Conservation of the Northern Spotted Owl and Marbled Murrelet 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 and the Marbled Murrelet that will provide for viability of each species -- for the owl, well distributed along its current range on federal lands, and for the murrelet so far as nesting habitat is concerned"

--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
- Contiguous blocks are better than fragmented blocks
Primary sources

- FEMAT report and subsequent EIS’s
- Monitoring plans
- Status and Trend reports
  - Lint (owl)
  - Anthony et al. (owl demographics)
  - Huff et al. (murrelet)
  - Moeur et al. (old forest)
- Status reviews
  - Courtney et al. 2004 (owl)
  - McShane et al. 2004 (murrelet)
- Other recent literature
Contrasting lifestyles

- Year-round forest resident
- Nesting, roosting, foraging
- Home range in forest

- Part-time forest resident
- Nesting only
- Home range includes forest and ocean
- Complex habitat associations that vary along range
- Adult survival rate is limiting
- Lots of data

- Tied to large trees with “platforms” to support nests
- Recruitment is limiting
- Highly cryptic, little data
Expected trends

- Populations would decrease until rate of habitat recovery exceeds loss
- Conservation of existing habitat in reserves
- Restoration of unsuitable habitat in reserves
Observed population trends

- Population declining at mean rate of 3.7% per year over range
- Rate of decline greater in northern part of range (7.4% per year average)
- Stable or slight decline in southern range (2.0% per year average)
Rate of population change 1990-2003
(Anthony et al. 2004)
Ownership does not explain rates of decline
(each dot is a demographic study area)
Observed population trends

- Four years of population surveys
- Density varies within range
- Stable population trend from 2000 to 2003; more years needed to be confident
- Demographic models (McShane et al. 2004) would suggest ~ 5% decline per year
Population Estimate (+/- 95% C.I.)

(Miller et al. in press)
Population Estimate With 95% Confidence Interval

Population by Conservation Zone & Year

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5

- 2000
- 2001
- 2002
- 2003
Observed habitat trends

- Baseline habitat estimates have been completed for entire range
- Most acres of higher-suitability habitat are in reserves on federal land
- Significant amounts of habitat occur on nonfederal land
Habitat losses

- Expected rate of loss from harvest was 2.5% per decade
- Observed rate of loss was <0.3%

- Expected rate of loss from fire was also 2.5% per decade
- Observed rate was 1.3%

- Rates vary by state but are well below expectations
• Over 60% of forested land in reserves has potential to become nesting habitat

• Moeur et al. (in press) estimate 1.5% net annual increase in extent of larger-diameter forest

• Nesting habitat will increase over time, but net rate is uncertain
Nesting habitat federal, nonfed.  
Foraging habitat federal, nonfed.  
Production of young  
Prey abundance and distribution  
Recruitment  
Adult survival  
Population status and trend  
Competitors (Barred Owl)  
Disease (WNV)  
Climate  
Distribution and movement
Interactions are important

Climate Gradient (Franklin et al. 2000)
Summary Considerations

- Owl and murrelet populations respond to multiple stressors, only some of which are under control of federal land managers.
- Stressors differ for owls and murrelets.
- Habitat remains a necessary, but not sufficient, requirement to conserve these birds.
- The Plan’s habitat provisions are on the right trajectory.
Habitat takes time to develop
Summary Considerations

- Multiple large reserves remain a valid conservation strategy to conserve and restore habitat
- Reserves will eventually produce a net increase in suitable habitat
- Uncertainties remain, due to emerging threats and factors outside federal management control
- Federal and nonfederal lands play roles in conservation