

## **Project Benchmarking Exercise**

Due March 14<sup>th</sup>, 2008 to TA as Word document

### *Introduction*

**Benchmarks** (also known as project targets or standards) are established **measureable** parameters that indicate the progress of a project towards its defined goals and objectives. They set specific metrics on key structural and functional attributes that indicate movement towards the project goals and objectives. Metaphorically they are signposts that tell project managers whether or not the project is on target to meet project goals and objectives.

**Monitoring** is the means by which a project is evaluated to assess its change in structure and function over time (and whether these are effectively heading toward project goals and objectives). Monitoring must be targeted at assessing the attributes defined in the benchmarks for those benchmarks to be meaningful. If your objective is to increase avian presence on the site and you don't perform a bird count before implementation and after implementation, then you cannot say with authority if that benchmark is being met and on track to satisfy the objective. Furthermore, benchmarks must be measureable. If you have no practical means to monitor avian presence on the project site then the objective may not be able to be benchmarked.

Many of your benchmarks in ecological restoration should be **ecologically meaningful**. That is, these ecological benchmarks should indicate significant shifts in ecosystem structure and function towards the ecological goals of the project (e.g., ecosystem self-sufficiency and resilience). In order to measure this shift, baseline data needs to be collected through pre-restoration site assessment that establishes the level functionality and structural conditions before project implementation and immediately following implementation.

For example, a benchmark could be set that says native shrub cover should increase by 25% post-installation by year 3 in order to meet the objective of increased native plant cover. Measureable, yes, monitorable, yes, but is it meaningful? What does a 25% increase in native shrub cover indicate? Is this the standard expectation of shrub cover after 3 years for restoration in this type of ecosystem? Does 25% increase in cover yield a measureable and meaningful change in related functions such as avian presence or invasive control?

Setting benchmarks requires a certain level of knowledge of the normative range for functions and structural development at crucial stages in an ecosystem's development. Reference sites can be utilized to quantify functions and structure to develop benchmarks. If your reference site is a 20 year old riparian forest dominated by *Alnus rubra* (red alder) and a mixed shrub understory then you can measure vegetative cover, primary productivity, species richness, O horizon depth, etc. to set targets for your project.

Restoration benchmarks have been set by project managers and researchers for many ecosystems. They can be difficult to find however since they are often buried in lengthy project reports and government documents. **Educated** estimation of benchmark metrics can be employed when lacking explicit references to inform and substantiate benchmarks. Doing so assumes a confident grasp of the functional and structural parameters of the undisturbed or minimally disturbed reference conditions for the intended ecosystem. Such benchmarking by inference requires a literature search for reputable research on your reference ecosystem.

**Sociopolitical and educational objectives can also be benchmarked.** Community participation, outreach efforts, and educational effectiveness can be quantified via before and after surveys. Volunteers can be asked to fill out questionnaires regarding how they learned about the project. Neighbors can be surveyed for their awareness of the project site before and after implementation. Information abounds in the sociological and educational literature on the effectiveness of public education and out reach efforts.

### *Exercise Instructions*

**For each objective in your work plan** please make your best attempt at establishing a benchmark or series of benchmarks, if the objective requires multiple benchmarks. **Please try to substantiate each benchmark** with references from reputable peer reviewed and practitioner sources either directly through prescribed ecological benchmarks relevant to your project or indirectly through established ecological functional and structural parameters for your reference ecosystem. Sociopolitical and educational benchmarks can also be directly relevant or derived from the research literature. This will require some literature review and web searching. Several excellent sources for riparian systems have been posted on the class webpage. You should make an attempt to find resources as relevant as possible to your particular project, even if they are based on similar ecosystems but outside the Pacific Northwest bioregion. **If you reach nothing but dead ends then create a benchmark based on what information and knowledge you have and explain why you think the benchmark is appropriate.**

Unavoidably, the long term success in whether your benchmarks provide useful information and are used to inform site maintenance will be constrained by the willingness and ability of your clients and/or volunteers to perform the required monitoring and assessment with the resources they have. Developing benchmarks (however important they are) that have no hope of being utilized by those responsible for the site is not an effective exercise. **You should develop benchmarks that are 'reasonable' within known constraints.**

Here's an example on how to articulate benchmarks. Please follow the format of stating the benchmark and then providing the substantiation.

**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: At least 50% reduction of *Phalaris arundinacea* cover from pre-treatment conditions 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.**

**Goal 2:** *Encourage community ownership of project site*

*Objective 2-1: Increase attendance by locals at work parties*

**Benchmark 2-1a: Participation at community work parties will increase by 30% after outreach efforts.**

**Whoosiwitche et al. (2007) documented a 37% increase in volunteer participation at a city park clean up in Kalamazoo MI after distributing flyers door to door to 500 households. We will be distributing flyers to approximately 300 households and attending community meetings.**

We acknowledge this exercise will be challenging. You needn't exhaustively reference each benchmark but do try to find at least TWO solid references from peer-reviewed journals, textbooks, and reputable on-line sources.

This exercise, hopefully, will lead to a greater comprehension of the relationship between the project goals and objectives and post-implementation ecological, sociopolitical, and educational outcomes. Farther on in spring quarter the benchmarks you develop will be further elaborated to create a stewardship plan for your clients where careful monitoring of benchmarks will inform adaptive management approaches on the site to ensure its long term success.