Append 18

Other Non-Silvicultural Activities in Late-Successional Habitat

This section discusses categories of actions already determined to be consistent with ACS or neutral or beneficial in effects on LS habitat as included in the Northwest Forest Plan. (see social module)

Genetic Developments and Research: The "Standards and Guidelines for Management of Habitat for Late Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl" (S&G) page C-17 states: Existing developments in Late-Successional Reserves such as campgrounds, recreation residences, ski areas, utility corridors, and electronic sites are considered existing uses with respect to Late-Successional Reserve objectives, and may remain, consistent with other standards and guidelines. Routine maintenance of existing facilities is expected to have less effect on current old-growth conditions that development of new facilities.

Maintenance activities may include felling hazard trees along utility rights-of-way, trails, and other developed areas". On April 17, 1995 Ken Denton, Regional Office Issues Resolution Team, sent out direction which stated: "evaluation plantations are considered existing developments under S&G page C-17, not "Silvicultural" activities, and you should continue to maintain them per budget advice,... continued maintenance of existing evaluation plantations - typically fenced, staked trees, historically maintained to evaluate the performance of different genetic parents, and so forth, should be treated as existing developments.

On Page C-18 and C-19 of S&G, research activities are addressed. It states: "A variety of wildlife and other research activities may be ongoing and proposed in late-successional habitat. These activities must be assessed to determine if they are consistent with Late-Successional Reserve objectives. Some activities (including those within experimental forest) not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of these standards and guidelines, will produce results important for habitat development, or if the activities represent continuation of long-term research.

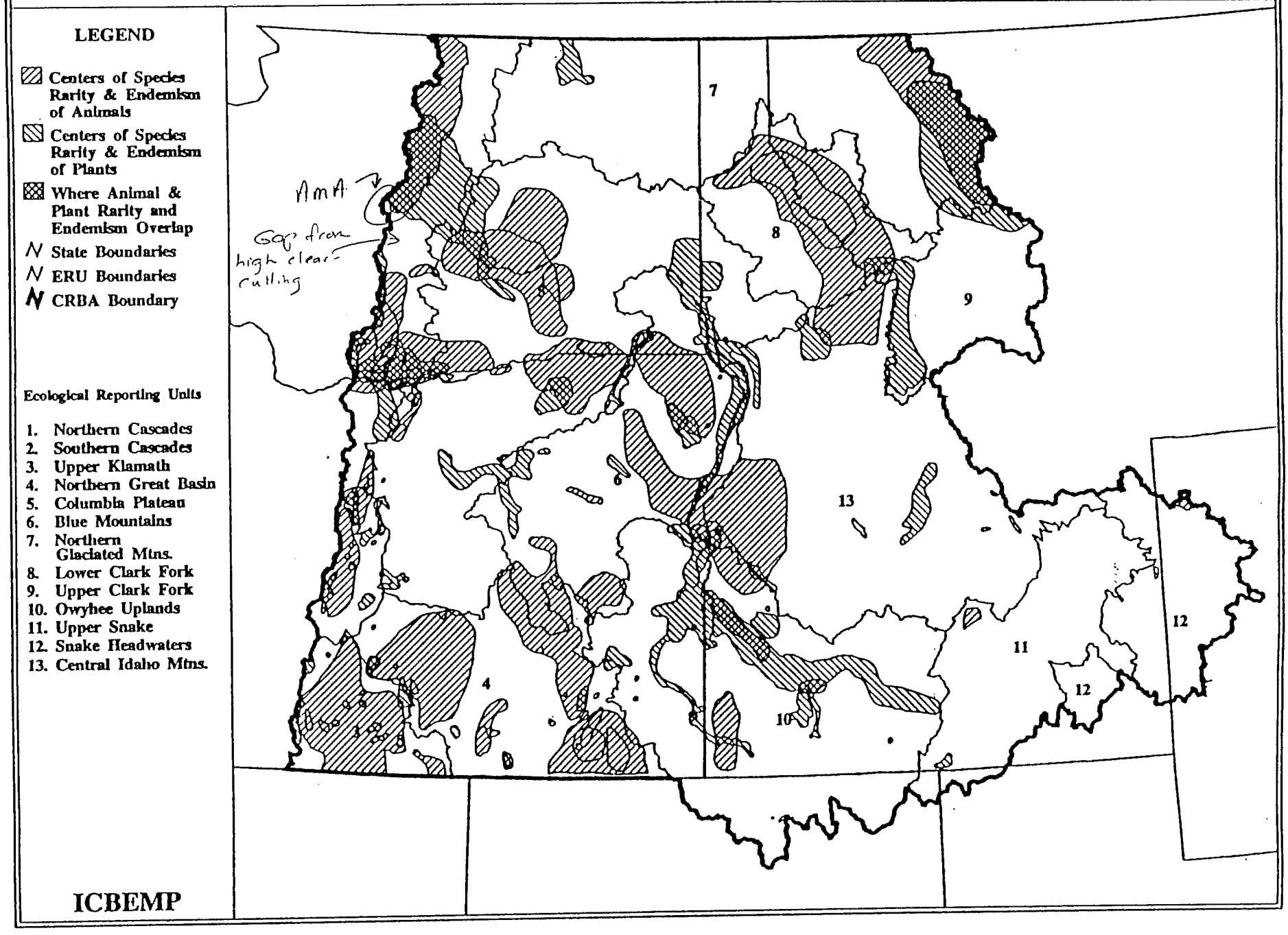
These activities should only be considered if there are no equivalent opportunities outside Late-Successional Reserves." It goes on to say: "Current, funded, agency-approved research that meets the above criteria is assumed to continue if analysis ensures that a significant risk to Aquatic conservation Strategy objectives does not exist."

Maintenance of the evaluation plantations, seed orchards, and genetic test sites will have no effect on current old-growth conditions, and will create no risk to Aquatic Conservation Strategy objectives. Given: 1) the small areas of the evaluation plantations, orchards, and test sites; and 2) that they will not contribute to late-successional characteristics of the LSR's until at least 50 years in the future. These activities will not impair the objectives of the LSR's.

Fig 17 Figure

DISTRIBUTION OF CENTERS OF SPECIES RARITY AND ENDEMISM

PLANTS & ANIMALS



Appendix 19

Acres of Forest Interior in Each Late Successional Reserve

Wenatchee National Forest

Acres of Forest Interior in each Late Successional Reserve

LSR	Acres in LSR		*Patches > 600' and > 26 acres*				*Patches > 1200' and > 104 acres*			
			Dry	*High*	*Moist*	*Total*	*Dry*	*High*	*Moist*	*Total*
RW131 **Boundary Butte**	8,743	Ac. Sm. Patch	87			**87**				
		Ac. Lg. Patch	124			**124**				
		# Patches	2			**2**				
		Acres	211			**211**				
		% of LSR	2%			**2%**				
RW126 **Bumping**	14,989	Ac. Sm. Patch			29	**29**			260	**260**
		Ac. Lg. Patch			837	**837**			260	**260**
		# Patches			16	**16**			1	**1**
		Acres			2,489	**2,489**			260	**260**
		% of LSR			17%	**17%**			2%	**2%**
RW135 **Chiwawa**	107,044	Ac. Sm. Patch	27	27	28	**27**		948	134	**134**
		Ac. Lg. Patch	390	2,311	1,592	**2311**		948	628	**948**
		# Patches	21	21	27	**69**		1	4	**5**
		Acres	2,335	4,121	6,632	**13,088**		948	1,415	**2,362**
		% of LSR	2%	4%	6%	**12%**		1%	1%	**2%**
RW133 **Deadhorse**	18,319	Ac. Sm. Patch	28			**28**				
		Ac. Lg. Patch	112			**112**				
		# Patches	6			**6**				
		Acres	298			**298**				
		% of LSR	2%			**2%**				
RW132 **Icicle**	14,289	Ac. Sm. Patch	26	32	54	**26**			353	**353**
		Ac. Lg. Patch	26	32	724	**724**			353	**353**
		# Patches	1	1	7	**9**			1	**1**
		Acres	26	32	2,144	**2,202**			353	**353**
		% of LSR	0%	0%	15%	**15%**			2%	**2%**
RW134 **Little Wenatchee**	52,524	Ac. Sm. Patch		46	26	**26**			152	**152**
		Ac. Lg. Patch		72	555	**555**			152	**152**
		# Patches		3	30	**33**			1	**1**
		Acres		177	3,558	**3,735**			152	**152**
		% of LSR		0%	7%	**7%**			0%	**0%**
RW138 **Lucerne**	8,693	Ac. Sm. Patch	41			**41**	545			**545**
		Ac. Lg. Patch	1,296			**1296**	545			**545**
		# Patches	3			**3**	1			**1**
		Acres	1,703			**1,703**	545			**545**
		% of LSR	20%			**20%**	6%			**6%**
RW125 **Manastash**	104,661	Ac. Sm. Patch	56	28	26	**26**		137	111	**111**
		Ac. Lg. Patch	56	1,971	4,082	**4082**		1,028	1,882	**1,882**
		# Patches	1	21	46	**68**		3	8	**11**
		Acres	56	6,014	16,040	**22,110**		1,876	3,973	**5,849**
		% of LSR	0%	6%	15%	**21%**		2%	4%	**6%**
RW128 **Rattlesnake**	10,484	Ac. Sm. Patch		26	40	**26**			125	**125**
		Ac. Lg. Patch		78	347	**347**			125	**125**
		# Patches		7	5	**12**			1	**1**
		Acres		269	579	**848**			125	**125**
		% of LSR		3%	6%	**8%**			1%	**1%**

Wenatchee National Forest

Acres of Forest Interior in each Late Successional Reserve

LSR	Acres in LSR		*Patches > 600' and > 26 acres*				*Patches > 1200' and > 104 acres*			
			Dry	*High*	*Moist*	*Total*	*Dry*	*High*	*Moist*	*Total*
RW139 **Sawtooth**	15,246	Ac. Sm. Patch	39	27		**27**		168		**168**
		Ac. Lg. Patch	39	495		**495**		168		**168**
		# Patches	1	6		**7**		1		**1**
		Acres	39	856		**895**		168		**168**
		% of LSR	0%	6%		**6%**		1%		**1%**
RW136 **Shady Pass**	76,502	Ac. Sm. Patch	32	27	29	**27**	179	116	107	**107**
		Ac. Lg. Patch	2,074	5,246	2,359	**5246**	555	1,609	332	**1,609**
		# Patches	13	23	13	**49**	3	10	11	**24**
		Acres	3,722	13,766	5,170	**22,657**	1,281	6,343	1,970	**9,594**
		% of LSR	5%	18%	7%	**30%**	2%	8%	3%	**13%**
RW137 **Slide Peak**	1,658	Ac. Sm. Patch								
		Ac. Lg. Patch								
		# Patches								
		Acres								
		% of LSR								
RW129 **Swauk**	107,962	Ac. Sm. Patch	27	27	26	**26**	111	138		**111**
		Ac. Lg. Patch	515	6,863	78	**6863**	111	1,463		**1,463**
		# Patches	26	13	4	**43**	1	7		**8**
		Acres	2,651	9,855	195	**12,701**	111	3,544		**3,655**
		% of LSR	2%	9%	0%	**12%**	0%	3%		**3%**
RW130 **Teanaway**	34,043	Ac. Sm. Patch	49	29	29	**29**				
		Ac. Lg. Patch	119	455	269	**455**				
		# Patches	4	8	10	**22**				
		Acres	295	1,243	1,216	**2,754**				
		% of LSR	1%	4%	4%	**8%**				
RW153 **Tieton**	39,998	Ac. Sm. Patch	27	48	28	**27**	195		131	**131**
		Ac. Lg. Patch	514	162	1,615	**1615**	195		975	**975**
		# Patches	3	5	24	**32**	1		2	**3**
		Acres	953	398	5,364	**6,715**	195		1,106	**1,301**
		% of LSR	2%	1%	13%	**17%**	0%		3%	**3%**
RW127 **Upper Nile**	9,191	Ac. Sm. Patch		27	26	**26**				
		Ac. Lg. Patch		92	156	**156**				
		# Patches		2	9	**11**				
		Acres		120	768	**888**				
		% of LSR		1%	8%	**10%**				

Wenatchee National Forest

Acres of Forest Interior in each Managed Late Successional Area

MLSA	Acres in MLSA		*Patches > 600' and > 26 acres*				*Patches > 1200' and > 104 acres*			
			Dry	*High*	*Moist*	*Total*	*Dry*	*High*	*Moist*	*Total*
DM-6 Camas	1,545	Ac. Sm. Patch	136			**136**				
		Ac. Lg. Patch	143			**143**				
		# Patches	2			**2**				
		Acres	279			**279**				
		% of LSR	18%			**18%**				
DM-14 Crow	12,479	Ac. Sm. Patch			28	**28**			127	**127**
		Ac. Lg. Patch			1,456	**1456**			197	**197**
		# Patches			10	**10**			3	**3**
		Acres			3,486	**3,486**			488	**488**
		% of LSR			28%	**28%**			4%	**4%**
DM-5 Eagle Creek	5,267	Ac. Sm. Patch	35		54	**35**				
		Ac. Lg. Patch	35		135	**135**				
		# Patches	1		2	**3**				
		Acres	35		189	**224**				
		% of LSR	1%		4%	**4%**				
DM-10 Haystack	24,644	Ac. Sm. Patch	29		26	**26**	130			**130**
		Ac. Lg. Patch	625		192	**625**	186			**186**
		# Patches	11		8	**19**	2			**2**
		Acres	2,146		584	**2,731**	316			**316**
		% of LSR	9%		2%	**11%**	1%			**1%**
DM-12 Lost Lake	6,946	Ac. Sm. Patch	149		28	**28**	336			**336**
		Ac. Lg. Patch	607		28	**607**	336			**336**
		# Patches	2		1	**3**	1			**1**
		Acres	756		28	**784**	336			**336**
		% of LSR	11%		0%	**11%**	5%			**5%**
DM-9 Milk Creek	15,711	Ac. Sm. Patch			28	**28**				
		Ac. Lg. Patch			217	**217**				
		# Patches			13	**13**				
		Acres			1,489	**1,489**				
		% of LSR			9%	**9%**				
DM-2 Natapoc	1,072	Ac. Sm. Patch	73			**73**				
		Ac. Lg. Patch	73			**73**				
		# Patches	1			**1**				
		Acres	73			**73**				
		% of LSR	7%			**7%**				
DM-11 Russell Ridge	12,335	Ac. Sm. Patch	30	36	29	**29**	121			**121**
		Ac. Lg. Patch	369	54	186	**369**	121			**121**
		# Patches	5	3	5	**13**	1			**1**
		Acres	725	137	373	**1,235**	121			**121**
		% of LSR	6%	1%	3%	**10%**	1%			**1%**

Wenatchee National Forest

Acres of Forest Interior in each Managed Late Successional Area

MLSA	Acres in MLSA		*Patches > 600' and > 26 acres*				*Patches > 1200' and > 104 acres*			
			Dry	*High*	*Moist*	*Total*	*Dry*	*High*	*Moist*	*Total*
DM-7 Sand Creek	9,225	Ac. Sm. Patch	27			**27**				
		Ac. Lg. Patch	139			**139**				
		# Patches	10			**10**				
		Acres	630			**630**				
		% of LSR	7%			**7%**				
DM-3 Tumwater	4,079	Ac. Sm. Patch	48			**48**				
		Ac. Lg. Patch	48			**48**				
		# Patches	1			**1**				
		Acres	48			**48**				
		% of LSR	1%			**1%**				
DM-1 Twin Lakes	5,573	Ac. Sm. Patch			31	**31**				
		Ac. Lg. Patch			62	**62**				
		# Patches			2	**2**				
		Acres			93	**93**				
		% of LSR			2%	**2%**				

Appendix 20

Road Miles & Densities in Riparian Reserves in LSR's/MLSA's

Wenatchee National Forest

Road Miles and Densities in Riparian Reserves in each Late Successional Reserve

Late Successional Reserve		Area of LSR		Area of Riparian Reserves[1]			Miles of Road in Riparian Reserves			Road Density in Riparian Reserves (mi/mi^2)		
Num.	Name	Acres	Miles^2	Acres	Miles^2	% of LSR	Open	Closed	Total	Open	Closed	Total
RW131	*Boundary Butte*	8,743	13.7	482	0.8	6%	0.0	0.0	0.0	0.00	0.00	0.00
RW126	*Bumping*	14,989	23.4	3,947	6.2	26%	12.2	3.3	15.5	1.98	0.53	2.51
RW135	*Chiwawa*	107,044	167.3	14,074	22.0	13%	57.2	12.0	69.2	2.60	0.54	3.14
RW133	*Deadhorse*	18,319	28.6	1,684	2.6	9%	9.4	3.9	13.4	3.58	1.49	5.08
RW132	*Icicle*	14,289	22.3	1,820	2.8	13%	10.0	2.1	12.0	3.50	0.73	4.23
RW134	*Little Wenatchee*	52,524	82.1	7,312	11.4	14%	26.4	6.7	33.1	2.31	0.58	2.90
RW138	*Lucerne*	8,693	13.6	1,007	1.6	12%	0.9	0.0	0.9	0.57	0.00	0.57
RW125	*Manastash*	104,661	163.5	14,513	22.7	14%	57.5	10.3	67.8	2.54	0.46	2.99
RW128	*Rattlesnake*	10,484	16.4	1,223	1.9	12%	5.4	0.1	5.5	2.83	0.07	2.90
RW139	*Sawtooth*	15,246	23.8	1,514	2.4	10%	5.5	1.3	6.8	2.33	0.55	2.88
RW136	*Shady Pass*	76,502	119.5	6,832	10.7	9%	12.2	12.2	24.4	1.15	1.14	2.28
RW137	*Slide Peak*	1,658	2.6	75	0.1	5%	0.0	0.0	0.0	0.00	0.00	0.00
RW129	*Swauk*	107,962	168.7	12,678	19.8	12%	94.9	13.9	108.8	4.79	0.70	5.49
RW130	*Teanaway*	34,043	53.2	3,941	6.2	12%	16.0	4.5	20.5	2.59	0.73	3.32
RW153	*Tieton*	39,998	62.5	6,208	9.7	16%	24.5	3.1	27.6	2.52	0.32	2.84
RW127	*Upper Nile*	9,191	14.4	1,108	1.7	12%	3.8	0.0	3.8	2.17	0.02	2.19

[1] These figures do not include the reserves around wetlands less than 1acre in size and small, intermittent streams. For PSQ estimation, riparian reserves were estimated to be 20% of all LSRs and MSLAs.

Wenatchee National Forest

Road Miles and Densities in Riparian Reserves in each Managed Late Successional Area

Managed Late Successional Area		Area of LSR		Area of Riparian Reserves[1]			Miles of Road in Riparian Reserves			Road Density in Riparian Reserves (mi/mi^2)		
Num.	Name	Acres	Miles^2	Acres	Miles^2	% of LSR	Open	Closed	Total	Open	Closed	Total
DM-6	*Camas*	1,545	2.4	162	0.3	11%	1.8	0.0	1.8	7.01	0.00	7.01
DM-14	*Crow*	12,479	19.5	1,326	2.1	11%	4.6	0.4	5.0	2.21	0.20	2.42
DM-5	*Eagle Creek*	5,267	8.2	519	0.8	10%	3.8	1.9	5.7	4.73	2.31	7.04
DM-10	*Haystack*	24,644	38.5	3,138	4.9	13%	24.7	0.6	25.3	5.04	0.12	5.16
DM-12	*Lost Lake*	6,946	10.9	1,075	1.7	15%	4.9	0.7	5.6	2.93	0.39	3.33
DM-9	*Milk Creek*	15,711	24.5	2,482	3.9	16%	21.7	2.4	24.1	5.59	0.63	6.22
DM-2	*Natapoc*	1,072	1.7	102	0.2	9%	2.0	0.0	2.0	12.78	0.00	12.78
DM-11	*Russell Ridge*	12,335	19.3	1,426	2.2	12%	9.4	0.9	10.2	4.20	0.39	4.59
DM-7	*Sand Creek*	9,225	14.4	862	1.3	9%	4.9	0.0	4.9	3.64	0.00	3.64
DM-3	*Tumwater*	4,079	6.4	326	0.5	8%	2.1	1.2	3.3	4.05	2.40	6.44
DM-1	*Twin Lakes*	5,573	8.7	183	0.3	3%	0.9	0.0	0.9	2.98	0.14	3.12

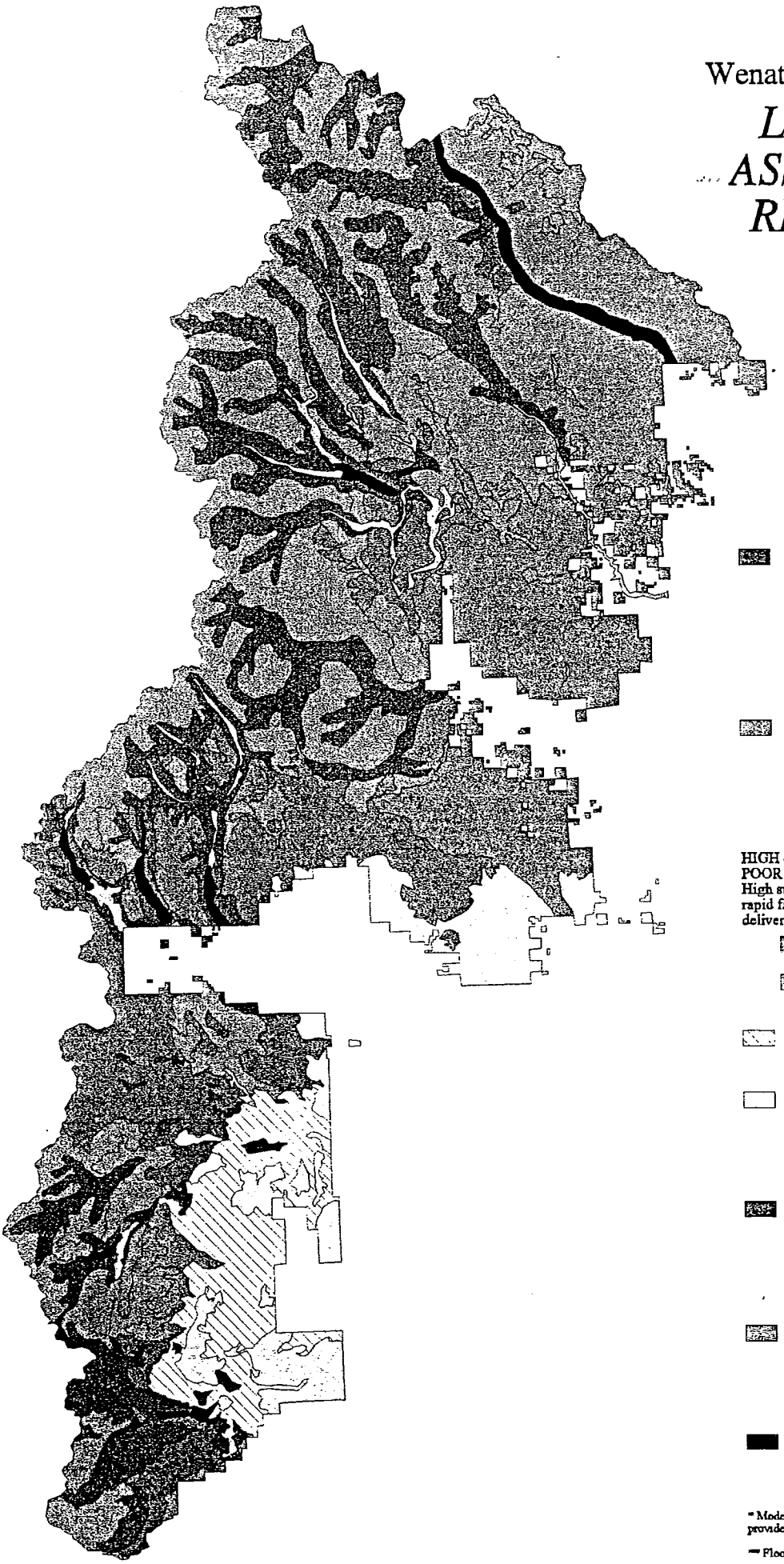
[1] These figures do not include the reserves around wetlands less than 1acre in size and small, intermittent streams. For PSQ estimation, riparian reserves were estimated to be 20% of all LSRs and MSLAs.

Appendix 21

Land Type Association Response Maps

Wenatchee National Forest

LANDTYPE ASSOCIATION RESPONSES



WELL REGULATED HYDROLOGIC and HIGH SEDIMENT RESPONSE:
High subsurface water storage,
High stream flow regulation,
Low stream temperature,
Relatively high debris slide and/or surface erosion hazard,
High coarse sediment delivery.
UNITS B, B1, J, D.

POORLY REGULATED HYDROLOGIC RESPONSE:
High surface runoff,
High first order stream density,
High bedrock exposures,
High precipitation zones.
UNIT A

HIGH SEDIMENT RESPONSE and POOR HYDROLOGIC REGULATION:
High surface erosion and/or shallow rapid failure hazards, High sediment delivery, Moderate to high surface runoff.

- Fine Sediment Input
  UNITS F, C1.
- Fine to Coarse Sediment Input
  UNITS C, C2.

HIGH DEEP SEATED FAILURE HAZARD
UNITS F1, J.*

HIGH SOIL MOISTURE STRESS:
Low stream flow regulation (intermittent stream flow),
Low stream density.
UNITS E1, G.

HIGH FINE SEDIMENT RESPONSE and SOIL MOISTURE STRESS:
Low stream flow regulation (intermittent stream flows).
UNIT E.
(Also includes some F and G.)

FLOODPLAIN RESPONSE**:
High channel bank erosion,
Riparian zone, Class 1 and 2 streams, High water table.
UNIT H.

Major Lakes

* Moderate deep seated failure hazards can also provide sources of fine sediment loading.

** Floodplains identified at 1/2" = 1 mile scale.

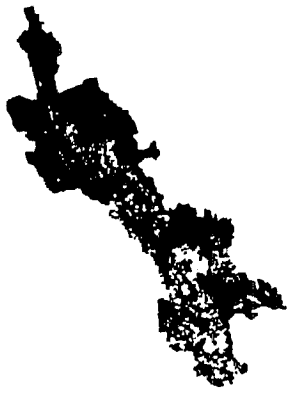
Appendix 22

Disturbance Risk Maps

These maps are grouped by LSR/MLSA in the following order:

1. Insects
2. Diseases
3. Fire
4. Composite (a combined risk integrating insects, disease and fire).

Chiwawa LSR
Risk Maps



Western
Spruce Budworm

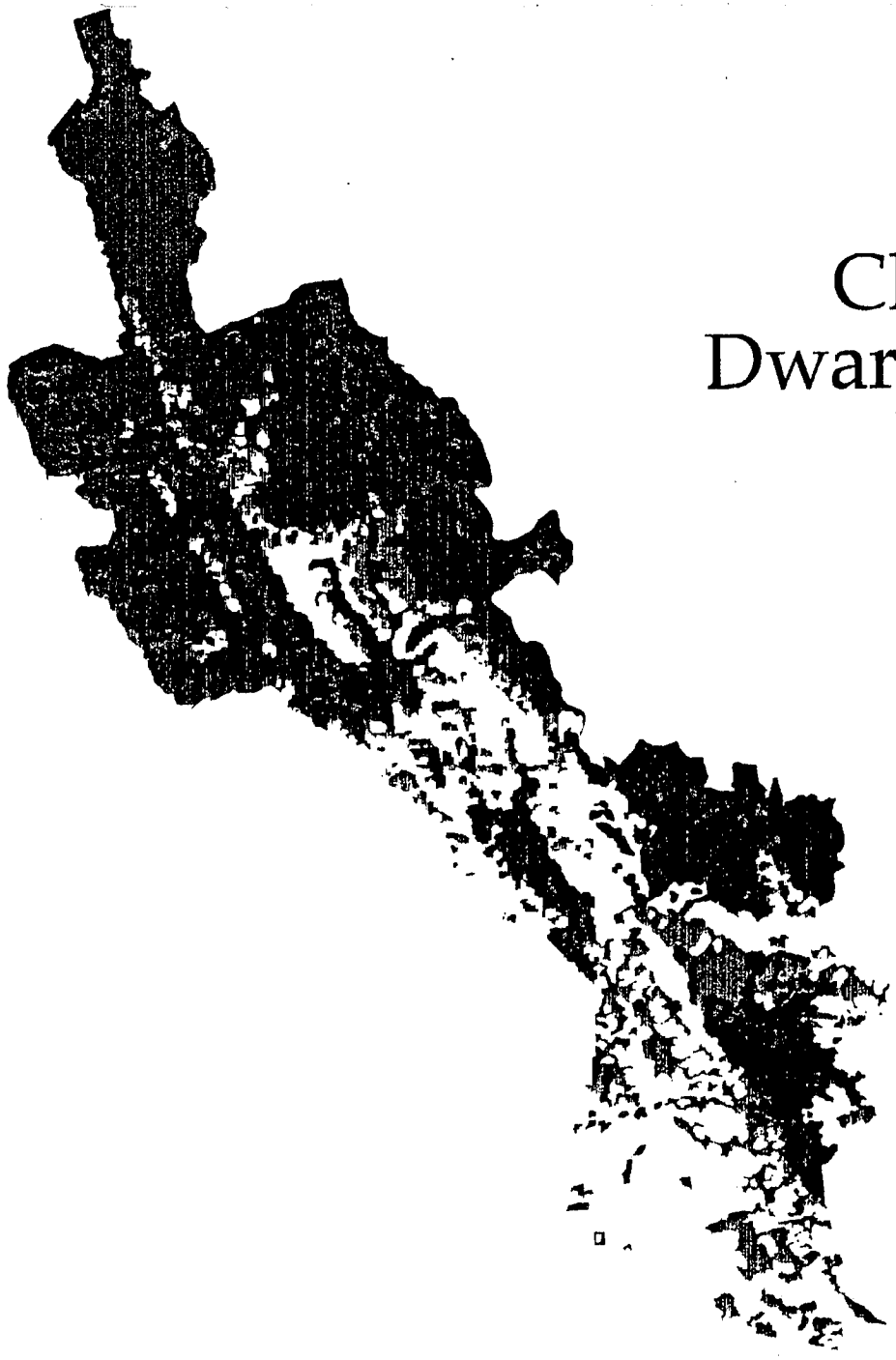
Douglas-fir
Beetle

Mountain Pine
Beetle

Fir Engraver

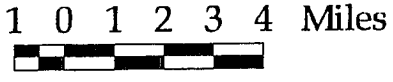
High Risk
Moderate Risk
Low Risk
No Risk

Chiwawa LSR
Dwarf Mistletoe Risk
Douglas-fir



Dwarf Mistletoe PSME

- High Risk
- Low Risk
- Moderate Risk
- No Risk



Chiwawa LSR
Risk Maps

Armillaria
Root Disease

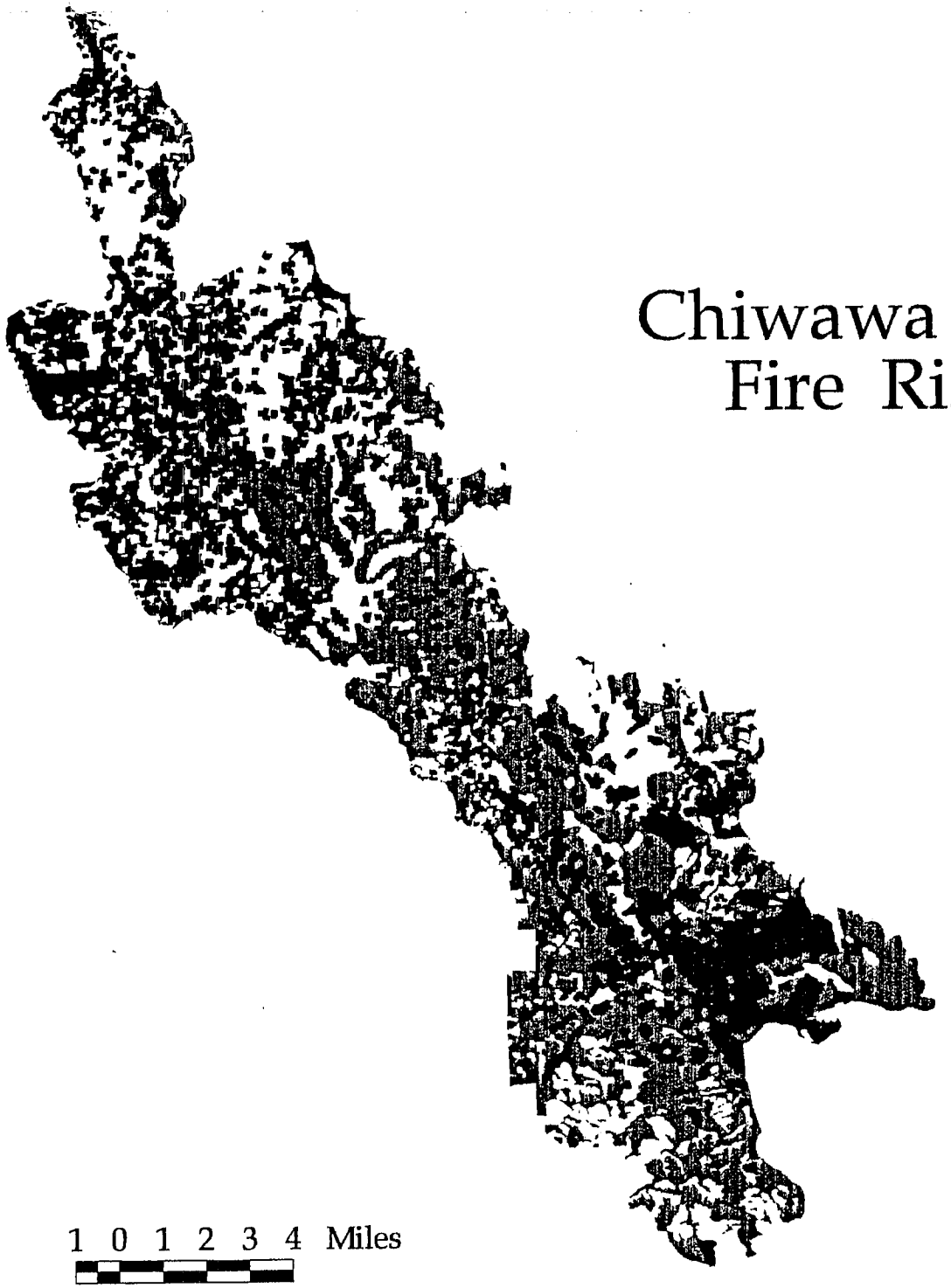
Annosus
Root Disease

Phellinus weirii
Laminated Root Rot

White Pine
Blister Rust

- High Risk
- Moderate Risk
- Low Risk
- No Risk

Chiwawa LSR
Fire Risk

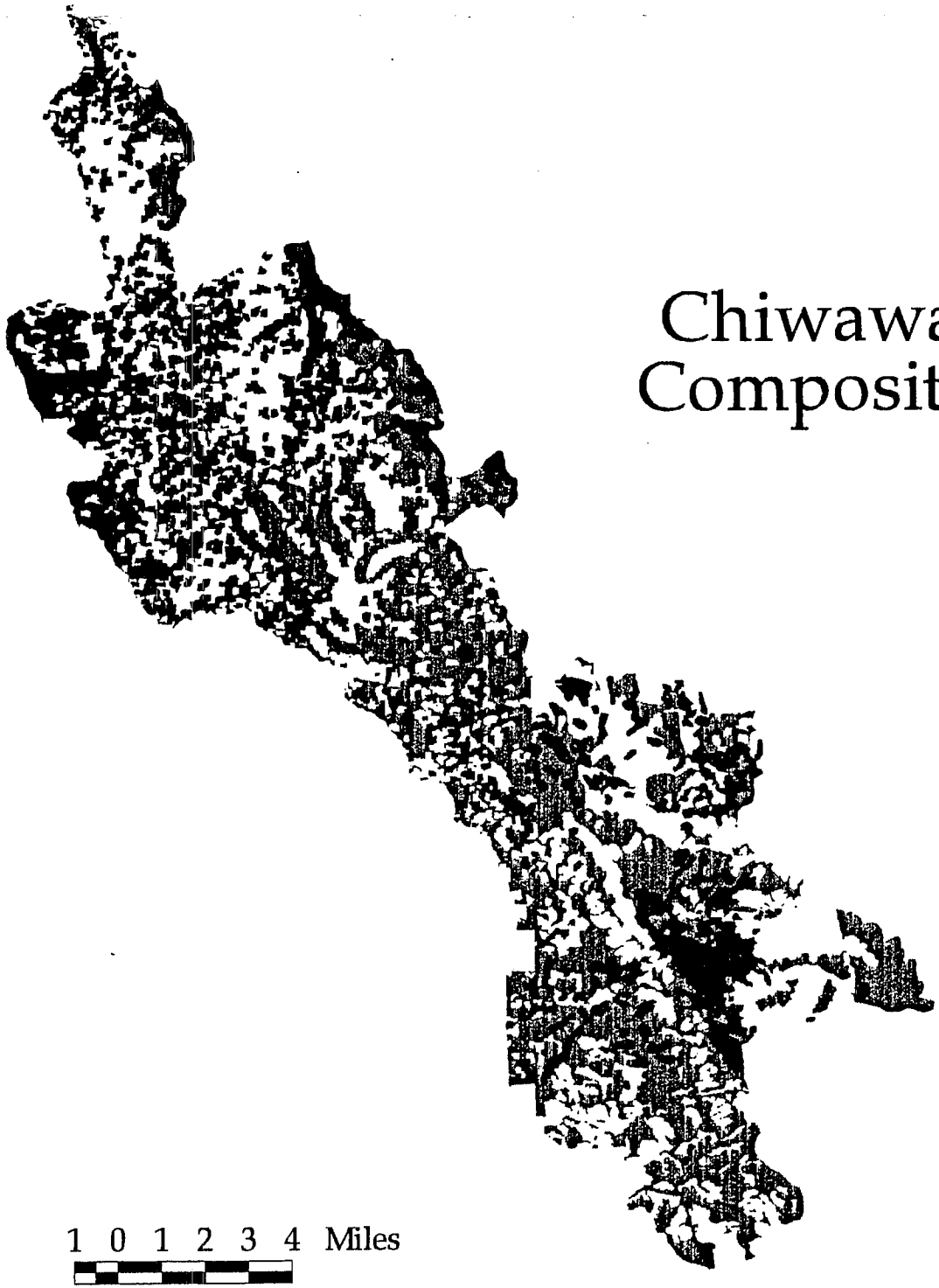


Fire Risk
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

1 0 1 2 3 4 Miles

Chiwawa LSR Composite Risk



Composite Risk
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

1 0 1 2 3 4 Miles

Haystack LSR
Risk Maps

Western
Spruce Budworm

Douglas-fir
Beetle

Fir Engraver

High Risk
Moderate Risk
Low Risk
No Risk

Haystack LSR
Dwarf Mistletoe Risk

Douglas fir

Western Larch

Western Hemlock

High Risk
Moderate Risk
Low Risk
No Risk

Haystack LSR
Risk Maps

Armillaria
Root Disease

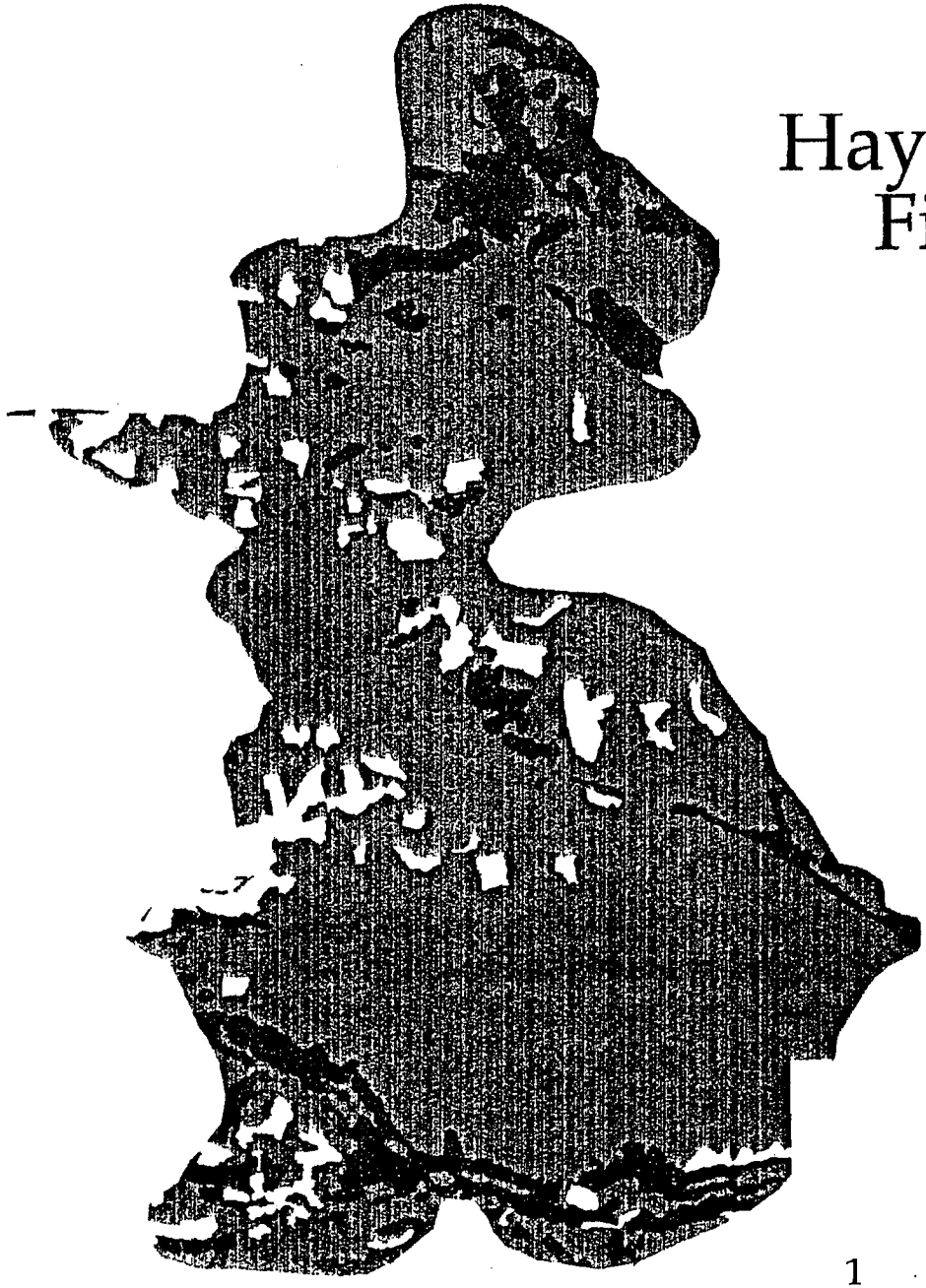
Annosus
Root Disease

Phellinus weirii
Laminated Root Rot

White Pine
Blister Rust

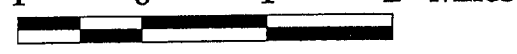
High Risk
Moderate Risk
Low Risk
No Risk

Haystack LSR
Fire Risk

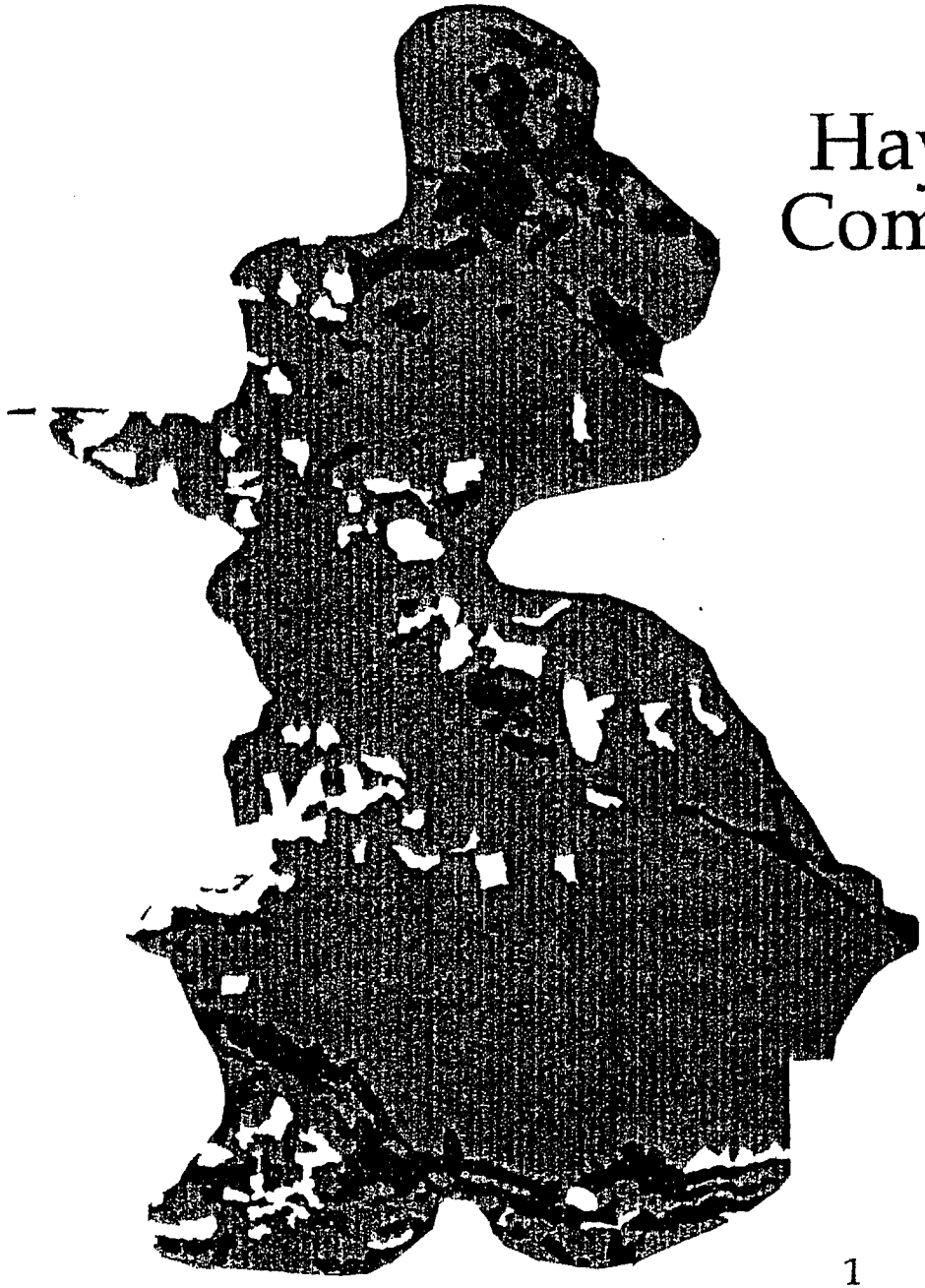


Fire Risk

- High Risk
- Low Risk
- Moderate Risk
- No Risk



Haystack LSR Composite Risk



Composite Risk
- High Risk
- Low Risk
- Moderate Risk
- No Risk

1 0 1 2 Miles

N W E S

Upper Nile LSR
Risk Maps

Western
Spruce Budworm

Douglas-fir
Beetle

Fir Engraver

- High Risk
- Moderate Risk
- Low Risk
- No Risk

Upper Nile
Dwarf Mistletoe Risk

Douglas fir

Western Larch

Western Hemlock

High Risk
Moderate Risk
Low Risk
No Risk

Upper Nile LSR
Risk Maps

Armillaria
Root Disease

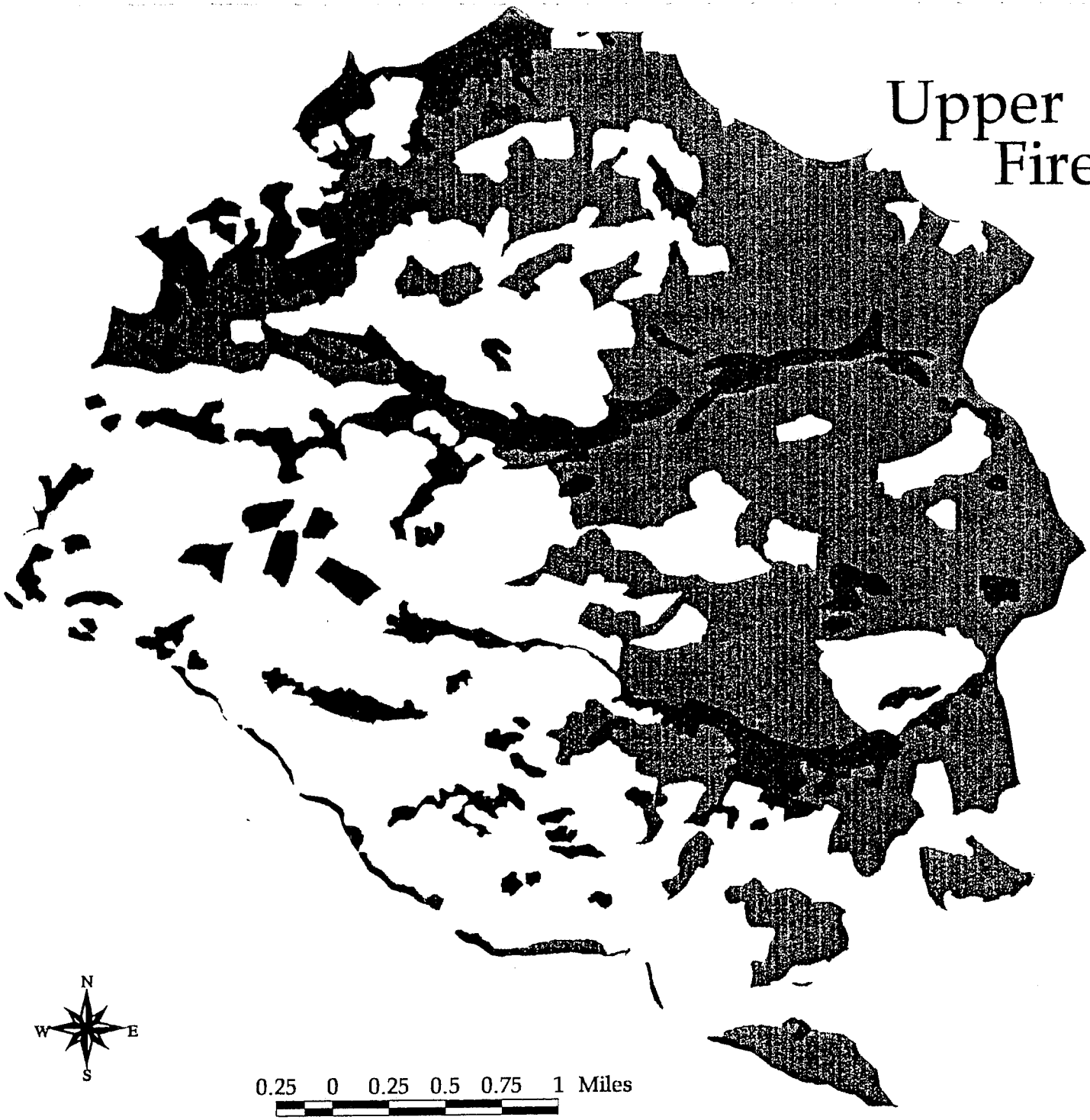
Annosus
Root Disease

Phellinus weirii
Laminated Root Rot

White Pine
Blister Rust

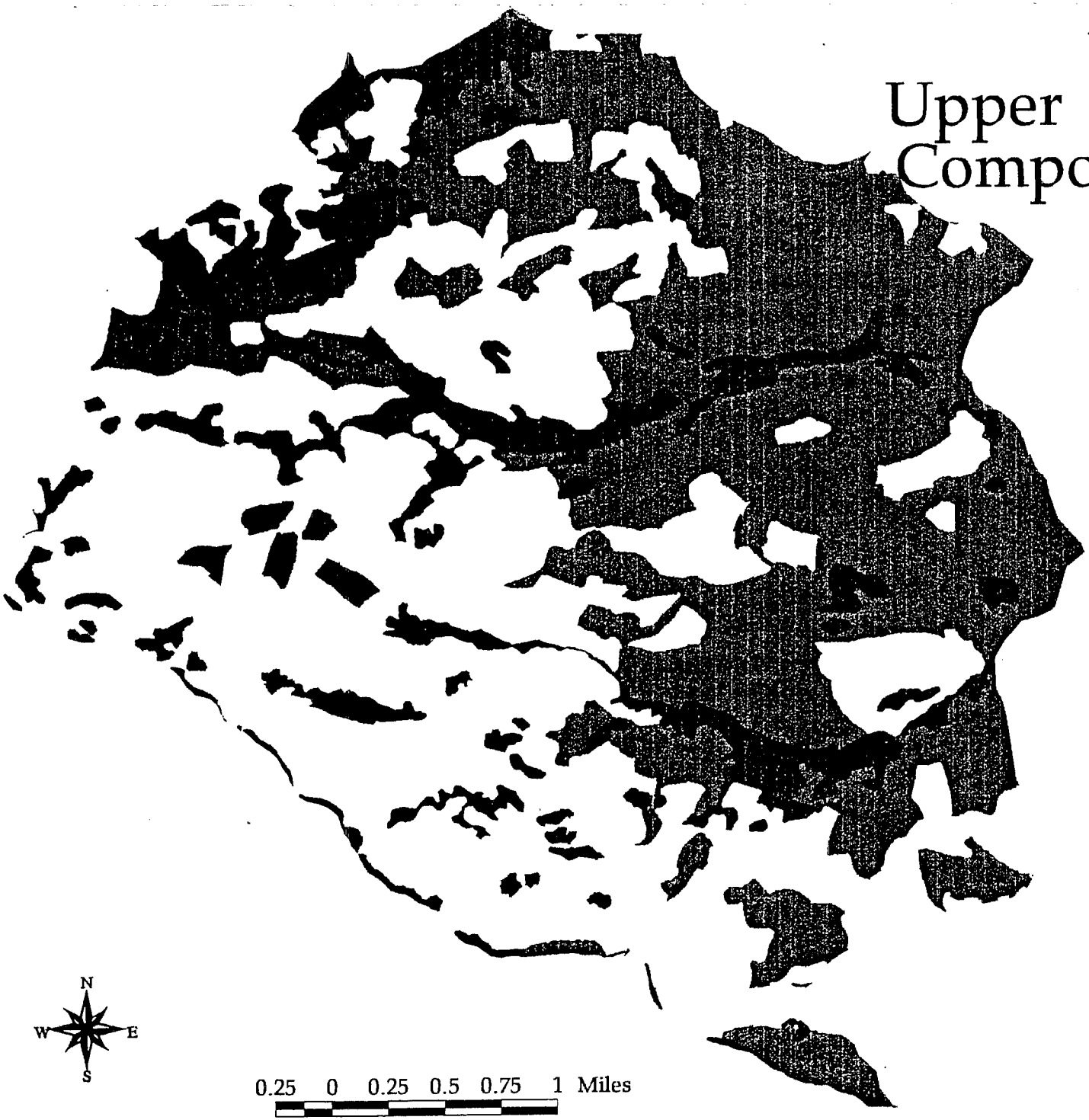
High Risk
Moderate Risk
Low Risk
No Risk

Upper Nile LSR Fire Risk



Fire Risk
- High Risk
- Low Risk
- Moderate Risk
- No Risk

Upper Nile LSR Composite Risk



Composite Risk
- High Risk
- Low Risk
- Moderate Risk
- No Risk

Milk Creek LSR
Risk Maps

Western
Spruce Budworm

Douglas-fir
Beetle

Fir Engraver

High Risk
Moderate Risk
Low Risk
No Risk

Milk Creek
Dwarf Mistletoe Risk

Douglas fir

Western Larch

Western Hemlock

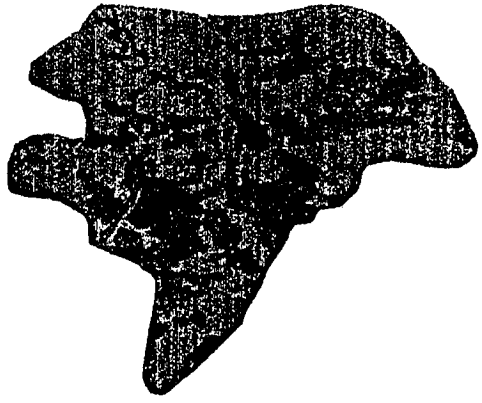
High Risk
Moderate Risk
Low Risk
No Risk

Milk Creek LSR
Risk Maps

Armillaria
Root Disease

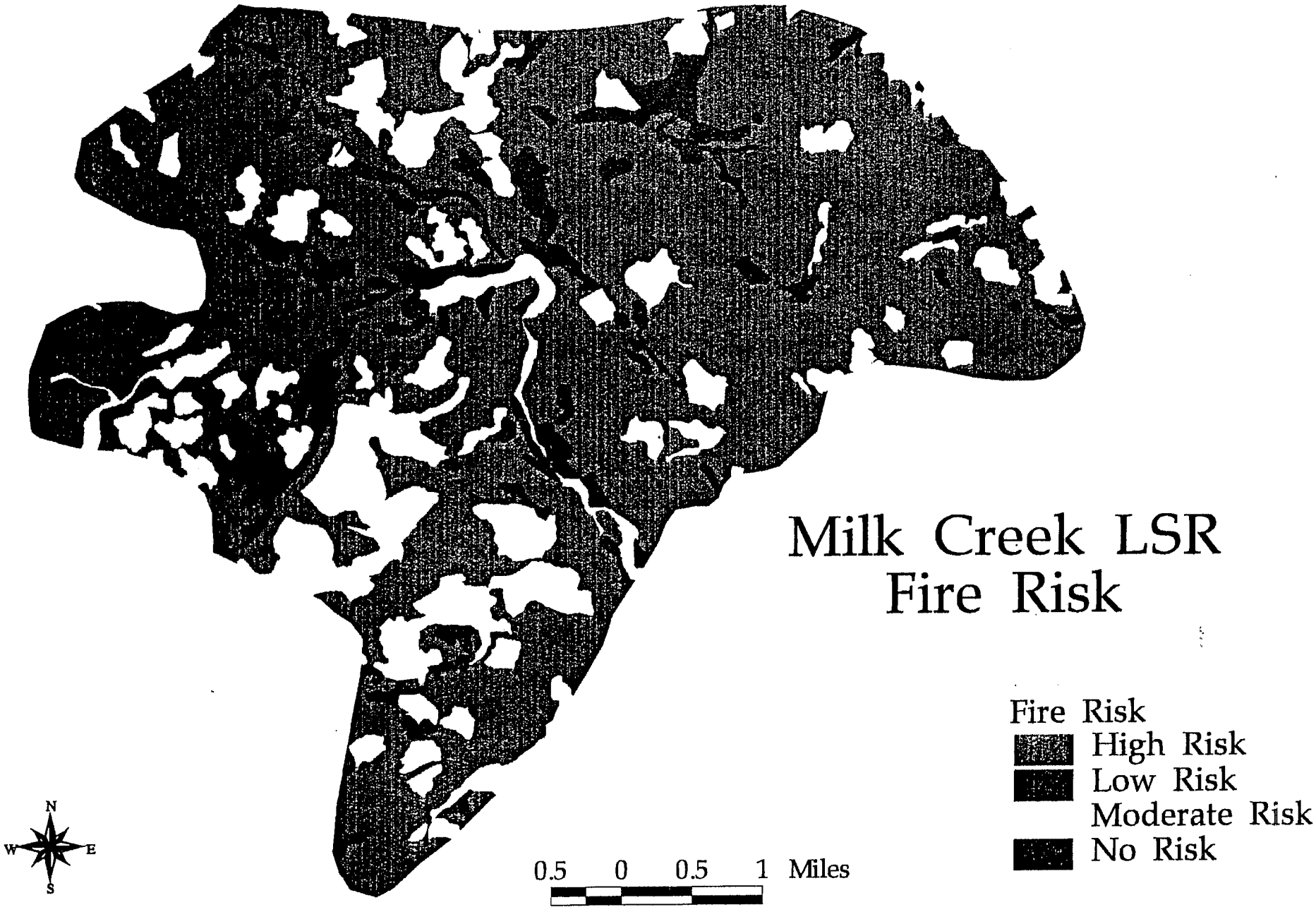
Annosus
Root Disease

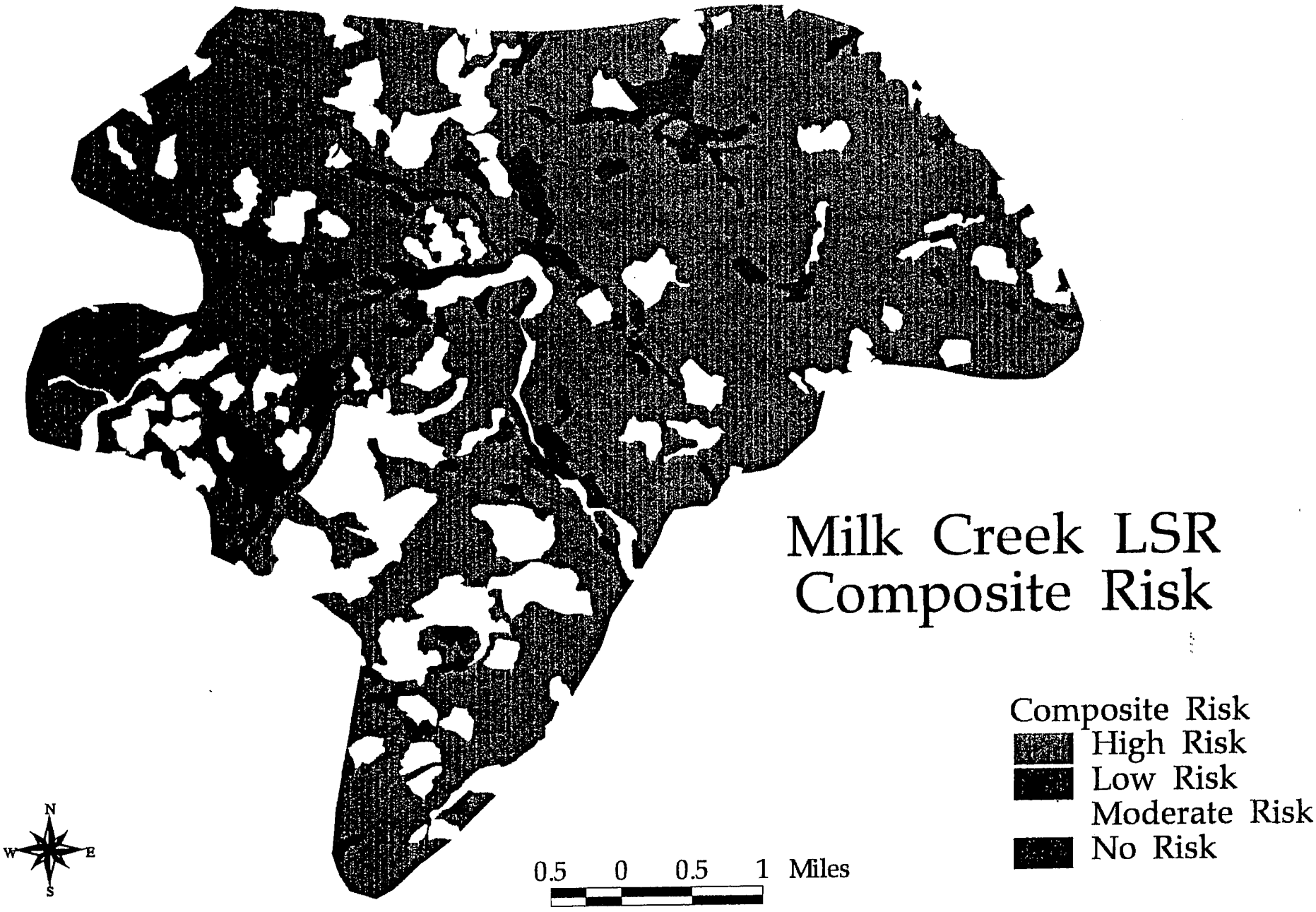
Phellinus weirii
Laminated Root Rot



White Pine
Blister Rust

High Risk
Moderate Risk
Low Risk
No Risk


Milk Creek LSR
Fire Risk
Fire Risk
High Risk
Low Risk
Moderate Risk
No Risk
0.5 0 0.5 1 Miles
N
W
E
S


Milk Creek LSR
Composite Risk
Composite Risk
High Risk
Low Risk
Moderate Risk
No Risk
0.5 0 0.5 1 Miles
N
W
E
S

Shady Pass LSR
Risk Maps

Western
Spruce Budworm

Douglas-fir
Beetle

Mountain Pine
Beetle

Western Pine
Beetle

High Risk
Moderate Risk
Low Risk
No Risk

Shady Pass
Dwarf Mistletoe Risk

Ponderosa Pine

Douglas fir

Western Larch

High Risk
Moderate Risk
Low Risk
No Risk

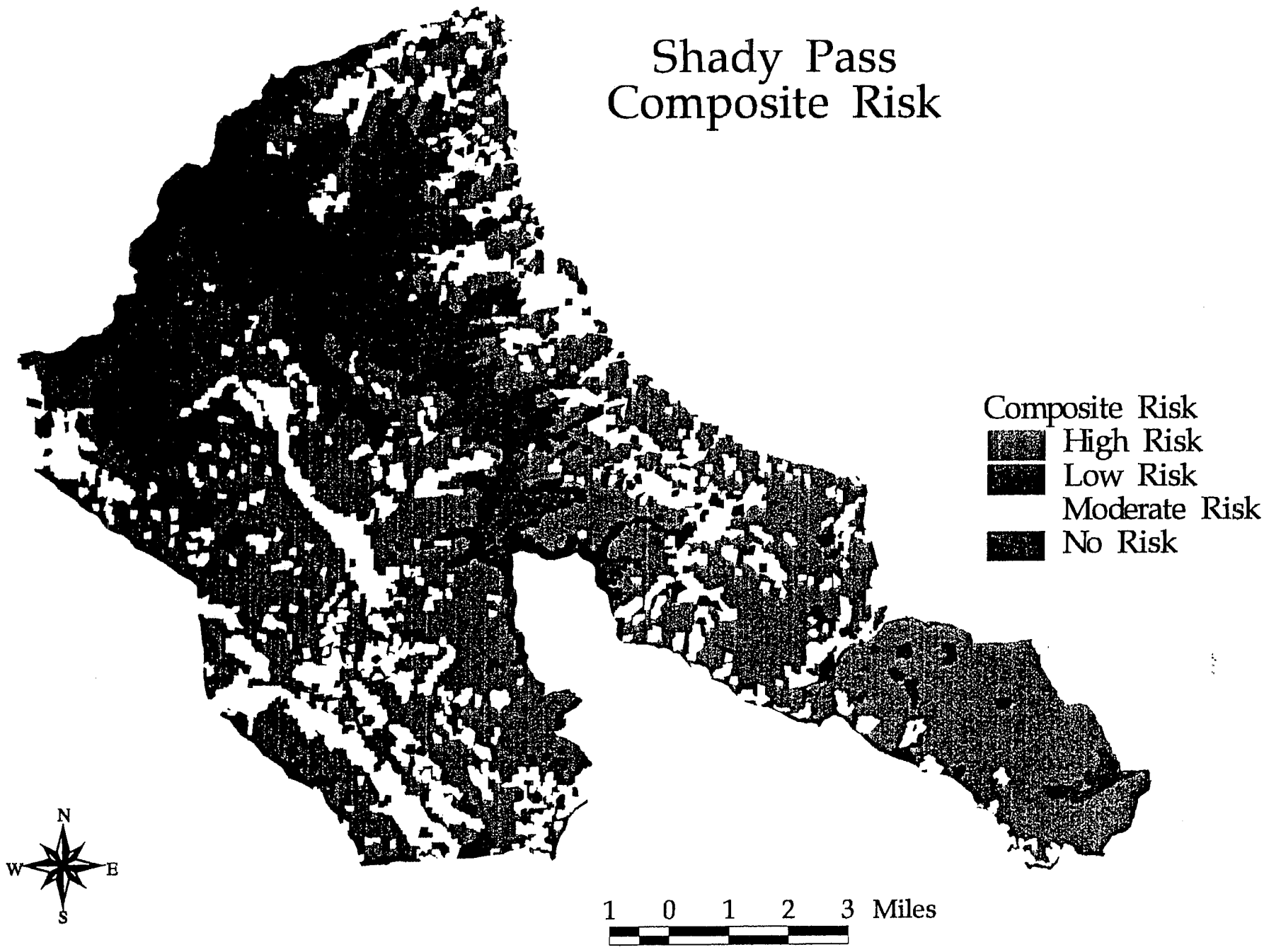
Shady Pass LSR
Risk Maps

Armillaria
Root Disease

Annosus
Root Disease

White Pine
Blister Rust

High Risk
Moderate Risk
Low Risk
No Risk


Shady Pass
Composite Risk
Composite Risk
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
1 0 1 2 3 Miles

Swauk Pass LSR
Risk Maps

Western
Spruce Budworm

Douglas-fir
Beetle

Mountain Pine
Beetle

Western Pine
Beetle

Fir Engraver

High Risk
Moderate Risk
Low Risk
No Risk

Swauk Pass
Dwarf Mistletoe Risk

Ponderosa Pine

Douglas fir

Western Larch

High Risk
Moderate Risk
Low Risk
No Risk

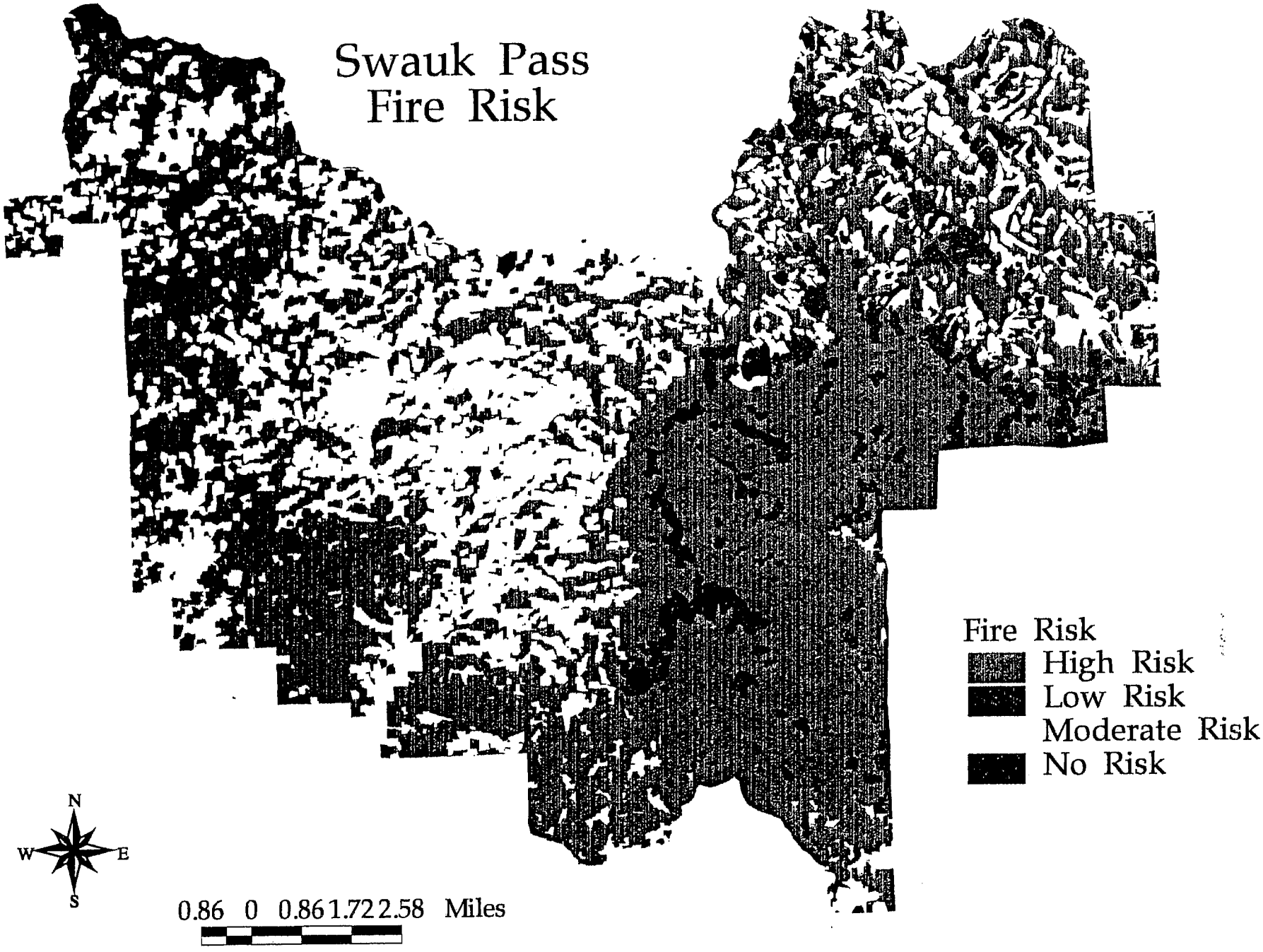
Swauk Pass LSR
Risk Maps

Armillaria
Root Disease

Annosus
Root Disease

White Pine
Blister Rust

High Risk
Moderate Risk
Low Risk
No Risk


Swauk Pass
Fire Risk
Fire Risk
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
0.86 0 0.86 1.72 2.58 Miles

Manastash LSR Risk Maps

Western Spruce Budworm

Douglas-fir Beetle

Mountain Pine Beetle

Fir Engraver

High Risk
Moderate Risk
Low Risk
No Risk

Manastash LSR
Dwarf Mistletoe Risk

Douglas fir

Western Larch

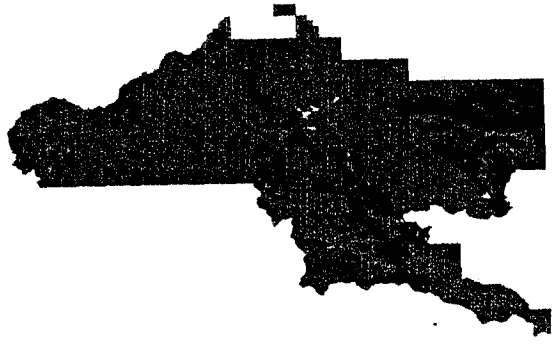
High Risk
Moderate Risk
Low Risk
No Risk

Manastash LSR
Risk Maps

Armillaria
Root Disease

Annosus
Root Disease

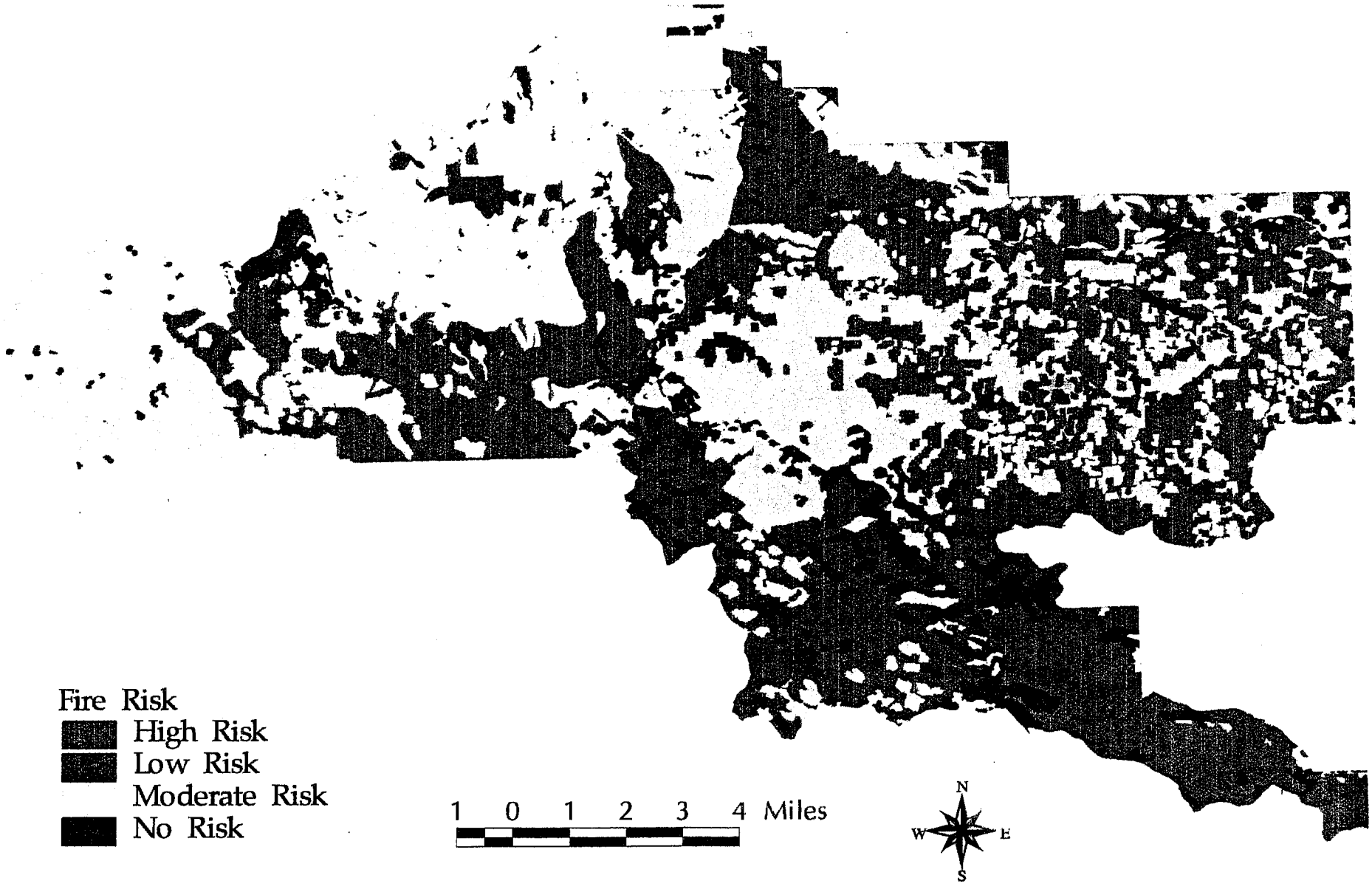
Phellinus weirii
Laminated Root Rot



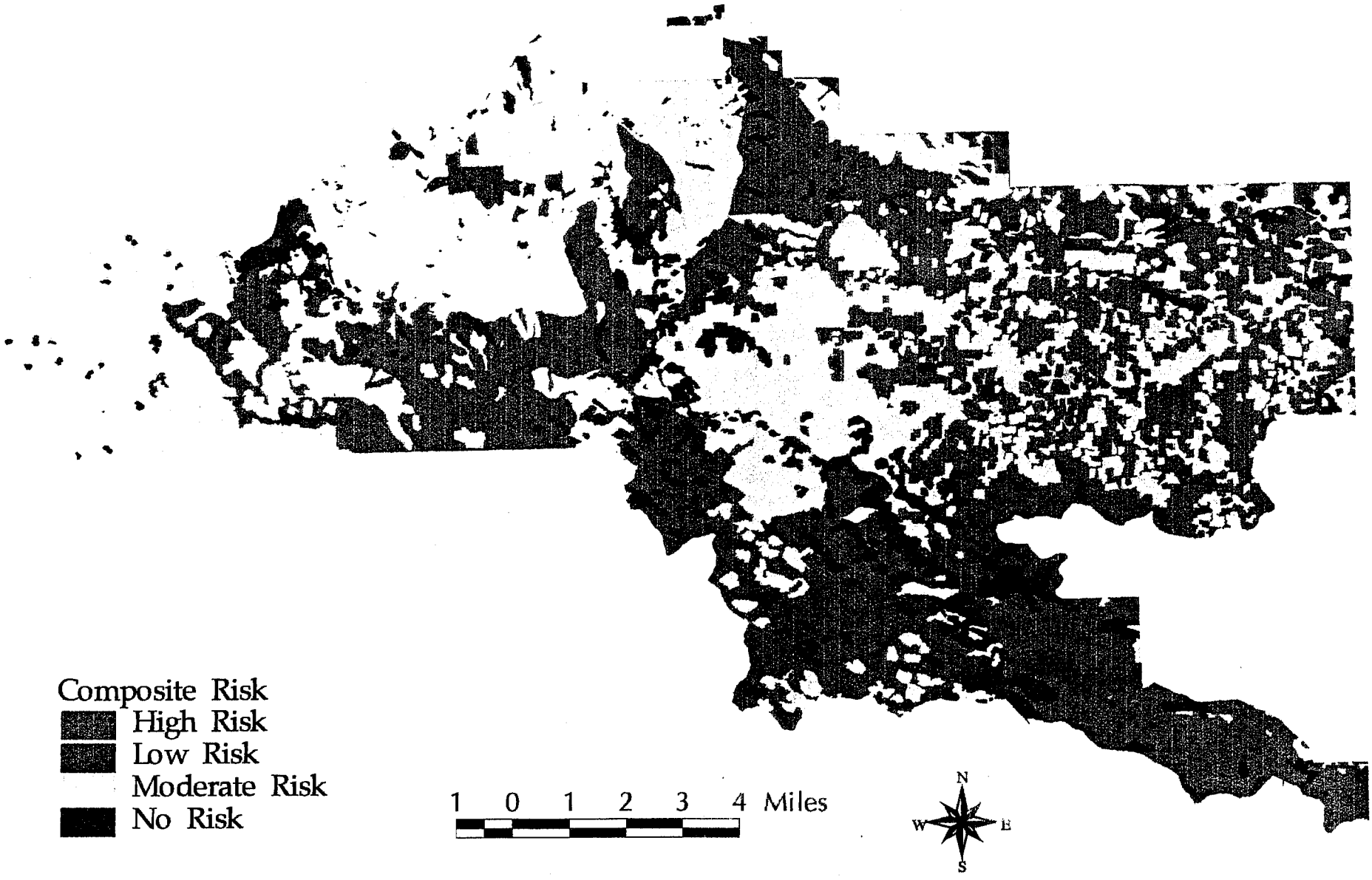
White Pine
Blister Rust

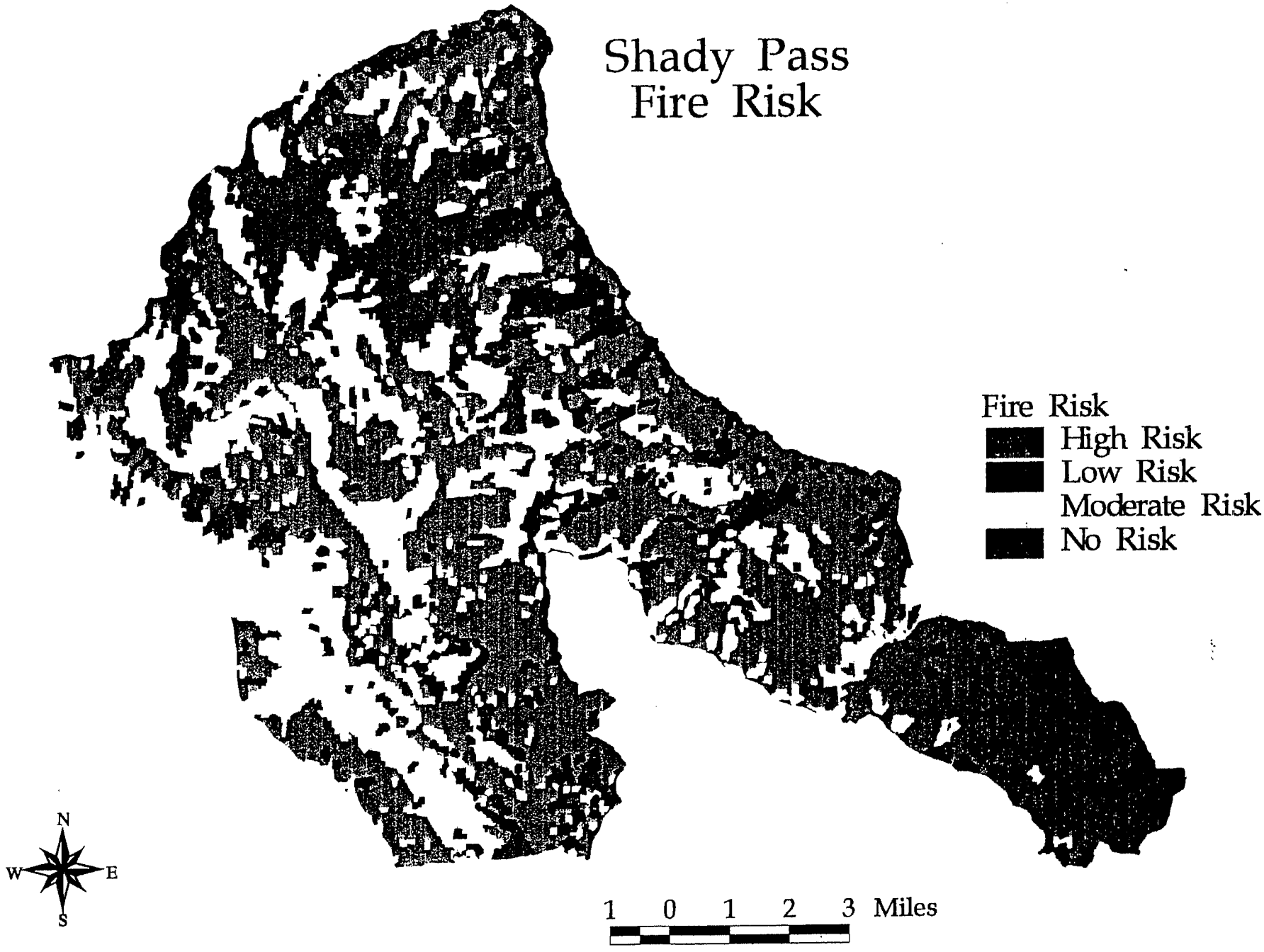
- High Risk
- Moderate Risk
- Low Risk
- No Risk

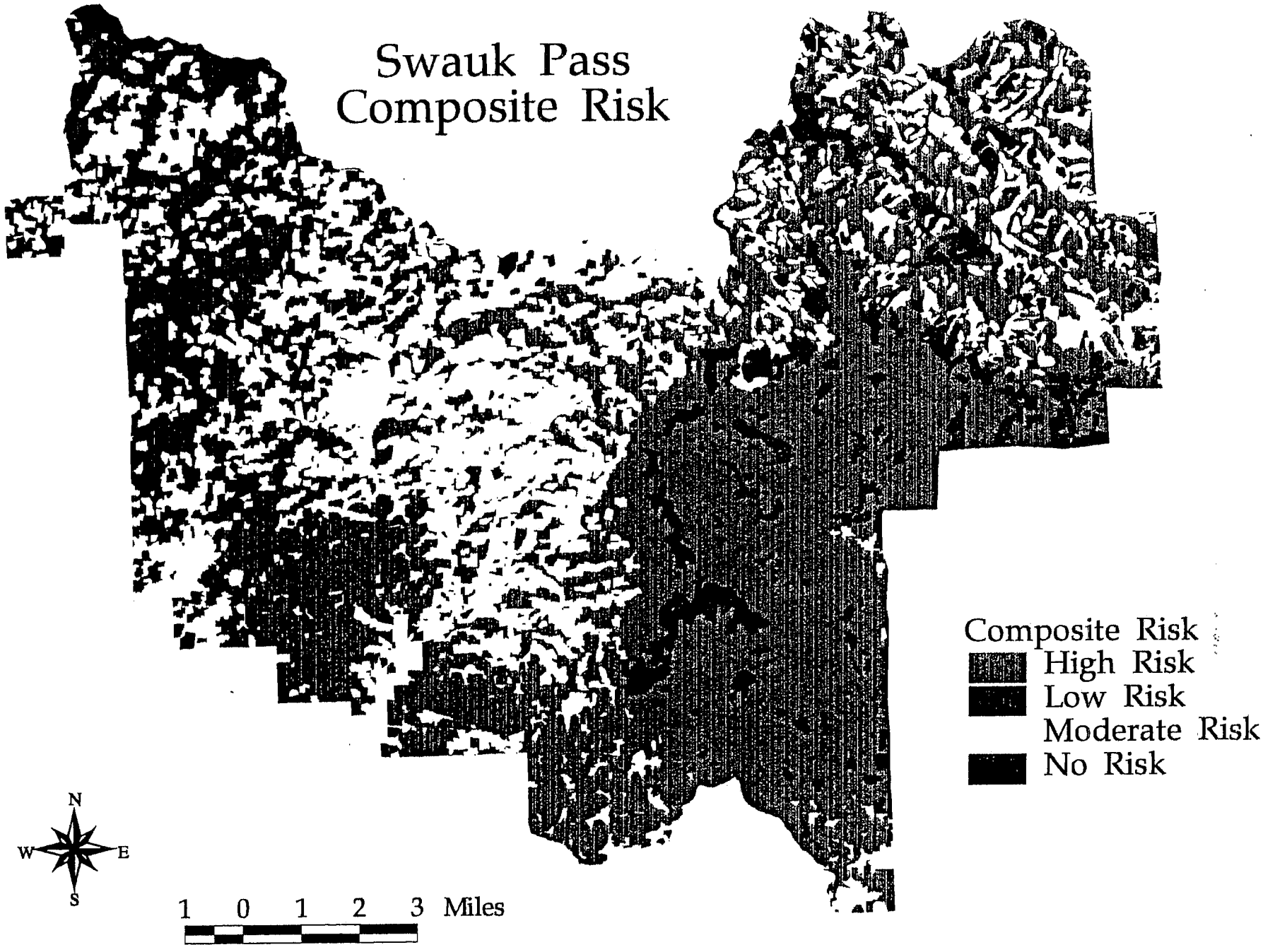
Manastash LSR
Fire Risk



Manastash LSR Composite Risk




Shady Pass
Fire Risk
Fire Risk
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
1 0 1 2 3 Miles


Swauk Pass
Composite Risk
Composite Risk
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
1 0 1 2 3 Miles