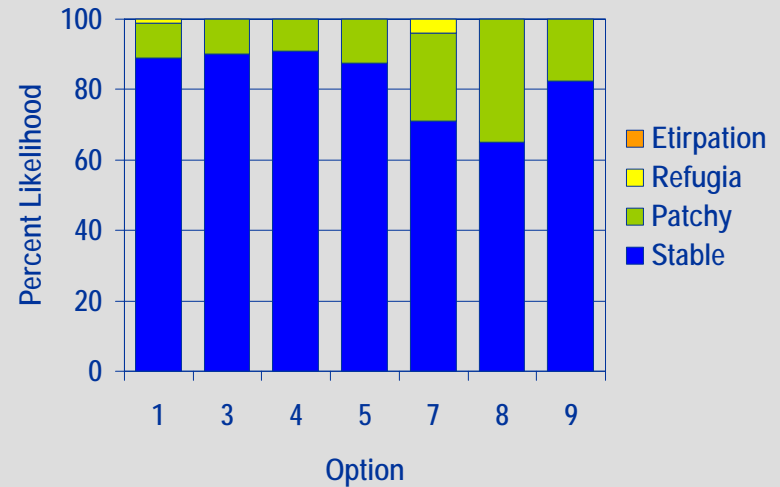
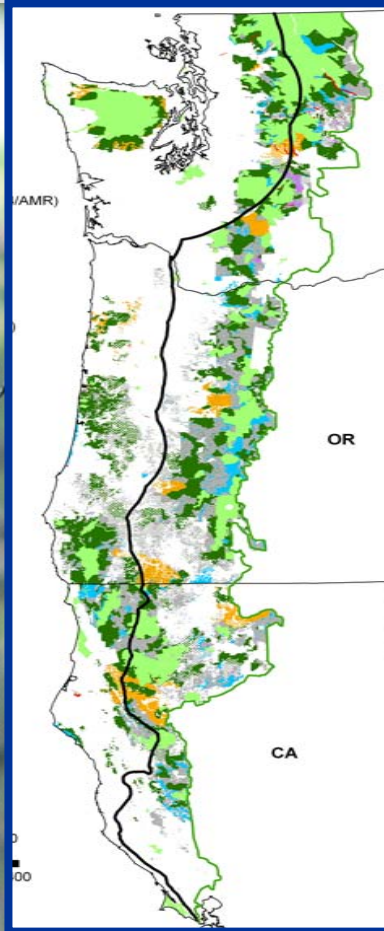


# Assumptions and assessments of Northern Spotted Owl Viability under the Northwest Forest Plan



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

"maintenance and/or restoration of habitat conditions for the Northern Spotted Owl that will provide for viability of the species, well distributed along its current range on federal lands"

--FEMAT 1993:iv

# Conservation Biology Principles

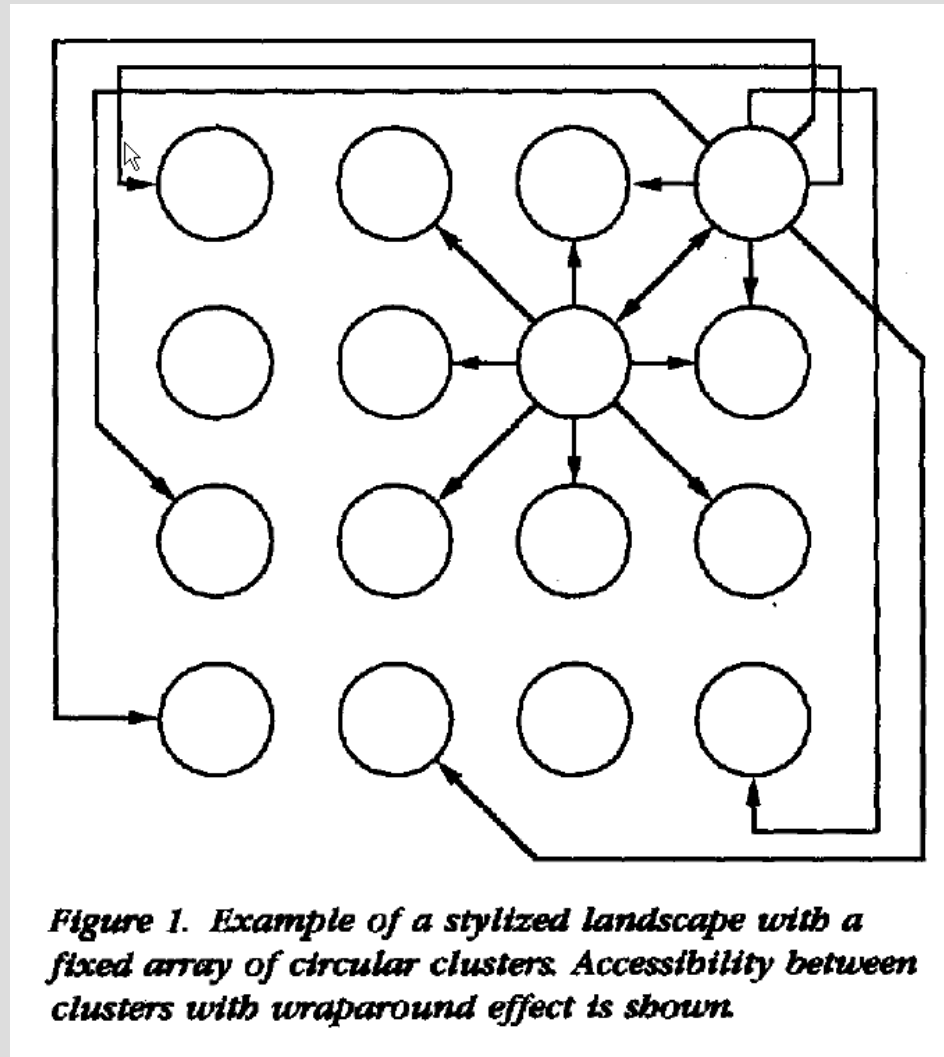
(Thomas et al. 1990)

- ✦ 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
- ✦ Contiguous blocks are better than fragmented blocks

# Building Blocks

- ✦ Late-successional/Old growth
- ✦ Owl Habitat Conservation Areas
- ✦ Occupied murrelet sites
- ✦ Riparian reserves
- ✦ Habitat retention in matrix (15%)
- ✦ Species buffers from SAT for local endemics
- ✦ Survey and manage for at-risk species
- ✦ Standards and Guidelines

# Patch model structure

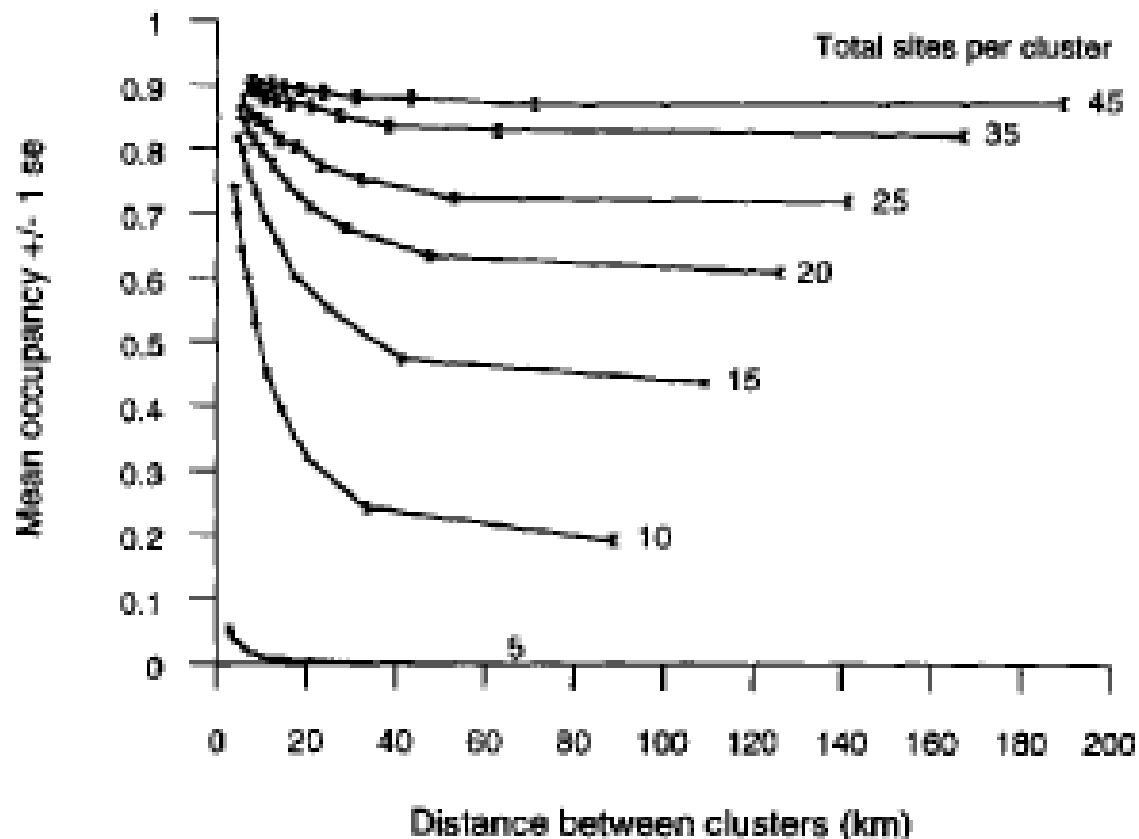


Lamberson et al. 1994

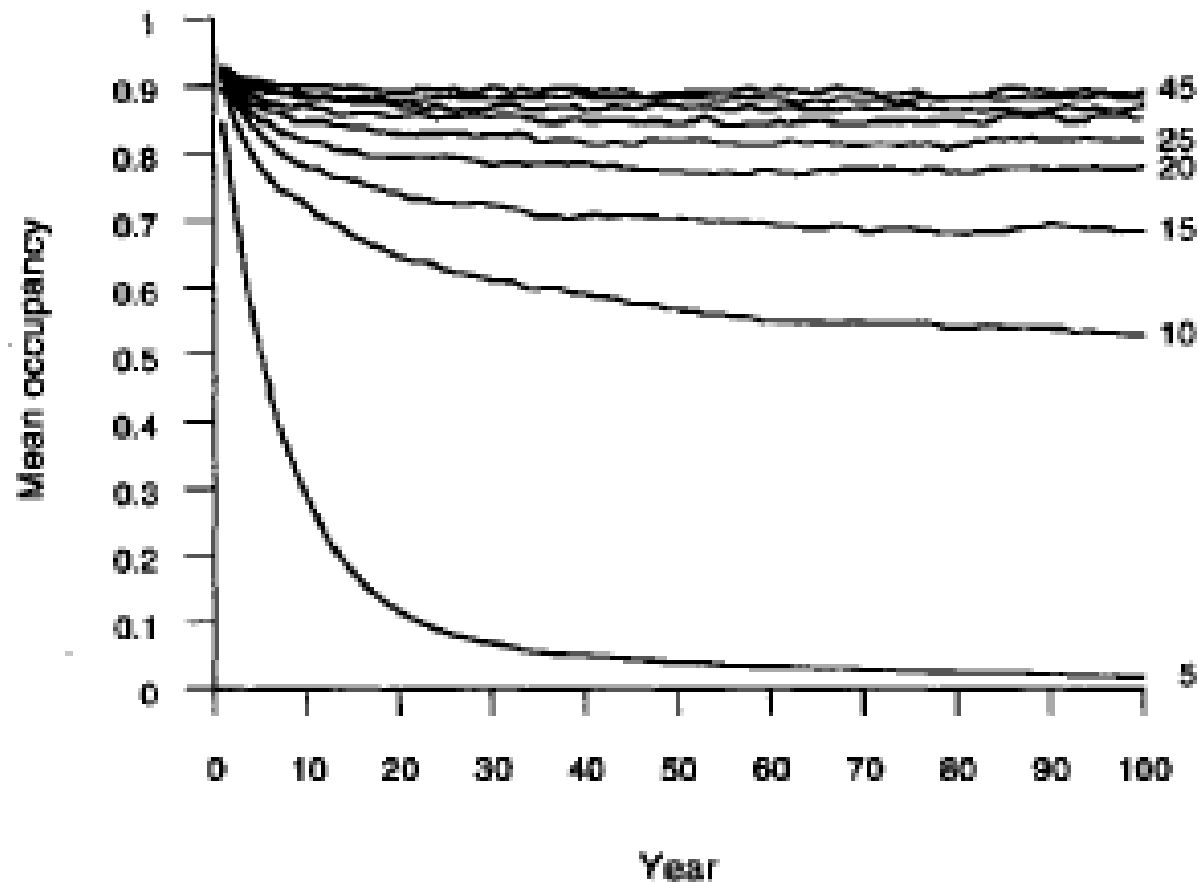
**Table 1. Estimates of survival and fecundity based on Franklin et al. (1990), and values used in model simulations.**

<i>Parameter</i>	<i>Franklin et al. Estimate</i>	<i>Model Values</i>
Juvenile survival	0.159	—
Predispersal survival	—	0.60, 0.69
Subadult survival	0.83	0.83
Adult survival	0.84	0.92
Fecundity*	0.38	0.38

\* *Number of female young per territorial adult female.*



*Figure 9. Mean occupancy  $\pm 1$  S.E. versus edge-to-edge distance to nearest cluster, for various total sites per cluster. Occupancy rates represent the last 10 years of each simulation. Total sites per cluster = 5, 10, 15, 20, 25, 35, and 45, of which 60% were suitable sites.*



*Figure 5. Mean occupancy versus time for various cluster sizes with 60% suitable within cluster. Total sites per cluster = 5, 10, 15, 20, 25, 30, 35, 40, and 45, with the lowest curve representing 5 sites per cluster and moving progressively upward to the top curve, which represents 45 sites per cluster.*

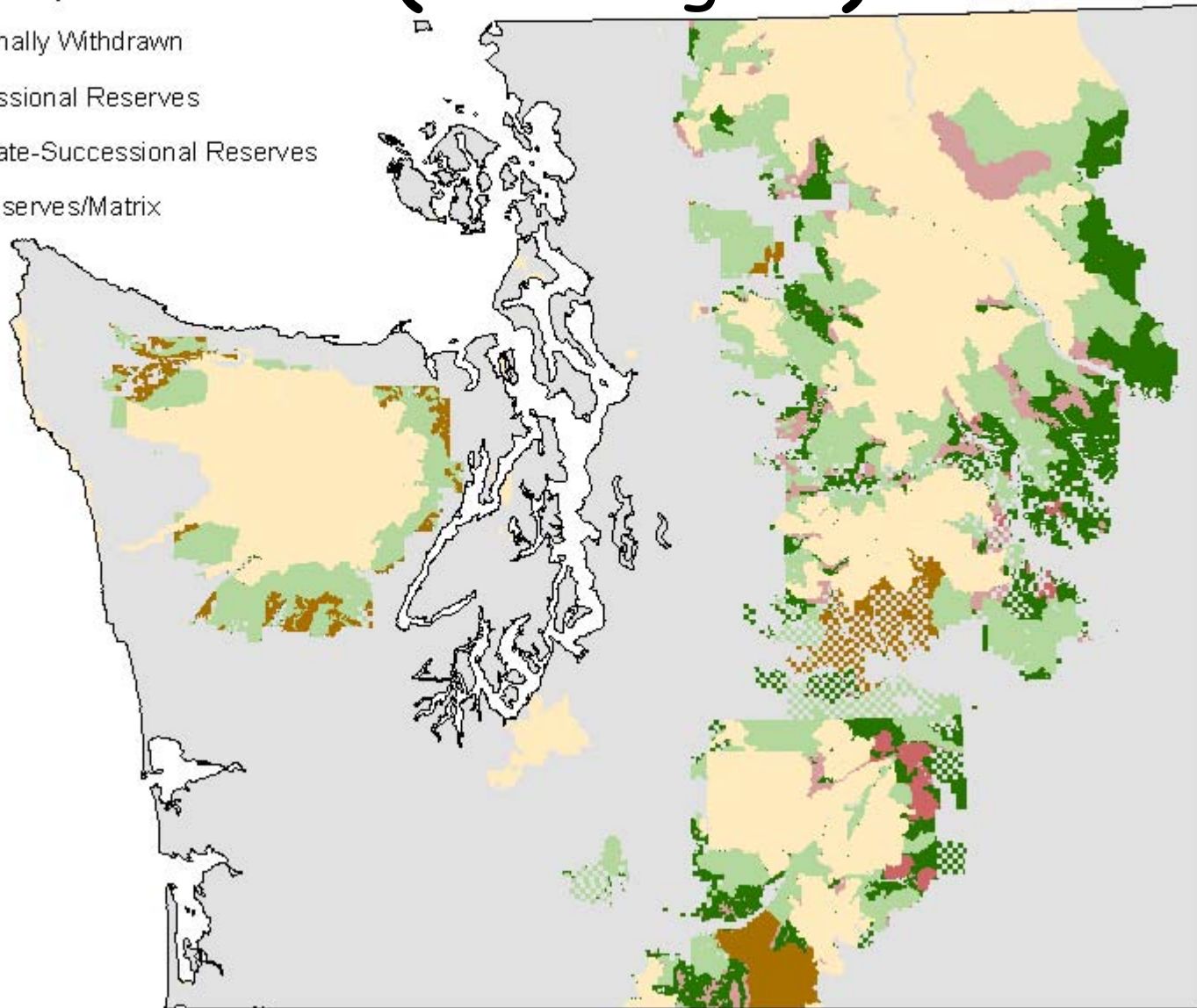
# Cluster Model Results

- ✦ Clusters of 20-25 pairs support persistent populations if juvenile search efficiency is high and edge effects are minimal (Lamberson et al. 1994)
- ✦ Distance between clusters less important than size, for larger clusters
- ✦ More recent work suggests 30-40 pairs per cluster are needed to achieve local stability (Noon and McKelvey 1996)

# Land Allocations (Washington)

## Allocations

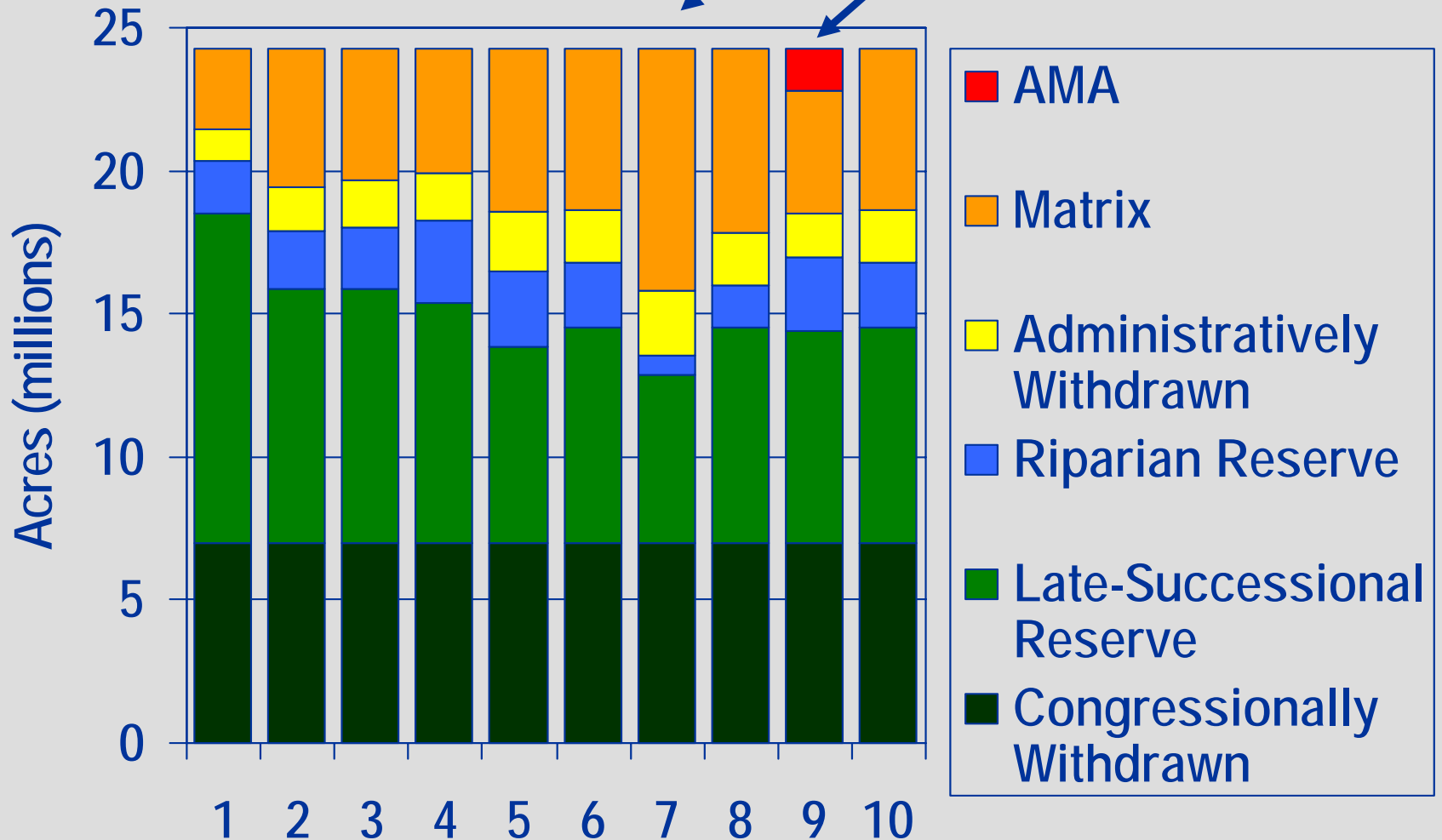
- Adaptive Management Areas
- Administratively Withdrawn
- Congressionally Withdrawn
- Late-Successional Reserves
- Managed Late-Successional Reserves
- Riparian Reserves/Matrix



# 10 Alternatives Considered

Recovery Plan

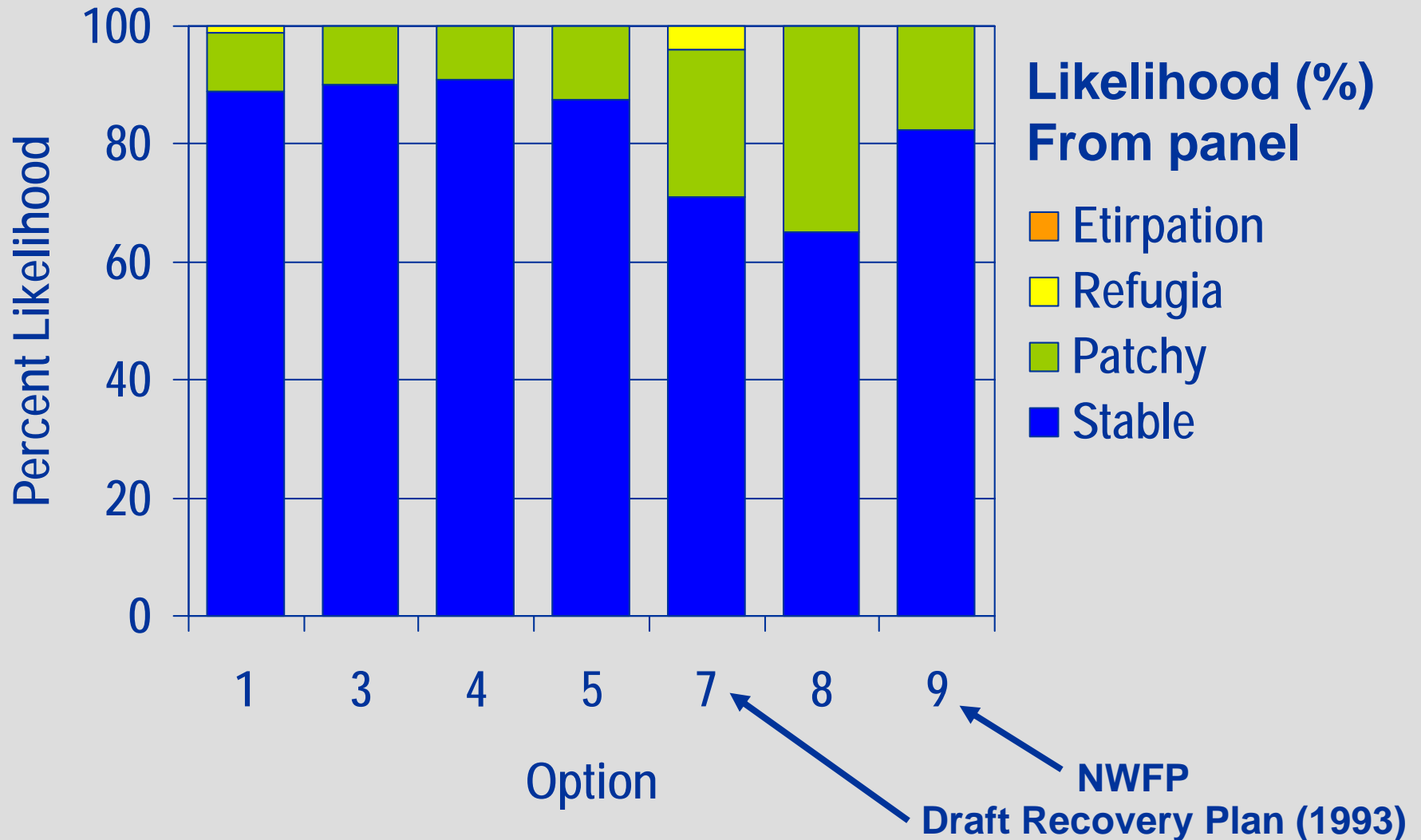
NWFP



# 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

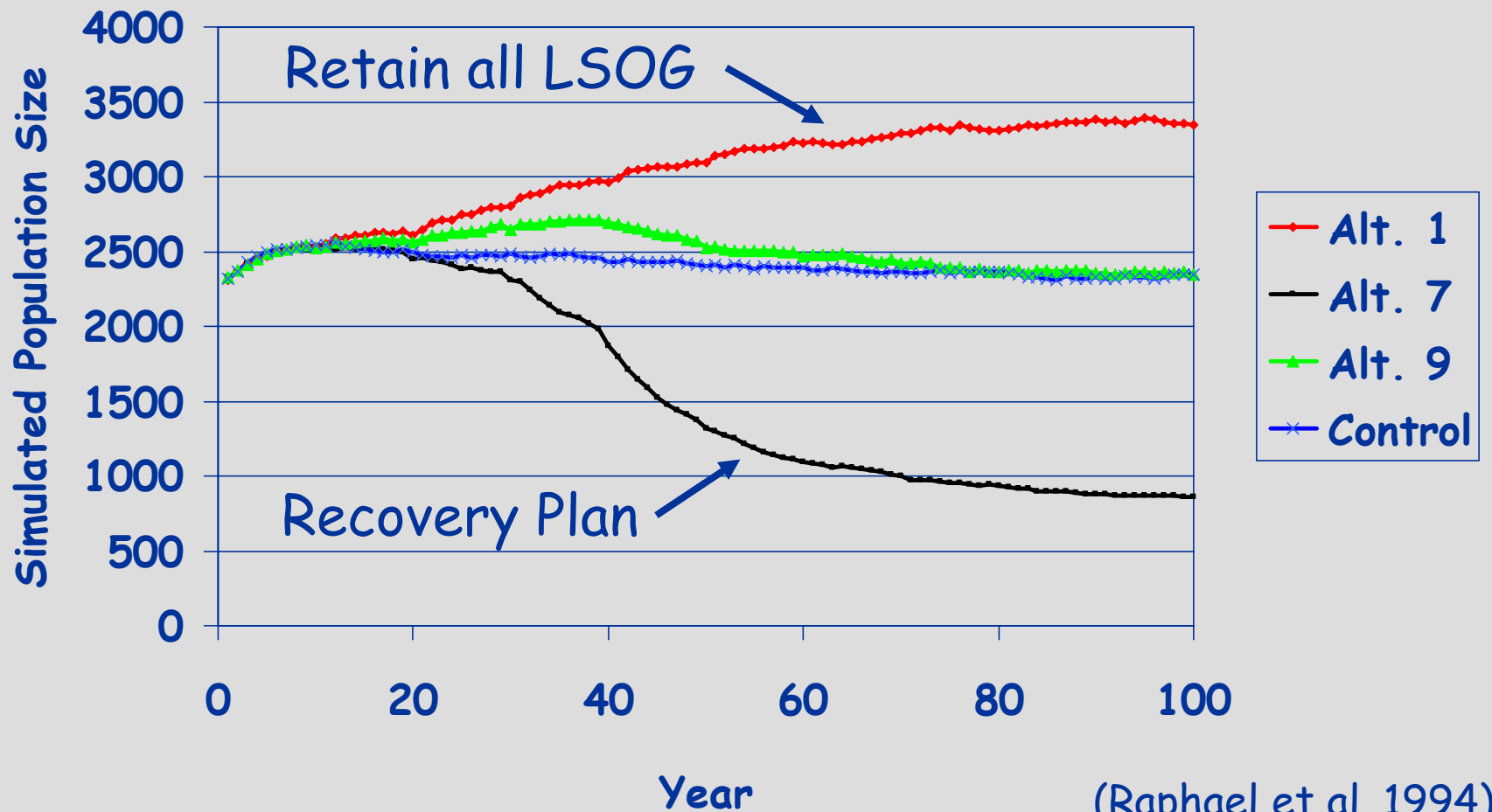
# Spotted Owl Viability



# Spatially-explicit Population Model

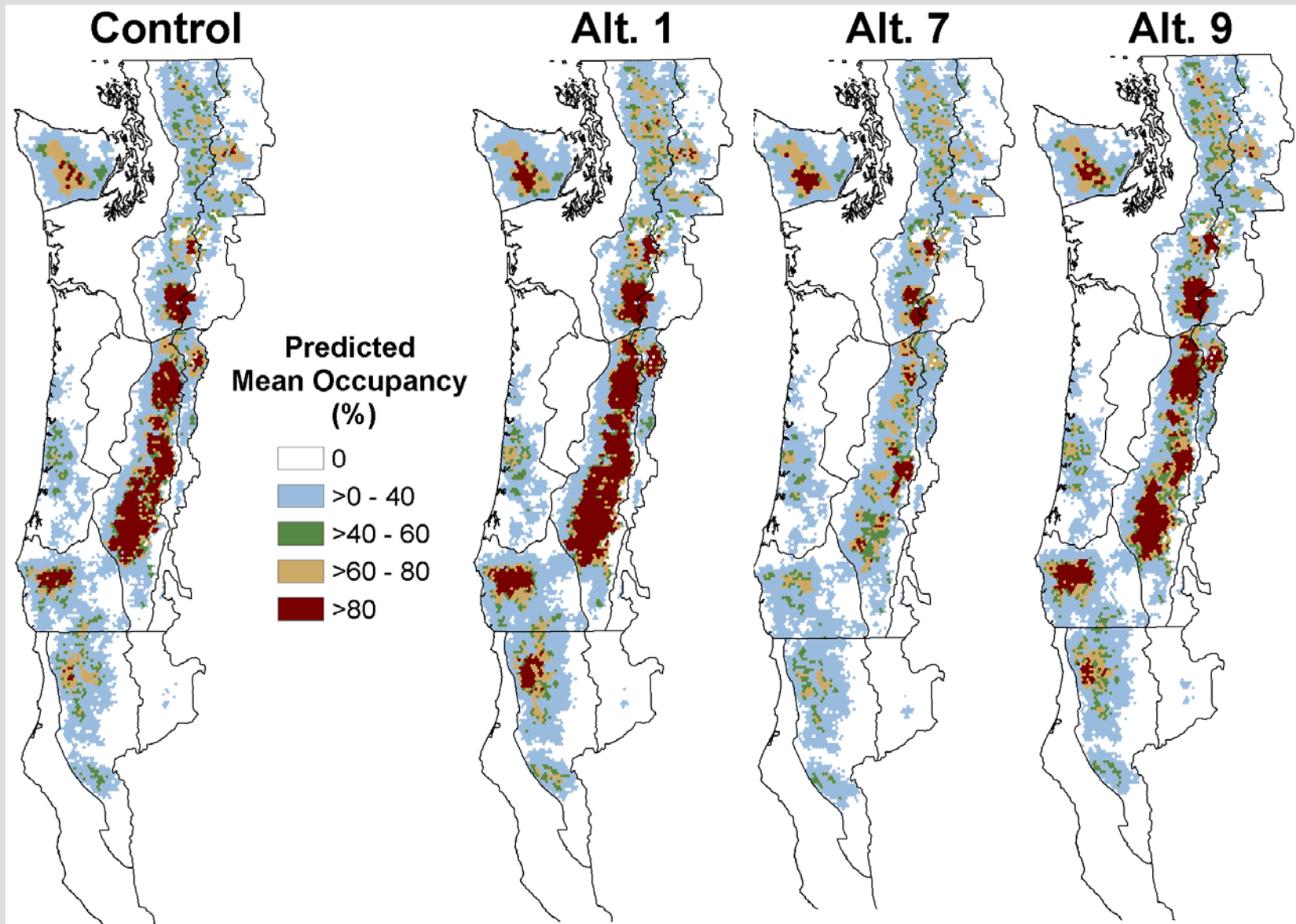
- ✦ "Owl" software (McKelvey et al. 1993)
- ✦ Modeled habitat and change only on federal lands
- ✦ Modeled 4 harvest and growth scenarios:
  - ✦ No change from current conditions
  - ✦ Retain all existing LSOG forest (Alt. 1)
  - ✦ Draft Recovery Plan (Alt. 7)
  - ✦ NWFP (Alt. 9)
- ✦ Regrowth assuming constant rate
- ✦ Harvest based on PSQ estimates by province
- ✦ No fire or barred owl effects

# Spatially-explicit Model Outcome (Oregon Cascades and Coast)



(Raphael et al. 1994)

# Spatial distribution - occupancy after 100 yr



(Raphael et al. 1994)

# Summary Considerations

- ✦ Models were based on early demographic results - newer data now available
- ✦ Newer models are available (e.g., "Patch")
- ✦ Recent studies might allow better parameterization of relationships between habitat and vital rates (e.g., Franklin et al. 2000; Olson et al. 2005; Dugger et al. 2005)
- ✦ Modeling effects of Barred Owl could be attempted