



# The Forest Insect and Pathogen Hazard Rating System Database: Risk Model Application



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**<http://www.fs.fed.us/foresthealth/technology/>**



# The Forest Insect and Pathogen Hazard Rating System Database



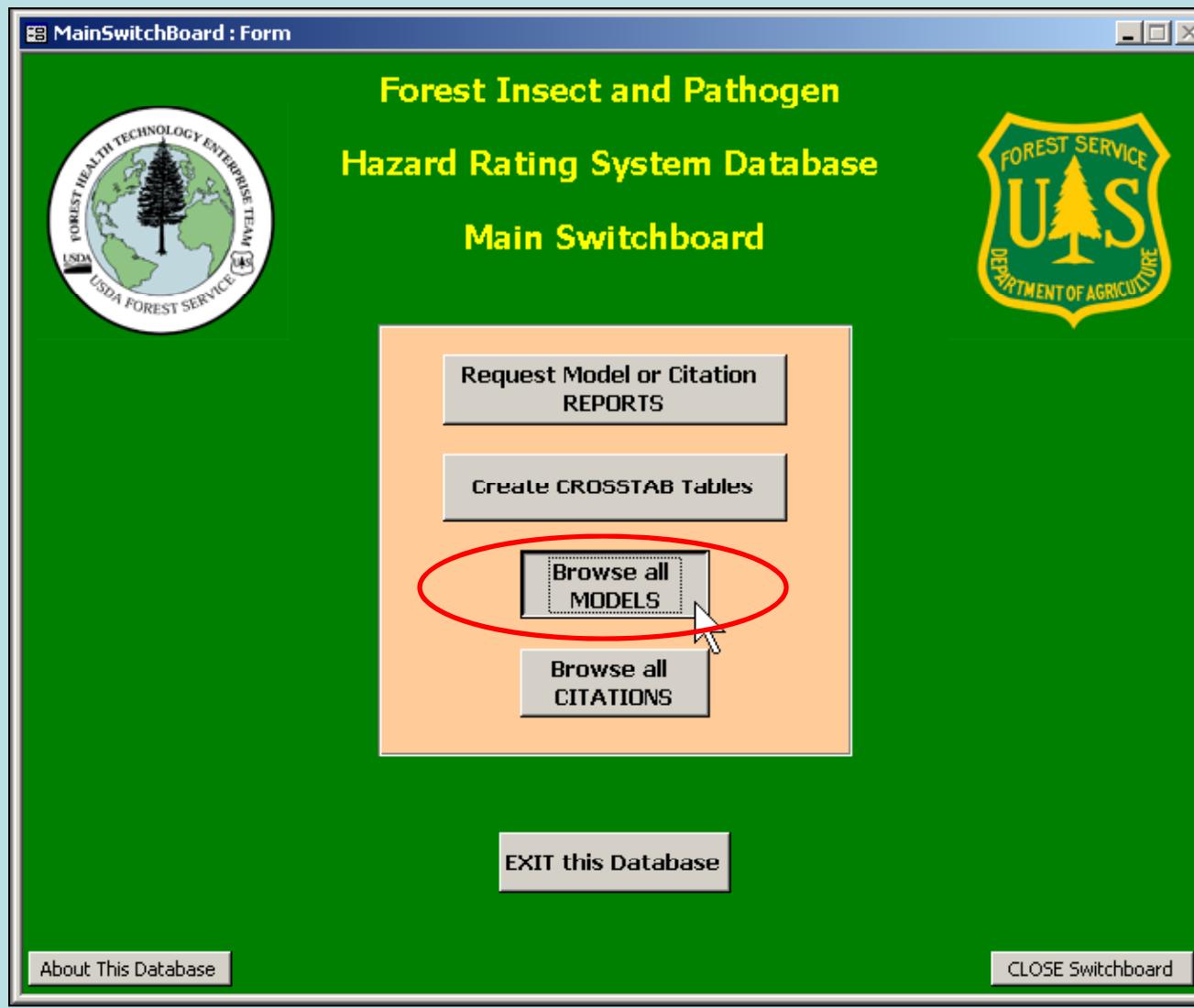
**With it you can...**

- Find existing hazard rating systems
- Evaluate existing models
- Build and support new models
- Investigate current knowledge base

## **Current Database Status**

- Contains 543 citations, 191 of which are seminal for 512 models, 200 of which are NIDRM models
- Packaged with 201 publicly-distributable documents
- Linked to 211 documents online
- Constructed in MS Access 2002; source data and VBA code are fully exposed
- DB size 6 MB; ~700 MB w/ documents
- Eventually to be web-mounted

# Browse All Models



# Form Displaying One Model Record

Model Information		Related Citations			
Seミnal Citation:	Citation ID (CID): 322	MID: 911	RATING SYSTEM NAME	Agent: Annosus	FilterBySelection UnFilter ?
Baker, F.A.; Verbyla, D.L.; Hodges, C.S., Jr.; Ross, E.W. 1993. Classification and regression tree analysis for assessing hazard of pine mortality caused by <i>Heterobasidion annosum</i> . Plant Disease. 77(2): 136-139.		Annosus-Baker		Print Detailed Model Report Sort Records By Name <--> MID CLOSE FORM	
Model Factors:		Agent Common Name	Category:	Model Hosts:	
▶ Factors (Simple) Factors (Detailed) Risk Map Use Notes		Annosus root disease	Root disease	CommonName TID: >SOUTHERN PINES 23 loblolly pine 9 slash pine 22	
Factor: class Factor scope: Qualifiers: Soil texture □ plantations of A horizon		GO TO MODEL ... Sort "GoTo" List By Name <input checked="" type="radio"/> MID Go Back		Forest Description: Forest Type:	
▶ Factors (Simple) Factors (Detailed) Risk Map Use Notes		Model Geography: southeast coastal plain and piedmont		Notes: Simple 2-node CART tree using soil information. Data from 16 sites mostly loblolly or slash pine plantations on SE Coastal Plain and Piedmont	
Factor: class Factor scope: Qualifiers: Soil pH □ plantations of A horizon		▶ STATE FOREST DISTRICT ECOREGION OTHER NC		Record: 1 of 4 Model Type: CART Model Category: Susceptibility Scope: Plantation Output Category: CART Class # Classes: 3 Output Produced: 1 low and 2 high classes	

# Model Form Consists of 2 Pages / Record

## Model Information

## Related Citations

<u>Model Information</u>		<u>Related Citations</u>									
<p>Model Information</p> <p>Related Citations</p> <p>Model Factors:</p> <p>Factors (Simple) Factors (Detailed) Risk Map Use Notes</p> <p>Factor: class Factor scope: Qualifiers: Soil texture plantations of A horizon</p> <p>Factors (Simple) Factors (Detailed) Risk Map Use Notes</p> <p>Factor: class Factor scope: Qualifiers: Soil pH plantations of A horizon</p>		<p>MID: 311 RATING SYSTEM NAME: Agent: Annosus</p> <p>FilterBySelection UnFilter ?</p> <p>Annosus-Baker</p> <p>Agent Common Name: Annosus root disease Category: Root disease</p> <p>Heterobasidion annosum (Fr) Bref.</p> <p><a href="http://www.forestpests.org/subject.html?SUB=519">http://www.forestpests.org/subject.html?SUB=519</a></p> <p>Previous Record Next Record GO TO MODEL ... Sort "GoTo" List By Name MID Go Back</p> <p>Forest Description:</p> <p>Forest Type:</p> <p>Model Geography: southeast coastal plain and piedmont</p> <p>STATE FOREST DISTRICT ECOREGION OTHER</p> <p>NC</p> <p>Record: 1 of 4</p> <p>Model Type: CART</p> <p>Model Category: Susceptibility Scope: Plantation</p> <p>Output Category: CART Class # Classes: 3</p> <p>Output Produced: 1 low and 2 high classes</p> <p>Print Detailed Model Report</p> <p>Sort Records By Name &lt;--&gt; MID</p> <p>CLOSE FORM</p> <p>Model Hosts:</p> <table border="1"><thead><tr><th>CommonName</th><th>TID</th></tr></thead><tbody><tr><td>&gt;SOUTHERN PINES</td><td>23</td></tr><tr><td>loblolly pine</td><td>9</td></tr><tr><td>slash pine</td><td>22</td></tr></tbody></table> <p>Notes:</p> <p>Simple 2-node CART tree using soil information. Data from 16 sites mostly loblolly or slash pine plantations on SE Coastal Plain and Piedmont</p>		CommonName	TID	>SOUTHERN PINES	23	loblolly pine	9	slash pine	22
CommonName	TID										
>SOUTHERN PINES	23										
loblolly pine	9										
slash pine	22										

# Model Information Includes...

Model's seminal citation

Identifying name

Agent info

Host info

Model's driving variables

Model's geography

Model type and output

Descriptive notes

Model Information		Related Citations		Model Hosts:	
Model Factors:	Factors (Simple) Factors (Detailed) Risk Map Use Notes	MID: 911 RATING SYSTEM NAME Agent: Annosus	Agent Common Name Annosus-Baker Annosus root disease <i>Heterobasidion annosum (Fr) Bref.</i> <a href="http://www.forestpests.org/subject.html?SUB=519">http://www.forestpests.org/subject.html?SUB=519</a>	Print detailed Model Report	Sort Records By Name <--> MID CLOSE FORM
Factor: class Factor scope: Qualifiers: Soil texture plantations of A horizon		Previous Record Next Record GO TO MODEL ... Sort "GoTo" List By Name MID Go Back	Forest Description: Forest Type: Model Geography: southeast coastal plain and piedmont STATE FOREST DISTRICT ECOREGION OTHER NC Record: 1 of 1 Model Type: CART Plantation	CommonName TID: >SOUTHERN PINES 23 loblolly pine 9 slash pine 22	
Factor: class Factor scope: Qualifiers: Soil pH plantations of A horizon		Output Produced: 1 low and 2 high classes		Notes: Simple 2-node CART tree using soil information. Data from 16 sites mostly loblolly or slash pine plantations on SE Coastal Plain and Piedmont	

# Related Citation Page provides...

**Model Information**

**Related Citations**

MID: 972 RATING SYSTEM NAME Agent: Annosus FilterBySelection

Agent: Anno: [Heterobasidion annosum \(P.\) Bres.](http://www.forestpests.org/subject.html?SUB=519)

Agents associated w/ seminal citation: 327

Print Detailed Model Report Sort Records By Name <--> MID CLOSE FORM

All agents associated with the seminal citation

Agents associated w/ seminal citation: 327

Annosus root disease

Armillaria root disease

Douglas-fir beetle

Dwarf mistletoe

Indian paint fungus

Citations related to this model

Notes:

Hyperlinks to local and internet electronic documents

**Model Information**

**Seminal Citation:** Citation ID (CID): 327

Hessburg, Paul F.; Smith, Bradley G.; Miller, Craig A.; Kreiter, Scott D.; Salter, R. Brion 1999. Modelling change in potential landscape vulnerability to forest insect and pathogen disturbances: Methods for forested subwatersheds sampled in the midscale Interior Columbia River Basin assessment. Gen. Tech. Rep. PNW-GTR-454. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 56 p. (Quigley, Thomas M., ed. Interior Columbia Basin Ecosystem Mgmt Project: scientific assessment).

**Related citations:**

Citn ID: Hessburg, Paul F.; Mitchell, Russel G.; Filip, Gregory M. 1994. Historical and current roles of insects and pathogens in eastern Oregon and Washington forested landscapes. Gen. Tech. Rep. PNW-GTR-327. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 72 p. (Everett, Richard L., assessment team leader; Eastside forest ecosystem health assessment; Hessburg, Paul) PDF: [docs\512\\_Hessburg\\_Mitchell\\_94.zip](docs\512_Hessburg_Mitchell_94.zip) Online: <http://www.treesearch.fs.fed.us/pubs/6390>

Citn ID: Hessburg, Paul F.; Smith, Bradley G.; Kreiter, Scott D.; Miller, Craig A.; Salter, R. Brion; McNicoll, Cecilia H.; Hann, Wendel J. 1999. Historical and current forest and range landscapes in the interior Columbia River basin and portions of the Klamath and Great Basins. Part I: Linking vegetation patterns and landscape vulnerability to potential insect and pathogen disturbances. Gen. Tech. Rep. PNW-GTR-458. Portland, OR: PDF: [docs\511\\_Hessburg\\_Smith\\_99.zip](docs\511_Hessburg_Smith_99.zip) Online: [http://www.fs.fed.us/pnw/pubs/gtr\\_458.htm](http://www.fs.fed.us/pnw/pubs/gtr_458.htm)

Citn ID: Hessburg, Paul F.; Smith, Bradley G.; Miller, Craig A.; Kreiter, Scott D.; Salter, R. Brion 1999. Modelling change in potential landscape vulnerability to forest insect and pathogen disturbances: Methods for forested subwatersheds sampled in the midscale Interior Columbia River Basin assessment. Gen. Tech. Rep. PNW-GTR-154. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 88 p. (Everett, Richard L., team leader; Eastside forest) PDF: [docs\327\\_Hessburg\\_Smith\\_99.pdf](docs\327_Hessburg_Smith_99.pdf) Online: <http://www.treesearch.fs.fed.us/pubs/2987>

Citn ID: Lehmkuhl, John F.; Hessburg, Paul F.; Everett, Richard L.; Huff, Mark H.; Ottmar, Roger D. 1994. Historical and current forest landscapes of eastern Oregon and Washington. Part I: vegetation pattern and insect and disease hazard. Gen. Tech. Rep. PNW-GTR-328. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 88 p. (Everett, Richard L.; team leader; Eastside forest) PDF: [docs\513\\_Lehmkuhl\\_Hessburg\\_94.zip](docs\513_Lehmkuhl_Hessburg_94.zip) Online: <http://www.treesearch.fs.fed.us/pubs/6407>

# Navigating through the records

**Model Information**      **Related Citations**

Seminal Citation:      Citation ID (CID): 322

Baker, F.A.; Verbyla, D.L.; Hedges, C.S., Jr.; Ross, E.W. 1993. Classification and regression tree analysis for assessing hazard of pine mortality caused by *Heterobasidion annosum*. Plant Disease. 77(2): 136-139.

MID: 911      RATING SYSTEM NAME: Annosus      Agent: Annosus

Annosus-Baker

Agent Common Name: Annosus root disease      Category: Root disease

*Heterobasidion annosum (Fr) Bref.*

Print Detailed Model Report      Sort Records By Name <--> MID

CLOSE FORM

Model Hosts:

Model Fact

▶ Factors (Simple)      Factor: Soil texture      plantations      of A horizon

▶ Factors (Detailed)      Risk Map Use      Notes

Factor: class      Factor scope: Qualifiers:  
Soil pH      plantations      of A horizon

GO TO MODEL ...      Sort "GoTo" List By  
 Name       MID      Go Back

TID: 23  
9  
22

Model Geography: southeast coastal plain and piedmont

▶ STATE FOREST DISTRICT ECOREGION OTHER  
NC

Record: 1 of 4

Model Type: CART

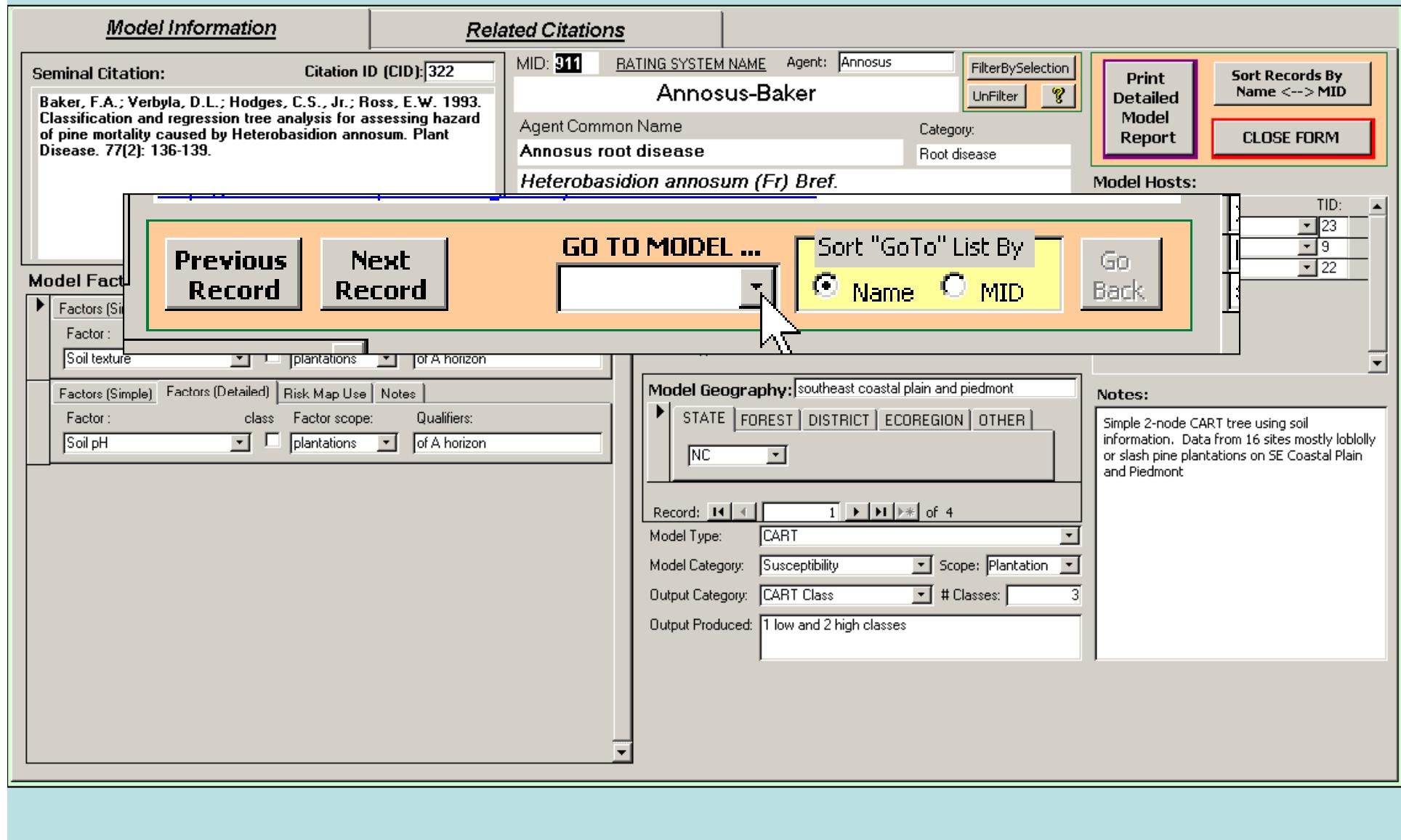
Model Category: Susceptibility      Scope: Plantation

Output Category: CART Class      # Classes: 3

Output Produced: 1 low and 2 high classes

Notes:

Simple 2-node CART tree using soil information. Data from 16 sites mostly loblolly or slash pine plantations on SE Coastal Plain and Piedmont



# Open the dropdown

**Model Information**      **Related Citations**

Seminal Citation: Citation ID (CID): 322  
Baker, F.A.; Verbyla, D.L.; Hedges, C.S., Jr.; Ross, E.W. 1993. Classification and regression tree analysis for assessing hazard of pine mortality caused by *Heterobasidion annosum*. Plant Disease. 77(2): 131-136.

MID: 911 RATING SYSTEM NAME: Annosus Agent: Annosus

Annosus-Baker

Agent Common Name: Category:

FilterBySelection UnFilter ?

Print Detailed Model Report Sort Records By Name <-> MID

CLOSE FORM

**Previous Record**    **Next Record**

**GO TO MODEL ...**    Sort "GoTo" List By  Name  MID    Go Back

MID	Rating System Name	CID
911	Annosus-Baker	322
59	Annosus-Froelich	57
97	Annosus-FVS	435
118	Annosus-Morris	414
972	AnnosusP-Hessburg	327
912	Annosus-Preisler	351
971	AnnosusS-Hessburg	327
957	Annosus-Steele	65
1029	Armillaria-FVS	435
969	Armillaria-Hessburg	327
984	Armillaria-McDonald	525
958	Armillaria-Steele	65
17	BWA-Page	106
14	CA Pine (Salman&Bongberg)	14

Forest Description: Forest Type: Model Geog: STATE: NC

Record: ▶◀

Model Type: Model Category: Output Category: Output Product:

Soil texture: Factor: Soil pH: Factor: Soil texture: Factor: Soil pH:

# Select a model

Model Information      Related Citations

Seminal Citation: Citation ID (CID): 322 MID: 311 RATING SYSTEM NAME Agent: Annosus Annosus-Baker FilterBySelection UnFilter ? Print Detailed Model Sort Records By Name <-> MID

Baker, F.A.; Verbyla, D.L.; Hedges, C.S., Jr.; Ross, E.W. 1993. Classification and regression tree analysis for assessing hazard of pine mortal Disease. 77(2)

Previous Record      Next Record      GO TO MODEL ...      Sort "GoTo" List By Name MID      Go Back

MID	Rating System Name	CID
695	NIDRM_IW_WPBP_PP5	460
696	NIDRM_IW_WPBP_PP6	460
675	NIDRM_IW_WPBR_LmbrP	460
709	NIDRM_IW_WPBR_WBP	460
705	NIDRM_IW_WPBR_WWP	460
671	NIDRM_IW_WSRW_DF	460
673	NIDRM_IW_WSBW_GF	460
701	NIDRM_IW_WSBW_SAF	460
707	NIDRM_IW_WSBW_WF	460
810	NIDRM_NA_ALB_Mpl	460
813	NIDRM_NA_BBB_S	460
814	NIDRM_NA_BBB_V	460
812	NIDRM_NA_BBD	460
815	NIDRM_NA_BCanker	460

Model Factors  
Factors (Simple)  
Factor:  
Soil texture

Model Geog  
Factors (Simple)  
Factor:  
Soil pH

Forest Description  
Forest Type:  
Model Geog  
Record: 14  
STATE  
NC

TID: 23  
9  
22

loblolly pine  
slash pine

long soil  
sites mostly loblolly  
Coastal Plain

in.  
ine  
on

# Form displays selected record

Model Information		Related Citations		Actions			
Seimonal Citation:	Citation ID (CID): 460	MID: 671	RATING SYSTEM NAME Agent: IWSBW	FilterBySelection		Print Detailed Model Report	Sort Records By Name <--> MID
USDA Forest Service 2006. National Forest Insect and Disease Risk Map. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team.		NIDRM_IW_WSBW_DF		UnFilter	?	CLOSE FORM	
Model Factors:		Agent Common Name Spruce budworm (western)		Category: Defoliator		Model Hosts:	
Factors (Simple) Factors (Detailed) Risk Map Use Notes		Choristoneura occidentalis Freeman		http://www.forestpests.org/subject.html?SUB=116		CommonName TID: >DOUGLAS-FIR 59	
Factor: class Factor scope: Qualifiers:		GO TO MODEL ... Sort "GoTo" List By		671		Go Back	
%BAH		Previous Record		Next Record	Name	MID	
Physiography							
Basal area							
Forest Description:							
Forest Type:							
Model Geography: IW							
Record: << << >> >> *							
Model Type: 3 - Informed Professional Judgement							
Model Category: Vulnerability Scope: 1 km grid							
Output Category: # Classes:							
Output Produced: BA mortality estimate							
Constraints: NIDRM RISK MAP USAGE				NIDRM Region: IW			
Restricted to areas where Douglas-fir basal area > 1.				Weight (Susceptible vs Vulnerable) %: 100			
				Maximum Mortality %: 3			

**Additional Information re:  
National Insect and Disease  
Risk Map (NIDRM) Models**

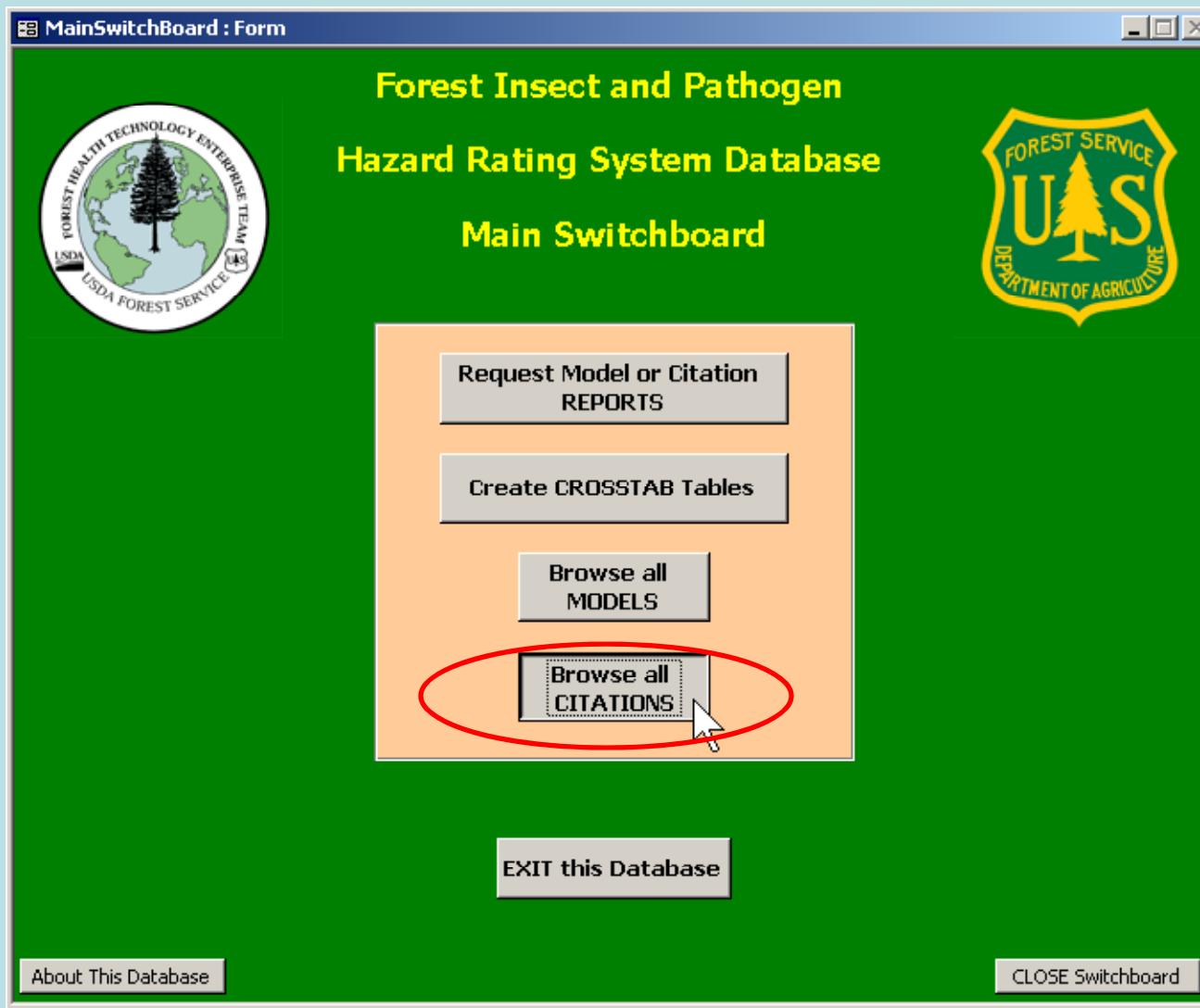
<u>Model Information</u>		<u>Related Citations</u>																																																			
Seimnal Citation:	Citation ID (CID): 460	MID: 671	RATING SYSTEM NAME Agent: WSBW	<input type="button" value="FilterBySelection"/>	<input type="button" value="UnFilter"/> <input type="button" value="?"/>																																																
USDA Forest Service 2006. National Forest Insect and Disease Risk Map. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team.		NIDRM_IW_WSBW_DF																																																			
		Agent Common Name	Category:																																																		
		Spruce budworm (western)	Defoliator																																																		
		<i>Choristoneura occidentalis Freeman</i>																																																			
		<a href="http://www.forestpests.org/subject.html?SUB=116">http://www.forestpests.org/subject.html?SUB=116</a>																																																			
		<input type="button" value="Previous Record"/>	<input type="button" value="Next Record"/>	<input type="button" value="GO TO MODEL ..."/>	<input by"="" goto"="" list="" type="button" value="Sort "/>																																																
				671	<input checked="" type="radio"/> Name <input type="radio"/> MID <input type="button" value="Go Back"/>																																																
<p><b>Model Factors:</b></p> <table border="1"> <tr> <td><input type="button" value="Factors (Simple)"/></td> <td><input type="button" value="Factors (Detailed)"/></td> <td><input style="outline: 2px solid red;" type="button" value="Risk Map Use"/></td> <td><input type="button" value="Notes"/></td> </tr> <tr> <td>Weight</td> <td>Begin:</td> <td>Peak:</td> <td>Decline:</td> <td>RiskMapEnd:</td> <td>Screen?</td> </tr> <tr> <td>0.33333333</td> <td>60</td> <td>80</td> <td>80</td> <td>80</td> <td><input type="checkbox"/></td> </tr> </table> <table border="1"> <tr> <td><input type="button" value="Factors (Simple)"/></td> <td><input type="button" value="Factors (Detailed)"/></td> <td><input type="button" value="Risk Map Use"/></td> <td><input type="button" value="Notes"/></td> </tr> <tr> <td>Weight</td> <td>Begin:</td> <td>Peak:</td> <td>Decline:</td> <td>RiskMapEnd:</td> <td>Screen?</td> </tr> <tr> <td>0.33333333</td> <td>Ridges</td> <td>Slopes</td> <td>Valleys</td> <td>Valleys</td> <td><input type="checkbox"/></td> </tr> </table> <table border="1"> <tr> <td><input type="button" value="Factors (Simple)"/></td> <td><input type="button" value="Factors (Detailed)"/></td> <td><input type="button" value="Risk Map Use"/></td> <td><input type="button" value="Notes"/></td> </tr> <tr> <td>Weight</td> <td>Begin:</td> <td>Peak:</td> <td>Decline:</td> <td>RiskMapEnd:</td> <td>Screen?</td> </tr> <tr> <td>0.33333333</td> <td>80</td> <td>100</td> <td>100</td> <td>100</td> <td><input type="checkbox"/></td> </tr> </table>						<input type="button" value="Factors (Simple)"/>	<input type="button" value="Factors (Detailed)"/>	<input style="outline: 2px solid red;" type="button" value="Risk Map Use"/>	<input type="button" value="Notes"/>	Weight	Begin:	Peak:	Decline:	RiskMapEnd:	Screen?	0.33333333	60	80	80	80	<input type="checkbox"/>	<input type="button" value="Factors (Simple)"/>	<input type="button" value="Factors (Detailed)"/>	<input type="button" value="Risk Map Use"/>	<input type="button" value="Notes"/>	Weight	Begin:	Peak:	Decline:	RiskMapEnd:	Screen?	0.33333333	Ridges	Slopes	Valleys	Valleys	<input type="checkbox"/>	<input type="button" value="Factors (Simple)"/>	<input type="button" value="Factors (Detailed)"/>	<input type="button" value="Risk Map Use"/>	<input type="button" value="Notes"/>	Weight	Begin:	Peak:	Decline:	RiskMapEnd:	Screen?	0.33333333	80	100	100	100	<input type="checkbox"/>
<input type="button" value="Factors (Simple)"/>	<input type="button" value="Factors (Detailed)"/>	<input style="outline: 2px solid red;" type="button" value="Risk Map Use"/>	<input type="button" value="Notes"/>																																																		
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0.33333333	60	80	80	80	<input type="checkbox"/>																																																
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Weight	Begin:	Peak:	Decline:	RiskMapEnd:	Screen?																																																
0.33333333	80	100	100	100	<input type="checkbox"/>																																																



## NIDRM Model parameters

Agent Common Name	Category:
Spruce budworm (western)	Defoliator
<i>Choristoneura occidentalis Freeman</i>	
<a href="http://www.forestpests.org/subject.html?SUB=116">http://www.forestpests.org/subject.html?SUB=116</a>	
<input type="button" value="Previous Record"/>	<input type="button" value="Next Record"/>
<input type="button" value="GO TO MODEL ..."/>	<input by"="" goto"="" list="" type="button" value="Sort "/>
671	<input checked="" type="radio"/> Name <input type="radio"/> MID <input type="button" value="Go Back"/>
<p>Forest Description:</p> <p>Forest Type:</p> <p><b>Model Geography:</b> IW</p> <p>Record: <input type="button" value="&lt;&lt;"/> <input type="button" value="&lt;"/> <input type="button" value="&gt;"/> <input type="button" value="&gt;&gt;"/> <input type="button" value="*"/></p> <p>Model Type: 3 - Informed Professional Judgement</p> <p>Model Category: Vulnerability Scope: 1 km grid</p> <p>Output Category: # Classes: <input type="text"/></p> <p>Output Produced: BA mortality estimate</p>	
<p>Constraints: NIDRM RISK MAP USAGE</p> <p>NIDRM Region: IW</p> <p>Restricted to areas where Douglas-fir basal area &gt; 1.</p> <p>Weight (Susceptible vs Vulnerable) %: 100</p> <p>Maximum Mortality %: 3</p>	

# Browse All Citations



# Citation Information Includes...

**Source Info**

**Hyperlinks to electronic documents**

**Models referenced by this citation**

**Agents associated w/ this citation**

**Descriptive notes**

**Database currently contains 543 citations**

FHTET Forest Insect and Disease Hazard Database - [CITATIONS (Read Only)]

Title: Annosus root disease hazard rating, detection, and management strategies in the southeastern US

Source: In: Orosina, William J. and Scharpf, Robert F., tech coords. 1989. Proceedings of the symposium on research and management of annosus root disease (*Heterobasidion annosum*) in western NA. April 18-21 1989, Monterey, CA. Gen. Tech. Rep. PSW-116. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station. 111-116.

Year: 1989

Public?

Related Models:

MID	Model Name	Seminal CID
118	Annosus-Morris	ViewDetail 414

Related Citations:

Tanelli, E.S.; Hokans, R.H.; Alexander, S.A. 1984. Cubic-foot-thinned loblolly pine plantations on high annosus hazard sites. Version 1.0. Blacksburg, VA: Virginia Polytechnic Institute School of Forestry and Wildlife resources.

Morris, C.L. 1967. Development of a hazard rating for *Fomes annosus* in Virginia. In: Proceedings, Fourth Forest Insect and Disease Control Work Conference: Atlanta Cabana Motel, Atlanta, Georgia, March 7-9, 1967. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southeastern Area, State and Private Forestry, Division of Forest Pest Control. 219-221.

Agents associated w/ this citation

Annosus root disease

View Entire Citations List

Record: 1 of 543

Print Detailed Citation Report

Sort Records by Author <--> CID

Set Report Options

CLOSE FORM

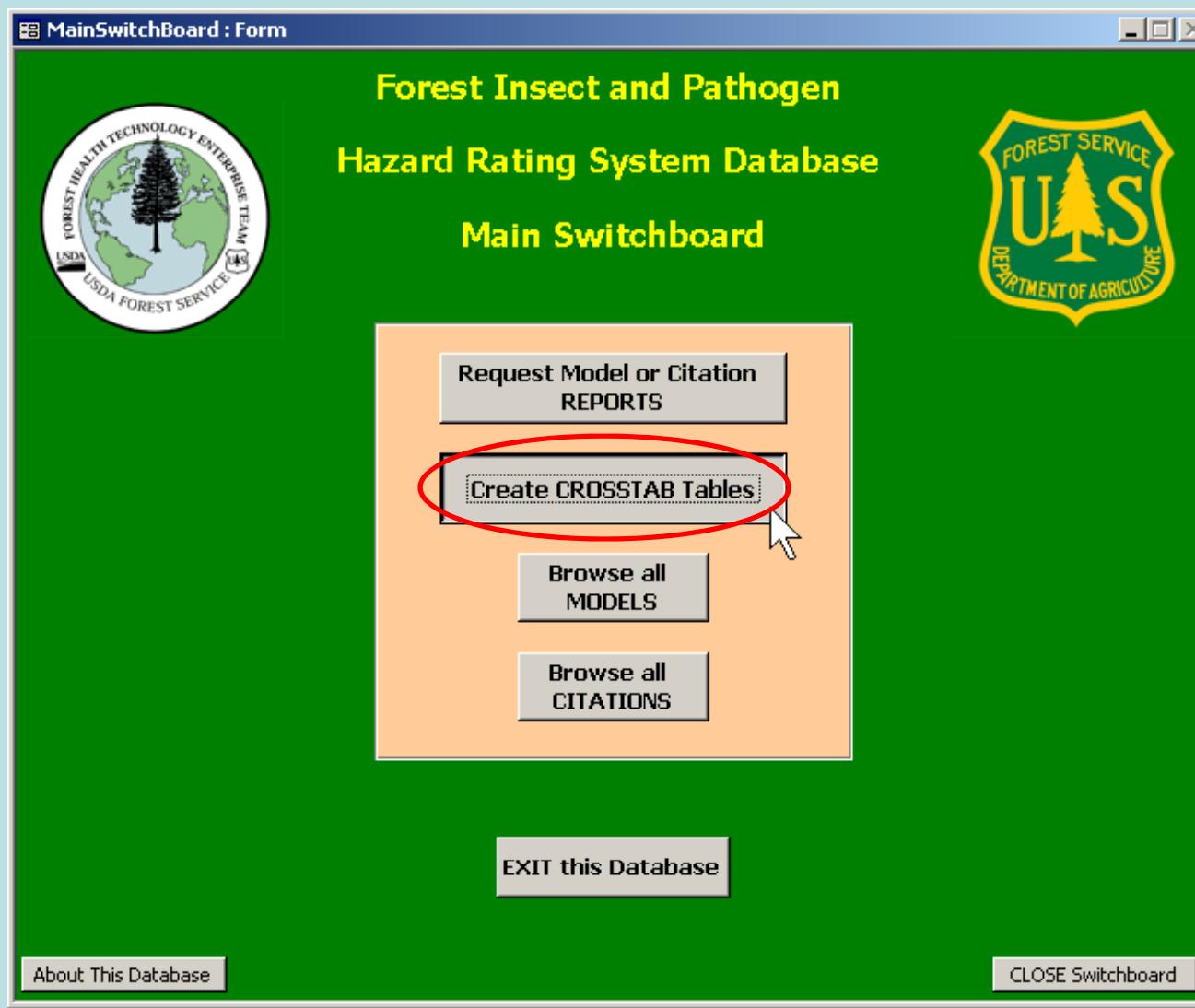
AID: Author CID: 420

3 Alexander S.A. More

Notes:

Review. Cites Morris 1966 (CID 414); soil hazard rating system (mis-cited as Morris & Frazier 66); Froelich et al. 1966; Alexander et al. 1975; Annosus Sampling Procedure (Alexander and Anderson 1985); GY\_ANNOSUS computer program (Tanelli et al. 1984, see CID 466))

# Create Cross-tab Tables



**Cross-tab tables are two-way tables listing—for a given agent—models across the top (column headings) and either model factors or model geography down the side (row headings)**

**Models x geography (state) cross-tab table**

Agent	States	Model 1	Model 2	Model 3	etc...
	CO	x			
	ID	x	x		
	MT	x	x		
	OR		x	x	
	WA		x	x	
	etc...				

**Cross tab tables are two-way tables listing—for a given agent—models across the top (column headings) and either model factors or model geography down the side (row headings)**

**Models x Model Factors cross-tab table**

Agent	Factors	Model 1	Model 2	Model 3	etc...
	Basal area	x		x	
	Canopy cover	x	x		
	Precipitation		x		
	Soil texture		x	x	
	TPA	x			
	etc...				

# The real power of this database is in its Report Generator

**Report Request**

**SELECT A REPORT**

- Model Report**
  - Include Related Citations?
- Detailed Model Report**
- Citation Report**
  - Include notes and hyperlinks?
- Detailed Citation Report**

Group Citations by Agent?  yes  no

**Years to Include:**

- All Year:
- After Year:
- Before Year:
- Exactly Year:
- Between  and

Include National Insect and Disease Risk Map Models?

- No
- Yes
- Only

**Help** Select any combination of YEARS, AGENT, AGENT GROUP, HOSTS, LOCATIONS (US states or Canadian provinces), REGIONS, or AUTHORS to include in your report. Multiple selections within a category may be made via <Ctrl> or <shift> + selection.

Agent(s):	Agent Group(s):	Host(s):	Location(s):	Author(s):
<input type="button" value="Clear Selection"/>	<input type="button" value="Clear Selection"/>	<input type="button" value="Clear Selection"/> Host >GROUPS are in ALL CAPS	<input type="button" value="Clear Selection"/>	<input type="button" value="Clear Selection"/>
<All> Anthonomus root disease Armillaria root disease Asian longhorned beetle Aspen decline Balsam woolly adelgid Beech bark disease Black stain root disease Blackheaded budworm (eastern) Blackheaded budworm (western) Bronze birch borer Butternut canker Commandra blister rust Defoliators Douglas-fir beetle Douglas-fir tussock moth Dutch elm disease Dwarf mistletoe Eastern larch beetle Emerald ash borer Fir engraver Flatheaded wood borer Forest tent caterpillar Fusiform rust Gypsy moth Heart rot/root rot Hemlock woolly adelgid Indian paint fungus Jack pine budworm Jeffrey pine beetle	<All> Bark beetle Decline Defoliator Needle miner Parasitic plant Root disease Sap sucking Shoot borer Stem rust Wood borer Wood decay / canker	<All> >ASH >ASPEN >BASSWOOD >CAROLINA/EASTERN HEMLOCK >CONIFERS (all) >CONIFERS (eastern) >CONIFERS (western) >COTTONWOOD >DOUGLAS-FIR >ELM >FIR (all) >FIR (eastern) >FIR (western) >JUNIPER >OAK >PAPER/GRAY BIRCH >PINES (all) >PINNS (eastern) >PINNS (western) >PINON PINE >RED FIR >RED OAKS >SOUTHERN PINES >SOUTHERN YELLOW PINES >SPRUCE (all) >SPRUCE (eastern) >SPRUCE (western)	<All> AB AK AL AR AZ BC CA CO CT FL GA ID KY LA MA MD	<All> Adams, D.L. Alexander, S.A. Allen, Kurt K. Amateis, R.L. Amman, Gene D. Ammon, Vernon Anderson, Robert L. Anhold, John A. Archambault, L. Atruy, Gordon L. Baker, Bruce H. Baker, F.A. Balch, R.E. Barbouletos, Tom N. Barclay, Hugh J. Barrett, Hope R.
<input type="button" value="Clear ALL ListBox Selections"/>		<input type="button" value="Set Report Options"/>	<input type="button" value="Region Info"/> <input type="button" value="Clear Selection"/>	
<input type="button" value="GENERATE REPORT"/>		<input type="button" value="Host GROUP Membership Info"/>		
<input type="button" value="CLOSE FORM"/>				

Note: The set of models (or citations) returned from your report request will meet ALL of the selection criteria ACROSS categories and (at least) ANY ONE of the criteria WITHIN each category. Selecting '<All>' in a category dictates that NO filtering by the category will be performed.

**Region(s):** Note: Regions overlap

0 <All>
1 Inland Empire (ID / MT / ND)
2 Southern Rockies (CO, KS, NE, SD, WY)
3 Southwest (AZ / NM)
4 Great Basin (ID / NV / UT)
5 California
6 Pacific NW (OR, WA)
7 Lake States (MI, MN, WI)

**More Info re:  
selection sets**

**With the Report Generator, you query the database for...**

- **Models of interest, or....**
- **Citations of interest...**

**By:**

- **Agent or agent group**
- **Host**
- **Location (model geography)**
- **Author**
- **Year**

Select the type of report you want

**A simple or detailed MODEL report...**

**...or a simple or detailed CITATION report...**

**Report Request**

**SELECT A REPORT**

Model Report  
 Include Related Citations?

Detailed Model Report

Citation Report  
 Include notes and hyperlinks?

Detailed Citation Report

Group Citations by Agent?  Yes  No

Years to Include:

All Year: \_\_\_\_\_

After Year: \_\_\_\_\_

Before Year: \_\_\_\_\_

Exactly Year: \_\_\_\_\_

Between Year: \_\_\_\_\_

Include National Insect and Disease Risk Map Models?  
 No  
 Yes  
 Only

**Agent(s):** Clear Selection  
<All>  
Anthonomus root disease  
Armillaria root disease  
Asian longhorned beetle  
A  
B  
B  
Black stain root disease  
Blackheaded budworm (eastern)  
Blackheaded budworm (western)  
Bronze birch borer  
Butternut canker  
Commander blister rust  
Defoliators  
Douglas-fir beetle  
Douglas-fir tussock moth  
Dutch elm disease  
Dwarf mistletoe  
Eastern larch beetle  
Emerald ash borer  
Fir engraver  
Flatheaded wood borer  
Forest tent caterpillar  
Fusiform rust  
Gypsy moth  
Heart rot/root rot  
Hemlock woolly adelgid  
Indian paint fungus  
Jack pine budworm  
Jeffrey pine beetle

**Agent Group(s):** Clear Selection  
<All>  
Bark beetle  
Decline  
Defoliator  
Sap sucking  
Shoot borer  
Stem rust  
Wood borer  
Wood decay / canker

**Host(s):** Host >GROUPS are in ALL CAPS  
Clear Selection  
<All>  
>ASH  
>ASPEN  
>BASSWOOD  
>CONIFERS (western)  
>COTTONWOOD  
>DOUGLAS-FIR  
>ELM  
>FIR (all)  
>FIR (eastern)  
>FIR (western)  
>JUNIPER  
>OAK  
>PAPER/GREY BIRCH  
>PINES (all)  
>PINES (eastern)  
>PINES (western)  
>PINON PINE  
>RED FIR  
>RED OAKS  
>SOUTHERN PINES  
>SOUTHERN YELLOW PINES  
>SPRUCE (all)  
>SPRUCE (eastern)  
>SPRUCE (western)

**Location(s):** Clear Selection  
<All>  
AB  
AK  
AL  
CA  
CO  
CT  
FL  
GA  
ID  
KY  
LA  
MA  
MD  
Note: Regions overlap  
Region(s):  
0 <All>  
1 Inland Empire (ID / MT / ND)  
2 Southern Rockies (CO, KS, NE, SD, WY)  
3 Southwest (AZ / NM)  
4 Great Basin (ID / NV / UT)  
5 California  
6 Pacific NW (OR, WA)  
7 Lake States (MI, MN, WI)

**Author(s):** Clear Selection  
<All>  
Adams, D.L.  
Alexander, S.A.  
Allen, Kurt K.  
Amateis, R.L.  
Amman, Gene D.  
Ammon, Vernon  
Anderson, Robert L.  
Anhold, John A.  
Archambault, L.  
Autry, Gordon L.  
Baker, Bruce H.  
Baker, F.A.  
Balch, R.E.  
Barbouletos, Tom N.  
Barclay, Hugh J.  
Barrett, Hope R.

**CLOSE FORM**

Note: The set of models (or citations) returned from your report request will meet ALL of the selection criteria ACROSS categories and (at least) ANY ONE of the criteria WITHIN each category. Selecting '<All>' in a category dictates that NO filtering by the category will be performed.

Region Info Clear Selection More Info re: selection sets

## Select how information should be “filtered”; i.e. what records do you want in your report

**Report Request**

**SELECT A REPORT**

Model Report  
 Include Related Citations?

Detailed Model Report

---

Citation Report  
 Include notes and hyperlinks?

Detailed Citation Report

Group Citations by Agent?  yes  no

**Years to Include:**

All Year: \_\_\_\_\_  
 After Year: \_\_\_\_\_  
 Before Year: \_\_\_\_\_  
 Exactly \_\_\_\_\_  
 Between \_\_\_\_\_ and \_\_\_\_\_

Include National Insect and Disease Risk Map Models?  
 No  
 Yes  
 Only

**Help**

Select any combination of YEARS, AGENT, AGENT GROUP, HOSTS, LOCATIONS (US states or Canadian provinces), REGIONS, or AUTHORS to include in your report. Multiple selections within a category may be made via <Ctrl> or <shift> + selection.

Agent(s):	Agent Group(s):	Host(s):	Location(s):	Author(s):
<input type="button" value="Clear Selection"/>	<input type="button" value="Clear Selection"/>	<input type="button" value="Clear Selection"/>	<input type="button" value="Clear Selection"/>	<input type="button" value="Clear Selection"/>
<All> Anthonomus root disease Armillaria root disease Asian longhorned beetle Aspen decline Balsam woolly adelgid Beech bark disease Black stain root disease Blackheaded budworm (eastern) Blackheaded budworm (western) Bronze birch borer Butternut canker Commandra blister rust Defoliators Douglas-fir beetle Douglas-fir tussock moth Dutch elm disease Dwarf mistletoe Eastern larch beetle Emerald ash borer Fir engraver Flatheaded wood borer Forest tent caterpillar Fusiform rust Gypsy moth Heart rot/root rot Hemlock woolly adelgid Indian paint fungus Jack pine budworm Jeffrey pine beetle	<All> Bark beetle Decline Defoliator Needle miner Parasitic plant Root disease Sap sucking Shoot borer Stem rust Wood borer Wood decay / canker	<All> >ASH >ASPEN >BASSWOOD >CAROLINA/EASTERN HEMLOCK >CONIFERS (all) >CONIFERS (eastern) >CONIFERS (western) >COTTONWOOD >DOUGLAS-FIR >ELM >FIR (all) >FIR (eastern) >FIR (western) >JUNIPER >OAK >PAPER/GREY BIRCH >PINES (all) >PINES (eastern) >PINES (western) >PINON PINE >RED FIR >RED OAKS >SOUTHERN PINES >SOUTHERN YELLOW PINES >SPRUCE (all) >SPRUCE (eastern) >SPRUCE (western)	<All> AB AK AL AR AZ BC CA CO CT FL GA ID KY LA MA MD	<All> Adams, D.L. Alexander, S.A. Allen, Kurt K. Amateis, R.L. Amman, Gene D. Ammon, Vernon Anderson, Robert L. Anhold, John A. Archambault, L. Aubry, Gordon L. Baker, Bruce H. Baker, F.A. Balch, R.E. Barbouletos, Tom N. Barclay, Hugh J. Barrett, Hope R.

**Region(s):** Note: Regions overlap

0 <All>  
1 Inland Empire (ID / MT / ND)  
2 Southern Rockies (CO, KS, NE, SD, WY)  
3 Southwest (AZ / NM)  
4 Great Basin (ID / NV / UT)  
5 California  
6 Pacific NW (OR, WA)  
7 Lake States (MI, MN, WI)

**Note:** The set of models (or citations) returned from your report request will meet ALL of the selection criteria ACROSS categories and (at least) ANY ONE of the criteria WITHIN each category. Selecting '<All>' in a category dictates that NO filtering by the category will be performed.

**More Info re: selection sets**

Select any combination of...

...one or more ...one or more US states ...one or more authors

...publication year(s)

...NIDRM models

...or region (groups of states & provinces)

Report Request

Model Report  
 Include Related Citations?

Detailed Model Report

Citation Report  
 Include notes and hyperlinks?

Detailed Citation Report

Agent(s):  Clear Selection  
<All>  
Anthonomus root disease  
Armillaria root disease  
Asian longhorned beetle  
Aspen decline  
Balsam woolly adelgid  
Beech bark disease  
Black stain root disease  
Blackheaded budworm (eastern)  
Blackheaded budworm (western)

Agent Group(s):  Clear Selection  
<All>  
Bark beetle  
Decline  
Defoliator  
Needle miner  
Parasitic plant  
Root disease  
Sap sucking  
Shoot borer  
Stem rust  
Wood borer  
Wood decay / canker

Host(s):  Host >GROUPS are in ALL CAPS  
 Clear Selection  
<All>  
>ASH  
>ASPEN  
>BASSWOOD  
>CAROLINA/EASTERN HEMLOCK  
>CONIFERS (all)  
>CONIFERS (eastern)  
>CONIFERS (western)  
>COTTONWOOD  
>DOUGLAS-FIR  
>ELM  
>FIR (all)  
>FIR (eastern)  
>FTD (western)

Location(s):  Clear Selection  
<All>  
AB  
AK  
AL  
AR  
AZ  
BC  
CA  
CO  
CT  
FL  
GA  
ID  
IV  
KS  
LA  
MD  
ME  
MI  
MN  
MO  
MS  
NC  
ND  
NE  
NH  
NJ  
NM  
NV  
NY  
PA  
PR  
RI  
SD  
TN  
UT  
VA  
WA  
WI  
WV  
WY

Author(s):  Clear Selection  
<All>  
Adams, D.L.  
Alexander, S.A.  
Allen, Kurt K.  
Amateis, R.L.  
Amman, Gene D.  
Ammon, Vernon  
Anderson, Robert L.  
Anhold, John A.  
Archambault, L.  
Aubry, Gordon L.  
Baker, Bruce H.  
Baker, F.A.  
Bralin, D.F.

Years to Include:  
 All  
 After   
 Before   
 Exactly  
 Between  and

Include National Insect and Disease Risk Map Models?  
 No  
 Yes  
 Only

Region(s):  Note: Regions overlap  
 Clear Selection  
1 Inland Empire (ID / MT / ND)  
2 Southern Rockies (CO, KS, NE, SD, WY)  
3 Southwest (AZ / NM)  
4 Great Basin (ID / NV / UT)  
5 California  
6 Pacific NW (OR, WA)  
7 Lake States (MI, MN, WI)

GENERATE REPORT  
Set Report Options  
CLOSE FORM

Note: The set of models (or citations) returned from your report request will meet ALL of the selection criteria ACROSS categories and (at least) ANY ONE of the criteria WITHIN each category. Selecting '<All>' in a category dictates that NO filtering by the category will be performed.

More Info re: selection sets

**A brief citation report includes only full citations and agent-related hyperlink to forestpests.org, and a summary of the query used to generate the report**

- Citations for Agent: Category:  
**Douglas-fir beetle** Bark beetle <http://www.barkbeetles.org/browse/subject.cfm?SUB=28>  
*Dendroctonus pseudotagae* Hopkins
- Dodds, Kevin J.; Ross, Darrell W.; Randall, Carol; Dateman, Gary E. 2004. Landscape level validation of a Douglas-fir beetle stand hazard-rating system using GIS. Western Journal of Applied Forestry. 19(2): 77-81. CID: 215
- Hagle, S.K.; Johnson, Temi L.; Stipe, Lawrence E.; Schwandt, John W.; Byler, James W.; Kegley, Sandra J.; Randall, Carol S.; Bell, Taylor, Jane E.; Lockman, I.; Blakey, Sturdevant, Nancy J.; Williams, Stephen B.; Marsden, Michael A.; Lewis, Lowell G. 2000. Succession functions of forest pathogens and insects: Ecoregions sections M330A and M333d in northern Idaho and western MT: Vol 1: methods. FHP Report 00-10. [Missoula, MT]: U.S. Department of Agriculture, Forest Service, State and Private Forestry, Forest Health Protection, Northern Region. 101 p. CID: 297
- Krist, Frank K. Jr.; Sapio, Frank J.; Tkacz, Borys M. 2007. Mapping risk from forest insects and diseases. 2006. FHTET 2007-06. Fort Collins, CO: United States Department of Agriculture, Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. CID: 551
- McMillin, J.D.; 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. CID: 305
- Schmitt, C.L.; Powell, David C. 2002. Risk rating forest stands for insect and disease impacts: a simplified approach using aerial photography data. Publication BMPMSC-02-03. LaGrande, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Wallowa-Whitman NF, Blue Mtns Pest Mgmt Serv Center 38 p. CID: 261
- Schmitt, C.L.; Powell, David C. 2005. Rating forest stands for insect and disease susceptibility: a simplified approach Version 2.0. Publication BMPMSC-05-01. LaGrande, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Wallowa-Whitman NF, Blue Mtns Pest Mgmt Serv. Center 20 p. CID: 557
- USDA Forest Service 2006. National Forest Insect and Disease Risk Map (2006): West Coast Workbook. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team. CID: 557
- USDA Forest Service 2006. National Forest Insect and Disease Risk Map. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team. CID: 460

**Report Query Summary** Below is a listing of what query filters (if any) were used to generate this report. Note: Citation Reports are not filterable by Host or Location

Years: Year is greater than or equal to 2000  
Agents: Agents include only: (DOUGLAS-FIR BEETLE);  
Agent ALL AGENT GROUPS: (No filtering by Agent Group)  
Authors: ALL AUTHORS (No filtering by Author)

## Links to electronic copies of documents can be included in a brief citation report

“Local” PDFs are publicly distributable documents provided with the database

Citations for Agent: Category:  
**Douglas-fir tussock moth** Defoliator <http://www.forestsheets.org/subject.html?SUB=198>  
*Orgyia pseudotsugata (McDunnough)*

Kegley, Sandra; Pederson, Lee; Beckman, David; Wulff, Doug 2005. 2004 North Idaho Douglas-fir tussock moth early warning system trapping report. Report 05-05. Missoula, MT: U.S. Department of Agriculture, Forest Service, Northern Region. 9 p. CID: 521

On the web--> <http://www.fs.fed.us/t1/r4/spf/tp/publicationsbystate/R1Pub05-05%20.pdf>  
Local PDF--> [521\\_Kegley\\_Pederson\\_05.pdf](#)

Notes: The Early Warning System is a series of permanent traps used to identify DFTM population trends; this is a periodical report.

Krist, Frank K. Jr.; Sapió, Frank J.; Tkacz, Borys M. 2007. Mapping risk from forest insects and diseases. 2006. FHTET 2007-06. Fort Collins, CO: United States Department of Agriculture, Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. CID: 551

On the web--> [http://www.fs.fed.us/foresthealthtechnology/pdfs/FHTET2007-06\\_RiskMap.pdf](http://www.fs.fed.us/foresthealthtechnology/pdfs/FHTET2007-06_RiskMap.pdf)  
Local PDF-->  
Notes:

Schmitt, C.L.; Powell, David C. 2002. Risk rating forest stands for insect and disease impacts: a simplified approach using aerial photography data. Publication EMPMSC-02-03. LaGrande, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Wallowa-Whitman NF, Blue Mtns Pest Mgmt Serv Center 36 p. CID: 261

On the web--> <http://www.fs.fed.us/t1/r4/pubsweb/r5apd.pdf>  
Local PDF--> [261\\_Schmitt\\_Powell\\_02.pdf](#)  
Notes: Cited in R6 Risk Map. "risk" (as LHM) is defined as "relative probability of agent causing damage."

Schmitt, C.L.; Powell, David C. 2005. Rating forest stands for insect and disease susceptibility: a simplified approach Version 2.0. Publication EMPMSC-US-01. LaGrande, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Wallowa-Whitman NF, Blue Mtns Pest Mgmt Serv. Center 20 p. CID:

On the web--> <http://www.fs.fed.us/t6/ma/publications/SusceptibilityRatingV2.pdf>  
Local PDF--> [260\\_Schmitt\\_Powell\\_05.pdf](#)  
Notes: Cited in R6 Risk Map. Most if not all are susceptibility scores, though they distinguish "risk" from "susceptibility", though the definitions are difficult to differentiate. Some systems modified from earlier version (CID 261)

USDA Forest Service 2006. National Forest Insect and Disease Risk Map. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team. CID: 460

On the web--> <http://www.fs.fed.us/foresthealthtechnology/ridm.shtml>  
Local PDF-->  
Notes:

**Report Query Summary:** Below is a listing of what query filters (if any) were used to generate this report. Note: Citation Reports are not filterable by Host or Location

**Years:** Year is greater than or equal to 2000  
**Agents:** Agents include only: (DOUGLAS-FIR TUSSOCK MOTH);  
**Agent:** ALL AGENT GROUPS: (No filtering by Agent Group)  
**Authors:** ALL AUTHORS (No filtering by Author.)

## Detailed citation reports also include:

**Listing of related models**

**Listing of related citations**

| Citations for Agent:  
**Mountain pine beetle**  
*Dendroctonus ponderosae* Hopkins category  
**Bark beetle** <http://www.barkbeetles.org/browse/subject.cfm?SUB=27>

**Chojnacky, David C.; Bentz, Barbara J.; Logan, Jesse A.** 2000. Citation ID: 360

Chojnacky, David C.; Bentz, Barbara J.; Logan, Jesse A. 2000. Mountain pine beetle attack in ponderosa pine: Comparing methods for rating susceptibility. Res. Pap. RMRS-RP-26. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 10p.

On the web--> <http://www.treesearch.fs.fed.us/pubs/4621>

Local PDF--> [360\\_Chojnacky\\_Bentz\\_00.pdf](#)

Notes comparative study of Munson and Anhold (unpub, hence this is seminal citn for MID89), and Stevens et al 1980 CID2 (MID2)

### Models for which this Citation is Seminal:

<u>Rating System Name:</u>	<u>MID:</u>
MPB-ChojnackyBentzLogan	278
MPB-Munson&Anhold	89

### Other Related Models:

<u>Rating System Name:</u>	<u>MID:</u>
MPB-Erikson	983
MPB-Stevens	2
NIDRM_IW_MPB_PP_FrntRng	686
NIDRM_IW_MPB_PP1	684
NIDRM_IW_MPB_PP2	685

### Related Citations:

Stevens, R.E.; McCambridge, W.F.; Edminster, C.B. 1980. Risk rating guide for mountain pine beetle in Black Hills ponderosa pine. Res. Note RM-385. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 2 p. CID: 2

CID: 2

USDA Forest Service 2006. National Forest Insect and Disease Risk Map. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team. CID: 460

CID: 460

Erickson, Bruce; Burwasser, Jim; Gibson, Ken 2006. Reducing mountain pine beetle-caused mortality in ponderosa pine plantations: A risk-rating system for western Montana. Report 06-10. Missoula, MT: U.S. Department of Agriculture, Forest Service, Northern Region. 9 p. CID: 520

CID: 520

### Report Query

Below is a listing of what query filters (if any) were used to generate this report. Note: Citation Reports are not filterable by Host or Location

**Years:** ALL YEARS. (No filtering by year)

**Agents:** ALL AGENTS (No filtering by agent)

**Agent** Agent Groups include only: (BARK BEETLE);

**Authors:** Authors include only: (Chojnacky, David C.);

## **Brief model reports** **contain only** **summary** **information about** **models**

### **Models for Agent: Mountain pine beetle**

### **Category Bark beetle**

---

Model ID: **278** Model name: **MPB-ChojnackyBentzLogan** Author(s); year **Seminal Citation ID: (CID)**  
*Chojnacky, David C., Bentz, Barbara J., et al., 2000* 360

Agent: **Mountain pine beetle** Hosts: **ponderosa pine**  
Geography: **Colorado Plateau** Scope: **Stand/tree** Output: **probability of beetle attack**  
Model Factors: **BAH, DBH, QMD, SDI, SDI**

---

Model ID: **89** Model name: **MPB-Munson&Anhold** Author(s); year **Seminal Citation ID: (CID)**  
*Chojnacky, David C., Bentz, Barbara J., et al., 2000* 360

Agent: **Mountain pine beetle** Hosts: **ponderosa pine**  
Geography: **Colorado Plateau** Scope: **Stand** Output: **stand susceptibility rating**  
Model Factors: **Basal area, DBH-H, Density, Percent host**

---

**Report Query Summary** Below is a listing of what query filters (if any) were used to generate this report.

**Years:** ALL YEARS. (No filtering by year.) **NIDRM\*** NIDRM Models are included

**Agents:** ALL AGENTS (No filtering by agent)

**Agent Group** ALL AGENT GROUPS: (No filtering by Agent Group)

**Authors:** Authors include only: (Chojnacky, David C.);

**Host species and groups** ALL HOSTS. (No filtering by host tree species)

**Locations (States and Provinces)** ALL STATES AND PROVINCES. (No filtering by location)

**Regions:** ALL REGIONS (No filtering by Region)

\* NIDRM: National Insect and Disease Risk Map.

**Related citations  
can be included  
with *brief* model  
reports**

<u>Models for Agent:</u>	<u>Category:</u>	<u>Author(s), year</u>	<u>Seminal Citation ID: (CID)</u>
<b>Mountain pine beetle</b>	<a href="http://www.barkbeetles.org/browse/subject.cfm?SUB=27#">http://www.barkbeetles.org/browse/subject.cfm?SUB=27#</a>		
Model ID 278 Model name <u>MPB-ChojnackyBentzLogan</u>	Agent: <b>Mountain pine beetle</b>	<u>Chojnacky, David C., Bentz, Barbara J., et al.</u> , 2000	360
	Geography: <b>Colorado Plateau</b>		
	Model Factors: <b>BAH, DBH, QMD, SDI, SDI</b>	Hosts: <b>ponderosa pine</b>	
		Scope: Stand/tree Output: <b>probability of beetle attack</b>	
	Related Citations:		
	Citation ID 360 (Seminal Citation)		
	<b>Chojnacky, David C.; Bentz, Barbara J.; Logan, Jesse A. 2000. Mountain pine beetle attack in ponderosa pine: Comparing methods for rating susceptibility. Res. Pap. RMRS-RP-26. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 10p.</b>		
	<a href="http://www.beesearch.fs.fed.us/pubs/4621">http://www.beesearch.fs.fed.us/pubs/4621</a>	Local PDF: <a href="#">360 Chojnacky Bentz 00.pdf</a>	
	Citation ID 478		
	<b>Munson, A. S.; Anhold, J.A. 1995. Site risk rating for mountain pine beetle in ponderosa pine. Unpublished paper on file at: U.S. Department of Agriculture, Forest Service, Intermountain Region, State and Private Forestry, Forest Health Protection, Ogden, UT. 1 p.</b>		
	<a href="#">not avail.</a>	PDF n/a	
	Citation ID 2		
	<b>Stevens, R.E.; McCambridge, W.F.; Edminster, C.B. 1980. Risk rating guide for mountain pine beetle in Black Hills ponderosa pine. Res. Note RM-385. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 2 p.</b>		
	<a href="#">not avail.</a>	PDF n/a	

## Detailed model reports include:

Summary Info

Details regarding driving variables

Model notes

Related citations

Model ID:	89 Model	<u>MPB-Munson&amp;Anhold</u>	Author(s)/Year	seminal Citation ID: (CID)
			Chejnacky, David C., Bentz, Barbara J., et al.	360
			et al., 2000	
Agent:	Mountain pine beetle	Hosts:	ponderosa pine	
Forest Description:	N/A	Forest Type:	N/A	
Geography:	Colorado Plateau	Model Scope:	Stand	
Model Category:	Susceptibility	Model Type:	point	
Output Category:	Categorical	Output:	stand susceptibility rating	
Model Factors:	Basal area, DBH-H, Density, Percent host			
<u>Model Factor Details:</u>				
Factor	Qualifiers:	Units:	Scope:	Notes:
Basal area	# of trees > 5" dbh		stand	
DBH-H	# of host trees > 5" dbh		stand	actions explicitly state "average DBH" for this system, while discussing "QMD" in unrelated areas of paper, implying that it's average DBH is total QMD. Though this is not definite.
Density	# of stems of trees > 5" dbh		stand	
Percent host	% of canopy of host trees > 5" dbh		stand	
<u>Notes:</u>				
CID 360 is a comparative study of Munson and Anhold (cid 478, unpub; hence CID360 is seminal for this system), MPB-Stevens (CID2; MID2). Four factors, each scored 1,2,or 3; summed. Scores 1-12 grouped into LMH.				
<u>Related Citations:</u>				
Citation 360 (Seminal Citation)				
Chejnacky, David C.; Bentz, Barbara J.; Logan, Kevin A. 2000. Mountain pine beetle attack in ponderosa pine: Comparing methods for rating susceptibility. Res. Pap. RMRS-RP-14. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 10 p.				
<a href="http://www.fs.fed.us/w/pubs/4421">http://www.fs.fed.us/w/pubs/4421</a>				
Local PDF: <a href="#">360_Chejnacky_Bentz_00.pdf</a>				
Citation 478				
Munson, A. S.; Anhold, J.A. 1995. Site risk rating for mountain pine beetle in ponderosa pine. Unpublished paper on file at U.S. Department of Agriculture, Forest Service, Intermountain Region, State and Private Forestry, Pest Health Protection, Ogden, UT. 1 p.				
<a href="#">unpubl</a>				
PDF:n/a				

Report Query Summary Below is a listing of what query filters (if any) were used to generate this report.

Years: ALL YEARS. (No filtering by year.) NIDRM\*: NIDRM Models are included

Agents: ALL AGENTS (No filtering by agent)

Agent: ALL AGENT GROUPS: (No filtering by Agent Group)

Authors: Authors include only: (Chejnacky, David C.)

Host species and: ALL HOSTS. (No filtering by host tree species)

Locations (States and Provinces): ALL STATES AND PROVINCES. (No filtering by location.)

Regions: ALL REGIONS (No filtering by Region.)

\* NIDRM: National Insect and Disease Risk Map.

# Using the database to investigate pest hazard models

1. Cursory review: Generate crosstab tables:
  - Investigate model **factors** and model **range-of-applicability**
2. Review model details: Browse models
  - Filter by agent, scrutinize model details
3. Generate reports for model(s) of interest.
4. Review original **documentation** for models of interest

# Using the database to investigate pest hazard models

1. Cursory review: Generate crosstab tables:

- Investigate model **factors** and model **range-of-applicability**

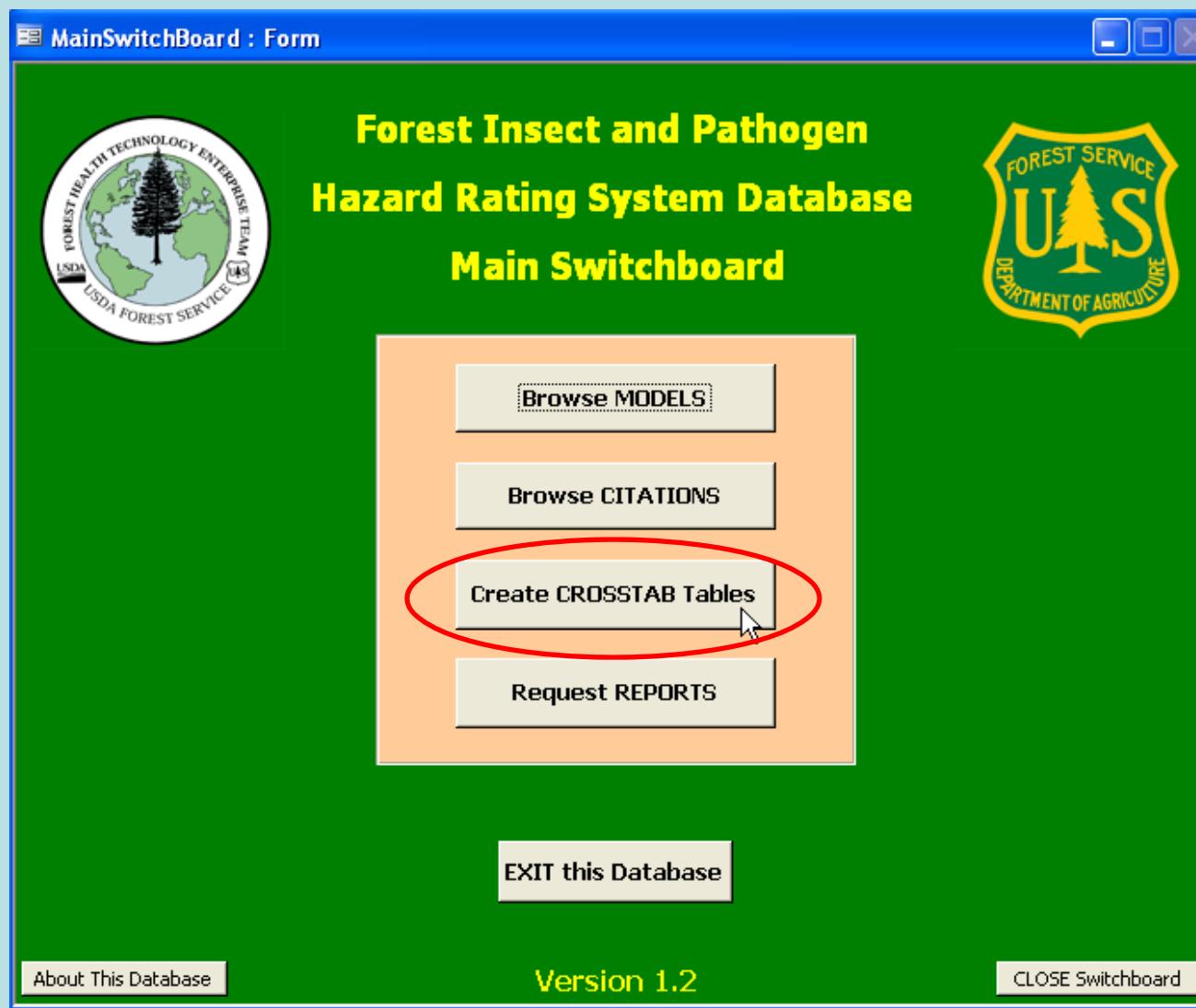
2. Review model details: Browse models

- Filter by agent, scrutinize model details

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# Create Cross-tab Tables





**Generate Cross-Tab Tables**

Select a CrossTab Table

Models x Factors  
 Models x States/Provinces

Select an Agent

Annosus root disease

Generate Table

What is a CrossTab Table?

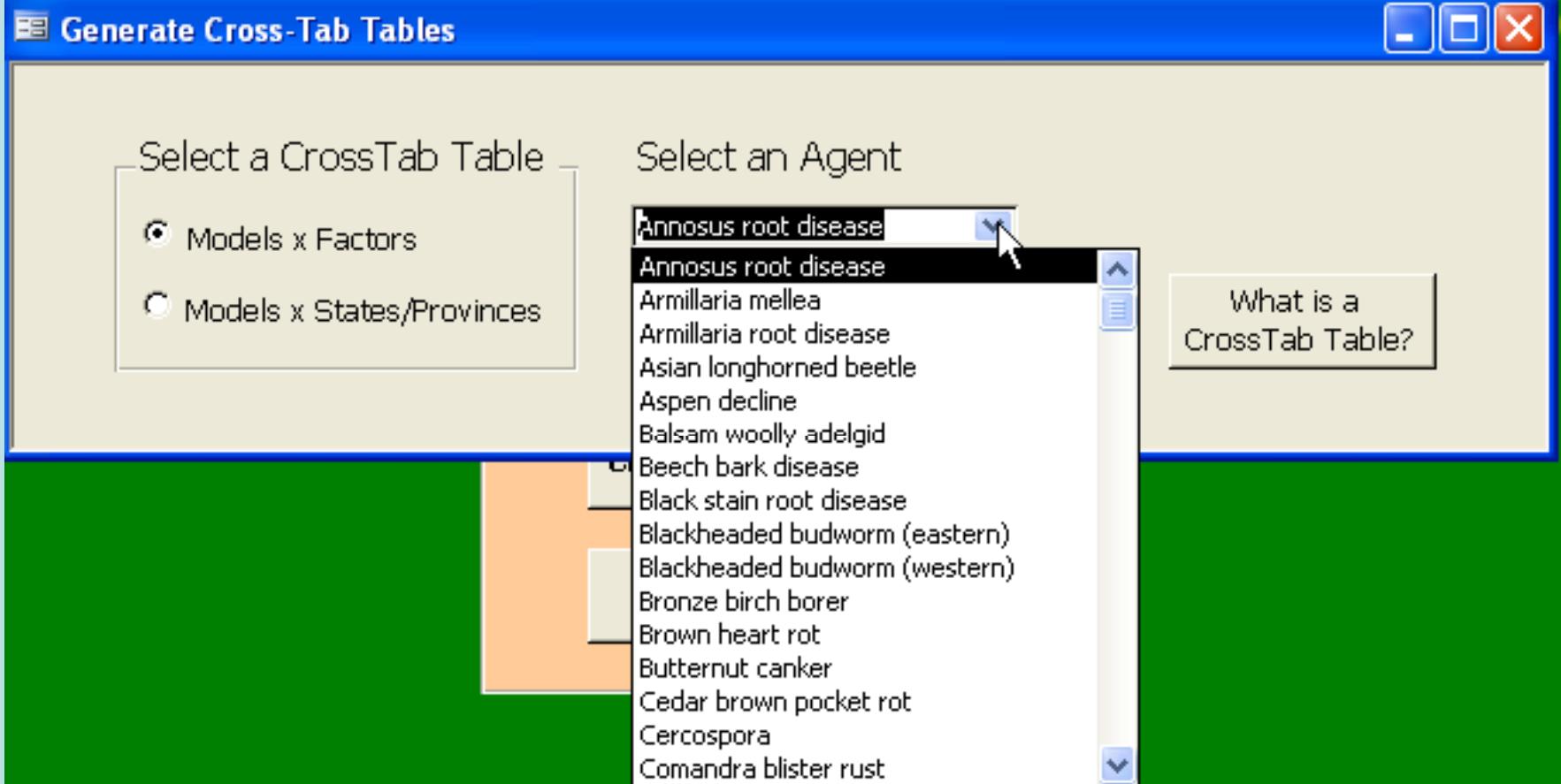
Request REPORTS

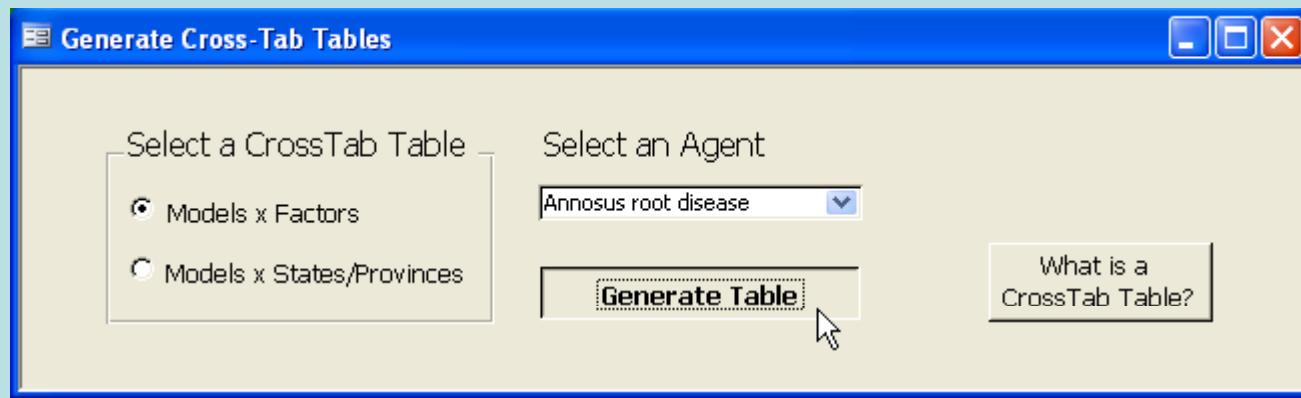
EXIT this Database

About This Database

Version 1.2

CLOSE Switchboard





# Model x FACTORS Cross-tab table for annosus

Model  
factors

Annosus models




factor	Annosus-Baker	Annosus-Froelich	Annosus-FVS	Annosus-Morris	AnnosusP-Hess	Annosus-Preisler	AnnosusS-Hess	Annosus-Steele	NIDRM06_CA_a	NIDRM06_CA_a
# dead trees	Annosus-Baker			# dead trees						
# infested trees				# infested trees						
%BAH									%BAH	%BAH
Age					Age		Age	Age		
Annosus presence										Annosus preser
Cover %					Cover %		Cover %			
DBH			DBH			DBH				
Disturbance regime		Disturbance reg								
Habitat type					Habitat type		Habitat type			
Height			Height							
Infection rate			Infection rate							
Innoculum potential									Innoculum poten	
Insect population density			Insect populatio							
Location		Location								
Logging			Logging		Logging		Logging			
Percent host									Percent host	
Proximity			Proximity		Proximity	Proximity	Proximity	Proximity		
Slope position		Slope position								
Soil depth				Soil depth						
Soil drainage			Soil drainage							
Soil pH	Soil pH									
Soil texture	Soil texture	Soil texture		Soil texture						
Soil type			Soil type							
Species			Species			Species				
Species composition									Species compo	
Storiedness					Storiedness		Storiedness			
Time						Time				
Windthrow density			Windthrow dens							

MainSwitchBoard : Form

# Forest Insect and Pathogen Hazard Rating System Database



Generate Cross-Tab Tables

Select a CrossTab Table

Models x Factors

Models x States/Provinces

Select an Agent

Annosus root disease

Generate Table

What is a CrossTab Table?

EXIT this Database

About This Database

Version 1.2

CLOSE Switchboard

# Model x geography Cross-tab table for annosus

# Model geography (states)

# Annosus models

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	state	states	Anomos-Baker	Anomos-Froelich	Anomos-FVS	Anomos-Morris	Anomos-P-Hessburg	Anomos-Priester	Anomos-S-Hessburg	Anomos-Steele	NIDRM06_CA_Anomos_Coultr_P	NIDRM06_CA_Anomos_JP	NIDRM06_CA_Anomos_PP	NIDRM06_CA_Anomos_RF	NIDRM06_CA_Anomos_WF1	NIDRM06_CA_Anomos_WF2	NIDRM06_SA_Anomos_eYelp
2	AL	ALABAMA	AL														AL
3	AR	ARKANSAS	AR														
4	AZ	ARIZONA		AZ													
5	CA	CALIFORNIA		CA		CA											
6	CO	COLORADO		CO													
7	FL	FLORIDA	FL														FL
8	GA	GEORGIA	GA	GA													GA
9	ID	IDAHO		ID		ID		ID	ID								
10	KY	KENTUCKY	KY														
11	LA	LOUISIANA	LA														LA
12	MS	MISSISSIPPI	MS														MS
13	MT	MONTANA		MT		MT		MT									
14	NC	NORTH CAROLINA	NC	NC													NC
15	NM	NEW MEXICO			NM												
16	NV	NEVADA			NV												
17	OK	OKLAHOMA	OK														
18	OR	OREGON															
19	SC	SOUTH CAROLINA															
20	SD	SOUTH DAKOTA															
21	TN	TENNESSEE															
22	TX	TEXAS															
23	UT	UTAH		UT													
24	VA	VIRGINIA	VA	VA		VA											VA
25	WA	WASHINGTON		WA		WA		WA									
26	WY	WYOMING		WY													
27																	
28		FACTORS															
29		# dead trees		# dead trees													
30		# infested trees		# infested trees													
31		%BAH									%BAH	%BAH					%BAH
32		Age			Age			Age		Age							
33		Anomos presence									Anomos	Anomos	Anomos	Anomos	Anomos	Anomos presence	
34		Cover %			Cover %			Cover %		Cover %							
35		DBH		DBH			DBH										
36		Disturbance regime		Disturbance regime													
37		Habitat type				Habitat type		Habitat type									
38		Height		Height													
39		Infection rate		Infection rate													
40		Innoculum potential									Innoculum potential						
41		Insect population density			Insect population density												
42		Location		Location													
43		Logging		Logging		Logging		Logging									
44		Percent host									Percent host						
45		Proximity		Proximity			Proximity	Proximity	Proximity								
46		Slope position		Slope position													
47		Soil depth				Soil depth											
48		Soil drainage		Soil drainage													
49		Soil pH	Soil pH														
50		Soil texture	Soil texture		Soil texture		Soil texture										
51		Soil type	Soil type														
52		Species		Species		Species		Species									
53		Species composition									Species composition						
54		Storiedness				Storiedness		Storiedness		Storiedness							
55		Time						Time									
56		Windthrow density		Windthrow density													
57																	

**Results exported to excel spreadsheet**

# Using the database to investigate pest models

## 1. Cursory review: Generate crosstab tables:

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## 3. Generate reports for model(s) of interest.

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MainSwitchBoard : Form



# Forest Insect and Pathogen Hazard Rating System Database Main Switchboard



[Browse MODELS](#)

[Browse CITATIONS](#)

[Create CROSSTAB Tables](#)

[Request REPORTS](#)

[EXIT this Database](#)

[About This Database](#)

Version 1.2b

[CLOSE Switchboard](#)

# Form Displaying One Model Record

Model Information		Related Citations			
		MID: 911	RATING SYSTEM NAME	Agent: Annosus	<input type="button" value="FilterBySelection"/> <input type="button" value="UnFilter"/> <input style="border: 1px solid orange; padding: 2px 5px;" type="button" value="?"/>
Seminal Citation:		Citation ID (CID): 322 <b>Baker, F.A.; Verbyla, D.L.; Hodges, C.S., Jr.; Ross, E.W. 1993. Classification and regression tree analysis for assessing hazard of pine mortality caused by <i>Heterobasidion annosum</i>. Plant Disease. 77(2): 136-139.</b>			
Model Factors:		<input type="button" value="Previous Record"/> <input type="button" value="Next Record"/> <input type="button" value="GO TO MODEL ..."/> <input by"="" goto"="" list="" type="button" value="Sort "/> <input checked="" type="radio"/> Name <input type="radio"/> MID <input type="button" value="Go Back"/>			
<input checked="" type="checkbox"/> Factors (Simple) <input type="checkbox"/> Factors (Detailed) <input type="checkbox"/> Risk Map Use <input type="checkbox"/> Notes Factor: Soil texture Units: Class Factor scope: Qualifiers: Soil texture <input type="button" value="▼"/> <input type="checkbox"/> plantations <input type="button" value="▼"/> of A horizon		Forest Description: Forest Type:  <b>Model Geography:</b> southeast coastal plain and piedmont <input type="checkbox"/> STATE <input type="checkbox"/> FOREST <input type="checkbox"/> DISTRICT <input type="checkbox"/> ECOREGION <input type="checkbox"/> OTHER NC <input type="button" value="▼"/> Record: <input type="button" value="◀"/> <input type="button" value="◀"/> 1 <input type="button" value="▶"/> <input type="button" value="▶"/> * of 4			
<input type="checkbox"/> Factors (Simple) <input checked="" type="checkbox"/> Factors (Detailed) <input type="checkbox"/> Risk Map Use <input type="checkbox"/> Notes Factor: Soil pH Units: Class Factor scope: Qualifiers: Soil pH <input type="button" value="▼"/> <input type="checkbox"/> plantations <input type="button" value="▼"/> of A horizon		Model Type: CART Model Category: Susceptibility Scope: Plantation Output Category: CART Class # Classes: 3 Output Produced: 1 low and 2 high classes			
		Print Detailed Model Report <input type="button" value="Set Report Options"/> <input style="border: 2px solid red; padding: 2px 10px;" type="button" value="CLOSE FORM"/>			
		Sort Records By Name <--> MID Model Hosts: CommonName TID: loblolly pine 9 slash pine 22 >SOUTHERN PINES 23			
		Notes: Simple 2-node CART tree using soil information. Data from 16 sites mostly loblolly or slash pine plantations on SE Coastal Plain and Piedmont			

# Navigate to model of interest

**Model Information**

**Related Citations**

Seimnal Citation: Citation ID (CID): 322

Baker, F.A.; Verbyla, D.L.; Hedges, C.S., Jr.; Ross, E.W. 1993. Classification and regression tree analysis for assessing hazard of pine mortality caused by *Heterobasidion annosum*. Plant Disease. 77(2): 136-139.

MID: 911 RATING SYSTEM NAME: Annosus Agent: Annosus

**Annosus-Baker**

Agent Common Name: Annosus root disease Category: Root disease

*Heterobasidion annosum (Fr) Bref.*

<http://www.forestpests.org/subject.html?SUB=519>

**Print Detailed Model Report** **Sort Records By Name <--> MID**

**Set Report Options** **CLOSE FORM**

**Model Factors:**

- Factors (Simple) Factors (Detailed) Risk Map Use Notes
- Factor: Soil texture Units: Class Factor scope: Qualifiers: plantations of A horizon
- Factors (Simple) Factors (Detailed) Risk Map Use Notes
- Factor: Soil pH Units: Class Factor scope: Qualifiers: plantations of A horizon

**GO TO MODEL ...** Sort "GoTo" List By:  Name  MID Go Back

MID	Rating System Name	CID
911	Annosus-Baker	322
59	Annosus-Froelich	57
97	Annosus-FVS	435
118	Annosus-Morris	414
972	AnnosusP-Hessburg	327
912	Annosus-Preisler	351
971	AnnosusS-Hessburg	327
957	Annosus-Steele	65
1029	Armillaria-FVS	435
969	Armillaria-Hessburg	327
984	Armillaria-McDonald	525
958	Armillaria-Steele	65
17	BWA-Page	106
14	CA Pine (Salman&Bongberg)	14

**Model Hosts:**

CommonName	TID
loblolly pine	9
slash pine	22
>SOUTHERN PINES	23

node CART tree using soil  
n. Data from 16 sites mostly loblolly  
pine plantations on SE Coastal Plain  
front

GO TO MODEL ... Sort "GoTo" List By  Name  MID Go Back slash pine >SOUTHERN

MID	Rating System Name	CID
52	SWPB-Pierce	50
973	Tomentosa-Hessburg	327
918	wBHBW-ForCan	468
88	WHL-Borecky	359
41	WPB(fir)-Ferrell	39
9	WPB-Hall(Smith)	9
961	WPB-Hessburg1	327
962	WPB-Hessburg2	327
8	WPB-Johnson	8
927	WPB-Keen	13
13	WPB-Keen1	13
10	WPB-Keen2	10
1003	WPB-Lehmkuhl1	513
1004	WPB-Lehmkuhl2	513

Detailed Report Sort Records By Name <--> MID

Sort Options CLOSE FORM

Posts:
 

Name	TID:
Site	9
Soil	22
ORN PINES	23

Node CART tree using soil  
 n. Data from 16 sites mostly loblolly  
 pine plantations on SE Coastal Plain  
 forest

# Filter form to contain only records for WPB

**Model Information**

Rating System Name: Agent: WPB

WPB-Hall(Smith)

FilterBySelection

UnFilter ?

Print Detailed Model Report Sort Records By Name <--> MID

Set Report Options CLOSE FORM

**Model Hosts:**

CommonName	TID:
Jeffrey pine	7
ponderosa pine	16

**Model Factors:**

- Factors (Simple) Factors (Detailed) Risk Map Use Notes
- Factor: Needle condition Units: Class Factor scope: Qualifiers: tree
- Factors (Simple) Factors (Detailed) Risk Map Use Notes
- Factor: Crown condition Units: Class Factor scope: Qualifiers: tree twig and branch
- Factors (Simple) Factors (Detailed) Risk Map Use Notes
- Factor: Crown condition Units: Class Factor scope: Qualifiers: tree top
- Factors (Simple) Factors (Detailed) Risk Map Use Notes
- Factor: Lightning Units: Class Factor scope: Qualifiers: tree
- Factors (Simple) Factors (Detailed) Risk Map Use Notes
- Factor: Infection rate Units: Class Factor scope: Qualifiers: D. valens attacks

GO TO MODEL ... Sort "GoTo" List By Name MID Go Back

Forest Description: eastside old growth

Forest Type:

**Model Geography:** northern California

STATE FOREST DISTRICT ECOREGION OTHER CA

Record: 1 of 1

Model Type: penalty-point

Model Category: Susceptibility Scope: Tree

Output Category: Categorical # Classes: 4

Output Produced: individual tree risk rating

Notes:

Some validation included. Discuss Keen, Salman & Bongberg (1942--the Ca Pine risk rating system cid 14) and introduce heretofore unpublished Hall 1951 (CID 15); discuss Miller et al 1941 (unpublished) and Johnson 1949 (MID=8). An excellent overview of most existing systems for WPB in CA pines. Included here for its publication of Hall (heretofore unpublished, 1951).

**Model Information**

**Related Citations**

SEMINAL CITATION: Citation ID (CID): 14  
Salman, K.A.; Bongberg, J.W. 1942. Logging high-risk trees to control insects in the pine stands of northeastern California. Journal of Forestry. 40(7): 533-539.

MID: 14 RATING SYSTEM NAME: Agent: WPB  
CA Pine (Salman&Bongberg)

Agent Common Name: Western pine beetle Category: Bark beetle

FilterBySelection UnFilter ? Print Detailed Model Report Sort Records By Name <--> MID

Set Report Options CLOSE FORM

Previous Record Next Record ! GO TO MODEL ... Sort "GoTo" List By Name MID Go Back

TID: 7 16

**Model Factors:**

Factors (Simple) Factors (Detailed) Risk Map Use Notes

Factor: Units: Class Factor scope: Qualifiers:  
Crown condition tree

Forest Description: eastside old growth  
Forest Type:

**Model Geography:** northeast California

STATE FOREST DISTRICT ECOREGION OTHER  
CA

Record: 1 of 1

Model Type: Qualitative description  
Model Category: Scope: Tree  
Output Category: Categorical # Classes: 4  
Output Produced: individual tree risk-rating

**Notes:**  
Johnson '51 (CID126) applies this system to the Inland Empire. Hall (CID 16) applies this system to southern CA

**Record:** 1 of 23 (Filtered)

Record: 1 of 23 (Filtered) FLTR NUM

Form View

<u><b>Model Information</b></u>		<u><b>Related Citations</b></u>	
<p><b>Seminal Citation:</b> Citation ID (CID): 16</p> <p>Hall, Ralph C.; Pierce, John R. 1965. Sanitation treatment for insect control. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Pacific Southwest Region, Timber Management. 21 p.</p>		<p>MID: 16      RATING SYSTEM NAME: Agent: WPB</p> <p><b>CA Pine-Hall-65</b></p> <p>Agent Common Name: Western pine beetle      Category: Bark beetle</p> <p><i>Dendroctonus brevicomis</i> LeConte</p> <p><a href="http://www.barkbeetles.org/browse/subject.cfm?SUB=23">http://www.barkbeetles.org/browse/subject.cfm?SUB=23</a></p> <p><b>Print Detailed Model Report</b>      <b>Sort Records By Name &lt;--&gt; MID</b></p> <p><b>Set Report Options</b>      <b>CLOSE FORM</b></p>	
<p><b>Model Factors:</b></p> <p>▶ Factors (Simple) Factors (Detailed) Risk Map Use Notes</p> <p>Factor:      Units: Class Factor scope: Qualifiers:</p> <p>Crown condition      tree</p>		<p>Forest Description: recreation areas</p> <p>Forest Type:</p> <p><b>Model Geography:</b> southern California</p> <p>▶ STATE FOREST DISTRICT ECOREGION OTHER</p> <p>CA</p> <p>Record: 1 of 1</p> <p>Model Type:</p> <p>Model Category:      Scope: Tree</p> <p>Output Category: Categorical      # Classes: 4</p> <p>Output Produced: individual tree risk rating</p>	
		<p><b>Notes:</b></p> <p>Extends MID 14 (CID14) to So. CA</p>	

CA Pine (Salman&Bongberg)
CA Pine-Hall-65
MPB/WPB(pp)-Schmitt&Powell1
MPB/WPB(pp)-Schmitt&Powell2
MPB/WPB(pp)-Steele
WPB-Hall(Smith)
WPB-Hessburg1
WPB-Hessburg2
WPB-Johnson
WPB-Keen
WPB-Keen1
WPB-Keen2
WPB-Lehmkuhl1
WPB-Lehmkuhl2
WPB-Liebold

All 23 WPB models  
populating the  
current form

NIDRM06_CA_WPBP_CoultrP
NIDRM06_CA_WPBP_PP1
NIDRM06_CA_WPBP_PP2
NIDRM06_CA_WPBP_PP3
NIDRM06_IW_WPBP_PP1
NIDRM06_IW_WPBP_PP2
NIDRM06_IW_WPBP_PP3
NIDRM06_IW_WPBP_PP4
NIDRM06_IW_WPBP_PP5
NIDRM06_IW_WPBP_PP6
NIDRM06_PNW_WPBP_PP

Model Information		Related Citations	
Seminal USDA F Risk Ma Forest S	<b>Model Factors:</b>		
	<b>Factors (Simple)</b> Factors (Detailed) Risk Map Use Notes		
	Factor:	Units:	Class Factor scope: Qualifiers:
	QMDH	inches	<input type="checkbox"/> 1 km grid
	<b>Factors (Simple)</b> Factors (Detailed) Risk Map Use Notes		
	Factor:	Units:	Class Factor scope: Qualifiers:
	%BAH	%	<input type="checkbox"/> 1 km grid
	<b>Factors (Simple)</b> Factors (Detailed) Risk Map Use Notes		
	Factor:	Units:	Class Factor scope: Qualifiers:
	Basal area	sq ft/ac	<input type="checkbox"/> 1 km grid
	Restricted to the following ecoregion sections: M313B, N315A, N321A, N322B.		
	Weight (Susc vs Vuln) % 100		
	Maximum Mortality % 10		
	Maximum Mortality % 10		

## Related Citations

Model Information      Related Citations

Seminal Citation: Citation ID (CID): 460 MID: 692 RATING SYSTEM NAME Agent: WPB FilterBySelection

USDA Risk M Forest

Model Factors:

	Factors (Simple)	Factors (Detailed)	Risk Map Use	Notes		
Curve:	Weight	Begin:	Peaks:	Declines:	End:	Screen?
Linear	0.333333	6	10	10	10	<input type="checkbox"/>

	Factors (Simple)	Factors (Detailed)	Risk Map Use	Notes		
Curve:	Weight	Begin:	Peaks:	Declines:	End:	Screen?
Linear	0.333333	40	65	65	65	<input type="checkbox"/>

	Factors (Simple)	Factors (Detailed)	Risk Map Use	Notes		
Curve:	Weight	Begin:	Peaks:	Declines:	End:	Screen?
Linear	0.333333	80	120	120	120	<input type="checkbox"/>

Record Print Detailed Model Report Sort Records By Name <--> MID Report Options CLOSE FORM

Model Hosts:

Common Name	TID:
Monrovia pine	16

Model Constraints: NIDRM RISK MAP USAGE NIDRM Region: IW  
Restricted to the following ecoregion sections: M313B, N315A, N321A, N322B.  
Weight (Susceptibility vs Vulnerability) %: 100  
Maximum Mortality %: 10

**Model Information**

**Related Citations**

Seminal Citation: **Citation ID (CID): 460**  
USDA Forest Service 2006. National Forest Insect and Disease Risk Map. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team.

MID: 692 RATING SYSTEM NAME Agent: WPB  
**NIDRM06\_IW\_WPBP2**

Agent Common Name: **Western pine beetle** Category: Bark beetle

*Dendroctonus brevicomis* LeConte  
<http://www.barkbeetles.org/browse/subject.cfm?SUB=23>

Print Detailed Model Report | Sort Records By Name <--> MID  
Set Report Options | **CLOSE FORM**

Agents associated w/ seminal citation: 460

Asian longhorned beetle  
Annosus root disease  
Aspen decline  
Bronze birch borer  
Beech bark disease

**Related citations:**

Related citation	Citn ID:	DeMars, C.J.; Roettgering, B.H. 1982. Western Agriculture, Forest Service. 8 p.	View Details
Related citation	294	Citn ID: Krist, Frank K. Jr.; Sapió, Frank J.; Tkacz, Borys M. 2007. Mapping risk from forest insects and diseases. 2006. FHTET 2007-06. Fort Collins, CO: United States Department of Agriculture, Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team.	View Details
	294	PDF: <a href="docs\294_DeMars_Roettgering_82.pdf">docs\294_DeMars_Roettgering_82.pdf</a>	View Details
	551	PDF: <a href="docs\551_Krist_Sapió_07.pdf">docs\551_Krist_Sapió_07.pdf</a>	View Details
	65	Online: <a href="http://www.fs.fed.us/foresthealth/technology/pdfs/FHTET2007-06_R">http://www.fs.fed.us/foresthealth/technology/pdfs/FHTET2007-06_R</a>	View Details
	65	PDF: <a href="docs\065_Steele_Williams_96.pdf">docs\065_Steele_Williams_96.pdf</a>	View Details
		Online: <a href="http://www.treesearch.fs.fed.us/pubs/23915">http://www.treesearch.fs.fed.us/pubs/23915</a>	



Forest Insect  
& Disease  
Leaflet 1

U.S. Department  
of Agriculture  
Forest Service

### *Western Pine Beetle*

Clarence J. DeMars, Jr.,<sup>1</sup> and Bruce H. Roettgering<sup>2</sup>



The western pine beetle,  
*Dendroctonus brevicomis* LeConte,  
can aggressively attack and kill ponderosa and Coulter pine trees of all ages  
and vigor classes that are 6 inches (15

of trees is common in dense, overstocked stands of pure, even-aged, young sawtimber (fig. 1), but also occurs among dense clumps of pine in stagnating mixed-conifer stands. One million or more trees containing more than 1 billion board feet of timber may be killed each year during an outbreak. Such extensive tree killing may deplete timber supplies, adversely affect levels and distributions of stocking, disrupt management planning and operations, and increase forest fire danger by adding to available fuels.



<u>Model Information</u>		<u>Related Citations</u>																											
<b>Seminal Citation:</b> USDA Forest Service 2006. National Forest Insect and Disease Risk Map. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team.	<b>Citation ID (CID):</b> 460	MID: 692	RATING SYSTEM NAME: NIDRM06_IW_WPB_PP2	Agent: WPB	<input type="button" value="FilterBySelection"/> <input type="button" value="UnFilter"/> <input style="border: 2px solid orange; padding: 2px; margin-left: 10px;" type="button" value="?"/>																								
		Agent Common Name: Western pine beetle		Category: Bark beetle																									
		<i>Dendroctonus brevicomis</i> LeConte																											
		<a href="http://www.barkbeetles.org/browse/subject.cfm?SUB=23">http://www.barkbeetles.org/browse/subject.cfm?SUB=23</a>																											
		<input type="button" value="Previous Record"/>	<input type="button" value="Next Record"/>	<input type="button" value="GO TO MODEL ..."/> <input by"="" goto"="" list="" style="border: 2px solid orange; padding: 2px; margin-left: 10px;" type="button" value="Sort "/> 9 <input type="button" value="View Details"/> <input checked="" type="radio" value="Name"/> Name <input type="radio" value="MID"/> MID <input type="button" value="Go Back"/>																									
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United States Department of Agriculture  
Forest Service



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ENTERPRISE TEAM



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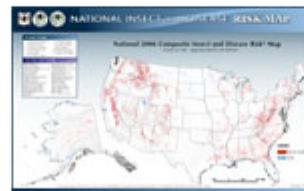
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- [\*Sirex noctilio\*](#)
- [\*Phytophthora alni\* ssp \*alni\*](#)

### MODEL INPUT (Forest Parameter Surfaces)

The National Insect and Disease Risk Map project (NIDRM) was driven by the 188 models which attempt to predict how individual tree species will react to various mortality agents. The models, in turn, are the interactions of predicted agent behavior with known forest parameters (criteria).

### INDIVIDUAL SPECIES SURFACES (zip files):

The most widely used forest parameters for NIDRM were stand basal area (BA), stand density index (SDI), and tree diameter or its surrogate, quadratic mean diameter (QMD). Plot data were interpolated to create uniform 'surfaces' that capture natural variations in forest parameters. The GIS grids

MID:

Friday, February 20, 2009

Detailed Model Report

Page 2 of 2

5 By  
MID

RM

Ager

Wes

Den

Model: NIDRM06 IW WPB PP2 (MID 692)

Source: *USDA Forest Service, 2006 CID: 460*

Hosts: ponderosa pine

Forest Description: N/A

Geography: portions of IW

Model type: 3 - Informed Professional Judgement

Output produced: BA mortality estimate

Agent: Western pine beetle

Scope: 1 km grid

Forest type: N/A

I Model category: Vulnerability

Maximum BA Mortality (%): 10

NIDRM Model Weight (%): 100

Model's independent variables:

Factor (Qualifiers; Units): Scope: NOTES:

NIDRM Curve, range, wt:

%BAH (%) 1 km grid

Linear, 40, 65, 65, 65, 0.333

Basal area (sq ft/acre) 1 km grid

Linear, 80, 120, 120, 120, 0.333

QMDH (inches) 1 km grid

Linear, 6, 10, 10, 10, 0.333

Notes:

Related Citations:

Citation ID: 294

DeMars, C.J.; Roettgering, B.H. 1982. Western pine beetle. Forest Insect & Disease Leaflet 1. [Washington, D.C.] : U.S. Department of Agriculture, Forest Service. 8 p.

<http://www.fs.fed.us/h6/mr/fid/fidl1.pdf>

Local PDF: [294 DeMars Roettgering 82.pdf](#)

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[http://www.fs.fed.us/forestry/technology/pdfs/FHTET2007-06\\_RiskMap.pdf](http://www.fs.fed.us/forestry/technology/pdfs/FHTET2007-06_RiskMap.pdf)

Local PDF: [551 Krist Sapiro 07.pdf](#)

# Using the database to investigate pest hazard models

## 1. Cursory review: Generate crosstab tables:

- Investigate model **factors** and model **range-of-applicability**

## 2. Review model details: Browse models

- Filter by agent, scrutinize model details

## 3. Generate reports for model(s) of interest.

## 4. Review original **documentation** for models of interest

ted Citations

MID: 692

RATING SYSTEM NAME

Agent: WPB

FilterBySelection

Print Detailed

Sort Records By  
MID

FORM

MainSwitchBoard : Form

Agent

West

Deno



# Forest Insect and Pathogen Hazard Rating System Database Main Switchboard



Browse MODELS

Browse CITATIONS

Create CROSSTAB Tables

Request REPORTS

EXIT this Database

About This Database

Version 1.2b

CLOSE Switchboard

## Report Request

**SELECT A REPORT**

**Model Report**  
 Include Related Citations?

**Detailed Model Report**

---

**Citation Report**  
 Include notes and hyperlinks?

**Detailed Citation Report**

Group Citations by Agent?  
 yes     no

**Years to Include:**

All    Year: \_\_\_\_\_  
 After    Year: \_\_\_\_\_  
 Before    Year: \_\_\_\_\_  
 Exactly    \_\_\_\_\_  
 Between    \_\_\_\_\_

Include National Insect and Disease Risk Map Models?  
 No  
 Yes  
 Only

**Help**

Select any combination of YEARS, AGENT, AGENT GROUP, HOSTS, LOCATIONS (US states or Canadian provinces), REGIONS, or AUTHORS to include in your report. Multiple selections within a category may be made via <Ctrl> or <shift> + selection.

**Agent(s):** Clear Selection <All> Annosus root disease, Armillaria root disease, Asian longhorned beetle, Aspen decline, Balsam woolly adelgid, Beech bark disease, Black stain root disease, Blackheaded budworm (eastern), Blackheaded budworm (western), Bronze birch borer, Butternut canker, Comandra blister rust, Defoliators, Douglas-fir beetle, Douglas-fir tussock moth, Dutch elm disease, Dwarf mistletoe, Eastern larch beetle, Emerald ash borer, Fir engraver, Flatheaded wood borer, Forest tent caterpillar, Fusiform rust, Gypsy moth, Heart rot/root rot, Hemlock woolly adelgid, Indian paint fungus, Jack pine budworm, Jeffrey pine beetle

**Agent Group(s):** Clear Selection <All> Bark beetle, Decline, Defoliator, Needle miner, Parasitic plant, Root disease, Sap sucking, Shoot borer, Stem rust, Wood borer, Wood decay / canker

**Host(s):** Host >GROUPS are in ALL CAPS Clear Selection <All> >ASH, >ASPEN, >BASSWOOD, >CAROLINA/EASTERN HEMLOCK, >CONIFERS (all), >CONIFERS (eastern), >CONIFERS (western), >COTTONWOOD, >DOUGLAS-FIR, >ELM, >FIR (all), >FIR (eastern), >FIR (western), >JUNIPER, >OAK, >PAPER/GRAY BIRCH, >PINES (all), >PINES (eastern), >PINES (western), >PINYON PINE, >RED FIR, >RED OAKS, >SOUTHERN PINES, >SOUTHERN YELLOW PINES, >SPRUCE (all), >SPRUCE (eastern), >SPRUCE (western)

**Location(s):** Clear Selection All <All> AL ALABAMA, AK ALASKA, AB Alberta, AZ ARIZONA, AR ARKANSAS, BC British Columbia, CA CALIFORNIA, CO COLORADO, CT CONNECTICUT, DE DELAWARE, FL FLORIDA, GA GEORGIA, ID IDAHO, IL ILLINOIS, IN INDIANA

**Author(s):** Clear Selection <All> Adams, David L., Alexander, Sam A., Allen, Kurt K., Amateis, Ralph L., Amman, Gene D., Ammon, Vernon, Anderson, Robert L., Anhold, John A., Archambault, L., Autry, Gordon L., Baker, Bruce H., Baker, Fred A., Balch, Reginald Ernest, Barbourletos, Tom N., Barclay, Hugh J., Barrett, Hope R.

**Region(s):** Note: Regions overlap 0 <All> 1 Inland Empire (ID / MT / ND) 2 Southern Rockies (CO, KS, NE, SD, WY) 3 Southwest (AZ / NM) 4 Great Basin (ID / NV / UT) 5 California 6 Pacific NW (OR, WA) 7 Lake States (MI, MN, WI)

Host GROUP Membership Info

Region Info    Clear Selection

Note: The set of models (or citations) returned from your report request will meet ALL of the selection criteria ACROSS categories and (at least) ANY ONE of the criteria WITHIN each category. Selecting '<All>' in a category dictates that NO filtering by the category will be performed.

**More Info re: selection sets**

# Request detailed model report for all oak decline models

<input type="checkbox"/> Include Related Citations?	Agent(s):																																			
<input checked="" type="radio"/> Detailed Model Report <input type="radio"/> Citation Report <input type="radio"/> Detailed Citation Report		<p style="text-align: center;">Clear Selection</p> <ul style="list-style-type: none"> <li>Forest tent caterpillar</li> <li>Fusiform rust</li> <li>Gypsy moth</li> <li>Heart rot/root rot</li> <li>Hemlock woolly adelgid</li> <li>Indian paint fungus</li> <li>Jack pine budworm</li> <li>Jeffrey pine beetle</li> <li>Laminated root rot (<i>Phellinus</i>)</li> <li>Little leaf disease</li> <li>Lodgepole pine needle miner</li> <li>Madrone decline</li> <li>Miscellaneous mortality</li> <li>Mountain pine beetle</li> <li>Mountain/western pine beetle (as one)</li> <li>Multiple agents</li> <li>Northern hardwood declines</li> <li>Oak decline</li> <li>Oak wilt disease</li> <li>Pine engraver</li> <li>Pine shoot moth</li> </ul>																																		
<input type="checkbox"/> Group Citations by Agent? <input checked="" type="radio"/> yes <input type="radio"/> no		<p style="text-align: center;">TS, LOCATIONS (US states or Canadian provinces), REGIONS, or category may be made via &lt;Ctrl&gt; or &lt;shift&gt; + selection.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Host &gt;GROUPS are in ALL CAPS</td> <td style="width: 25%;">Location(s):</td> <td style="width: 25%;">Author(s):</td> </tr> <tr> <td style="text-align: center;">Clear Selection</td> <td style="text-align: center;">Clear Selection</td> <td style="text-align: center;">Clear Selection</td> </tr> <tr> <td style="background-color: #f0f0f0;"> <input type="checkbox"/> All    &lt;All&gt;            AL ALABAMA            AK ALASKA            AB Alberta            AZ ARIZONA            AR ARKANSAS            BC British Columbia            CA CALIFORNIA            CO COLORADO            CT CONNECTICUT            DE DELAWARE            FL FLORIDA            GA GEORGIA            ID IDAHO            IL ILLINOIS            IN INDIANA         </td> <td style="background-color: #f0f0f0;"> <input type="checkbox"/> BIRCH            BIRCH         </td> <td style="background-color: #f0f0f0;"> <input type="checkbox"/> &lt;All&gt;            Adams, David L.            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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Region(s):</td> <td style="width: 25%;">Note: Regions overlap</td> <td style="width: 25%;"></td> </tr> <tr> <td style="text-align: center;">0 &lt;All&gt;</td> <td style="text-align: center;">0 &lt;All&gt;</td> <td style="text-align: center;">0 &lt;All&gt;</td> </tr> <tr> <td style="background-color: #f0f0f0;">           1 Inland Empire (ID / MT / ND)            2 Southern Rockies (CO, KS, NE, SD, WY)            3 Southwest (AZ / NM)            4 Great Basin (ID / NV / UT)            5 California            6 Pacific NW (OR, WA)            7 Lake States (MI, MN, WI)         </td> <td style="background-color: #f0f0f0;">           1 Inland Empire (ID / MT / ND)            2 Southern Rockies (CO, KS, NE, SD, WY)            3 Southwest (AZ / NM)            4 Great Basin (ID / NV / UT)            5 California            6 Pacific NW (OR, WA)            7 Lake States (MI, MN, WI)         </td> <td style="background-color: #f0f0f0;">           1 Inland Empire (ID / MT / ND)            2 Southern Rockies (CO, KS, NE, SD, WY)            3 Southwest (AZ / NM)            4 Great Basin (ID / NV / UT)            5 California            6 Pacific NW (OR, WA)            7 Lake States (MI, MN, WI)         </td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td colspan="3" style="text-align: right; padding-right: 10px;">Note: Regions overlap</td> </tr> </table>			Region(s):	Note: Regions overlap		0 <All>	0 <All>	0 <All>	1 Inland Empire (ID / MT / ND) 2 Southern Rockies (CO, KS, NE, SD, WY) 3 Southwest (AZ / NM) 4 Great Basin (ID / NV / UT) 5 California 6 Pacific NW (OR, WA) 7 Lake States (MI, MN, WI)	1 Inland Empire (ID / MT / ND) 2 Southern Rockies (CO, KS, NE, SD, WY) 3 Southwest (AZ / NM) 4 Great Basin (ID / NV / UT) 5 California 6 Pacific NW (OR, WA) 7 Lake States (MI, MN, WI)	1 Inland Empire (ID / MT / ND) 2 Southern Rockies (CO, KS, NE, SD, WY) 3 Southwest (AZ / NM) 4 Great Basin (ID / NV / UT) 5 California 6 Pacific NW (OR, WA) 7 Lake States (MI, MN, WI)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Note: Regions overlap																					
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<p style="margin-top: 10px;">Years to Include:</p> <p><input checked="" type="radio"/> All      Year: <input type="text" value=""/></p> <p><input type="radio"/> After      <input type="button" value="▼"/></p> <p><input type="radio"/> Before      Year: <input type="text" value=""/></p> <p><input type="radio"/> No  <input checked="" type="radio"/> Yes  <input type="radio"/> Only</p> <p>Schweinitzii root and butt disease            Scleroderris disease</p> <p style="text-align: center;">Host GROUP Membership Info</p> <p>Note: The set of models (or citations) returned from your report request will meet ALL of the selection criteria ACROSS categories and (at least) ANY ONE of the criteria WITHIN each category. Selecting '&lt;All&gt;' in a category dictates that NO filtering by the category will be performed.</p> <p style="text-align: right;">More Info re: selection sets</p>																																				

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Models for Agent: Oak decline<http://www.forestpests.org/gfcfacts/hypoxylon.html#>Category Wood decay /

Model: OD-Ammon1 (MID 94)

Agent: Oak decline

Source: Ammon, Vernon, Nebeker, T. Evan, et al., 1992 CID: 371

Scope: Stand

Hosts: OAK

Forest type: N/A

Forest Description: N/A

Geography: Tennessee-Tombigbee R basin

Model category: Vulnerability

Model type: canonical discriminant function

Output produced: classification ("decline" or not)

Model's independent variables:

ERN HEMLOCI

Factor (Qualifiers; Units): Scope: NOTES:

ern)

exp)

X

Crown condition tree 5 classes based on proportion of crown affected: healthy, &lt;1/3, 1/3-2/3, &gt;2/3; dead

Crown position tree dom, co-dom, interm; suppressed

Growth rate (growth increment; N/A) tree

Structural factors (tree form class; N/A) tree (1) straight; (2) some curvature/branching; (3) crooked or hollow

on criteria.

Notes:

Yields a classification as either a "decline" stand or not. Thus this is not a hazard system per se, but could be useful in building one. Two models: one for Tennessee-Tombigbee R basin; another for Mississippi R basin

Related Citations:Citation ID: 371 (Seminal Citation)

Ammon, Vernon; Nebeker, T. Evan; Boyle, Carolyn R.; McCracken, Francis I.; Solomon, James, D. 1992. Development of a hazard rating system for decline in southern bottomland oaks. In: Forest decline concepts. St Paul, MN: APS Press: 168-180.



## The Forest Insect and Pathogen Hazard Rating System Database

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**Please contact us with submissions  
or ideas for improvement**

**Andrew McMahan:** [dmcmahan@fs.fed.us](mailto:dmcmahan@fs.fed.us)

**Eric L Smith:** [elsmith@fs.fed.us](mailto:elsmith@fs.fed.us)

**Forest Health Technology Enterprise Team, Fort Collins, CO**

**<http://www.fs.fed.us/foresthealth/technology/>**



**Misc junk slides follow**

**Models for Agent: Pine engraver****Category Bark beetle**

Model: NIDRM06 CA Ips PynP1 (MID 778)

Agent: Pine engraver

Source: *USDA Forest Service, 2006 CID: 460*

Scope: 1 km grid

Hosts: PINYON PINE

Geography: 341D, E, M261E, F, 342B, 341F

Maximum BA mortality (%): 50

Output BA mortality estimate

Model Factors: Basal area, QMD

Model: NIDRM06 CA Ips PynP2 (MID 779)

Agent: Pine engraver

Source: *USDA Forest Service, 2006 CID: 460*

Scope: 1 km grid

Hosts: PINYON PINE

Geography: M262B

Maximum BA mortality (%): 25

Output BA mortality estimate

Model Factors: Basal area, Black Stain presence, DMR

Model: NIDRM06 IW Ips PynP (MID 678)

Agent: Pine engraver

Source: *USDA Forest Service, 2006 CID: 460*

Scope: 1 km grid

Hosts: PINYON PINE

Geography: IW

Maximum BA mortality (%): 70

Output BA mortality estimate

Model Factors: QMDH, SDI-H

**Report Query Summary** Below is a listing of what query filters (if any) were used to generate this

Years: ALL YEARS. (No filtering by year)

NIDRM\* ONLY NIDRM models are included

Agents: Agents include only: (PINE ENGRAVER);

Agent group: ALL AGENT GROUPS: (No filtering by Agent Group)

Model: NIDRM06 CA Ips PynP2 (MID 779) Agent: Pine engraver  
Source: *USDA Forest Service, 2006 CID: 460* Scope: 1 km grid  
Hosts: PINYON PINE  
Forest Description: N/A Forest type: N/A  
Geography: M262B  
Model type: 3 - Informed Professional Judgement Model category: Vulnerability  
Output produced: BA mortality estimate Maximum BA Mortality (%): 25  
NIDRM Model Weight (%): 100

Model's independent variables:

<u>Factor (Qualifiers; Units):</u>	<u>Scope:</u>	<u>NOTES:</u>	<u>NIDRM Curve, range, wt:</u>
Basal area (sq ft / acre)	1 km grid		Linear, 10, 10, 10, 10, 0.25
Black Stain presence	1 km grid		Linear, present, present, present, present, 0.5
DMR	1 km grid		Linear, 1, 6, 6, 6, 0.25

Notes:Related Citations:

Citation ID: 551

Krist, Frank K. Jr.; Sapió, Frank J.; Tkacz, Borys M. 2007. Mapping risk from forest insects and diseases. 2006. FHTET 2007-06. Fort Collins, CO: United States Department of Agriculture, Forest Service, Forest Health Protection, Forest Health Technology Enterprise

[http://www.fs.fed.us/foresthealth/technology/pdfs/FHTET2007-06\\_RiskMap.pdf](http://www.fs.fed.us/foresthealth/technology/pdfs/FHTET2007-06_RiskMap.pdf)

Local PDF: [551\\_Krist\\_Sapió\\_07.pdf](#)

Citation ID: 424

Negrón, Jose; Wilson, Jill 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.

<http://contentdm.lib.bsu.edu/cgi-bin/docviewer.exe?CISOROOT=NaNaturalist&CISOPTN=4606>

Local PDF: [305\\_424\\_NANaturalist03.pdf](#)

**Models for Agent:** **White pine blister rust****Category** **Stem rust**<http://www.forestpests.org/subject.htm?SUB=722#>Model: NIDRM06\_IW\_WPBR\_LmbrP (MID 675)

Agent: White pine blister rust

Source: *USDA Forest Service, 2006 CID: 460*

Scope: 1 km grid

Hosts: limber pine

Forest type: N/A

Forest Description: N/A

Model category: Susceptibility

Geography: central Rocky Mountains

Maximum BA Mortality (%): 10

Model type: 2 - Literature/Research Based

NIDRM Model Weight (%): 100

Output produced: BA mortality estimate

**Model's independent variables:****Factor (Qualifiers; Units):**    **Scope:**    **NOTES:****NIDRM Curve, range, wt:**

Precipitation (May; mm)    1 km grid

Linear, 45, 45, 45, 87, 0.119

Relative Humidity (May; %)    1 km grid

Linear, 45, 54, 54, 54, 0.597

Temperature (Aug minimum; F)    1 km grid

Linear, 37, 48, 53, 63, 0.085

Temperature (May minimum; F)    1 km grid

Linear, 28, 34, 34, 34, 0.199

**Notes:****Related Citations:**

Citation ID: 300

Keams, H.S.J. 2005. White pine blister rust in the central Rocky Mountains: Modelling current status and potential impacts. Fort Collins, CO: Colorado State University. 243 p. Dissertation.

[Error! Hyperlink reference not valid.](#)

PDF n/a

