WSU EXTENSION FORESTRY

Western Washington Stand Dynamics

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A stand is an area of similar forest vegetation.

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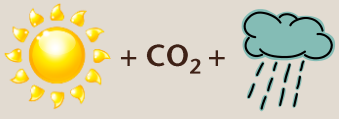
Forests are solar-powered.



= Sugar + O_2

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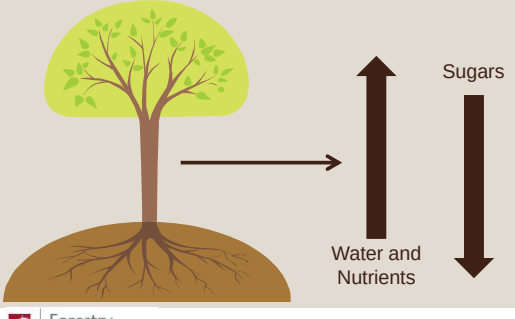
Tree stems are critical transport pathways between the crown and the roots.



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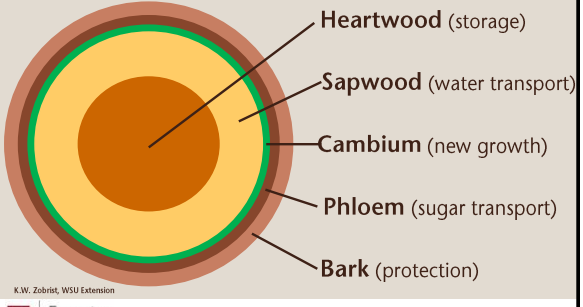
Different parts of the tree stem have different functions.



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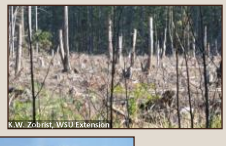
The forest development cycle begins and ends with a stand-replacing disturbance.



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Stand initiation is the first stage of forest development.

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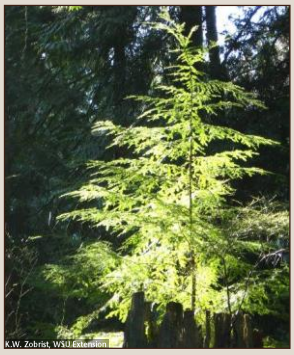
Succession is the change in the mix of tree species present in a stand over time.



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Forest communities vary in space and time based on competitive advantage.

Photos: K.W. Zobrist, WSU Extension

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Succession tends to begin with fast-growing, shade-intolerant pioneer species.

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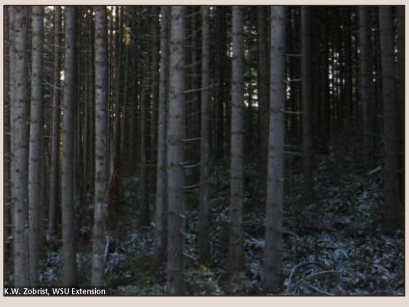
Stem exclusion is the dark, dense second stage of development.



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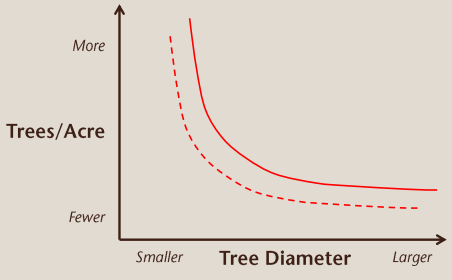
There is a limiting relationship between stand density and tree size.



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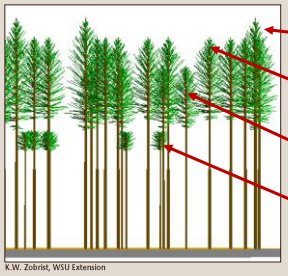
During this competitive process, trees differentiate into different crown classes.



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In understory reinitiation, space begins to open up for understory trees and shrubs.

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Over time, shade-tolerant species fill in gaps.

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Continued development without disturbance results in the complex old growth stage.

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Different ecological processes are at work during development and succession.

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Competition-based mortality characterizes the stem exclusion stage.

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The formation of gaps is an important part of late-successional development.

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Here are a few summary points.

1. Forests are dynamic.
2. Disturbance is not necessarily a bad thing.
3. Density management is important.
4. Keep diversity in mind.

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Here are some additional references and resources:

- Forest Ecology in Washington (WSU Extension Bulletin EB1943)
- Silviculture for Washington Family Forest Owners (WSU Extension Bulletin EB2000)
- Diversifying Forest Structure to Promote Wildlife Biodiversity in Western Washington Forests (WSU Extension Manual EM044)
- Natural Disturbance and Stand Development Principles for Ecological Forestry (USFS GTR-NRS-19)
- Forest Stand Dynamics (Oliver and Larson, 1990)

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