

Plant Materials

ESRM 302/CFR 590
Restoration Design

General Requirements

- Native
- Appropriate for restoration goal (to restore wetland, prairie, etc.)
- Will survive site conditions
- Will be competitive with invasive species
- Affordable
- Available when needed
- Meets requirements for local genotype

Basic Questions

- What species?
- What forms?
- What mix?
- When needed?

- What species?
 - Reference sites
 - Actual historic inventories
 - General ecosystem species lists
 - Special species to condition site
 - Key species that cannot be done without

- Conditioning goals
 - Create shade
 - Produce organic material
 - Stabilize site
 - Suppress weeds
 - Add vertical structure
 - Modify micro-climate

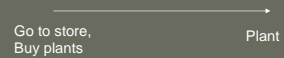
- Conditioning can be done with few species or with no species.

- What forms?
 - Seed
 - Container plants
 - Divisions
 - Rhizomes and bulbs
 - Bare root
 - Live Stakes

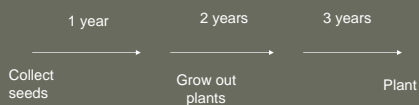
- What mix?
 - Trees are usually spaced 6'-10'
 - Shrubs 4'
 - Herbaceous 12"-24"
 - Mix is based on density of species per specific planting areas or zones.

- What mix?
 - Assembly rules
 - Drivers
 - Passengers

- When needed?
 - Buy-plant model



- When needed?
 - Collect seeds-grow-plant model



- Sequence:
 - Assess site
 - Make decision about species desired
 - Determine availability
 - Decide which to buy, collect, grow
 - Decide on forms, assess budget
 - If collecting and growing, determine timing
 - Modify or condition site before planting

- Make decision about species desired
 - You will plant few species, maybe 10-20.
 - Initial plantings may be to modify conditions.
 - Restoration species selection will include ones that are critical to success of site.
 - They may be spp. around which the vegetation is organized.
 - They may be spp. you think will survive.
 - They may be conditioners or facilitators.
 - They may be fillers or biomass providers.

- Species around which vegetation is organized:
 - Trees
 - Bunchgrasses
 - Rhizomatous wetland plants

- Species that will survive:
 - Snowberry
 - Small-fruited bulrush
 - Oregon ash
 - Douglas fir

- Conditioners or facilitators:
 - Red alder (grows fast)
 - Willows (produce dense shade)

- Fillers (produce ground cover)
 - Sword fern
 - Oregon grape

- Example: Coastal wetland
 - Common species
 - Successional complexity
 - Invasives
 - Forms
 - Availability
 - Genetics

- Common species

- *Carex lyngbyei* Lyngby's sedge
- *Schoenoplectus acutus* Soft-stem bulrush
- *Eleocharis palustris* Spikerush
- *Schoenoplectus maritimus* Coastal bulrush
- *Schoenoplectus pungens* Three-square bulrush

- Successional complexity

- No succession.
- Species sort out along salinity and elevation gradients.
- Drivers are *Carex lyngbyei* in upper intertidal and three-square bulrush in middle intertidal.

- Invasives

- Few
- *Spartina alterniflora* and *S. townsendii* in some bays.

- Forms

- Generally sold bare root as divisions.

- Availability

- Available from wetland nurseries; most are in Oregon.

- Genetics

- Systems are very open and outcrossed. The same species are often found all along coasts in the Northern Hemisphere.