The Science of Sustainable Sites: Native Plant Considerations

May 31, 2011

Ben Alexander, Sound Native Plants

SOUND NATIVE PLANTS

What is a "native" plant?

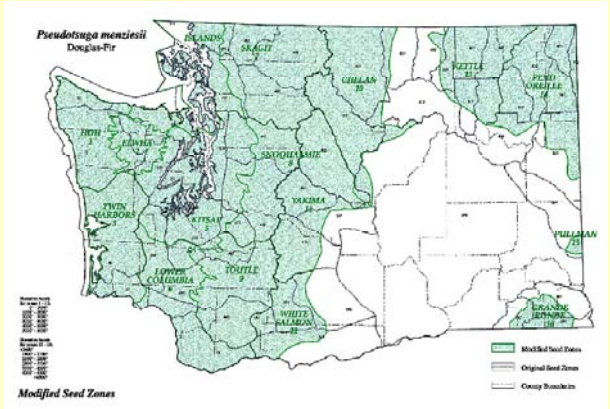
- "Washington native plants are those species that occur or historically occurred within the state boundaries before European contact based upon the best available scientific and historical documentation."

- Washington Native Plant Society

Spinulose woodfern detail from Lewis' journal, 1806

Salal sketch from Clark's journal, 1806

Location, location, location



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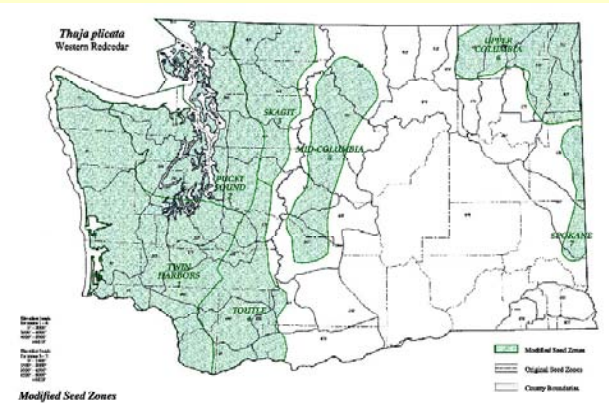

What's in a name?

Arctostaphylos uva-ursi 'Vancouver Jade'

Arctostaphylos uva-ursi 'Massachusetts'

Named cultivars of native species may have diverse origins

These are NOT western Washington natives!

Butterfly bush (*Buddleja daviddii*) – *Class C noxious weed*

English ivy (*Hedera helix*) – *Class C noxious weed*

Garden St John's wort (*Hypericum calycinum*)

Common St John's wort (*Hypericum perforatum*) – *Class B noxious weed*

Creeping Oregon grape (*Mahonia repens*) – *native to eastern Washington, does not occur naturally west of the cascade crest*

Beach rose (*Rosa rugosa*) – *introduced species has started to interbreed with native roses along the coast*

Wood rose (*Rosa woodsii*) – *native to eastern Washington, does not occur naturally west of the cascade crest*

Periwinkle (*Vinca minor, V. major*)

Cultivars of natives – examples: *Mahonia aquifolium* **'Compacta',** *Cornus sericea* **'Kelseyi',** *Cornus* **'Eddie's white wonder'**

Save all the pieces

"The last word in ignorance is the man who says of an animal or plant, "What good is it?" If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering."
— Aldo Leopold (Round River: From the Journals of Aldo Leopold)

How native plants are propagated

- **Preserve native genetics "save all the pieces"**
- **Maximize genetic variability: sizes, forms color, seasonality**
- **Small quantities from each source**
- **Collect from many sources**
- **Multiple locations**
- **Change sources often**
- **No "parent stock"**
- **Document locations**

Wild seed collection

- Crop availability varies widely from year to year
- Seed viability varies widely
- Propagation needs largely determined by trial-and-error

What is "Ecological Restoration"?

"Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed."

-Society for Ecological Restoration

"Restoration is an ecological act on behalf of the future, with respect for the past."

-Terry Tempest Williams

Ecological restoration vs. landscaping

- Restoration goals might include:
  - Improve salmon rearing success rate
  - Augment nesting sites for migratory birds
  - Increase diversity of stream aquatic insects
  - Expand water storage to improve flood control
  - Prevent spread of non-native species
  - Increase rare plant populations
- Landscaping goals might include:
  - Hide undesirable views
  - Reduce street noise
  - Provide bright fall foliage
  - Create shade to reduce summer cooling costs
  - Display aesthetically pleasing color combinations
  - Delineate paths and sitting areas

Look for restoration opportunities on development sites

Use GIS tools

- Map soils, slopes, natural features

Check habitats & species databases

- Washington natural heritage program

Identify critical areas

- shorelines, wetlands, streams, prairies, oak woodlands, forests, wildlife corridors

Consider ecosystem functions and values

Restoration opportunity: ditched stream

- Stream crosses a wetland in ditch and pipe
- House is in the shoreline buffer
- House is in the stream buffer
- House is in the wetland buffer

Solution: move stream away from house & daylight stream

- Stream is 25' from house
- Runs above ground
- Native plants for habitat
- Required a setback variance

Homeowner and county both win

- House has nice new amenity
- Addition was permitted
- Stream offers much better habitat for fish & wildlife


After: outlet to beach
06/11/2003


Before: View downstream


After: View downstream
13/10/2004


Before: View upstream
17/10/2003

Restoration opportunity: oak woodland

- Highly endangered ecosystem
- Douglas fir overtopping oaks and choking them out
- Invasive weeds spreading through understory
- Site being used for illegal dumping

Step 1: Map tree locations

- Delineate extent of oak canopy
- Measure and map locations of invading Douglas fir

Step 2: Plan site to preserve oaks

- Reduce number of lots
- Configure lots, roads and utilties to minimize oak impacts
- Place oak woodlands in open space tracts

Step 3: Develop a restoration plan

- Protect existing oaks during construction
- Remove overtopping Douglas fir trees using low-impact logging techniques
- Eradicate invasive weeds
- Plant oak seedlings in openings

ALBANY STREET OAK WOODLAND
HABITAT MANAGEMENT PLAN
Revision B

Prepared for:
R. Johnson Construction
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SOUND NATIVE PLANTS

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March 11, 2005
Rev. A July 15, 2005
Rev. B July 10, 2007

Step 4: Protect existing vegetation

Install construction fencing around protected oak woodlands

Step 5: Remove conifers

Move Douglas fir logs with trackhoe to minimize soil damage

Step 6: Revegetate with native plants

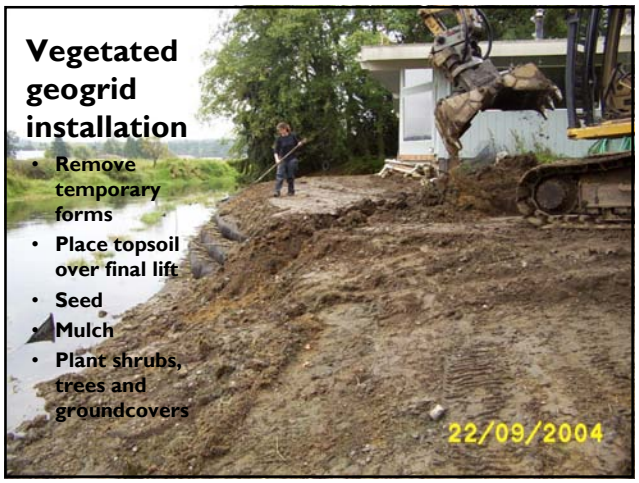
Opening ready to plant following conifer & weed removal

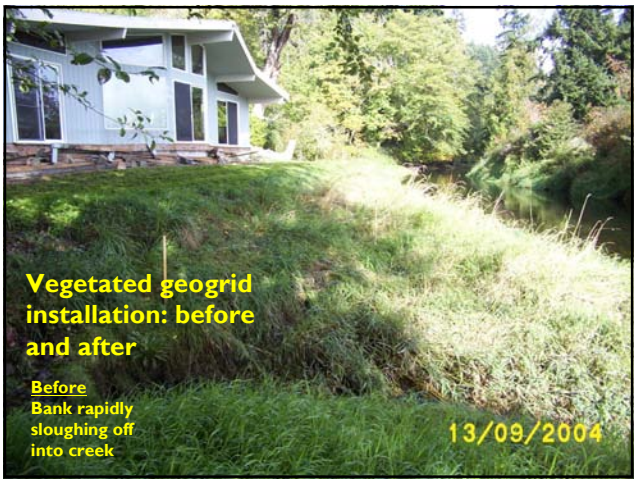
Restoration opportunity: eroding slope

- Slope erosion threatens structures
- Bioengineering offers alternative to retaining walls

Vegetated geogrid installation

- Wrap geotextile over the top and staple down
- Zigzag cuttings with the ends protruding out
- Spread topsoil over the cuttings



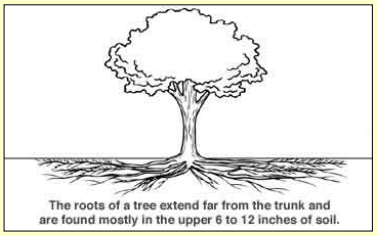


Protect native plants during construction

Reuse land clearing debris on-site

Prevent damage to trees

- Install fences or barriers around trees
- Avoid driving or parking near trees
- Don't spread soil over the tree root zone
- Don't dig trenches near trees
- Tunnel utilities under trees if possible
- Don't dump yard waste under trees

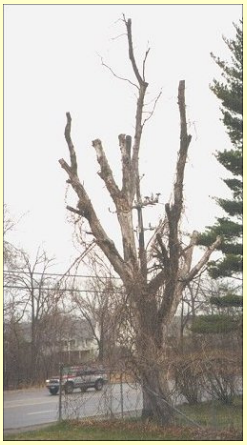


Drawing by International Society of Arboriculture, used by permission

Keep equipment out of vegetated areas

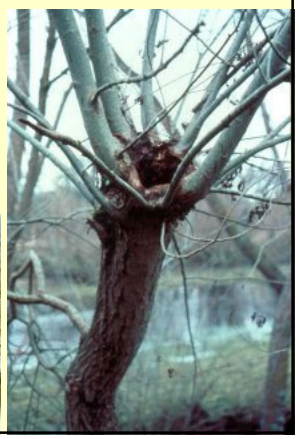
Tree topping is bad for trees

- Ugly
- Expensive
- Can lead to sunburn



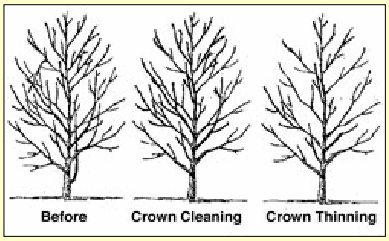
Topping causes more problems

- Stresses trees
- Causes decay
- Creates hazards
- High maintenance



Alternatives to tree topping

- Thinning removes dead and unhealthy branches
- Reduces weight
- Reduces susceptibility to wind throw
- Improves air circulation
- Proper pruning insures tree health
- Hire a certified arborist



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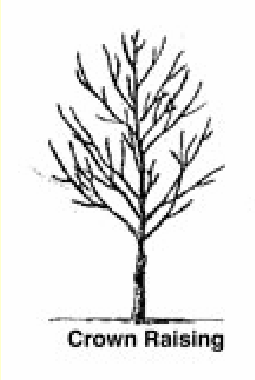
Alternatives to tree topping

- Crown raising removes lower limbs
- Improves view through lower portion of trees



Alternatives to tree topping

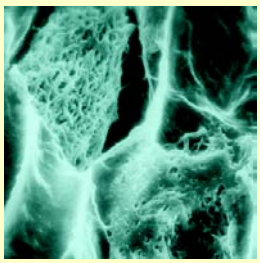
- Prune "windows" to maintain views
- Selectively remove individual trees
- Plant low growing vegetation

Protect soils on site

- Super-low ground pressure machinery may be able to access across wet areas

Soil flora and structure

- Uncompacted soil contains complex web of fungi and microorganisms that benefit vegetation
- Soil compaction destroys soil biota and structure



Damaged soils

- Extreme compaction
- Inadequate fertility
- Un-plantable (too rocky or clayey)
- Contamination

Damaged soils

- Soil decompaction is essential for damaged, hardened soil

Use caution with soil amendments

- Commercial topsoil usually contains 15% OM by weight
- Native topsoils contain about 5% OM by weight
- Abnormally high levels of nutrients can have negative effects on plant and soil health
- Any nutrients not immediately utilized by microbes or plants contribute to non-point source pollution
- Before adding organic amendments, have your soil tested
- Be conservative with organic amendments; add only enough to maintain 5% OM
- Do not incorporate organic amendments into landscapes destined for permanent installations; topdress with mulch instead

Adapted from Linda Chalker Scott, WSU

Mulching

- Retains soil moisture
- Suppresses weed growth
- Adds organics to soil
- Arborist chips work great - watch out for weed seeds
- Not a magic bullet

Seeding

- Only for short-term surface erosion control
- Grass cover on slopes can get heavy and slide when wet
- Grass competes with desired plants for soil moisture

Using biodegradable erosion control fabrics

- For surface erosion only
- Must be installed in contact with the soil
- Proper installation is critical
- Erosion control fabrics have limited value on steep slopes

Plant selection

- Matched to project goals
- Appropriate for site conditions (right place, right plant)
- Consider mature size
- Suitable layout and spacing
- Safety considerations
  - Tree hazards
  - Sight lines
  - Human & animal toxicity

Conifers for full sun: Douglas fir

- Commonest conifer in western Washington
- Tall, deep rooted
- Sun and drought tolerant
- Tends to shed limbs

Conifers for full sun: Shore pine

- Fast growing pine
- Mature size 40-60'
- Sun and drought tolerant
- Wide range of moisture tolerance

Photo by Sarah Thomas

Conifers for full sun: Western white pine

- Fast growing pine
- Mature size 100-150'
- Sun and drought tolerant
- Susceptible to blister rust

Photo by Miguel Vieira

Broadleaf trees for full sun: Red alder

- Colonizes disturbed areas and riparian zones
- Fast growing
- Nitrogen fixer
- Starts up naturally from nearby trees
- Somewhat difficult to transplant
- Relatively short-lived

Broadleaf trees for full sun: Bigleaf maple

- Common on coastal bluffs and in riparian areas
- Fast growing
- Deep rooted
- Sprouts from stumps
- Easy to establish
- Sun and shade tolerant

Broadleaf trees for full sun: Pacific madrone

- Common on coastal bluffs
- Slow growing
- Deep rooted
- Prone to root disease
- Very difficult to establish
- Peeling red bark
- Produces large quantities of red berries

Photo by Simon Johnston

Broadleaf trees for full sun: Black cottonwood

- Needs moist soil
- Mature height 100-150'
- Fast growing
- Deep rooted
- Grows from cuttings and stumps
- Easy to establish
- Reputation for brittleness
- Fragrant flowers

Shrubs for full sun: Red flowering currant

- Open riparian zones
- Mature height 8 -10'
- Drought tolerant
- Easy to establish
- Attracts hummingbirds in spring
- Prefers nutrient-poor soils

Shrubs for full sun: Red osier dogwood

- Mature height 10-15'
- Fast growing
- Thicket forming
- Easy to establish
- Sun and shade tolerant
- Food source for birds and wildlife

Shrubs for full sun: Common snowberry

- Throughout the northwest
- Strong fibrous roots
- Mature height 4-6’
- Thicket forming
- Easy to establish
- Sun and shade tolerant
- Wet and dry tolerant

Shrubs for full sun: Oceanspray

- Coastal bluffs and forest under-story
- Mature height 12’
- Deep, fibrous roots
- Drought tolerant
- Easy to establish
- Sun and shade tolerant

Shrubs for full sun: Nootka rose

- Riparian areas and moist forest openings
- Fast growing
- Forms thickets, spreads aggressively
- Competes with blackberry
- Easy to establish
- Sun to part shade

Shrubs for full sun: Thimbleberry

- Riparian areas and moist slopes
- Mature height 3-5’
- Fast growing
- Spreads quickly by root suckering
- Easy to establish
- Sun and shade tolerant
- Edible fruit

Groundcovers for full sun: Coastal strawberry

- Sandy coastal soils
- Fast growing ground-cover
- Semi-evergreen
- Spreads rapidly by runners
- Easy to establish
- Sun or part shade
- Edible fruit

Groundcovers for full sun: Kinnikinnik

- Coastal bluffs and rocky, well drained sites
- Slow growing ground-cover
- Evergreen
- Spreads by runners
- Sun and shade tolerant
- Dislikes rich soil

Groundcovers for full sun: Sedums

- Rocky outcrops
- Tough spreading ground-cover
- Drought tolerant
- Evergreen
- Sun and shade tolerant
- Most species have brightly colored, persistent flowers

Flowering perennials for full sun

Balsamroot

Oregon iris

Common camas

Whit fawn lily

Canary violet

More flowering perennials for full sun

Nuttall's larkspur

Western columbine

Broad leaved shooting star

Early blue violet

Conifers for shade: Western hemlock

- Common tall conifer in western Washington
- Mature height 150 – 200'
- Deep rooted
- Requires shade
- Grows slowly
- Starts beneath forest canopy

Conifers for shade: Western red cedar

- Common riparian tree
- Mature height 150 – 200'
- Deep rooted
- Needs moist soil
- Somewhat hard to establish in full sun
- Prone to deer browse

Broadleaf trees for shade: Vine maple

- Moist forests & riparian zones
- Mature height 20-25'
- Colorful fall foliage
- Prefers moist soil

Broadleaf trees for shade: Cascara

- Moist forests & openings
- Mature height 25-30'
- Colorful fall foliage
- Berries are important food for birds and wildlife
- Edible fruit

Shrubs for shade: Salmonberry

- Riparian areas and wet slopes
- Mature height 6' – 8'
- Fast growing
- Spreads by root suckering, forms thickets
- Competes with blackberry
- Easy to establish
- Somewhat sun tolerant

Shrubs for shade: Salal

- Forest under-story
- Evergreen ground-cover
- Slow growing
- Spreading or semi-erect
- Difficult to transplant in the wild
- Prefers shade & woody mulch

Shrubs for shade: Low Oregon grape

- Forest understory
- Evergreen ground-cover
- Slow growing
- Spreading or semi-erect
- Difficult to transplant in the wild
- Prefers shade & woody mulch
- Edible berries

Groundcovers for shade: Inside out flower

- Dry shady forests
- Spreading, fast growing
- Easy to establish
- Shade or part sun

Groundcovers for shade: Oregon oxalis

- Dry shady forests
- Spreading, fast growing
- Easy to establish
- Full shade

Flowering perennials for shade

Western trillium

Smith's fairy bells

Wild ginger

Foamflower

Woodland beardtongue

For an evergreen hedge try

California wax myrtle

Instead of English laurel

For evergreen groundcover, try

Kinnikinnik

Instead of Cotoneaster

For fast-spreading groundcover, try

Coastal strawberry

Instead of Pink Panda strawberry

Groundcover development

Coastal strawberry planted 18" on center

For deciduous screening, try

Red osier dogwood

Instead of bamboo

For berry-bearing specimen shrubs, try

Evergreen huckleberry

Instead of nandina

For foliage trees, try

Vine maple

Instead of Japanese maple

For evergreen shrubs, try

Tall Oregon grape

Instead of dwarf holly

For deciduous borders, try

Fairy bells

Instead of epimediums

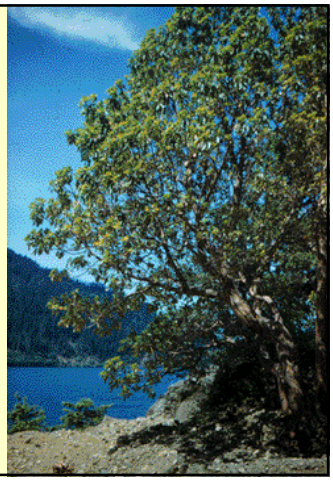
For specimen flowering shrubs, try

Pacific rhododendron
(the state flower)

Instead of hybrid rhododendrons

Marine shoreline trees

- Douglas fir
- Pacific madrone
- Big leaf maple
- Sitka spruce
- Grand fir
- Shore pine



Marine shoreline shrubs

- Willows
- Oceanspray
- Salal
- Snowberry
- Evergreen huckleberry

Plants you are unlikely to see anywhere but near marine shorelines:

- Hairy honeysuckle
- Poison oak
- Hooker's willow

Common errors: not enough space

This oceanspray will . . .

. . .become this oceanspray

Common errors: placing shade plants in the sun

Salal shouldn't look like this

it should look like this

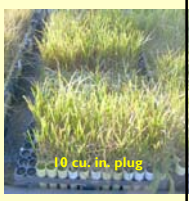
Common errors: inappropriate specs

Maximum 2-gallon:
- Most native shrubs

Maximum 1-gallon:
- Low Oregon grape
- Salal

Maximum 4" pot or plug:
- Soft rush
- Slough sedge
- Most emergents
- Coastal strawberry

Limited availability:
- Pacific yew
- Pacific dogwood
- Pacific madrone



A note about the size of plant materials

Small plants:
- Need less watering
- Recover quicker from transplanting

Large plants :
- Harder to move
- More laborious to plant
- Longer to get established

Condition of roots more important than size of above-ground portion

Common errors: inadequate maintenance

- Native plants need watering at first
- Irrigate and weed for 2+ years to improve survival
- Survival rates will vary by species and type of plant material
- Irrigate for 2-3 seasons, infrequent, deep watering

Sample plant assemblage #1

Bleedingheart and salal understory in a parking strip

Sample plant assemblage #2

Coastal strawberry and red flowering currant paired with Cornus 'Eddie's white wonder" – a hybrid that resists anthracnose

Sample plant assemblage #3

Sword fern and tall Oregon grape underneath vine maple and Cornus 'Eddie's white wonder'

Sample plant assemblage #4

Pacific ninebark, Pacific rhododendron and shore pine

Sample plant assemblage #5

Thimbleberry used to screen a fence

Sample plant assemblage #6

Snowberry and ninebark to screen a parking area

Sample plant assemblage #7

Fairy bells and sword fern paired with ornamental bleeding hearts and low-growing bamboo

Sample plant assemblage #8

Snowberry, thimbleberry, tall Oregon grape & coastal strawberry

Sample plant assemblage #9

Large leaf lupine & fringecup in the parking strip

Sample plant assemblage #10

Tall Oregon grape, great camas, and coastal strawberry

Sample plant assemblage #11

Rhoemer's fescue & snowberry under an ornamental conifer

Thank you!

For more info:

www.soundnativeplants.com