

The Starflower Foundation Restoration Strategy

“When we see land as a community to which we belong, we may begin to use it with love and respect.” -- Aldo Leopold



Background

Over its 10-year history, the Starflower Foundation worked on 18 urban habitat restoration projects in Seattle, Washington. The mission of the foundation was to assist *creation, rehabilitation, and stewardship of Pacific Northwest native plant communities by supporting citizen-driven restoration and education projects that inspire understanding, appreciation and preservation of Pacific Northwest native ecosystems, with humans as an integral part of these systems.*

Starflower restoration activities took several forms:

- Rehabilitation of landscapes and natural areas on public land.
- Urban garden education programs.
- Participatory educational experiences for all age groups, providing opportunities for experiential-based learning.
- Opportunities for project participants to develop skills to initiate and sustain similar projects.

The creative force behind Starflower Foundation and its guiding principles was Ann Lennartz. As the founder and funder of Starflower, Ann focused her resources on creating urban native plant habitats so that we could have the opportunity to enjoy and appreciate the abundant natural wonders that the Pacific Northwest offers. Her greatest desire was that these restoration projects would help people understand the natural world and inspire us to become thoughtful stewards. As such, a core of committed volunteers was at the center of each project with the vision of restoring an area of their neighborhood park or school grounds with Pacific Northwest native plant communities. As an operating foundation, Starflower supported design, implementation, and maintenance for these projects. During all phases of the projects, the foundation pursued a restoration strategy designed to fast-track the successional process and strove for a high level of native plant species diversity.

Starflower Foundation’s goals for restoration projects were threefold:

1. Facilitate high-quality, innovative landscape renewal projects, requiring little or no physical structure, that preserve and rehabilitate Pacific Northwest native habitat on Seattle public lands.
2. Increase understanding and appreciation of the community of living organisms, with humans as an integral part of that community.
3. Institutionalize, over the long term, the practical skills, values, and knowledge needed to successfully initiate and implement similar projects.

Starflower rehabilitation activities involved collaborating with community groups and relevant public agencies to plan, establish, and maintain new landscape installations and

other natural area enhancements on public land. Starflower Foundation also collaborated with Seattle public schools in planning, constructing, and maintaining natural areas on public school grounds. From time to time, the foundation was involved in rehabilitation of other public land or land owned by charitable organizations.

Starflower Foundation supported these community-initiated efforts by establishing thriving Pacific Northwest native plant communities in the city of Seattle in areas where native plants had been largely or entirely displaced. While ecological restoration principals guided much of our work, the foundation did not do restoration in the strictest sense. This is largely because the impacts on the urban landscape are such that it would be impossible to restore a site to the conditions that existed prior to urbanization. Significant impacts of urbanization to a native plant landscape include: the heat island effect created by massive displacement of vegetation by structures and roads, flashy hydrology resulting from the high percentage of impervious surface in the city, the high concentration of invasive species, and direct human contact (trampling, picking flowers, etc.).

In establishing native plants at a site, Starflower Foundation took into consideration its urban setting and the unpredictability of the conditions that could occur there in the future. Hence, a broad array of native plants was introduced (as small containerized nursery stock and as seed), including early, mid and late successional species with the expectation that species persisting from the various stages of succession would provide the site with the resources to recover from unknown disturbances in the future. Starflower also worked under the premise that during the establishment phase, a site densely vegetated with a high diversity of native plants and no non-native species would be resistant to subsequent invasion by non-native species. This resistance was deemed critical, given the ready availability of non-native propagules (seeds, rhizomes, etc.) in the city. As such, considerable effort was put into removal of all non-native plants.

Guiding Principles

To achieve the ends noted above, Starflower Foundation employed the following principles and definitions:

- Establish 100% self-sustaining Pacific Northwest native plant community coverage in five years with the maintenance objective of 0% weed species.
- Landscape contains all species for each plant community successional stage (early, mid, late) appropriate for the ecology of the site, in appropriate relative quantities, enabling independent succession of PNW native plant landscape to occur indefinitely.
- Dense planting/seeding of ecologically complete plant communities in Year 1 fall/winter planting and seeding. 150+ species is desirable.

Independent Succession of PNW Native Plant Landscape is defined as requiring no human intervention to retain 100% PNW native plant community dominance, and if severely disturbed, landscape reverts to early-successional PNW native plant communities and proceeds through PNW native plant community successional stages.

Starflower used the following guidelines to describe the extent of the geographical area from within which the plant material used would originate:

Plant origins will be entirely from low elevations (always below 2500 feet a.s.l., preferably below 1500 feet a.s.l.), and entirely from western Washington, preferably from the Puget Sound area, and from King County and neighboring areas whenever possible.

Project components

Four major components were represented in each habitat restoration project:

1. Design of Pacific Northwest native plant habitat*
2. Planting of Pacific Northwest native plants
3. Stewardship of Pacific Northwest native plant habitat during a three to five-year establishment phase
4. Participatory education (general public, schools, public agencies):
 - a. Design, planting, stewardship during three-year establishment phase
 - b. Long-term maintenance and stewardship
 - c. Environmental education for all age groups, including public agency staff
 - d. By the project's conclusion, participants capable of initiating and sustaining similar projects on their own

*All designs, plans, and programs were subject to review and approval by the relevant public agency, the community, and Starflower Foundation.

Programs

Starflower Foundation primarily supported these activities:

1. Creation, rehabilitation and stewardship of urban natural areas on public land in Seattle, and the wildlife these areas support, focusing on Pacific Northwest native plant communities.
2. Facilitation and support, for all age groups, of participatory, interactive, educational experiences associated with creation, rehabilitation and stewardship of these urban natural areas and associated wildlife.
3. Facilitation and support of the creation and stewardship of “wild habitat gardens” on Seattle school grounds (K through 12), consisting of Pacific Northwest native plant communities. This included assisting with design and implementation of education programs involving these “wild habitat gardens.”

Criteria and Expectations

Starflower Foundation was particularly interested in facilitating high-quality projects that would serve as models or examples for similar projects undertaken by other groups or organizations. High-quality was not meant to imply high expense, as Starflower Foundation sought to support projects that used financial resources effectively and efficiently. As an

operating foundation, Starflower saw its role as one of cooperative partnership in lieu of providing actual funding support. Projects with multiple funding sources and various community volunteer commitments were given preference.

In addition, Starflower Foundation preferred to participate in an entire project from conception to completion as a partner in providing key services and materials that facilitated project development and implementation (see Types of Support below). Additional project partners with complimentary expertise and/or ability to provide financial support were welcomed and encouraged.

Starflower gave preference to participating in projects that included the following elements that the foundation believed would lead to success:

- Demonstrated community and Seattle Parks and Recreation interest and commitment (time and money—short-term and long-term).
- Provided a suitable site.
- Applied maximum resources to native plant community design, installation, and maintenance (While public parks projects may have required inclusion of features such as paths, walkways, signs, benches, or other man-made elements, Starflower Foundation preferred to direct the maximum of its resources towards the design, installation, and maintenance of native plant communities. To the extent that other, non-plant features were desirable and compatible with the overall project goals, the foundation encouraged seeking out other available sources to fund appropriate additional features.)
- Rehabilitated and/or restored self-sustaining urban natural landscapes on public land using Pacific Northwest native plant communities.
- Developed good, sustainable and self-sustaining, low-maintenance wildlife habitat. This habitat is appealing to humans and wildlife.
- Re-established self-sustaining Pacific Northwest native habitats that recognized and fostered the interdependence of plant communities and wildlife.
- Generated community interest in and support for creation and stewardship of Pacific Northwest native habitats.
- Helped educate surrounding communities, including school children of all ages, about the creation, stewardship, and enjoyment of Pacific Northwest native habitats and the wildlife that depends on them.
- Incorporated participatory educational components for the following groups throughout the design, installation, establishment/maintenance phases of each project:
 - School children of all ages
 - Interested community members and volunteers
 - Park gardeners and maintenance staff

Types of Support

As a project partner and participant, Starflower Foundation hired consultants and/or purchased materials directly rather than providing monetary grants to organizations. The following resources were provided to assist projects. The type(s) of resources provided varied with the project requirements.

- Landscape architect or designer
- Biologist, botanist, ecologist, wildlife habitat expert, wetland expert, etc.
- Naturalist and/or assistance with environmental education
- Pacific Northwest native plants
- Plant landscape installation
- Plant landscape maintenance during a three to five-year establishment phase
- Educational expertise

Project Timeline and Planting Guidelines

Starflower Foundation sought to establish a restoration project in a five-year period with the goal of completion in five years from the date of first planting/seeding. However, depending on site conditions, size of project, and plant communities, a project timeline could sometimes be completed in three years. An idealized project timeline follows:

Project Timeline

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Year 0	Design development, soil preparation, soil amendment <i>Note: Public agencies usually will not allow soil preparation or soil amendment until after final approval of design</i>											
Year 1	Design development, soil preparation, soil amendment <i>Note: Public agencies usually will not allow soil preparation or soil amendment until after final approval of design</i>											Dense planting & seeding of ecologically complete plant communities.
Year 2	Planting & Seeding		0% weeds		0% weeds		75%+ PNW native plants	0% weeds			Adaptive management: planting & seeding where removal of non-natives or native plant mortality left openings	
	Maintenance & Weeding											
Year 3	Planting & Seeding		0% weeds		0% weeds		85%+ PNW native plants	0% weeds			Adaptive management: planting & seeding where removal of non-natives or native plant mortality left openings	
	Maintenance & Weeding											
Year 4	Planting & Seeding		0% weeds		0% weeds		100% PNW native plants	0% weeds				
	Maintenance & Weeding											
Year 5			0% weeds		0% weeds		100% PNW native plants	0% weeds				
	Maintenance & Weeding											
Year 6 and beyond	Monitoring & Weeding											

1. Year 0: Site design, action plan preparation and soil preparation for weed control. Generally, public agencies will not allow soil preparation or soil amendment until after approval of final design and permit(s). However, woodchips over cardboard may be allowed on parts of a site.
2. Year 1: Soil preparation, dense seeding and planting in the fall/winter (November, December, January). Generally, public agencies will not allow soil prep or soil amendment until after final approval of final design and permit(s). This means that soil preparation usually cannot start until right before fall planting and seeding. Seed as soon after planting as possible.

Dense planting and seeding of ecologically complete plant communities is defined as:

- At least 75% of plant & seed quantities are early and mid-successional forbs
- At least 75 different forb species introduced (150+ species desirable) even in bogs and wetlands.
- Grass species planted as plugs (7"-10" tubes)
- Sedges/Rushes: 75% early successional and less common, harder to obtain species
- At least 50% evergreen species at each landscape level (ground, shrub, tree) whenever possible.

3. Year 2: Schedule maintenance to meet objectives of 0% weeds on March 15, June 15, and September 30, and 50% native plant coverage on July 15. Plan fall/winter planting and seeding to fill gaps with forb and early-successional species that could not be obtained in Year 1.
4. Year 3: Schedule maintenance to meet objectives of 0% weeds on March 15, June 15, and September 30, and 75% native plant coverage on July 15. For maturing grasslands and wetlands, 0% weeds objective shifts to April 15 and July 15. Fall/winter planting and seeding should include species either missing or underrepresented.
5. Year 4: Schedule maintenance to meet objectives of 0% weeds on March 15, June 15, and September 30, and 100% native plant coverage on July 15. For maturing grasslands and wetlands, 0% weeds objective is April 15 and July 15.
6. Year 5: Schedule maintenance to meet objectives of 0% weeds on March 15, June 15, and September 30, and 100% native plant coverage on July 15. For maturing grasslands and wetlands, 0% weeds objective is April 15 and July 15.
7. Year 6: Monitor and weed site for 100% PNW Native coverage and 0% weeds. Remove all weeds.

Planting Guidelines

	Root crown position relative to soil level (or decomposed mulch level)			
	Bareroot	Tubes	4" pots	Gallons
Areas with little or no mulch	at grade	at grade	at grade	n/a
Areas with (or to receive) mulch	at grade	1/2" above	1/2" above	1/2" above
	Minimum portion of root mass in contact with soil in areas that have a lot of pre-existing, decomposed mulch with newer mulch on top			
	Bareroot	Tubes	4" pots	Gallons
	at least 3/4 of root mass in soil, remainder in decomposed mulch	3/4 of tube length in soil	1/2 of root mass in soil	1/2 (to 3/4) of root mass in soil

To assure diversity of forb planting throughout a site, plant forbs in clusters as follows:

- All forb plantings in open ground should be in clusters. (Shrubs and trees should be installed individually, on variable spacing, throughout the area.)
- One cluster is defined as 6-8 different species, triangular spacing, 3" on center.
- No single species drifts.
- Exercise variable triangular spacing of clusters, 1' between clusters.
- Modify clusters as necessary to fit within smaller planting areas.

Yearly Restoration Activity Calendar

ECOLOGICAL STRATEGY CALENDAR												
	FALL			WINTER			SPRING			SUMMER		
ACTIVITY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
Planting Plan:												
Create planting plan for fall/winter planting				X								
Plant Order(s):												
Initial plant order				X								
1 st check-in w/growers & substitutions							X					
2 nd check-in w/growers & substitutions										X		
3 rd check-in w/growers: finalize plant order												X
Plant deliveries	X											
Planting Bid:												
Prepare bid documents including drawings w/plant lists				X								
Send bid documents to planting contractors					X							
Select planting contractor and finalize planting contract						X						
Seed Order(s):												
Initial seed order				X								
1 st check-in w/seed collectors and substitutions						X						
2 nd check-in w/seed collectors and substitutions												
3 rd check-in w/seed collectors: finalize seed order										X		
All seeds for fall/winter seeding delivered	X											
Planting:												
wet areas		X										
dry areas		X	X									

	FALL			WINTER			SPRING			SUMMER		
ACTIVITY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
Seeding:												
Create seed mixes		X										
Seed			X									
Maintenance Contracts:												
Estimate field crew hours needed for following year	X											
Contact maintenance crews for availability		X										
Select crew(s) and finalize maint. contract(s)			X									
Mulching:		X	X	X	X							
Weeding:												
Grasses	X			X	X	X	X	X	X	X	X	X
Perennials	X			X	X	X	X	X	X	X	X	X
Annuals	X			X	X	X	X	X	X	X	X	X
Evergreen	X			X	X	X	X	X	X	X	X	X
Monthly Site Assessment	X	X	X	X	X	X	X	X	X	X	X	X
Assess plant/seed species needs for fall planting in late June									X			
Monitoring:												
TIMING												
Photo				X						X		
Vegetation					X	X	X					
Insects	X					X	X	X	X	X	X	X
Birds	X	X	X	X	X	X	X	X	X	X	X	X
Water					X						X	
Education:												
TIMING												
Winter id				X	X	X						
Spring greens/flowers							X	X	X			
Summer flowers										X	X	X
Fall colors	X	X	X									
Wildlife	X	X	X	X	X	X	X	X	X	X	X	X

ACTIVITY	FALL			WINTER			SPRING			SUMMER		
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
restoration techniques	X	X	X	X	X	X	X	X	X	X	X	X
monitoring	X	X	X	X	X	X	X	X	X	X	X	X
Field trips	X	X	X	X	X	X	X	X	X			X

Project Evaluation/Monitoring

Monthly Site Assessment: Visit the site once a month and record site conditions. Use the monthly site assessment to prioritize tasks to meet the objectives, estimate time needed to accomplish tasks, and to assign field crew time to complete tasks.

Plants needed/planting assessment: Walk through the site in late June to assess plant/seed species quantity needs for fall planting/seeding and planting schedule. Add species and/or quantities to plant order with second grower check-in in July.

Percent Weed Evaluation:

Early Spring Evaluation: Evaluate site between February 15 and March 15 for extent of weed presence. The objective is to attain 0% weeds.

Late Spring Evaluation: Evaluate site between May 15 and June 15 for extent of weed presence. The objective is to attain 0% weeds.

Fall Evaluation: Evaluate site prior to September 30 for extent of weed presence. The objective is to attain 0% weeds.

Project Evaluation Method: The site is evaluated visually. Crisscross the sites looking for weeds. Either pull or note the weed. After completing the observation phase, estimate the coverage by visualizing the surface area that 1, 5 or 10 % of the site would occupy and estimate which of those areas the weeds would cover. Weed coverage is rated as follows: 0%=outstanding, <1% = excellent; 1-5% = needs some attention; 5%-10% = requires immediate attention and increased resource allocation; more than 10%/non-rated = the site has not attained sufficient native plant coverage to be evaluated. When plants cannot be positively identified, they are treated as native and the site receives a conditional rating until such time as the plants can be positively identified.

Native Plant Coverage and Diversity Survey: During the first half of July, the site is surveyed for percent native coverage and plant diversity.

Percent Native Plant Coverage Survey: This measure is taken at the ground level, and thus includes the part of the plant directly in contact with the ground (all parts of ground-covers, only stems of trees/shrubs).

Number of Native Plant Species Survey: This is an inventory of all species present on the site. Species are recorded for presence or absence. Number of species present and species successional stages are recorded and compared with the lists of species planted and seeded to assess the goals for number of native plant species and successional stage ratios.

Photo Point Monitoring: The Photo Point Monitoring System is intended to illustrate the changes in landscapes and plant communities over time and across seasons. Photo point monitoring should occur quarterly according to the Photo Point Monitoring System Protocol.

Successional Strategy

Independent Succession of PNW Native Plant Landscape is defined as requiring no human intervention to retain 100% PNW native plant community dominance, and, if severely disturbed, landscape reverts to early-successional PNW native plant communities and proceeds through PNW native plant community successional stages.

Succession is encouraged by including all obtainable species for each native plant community successional stage (early, mid, late), in appropriate relative quantities, enabling independent succession of native plant landscape to occur indefinitely. During Year 1 planting and seeding, the appropriate ratio is 75% of early to mid-successional forbs to 25% non-forbs and late successional plants. 50% or more evergreen at each vegetation level (ground, shrub, tree) is desirable whenever attainable.

Weeding Strategy

Weeds: Any plant not native to the Pacific Northwest prior to European settlement, as well as weedy native species that tend to form large, single-species stands. Such determinations are site-specific. Cattail is an example of a native species that was regularly removed from wetland plantings during the plant establishment phase. Soft rush is an example of a native species with several varieties, most of which are not native to the Pacific Northwest and at least one of which likely is. Soft rush was regularly weeded out, and it is believed that most, if not all, plants encountered were of a non-native variety. Weeds are to be removed from landscape during first five years of maintenance. Weedy native species can be allowed to seed themselves in after the first five years of landscape establishment.

The site is weeded to 0% weeds between February 1 and June 15 by removing all visible weeds more than 2 inches high, preferably by hand weeding, including the root and any rhizomes.

Exception: Sunny grasslands and wetlands that are 2 or more years old. These areas often cannot be mulched due either to having been seeded or to their status as a wetland. Lacking mulch and shade, they can become vegetated with non-native plants to such a degree that a standard of 0% weeds becomes impractical. In these cases, the standard becomes 0% invasive species. Invasive species include listed noxious weeds and any species observed to be spreading in an invasive manner at the site in question.

Between June 15 and December 15, all weeds are to be removed, seeds and roots, prior to seed drop.

Seeding Strategy

Dense seeding should happen in Years 1-3. Use seed mixtures of annual and perennial forb species by ecology, with as many evergreen species as possible.

During Year 1 fall planting/seeding, annual and perennial forb pioneer species should be seeded at high density (40 lb/acre) and species important to mid and late-successional PNW Native plant communities that cannot be established by plants, seeded at high density (30+ lb/acre).

Monitor seeded areas to determine success in germination and survival of seeded species, and to track continued or discontinued presence over Years 2-5. During Years 3-4, continue seeding annuals, perennials and species that are hard to find at a high density (30 lb/acre) to ensure 100% native plant coverage in summer of Year 4.

Planting/Seeding Strategy

During the fall of Year 1, plant and seed at the highest density possible, using plants that are bare root or in tubes whenever possible, to reach 50% native plant coverage by the summer of Year 2.

In the spring of Years 2 and 3, projects are surveyed for plant survival, seed germination, coverage, density and diversity and plants/seeds are added in the fall to reach 100% coverage by summer of Year 4.

Soil Preparation Strategy

Adding mulch should be the primary means of preparing the soil. Forest duff is preferred. Wood chips, sawdust or hog fuel are okay. No need to till, as this can encourage weed seed germination. Use cardboard under mulch as a stronger weed suppression technique.

Prior to planting, prepare the soil on the site if it is not likely to sustain healthy native plant ecology, either because of poor structure, poor texture, hydrologic issues, amount of organic material, soil biota, or other reason. Soil preparation should be timed to allow for a proper planting or seeding in fall/winter, and should have an intended native plant community in mind.

Weed Suppression Strategy

Use weed suppression materials (degradable materials are preferred such as cardboard and wood chips, forest duff, and sawdust) either to cover bare ground to prevent weed seed germination or cover existing weeds to stop photosynthesis. The ideal time to install weed suppression materials is in the months after planting and just before the growing season while the ground is still moist, approximately November-February. When assessing what types of materials are best for the location, several issues should be considered, including: minimizing cost and time to keep site weed-free for 1 to 3 years, persistence of target weeds, cost of material, cost and difficulty of installation, use of biodegradable non-toxic materials, and the potential negative effects of the weed suppression strategy on the intended native plant community.

Social and Other Ecological Goals

- Year-round aesthetic appeal to human visitors
- Excellent habitat value for insects and other wildlife
- Community involvement, caring, and enjoyment of the landscape during the entire process

Process for Park and Public Land Landscape/Natural Area Rehabilitation Projects

The above strategies and timelines were employed in a variety of projects. These projects were viewed like any other “capital improvement” or “major maintenance” project and services were contracted for professional design, installation, educational assistance, and maintenance during a five-year establishment phase.

Generally, the phases of a project were as follows:

Phase I: Schematic Design: Establishment of the general project design intent and direction, including:

- Project goals and objectives. *What do we want to accomplish and why?*
- Project scope. *How big might the project be?*
- Develop schematic design. *The general layout and big picture.*
- Preliminary budget. *How much might it cost?*
- Preliminary timetable. *How long will it take to get it done?*
- Background information. *History, existing conditions, other related plans.*
- Contact and review with the committee, interested community groups, and Seattle Parks Department staff. *Keep people informed and provide feedback on schematic design.*

Phase II: Design Development: Develop drawings and other materials which describe the project in physical terms, including:

- Plans. Specific layout of each area of the plan showing planting areas, paths, seating areas, and other features.
- Plant selection. Type of plant communities proposed and where they would go.
- Consultation. Horticulturists, botanists, biologists, landscape architects, architects, and others.
- Preliminary cost estimate.
- Meetings with the committee, community groups and Seattle Parks Department to obtain approval of the proposed plan.

Phase III: Construction Documents: Produce drawings and related documents necessary to construct project.

- Plan revisions incorporating input from previous phase.
- Contract drawings and specifications.
- Coordination of community and Seattle Parks Department reviews.
- Refined cost estimate.

Phase IV: Bidding & Construction

- On-site construction observation.
- Review and approval of changes in the work.
- Coordination and consultation with Seattle Parks Department regarding project progress.

Phase V: Post Construction: Project establishment and maintenance.

- Implementation of the establishment and maintenance period.
- Maintenance personnel training.
- Ongoing educational and stewardship programs.

The following is a typical process followed for a Starflower restoration project:

1. All designs, plans, and programs were subject to Seattle Parks and Recreation review and approval.
2. Starflower Foundation might fund directly (as an in-kind gift to a community group):
 - Design and consultant fees (landscape and habitat related—no hardscape or landscape alterations that require major engineering)
 - Plant purchases
 - Landscape installation (plants and crews)
 - Landscape maintenance for a three to five-year establishment phase
 - Education programs and materials (consultants, materials, etc.)
3. Select landscape architect:
 - Landscape architect selection criteria:
 - Designs minimize “hardscape” and maximize natural areas, plant communities, wildlife habitat, human enjoyment and interaction with same, and participatory educational opportunities.
 - Demonstrated knowledge/skills:
 - Designs that work for wildlife and for people: appeal to people and attractive to wildlife.
 - Pacific Northwest native plants, plant communities and interrelationships with wildlife.
 - Restoration/reconstruction of natural areas: design and installation. Hands-on experience preferred.
 - Good designer with primary emphasis on plant communities rather than “structure.”
 - Good interpersonal skills in leading public process, interaction with public and Seattle Parks Department.
4. Select any other experts necessary (biologists, wetland experts, etc.).
5. Develop design with the community and Seattle Parks and Recreation.
6. Initiate participatory education programs. Select and engage any consultants necessary to facilitate educational programs.

7. Install designed landscape: Professional crews
Community and school children volunteers
Seattle Parks and Recreation staff
8. Maintain during three to five-year establishment phase. Based on project goals, create a maintenance plan that includes: objectives, tasks, and estimated resources (volunteer and contracted crew hours). Continue adding plants/seeds to assure coverage (density) and diversity of successional species.
9. Continue and expand participatory educational programs.
10. Conduct project evaluation. Monitor progress and adapt maintenance practices as necessary.

Summary

Inspired by its founder, Ann Lennartz, Starflower Foundation employed new and effective strategies to create, rehabilitate, and steward Pacific Northwest native plant communities through 18 projects in Seattle, Washington. Projects implemented a restoration strategy designed to fast-track the successional process and strove for a high level of native plant species diversity. Committed volunteers helped make these projects successful. It is to such committed individuals that these materials are directed.



City of Seattle

Gregory J. Nickels, Mayor

Seattle Department of Parks and Recreation

Kenneth R. Bounds, Superintendent

November 9, 2004

Ann Lennartz
Starflower Foundation, P.O. Box 22419
Seattle, WA 98122-0419

Dear Anne Lennartz:

Congratulations!

I am delighted to announce that you have been selected as a 2004 Denny Awards winner for your outstanding service as a volunteer in our Seattle Parks and Recreation system. The award will be presented to you at the 2nd Annual Denny Awards/Parks and Recreation Volunteer Recognition Celebration on Tuesday, November 16, 2004, 6 to 8:30 p.m., at the Seattle Asian Art Museum in Volunteer Park. You were nominated by Parks and Recreation staff and selected based on one or more of the following criteria.

- ★ Exceptional stewardship to parks and/or recreation
- ★ Stellar leadership related to enhancing and preserving parks and/or recreation programs
- ★ Significant personal commitment of time and effort to assist the Seattle Parks and Recreation
- ★ Respect of community peers for efforts to help Seattle Parks and Recreation

The qualities mentioned above have fostered a spirit of teamwork between the City and the community in helping to preserve and enhance parks and recreation facilities and services, and to create a positive and lasting parks and recreation legacy for future generations.

Thank you for your many years of service and your personal commitment to Seattle Parks and Recreation programs. I hope that we can continue to work together us for many years to come. Again, my congratulations on this well-deserved award. I look forward to giving it to you in person and sharing the evening with you on November 16.

Sincerely,

Kenneth R. Bounds
Superintendent



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ECOLOGY

NARRATING HISTORY WITH NATIVES

In Seattle, native species return to parks. By Clair Enlow

PLANTS MOVE. Just like the animals and the people they support, they “weep, leap, and creep,” says landscape architect Charles Anderson, ASLA. “It’s their nature.”

That’s one of the reasons Anderson, who has designed a series of landscapes using native plants in Seattle, questions the very idea of restoration—for historic landscapes or natural ones. The other reason has to do with the nature of creativity. Artful, ecological—or both—the hand of the designer has been there. Like it or not, expression is part of the package.

A history of interventions in one section of lakeshore yields one example. When he slashed his way along the edge of Lake Washington a century ago, John Charles Olmsted delighted in the meandering shoreline and dramatic views of Mount

Rainier. He treated these features—along with the lush native greenery—as found materials in a naturalistic composition that includes a boulevard and string of well-loved parks along the water’s edge.

Times have changed. In a controversial habitat restoration designed by Anderson, a select section of Olmsted’s scenic shore-

line—where greensward meets water—is now a tall thicket again. Once an excellent place to photograph Mount Rainier, this toe of stately Colman Park has been planted with willows and taken over by the eagle and the merganser, the Pacific tree frog, and the Chinook salmon.

Seattle-based Anderson and his firm,

Sword fern, salal, and trillium thrive in the woody debris that was deposited with a Madrona log, *top*, in the native plant garden at Seward Park. Near the Seward Park Environmental Education Center, nonnative spruce trees, *right*, will give way to intense plantings of native species.



COURTESY CHARLES ANDERSON ARCHITECTURE, ALL



Charles Anderson Landscape Architecture, are perhaps best known as landscape architects of record for monumental projects such as the Arthur Ross Terrace at the Museum of Natural History in Manhattan and the Olympic Sculpture Park in Seattle.

In a series of local projects, Anderson has combined his passion for native plants and his commitment to working in the urban context (see this month's Plants). These projects are sometimes subtle, sometimes dramatic interventions of native plant communities within existing parks. The plants are major players in a narrative that includes people—their lives, their boundaries, their buildings, and their ongoing history. Anderson calls them "the trillium projects" after his favorite native Northwest flower.

Eliza Davidson, an urban forester with the Seattle Department of Parks and Recreation who cares for the trees in some of Anderson's projects, is mindful of the potential conflicts between preserving a beloved landscape and the need to restore and enhance the natural environment. The restored habitats in Anderson's projects sometimes look scruffy and unfinished—because they are. "If we are serious about the urban forest and its function as real habitat...with water-cleaning and air-cleaning functions, then this is the future," she says. "We have a very explicit agenda about reintro-

Native horsetail is first in line for a succession of plants on a mound at Genesee Meadow, above. The mound is one of several that will eventually support birch trees at the edge of an artificial meadow—a sea of animal habitat on an old landfill. Swamp lantern blooms next to a newly enhanced wetland at Colman Park, below.

ducing natural, complete ecosystems.... Charles is very much a champion of that."

An Environmental Necklace

Lake Washington has been the focus of environmental quality improvement since the late 1960s, when a large levy was passed to

clean up the water. In the past few years, the endangered listing of the Chinook salmon has drawn more attention to Lake Washington and its shoreline, an important habitat for the salmon. Now, landscape architecture plays a role in water quality.

In 1994, Anderson began designing a 500-square-foot native plant garden at Seward Park. At the time, the Seattle parks department was just beginning to launch initiatives for the reintroduction of native plants into city parks. Since then, Anderson and his firm have produced a resource booklet on native plant communities and designed four landscapes within the bounds of city parks along Lake Washington. Anderson calls the landscapes the Lake Washington Environmental Education Sequence.

Four sites in parks along the lakeshore—the native plant garden at Seward Park, Genesee Meadow, Colman Park, and the Reserve at Pritchard Beach—now form a network of wetlands and native habitats, fine-tuned for environmental education. These projects represent four distinct Northwest ecologies: shorelines, lowland and upland wetlands, meadows, and old growth forests.

The first Seattle parks project to use only a native plant palette, the native plant garden at Seward Park is closely connected to an environmental education center there. Kiosks explaining the natural history and ethnobotany of the region lead to a series



ECOLOGY

of native plant communities. Visitors follow an accessible trail into the mature forest that covers much of the 120-acre Seward Park peninsula.

Genesee Meadow was first a bay along the lakeshore, then a landfill. Now it is a 15-acre meadow, with trails meandering across mounded woodland islands, grasslands, and drifts of wildflowers. A tall grass meadow is one of the only plant communities that can survive on the thin soils that cover a clay landfill cap, and it provides important habitat for a range of wildlife from voles to raptors. Three large earth mounds support the growth of trees and shrubs and allow them to colonize the meadow. The Audubon Society monitors bird populations on the site, and the Washington Native

Oregon ash, *top right*, meets a spray of Douglas iris, part of the spring scenery at forest edges and meadows from Alaska to California. *At right*, from left to right, lupine, columbine, common yarrow, and saldago at Pritchard Beach Wetland Walk. *Below*, the bog at Roxhill Park exposes layers of history at the South Seattle site. An ancient peat bog supports new wetland habitat, which wraps around an improved field and picnic area. The pattern of paths evokes the site's more recent history of truck gardens.

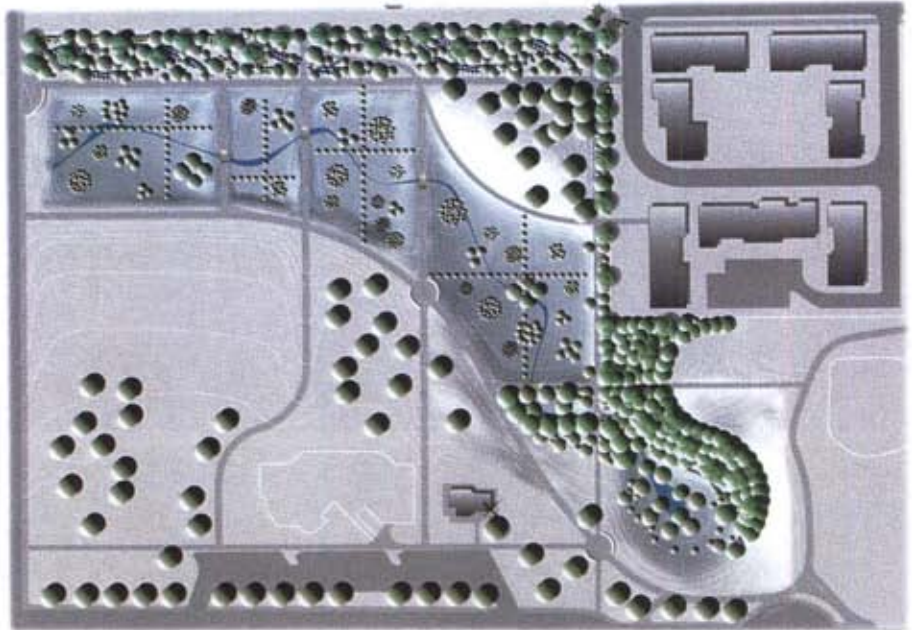


ECOLOGY

Plant Society observes the process of plant succession on the landfill.

Originally designed by the Olmsted Brothers, Colman Park is built around a serpentine roadway that winds up into a ravine and a walkway that leads down to a viewpoint on the shore. Native plant communities have been introduced at strategic locations throughout and are identified by interpretive signs. The most critical piece of the Colman Park project is a stand of willows and fallen snags at the water line. The short-lived willows will fall into the lake, enriching the habitat for a range of wildlife species.

The Reserve at Pritchard Beach, the latest of the series, is the first truly enveloping wetland environment to be created within city parkland along the lake. A trail and boardwalk lead around and through a



The plan for Roxhill Park is shown above. For over 75 years, Fort Lawton dominated the peninsula that is now Discovery Park, below, so barracks buildings are commemorated in the new landscape.



PLANTS

SUCCESS WITH NATURAL SUCCESSION

Seattle-area plant restorations take advantage of the laws of succession. **By Clair Enlow**

IN THE PACIFIC NORTHWEST environment, plant communities are established in four successive stages. First come the grasses and forbs, then shrubs, then deciduous trees—followed finally by tall conifers.

Under typical wilderness conditions, succession requires decades or even centuries to complete, but habitat restorations and interventions must be done in much shorter time periods. To reintroduce native species in urban environments (see Ecology), the natural laws of succession must be interpreted to fit the site and the real conditions on the ground. Urban native plant landscapes typically represent the latter stages of the cycle.

Large plants tend to be harder to establish than small ones, so it is cost-effective to work with a great number of seeds and small plants. However, simply scattering a mixture of native seeds on prepared soil is not likely to yield a successful native community. Larger plants can create the skeletal structure for establishing more favorable environmental conditions for natives. Mulching and consistent weeding are vital to most urban native-plant communities, especially at the outset.

According to *A Manual of Native Plant Communities for Urban Areas of the Pacific Northwest*, written by Charles Anderson, ASLA, for Seattle's Native Plant Alliance, native species thrive best in a "clump-gap mosaic" in which several species are concentrated in a clustered and competitive arrangement, while specimens from the same set are scattered in the more open areas in between. This arrangement provides the best chance for members of each species to play a role in the developing native plant community, for the short or long term.

The choice of specific plants for any native landscape should be governed by several factors, including the following:

Supply. Transplanting native plants from nature can be extremely tricky because of impacts and because the survival rate is low. But with greater environmental awareness and demand, the number of nurseries propagating native plants is growing.

Soil conditions. Most native Northwest plants thrive in soils rich in organic material and may depend on the presence of mycorrhizae, soil fungi that are present in most undisturbed soil and that are symbiotic with plant roots. Some plants will not grow at all unless the fungi are present, but most simply need optimum light conditions and soil amendments if they are planted in deficient soils. In some cases, such as the Discovery 500 project described in this month's Ecology, salvaged forest soils are added to the site. Many Northwest natives are chosen specifically for their suitability to wetlands or boggy conditions.

Composition. Like most plants, natives are chosen for the roles they will play in the layering of a landscape. Categories include forest canopy trees, understory shrubs, ground covers, mulches, and pioneers.

Community goals and support. In all of Anderson's landscape projects in Seattle, community support was important at every stage. In meeting after meeting, community groups actively shaped projects from the beginning and helped to determine the plantings chosen. A project's success is often contingent on the active stewardship of community groups, which can provide countless hours of trained volunteer time at the project site.

Threat of invasive species. The areas around each new native plant community must be mapped, with invasive species targeted for elimination or effective mitigation. Community groups must stand guard



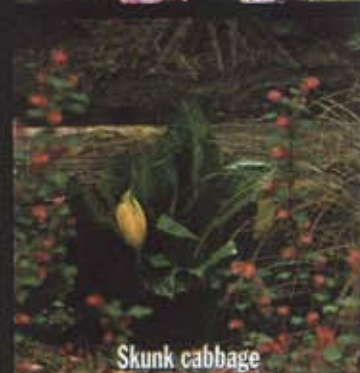
Blue-eyed grass



Fawn lily



Mountain laurel



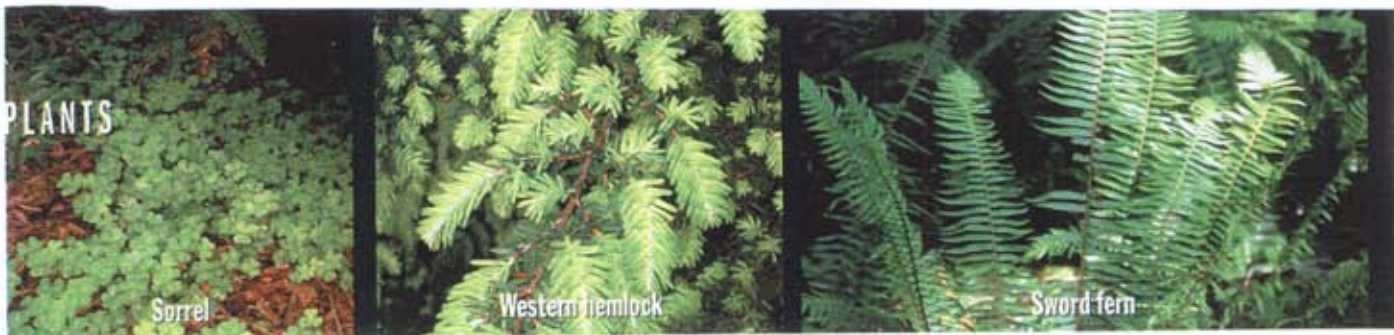
Skunk cabbage



Trillium



Camas



against the emergence of invasives like ivy and bindweed. If these measures are impossible or incomplete, native plants should be selected for hardiness.

MORE THAN 400 VARIETIES of native plants have been reintroduced into urban forests and green spaces in the Pacific Northwest. Here are some of the most popular:

Meadows

- ◆ From mountain meadows to roadside ditches, blue-eyed grass (*Sisyrinchium douglasii*), or Douglas iris, adapts to many habitats. The showy, tufted perennial can be used in grassy flats and wetlands alike.
- ◆ Swaths of spiky blue flowers in Northwest meadowlands indicate colonies of camas (*Camasia quamash*), a member of the lily family. The egg-shaped roots are a traditional food of Northwest native peoples.

- ◆ The lupines (*Lupinus arcticus* and *nootkatensis*), with their palmated leaves and tall bunches of purplish flowers, are ubiquitous in the wild areas of the Northwest. They are adapted to a wide variety of habitats, including gravel bars and sandy soils.
- ◆ With lance-shaped, white flowers and graceful foliage, the fawn lily (*Erythronium oregonum*) favors open, grassy areas in the coastal areas of Washington state.

Wetlands and Bogs

- ◆ The eye-catching sculptural leaves and bright yellow bract of the perennial swamp lantern (*Lysichiton americanum*), or skunk cabbage, emerge from the floors of wet forests and the edges of swamps and seepage areas at low to middle elevations.
- ◆ The stark-white, peeling bark of the paper birch (*Betula papyrifera*) is a traditional building material for baskets and canoes. The fine-leaved tree is adaptable to the edges of bogs and other wetlands and thrives on burned-over areas.

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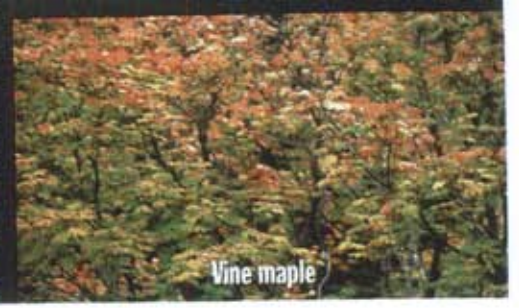
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Douglas Iris



Vine maple

◆ Small, slender-branched swamp laurel (*Kalmia microphylla*) grows on boggy soils and in mountain meadows from Alaska to California. Flowers are rose pink and saucer shaped.

Forests

- ◆ Fast-growing and multistemmed, the big leaf maple (*Acer macrophyllum*) competes with neighboring conifers, prevailing on previously disturbed or burned sites. Mature trees are sometimes covered with layers of moss that support other species.
- ◆ The fronds of the deer fern (*Blechnum spicant*) are leathery and evergreen, and they form an eye-catching fringe at the edges of slide areas, under alder, or on stream banks.
- ◆ Indian plumb (*Oemleria cerasiformis*) is one of the first native shrubs to flower in the spring. The delicate, greenish-white flowers turn to small peach-colored and dark-blue fruits. It thrives in the open woods and on stream banks in low elevations.

- ◆ With cloverlike leaves and delicate white flowers, the perennial redwood sorrel (*Oxalis oregana*) is common in low, forested sites—especially near fields and clearings.
- ◆ The sprawling habit of the vine maple (*Acer circinatum*) makes it an ideal small tree for new native landscapes in moist to wet soils. White flowers in the spring and bright-red foliage in the fall add seasonal spark to Northwest scenery.
- ◆ The down-sweeping branches and delicate, feathery foliage of western hemlock (*Tsuga heterophylla*) are important parts of Northwest mountain scenery. The trees prefer soil high in organic material.
- ◆ The western trillium (*Trillium ovatum*) blooms with whorls of three bright-white leaves on streambanks and in shaded, open areas in the Cascades and coastal woodlands.

Clair Enlow is a writer and columnist for the Seattle Daily Journal of Commerce.

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