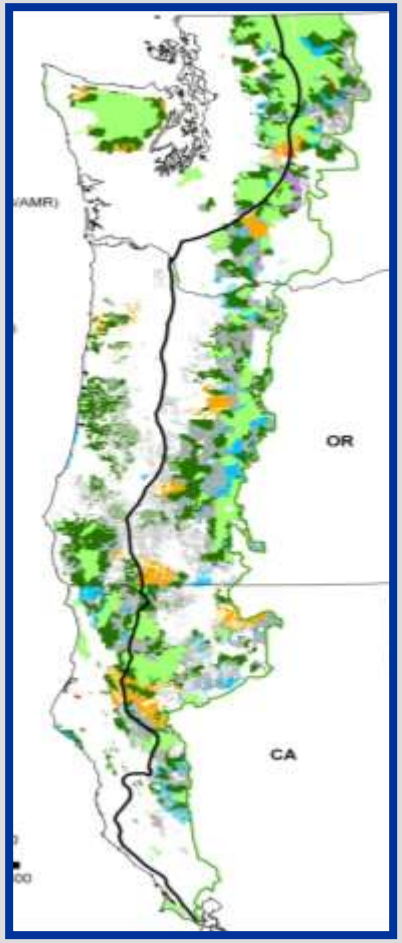
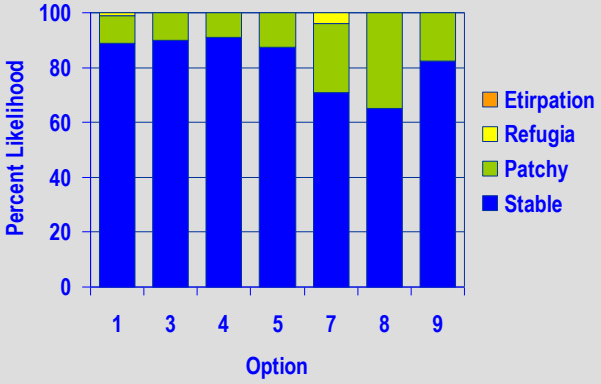
The Function of Riparian Reserves for Terrestrial Species: What was the Intent?





Martin G. Raphael

Pacific Northwest Research Station
USDA Forest Service

A primary objective of the Northwest Forest Plan was to achieve:

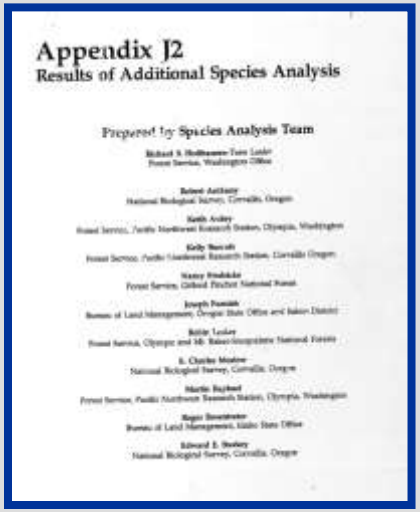
"maintenance and/or restoration of habitat conditions to support viable populations, well-distributed across their current ranges, of species known…to be associated with old-growth forest conditions"

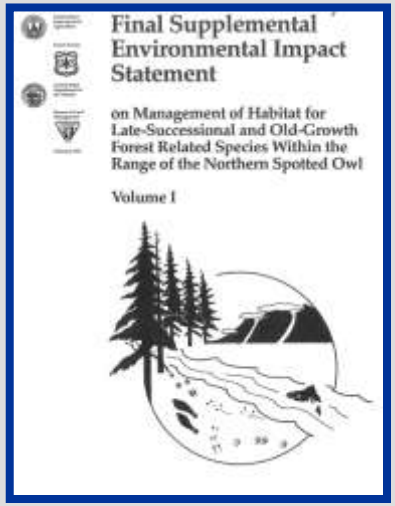
--FEMAT 1993:iv

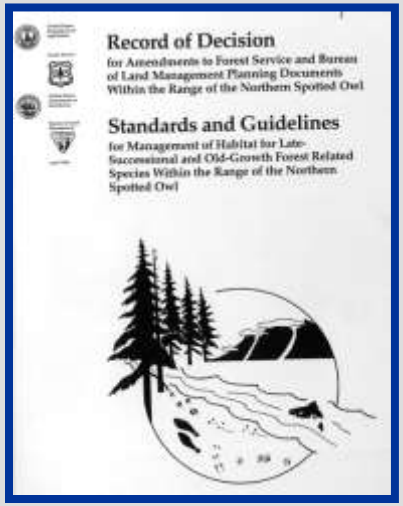
Conservation Biology Principles

- Species that are well distributed across their range are less prone to extinction
- Larger blocks of habitat are superior to smaller blocks
- Closer blocks are better than farther blocks
- Connected blocks are better than isolated blocks

From FEMAT to Record of Decision

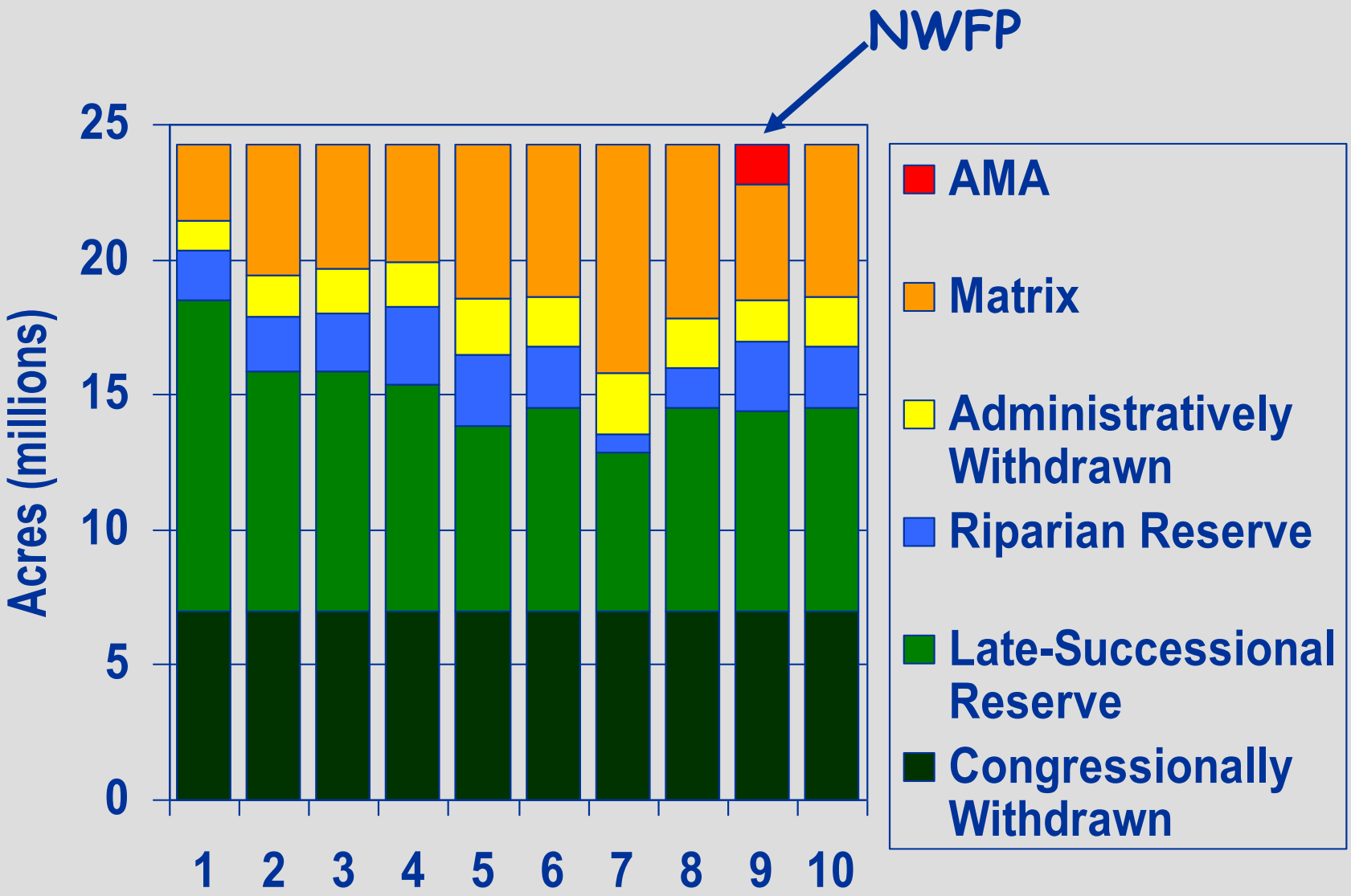






Riparian reserve buffer design changed along the way

10 Alternatives Considered



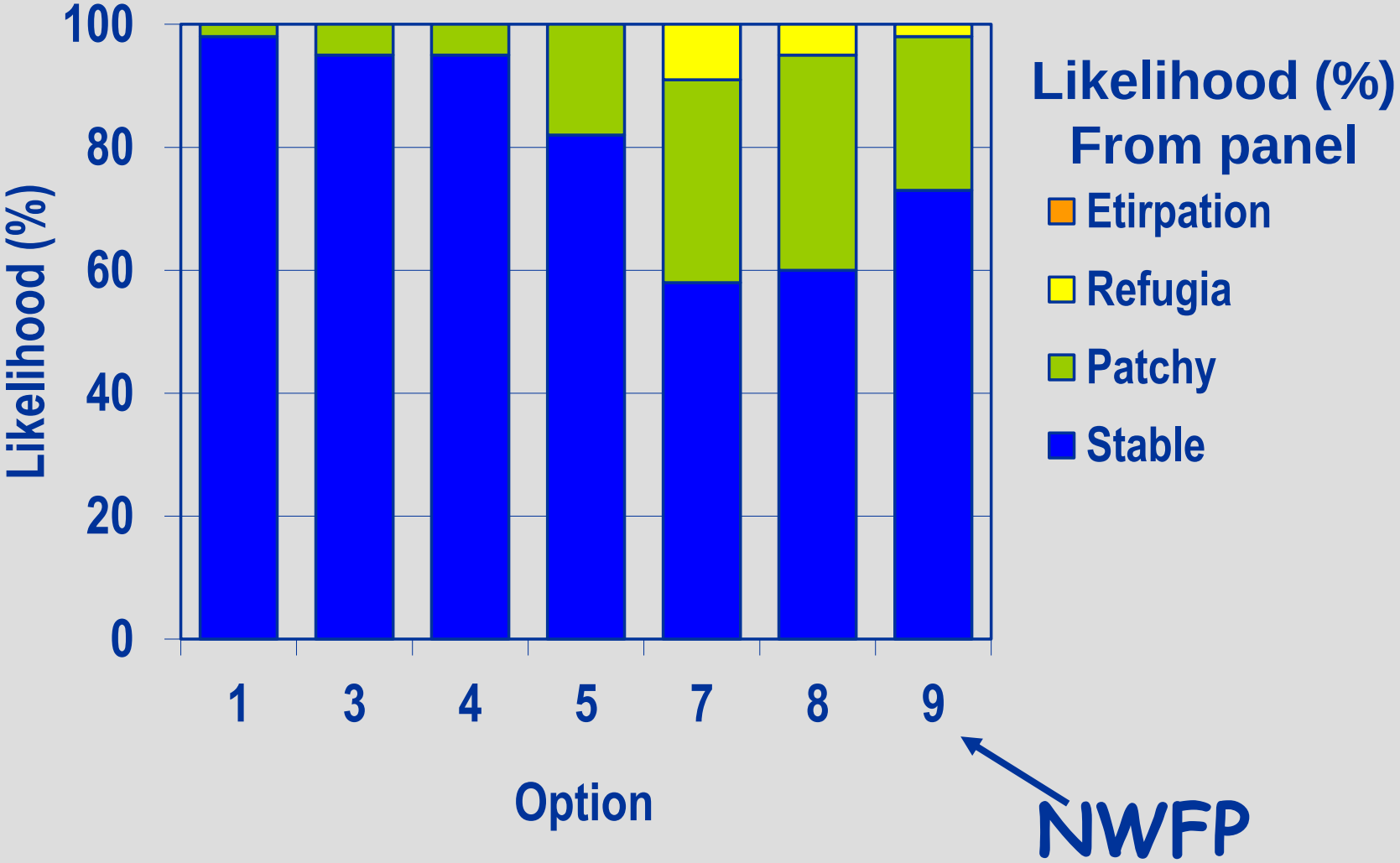
Riparian Buffers - FEMAT

- Fish-bearing streams - 2 tree heights
- Permanent non-fish-bearing streams – 1 tree height
- Intermittent streams in key watersheds – 1 tree height
- Intermittent streams outside of key watersheds – $\frac{1}{2}$ tree height

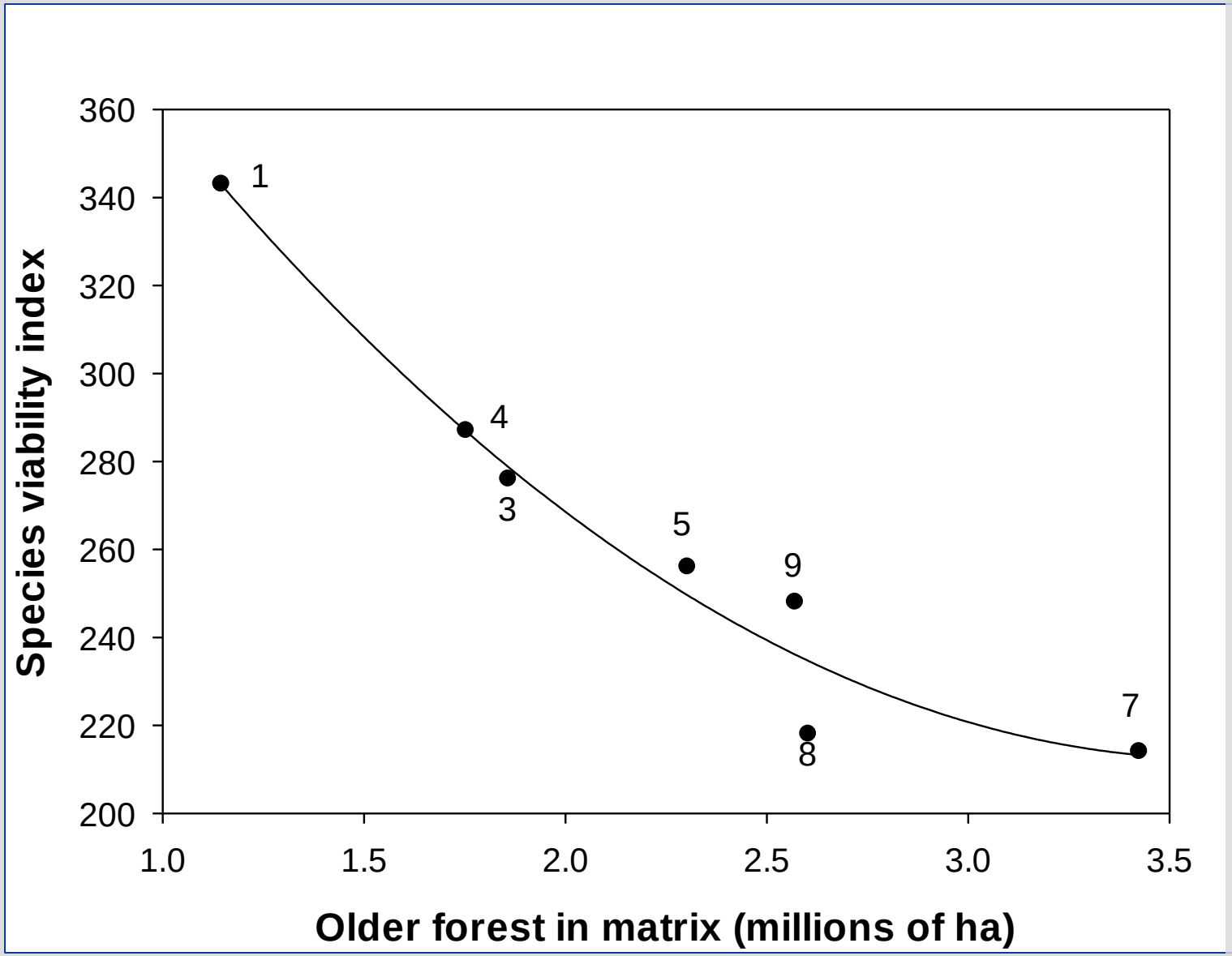
Assessment Panel

- Describe options
- Explain outcome rating scale
  - 4 outcomes ranging from likely extirpation to stable and well-distributed over next 100 years
- Score alternatives
- Discuss and revise scores
- Summarize as average among panelists
- Discuss contributions from non-federal land & cumulative effects from other threats

Red Tree Vole



Viability increased with amount of old forest in reserves and buffers



Additional Species Analysis

- Screen species for additional analysis
  - Species selected if rating <80 in outcome A
- Describe basis for concern
- Describe possible mitigation measures
- Describe benefits of mitigation
- Summarize mitigation measures

All of this is documented in detail in Appendix J2 of FEIS

Consolidated Mitigations

- Survey and manage (3)
- Riparian reserves (5)
- Watershed protections (2)
- Matrix management provisions (6)
- Other measures (7)

Riparian reserve mitigations

4. Survey for species and apply Riparian Reserve Scenario 1 where found
5. Apply RRS1 on intermittent fish-bearing streams and adjust after watershed analysis
6. Apply RRS1 on intermittent fish-bearing streams
7. Ensure riparian management in AMAs provides species protection equivalent to RRS1
8. Provide additional buffers around all wetlands

Sample from Appendix J2

Table J2-8g Level of Benefit Afforded to Individual Species or Functional Groups by the 23 Possible Mitigation Measures.
Refer to the Introduction of this Table and the Description of the Process for Further Explanation of Benefits and Mitigation Measures.

Possible Mitigation Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
AMPHIBIANS																							
Riparian																							
Black salamander	3	3	3	1	1	3			3	3							3	3					
Cascade torrent salamander (R. cascadae)	3	3	3	1	1				3	3							3	3					
Columbia torrent salamander (R. kezeri)				6	6																		
Cope's giant salamander	3	3	3	1	1	3			3	3							3	3					
Southern torrent salamander (R. varigatus)	3	3	3	1	1	3			3	3							3	3					
Tailed frog	3	3	3	1	1	3			3	3							3	3					
Van Dyke's salamander (Cascades)		5		5																			
Van Dyke's salamander (Coastal, Oly. Penin.)				6	6																		
Terrestrial																							
Clouded salamander (California)	3	3							3		1			3			3	1					
Larch Mountain salamander	3	1							3					3		3	3		3				
Oregon Slender salamander	3	3	3						3		1			3			3						
Shasta salamander		5	5																				
Siskiyou Mountains salamander		5	5																				

Mitigations 4, 5, 6, 7, & 8 apply to riparian reserves; numbers in cells indicate level of benefit (low numbers better)

Additional Species Analysis

Species group	FEMAT	App. J2	Riparian
Bryophytes	106	9	5
Fungi	527	255	23
Lichen	157	75	32
Vascular plants	124	17	5
Arthropods	15	4	0
Mollusks	102	97	40
Amphibians	18	12	8
Fish	7	7	7
Birds	38	4	1
Bats	11	7	6
Other mammals	15	3	3
Total	**1120**	**490**	**130**

Examples

Riparian lichens (e.g., *Cetrelia cetrariodes*)

Full buffers would provide connectivity and larger patch sizes of appropriate host trees

Examples

Streamside salamanders

Full buffers would maintain cool, clear water conditions critical for foraging and thermoregulation

Examples

Red tree vole

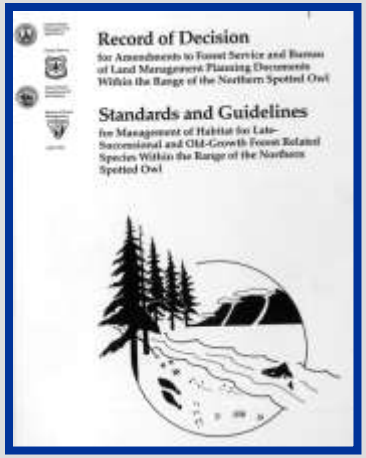
Full buffers would provide connectivity among patches of old forest in Matrix lands

Examples

American marten

Full buffers would provide connectivity among patches of old forest in Matrix lands and foraging, denning habitat along streams

Final Decision


Record of Decision

for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl

Standards and Guidelines

for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl

Once the list of proposed mitigations was presented to EIS team, a decision was made to implement Riparian Reserve Scenario 1 on all streams as this option captured most benefit. This was then made part of the Record of Decision for the plan.

Bottom Line

The added buffer widths were meant to reduce risk of extirpation for the ~130 terrestrial species associated with old forest that would benefit from greater protection of streams and streamside forest.