

**Raphael, M.G.; Evans-Mack, D.; Marzluff, J.M.; Luginbuhl, J.M. 2002.** Effects of forest fragmentation on populations of the marbled murrelet. *Studies in Avian Biology*

- This paper refers to edge often. It defines edge as “clearcuts, roads, and rivers.” The authors limit their definition of a “clearcut” to stands aged 1-15 years old.

**Nelson, Hamer. USDA Forest Service Gen. Tech. Rep. PSW-152. 1995.** Nest Success and the Effects of Predation on Marbled Murrelets.

- Here the authors define edge once as “unnatural openings, including but not limited to, roads and clearcuts.”

**Van Rooyan, Malt, Lank. Northwest Science, Vol. 85, No. 4, 2011** Relating Microclimate to Epiphyte Availability: Edge Effects on Nesting Habitat Availability for the Marbled Murrelet

- This paper got into a bit more depth on edge. The authors state that “dense canopy of regenerating forest at soft edges buffers the negative impacts of altered microclimate at forest edges.”
- They go on to define “regenerating forests” as forests between age of 11-30 years old and that such buffers may act as a “buffer.”
- Finally, they state that adverse impacts from edge are reduced as clearcuts “regenerate” and define this timeline as 20-30 years old.

**Malt, Lank. Biological Conservation 140 (2007) 160-173.** Temporal Dynamics of Edge Effects on Nest Predation Risk for the Marbled Murrelet.

- The authors define “hard edges” as “recent” clearcuts and “soft edges” as “regenerating forests.”
- The paper notes that “as replanted forests regenerate, predation risk at these edges appears to decrease back towards, or even below interior levels.”

**Malt, Lank. Ecological Applications, 19(5), 2009, pp. 1274–1287.** Marbled Murrelet nest predation risk in managed forest landscapes: dynamic fragmentation effects at multiple scales.

- This study suggests that regenerating forest 20–40 years old will provide relative safety from avian predators at both patch and landscape scales.

The MAMU Recovery Plan discusses edge but doesn’t clearly define what edge is. It does define “abrupt edge” as “clearcuts or fields.” The Plan “hypothesizes” that “logging activities increase the susceptibility of marbled murrelet nest to predation, because of increased edge and fragmentation created by clearcut harvest and selective harvest\*.”

\*this was the only place I could identify a hypothesis that “selective” harvest could be considered a detrimental “edge.”