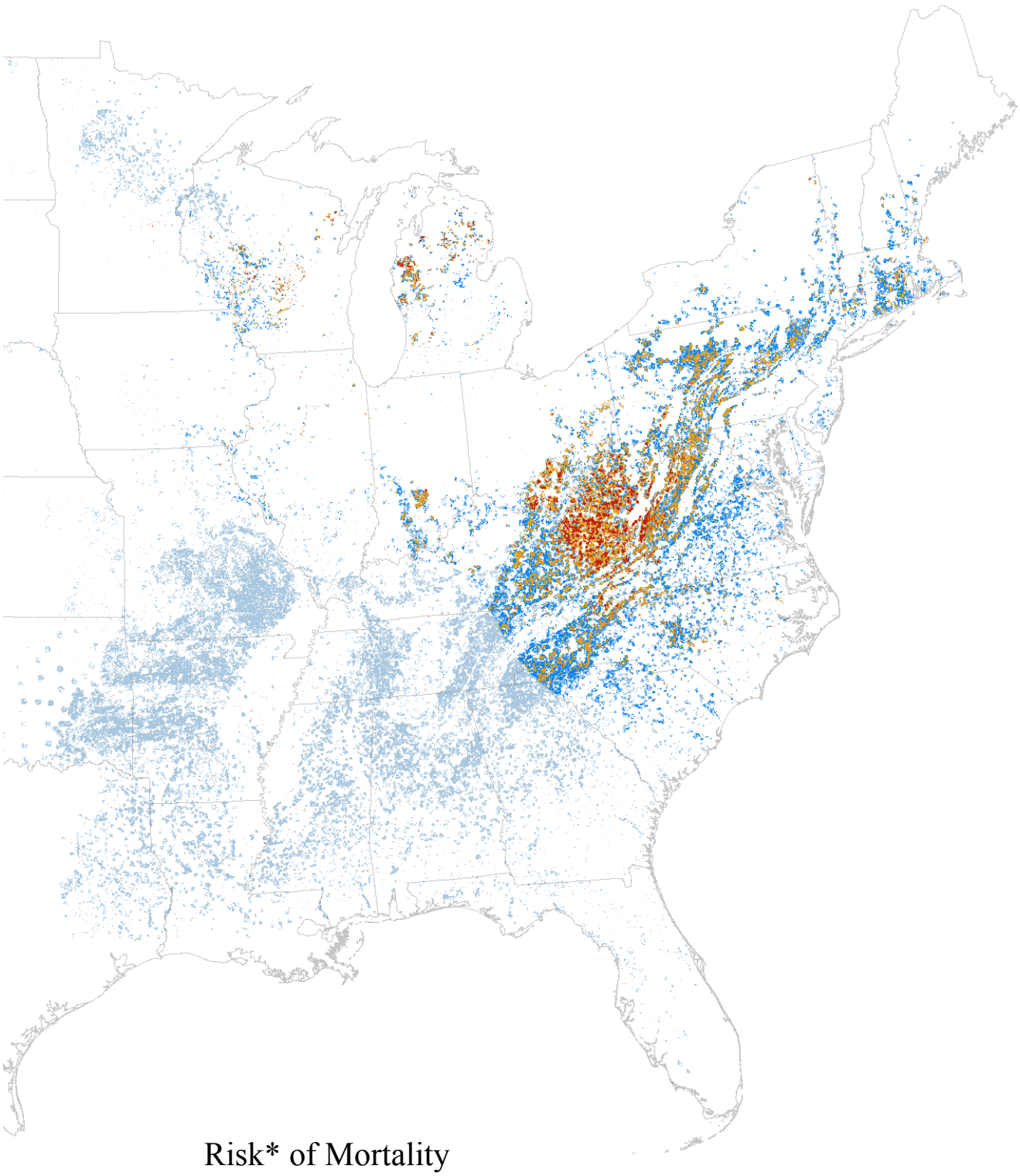
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1/2	33%								
Criteria 1		Proximity to Infestation	0	30	60	200	S 4	20	20%
Criteria 2		Avg Min Jan Temp (F)	5	12	12	12	S 1	20	20%
Criteria 3		% slope	0	1	1	1	S 1	10	10%
Criteria 4		Host basal area	10	50	50	50	S 1	50	50%
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	67%								
Criteria 1		Site quality	0	11	11	17	S 5	1	20%
Criteria 2		Host basal area	10	50	50	50	S 1	1	20%
Criteria 3		Annual precipitation	9	9	26	38	S 2	1	20%
Criteria 4		Soil Dryness	0	45	45	85	S 5	1	20%
Criteria 5		Proximity to Infestation	0	30	30	200	S 2	1	20%
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality
Gypsy Moth on White Oaks

Mortality Ceiling of 50%

0 50 100 200 300
Miles

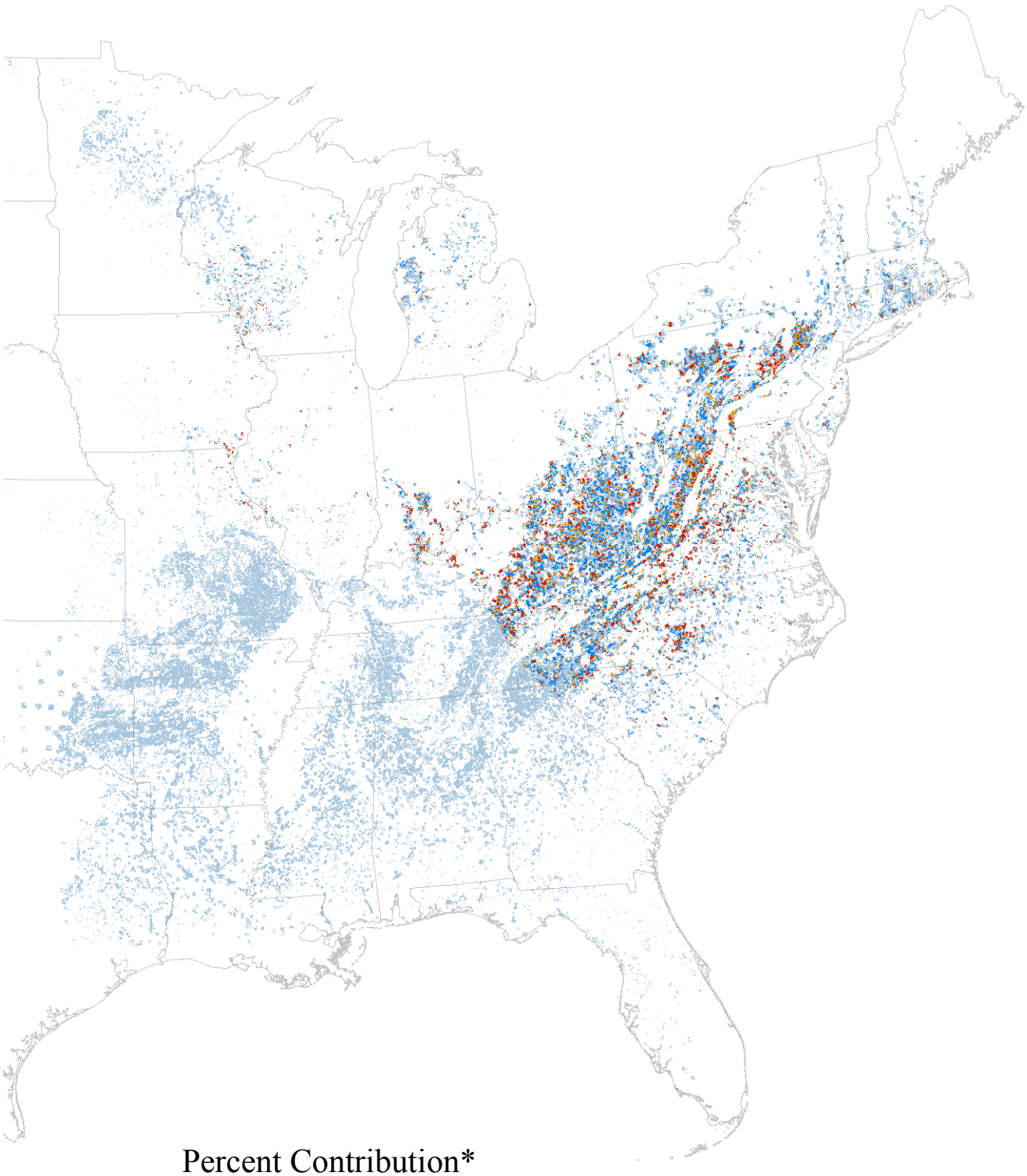
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*
Gypsy Moth on White Oaks

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Hemlock Woolly Adelgid	**Host(s):**	Carolina / Eastern Hemlock
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	75%

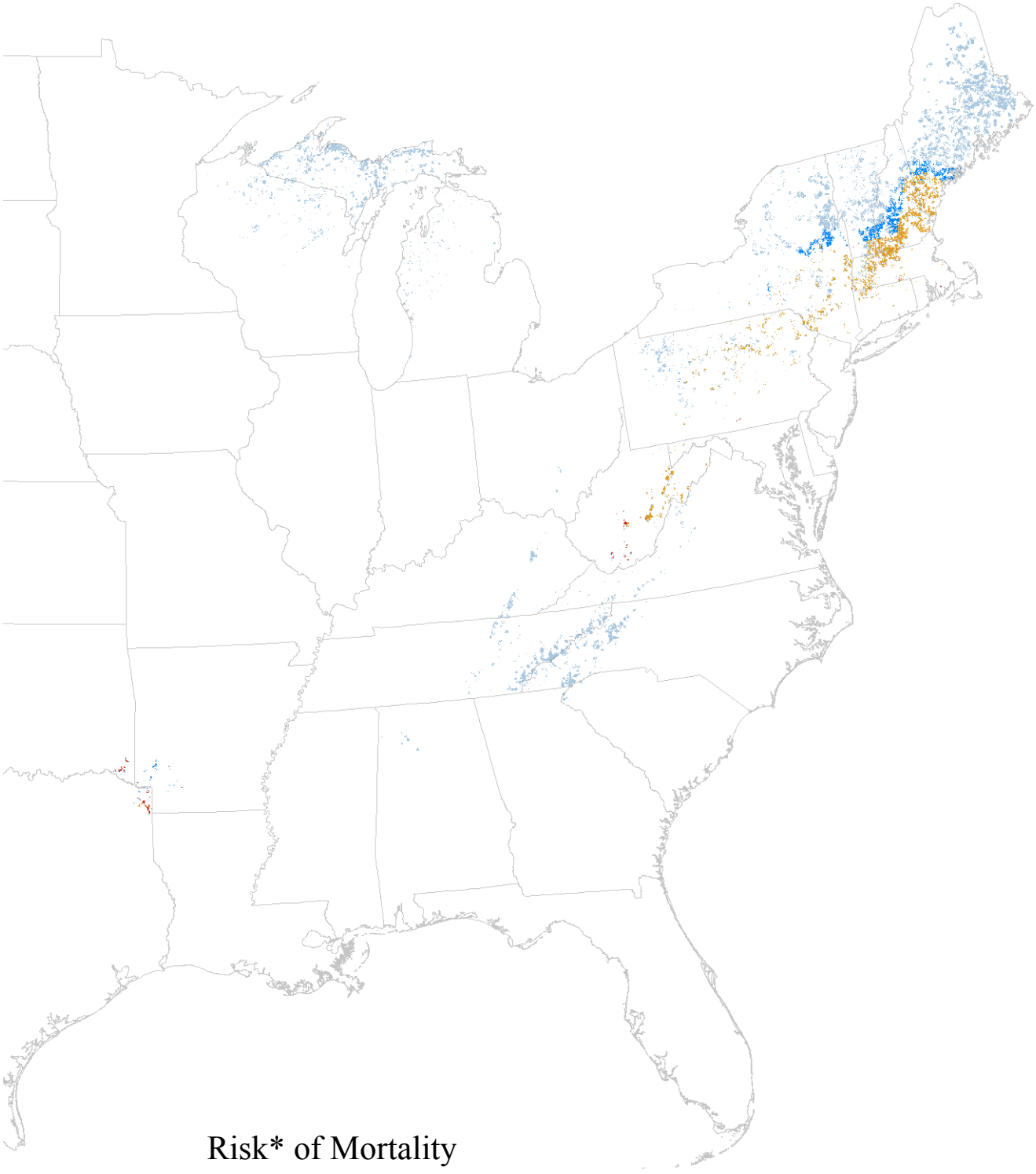
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		% Host	5	40	40	40	S 1	5	5%
Criteria 2		Avg Min Jan Temp (F)	3	12	12	12	S 1	50	50%
Criteria 3		Distance to Infestation	0	10	10	65	S 2	45	45%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
	0%								
Criteria 1									
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Elevation Restriction of 1600 ft in states North of Maryland	**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality
Hemlock Woolly Adelgid on Carolina/Eastern Hemlock (NA)
Mortality Ceiling of 75%

0 50 100 200 300
Miles

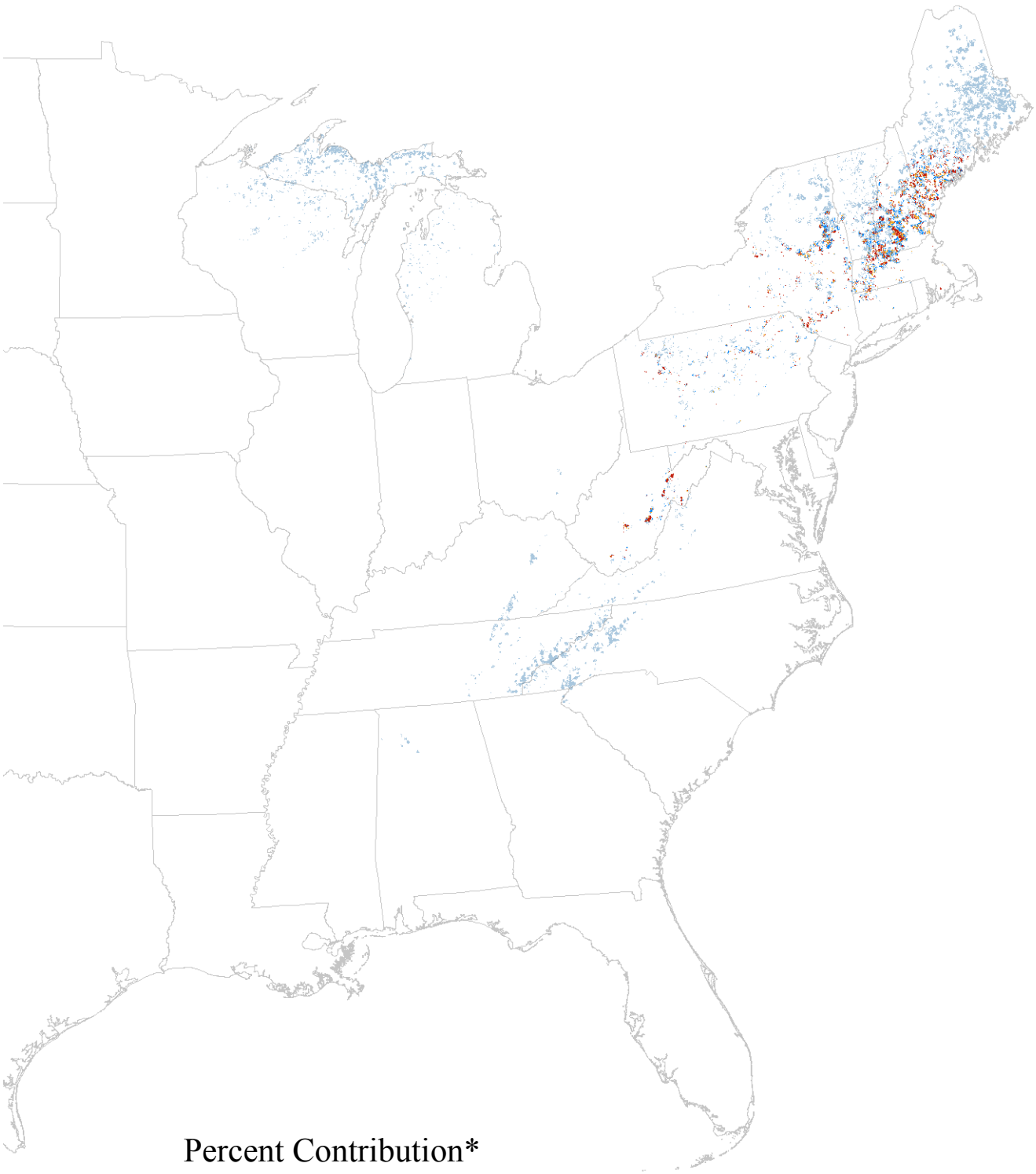
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Hemlock Woolly Adelgid on Carolina/Eastern Hemlock (NA)

0 50 100 200 300

Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Ips Engraver Beetle	**Host(s):**	Red Pine
Model Extent:	North Central States	**Max Percent Mortality:**	50%

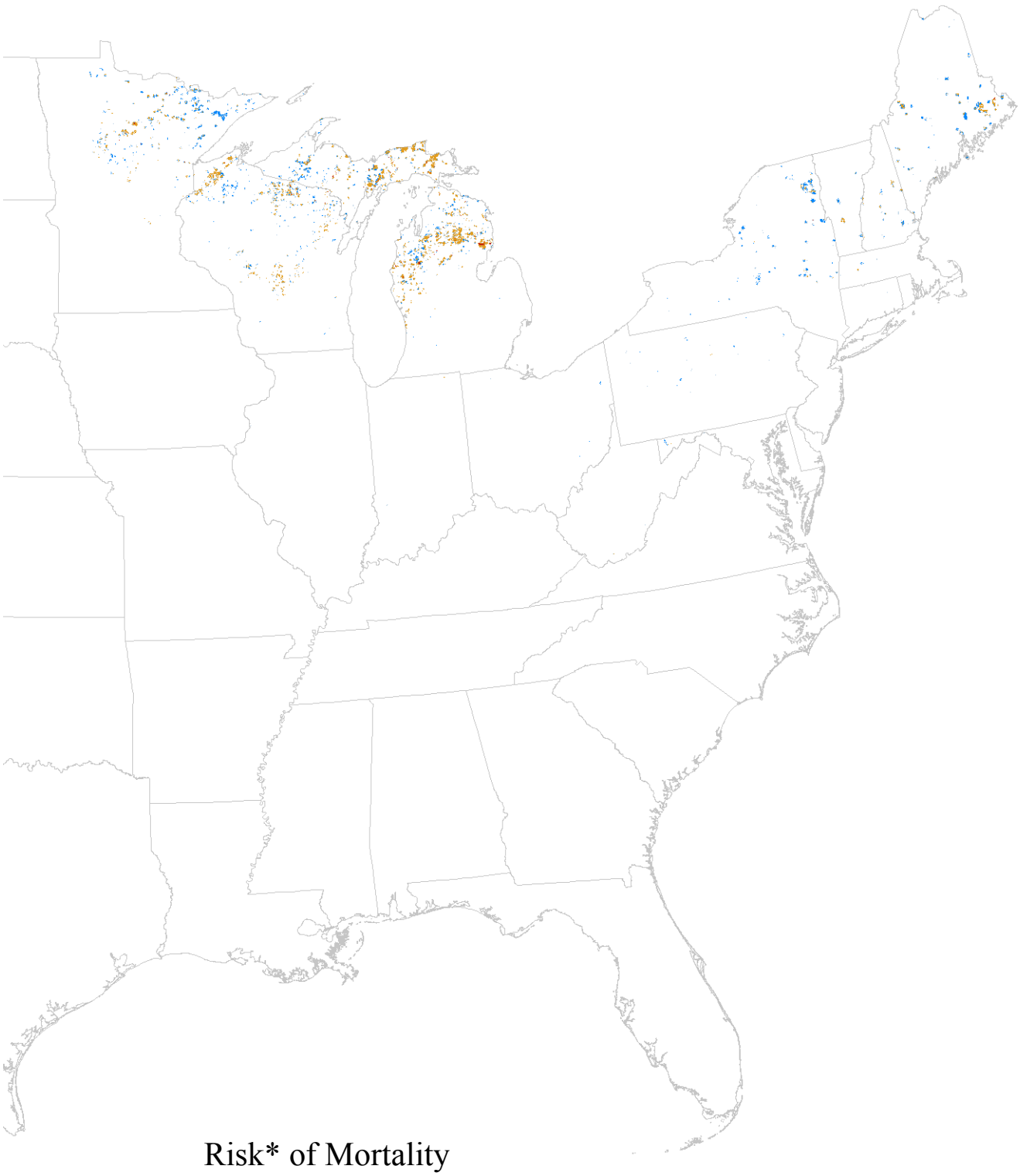
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
0	0%								
Criteria 1									
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host Basal Area	60	140	140	140	J-1	1	25%
Criteria 2		Host DBH	3	20	20	20	S-1	1	25%
Criteria 3		Soil Dryness	0	45	45	85	S-1	1	25%
Criteria 4		Annual Precipitation	9	24	24	38	S-2	1	25%
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	
Comments	
Citations	
Model Certainity	3 - Informed Professional Judgement



Risk* of Mortality

Ips Engraver Beetle on Red Pine

Mortality Ceiling of 50%

0 50 100 200 300

Miles

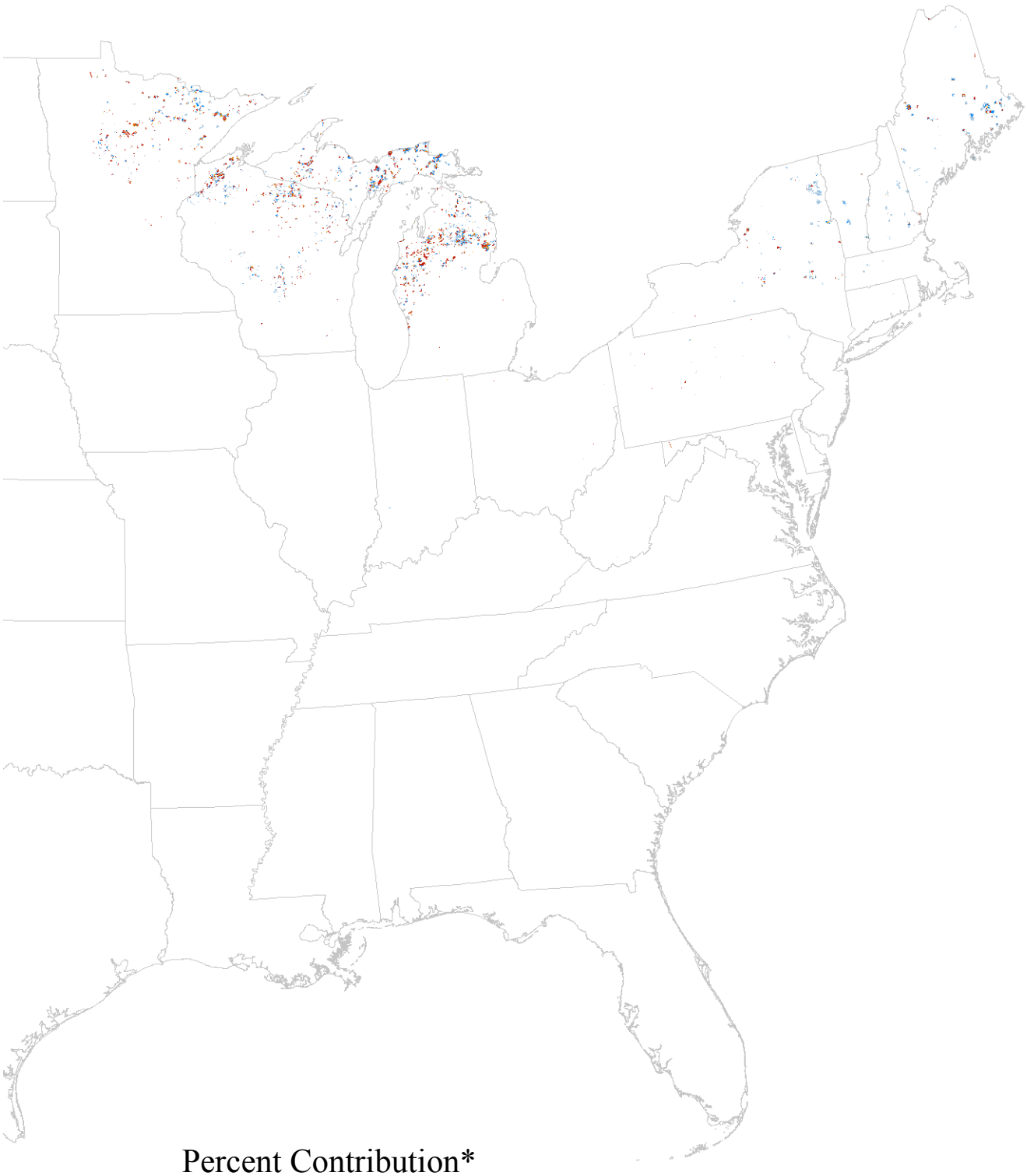
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Ips Engraver Beetle on Red Pine

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Jack Pine Budworm	**Host(s):**	Jack Pine
Model Extent:	Northeastern Area	**Max Percent Mortality:**	80%

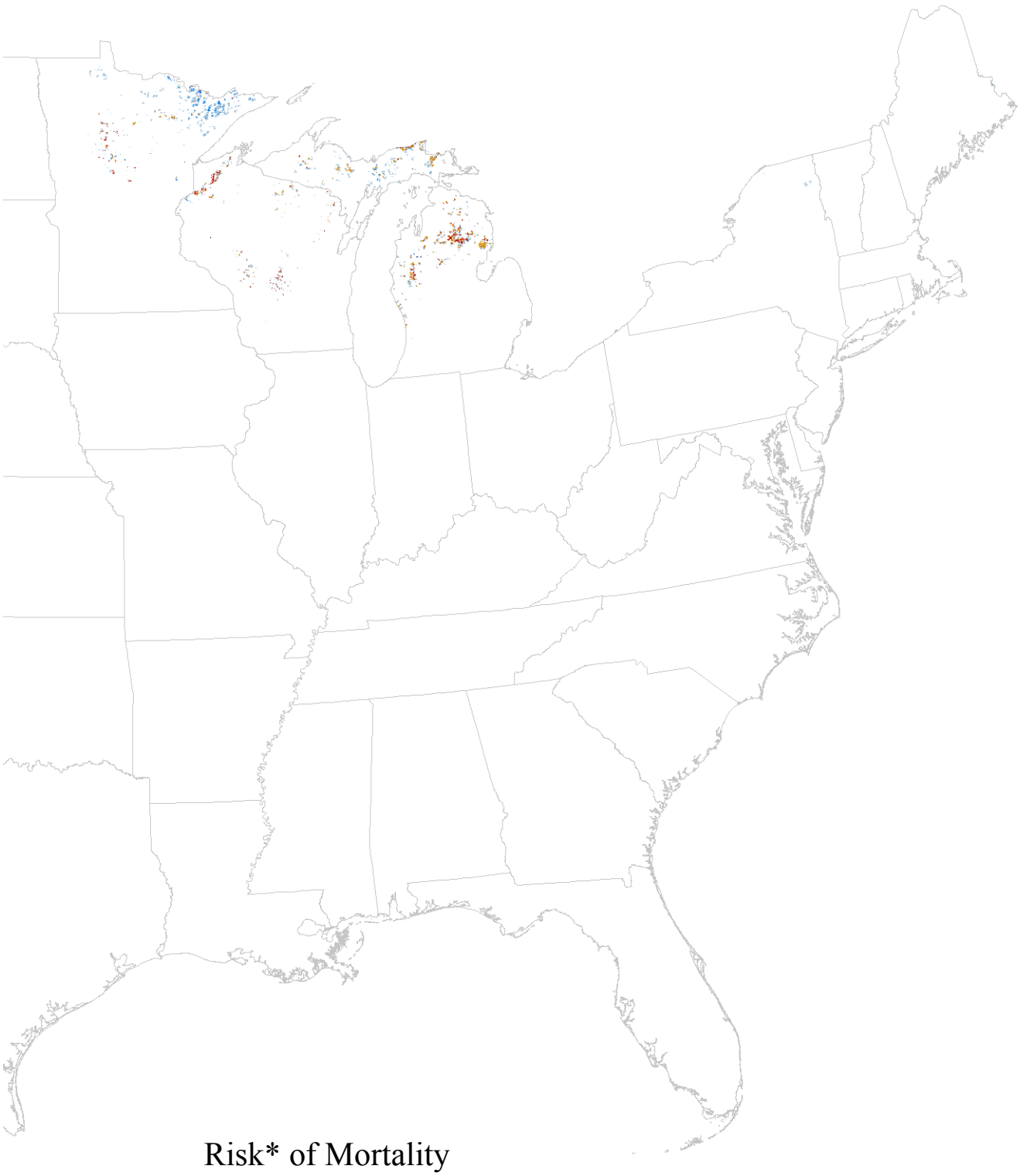
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1/2	33%								
Criteria 1		Soil Dryness	0	15	15	29	S 2	1	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	67%								
Criteria 1		Canopy Cover %	0	30	30	57	J 2	1	63%
Criteria 2		Host DBH	5	9	9	9	J 1	1/4	16%
Criteria 3		Host basal area	1	70	80	115	S 5	1/3	21%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Jack Pine Budworm on Jack Pine

Mortality Ceiling of 80%

0 50 100 200 300
Miles

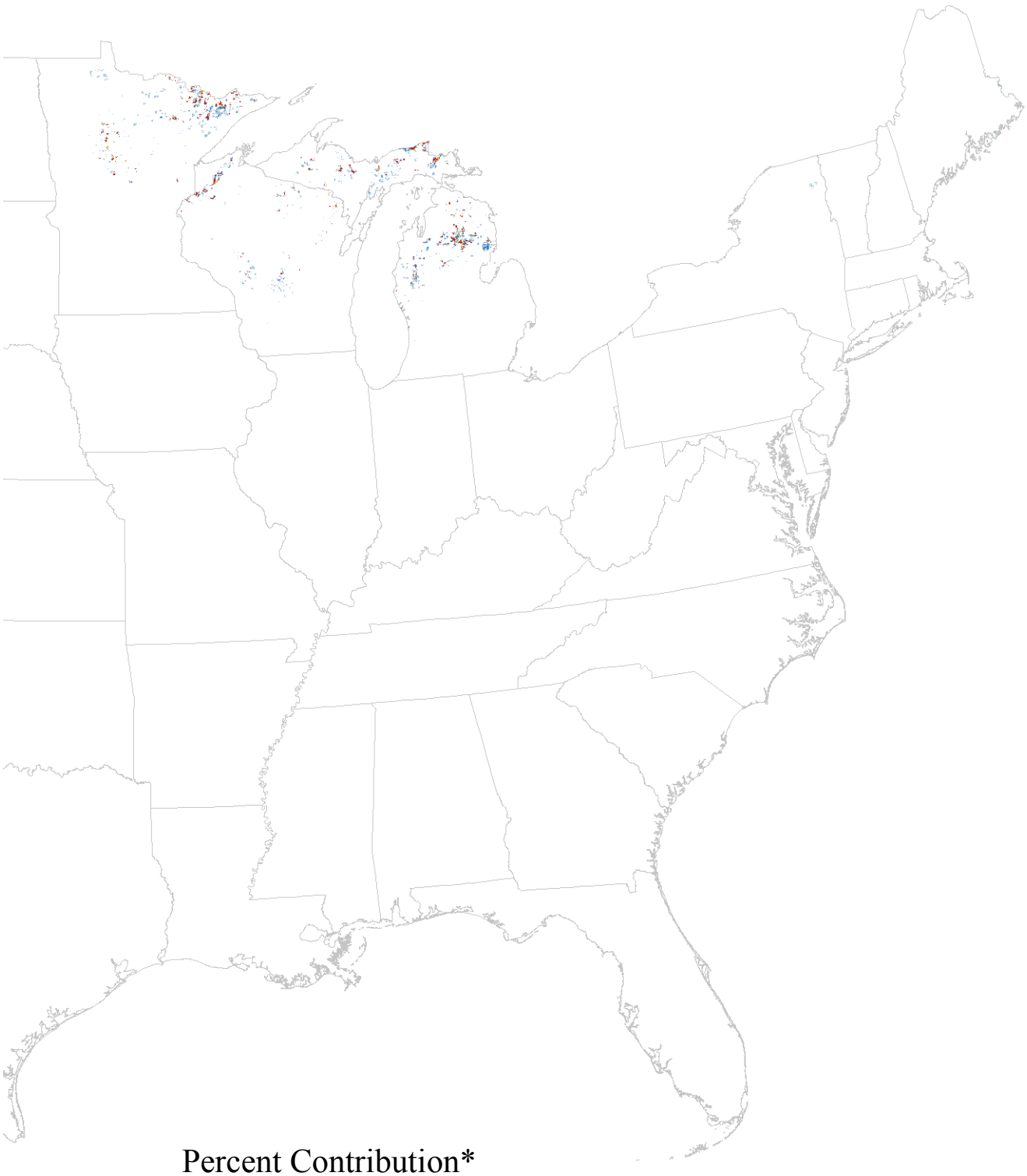
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Jack Pine Budworm on Jack Pine

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Oak Wilt	**Host(s):**	Red Oaks
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	12%

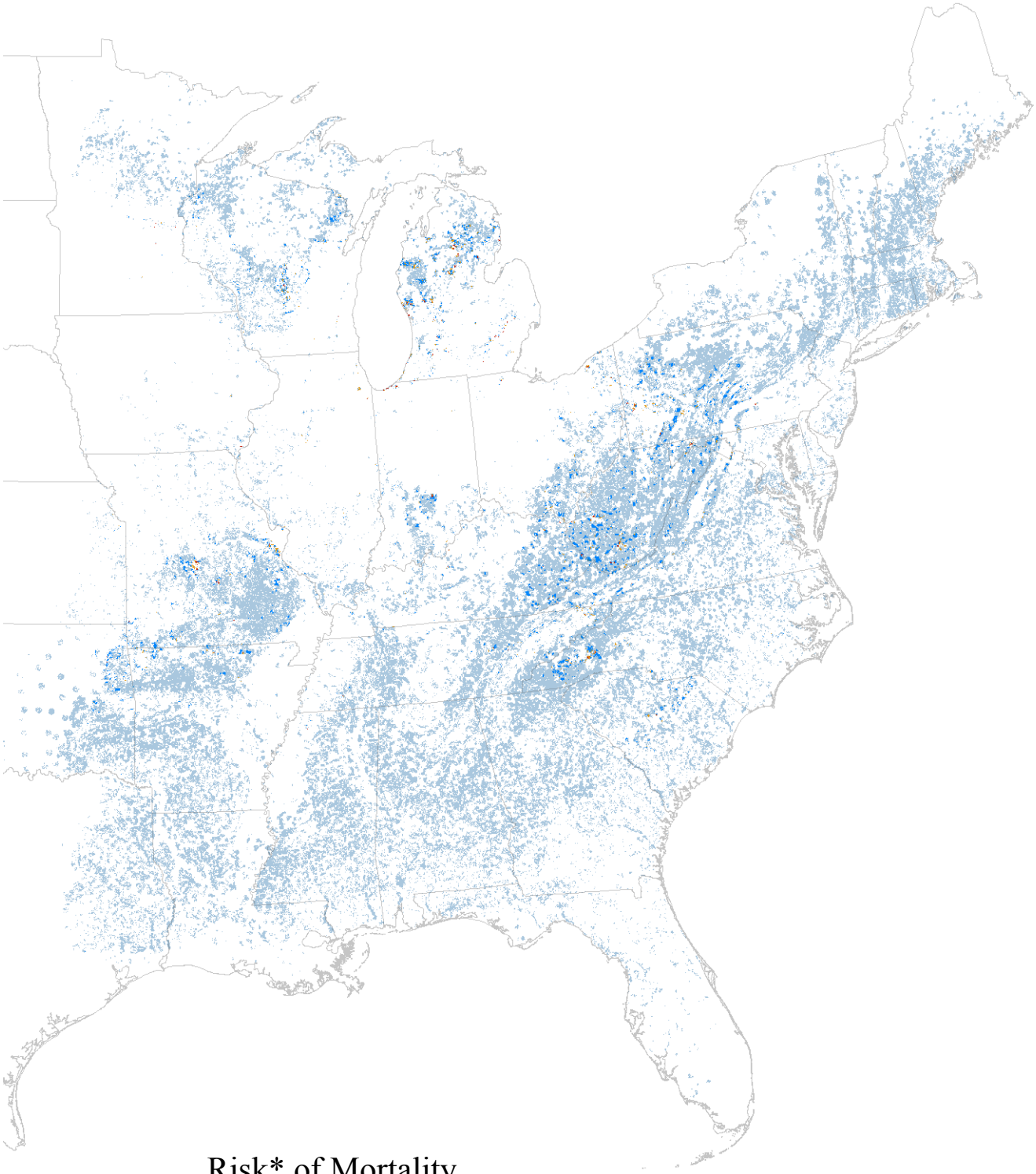
Susceptibility

Rank/Weight	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1	Host BA	10	30	30	30	S-1	1/2	25%
Criteria 2	Soil Texture	Fine	Very Coarse	Very Coarse	Very Coarse	S-1	1/2	25%
Criteria 3	Housing Density (Units per sq. Mile)	40	130	130	130		1	50%
Criteria 4								
Criteria 5								
Criteria 6								
Criteria 7								
Criteria 8								
Criteria 9								
Criteria 10								

Vulnerability

Rank/Weight	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1								
Criteria 2								
Criteria 3								
Criteria 4								
Criteria 5								
Criteria 6								
Criteria 7								
Criteria 8								
Criteria 9								
Criteria 10								

Constraints	Must be within 6km of an oak wilt center.	**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Oak Wilt on Red Oaks

Mortality Ceiling of 12%

0 50 100 200 300
Miles

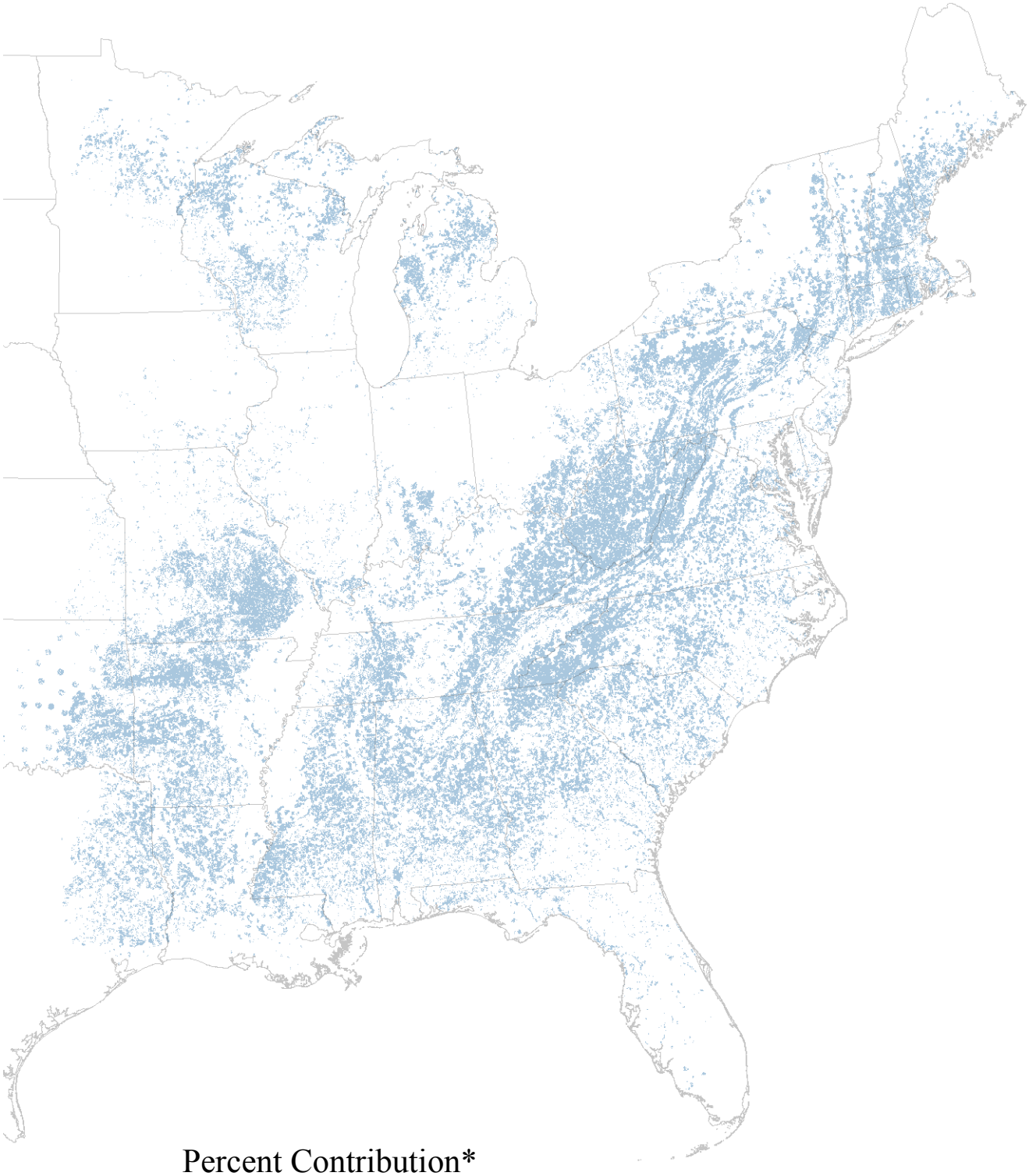
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*
Oak Wilt on Red Oaks

0 50 100 200 300
Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Oak Wilt	**Host(s):**	White Oaks
Model Extent:	Eastern U.S.	**Max Percent Mortality:**	4%

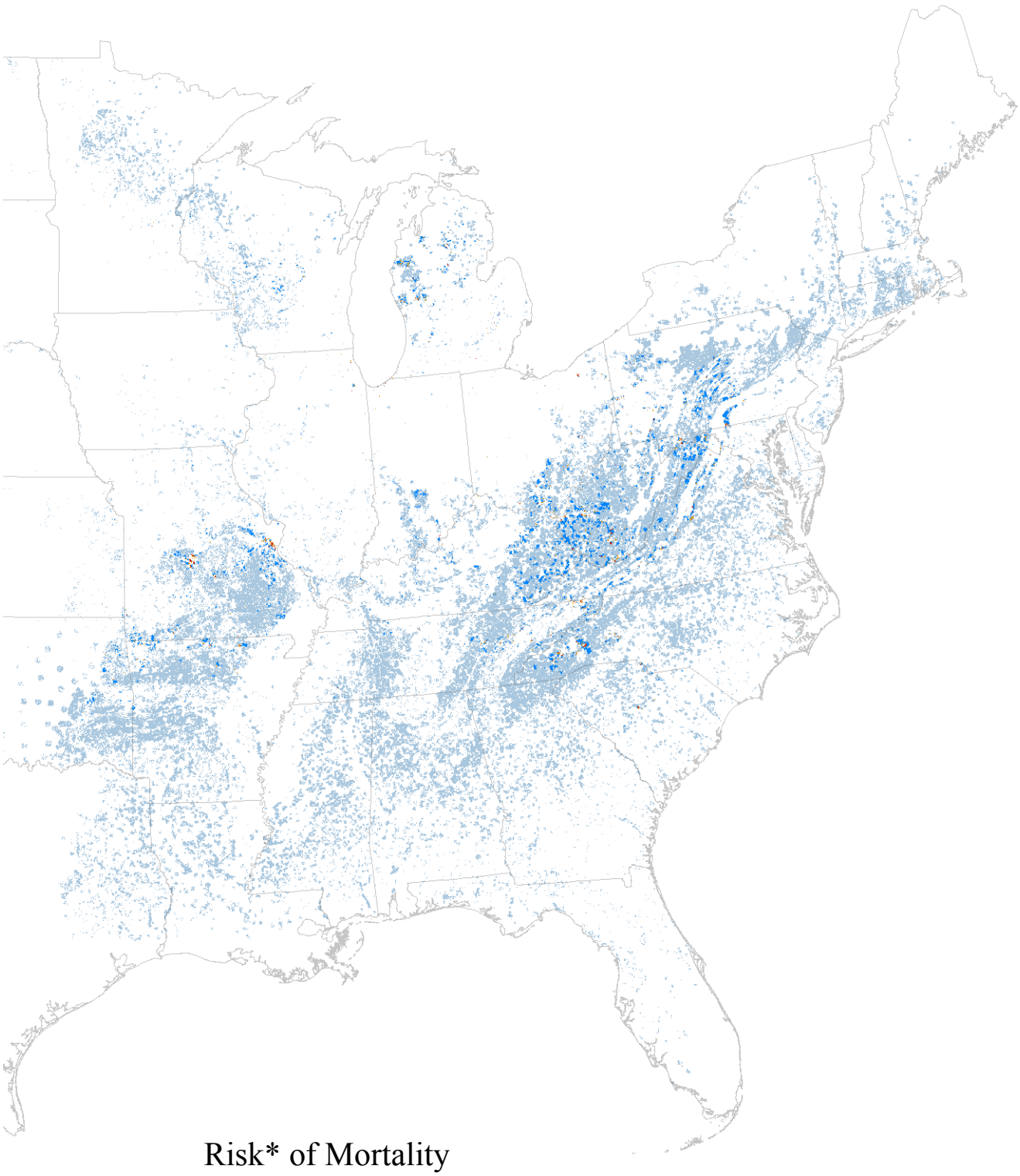
Susceptibility

Rank/Weight	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1	Host BA	10	30	30	30	S-1	1/2	25%
Criteria 2	Soil Texture	Fine	Very Coarse	Very Coarse	Very Coarse	S-1	1/2	25%
Criteria 3	Housing Density (Units per sq. Mile)	40	130	130	130		1	50%
Criteria 4								
Criteria 5								
Criteria 6								
Criteria 7								
Criteria 8								
Criteria 9								
Criteria 10								

Vulnerability

Rank/Weight	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1								
Criteria 2								
Criteria 3								
Criteria 4								
Criteria 5								
Criteria 6								
Criteria 7								
Criteria 8								
Criteria 9								
Criteria 10								

Constraints	Must be within 6km of an oak wilt center.	**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality
Oak Wilt on White Oaks

Mortality Ceiling of 4%

0 50 100 200 300
Miles

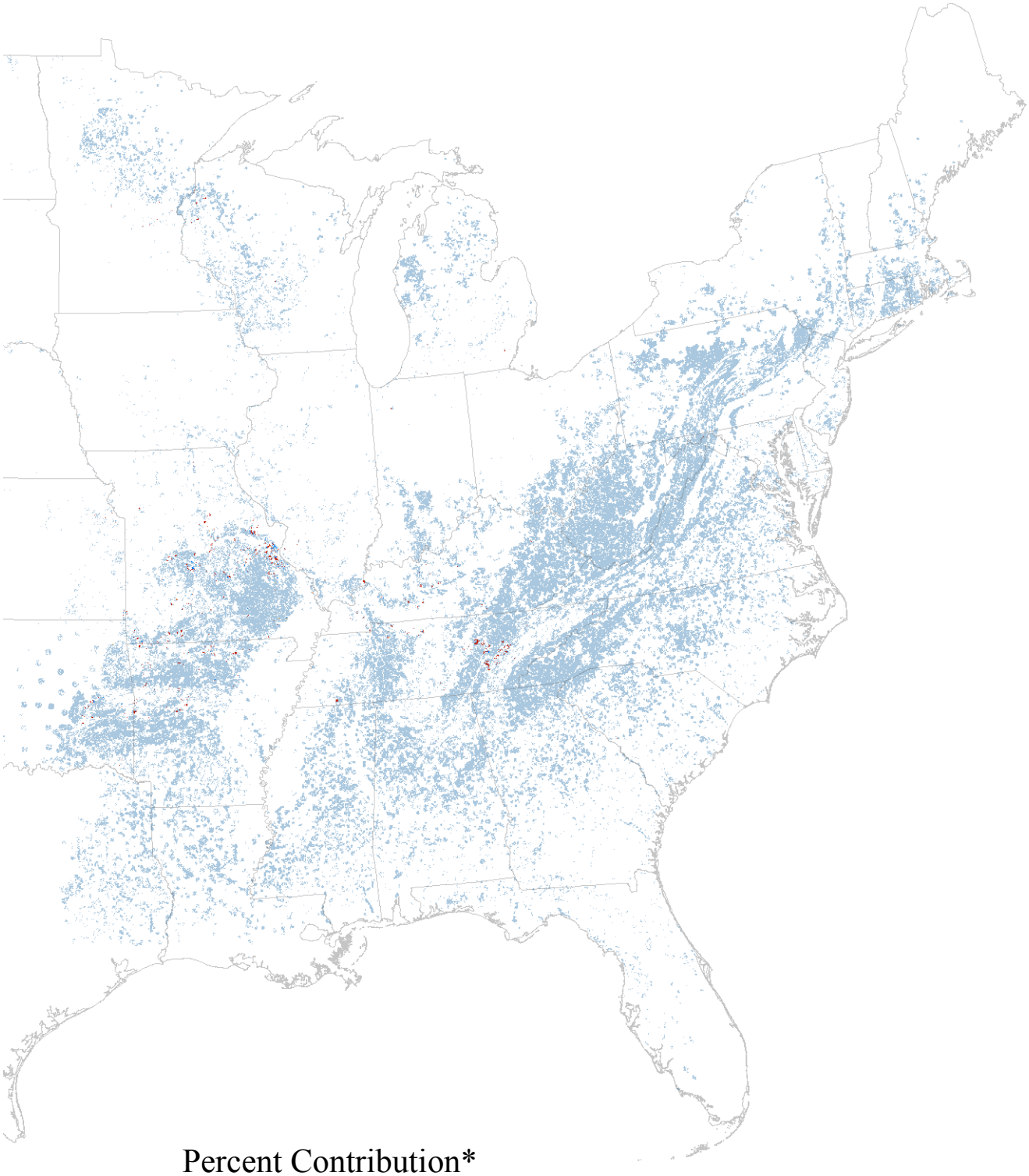
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

*Risk of experiencing mortality at a given threshold over a 15 year period.

Printing Date: November 8, 2007



Percent Contribution*

Oak Wilt on White Oaks

0 50 100 200 300

Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

*Risk of experiencing mortality at a given threshold over a 15 year period.

Printing Date: November 8, 2007

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Spruce Budworm	**Host(s):**	Balsam Fir
Model Extent:	Northeastern Area	**Max Percent Mortality:**	50%

Susceptibility

Rank/Weight 1/2	33%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		% Host	5	90	90	90	J 1	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight 1	67%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		Host BA x DBH Index	0	90	90	90	Linear	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Pest Range	**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement

Risk* of Mortality

Spruce Budworm on Balsam Fir

Mortality Ceiling of 50%

0 50 100 200 300

Miles

Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.

Percent Contribution*

Spruce Budworm on Balsam Fir

0 50 100 200 300

Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	Spruce Budworm	**Host(s):**	Spruce Species
Model Extent:	Northeastern Area	**Max Percent Mortality:**	25%

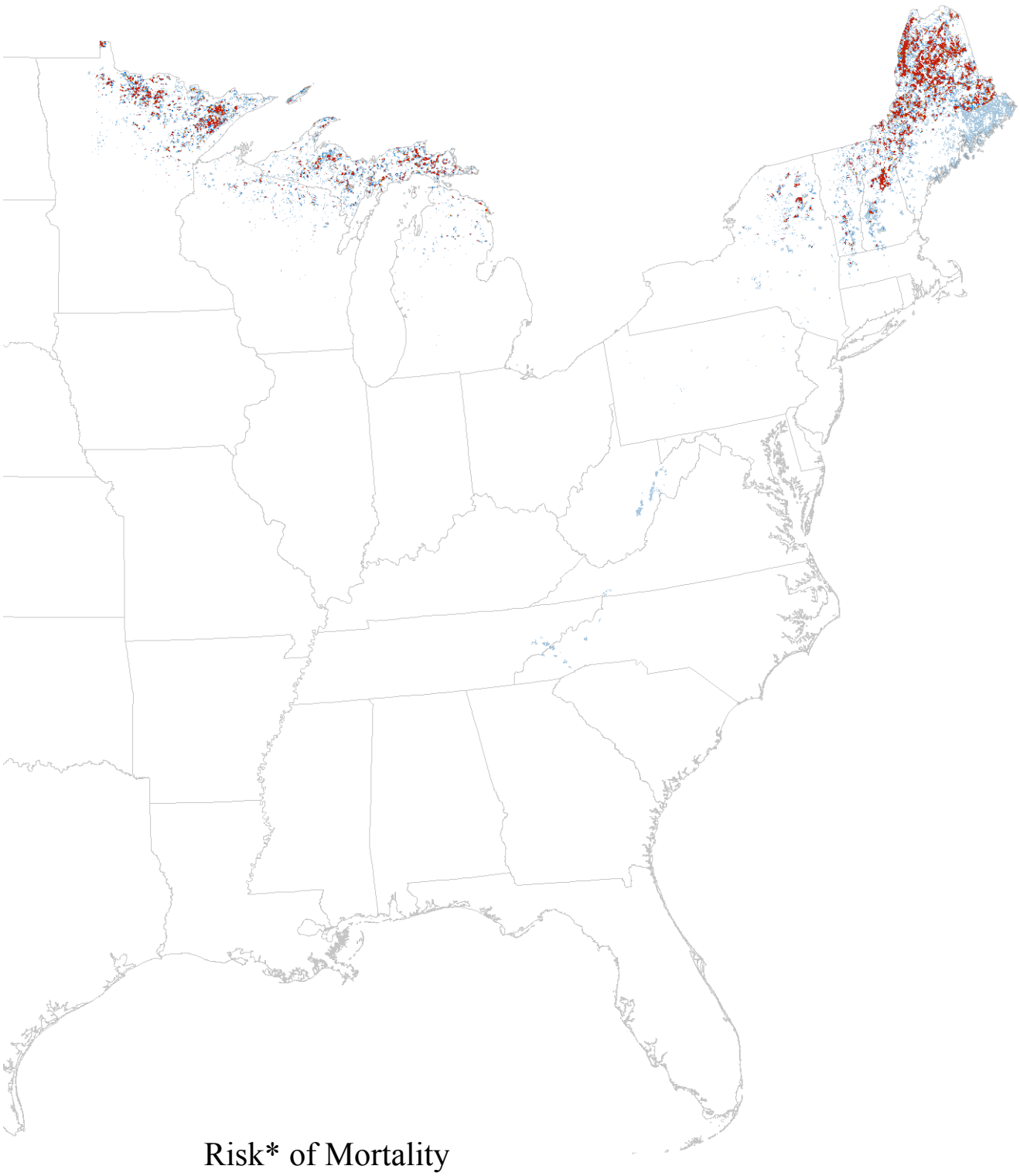
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1/2	33%								
Criteria 1		% Host	5	90	90	90	J 1	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	67%								
Criteria 1		Host BA x DBH Index	0	90	90	90	Linear	100	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Pest Range	**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality

Spruce Budworm on Spruce

Mortality Ceiling of 25%

0 50 100 200 300

Miles

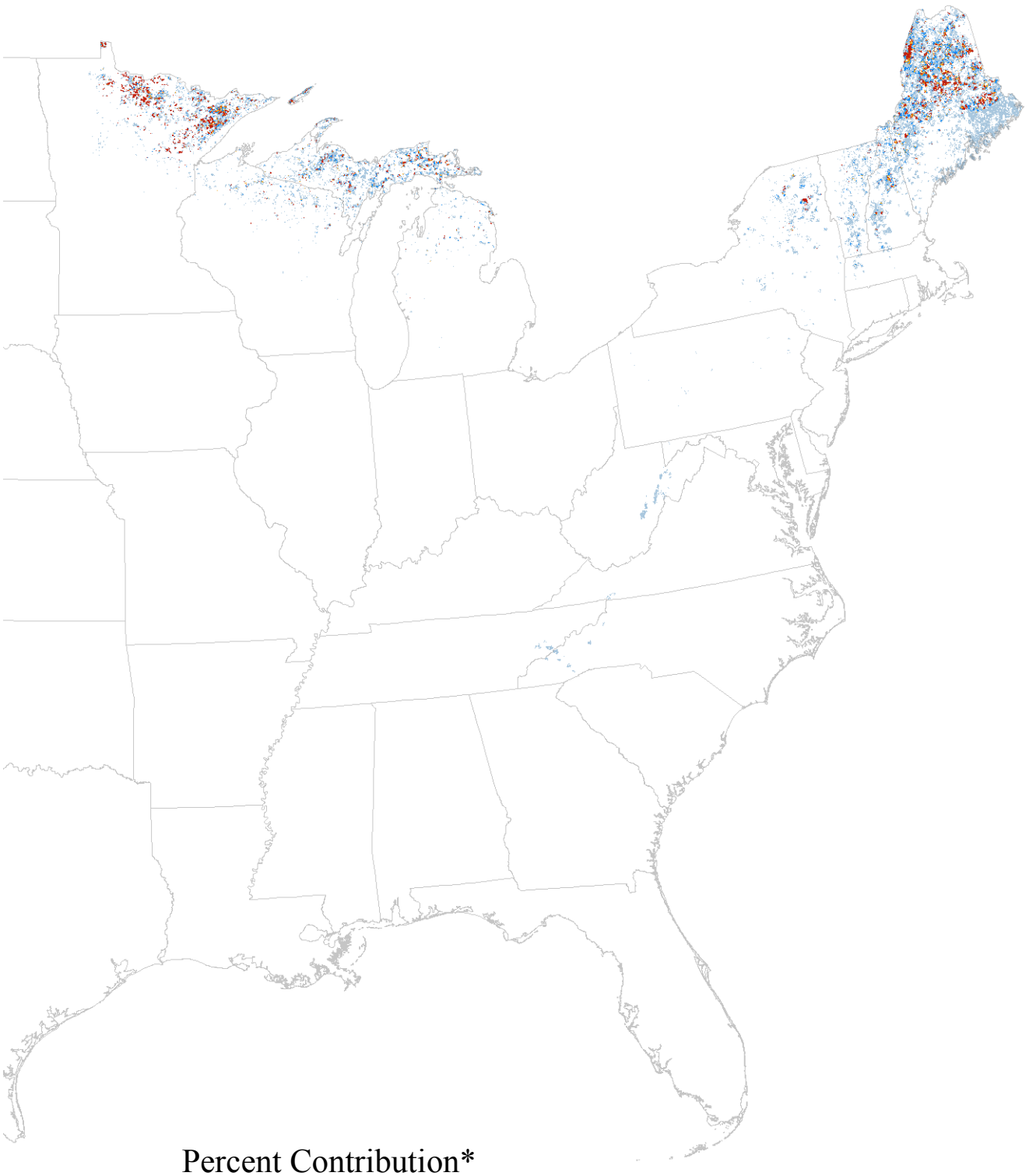
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

Spruce Budworm on Spruce

0 50 100 200 300

Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.

Risk Model Worksheet - Northeastern Area

Risk Agent(s):	White Pine Blister Rust	**Host(s):**	Eastern White Pine
Model Extent:	Northeastern Area	**Max Percent Mortality:**	25%

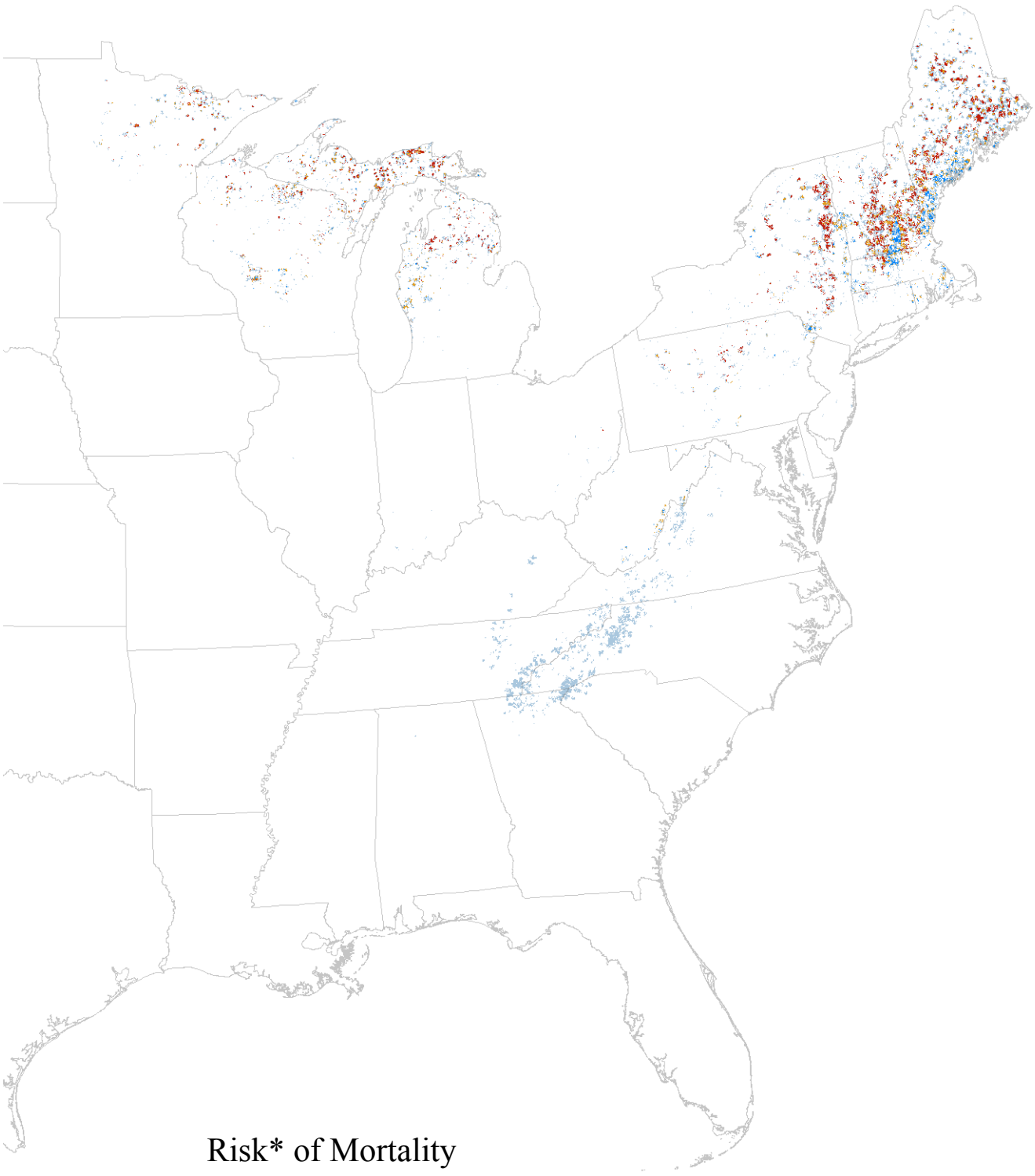
Susceptibility

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1/2	33%								
Criteria 1		Slope	0	32	32	32	J 1	1/5	9%
Criteria 2		Pest Range	0	1	1	1	J 1	1	45%
Criteria 3		% Host	0	90	90	90	J 1	1	45%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	67%								
Criteria 1		Risk Zone (1,2,3,4)	1	4	4	4	Linear	1	50%
Criteria 2		QMD	12	2	2	2	S-2	1	50%
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations		**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality
White Pine Blister Rust on Eastern White Pine
Mortality Ceiling of 25%

0 50 100 200 300
Miles

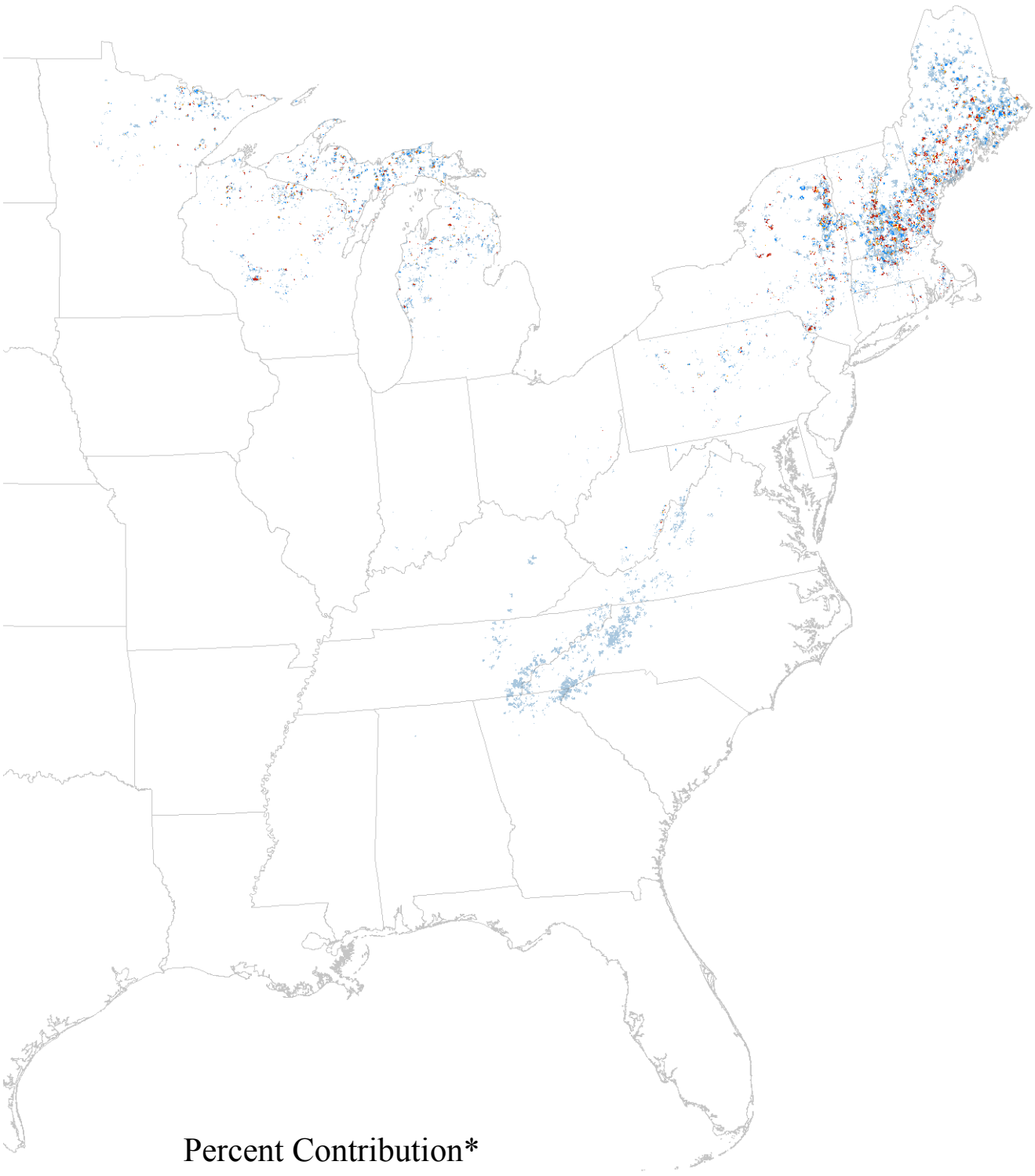
Legend

Level of risk for host

- 0 - 2 Little or no risk
- 3 - 4 Low risk
- 5 - 6 Medium risk
- 7 - 10 High risk

Printing Date: November 8, 2007

*Risk of experiencing mortality at a given threshold over a 15 year period.



Percent Contribution*

White Pine Blister Rust on Eastern White Pine

0 50 100 200 300

Miles

Legend

Percent contribution

- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Printing Date: November 8, 2007

*Percent contribution to composite basal area loss attributed to the individual risk agent.