Diseases & Management

Strategies				
Disease	Method of spread			
Armillaria root disease	Roots			
Laminated root rot	Roots			
	I			

Annosus root rot

Black stain root disease

Port-Orford-cedar root disease

D	C : C
Roots	All species

Insects, roots

Water, mud, roots

pines

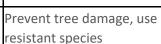
cedar

Port-Orford-

Major hosts



oaks



resistant species





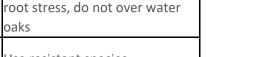
Avoid infested areas & use

Management strategies

Maintain tree vigor and avoid



Conifer species Use resistant species







Phytophthora's (e death)	.g. sudden oak Water,	soil, roots M	Avoid infes sanitation		ted areas & practice
Insects, Hosts & A	ffected Areas of Tree				
Insect	Major host(s)	Location	Parts of tree affected		Outcome (mass attack)
Mountain pine beetle	Pines, mostly lodgepole and sugar pines	Main Stem	Inner bark/cambium		Tree death
Western pine beetle	Ponderosa and coulter pine	Main Stem	Inner bark/cambium		Tree death
Jeffrey pine beetle	Jeffrey pine	Main Stem	Inner bark/cambium		Tree death
Douglas-fir beetle	Douglas-fir	Main stem and/or branches	Inner bark/cambium		Tree death or top dieback

Whole tree

Fir engraver

True firs

Inner bark/cambium

Tree death

Insect	Major host(s)	Location	Parts of tree affected	Outcome (mass attack)
Pine engraver (ips species)	Most pines	Top of living trees and green slash	Inner bark/cambium	Top kill in large trees, may result in smaller tree death
Flatheaded fir borer & flatheaded pine borer	Douglas-fir, firs, spruce, pines; hemlock & larch	Whole tree/ dead or dying	Inner bark/cambium	Tree death
Red turpentine beetle	Any pine	Bottom five feet	Inner bark/cambium	Rarely tree death
Ambrosia beetles	Hardwoods & softwoods	Whole tree/ dead or dying	Sap and heartwood	Tree death or top dieback
Cedar and cypress bark beetles	Cypress, juniper, redwood	Whole tree/ dying	Inner bark/cambium	Tree death or branch dieback

Insect	Major host(s)	Location	Parts of tree affected	Outcome (mass attack)
Oak bark beetle	Buckeye, oak, tanoak	Whole tree/ dying	Inner bark/cambium	Tree death