Grown to Survive:
How the New Burke Museum Project is Using Forestry Science to Change the way we Grow and Specify Plants in Landscape Architecture Projects

Bridget McNassar, Native Plant Nursery Manager, Oxbow Farm and Conservation Center

Rebecca Fuchs, Project Manager for the New Burke, GGN
Oxbow Farm & Conservation Center

We are a non profit organization located on 230 acres of forest and floodplain in the Snoqualmie River Valley, approximately 25 miles east of Seattle.
Oxbow’s Mission:
To inspire people to eat healthy, sustainably, grown food and to steward our natural resources for future generations.
Native Plant Nursery Mission:

Increase the availability and use of native plants throughout the region

Production of ecologically important species

Applied research aimed at practical solutions

Educational services, technical expertise
Restoration/Reforestation Planting
An equally harsh environment?
Washington State’s Oldest Museum

1885 Founded by Young Naturalists Society

The Burke is responsible for the state collections of natural and cultural objects. As a teaching institution, the Burke is a relied-upon resource for research around the globe. The collection has grown to over 16 million objects.

The New Burke removes barriers between visitors and experiencing the objects themselves. For too long the collections have been hidden away in storage. The new museum opens up the collection, gives visitors access to the breadth of the collection and to the innovative research going on behind the scenes.
Land Platted in 1856
Historically treed corner of campus
Urban Development
Urban Building in Forest Frame
indoor experience

outdoor experience

PASSAGE THROUGH NATURE/CULTURE

PASSAGE THROUGH LIVING TEXTURE
Clearing
Burke Yard as Clearing
Oxbow as Connection to Larger Landscape

- Burke as Portal
- Between People and Land
- Oxbow - Snoqualmie Valley
- Seattle
- City and Nature
State Museum with WA Genetic Heritage
Solutions from Restoration & Reforestation can be applied in Urban Projects as well

- Genetic Diversity in plant material
- Locally sourced genetics
- Roots grown for survival
Genetic diversity means resilience

Growing from seed = more diversity

Seed collected from multiple plants and locations = more diversity

Diversity means hedging your bets!
• Select for diversity throughout the growing process
Regionally appropriate seed

• Local plants have genes that allow them to best survive in local conditions

Source: https://plants.usda.gov

Range of western sword fern
We collect our own seed (and cutting or division materials) where we can.

Open coniferous forest

Riparian flood plain

Lady fern (Athyrium felix-femina)

Salal (Gaulthera shallon)

False lily-of-the-valley (Maianthemum dilatatum)

Fringecup (Tellima grandiflora)

Low Oregon grape (Berberis nervosa)

Sword fern (Polystichum munitum)
We were able to do a special collection from Dinner Island, San Juan Islands, home of Susan Potts 😊
Chocolate lily (Fritillaria affinis)

Large camas (Camassia leichtlinii)

Coast gumweed (Grindelia integrifolia)

Death camas (Toxicoscordion venenosum)

Broadleaf stonecrop (Sedum spathulifolium)
Challenges in growing from seed

• Obtaining seed
• Seed dormancy
Growing plants with roots in mind

Seedling Establishment
Occurs when seedlings are fully coupled to site hydrological cycle

Root access to soil water! Initiates positive feedback loop

Pinto et al, 2012
Ideal roots

- Long and straight
- Many fine roots/root tips
- Elongated containers
- Open bottoms = air pruning
- Plants establish at planting site faster
The unique situation of a nursery working with landscape architects

- Challenges around timelines and changing design
- Opportunity to work together on plant specifications and difficult to find species
Some examples of timelines:

**Common Camas** (*Camassia quamash*)

- Seed collected summer 2015
- Sown Fall 2015
- Bulbs continue to grow each year for 4 years!
- To be delivered fall 2019, hopefully ready to flower!
Evergreen huckleberry (*Vaccinium ovatum*)

- **Sown**: Fall 2016
- **Oct 2017**: 3 years
- **Oct 2018**:
- **To be delivered**: Fall 2019
Wild ginger (*Asarum caudatum*)

Sown Fall 2015

Oct 2016

2 years

Ready for installation Oct 2017
Contract growing is helpful/ideal for nurseries/growers

- Size
- Container
- Aesthetic qualities
- Timeline
Contract growing and reforestation techniques are helpful/ideal for landscape architects.
Size – it’s the size of the roots that matter

4” pot

7ci tube
Size – adapting drawings/specs/expectations for new sizes
Container

- Elongated containers
- Open bottoms = air pruning
- Plants establish at planting site faster
- Containers are made from higher quality plastic. Collected after install and returned to grower

- Standard containers
- Closed bottoms = often root bound
- Low-quality plastic taken to landfill after install
Timeline - bid plants earlier in project

- Seed collected: Year 1
- Bulbs continue to grow each year: Years 2 & 3
- Fall planted, spring bloom: Year 4

Structural Steel
Recommendations for Spring vs Fall 2019 Planting from Oxbow

**Spring blooming bulbs:** I very strongly recommend planting these in the fall. Transplanting them in spring, during their active growing period, would likely greatly reduce their survival, at the very least would cause them to lose out on a season of active growth. If we can hold them in the nursery for the 2019 growing season, they will be four years old when installed in the fall, and giving a better chance that a high percentage will bloom the following spring. Fall planting is standard practice for spring blooming bulbs.

**Quick-growing perennials:** I recommend that these plants are also installed fall of 2019. Their ideal cycle in the nursery is that they are started in spring from seed, and are ready for outplanting in the fall. In order to have them ready in the spring 2019, they would need to be grown the year before (2018) held over in the nursery until spring 2019 planting. Since this planting sounds like it will be in late spring/early summer 2019, the plants at this point will likely be quite root bound, which could also cause stunted/unattractive above-ground appearance. Bottom line is that you can have a higher quality plant in fall or a lower quality plant in spring.

**Plants that we can have ready in spring or fall:** there are a large number of the species that we can more easily have ready at any time of year (as long as we have enough notice) because they are slower growing and much less likely to become root bound, or are species that will do OK being sown in the fall and are able to grow over the winter and be ready the next spring.
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