IMPORTANT INFORMATION ABOUT THIS WORKBOOK
Risk Map Workbook

Please Select Your Area (e.g. Northeastern Area): **Interior West**

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:

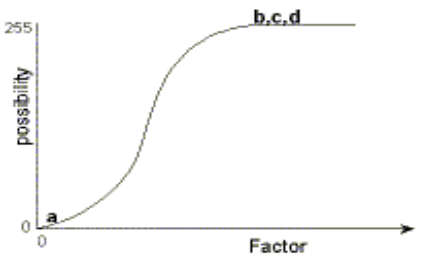
README	This worksheet
Curves	Curve graphics
Risk Rankings	Tool for assisting in developing scales
Citations	Listing and status of models for interior west
Base Sheet	Empty base sheet

Filling out the Model Worksheets

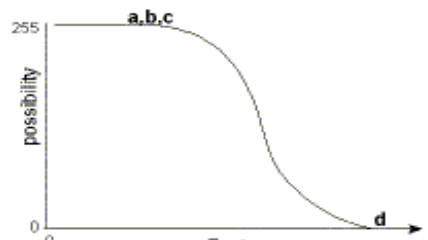
The area in blue on the top of the worksheet is for your use and is not printed. The format has changed slightly from the previous versions.

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.

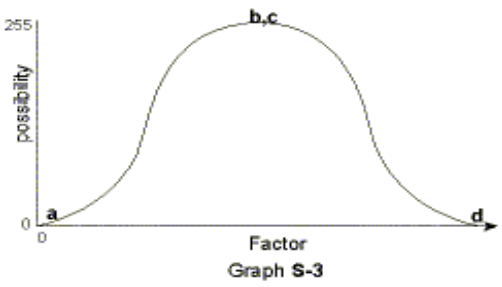
Sigmoidal Membership Functions



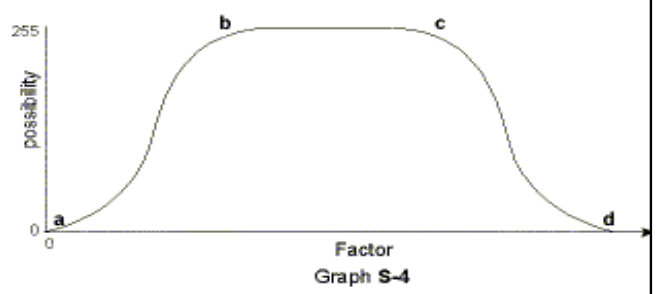
Graph **S-1**



Graph **S-2**

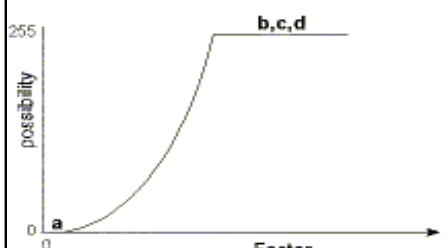


Graph **S-3**

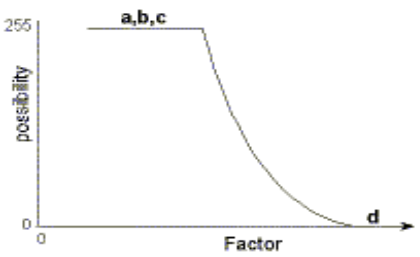


Graph **S-4**

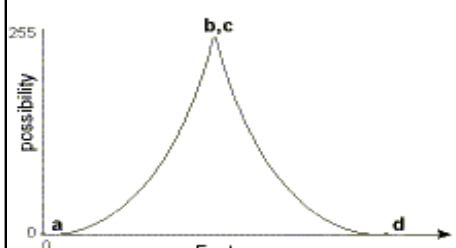
J-Shaped Membership Functions



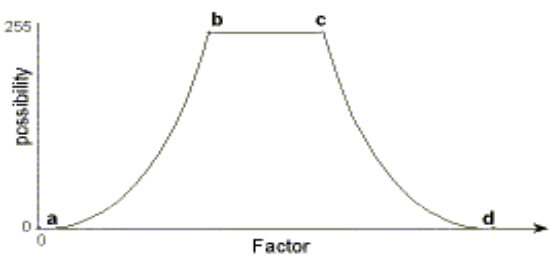
Graph **J-1**



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 - Interior West

No.	Citation
1	Amman, G.D., McGregor, M.D., Cahill, D.B., and Klein, W.H. 1977. Guidelines for reducing losses of lodgepole pine to the mountain pine beetle in unmanaged stands in the Rocky Mountains. USDA Forest Service, General Technical Report INT-36. Intermountain Forest and Range Experimental Station, Ogden, UT. 19 p.
2	Bartos, D.L., and Campbell R.B. 1998. Decline of quaking aspen in the interior west - examples from Utah. Rangelands 20(1): 17-24.
3	Bulaon, B.M. 2005. Personal communication on mountain pine beetle in whitebark pine.
4	Chojnacky, D.C., Bentz, B.J., and Logan, J.A. 2000. Mountain pine beetle attack in ponderosa pine: Comparing methods for rating susceptibility. USDA Forest Service, Research Paper RMRS-RP-26. Rocky Mountain Research Station, Odgen, UT. 10 p.
5	Conklin, D.A. 2005. Personal communication regarding dwarf mistletoe in ponderosa pine.
6	DeMars, C.J., and B.H. Roettgering. 1982. Western pine beetle. USDA Forest Service, Forest Insect & Disease Leaflet 1. 8 p.
7	Geils, B.W., Hawksworth, F.G., and Janssen, J.E. 1991. Longevity of ponderosa pine parasitized by southwestern dwarf mistletoe. Presentation for 76th Annual Meeting, Ecological Society of America 1991, August 4-8. San Antonio, TX. Supplement to the Bulletin of the Ecolological Society of America 72(2): 122.
8	Guyon, J.C. 2005. Personal communication on the aspen decline model.
9	Hagle, S.K. 2005. Root disease plot data for northern Idaho, western Montana and eastern Washington. On file at: USDA Forest Service, Forest Health Technology Enterprise Team, Fort Collins, CO.
10	Hagle, S.K., Johnson, T.L., Stipe, L.E., Schwandt, J.W.,Byler, J.W., Kegley, S.J., Randall C.S.B., Taylor, J.E., Lockman, I.B., Sturdevant, N.J., Williams, S.B., Marsden, M.A., and Lewis, L.G. 2000. Succession functions of forest pathogens and insects: Ecoregion sections M3332a and M333d in northern Idaho and western Montana. Volume 1: Methods. USDA Forest Service, Region 1 FHP Report No. 00-10. State and Private Forestry, Cooperative Forestry and Forest Health Protection, Northern Region, Missoula , MT. 101 p.
11	Hawksworth, F.G. 1977. The 6-class dwarf mistletoe rating system. USDA Forest Service, General Technical Report RM-48. Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 7 p.
12	Hawksworth, F.G., Wiens, D., Geils, B.W., and Nisley, R.G. 1996. Dwarf mistletoes: Biology, pathology and systematics. USDA Forest Service, Agriculture Handbook 709. Washington, D.C. 410 p.
13	Hebertson, E., and Munson, A.S. 2006. Personal communication on fir engraver beetle in white fir.
14	Hoffman, J.T. 2006. Personal communication on lodgepole pine mistletoe.
15	Kay, C.E., and Bartos, D.L. 2000. Ungulate herbivory on Utah aspen: Assessment of long-term exclosures. Journal of Range Management 53(2): 145-153.
16	Kearns, H.S.J. 2005. White pine blister rust in central Rocky Mountains: Modeling current status and potential impacts. Dissertation. Colorado State University, Fort Collins, CO. 243 p.
17	Kegley, S.J., Livington, R.L., and Gibson, K.E. 1997. Pine engraver, *Ips pini* (Say), in the western United States. USDA Forest Service, Forest Insect & Disease Leaflet 122. 5 p.
18	McCambridge, W.F., Hawksworth, F.G., Edminster, C.B., and Laut, J.G. 1982. Ponderosa pine mortality resulting from a mountain pine beetle outbreak. USDA Forest Service, Research Paper RM-235. Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 7 p.
19	McMillin, J.D., and Allen, K.K. 2003. Effects of Douglas-fir beetle (Coleoptera: Scolytidae) infestations on forest overstory and understory conditions in western Wyoming. Western North American Naturalist 63(4): 498-506.
20	McMillin, J.D., Allen, K.K., Long, D.F., Harris, J.L., and Negrón, J.F. 2003. Effects of western balsam bark beetle on spruce-fir forests of north-central Wyoming. Western Journal of Applied Forestry 18: 259-266.
21	McMillin, J.D., and Anhold, J.A. 2005. Personal communication regarding ips beetles in ponderosa pine.
22	Munson, A.S. 2005. Personal communication regarding spruce beetle model mortality threshold.
23	Negrón, J.F. 1997. Estimating probabilities of infestation and extent of damage by the roundheaded pine beetle in ponderosa pine in the Sacramento Mountains, New Mexico. Canadian Journal of Forest Research 27: 1935-1945.
24	Negrón, J.F. 1998. Probability of infestation and extent of mortality associated with the Douglas-fir beetle in the Colorado Front Range. Forest Ecology and Management 107: 71-85.
25	Negrón, J.F., Bennet, D.D., and Gibson, K.E. 2005. Personal communication regarding host basal area criteria in the Douglas fir beetle model.
26	Negrón, J.F., and Popp, J.B. 2004. Probability of ponderosa pine infestation by mountain pine beetle in the Colorado Front Range. Forest Ecology and Management 191: 17-27.
27	Negrón, J.F., Schaupp, W.C., Gibson, K.E., Anhold, J., Hansen, D., Their, R., and Mocettini, P. 1999. Estimating extent of mortality associated with the Douglas-fir beetle in central and northern Rockies. Western Journal of Applied Forestry 14(3): 121-127.
28	Negrón, J.F., and Wilson, J.L. 2003. Attributes associated with probability of infestation by the piñon ips, *Ips confusus* (Coleoptera: Scolytidae), in piñon pine, *Pinus edulis* . Western North American Naturalist 63(4): 440-451.
29	Negrón, J.F., Wilson, J.L., and Anhold, J.A. 2000. Stand conditions associated with roundheaded pine beetle (Coleoptera: Scolytidae) infestations in Arizona and Utah. Environmental Entomology 29(1): 20-27.
30	Parker, D.L. 1991. Integrated pest management guide: Arizona five-spined ips, *Ips lecontei* Swaine, in ponderosa pine and pine engraver, *Ips pini* (Say), in ponderosa pine. USDA Forest Service, R-3 91-8. Southwestern Region, Albuquerque, NM. 17 p.
31	Powell, D.C. 1994. Effect of the 1980s western spruce budworm outbreak on the Malheur National Forest in northeastern Oregon. USDA Forest Service, Technical Publication R6-FI&D-TP-12-94. Pacific Northwest Region, Portland, OR. 176 p.
32	Randall, C., and Tensmeyer, G. 1999. Douglas-fir beetle hazard rating system using the Oracle database and the Forest Service IBM platform. USDA Forest Service, Forest Health Protection Report 99-6. Northern Region, Missolua, MT. 5 p.
33	Randall, C., and Tensmeyer, G. 2000. Hazard rating system for mountain pine beetle in lodgepole pine using the Oracle database and the Forest Service IBM platform. USDA Forest Service, Forest Health Protection Report 00-6. Northern Region, Missoula, MT. 5 p.
34	Schmid, J.M., and Frye, R.H. 1976. Stand ratings for spruce beetles. USDA Forest Service, Research Note RM-309. Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 4 p.
35	Schmid, J.M., and Mata, S.A. 1992. Stand density and mountain pine beetle-caused tree mortality in ponderosa pine stands. USDA Forest Service, Research Note RM-515. Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 4 p.
36	Schmid, J.M., and Mata, S.A. 2005. Mountain pine beetle-caused tree mortality in partially cut plots surrounded by unmanaged stands. USDA Forest Service, Research Paper RMRS-RP-54. Rocky Mountain Research Station, Fort Collins, CO. 11 p.
37	Schmid, J.M., Mata, S.A., and Obedzinski, R.A. 1994. Hazard rating ponderosa pine stands for mountain pine beetle in the Black Hills. USDA Forest Service, Research Note RM-529. Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 4 p.

38 Steele, R., Williams, R.E., Weatherby, J.C., Reinhardt, E.D., Hoffman, J.T., and Their, R.W. 1996. Stand hazard rating for central Idaho forests. USDA Forest Service, General Technical Report INT-GTR-332. Intermountain Research Station, Ogden, UT. 29 p.

39 Stevens, R. E., McCambridge, W.F., and Edminster, C.B. 1980. Risk rating guide for mountain pine beetle in Black Hills ponderosa pine. USDA Forest Service, Research Note RM-385. Rocky Mountain Forest and Range Experimental Station, Ft. Collins, CO. 2 p.

40 Van Sickle, G.A. 1987. Host responses *In* Western spruce budworm. Edited by Brooks, M.H., Campbell, R.W., Colbert, J.J., Mitchell, R.G. and Stark, R.W. USDA Forest Service, Technical Bulletin 1694.

Risk Model Worksheet - Interior West

Risk Agent(s):	Aspen Decline	**Host(s):**	Aspen
Model Extent:	Interior West	**Max Percent Mortality:**	99%

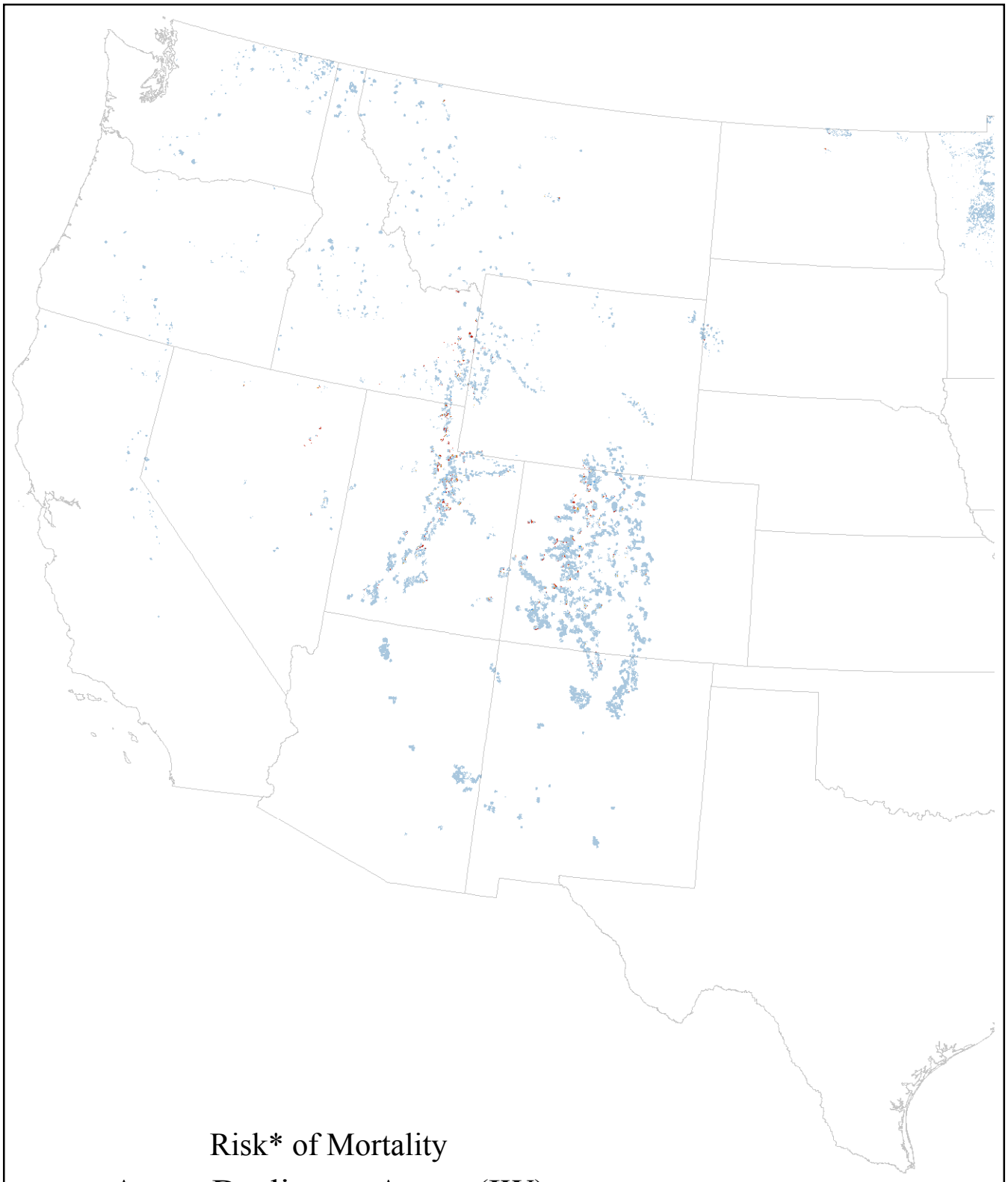
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	5	1	1	1	Linear	1	33%
Criteria 2		Percent Basal Area Host	90	100	100	100	S-1	1	33%
Criteria 3		Total Trees Per Acre	500	1	1	1	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	
Comments	There are two aspen models, this one is for aspen dominated stands. For QMD (critiera 1), risk decreases to 0 above 8 inches.
Citations	2, 8, 15
Model Certainity	4 - Expert Opinion



Risk* of Mortality

Aspen Decline on Aspen (IW)
Part 1 - Aspen dominated stands

Mortality Ceiling of 99%

0 50 100 200 300
Miles

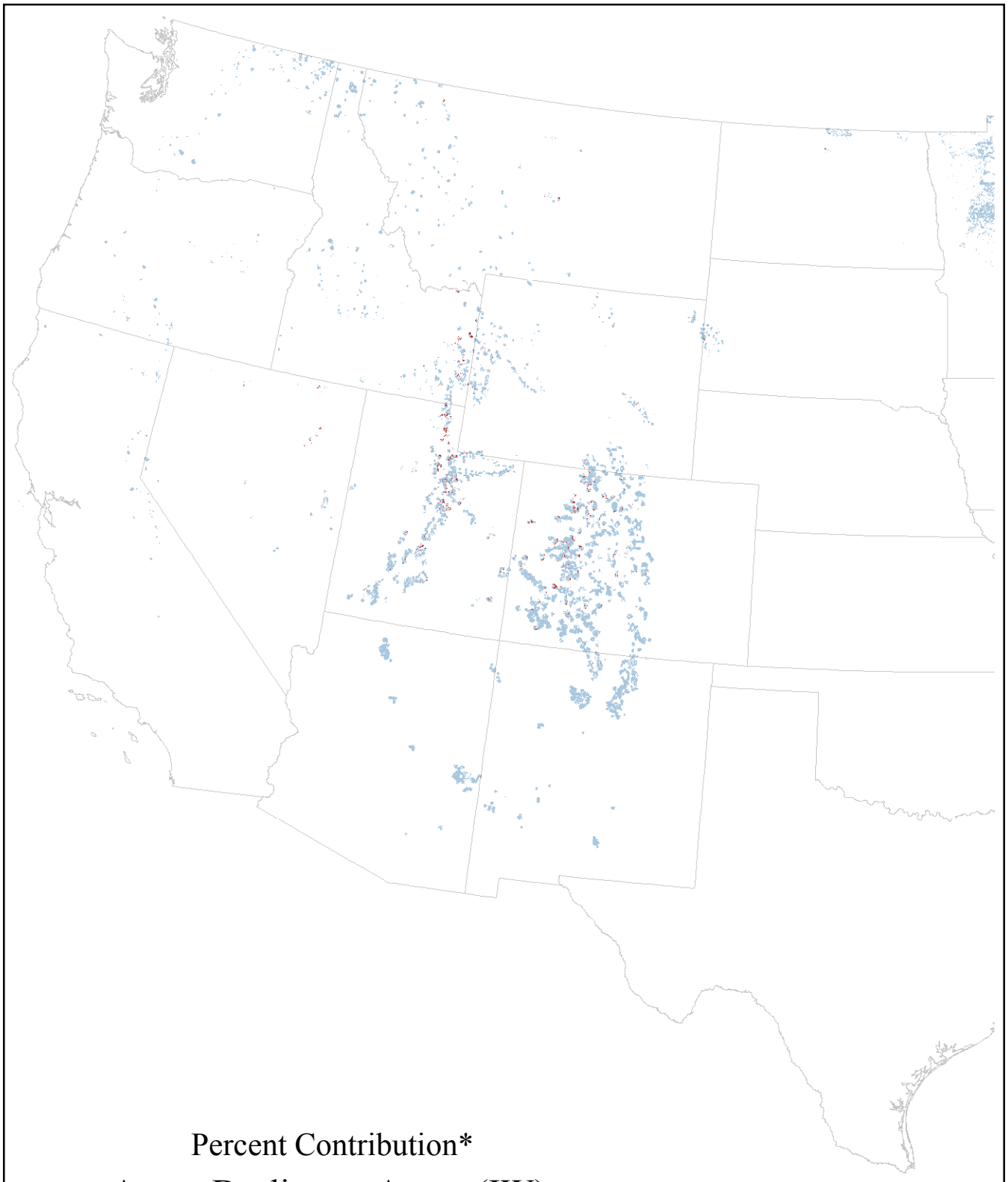
Legend

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 6, 2007

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



Percent Contribution*

Aspen Decline on Aspen (IW)
Part 1 - Aspen dominated stands

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Aspen Decline	**Host(s):**	Aspen
Model Extent:	Interior West	**Max Percent Mortality:**	60%

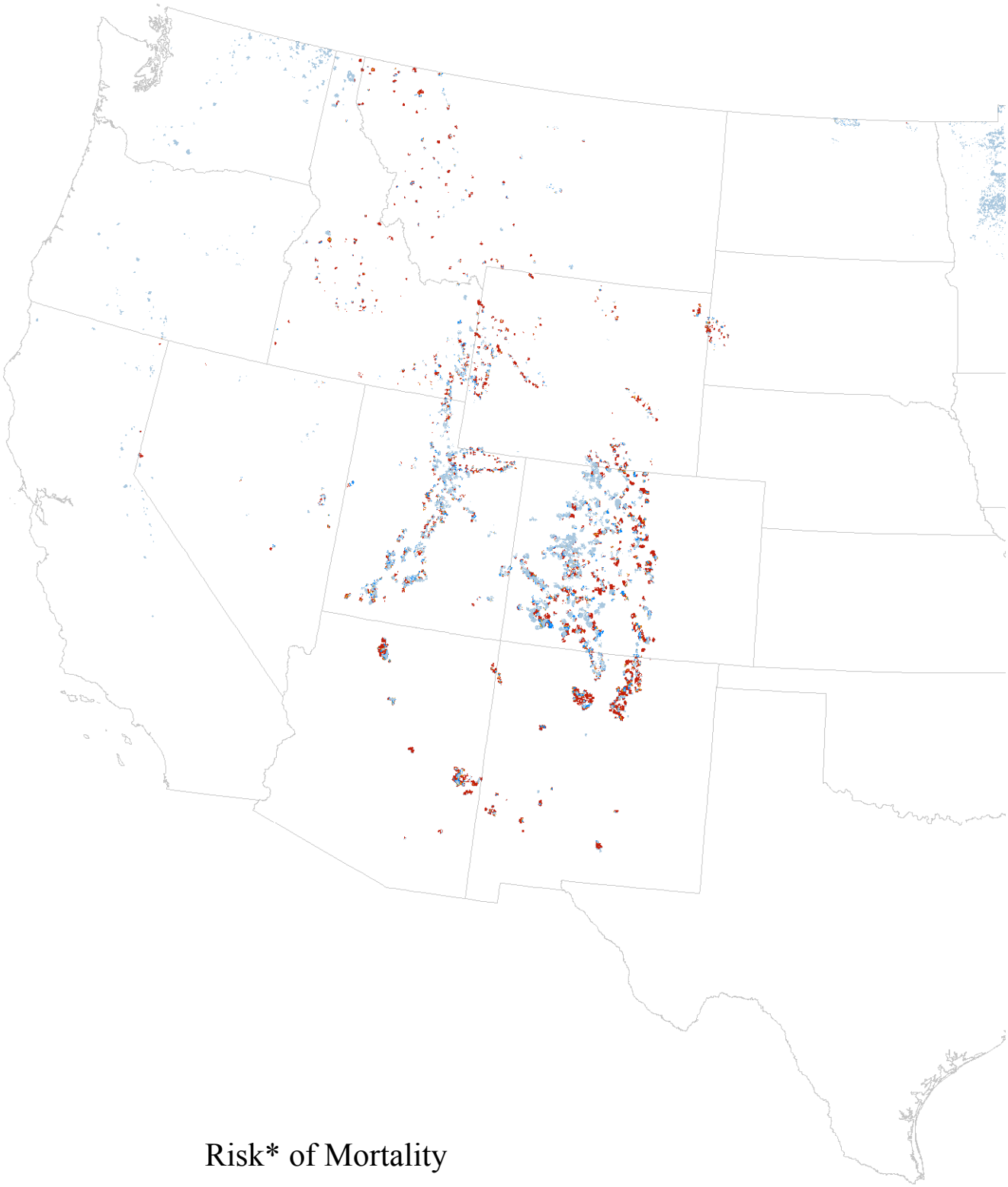
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Percent Basal Area Host	40	1	1	1	Linear	1	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	
Comments	There are two aspen models, this one is for mixed aspen-conifer stands.
Citations	2, 8, 15
Model Certainity	4 - Expert Opinion



Risk* of Mortality

Aspen Decline on Aspen (IW)
Part 2 - Mixed aspen-conifer stands

Mortality Ceiling of 60%

0 50 100 200 300
Miles

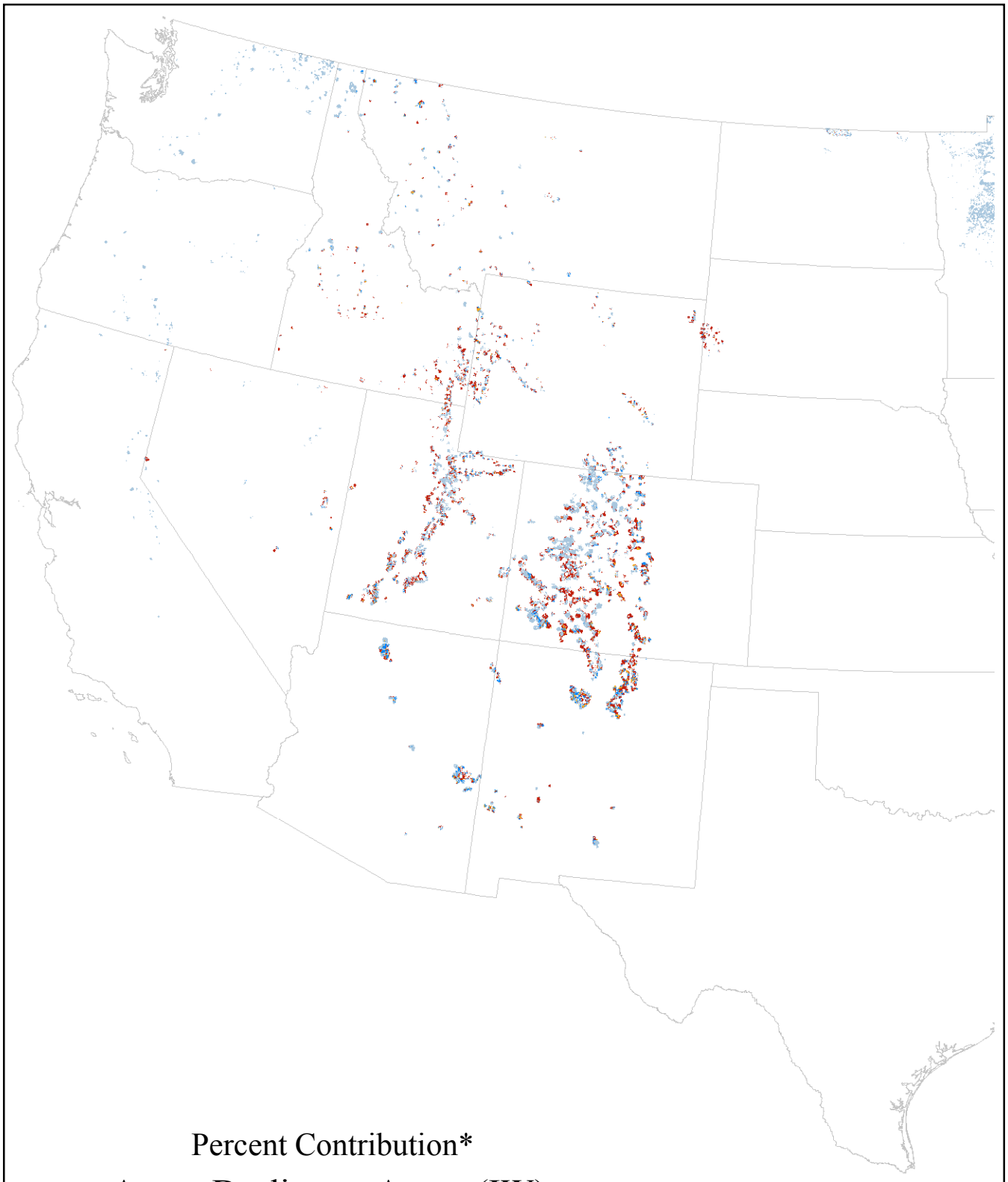
Legend

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 6, 2007

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



Percent Contribution*

Aspen Decline on Aspen (IW)
Part 2 - Mixed aspen-conifer stands

0 50 100 200 300
Miles

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

Legend

Percent contribution

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

Printing Date: November 6, 2007

Risk Model Worksheet - Interior West

Risk Agent(s):	Douglas-Fir Beetle	**Host(s):**	Douglas-Fir
Model Extent:	Interior West	**Max Percent Mortality:**	67%

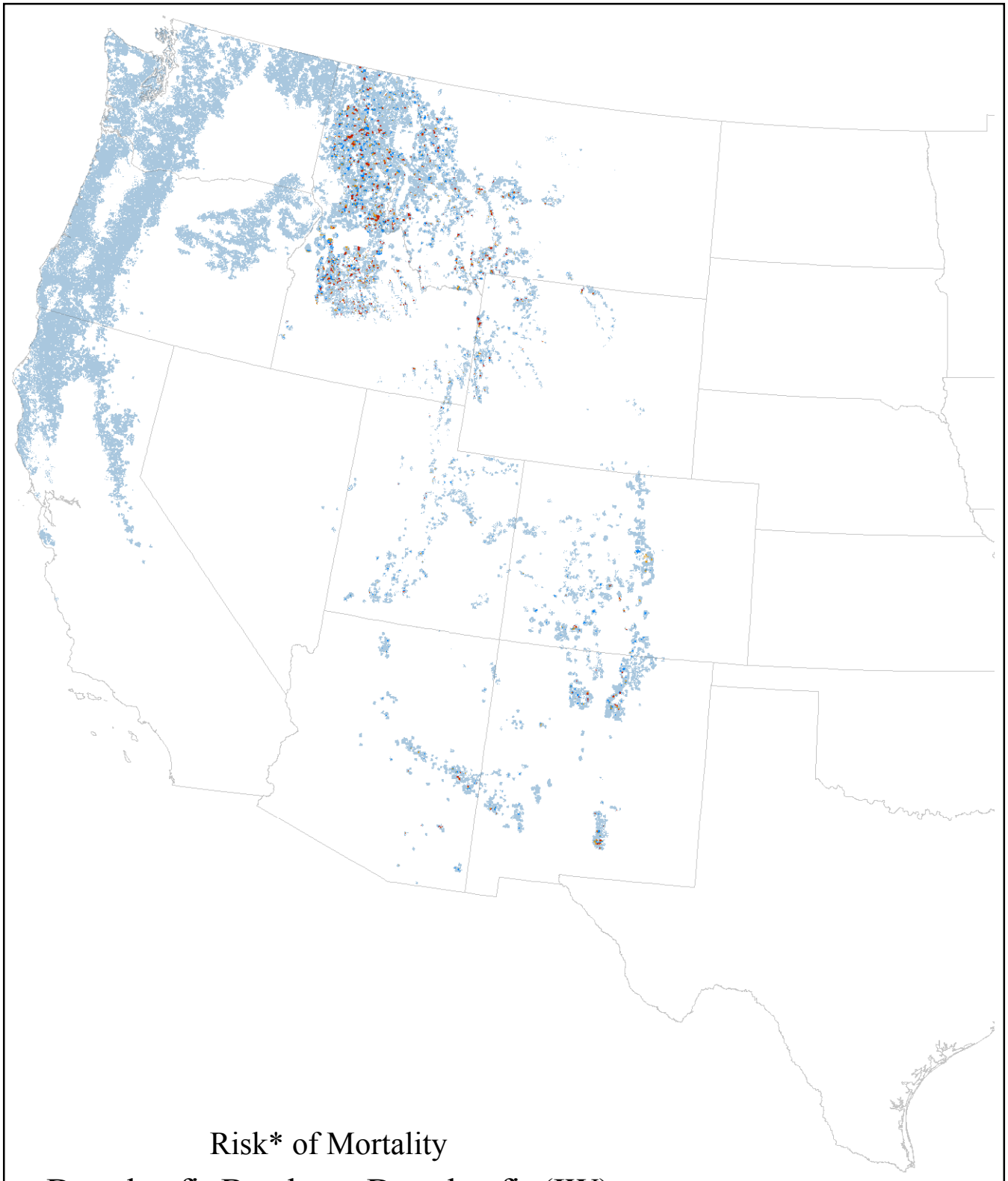
Susceptibility

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									

Vulnerability

Rank/Weight	1	100%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1			Host QMD (inches)	10	16	16	16	Linear	1/2	25%
Criteria 2			Percent Basal Area Host	25	50	50	50	Linear	1	50%
Criteria 3			Total Basal Area (sq ft / acre)	100	250	250	250	Linear	1/2	25%
Criteria 4										
Criteria 5										
Criteria 6										
Criteria 7										
Criteria 8										
Criteria 9										
Criteria 10										

Constraints	
Comments	
Citations	10, 19, 24, 25, 27, 32, 38
Model Certainity	2 - Literature/Research Based



Risk* of Mortality

Douglas-fir Beetle on Douglas-fir (IW)

Mortality Ceiling of 67%

0 50 100 200 300
Miles

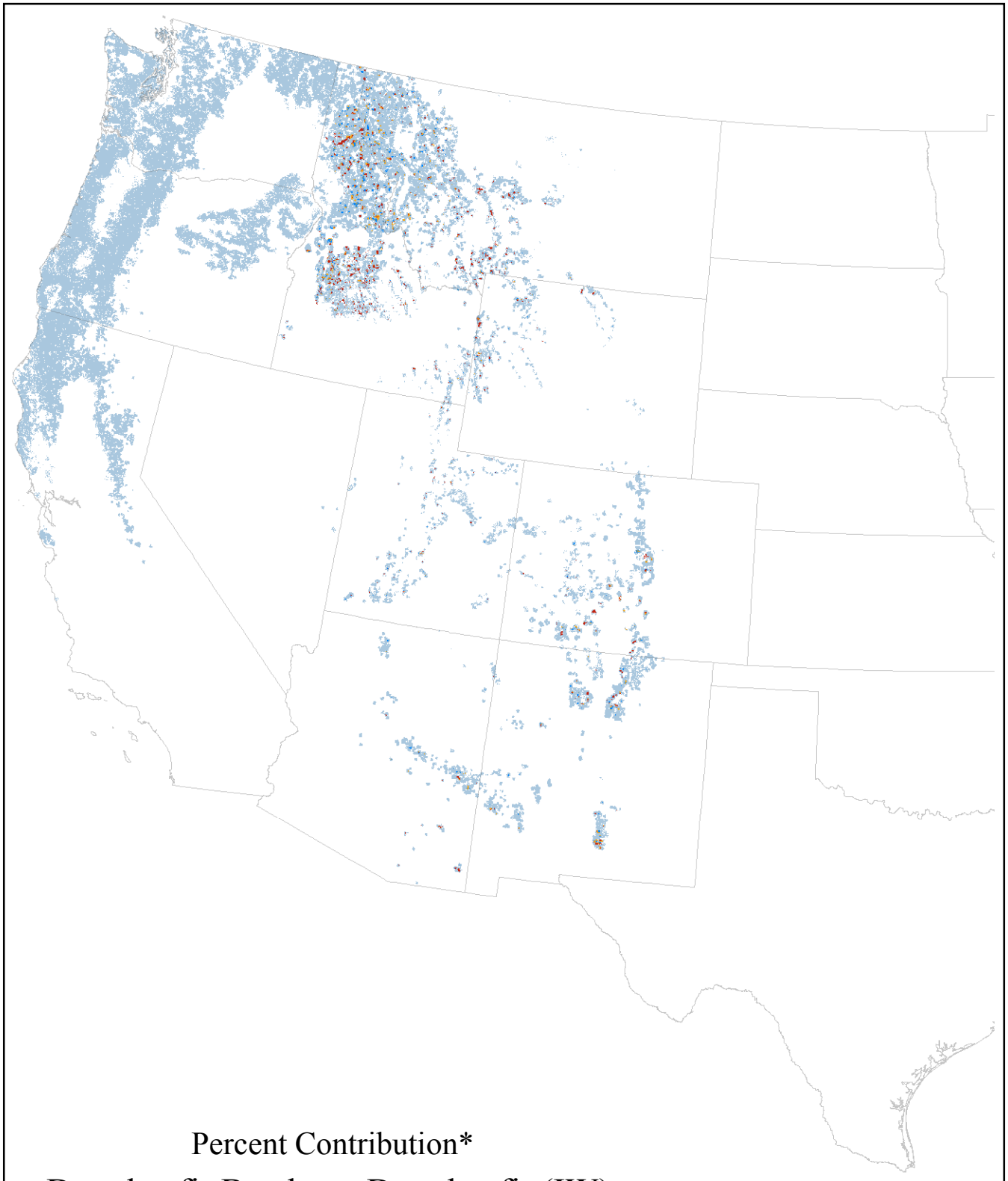
Legend

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 6, 2007

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



Percent Contribution*

Douglas-fir Beetle on Douglas-fir (IW)

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Dwarf Mistletoe	**Host(s):**	Lodgepole Pine
Model Extent:	Interior West	**Max Percent Mortality:**	30%

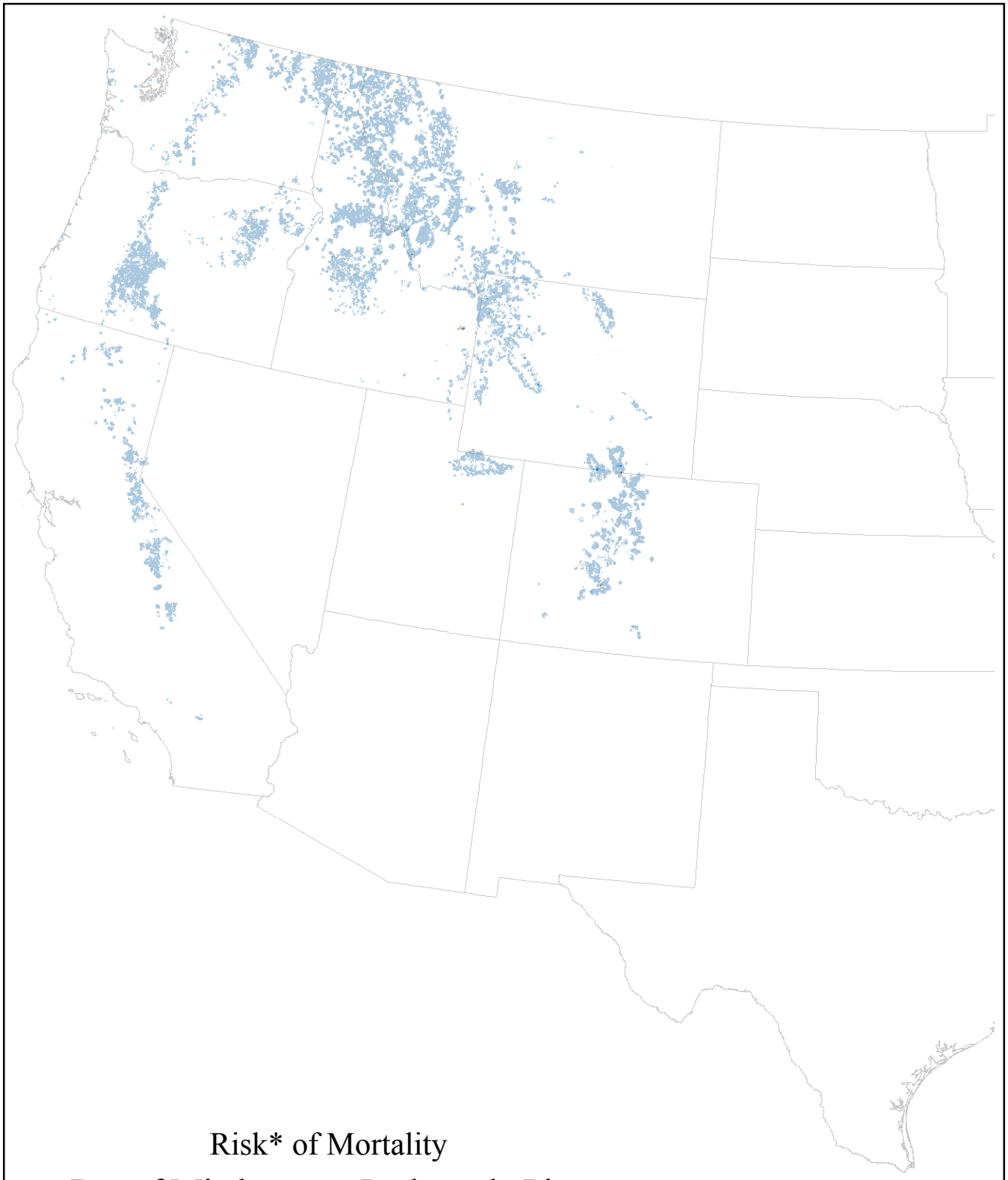
Susceptibility

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									

Vulnerability

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

Constraints	Restricted to area where lodgepole basal area > 1.
Comments	
Citations	11, 12, 14
Model Certainity	3 - Informed Professional Judgement



Risk* of Mortality

Dwarf Mistletoe on Lodgepole Pine

Mortality Ceiling of 30%

0 50 100 200 300

Miles

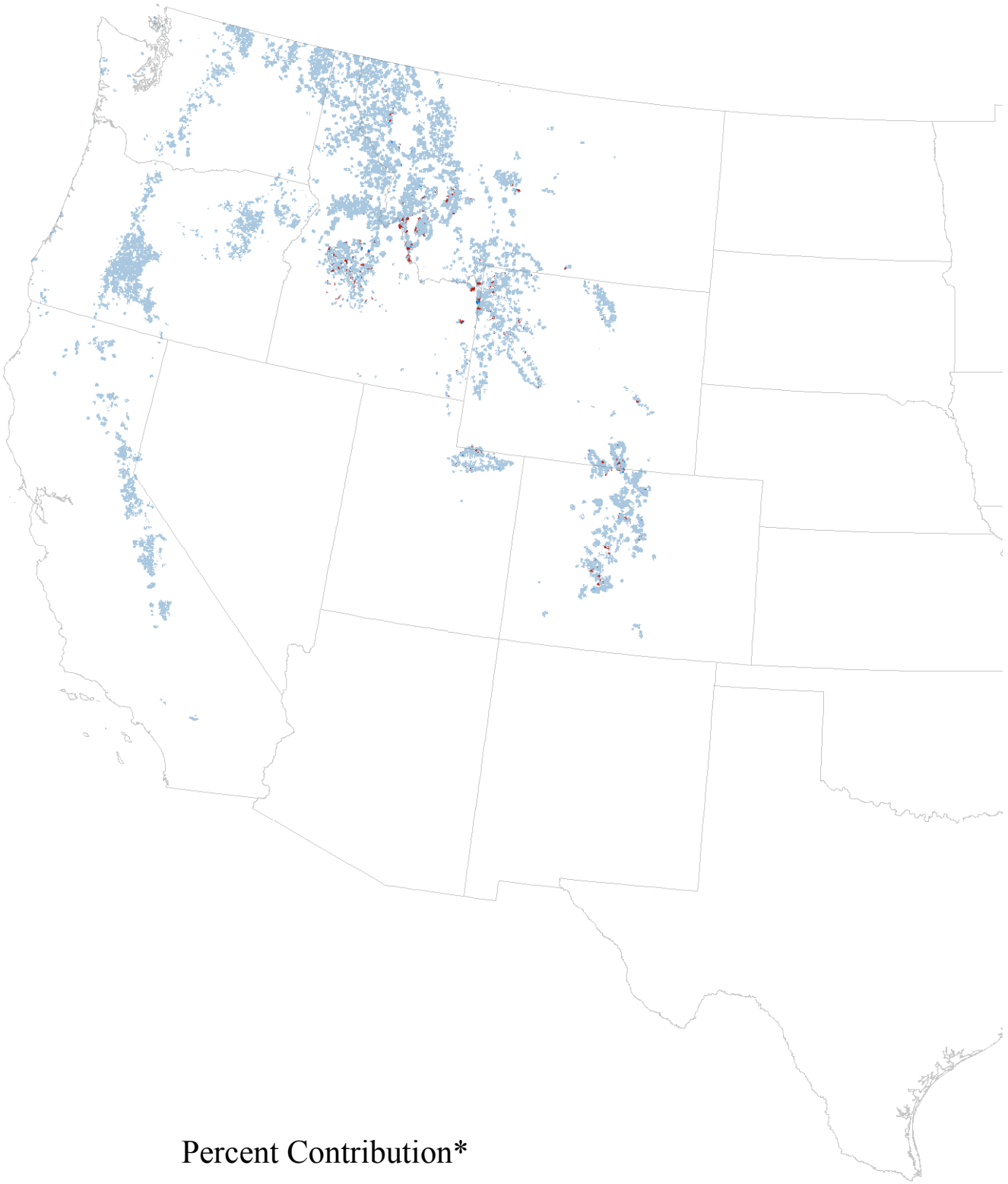
Legend

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 6, 2007

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



Percent Contribution*

Dwarf Mistletoe on Lodgepole Pine

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Dwarf Mistletoe	**Host(s):**	Ponderosa Pine
Model Extent:	Southern Interior West	**Max Percent Mortality:**	20%

Susceptibility

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									

Vulnerability

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

Constraints	Restricted to the following ecoregion sections: M313A, M313B, M331F, M331G, N313A, N313B, N313C, N313D, N313E, N315A, N321A, N322B, N331J.
Comments	
Citations	5, 7, 11, 12
Model Certainity	3 - Informed Professional Judgement

Risk* of Mortality
Dwarf Mistletoe
on Ponderosa Pine (IW)

Mortality Ceiling of 20%

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 7, 2007

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

Percent Contribution*
Dwarf Mistletoe
on Ponderosa Pine (IW)

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Fir Engraver Beetle	**Host(s):**	White Fir
Model Extent:	Interior West	**Max Percent Mortality:**	25%

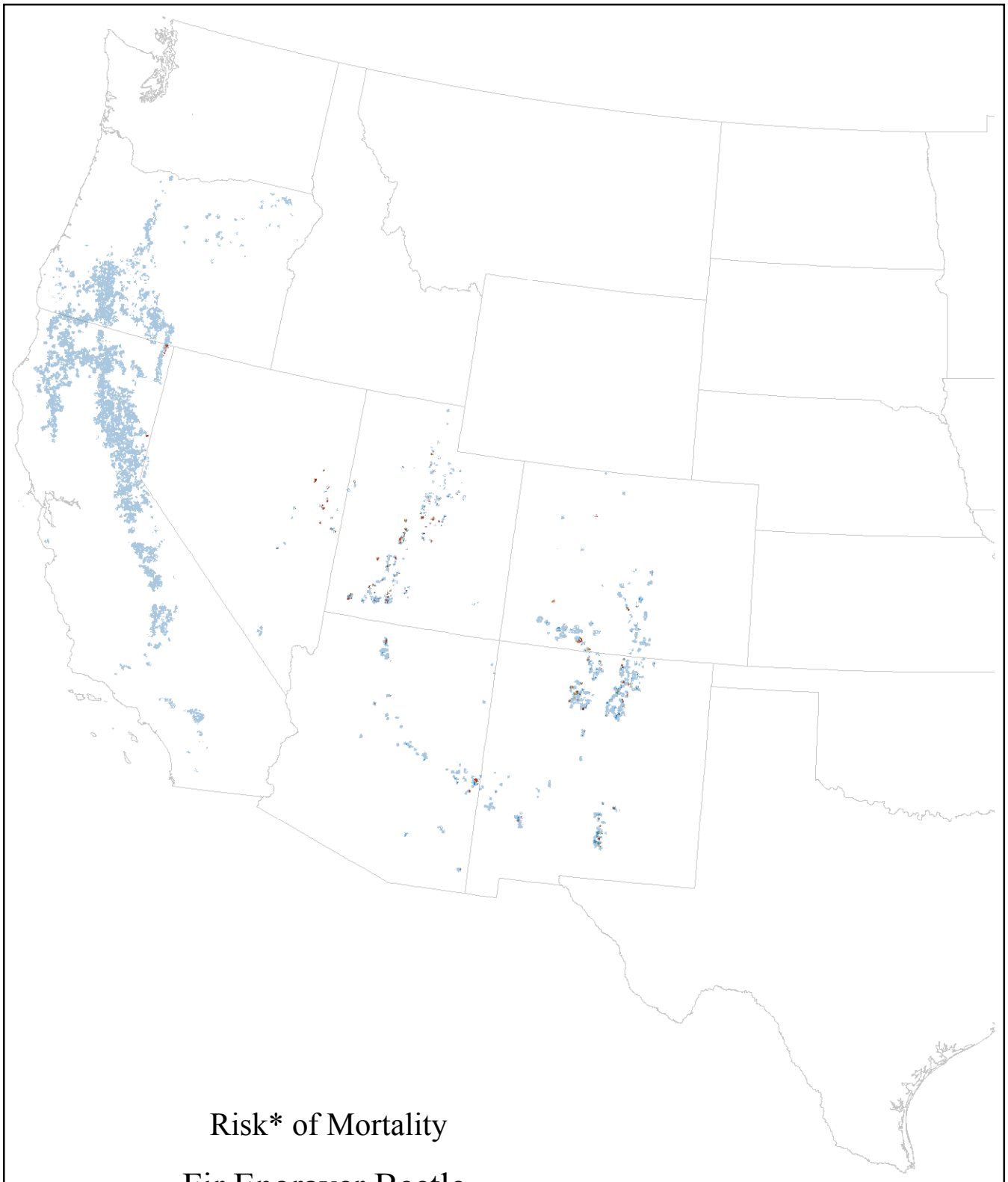
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Percent Host Basal Area	25	95	95	95	Linear	1	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	
Comments	
Citations	13
Model Certainity	4 - Expert Opinion



Risk* of Mortality

Fir Engraver Beetle on White Fir

Mortality Ceiling of 25%

0 50 100 200 300
Miles

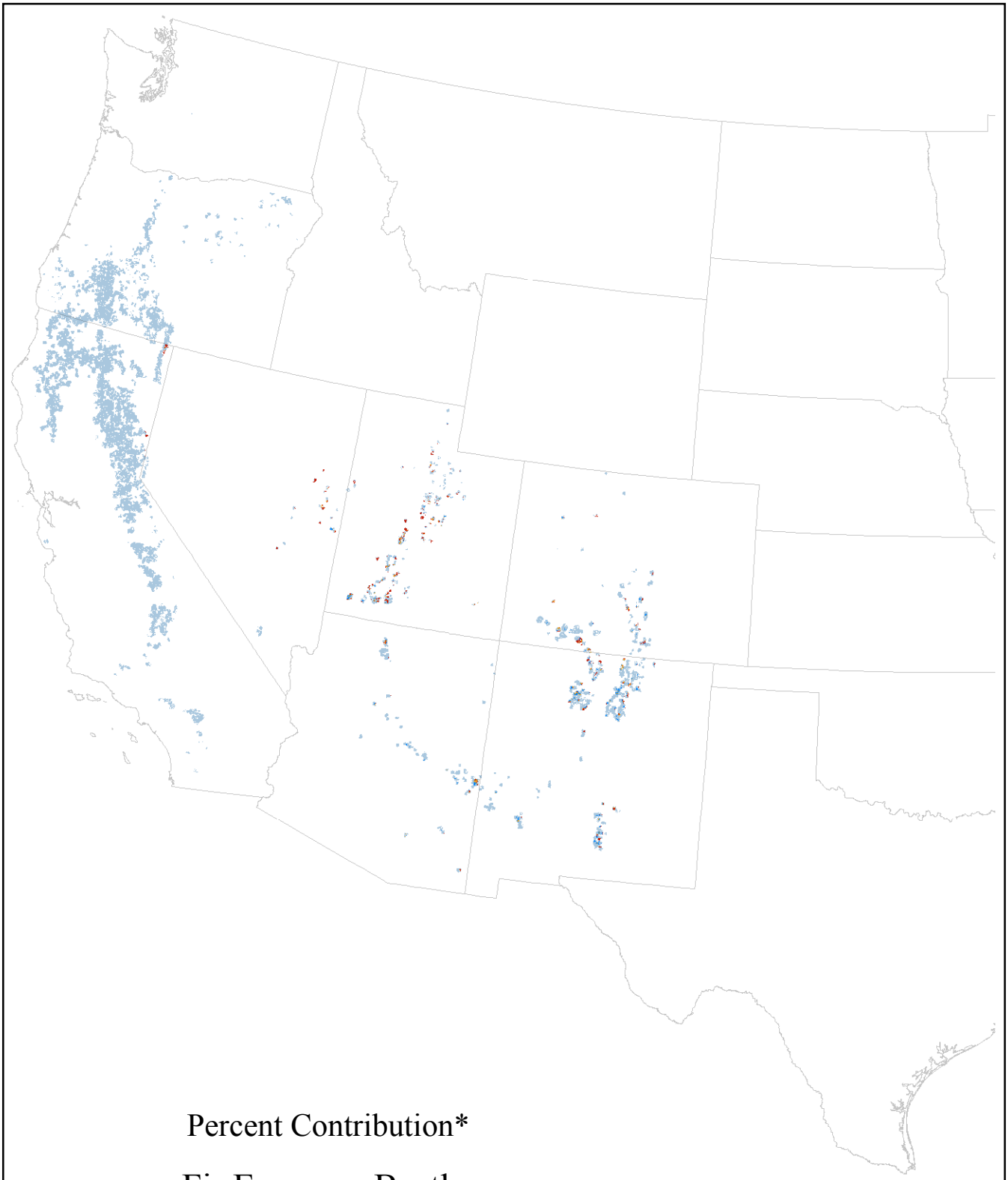
Legend

Level of risk for host

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

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

Printing Date: November 7, 2007



Percent Contribution*

Fir Engraver Beetle on White Fir

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Ips Engraver Beetle	**Host(s):**	Pinyon Pine
Model Extent:	Interior West	**Max Percent Mortality:**	70%

Susceptibility

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									

Vulnerability

Rank/Weight	1	100%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1			Host QMD (inches)	2	6	6	6	Linear	1	50%
Criteria 2			Pinyon SDI	10	140	140	140	S-1	1	50%
Criteria 3										
Criteria 4										
Criteria 5										
Criteria 6										
Criteria 7										
Criteria 8										
Criteria 9										
Criteria 10										

Constraints	Restricted to areas where pinyon is > 1% of the total basal area.
Comments	
Citations	28
Model Certainity	2 - Literature/Research Based

Risk Model Worksheet - Interior West

Risk Agent(s):	Ips Engraver Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Southern Interior West	**Max Percent Mortality:**	5%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	18	9	9	4	Linear	1	33%
Criteria 2		Percent Basal Area Host	80	100	100	100	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	150	150	150	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion section: N313A.	**Comments**	
Citations	17, 21, 30	**Model Certainity**	4 - Expert Opinion

Risk* of Mortality
Ips Engraver Beetles on Ponderosa Pine (IW)

N313A

Mortality Ceiling of 5%

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 6, 2007

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

Percent Contribution*

Ips Engraver Beetles on Ponderosa Pine (IW)

N313A

0 50 100 200 300 Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Ips Engraver Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Southern Interior West	**Max Percent Mortality:**	15%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	18	9	9	4	Linear	1	33%
Criteria 2		Percent Basal Area Host	80	100	100	100	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	150	150	150	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M313B, M331F, M331G, N313B, N313E, N315A, N321A, N322B, N331J.
Comments	
Citations	17, 21, 30
Model Certainity	4 - Expert Opinion

Risk* of Mortality
Ips Engraver Beetles on Ponderosa Pine (IW)

M313B, M331F, M331G, N313B,
N313E, N315A, N321A, N322B, N331J

Mortality Ceiling of 15%

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 6, 2007

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

Percent Contribution*

Ips Engraver Beetles on Ponderosa Pine (IW)

M313B, M331F, M331G, N313B, N313E, N315A, N321A, N322B, N331J

0 50 100 200 300 Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Ips Engraver Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Southern Interior West	**Max Percent Mortality:**	30%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	18	9	9	4	Linear	1	33%
Criteria 2		Percent Basal Area Host	80	100	100	100	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	150	150	150	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M313A, N313D.	**Comments**	
Citations	17, 21, 30	**Model Certainity**	4 - Expert Opinion

Risk* of Mortality
Ips Engraver Beetles on Ponderosa Pine (IW)

M313A, N313D

Mortality Ceiling of 30%

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 6, 2007

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

Percent Contribution*

Ips Engraver Beetles on Ponderosa Pine (IW)

M313A, N313D

0 50 100 200 300 Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Ips Engraver Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Southern Interior West	**Max Percent Mortality:**	40%

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 QMD (inches)	18	9	9	4	Linear	1	33%
Criteria 2		Percent Basal Area Host	80	100	100	100	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	150	150	150	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion section: N313C.	**Comments**	
Citations	17, 21, 30	**Model Certainity**	4 - Expert Opinion

Risk* of Mortality
Ips Engraver Beetles on Ponderosa Pine (IW)

N313C

Mortality Ceiling of 40%

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 6, 2007

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

Percent Contribution*
Ips Engraver Beetles on Ponderosa Pine (IW)

N313C

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Limber Pine
Model Extent:	Interior West	**Max Percent Mortality:**	70%

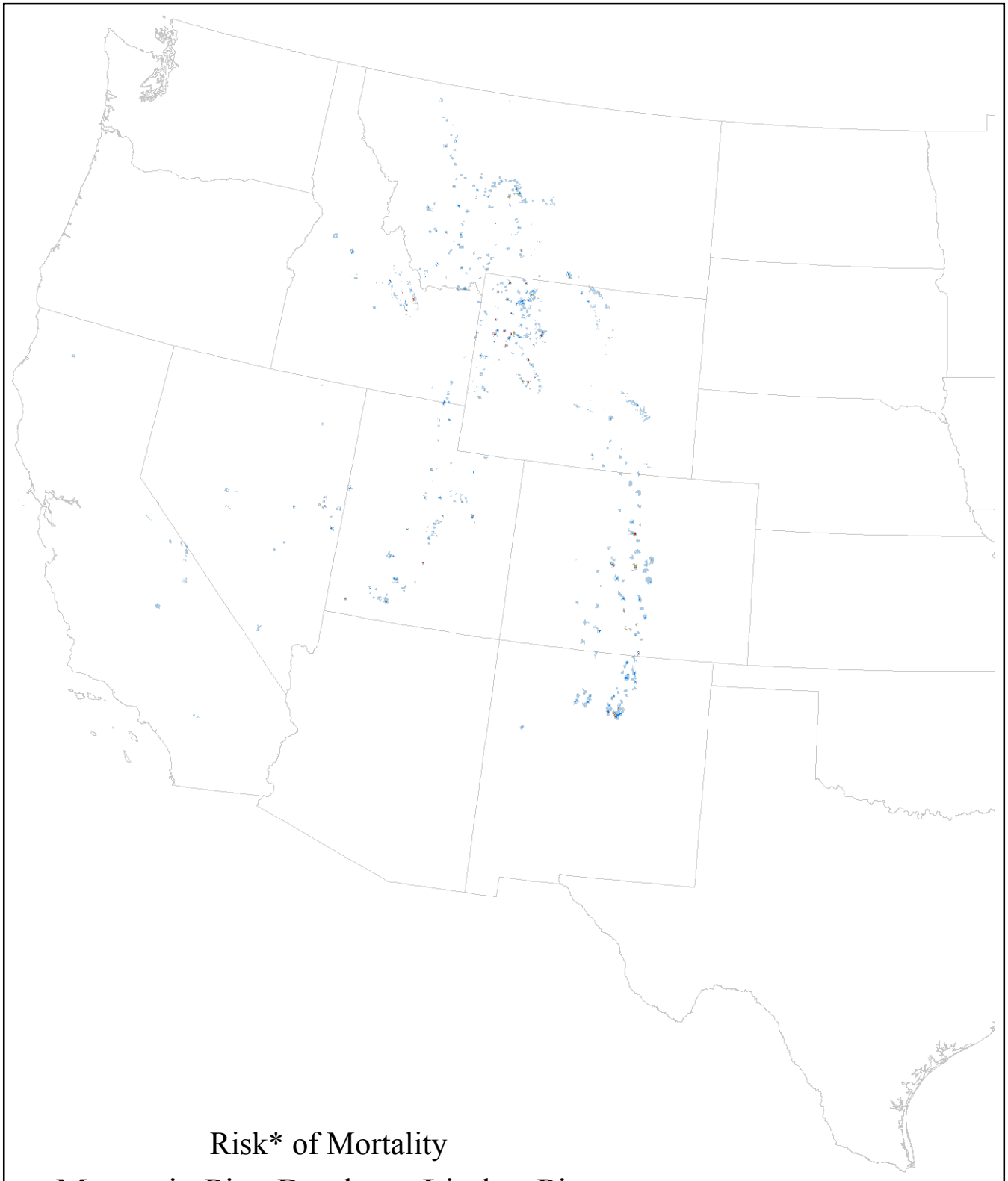
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	7	14	14	14	Linear	1	33%
Criteria 2		Percent Basal Area Host	25	50	50	50	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints		**Comments**	
Citations	10	**Model Certainity**	3 - Informed Professional Judgement



Risk* of Mortality
Mountain Pine Beetle on Limber Pine

Mortality Ceiling of 70%

0 50 100 200 300
Miles

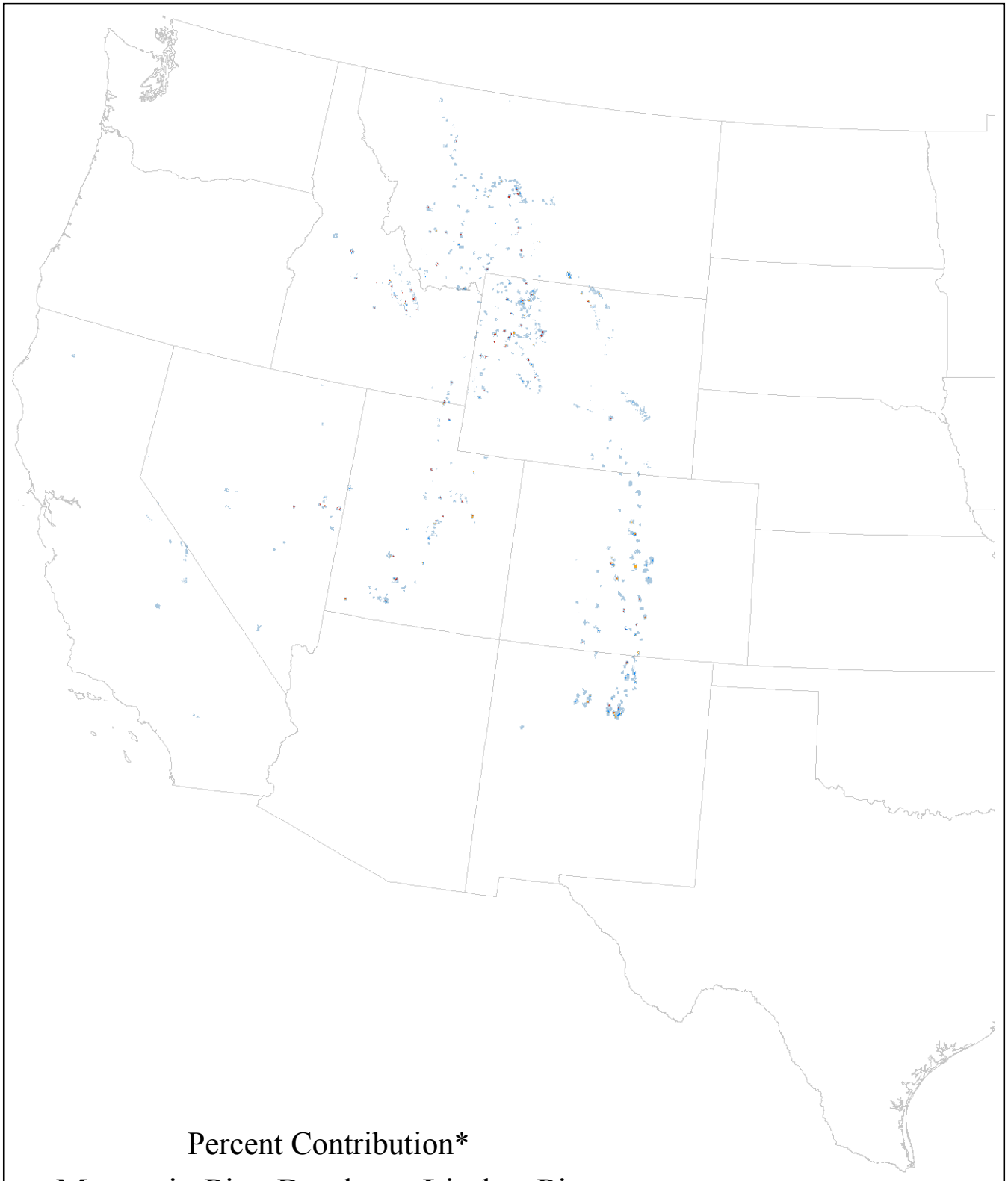
Legend

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 6, 2007

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



Percent Contribution*

Mountain Pine Beetle on Limber Pine

Legend

Percent contribution

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

0 50 100 200 300 Miles

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Lodgepole Pine
Model Extent:	Interior West	**Max Percent Mortality:**	70%

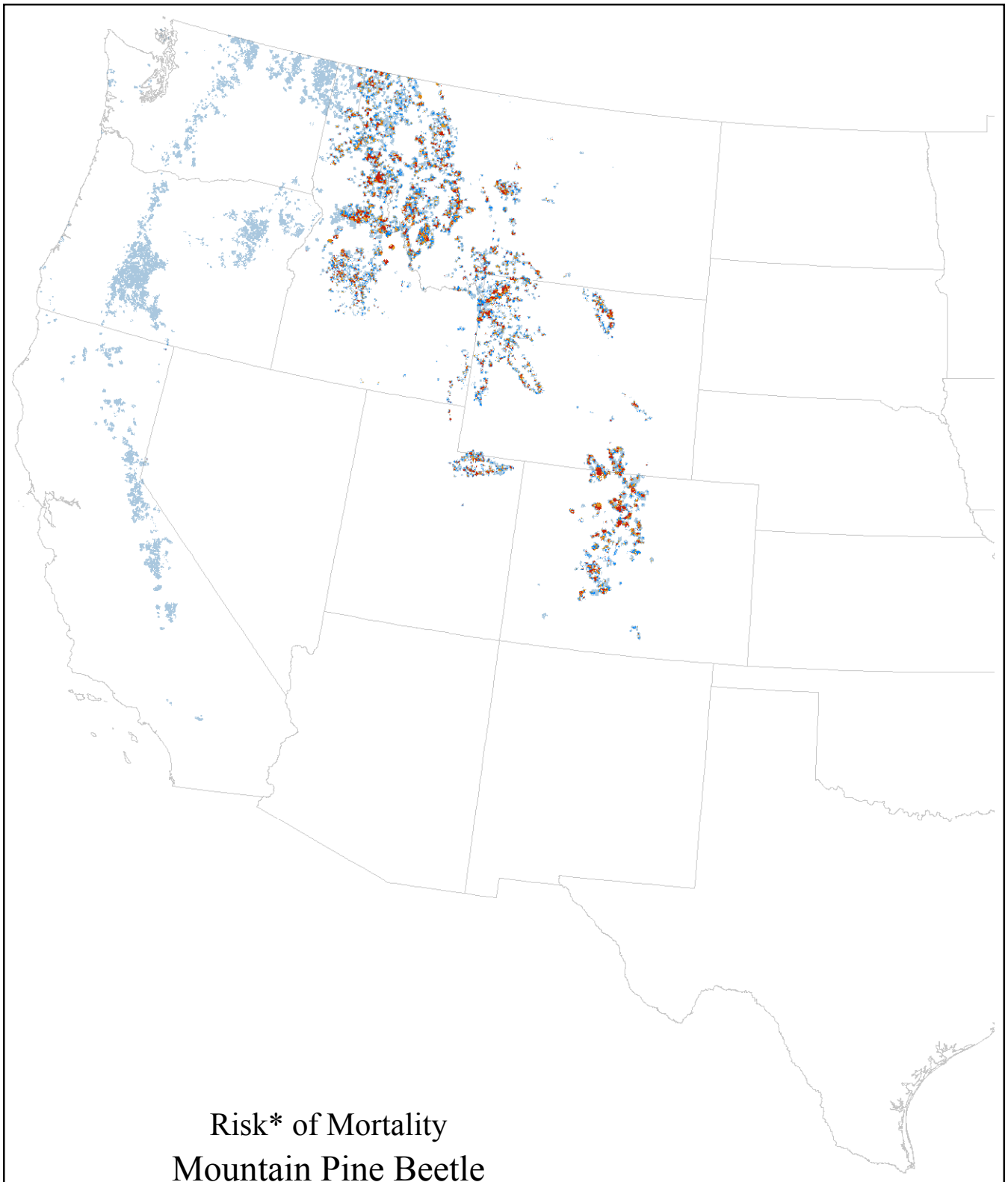
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	6	8	8	8	Linear	1	30%
Criteria 2		Percent Basal Area Host	25	50	50	50	Linear	1	30%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	160	250	S-4	1	30%
Criteria 4		Elevation/Latitude Risk	1	2	3	3	Linear	1/3	10%
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	
Comments	
Citations	1, 10, 33, 38
Model Certainity	2 - Literature/Research Based



Risk* of Mortality
Mountain Pine Beetle
on Lodgepole Pine (IW)
Mortality Ceiling of 70%

0 50 100 200 300
Miles

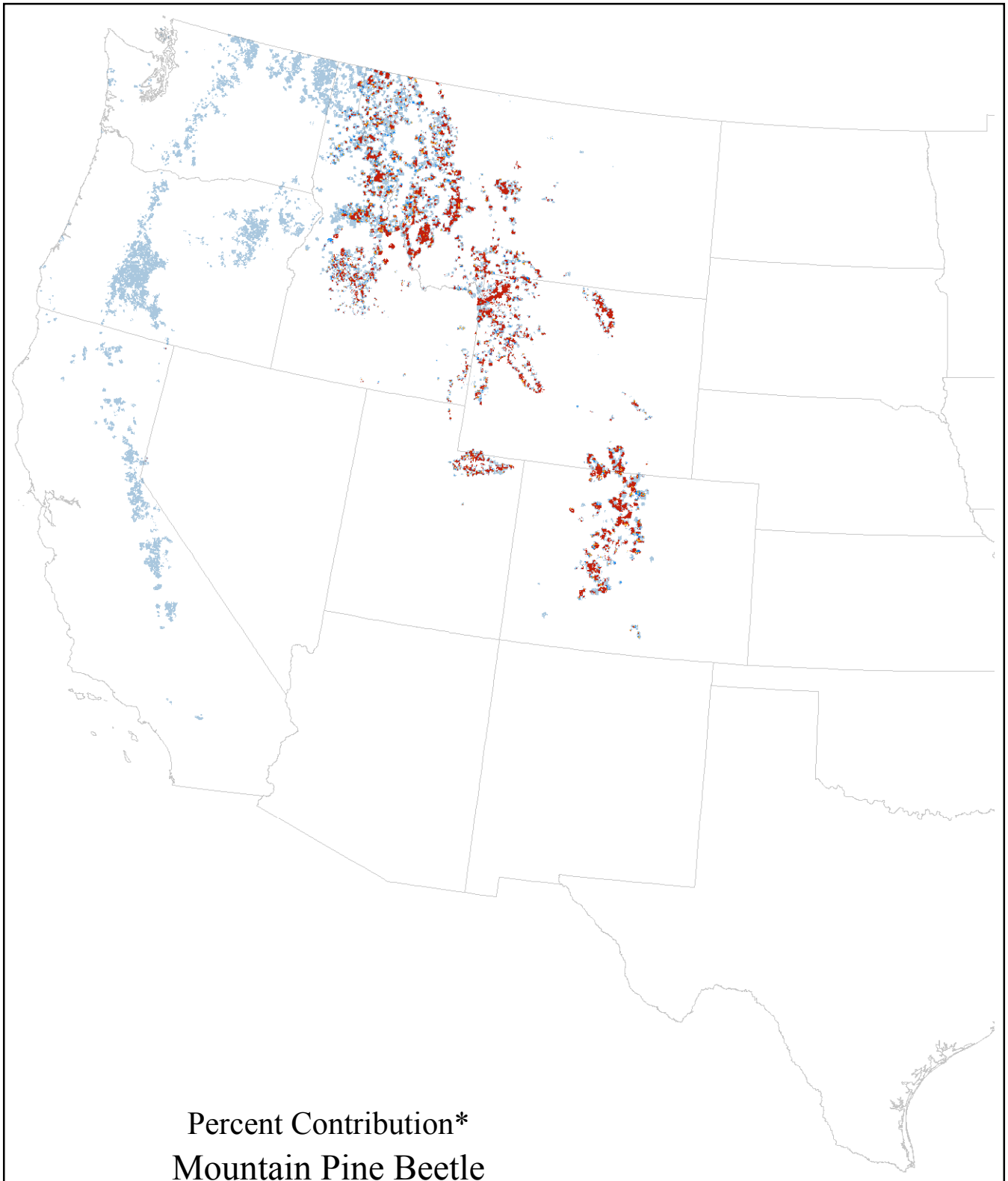
Legend

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 6, 2007

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



Percent Contribution*

Mountain Pine Beetle on Lodgepole Pine (IW)

0 50 100 200 300

Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Portions of the Interior West	**Max Percent Mortality:**	20%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	7	12	12	12	Linear	1	33%
Criteria 2		Percent Basal Area Host	50	75	75	75	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M332B, M332C, M332D, M332E, M332F, M333B, M333C, M333D, M341C, N313A, N341B, N341F, N342C, N342D.
Comments	
Citations	4, 18, 26
Model Certainity	2 - Literature/Research Based

Risk* of Mortality
Mountain Pine Beetle on Ponderosa Pine (IW)

M332B, M332C, M332D, M332E, M332F, M333B, M333C, M333D, M341C, N313A, N341B, N341F, N342C, N342D

Mortality Ceiling of 20%

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 6, 2007

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

Percent Contribution*
Mountain Pine Beetle on Ponderosa Pine (IW)

M332B, M332C, M332D, M332E, M332F, M333B, M333C, M333D, M341C, N313A, N341B, N341F, N342C, N342D

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Central Interior West	**Max Percent Mortality:**	40%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	7	12	12	12	Linear	1	33%
Criteria 2		Percent Basal Area Host	50	75	75	75	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M331E, M331H, M341B, N341C.	**Comments**	
Citations	4, 18, 26	**Model Certainity**	2 - Literature/Research Based

Risk* of Mortality
Mountain Pine Beetle on Ponderosa Pine (IW)

M331E, M331H, M341B, N341C

Mortality Ceiling of 40%

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 7, 2007

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

Percent Contribution*
Mountain Pine Beetle
on Ponderosa Pine (IW)

M331E, M331H, M341B, N341C

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Front Range of Rocky Mountains	**Max Percent Mortality:**	75%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	7	12	12	12	Linear	1	33%
Criteria 2		Percent Basal Area Host	50	75	75	75	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M331I, N331I, N342F.
Comments	
Citations	4, 18, 26
Model Certainity	2 - Literature/Research Based

Risk* of Mortality
Mountain Pine Beetle on Ponderosa Pine (IW)

M331I, N331I, N342F

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 7, 2007

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

Percent Contribution*
Mountain Pine Beetle on Ponderosa Pine (IW)

M331I, N331I, N342F

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Black Hills Area of Interior West	**Max Percent Mortality:**	60%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	6	9	9	9	Linear	1	33%
Criteria 2		Percent Basal Area Host	40	85	85	85	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	60	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M331A, M331B, M334A, N331D, N331F, N331G, N332C, N332D, N342A.
Comments	
Citations	35, 36, 37
Model Certainity	2 - Literature/Research Based

Risk* of Mortality
Mountain Pine Beetle on Ponderosa Pine (Black Hills)

M331A, M331B, M334A, N331D,
N331F, N331G, N332C, N332D, N342A

Mortality Ceiling of 60%

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 7, 2007

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

Percent Contribution*

Mountain Pine Beetle on Ponderosa Pine (Black Hills)

M331A, M331B, M334A, N331D,
N331F, N331G, N332C, N332D, N342A

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Southwestern White Pine
Model Extent:	Interior West	**Max Percent Mortality:**	70%

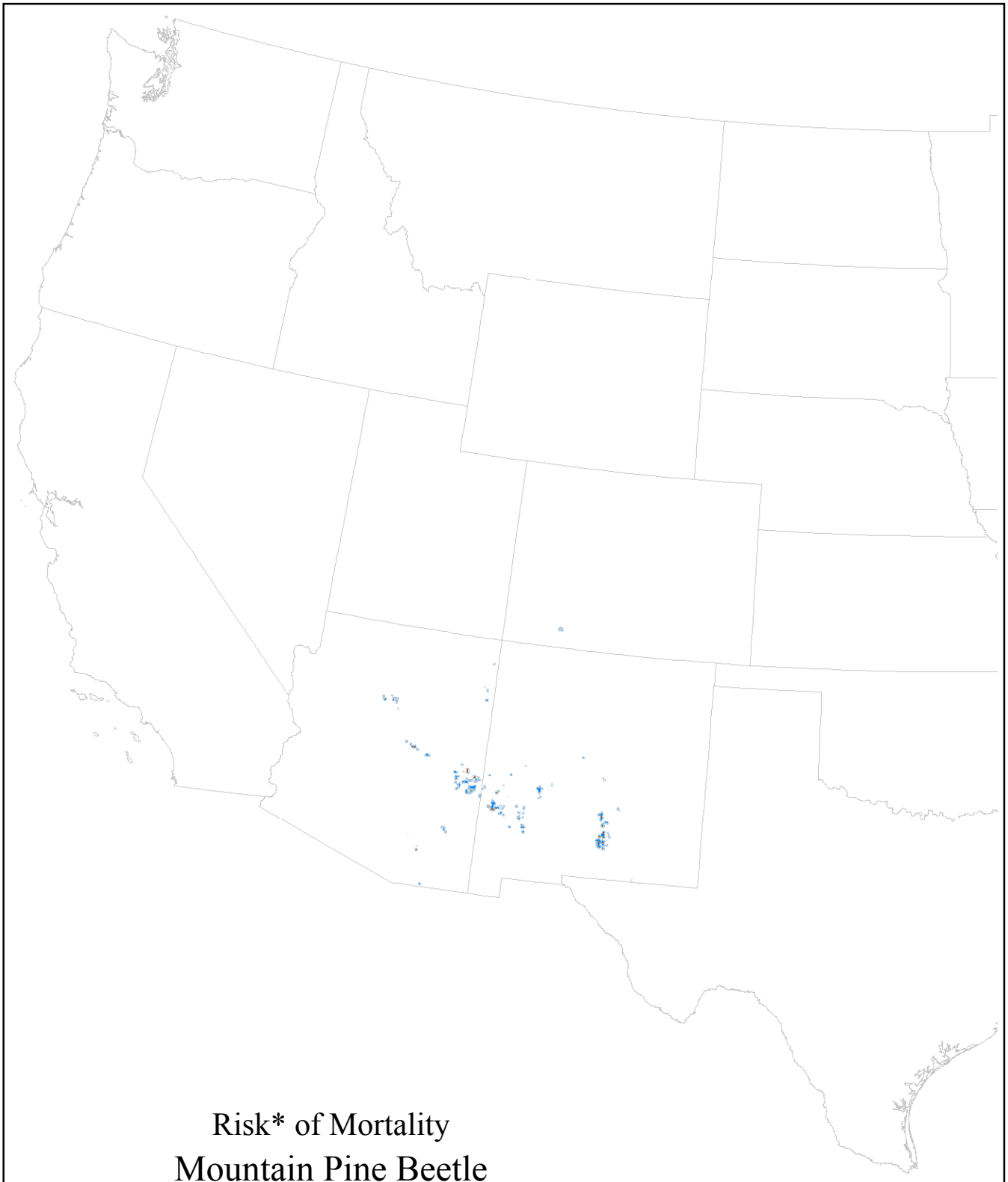
Susceptibility

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								

Vulnerability

Rank/Weight	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1	Host QMD (inches)	7	14	14	14	Linear	1	33%
Criteria 2	Percent Basal Area Host	25	50	50	50	Linear	1	33%
Criteria 3	Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4								
Criteria 5								
Criteria 6								
Criteria 7								
Criteria 8								
Criteria 9								
Criteria 10								

Constraints		**Comments**	
Citations	10	**Model Certainity**	4 - Expert Opinion



Risk* of Mortality
Mountain Pine Beetle
on Southwestern White Pine
Mortality Ceiling of 70%

0 50 100 200 300
Miles

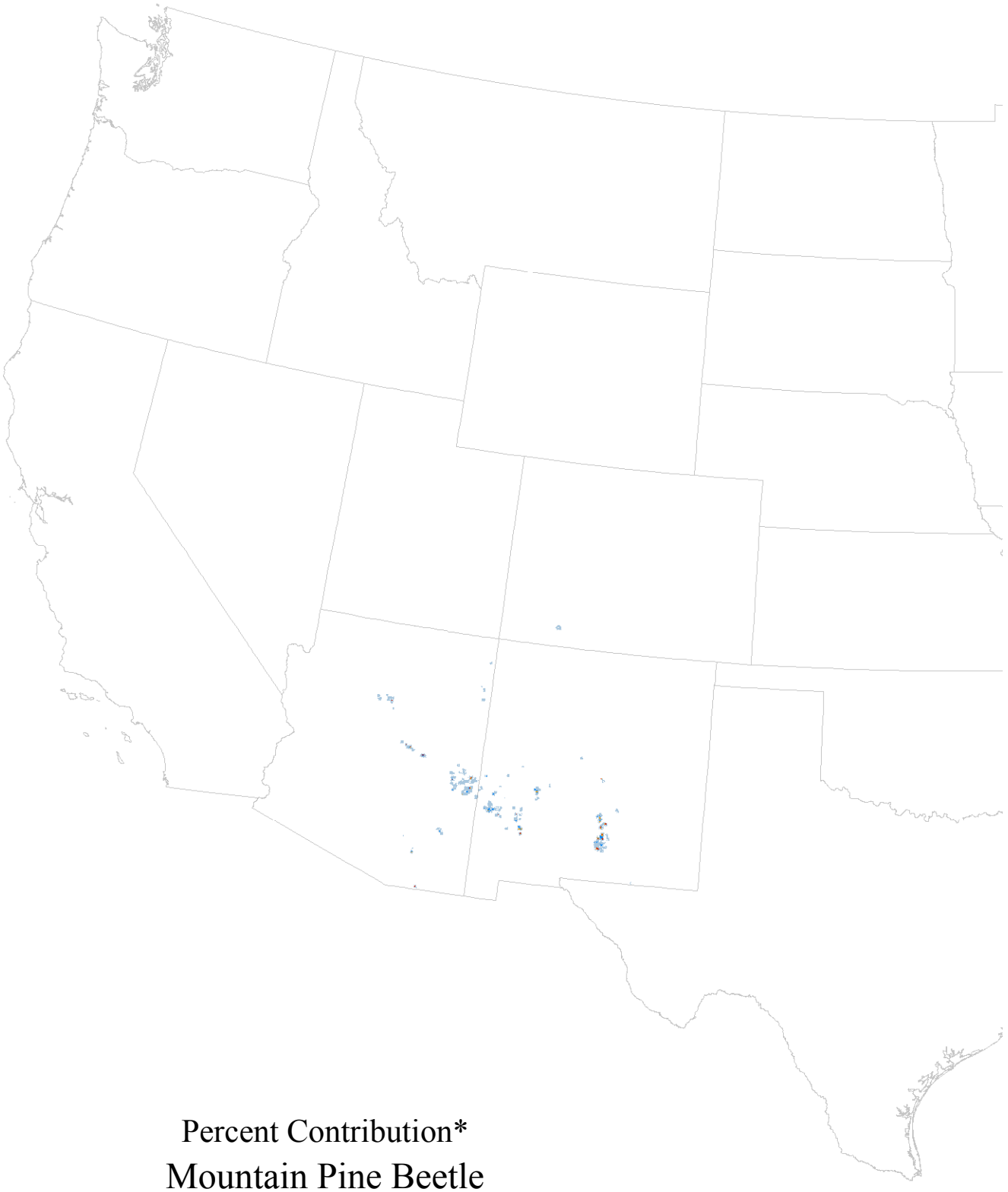
Legend

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 7, 2007

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



Percent Contribution*

Mountain Pine Beetle on Southwestern White Pine

0 50 100 200 300

Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Western White Pine
Model Extent:	Interior West	**Max Percent Mortality:**	60%

Susceptibility

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									

Vulnerability

Rank/Weight	1	100%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1			Host QMD (inches)	8	16	16	16	Linear	1	33%
Criteria 2			Percent Basal Area Host	25	50	50	50	Linear	1	33%
Criteria 3			Total Basal Area (sq ft / acre)	80	180	180	180	Linear	1	33%
Criteria 4										
Criteria 5										
Criteria 6										
Criteria 7										
Criteria 8										
Criteria 9										
Criteria 10										

Constraints		**Comments**	
Citations	10	**Model Certainity**	4 - Expert Opinion

Risk* of Mortality
Mountain Pine Beetle
on Western White Pine (IW)

Mortality Ceiling of 60%

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 7, 2007

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

Percent Contribution*

Mountain Pine Beetle on Western White Pine (IW)

0 50 100 200 300

Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Mountain Pine Beetle	**Host(s):**	Whitebark Pine
Model Extent:	Interior West	**Max Percent Mortality:**	60%

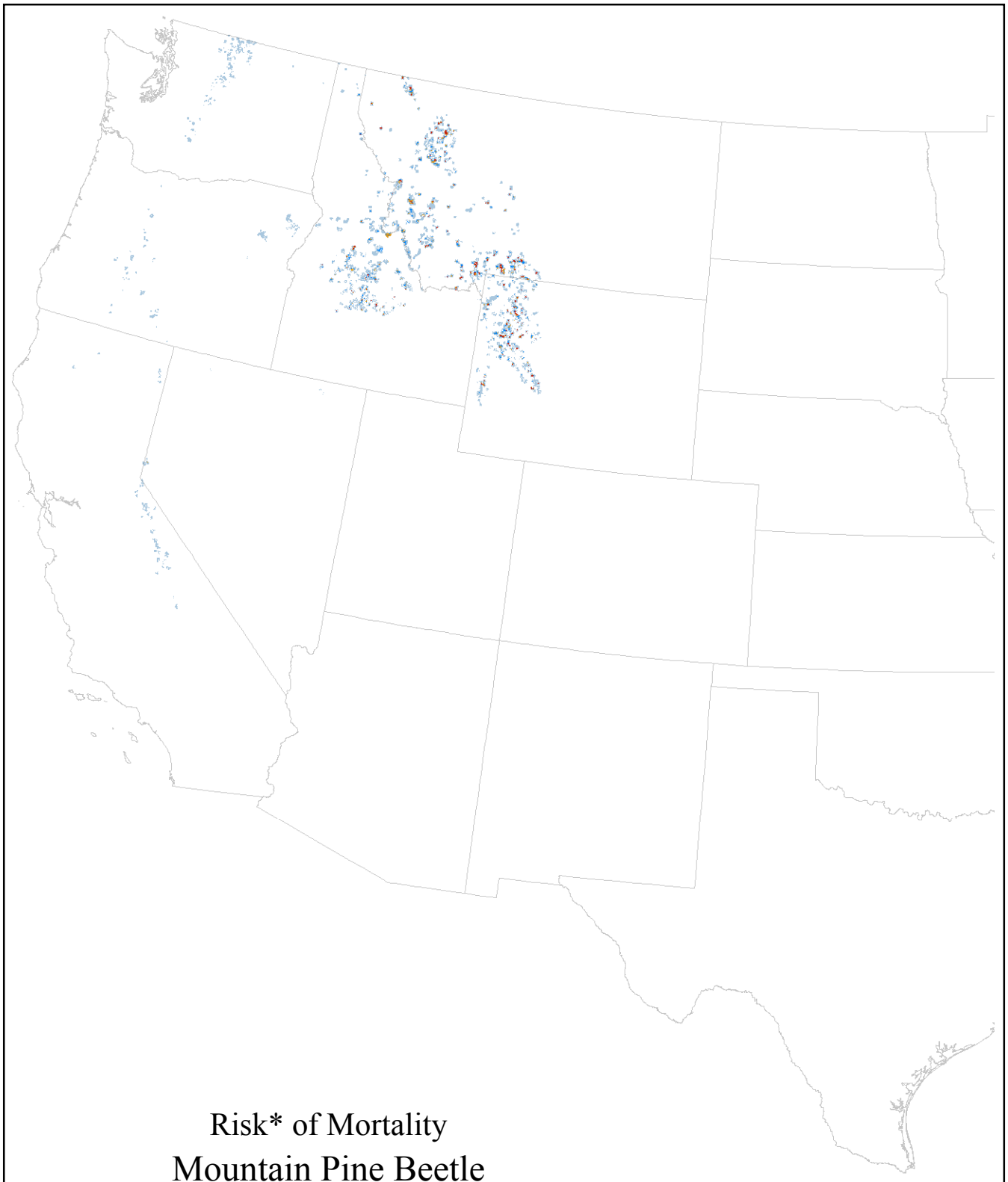
Susceptibility

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									

Vulnerability

Rank/Weight	1	100%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1			Host QMD (inches)	7	14	14	14	Linear	1	33%
Criteria 2			Percent Basal Area Host	25	50	50	50	Linear	1	33%
Criteria 3			Total Basal Area	80	120	120	120	Linear	1	33%
Criteria 4										
Criteria 5										
Criteria 6										
Criteria 7										
Criteria 8										
Criteria 9										
Criteria 10										

Constraints	
Comments	
Citations	3, 10
Model Certainity	4 - Expert Opinion



Risk* of Mortality
Mountain Pine Beetle
on Whitebark Pine (IW)

Mortality Ceiling of 60%

0 50 100 200 300
Miles

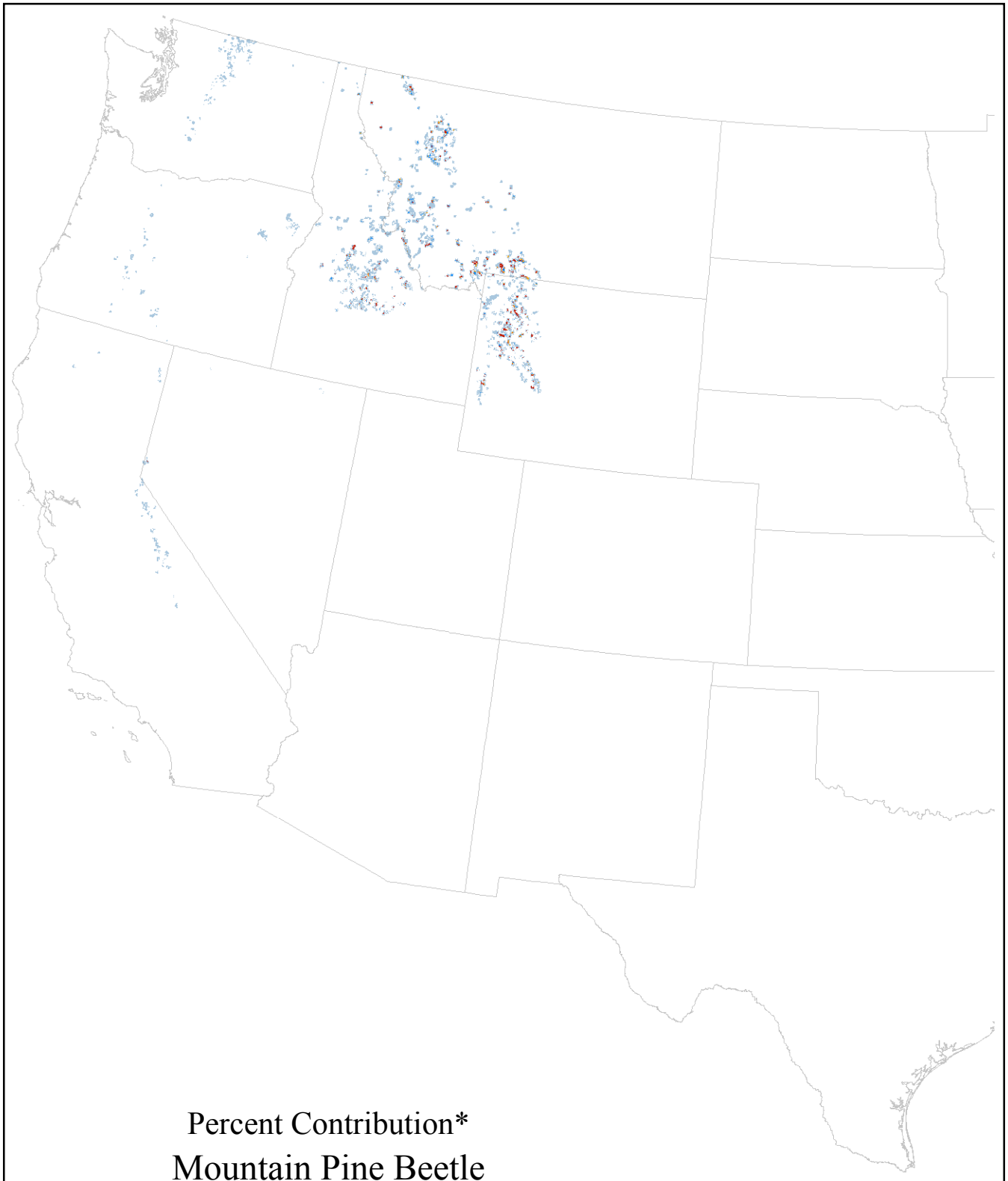
Legend

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 7, 2007

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



Percent Contribution*

Mountain Pine Beetle on Whitebark Pine (IW)

0 50 100 200 300

Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Root Diseases	**Host(s):**	Douglas-Fir
Model Extent:	M332A, M332B, M333A, M333D	**Max Percent Mortality:**	10 - 30%

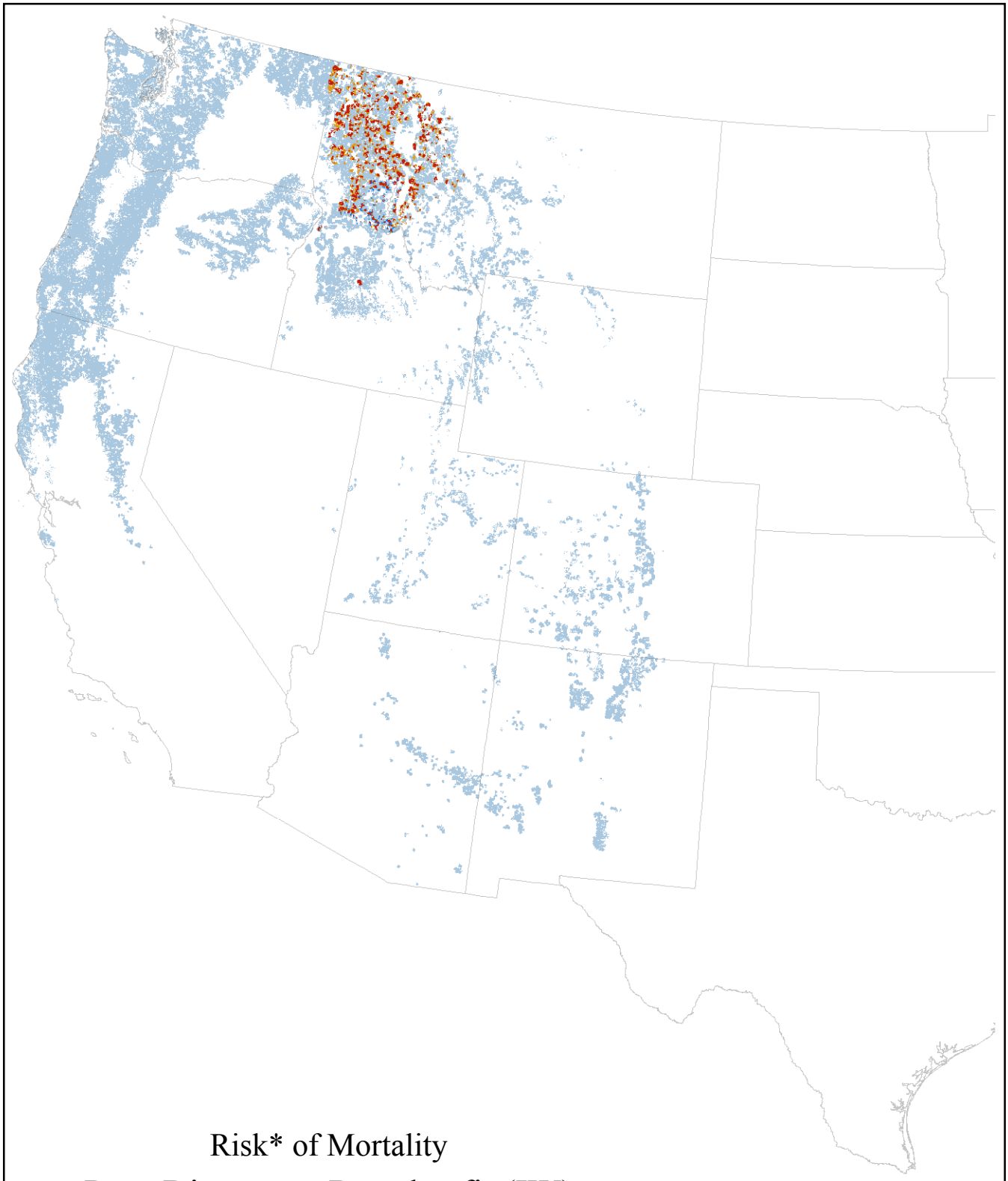
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Root Disease Severity Rating	1	3	3	3	Linear	1	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M332A, M332B, M333A, M333D.
Comments	Model runs on surfaced root disease layer that uses both FIA plots and Sue Hagle's plots. The mortality threshold varies according to ecoregion and elevation zone.
Citations	9
Model Certainity	1 - Data Driven



Risk* of Mortality

Root Disease on Douglas-fir (IW)

Mortality Ceiling varies from approx. 10% - 30%

0 50 100 200 300

Miles

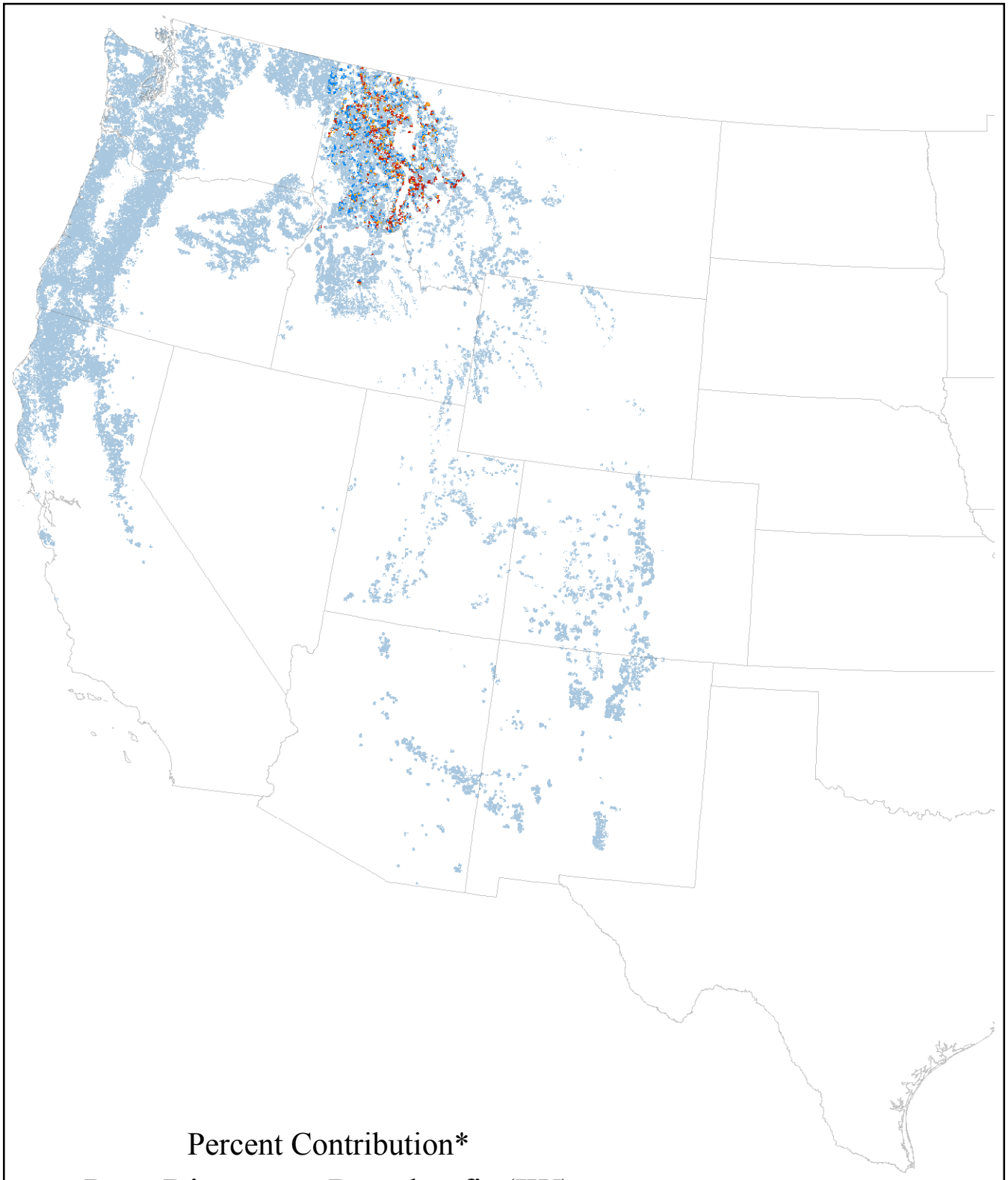
Legend

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 6, 2007

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



Percent Contribution*

Root Disease on Douglas-fir (IW)

0 50 100 200 300

Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Root Diseases	**Host(s):**	Grand Fir
Model Extent:	M332A, M332B, M333A, M333D	**Max Percent Mortality:**	10 - 30%

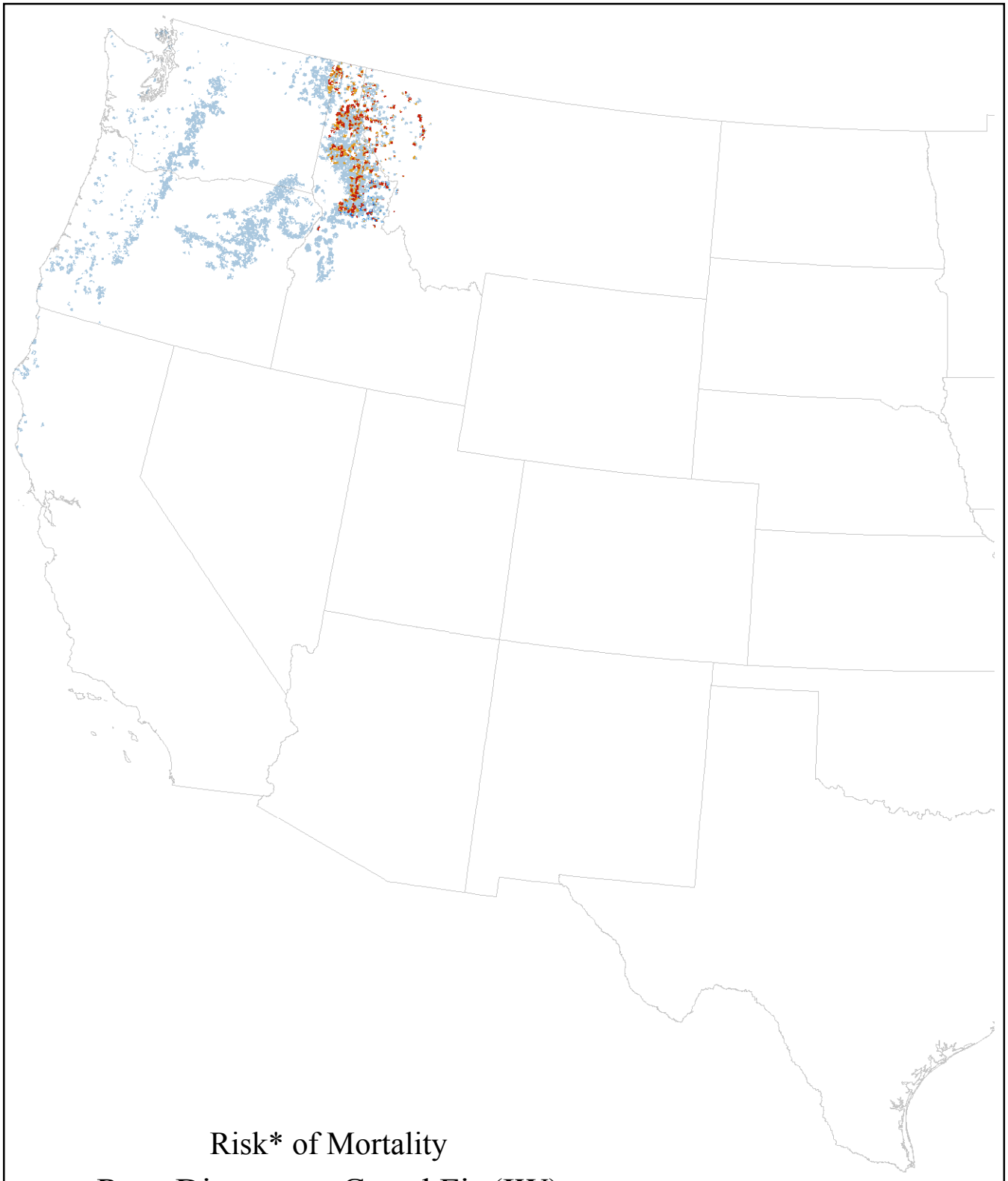
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Root Disease Severity Rating	1	3	3	3	Linear	1	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M332A, M332B, M333A, M333D.
Comments	Model runs on surfaced root disease layer that uses both FIA plots and Sue Hagle's plots. The mortality threshold varies according to ecoregion and elevation zone.
Citations	9
Model Certainity	1 - Data Driven



Risk* of Mortality

Root Disease on Grand Fir (IW)

Mortality Ceiling varies from approx. 10% - 30%

0 50 100 200 300
Miles

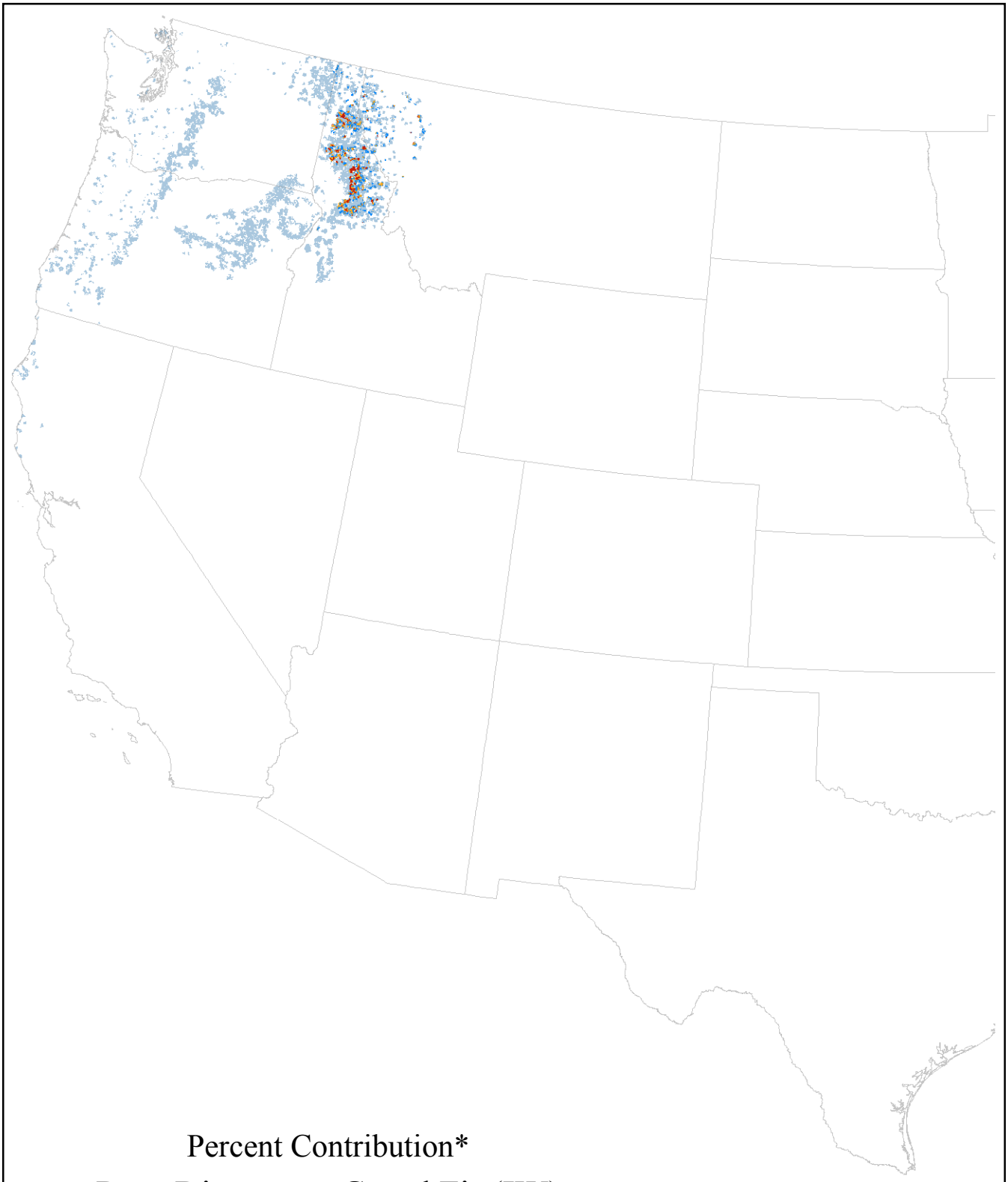
Legend

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 6, 2007

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



Percent Contribution*

Root Disease on Grand Fir (IW)

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Root Diseases	**Host(s):**	Mountain Hemlock
Model Extent:	M332A, M332B, M333A, M333D	**Max Percent Mortality:**	10 - 30%

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		Root Disease Severity Rating	1	3	3	3	Linear	1	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M332A, M332B, M333A, M333D.
Comments	Model runs on surfaced root disease layer that uses both FIA plots and Sue Hagle's plots. The mortality threshold varies according to ecoregion and elevation zone.
Citations	9
Model Certainity	1 - Data Driven

Risk* of Mortality

Root Disease on Mountain Hemlock (IW)

Mortality Ceiling varies from approx. 10% - 30%

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 6, 2007

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

Percent Contribution*

Root Disease on Mountain Hemlock (IW)

Legend

Percent contribution

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

0 50 100 200 300

Miles

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Root Diseases	**Host(s):**	Subalpine Fir
Model Extent:	M332A, M332B, M333A, M333D	**Max Percent Mortality:**	10 - 30%

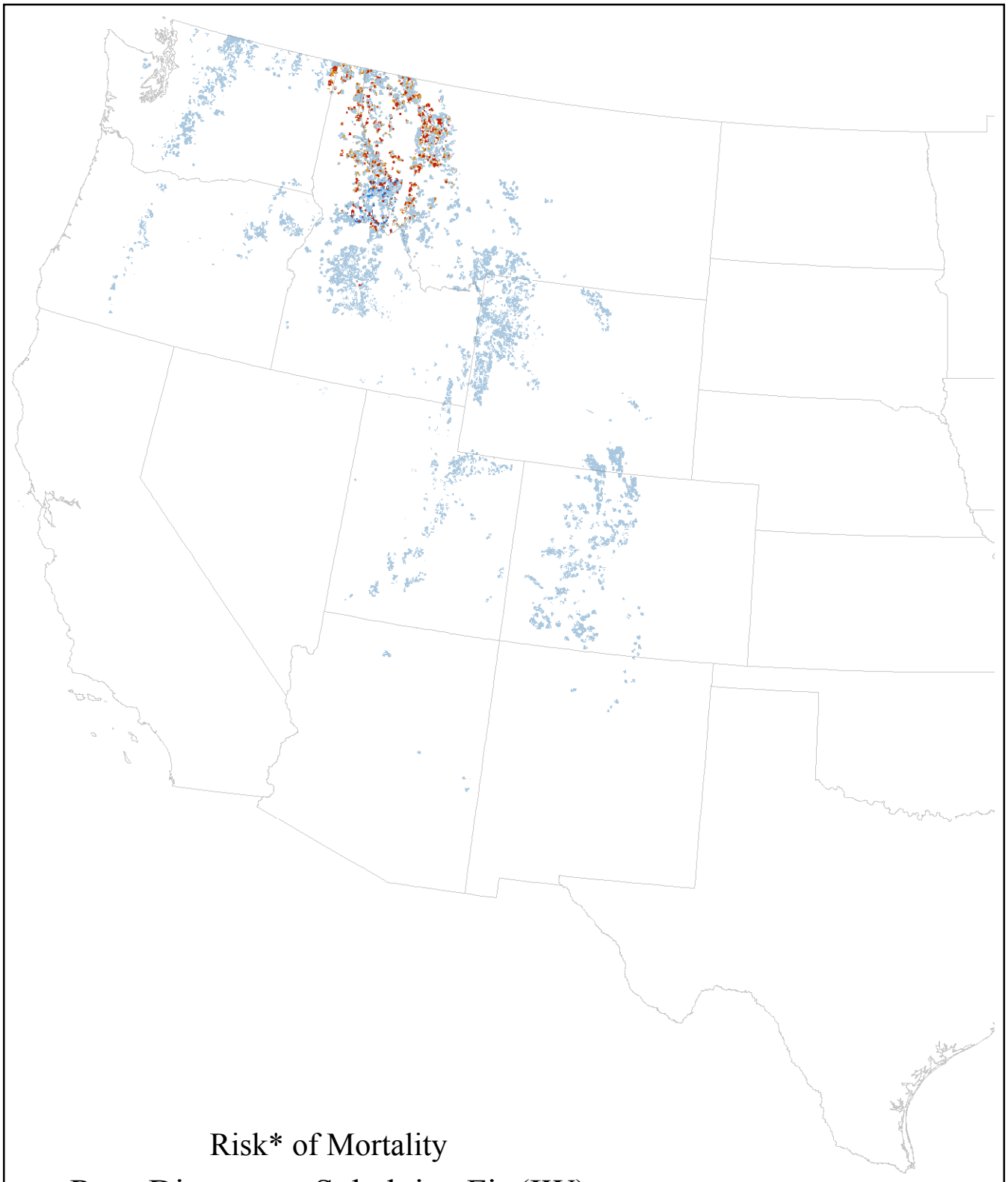
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Root Disease Severity Rating	1	3	3	3	Linear	1	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M332A, M332B, M333A, M333D.
Comments	Model runs on surfaced root disease layer that uses both FIA plots and Sue Hagle's plots. The mortality threshold varies according to ecoregion and elevation zone.
Citations	9
Model Certainity	1 - Data Driven



Risk* of Mortality

Root Disease on Subalpine Fir (IW)

Mortality Ceiling varies from approx. 10% - 30%

0 50 100 200 300
Miles

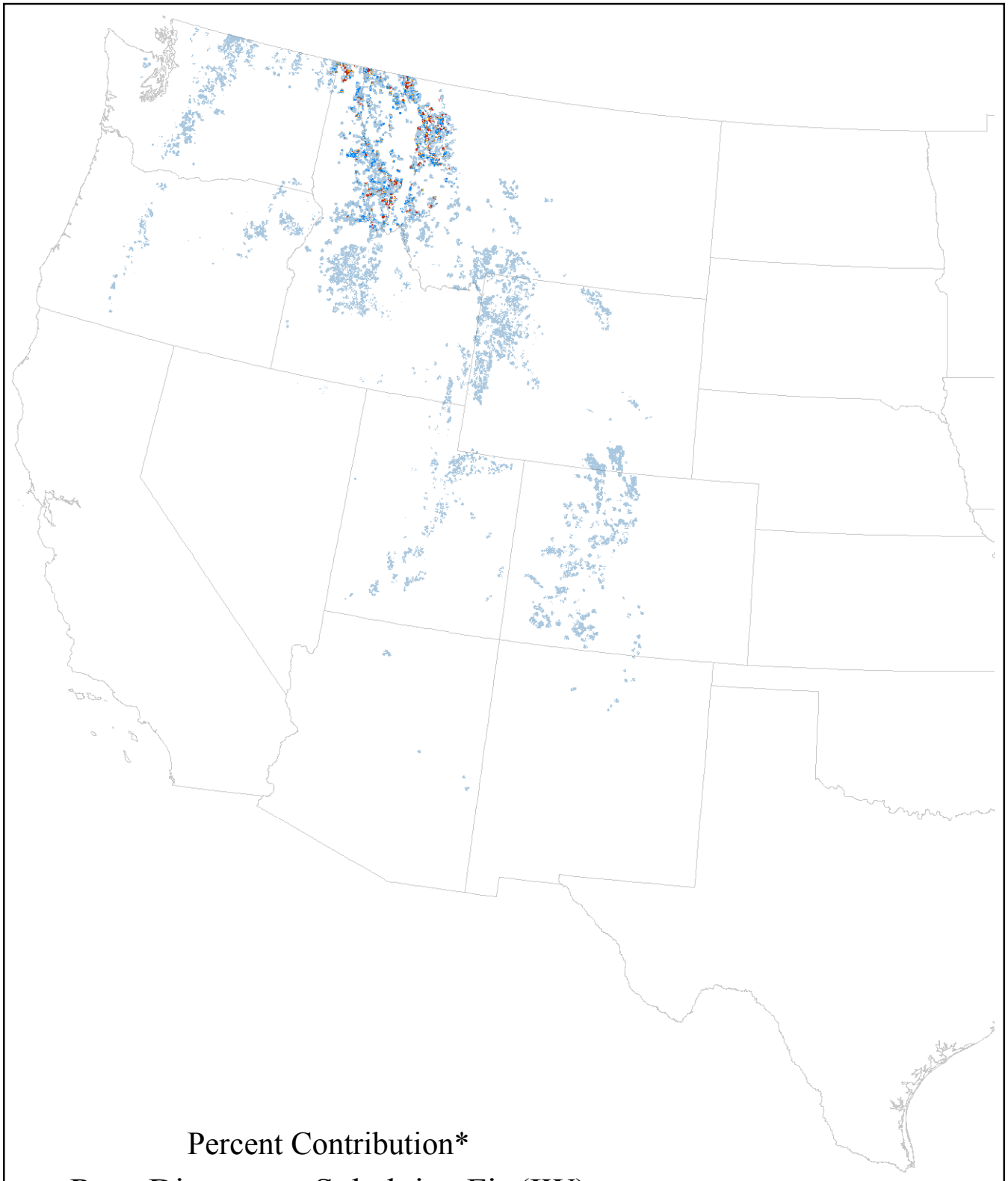
Legend

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 7, 2007

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



Percent Contribution*

Root Disease on Subalpine Fir (IW)

0 50 100 200 300

Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Root Diseases	**Host(s):**	Western Larch
Model Extent:	M332A, M332B, M333A, M333D	**Max Percent Mortality:**	10 - 30%

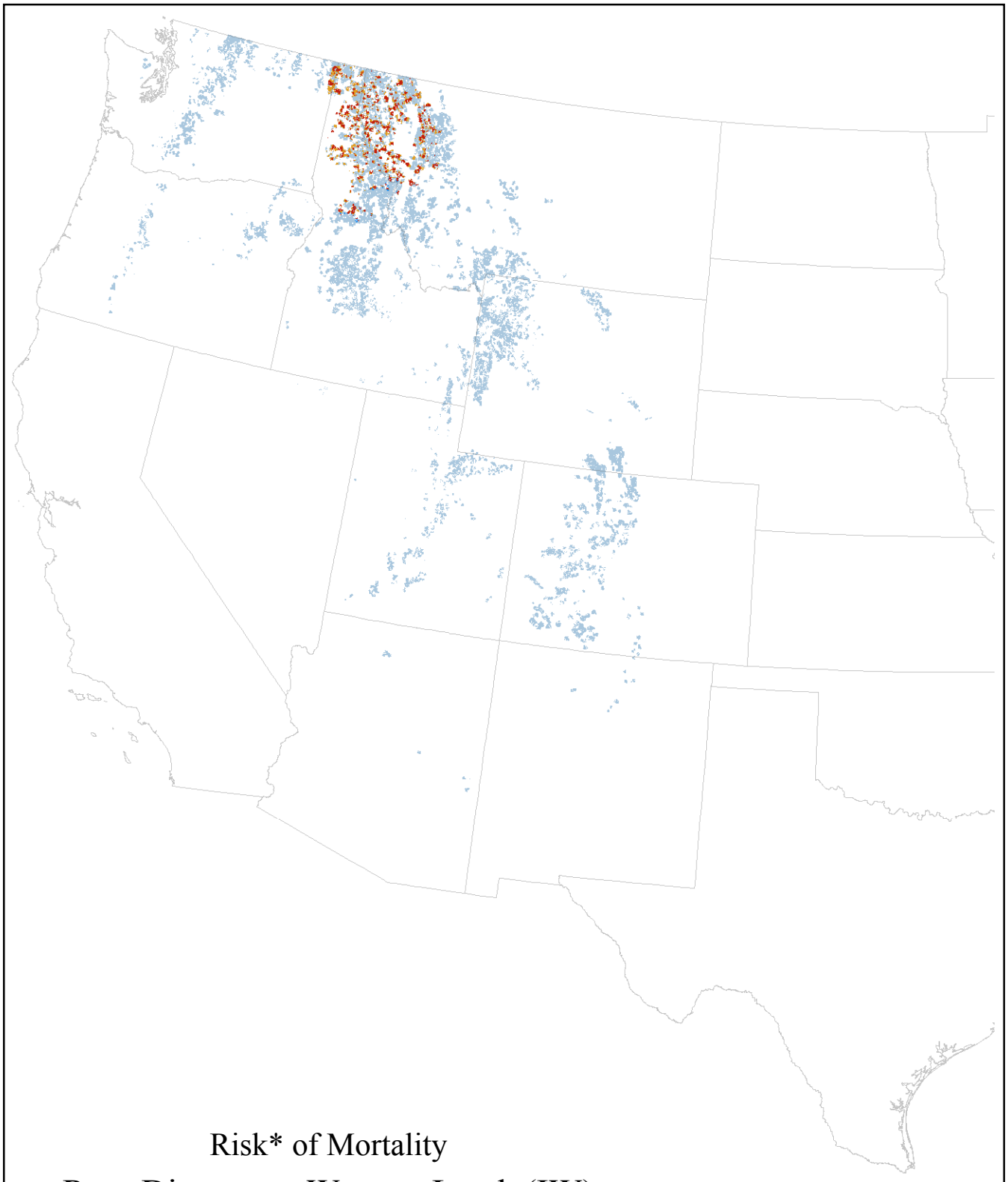
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Root Disease Severity Rating	1	3	3	3	Linear	1	100%
Criteria 2									
Criteria 3									
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M332A, M332B, M333A, M333D.
Comments	Model runs on surfaced root disease layer that uses both FIA plots and Sue Hagle's plots. The mortality threshold varies according to ecoregion and elevation zone.
Citations	9
Model Certainity	1 - Data Driven



Risk* of Mortality

Root Disease on Western Larch (IW)

Mortality Ceiling varies from approx. 10% - 30%

0 50 100 200 300
Miles

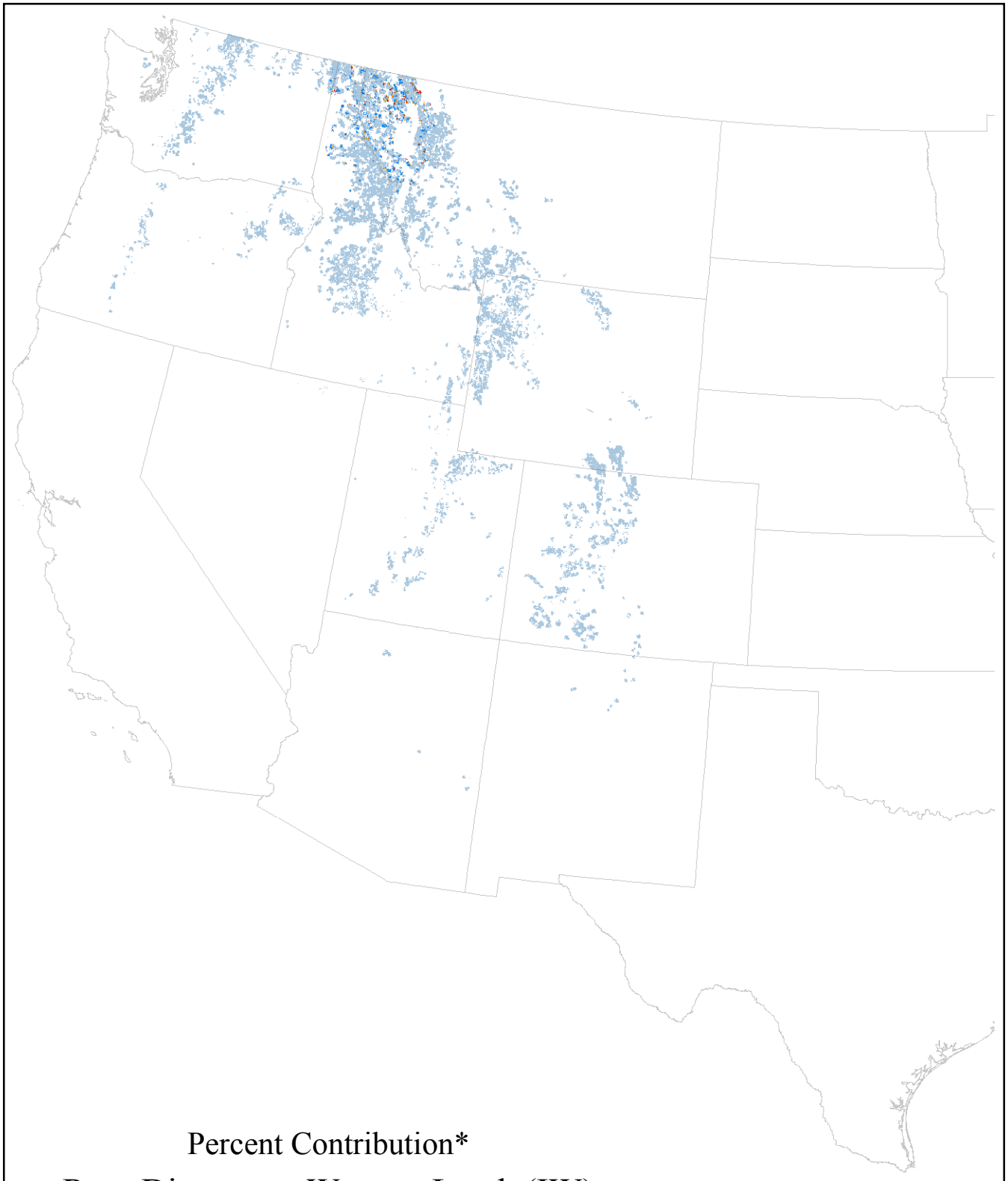
Legend

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 7, 2007

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



Percent Contribution*

Root Disease on Western Larch (IW)

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Roundheaded Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Southern Interior West	**Max Percent Mortality:**	5%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	5	12	18	100	S-4	1	33%
Criteria 2		Percent Basal Area Host	30	100	100	100	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	60	320	320	320	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M313A, M331F, M331G, N313B, N313C, N313D, N313E, N331J.
Comments	
Citations	23, 29
Model Certainity	2 - Literature/Research Based

Risk* of Mortality
Roundheaded Pine Beetle on Ponderosa Pine

M313A, M331F, M331G, N313B, N313C, N313D, N313E, N331J

Mortality Ceiling of 5%

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 7, 2007

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

Percent Contribution*
Roundheaded Pine Beetle on Ponderosa Pine

M313A, M331F, M331G, N313B, N313C, N313D, N313E, N331J

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Roundheaded Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Southern Interior West	**Max Percent Mortality:**	10%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	5	12	18	100	S-4	1	33%
Criteria 2		Percent Basal Area Host	30	100	100	100	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	60	320	320	320	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M341C, N313A, N341B, N341F.
Comments	
Citations	23, 29
Model Certainity	2 - Literature/Research Based

Risk* of Mortality
Roundheaded Pine Beetle on Ponderosa Pine

M341C, N313A, N341B, N341F

Mortality Ceiling of 10%

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 7, 2007

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

Percent Contribution*
Roundheaded Pine Beetle on Ponderosa Pine

M341C, N313A, N341B, N341F

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Roundheaded Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Southern Interior West	**Max Percent Mortality:**	25%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	5	12	18	100	S-4	1	33%
Criteria 2		Percent Basal Area Host	30	100	100	100	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	60	320	320	320	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M313B, N315A, N321A, N322B.	**Comments**	
Citations	23, 29	**Model Certainity**	2 - Literature/Research Based

Risk* of Mortality
Roundheaded Pine Beetle on Ponderosa Pine

M313B, N315A, N321A, N322B

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 7, 2007

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

Percent Contribution*
Roundheaded Pine Beetle on Ponderosa Pine

M313B, N315A, N321A, N322B

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Spruce Beetle	**Host(s):**	Spruce
Model Extent:	Interior West	**Max Percent Mortality:**	80%

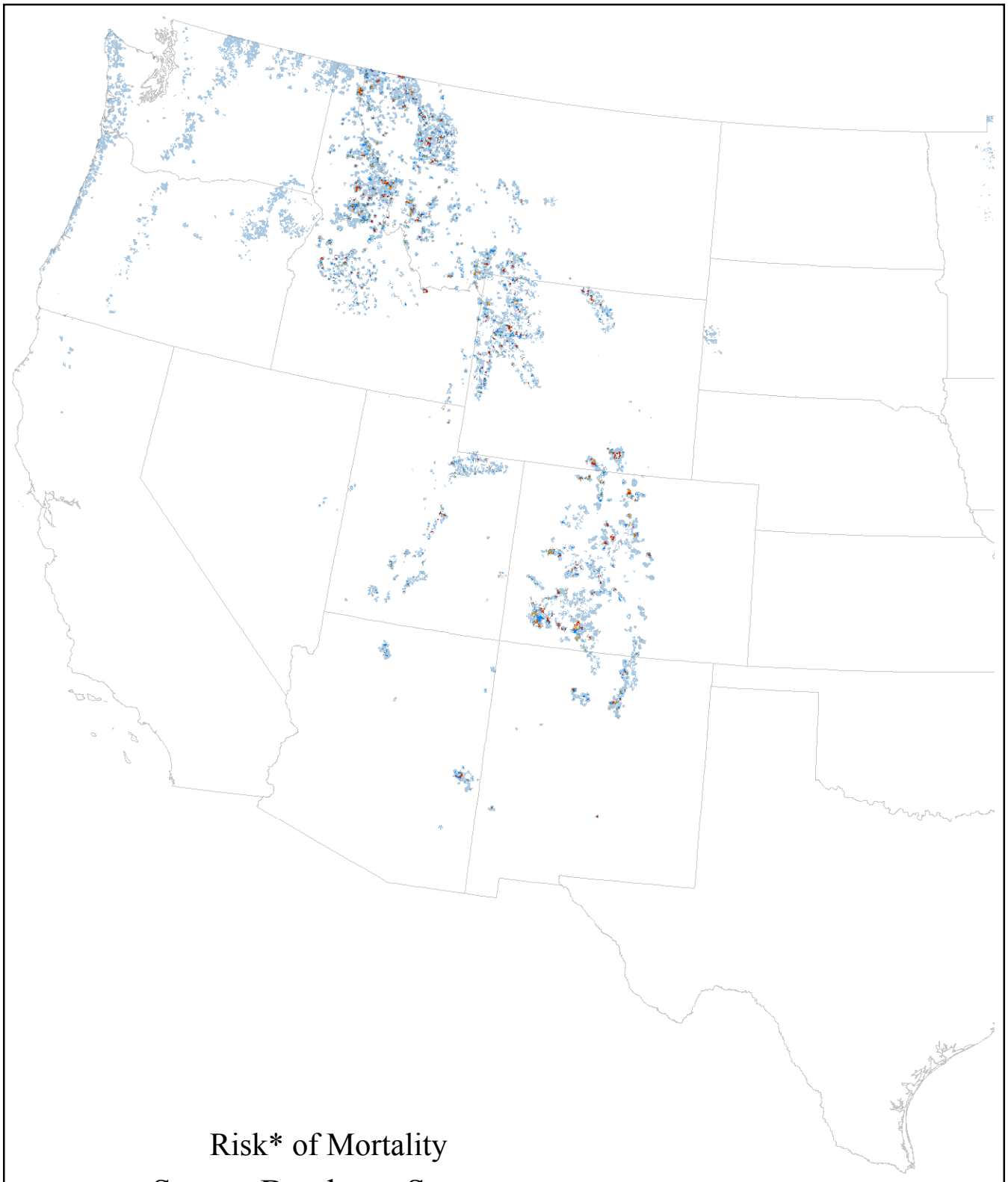
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	10	16	16	16	Linear	1	33%
Criteria 2		Percent Basal Area Host	50	65	65	65	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	100	150	150	150	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	
Comments	Mortality threshold based on information from Steve Munson.
Citations	10, 22, 34, 38
Model Certainity	2 - Literature/Research Based



Risk* of Mortality

Spruce Beetle on Spruce

Mortality Ceiling of 80%

0 50 100 200 300
Miles

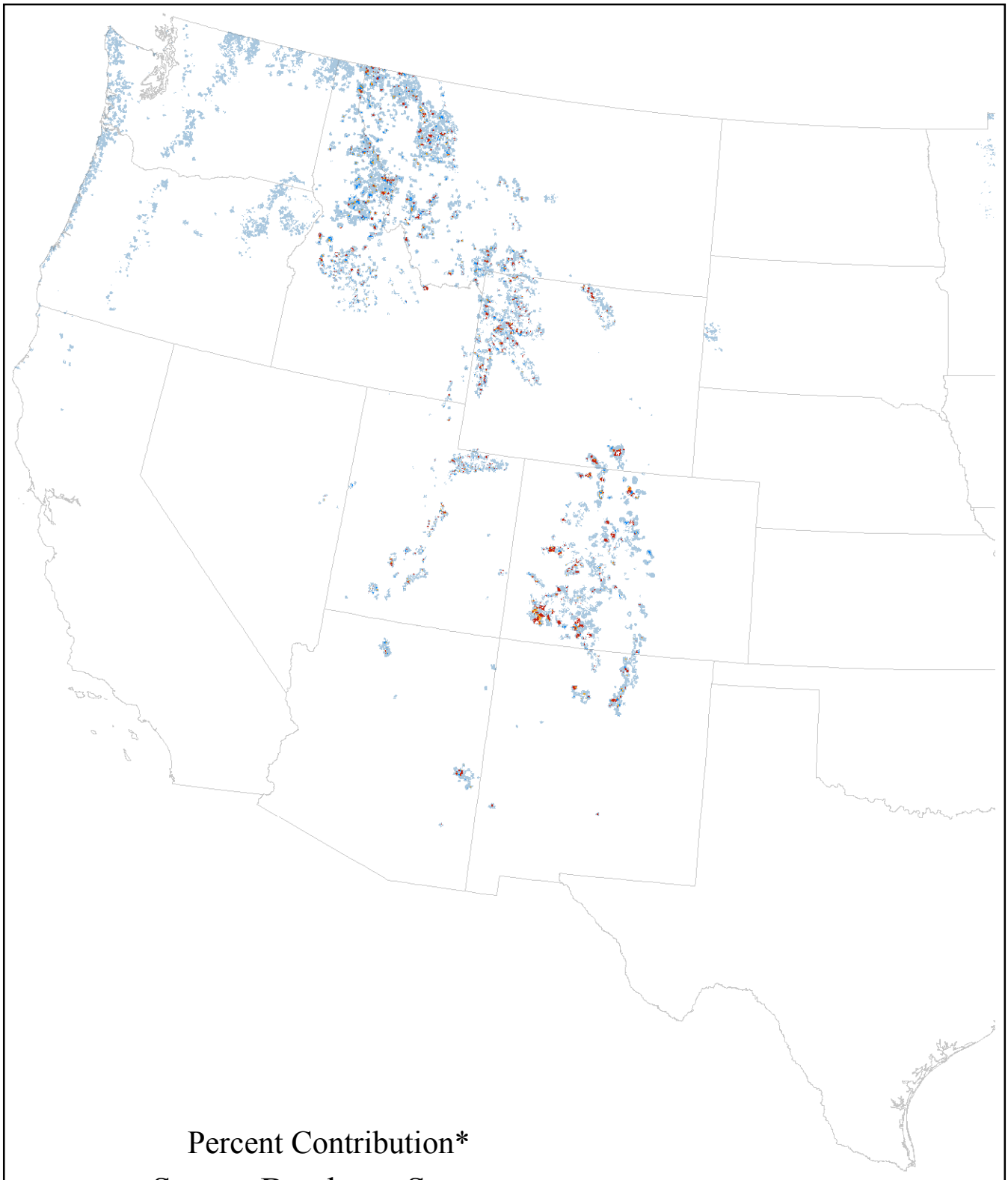
Legend

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 7, 2007

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



Percent Contribution*

Spruce Beetle on Spruce

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s): Western Balsam Bark Beetle

Host(s): Subalpine Fir

Model Extent: Interior West

Max Percent Mortality: 60%

Susceptibility

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									

Vulnerability

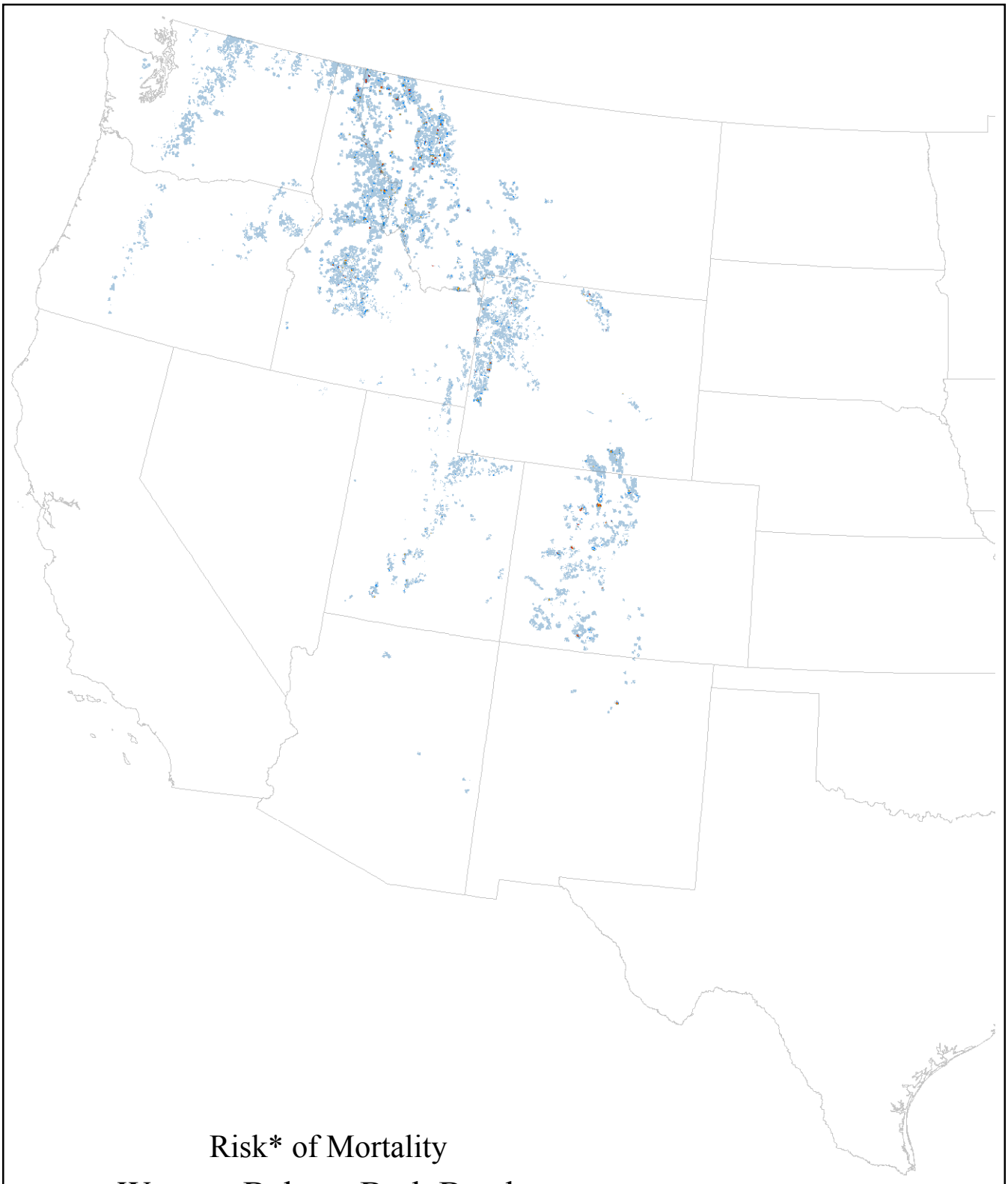
Rank/Weight	1	100%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1			Host Basal Area (sq ft / acre)	60	260	260	260	Linear	1	33%
Criteria 2			Host Stand Density Index	100	450	450	450	Linear	1	33%
Criteria 3			Percent Basal Area Host	40	90	90	90	Linear	1	33%
Criteria 4										
Criteria 5										
Criteria 6										
Criteria 7										
Criteria 8										
Criteria 9										
Criteria 10										

Constraints	

Comments	

Citations	20

Model Certainity	2 - Literature/Research Based



Risk* of Mortality

Western Balsam Bark Beetle on Subalpine Fir (IW)

Mortality Ceiling of 60%

0 50 100 200 300

Miles

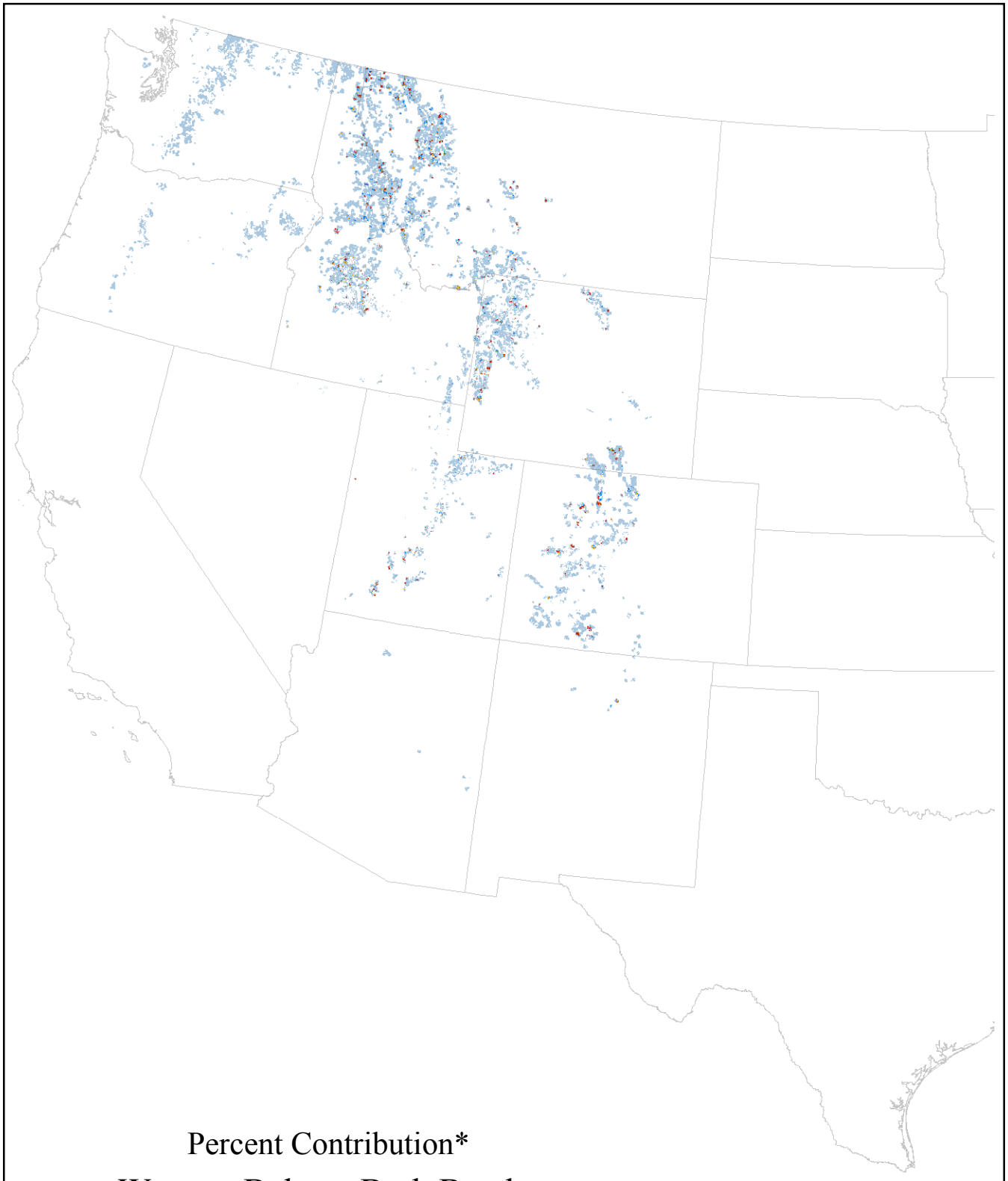
Legend

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 7, 2007

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



Percent Contribution*

Western Balsam Bark Beetle on Subalpine Fir (IW)

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Portions of the Interior West	**Max Percent Mortality:**	5%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	6	10	10	10	Linear	1	33%
Criteria 2		Percent Basal Area Host	40	65	65	65	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion section: N313C.	**Comments**	
Citations	6, 38	**Model Certainity**	3 - Informed Professional Judgement

Risk* of Mortality
Western Pine Beetle
on Ponderosa Pine (IW)

N313C

Mortality Ceiling of 5%

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 7, 2007

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

Percent Contribution*
Western Pine Beetle
on Ponderosa Pine (IW)

N313C

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Portions of the Interior West	**Max Percent Mortality:**	10%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	6	10	10	10	Linear	1	33%
Criteria 2		Percent Basal Area Host	40	65	65	65	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M313B, N315A, N321A, N322B.	**Comments**	
Citations	6, 38	**Model Certainity**	3 - Informed Professional Judgement

Risk* of Mortality
Western Pine Beetle
on Ponderosa Pine (IW)

M313B, N315A, N321A, N322B

Mortality Ceiling of 10%

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 7, 2007

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

Percent Contribution*
Western Pine Beetle
on Ponderosa Pine (IW)

M313B, N315A, N321A, N322B

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Portions of the Interior West	**Max Percent Mortality:**	15%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	6	10	10	10	Linear	1	33%
Criteria 2		Percent Basal Area Host	40	65	65	65	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M313A, N313A, N313D.	**Comments**	
Citations	6, 38	**Model Certainity**	3 - Informed Professional Judgement

Risk* of Mortality
Western Pine Beetle
on Ponderosa Pine (IW)

M313A, N313A, N313D

Mortality Ceiling of 15%

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 7, 2007

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

Percent Contribution*
Western Pine Beetle
on Ponderosa Pine (IW)

M313A, N313A, N313D

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Portions of the Interior West	**Max Percent Mortality:**	30%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	6	10	10	10	Linear	1	33%
Criteria 2		Percent Basal Area Host	40	65	65	65	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M331F, M331G, N313B, N313E, N331J.	**Comments**	
Citations	6, 38	**Model Certainity**	3 - Informed Professional Judgement

Risk* of Mortality
Western Pine Beetle
on Ponderosa Pine (IW)

M331F, M331G, N313B, N313E, N331J

Mortality Ceiling of 30%

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 7, 2007

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

Percent Contribution*
Western Pine Beetle
on Ponderosa Pine (IW)

M331F, M331G, N313B, N313E, N331J

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Portions of the Interior West	**Max Percent Mortality:**	40%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	6	10	10	10	Linear	1	33%
Criteria 2		Percent Basal Area Host	40	65	65	65	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M332B, M332C, M332D, M332E, M332F, M333B, M333C, M333D, N342C, N342D.	**Comments**	
Citations	6, 38	**Model Certainity**	3 - Informed Professional Judgement

Risk* of Mortality
Western Pine Beetle
on Ponderosa Pine (IW)

M332B, M332C, M332D, M332E, M332F,
M333B, M333C, M333D, N342C, N342D

Mortality Ceiling of 40%

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 7, 2007

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

Percent Contribution*
Western Pine Beetle on Ponderosa Pine (IW)

M332B, M332C, M332D, M332E, M332F,
M333B, M333C, M333D, N342C, N342D

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Pine Beetle	**Host(s):**	Ponderosa Pine
Model Extent:	Portions of the Interior West	**Max Percent Mortality:**	60%

Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Host QMD (inches)	6	10	10	10	Linear	1	33%
Criteria 2		Percent Basal Area Host	40	65	65	65	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	120	120	120	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion section: M332A.	**Comments**	
Citations	6, 38	**Model Certainity**	3 - Informed Professional Judgement

Risk* of Mortality
Western Pine Beetle
on Ponderosa Pine (IW)

M332A

Mortality Ceiling of 60%

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 7, 2007

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

Percent Contribution*
Western Pine Beetle
on Ponderosa Pine (IW)

M332A

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Spruce Budworm	**Host(s):**	Douglas-Fir
Model Extent:	Interior West	**Max Percent Mortality:**	3%

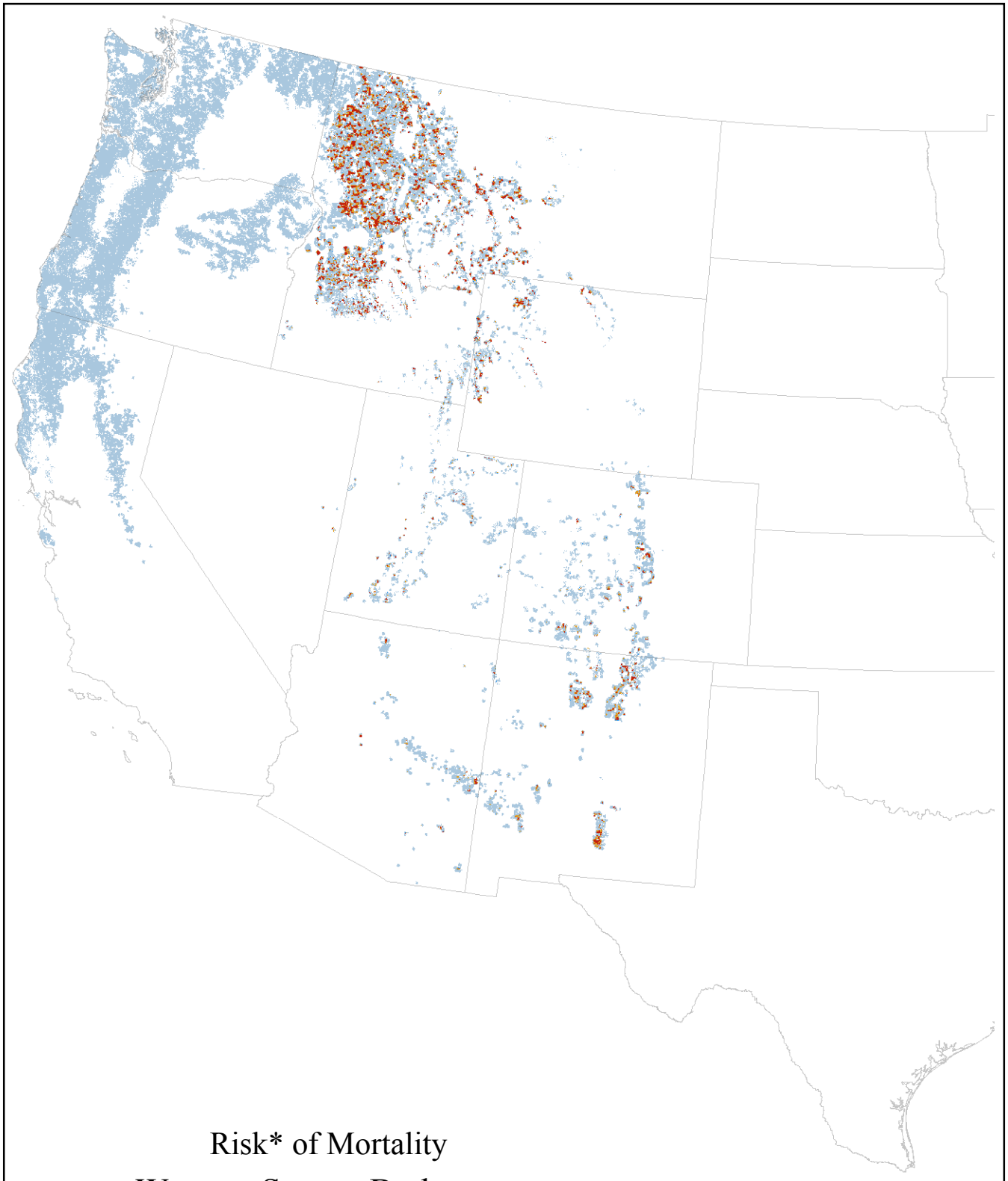
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Percent Basal Area Host Tree Species*	60	80	80	80	Linear	1	33%
Criteria 2		Physiographic Classes	Ridges	Slopes	Valleys	Valleys	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	100	100	100	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to areas where Douglas-fir basal area > 1.
Comments	Percent BA host tree species is the percent of the total BA comprised by Douglas-fir, white fir, grand fir and subalpine fir.
Citations	31, 38, 40
Model Certainity	3 - Informed Professional Judgement



Risk* of Mortality

Western Spruce Budworm on Douglas-fir (IW)

Mortality Ceiling of 3%

0 50 100 200 300

Miles

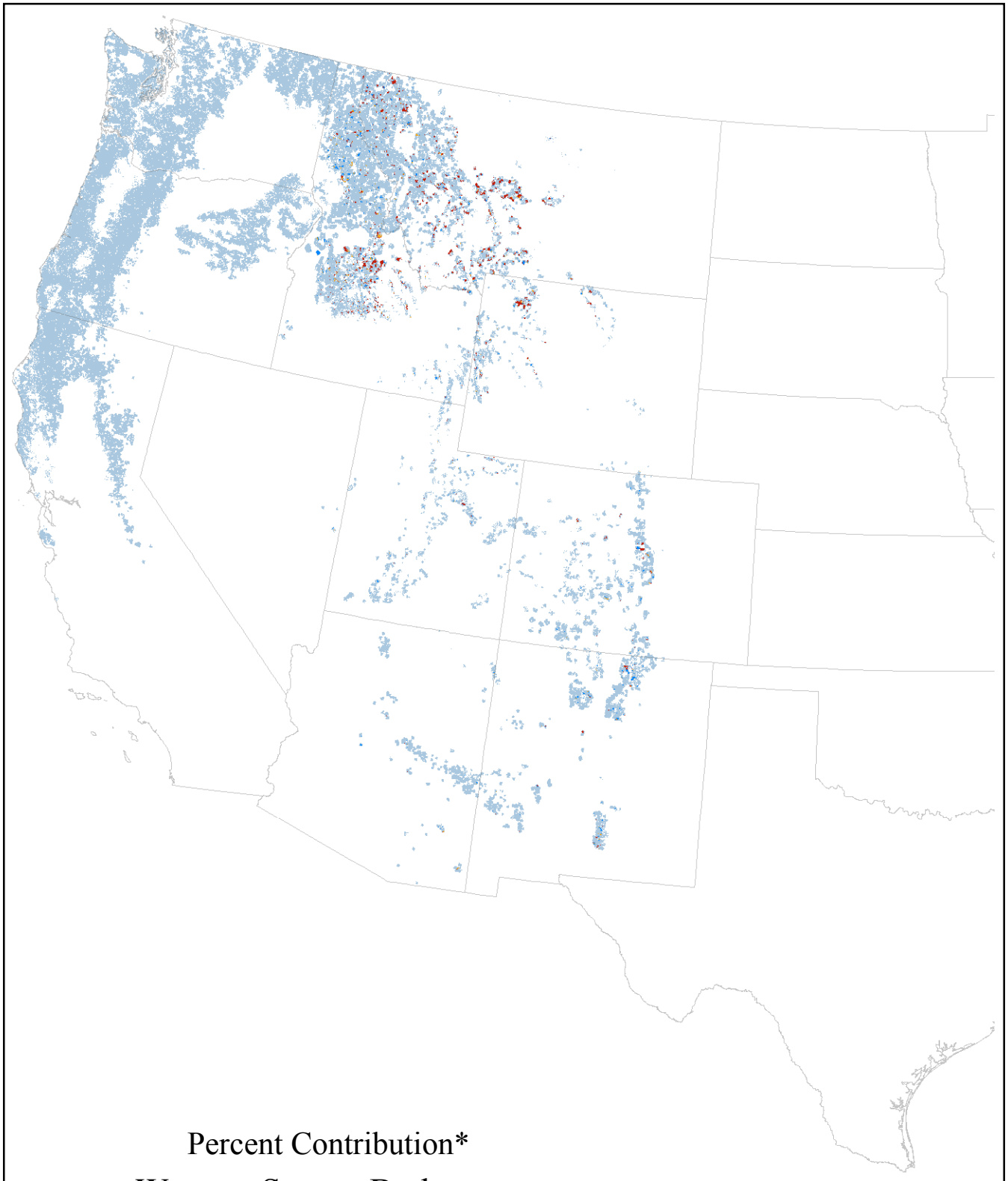
Legend

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 6, 2007

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



Percent Contribution*

Western Spruce Budworm on Douglas-fir (IW)

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Spruce Budworm	**Host(s):**	Grand Fir
Model Extent:	Interior West	**Max Percent Mortality:**	3%

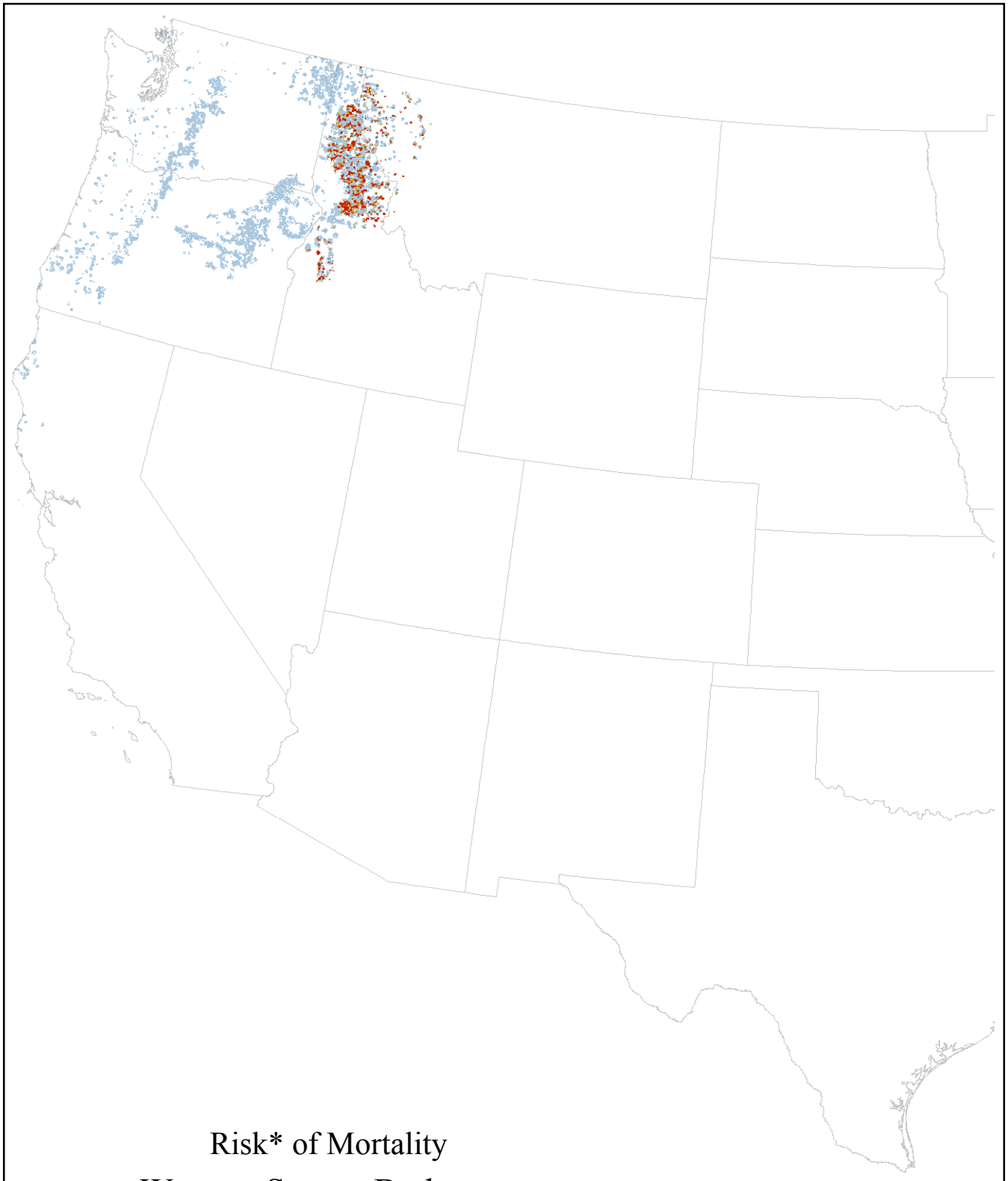
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Percent Basal Area Host Tree Species*	60	80	80	80	Linear	1	33%
Criteria 2		Physiographic Classes	Ridges	Slopes	Valleys	Valleys	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	100	100	100	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to areas where grand fir basal area > 1.
Comments	Percent BA host tree species is the percent of the total BA comprised by Douglas-fir, white fir, grand fir and subalpine fir.
Citations	31, 38, 40
Model Certainity	3 - Informed Professional Judgement



Risk* of Mortality

Western Spruce Budworm on Grand Fir (IW)

Mortality Ceiling of 3%

0 50 100 200 300

Miles

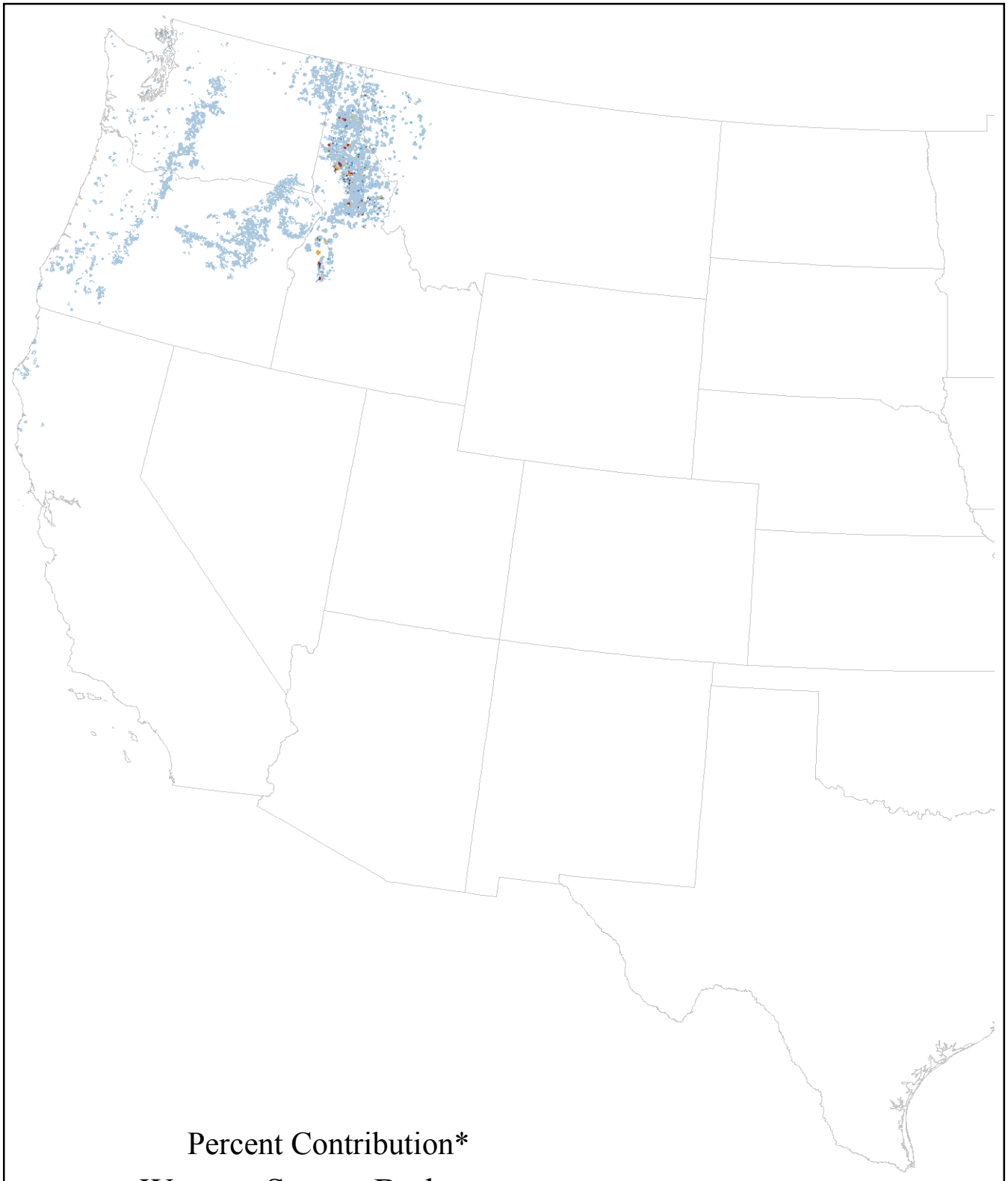
Legend

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 6, 2007

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



Percent Contribution*

Western Spruce Budworm on Grand Fir (IW)

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 6, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Spruce Budworm	**Host(s):**	Subalpine Fir
Model Extent:	Interior West	**Max Percent Mortality:**	3%

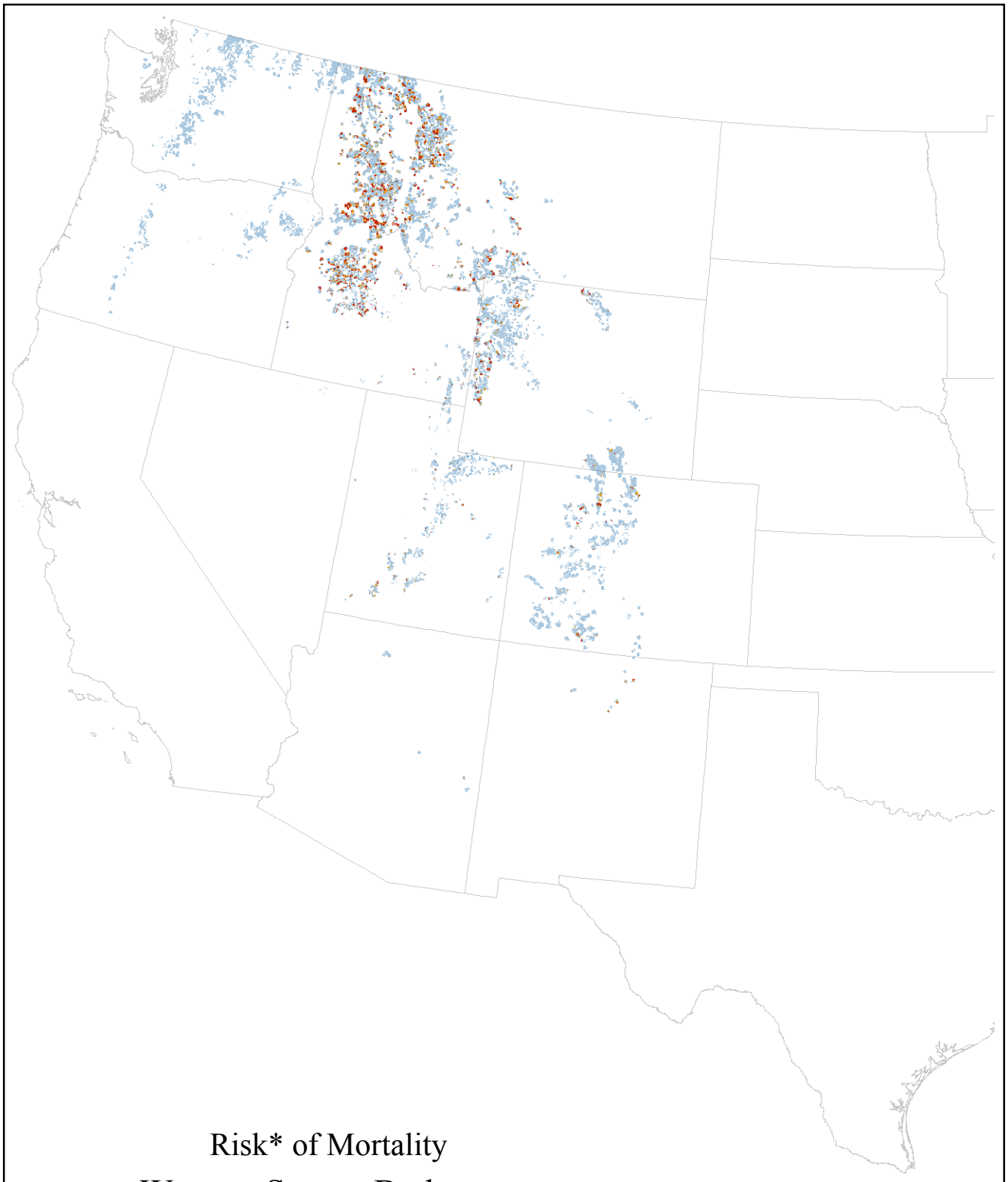
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Percent Basal Area Host Tree Species*	60	80	80	80	Linear	1	33%
Criteria 2		Physiographic Classes	Ridges	Slopes	Valleys	Valleys	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	100	100	100	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to areas where subalpine fir basal area > 1.
Comments	Percent BA host tree species is the percent of the total BA comprised by Douglas-fir, white fir, grand fir and subalpine fir.
Citations	31, 38, 40
Model Certainity	3 - Informed Professional Judgement



Risk* of Mortality

Western Spruce Budworm on Subalpine Fir (IW)

Mortality Ceiling of 3%

0 50 100 200 300

Miles

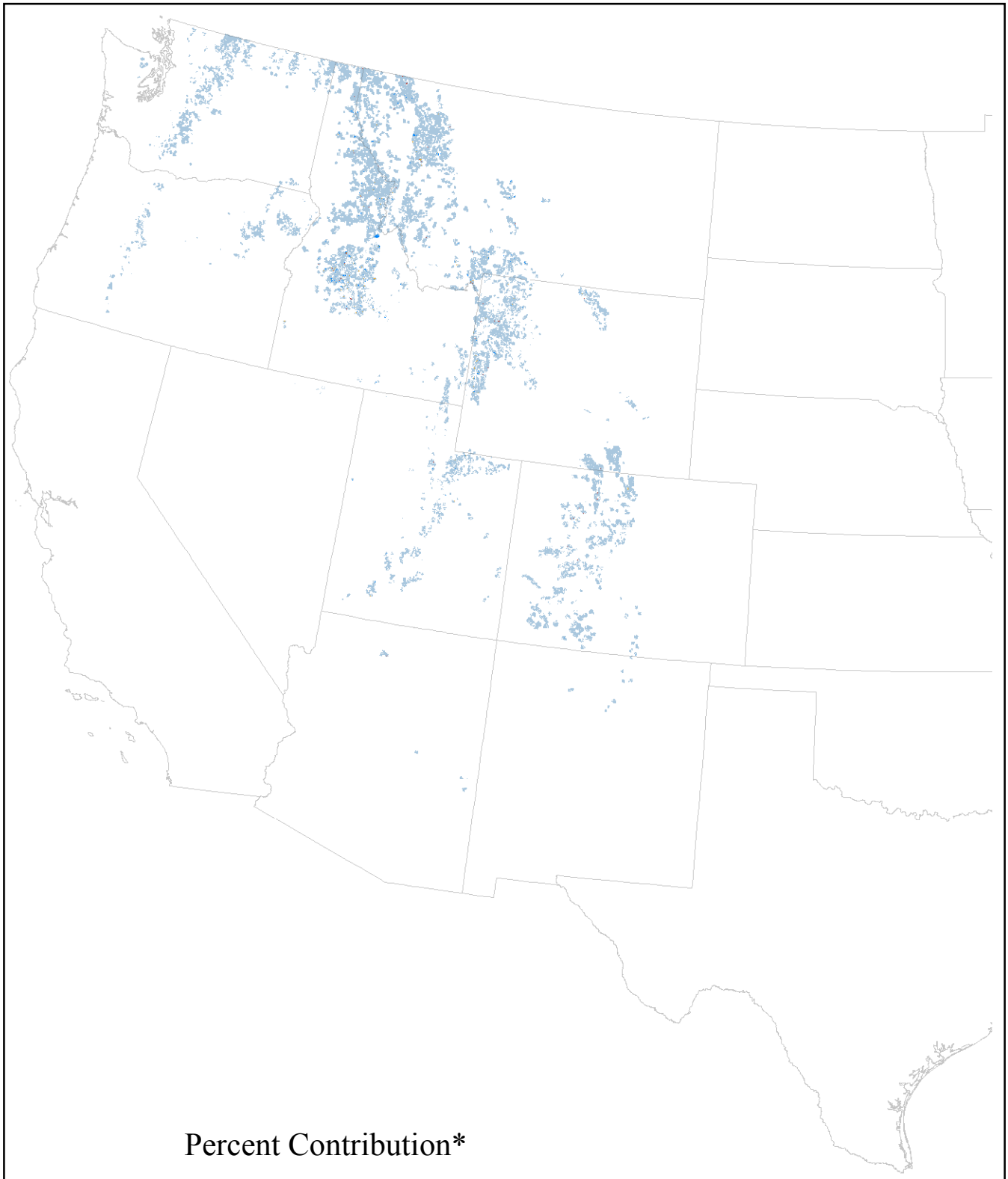
Legend

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 7, 2007

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



Percent Contribution*

Western Spruce Budworm on Subalpine Fir (IW)

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	Western Spruce Budworm	**Host(s):**	White Fir
Model Extent:	Interior West	**Max Percent Mortality:**	3%

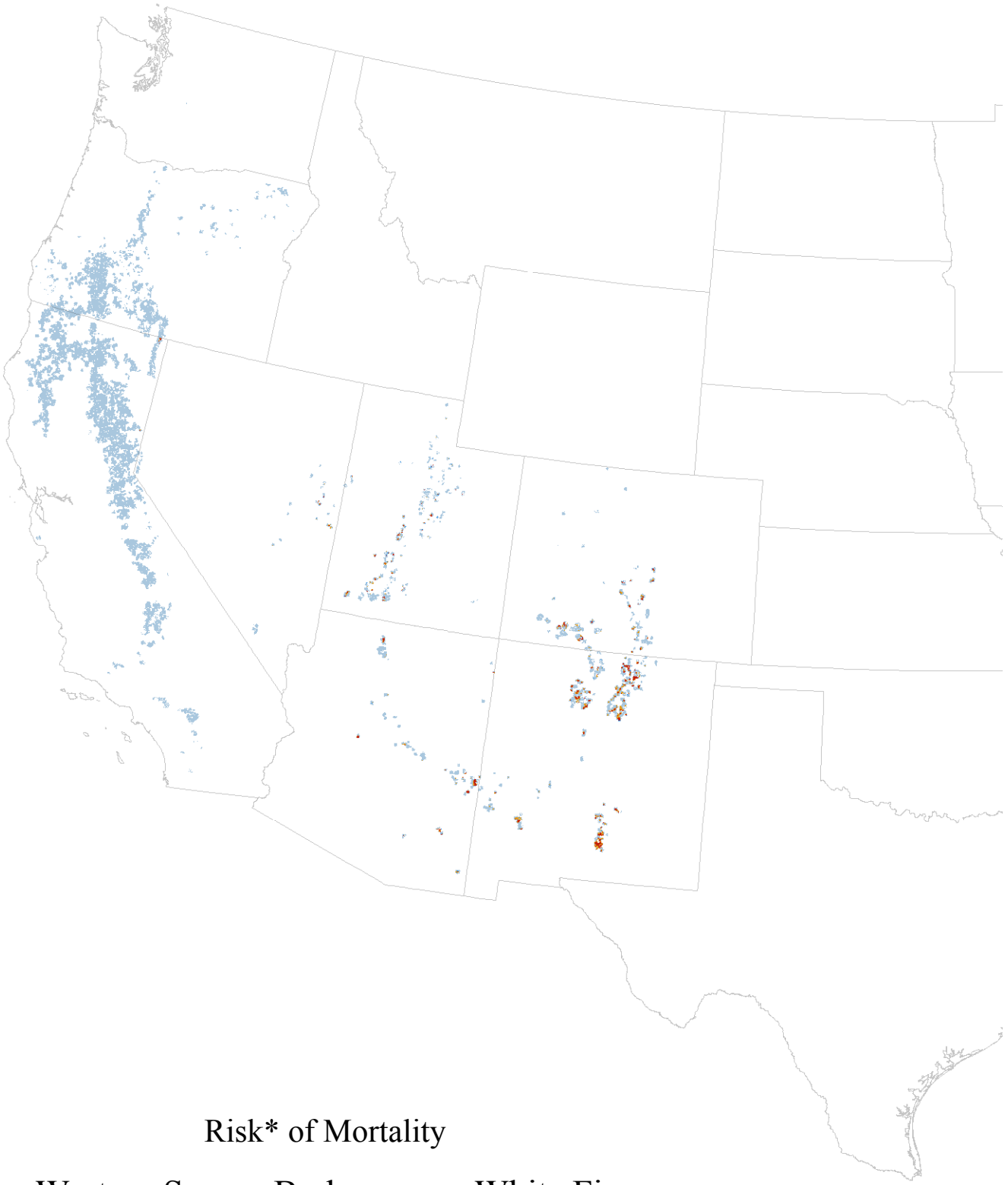
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Percent Basal Area Host Tree Species*	60	80	80	80	Linear	1	33%
Criteria 2		Physiographic Classes	Ridges	Slopes	Valleys	Valleys	Linear	1	33%
Criteria 3		Total Basal Area (sq ft / acre)	80	100	100	100	Linear	1	33%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to areas where white fir basal area > 1.
Comments	Percent BA host tree species is the percent of the total BA comprised by Douglas-fir, white fir, grand fir and subalpine fir.
Citations	31, 38, 40
Model Certainity	2 - Literature/Research Based



Risk* of Mortality

Western Spruce Budworm on White Fir

Mortality Ceiling of 3%

0 50 100 200 300
Miles

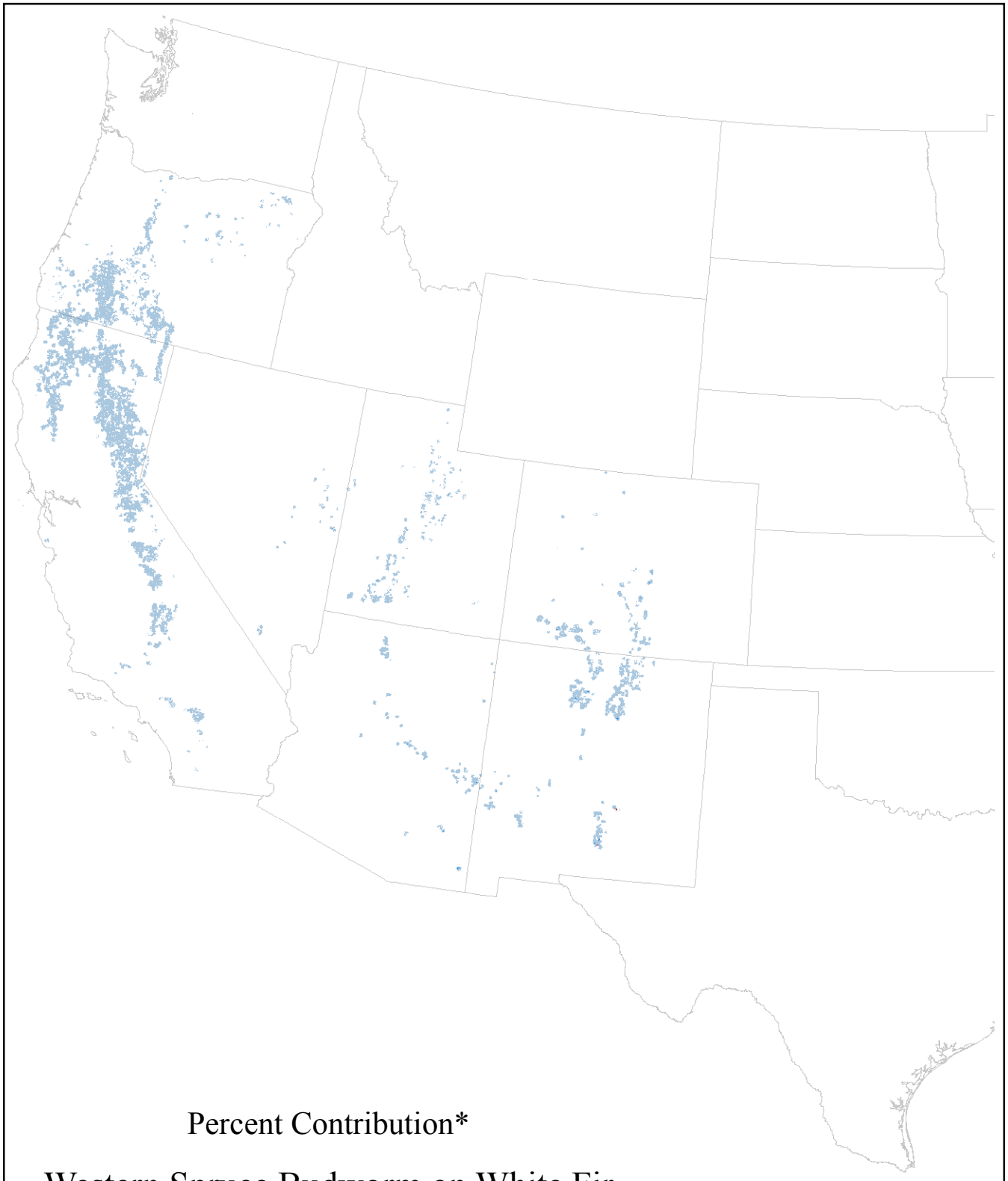
Legend

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 7, 2007

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



Percent Contribution*

Western Spruce Budworm on White Fir

0 50 100 200 300
Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	White Pine Blister Rust	**Host(s):**	Limber Pine
Model Extent:	Central Rocky Mountains	**Max Percent Mortality:**	10%

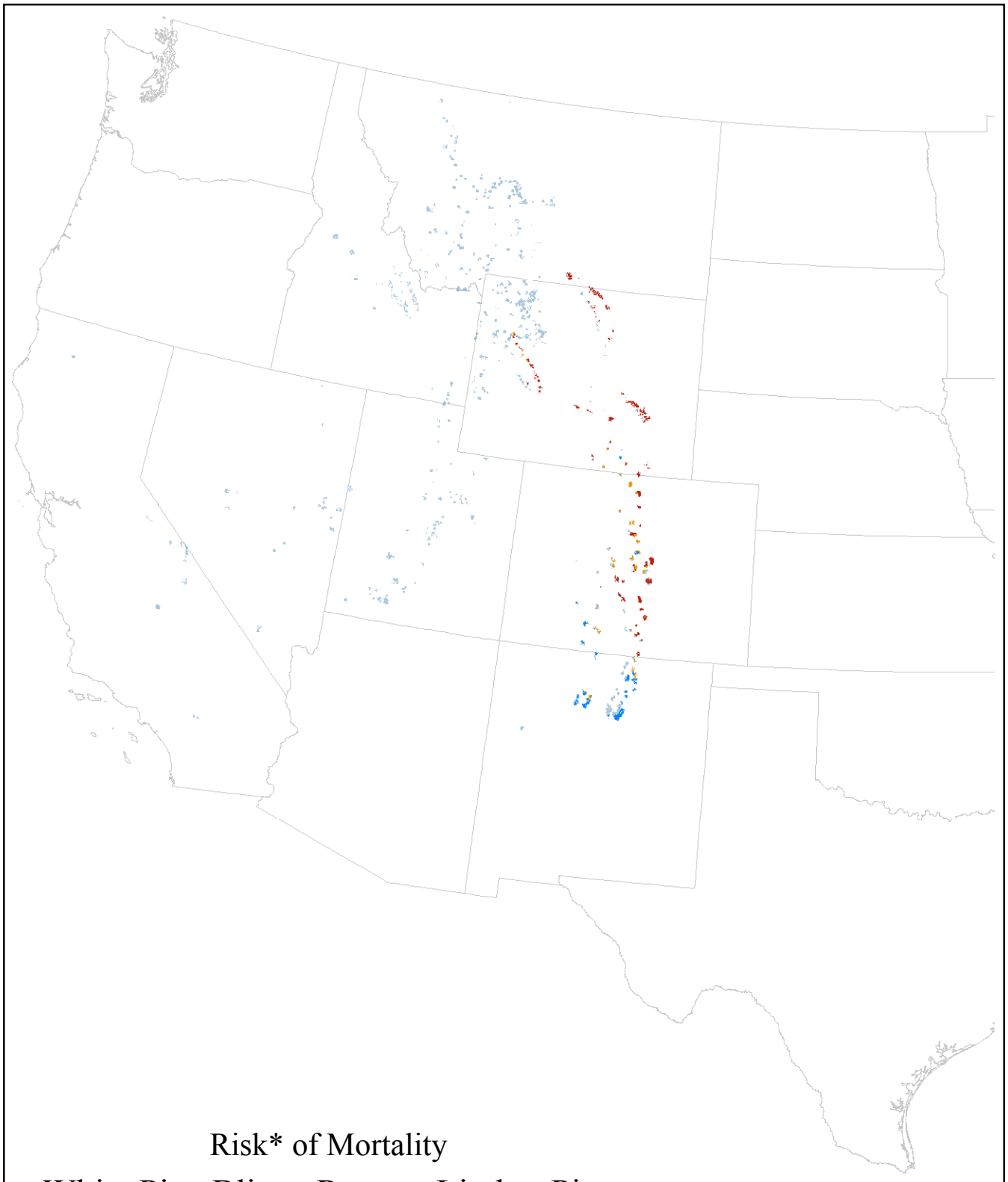
Susceptibility

Rank/Weight									
1	100%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1		May Relative Humidity	45	54	54	54	Linear	1	60%
Criteria 2		May Minimum Temperature (F)	28	34	34	34	Linear	1/3	20%
Criteria 3		May Precipitation (mm)	45	45	45	87	Linear	1/5	12%
Criteria 4		August Minimum Temperature (F)	37	48	53	63	Linear	1/7	9%
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	Restricted to the following ecoregion sections: M331B, M331I, M331F, M33G, M331J, N342F.	**Comments**	
Citations	16	**Model Certainity**	2 - Literature/Research Based



Risk* of Mortality

White Pine Blister Rust on Limber Pine

Central Rocky Mountains

Mortality Ceiling of 10%

0 50 100 200 300

Miles

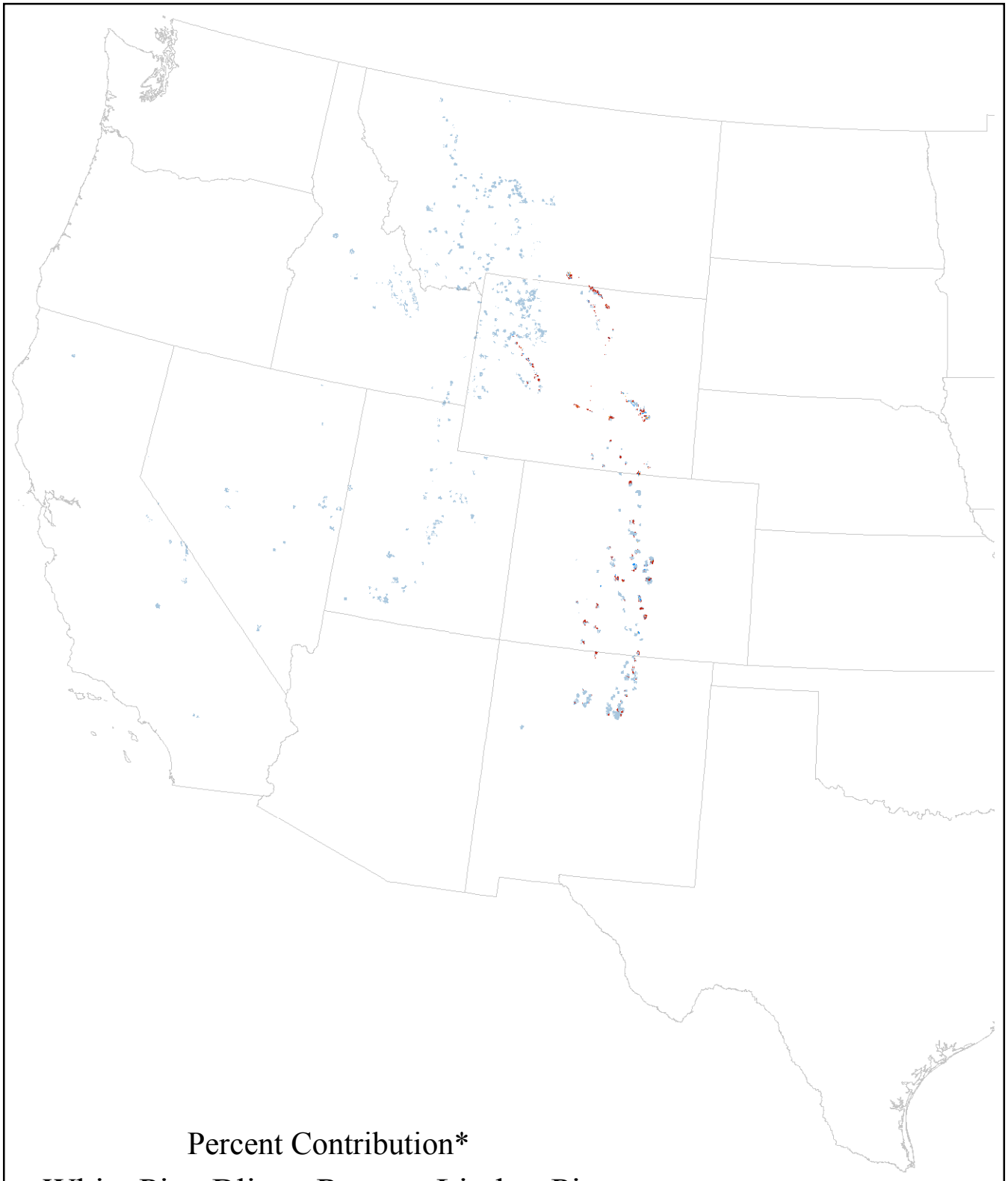
Legend

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 6, 2007

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



Percent Contribution*

White Pine Blister Rust on Limber Pine

Central Rocky Mountains

0 50 100 200 300
Miles

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

Legend

Percent contribution

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

Printing Date: November 6, 2007

Risk Model Worksheet - Interior West

Risk Agent(s):	White Pine Blister Rust	**Host(s):**	Western White Pine
Model Extent:	Northern portion of Interior West	**Max Percent Mortality:**	20%

Susceptibility

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									

Vulnerability

Rank/Weight	1	100%	Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
Criteria 1			Elevation (ft)	2000	7000	7000	7000	Linear	1/2	29%
Criteria 2			Host QMD (inches)	5	12	12	12	Linear	1/4	14%
Criteria 3			Percent Basal Area Host	15	50	50	50	Linear	1	57%
Criteria 4										
Criteria 5										
Criteria 6										
Criteria 7										
Criteria 8										
Criteria 9										
Criteria 10										

Constraints	Restricted to the following ecoregion sections: M332A, M332B, M332D, M332E, M333B, M333C, M333D. Restricted to areas where the basal area is composed of 50% or greater of one or a combination of the following tree species: grand fir, subalpine fir, spruce, western hemlock or western red cedar.
Comments	
Citations	10
Model Certainity	4 - Expert Opinion

Risk* of Mortality
White Pine Blister Rust on Western White Pine
Mortality Ceiling of 20%

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 7, 2007

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

Percent Contribution*

White Pine Blister Rust on Western White Pine

0 50 100 200 300

Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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

Risk Model Worksheet - Interior West

Risk Agent(s):	White Pine Blister Rust	**Host(s):**	Whitebark Pine
Model Extent:	Northern Portion of IW	**Max Percent Mortality:**	20%

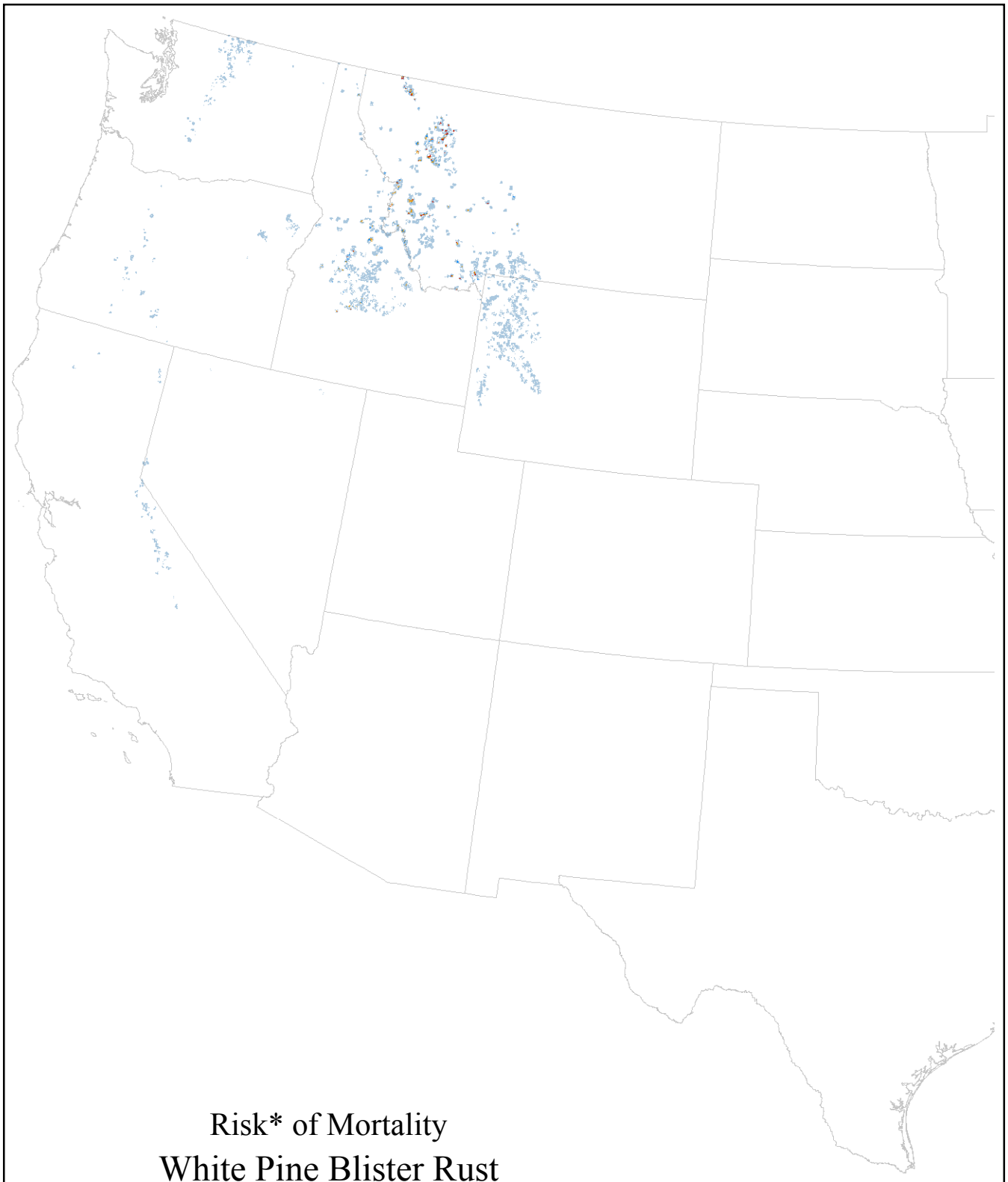
Susceptibility

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									

Vulnerability

Rank/Weight		Criterion	Risk Begins (a)	Risk Peaks (b)	Risk Decreases (c)	Risk Ends (d)	Curve	Rank	Weight
1	100%								
Criteria 1		Elevation (ft)	2000	7000	7000	7000	Linear	1/2	29%
Criteria 2		Host QMD (inches)	5	12	12	12	Linear	1/4	14%
Criteria 3		Percent Basal Area Host	15	50	50	50	Linear	1	57%
Criteria 4									
Criteria 5									
Criteria 6									
Criteria 7									
Criteria 8									
Criteria 9									
Criteria 10									

Constraints	Restricted to the following ecoregion sections: M332A, M332B, M332D, M332E, M333B, M333C, M333D. Restricted to areas where the basal area is composed of 50% or greater of one or a combination of the following tree species: grand fir, subalpine fir, spruce, western hemlock or western red cedar.
Comments	
Citations	10
Model Certainity	4 - Expert Opinion



Risk* of Mortality
White Pine Blister Rust on Whitebark Pine

Mortality Ceiling of 20%

0 50 100 200 300
Miles

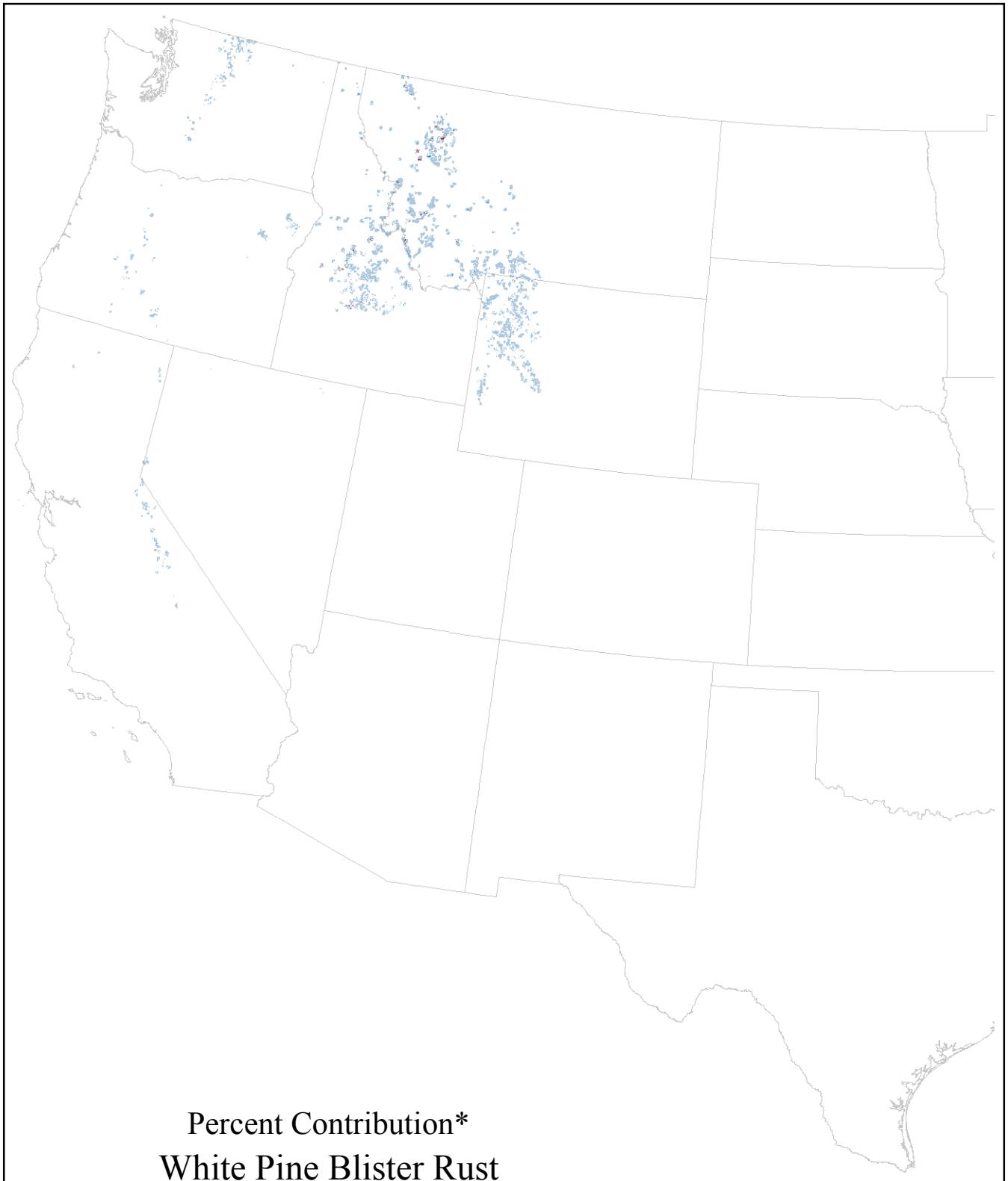
Legend

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 7, 2007

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



Percent Contribution*

White Pine Blister Rust on Whitebark Pine

0 50 100 200 300

Miles

Legend

Percent contribution

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

Printing Date: November 7, 2007

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