Ecological values of old forests: tree, stand, and landscape scales

Genetic
Old trees contain genetic information that makes them more resilient to disturbances like beetles, wildfires, and drought.

Biodiversity
Bark texture and canopy structure change with age, creating unique micro-habitats.

Habitat
Old trees can survive and persist for a very long time, providing a range of unique habitats as decay and damage occurs.

Unique structures and habitat features develop over long periods of time that enhance biodiversity and support uncommon species and species at risk.

Historical
Old trees provide a source of information on historical climate conditions, disturbances, and cultural uses.

Sense of place
Attachment to a place that provides a feeling of connection.

Structural variability
Structural complexity is a product of long time scales and cannot be reproduced artificially.

Hydrology
Older stands intercept more snow, buffer run off, filter water, and provide shade to regulate stream temperatures.

Carbon capture
Older trees allocate less carbon for above-ground growth, storing more carbon in stable below-ground reserves which contributes to climate stability more than young trees and wood products

Older stands store carbon in standing trees, downed and decaying wood, understory plants, forest floor, and below ground soil reservoirs.

Nutrient
Older stands have unique soil biodiversity including insects, bacteria, and fungi. Intact underground fungal networks enhance nutrient dynamics and the health of young trees.
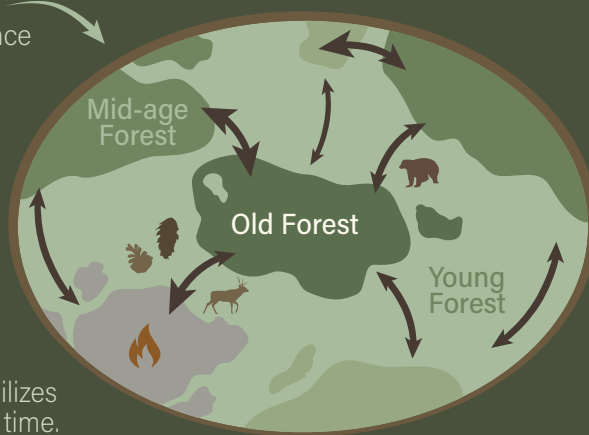
Interconnected ecosystems
The size of old forest patches and distance between them influence how species establish, disperse, and move which promotes ecosystem integrity at different scales.

Functionality
The spatial arrangement of old forests influence how species and nutrients move around the landscape.

Resiliency
Biodiversity from old forest patches stabilizes disturbed patches via reduced recovery time.

Mid-age Forest

Old Forest

Young Forest

Even   Random   Clumped

Ecosystem variability
Spatial patterns influence landscape functionality, resiliency, and interconnections.

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