

# ARE WE THERE YET?

BENCHMARKS  
aka PERFORMANCE STANDARDS;  
THE MAP FOR RESTORATION SITE  
MANAGEMENT

# DEFINITION

**Benchmarks** (also known as project targets or performance standards) are established **measurable** parameters that indicate the progress of a project towards its defined goals and objectives

# MEETING OBJECTIVES

Benchmarks apply to **objectives**. Each objective for a project should have one or more benchmarks. If the benchmarks are met then the objective is considered achieved.

*Objective 1-1: Remove and suppress recurrence of invasive species along the creek*

**Benchmark 1-1a: Less than 50% *Phalaris arundinacea* cover by the first year following mowing, mulching, and live staking treatments**

**Benchmark 1-2a: Less than 50% *Rubus armeniacus* cover in two years after manual removal, cardboard application, and mulching**

# MEETING GOALS

If all the benchmarks for all the objectives of a **goal** are being met then the goal is considered achieved.

**Goal 1:** *Promote the establishment and dominance of native vegetation typical of low elevation Puget Sound riparian zones along Yesler Creek*

*Objective 1-1: Remove and suppress recurrence of invasive species along the creek*

**Benchmark 1-1a:** *Less than 50% **Phalaris arundinacea** cover by the first year following mowing, mulching, and live staking treatments*

**Benchmark 1-2a:** *Less than 50% **Rubus armeniacus** cover in two years after manual removal, cardboard application, and mulching*

*Objective 1-2: Install dominant low elevation Puget Sound riparian trees and shrubs*

**Benchmark 1-2a:** *At least 50% cover of native shrub species by year 5*

**Benchmark 1-2b:** *At least 30% canopy cover of native tree species by year 5*

# TASK EFFECTIVENESS

Assessing the progress of objectives towards benchmarks is accomplished through **monitoring**. Monitoring measures the results of **tasks** that have been implemented.

*Objective 1-1: Remove and suppress recurrence of invasive species along the creek*

**Task 1-1a: Mow *Phalaris arundinacea* as short as possible and rake up thatch**

**Task 1-1b: Apply cardboard followed by mulch over mowed *P. arundinacea***

**Task 1-1c: Stake *Salix sitchensis*, *S. lucida* and *Cornus sericea* through cardboard**

objective

**Benchmark 1-1a: Less than 50% *Phalaris arundinacea* cover by the first year following mowing, mulching, and live staking treatments**

tasks

Brainstorm one monitoring method for one of these objectives – volunteer recruitment, public outreach, invasive removal, amphibian habitat enhancement

# MONITORING FOR MAINTENANCE

Comparison of monitoring results to benchmarks informs **maintenance** actions to be taken to meet benchmarks.

*Objective 1-1: Remove and suppress recurrence of invasive species along the creek*

**Benchmark 1-1a: Less than 50% *Phalaris arundinacea* cover by the first year following mowing, mulching, and live staking treatments**

**Monitoring results: Monitoring plots established in the area formerly dominated by *P. arundinacea* had an average 65% cover of *P. arundinacea* in the first year after project installation**

**Maintenance recommendation: Cut back *P. arundinacea* and reapply 15 cm of mulch to affected areas.**

# NOT SO FAST...

However monitoring results for all benchmarks should be considered before prescribing maintenance.

*Objective 1-1: Remove and suppress recurrence of invasive species along the creek*

**Benchmark 1-1a: Less than 50% *Phalaris arundinacea* cover by the first year following mowing, mulching, and live staking treatments**

**Monitoring results: 90% survival and 80% cover of *Salix* spp. and *C. sericea* stakes was observed in monitoring plots in the first year post-installation**

**Maintenance recommendation: Given the 90% survival and 80% cover of *Salix* spp. and *C. sericea* stakes in the first year the *P. arundinacea* should be strongly suppressed over the following growing seasons through shading. No maintenance action recommended at this time.**

# EVOLVING BENCHMARKS

Benchmarks can and should change with the development of the site.

Benchmarks during the establishment phase may be focused on survival, invasive control, & mitigating disturbance.

Monitoring during the establishment phase is more frequent to ensure the site stays on the intended trajectory. Typically every growing season over the first 3 years.

During the development phase cover, density, floral & faunal richness, OM accumulation, soil development, etc. may be targets for benchmarks and monitored less frequently over longer time periods. Typically every other year.

# STEWARDSHIP PLAN

Maintenance actions are prescribed in anticipation of challenges to meeting benchmarks. This prescription is compiled into a **stewardship plan**.

Maintenance actions may be modified or new ones prescribed in light of monitoring results!

# SUBSTANTIATION

If at all possible benchmarks should be based on quantified research or observations from reputable sources relevant to your objective.

***Goal 1: Promote the establishment and dominance of native vegetation typical of low elevation Puget Sound riparian zones along Yesler Creek***

*Objective 1-1: Remove and suppress recurrence of invasive species along the creek*

**Benchmark 1-1a: Less than 50% *Phalaris arundinacea* cover by the first year following mowing, mulching, and live staking treatments**

**Based on the research of Kim et al. (2006) there can be up to a 68% Reduction in *P. arundinacea* biomass in the first year using *Salix* spp. stakes on 0.6 m centers following mowing, herbicide, and mulching treatments. Herbicide was not applied on *P. arundinacea* at the project site so the benchmark was lowered accordingly.**

Name 5 sources of reliable, relevant data to support benchmarks

# OTHER SOURCES

However good relevant data can be virtually nonexistent for some benchmarks.

Client expectations

Ask knowledgeable practitioners what they think are reasonable expectations.

Set your benchmarks based on similar successful projects.

Set your benchmarks based on reference sites.

Use common sense.

Be the project that provides good relevant data for future projects! Monitor pre-installation, immediately after installation, and on a regular schedule over several years.

Skyway:

Objective 1-2: Install site-appropriate native conifers that will eventually replace short-lived deciduous canopy species.

Task 1-2a: Build hummocks in wet areas to create more ideal planting conditions for conifers.

Task 1-2b: Plant *T. plicata* in moist, shady areas.

Task 1-2c: Plant *Picea sitchensis* (Sitka spruce) and *Pseudotsuga menziesii* (Douglas fir) on hummocks located in moist and sunny areas

Task 1-2d: Plant *Tsuga heterophylla* (Western hemlock) on hummocks in partly shaded areas

T-105:

Objective 3a: Provide volunteer opportunities for Pierce Community College Earth and Space Sciences and Biology students.

**Task 1-3a:** Recruit volunteers.

PC Oaks:

Objective 2-3: Modify wetland topography to support a greater potential diversity of species.

Task 2-3a: Install woody debris

Ravenna:

Objective 2-1: Suppress grasses in polygon 3 to improve visibility

Task 2-1a: Remove grass biomass around each planting site.

Task 2-1b: Plant riparian trees and shrubs.

Cotton Hill:

Objective 3-2: Restrict foot traffic by defining a single path through the site.

Task 3-2a: Placement of large coarse woody debris

Task 3-2b: Plant native species densely to deter formation of new trails and define the riverbank trail