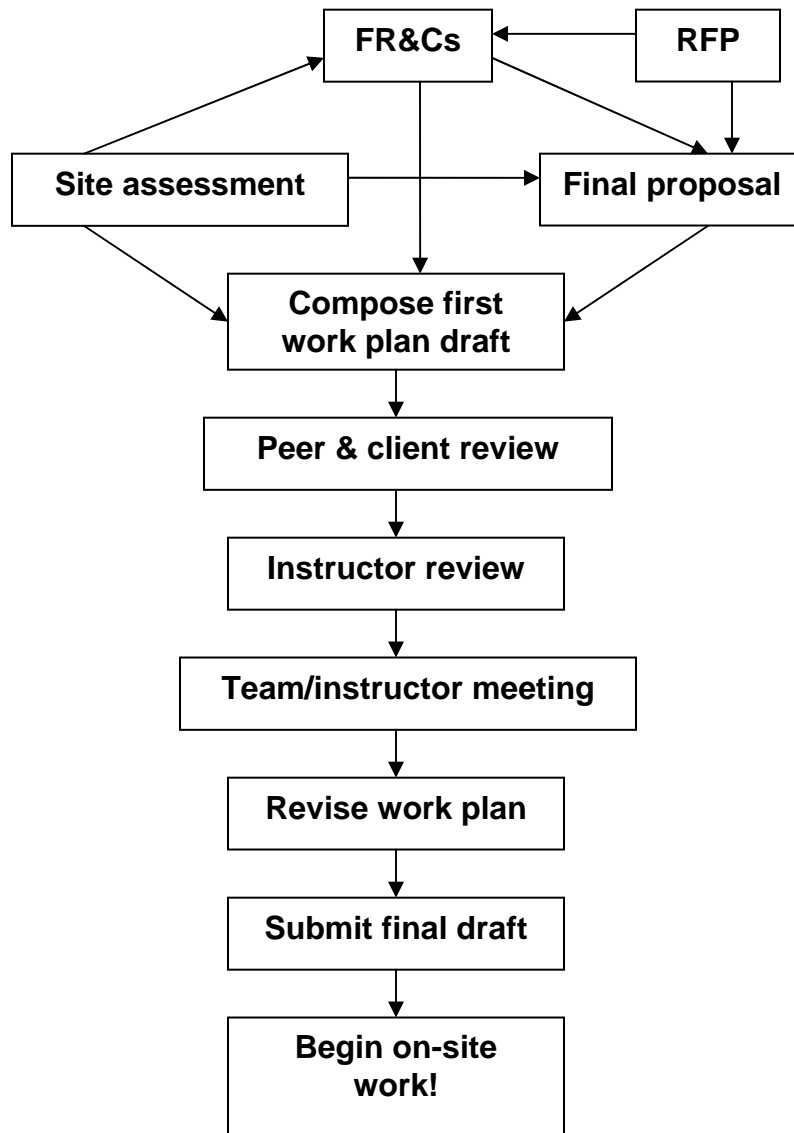


Work Plan Instructions

Introduction

The **work plan** is the keystone document of your project. It is where the goals and objectives from the proposal are explicated into a series of defined **tasks** which, if completed, will manifest the project into reality. By now it should be apparent that the **functional requirements and constraints, proposal, and site assessment** provide the critical information and framework to formulate the work plan.



Format

The work plan is an elaboration of the **final proposal** and follows the same format. Each **objective** should have a series of tasks that follow it **which are essential to the completion of that objective**. To repeat, each task should directly support the objective! Tasks are formulated as 'how-to' action statements and should be worded succinctly. Task statements however should not be 'recipes' where the specifics of tools, materials, methods, numbers, volumes, area, etc. are explained. For example here are proper tasks associated with a specific 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

Task 1-1a: *Remove all Himalayan blackberry (*Rubus armeniacus*) above and below ground biomass.*

Task 1-1b: *Remove all aboveground reed canarygrass (*Phalaris arundinacea*) biomass*

Task 1-1c: *Cover and protect soils in invasive control areas post-removal*

Task 1-1d: *Install multi-layer native canopy*

Task 1-1e: *Devise invasive control plan for client and volunteers*

If all of these tasks are successfully accomplished then the objective will be met. Contrast this with a task statement that contains too much detail:

Task 1-1a: *Cut all Himalayan blackberry (*Rubus armeniacus*) canes to 0.5 m above the ground and then use a clawed mattock to grub out all rootwads in the southwestern portion of polygon 6.*

And one that lacks detail and is indirectly related to the objective:

Task 1-1a: *Remove LWD*

What's LWD? Why are you removing it? What does it have to do with the objective? Does it need to be removed to access the site?

The **methods and materials** involved in implementing each task need to be outlined in detail in a separate **approach** narrative immediately following each task. For example:

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

*Task 1-1a: Remove all Himalayan blackberry (*Rubus armeniacus*) above and below ground biomass.*

Approach: *In all polygons where they are present *R. armeniacus* canes will be cut to within 0.5 m of the ground with pruners and loppers so that they are visible for rootwad removal. All rootwads will then be grubbed out manually using clawed mattocks and shovels. All canes and root wads will be stockpiled on cardboard to prevent re-establishment until hauled away by the Parks department.*

The development of tasks and approaches should provide a 'reality check' for the stated goals and objectives. Are they 'doable' as stated? If not then restating the task or even reformulation of the goals and objectives is in order.

Assignment

The work plan should be completed as follows with each section in sequential order:

1. Site Description

Revise the site description from your final proposal in light of corrections and commentary given on the draft & final proposals as well as the site assessment. This site description should be a narrative summary of the site assessment which provides a descriptive context for the project. The reader should be able to proceed into the goals and objectives with a general sense of the site conditions and understanding why the project is necessary. This section should also include any specific information necessary to understand the basis for the goals, objectives, tasks, and proposed approaches.

2. Tasks & Approaches:

Use the goals and objectives from your final proposal as the framework to formulate the tasks and approaches. **However do not simply cut and paste the goals and objectives from your final proposal!** Revise the goals and

objectives as per the comments and corrections provided by the instructors and client (yes – we will be checking to make sure you did this!). Use the structured format outlined above to complete this section. **Please provide a reference to sources OUTSIDE the in-class handouts to justify the choices of methods and materials made to accomplish each task.** These references can come from the primary research literature, information provided by government and nonprofit organizations, text books, handbooks, websites, and any well-recognized, reputable source. Peer reviewed scholarly sources are preferred, but in the emerging, multidisciplinary endeavor of ecological restoration systematic studies are not always available. Where applicable, indicate the theoretical or research basis for your choice of approach. For instance, your approach to a planting design may be based upon ideas that come from theories of ecological succession or your use of mulch to enhance soil moisture may be supported by the results of a specific study. An example sentence (and reference) has been included in the example below. Use a consistent standard method of citation, e.g., (Ewing, 2005) and list all cited materials in a 'Literature Cited' section at the end of the work plan.

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

*Task 1-1a: Remove all Himalayan blackberry (*Rubus armeniacus*) above and below ground biomass.*

Approach: In all polygons where they are present *R. armeniacus* canes will be cut to within 0.5 m of the ground with pruners and loppers so that they are visible for rootwad removal. All rootwads will then be grubbed out manually using clawed mattocks and shovels. Removal of rootwads has been shown to provide lower rates of overall *R. armeniacus* reinvasion along abandoned dikes in western Washington (Brokenback, 2006). All canes and root wads will be stockpiled on cardboard to prevent re-establishment until hauled away by the Parks department.

3. Site preparation and planting plan with maps and tables

Create three site maps:

- (1) Original site conditions** - Revise the site map from the site assessment as per comments and corrections. This map **MUST** show the site broken

down into distinct **polygons** based on the information gathered during the site assessment. These polygons should represent homogenous subsections of the site that have similar ecological conditions and overall objectives. **Overlay these polygons on the information required on the site map from the site assessment exercise instructions.**

- (2) *Site preparation* – Using the site conditions map as the basis indicate through color and pattern coding areas receiving specific site preparations (excavation, invasive removal, mulching, erosion control, etc.). Also include on this map any habitat and educational features you plan to install. **Each polygon should be designated to receive site preparation substantially different from other polygons based on their unique ecological conditions and objectives.**

In addition to the map elements outlined in the site assessment exercise instructions include these elements on the site preparation map:

- ☞ Point(s) of access and pathways for the delivery and distribution of materials
- ☞ Staging areas for materials (mulch, plants, cardboard, etc.)
- ☞ Parking for volunteers

- (3) *Planting plan* – Using the site conditions map as the basis indicate through color and pattern coding plant associations to be installed in each polygon (western red cedar-western hemlock (*Thuja plicata* - *Tsuga heterophylla*), red alder-salmonberry (*Alnus rubra* - *Rubus spectabilis*), etc.). **Each polygon should be designated to receive a suite of plants substantially different from other polygons based on their unique ecological conditions and objectives.**

NB: Keep in mind that this document may be photocopied and printed by various people, not all of whom might have color copiers or printers available. Thus, wherever possible use pattern coding in addition to coloring so black and white copies are decipherable.

Following the site maps provide a narrative for each polygon. This narrative needs to describe these five elements:

- (1) Approximate area and location of the polygon within the project site.
- (2) Site conditions and/or objectives that make each polygon distinct from other polygons including soils, vegetation, hydrology, disturbance, etc.

- (3) Site preparation to be performed in that polygon and why (i.e., how do such preparations support the next steps?). Where appropriate briefly refer to literature sources (as above).
- (4) Intended plant association to be installed, numbers of each species to be planted, spacing between each plant according to vegetative layer (canopy, shrub, ground cover), anticipated dispersion pattern (if applicable), and justification for the species you chose based on the site conditions and objectives. Briefly describe the principles that guided your selection of the forms, spacing, and general numbers of plants for this polygon. You can address this collectively, not separately for each species. Where appropriate describe the general ecological, physiological, or horticultural bases behind your selection approach. For instance, “As this polygon represents disturbed, sun-exposed conditions where we will initiate the development of a complex, multilayer evergreen forest community, early-successional species were selected for drought tolerance (Ewing, 2007 – class notes). At the same time, as the reinvasion of Scot’s broom to such sites is a concern (Parker, 2001) the potential competitiveness of installed species was also considered.”
- (5) Habitat, public access, and educational feature to be installed and why.

In these narratives you should reference the objective and tasks being accomplished by the actions being taken in each polygon. This is another opportunity to ‘reality check’ the tasks you have outlined. Did you describe tasks in the narratives that don’t exist among your stated tasks? If so, does adding this task directly support an objective? Are there stated tasks that were not described and referenced in the narratives? If so, are those tasks essential to meeting objectives? Consider whether or not the omission was just an oversight or that perhaps the task really isn’t necessary.

Please create two tables. One that summarizes the plant species, numbers, forms, and spacings for the whole site by polygon. For example:

	<i>Cornus sericea</i>			<i>Thuja plicata</i>		
	#	Form	centers	#	form	centers
Polygon 1	25	Live stakes	1 m	10	2 gal	2 m
Polygon 2				15	B&B	3 m
Polygon 3	50	Live stakes	1 m			
Polygon 4						

The other table should summarize the materials and tools required for each task with approximate quantities and sources. For example:

	Materials	qty	source	Tools	#	source
Task 1-1a	Cardboard	100 m2	Liquor store	Loppers	5	Parks dept.
	Woodchips	10 m3	Local arborists	Shovels	10	“”

				Mattocks	10	“”
				Gloves	10	“”
Task 1-1b	Cardboard	65 m2	Liquor store	brushcutter	1	Parks dept.
	Woodchips	5 m3	Local arborists	Rakes	5	” “

4. Work timeline

Provide a project timeline that clearly shows approximately when each task will be undertaken. Specific dates are not necessary. Every task should appear on this timeline with a brief description of that task. Pay careful attention to the sequencing of your tasks! Here’s yet another opportunity to consider the viability and logistics of the stated tasks. Here’s an example:

	January 2008	February	March	April
Task 1-1a: <i>R. armeniacus</i> removal				
Task 1-1b: remove <i>P. arundinacea</i>				
Task 1-1c: mulch over removal areas				
Task 1-1d: Install native plants				

5. Maintenance and monitoring approach

For each task provide a brief narrative that describes the maintenance and monitoring that needs to be done associated with that task to ensure success. For example:

Task 1-1d: Install multi-layer native canopy

M&M approach: Check and record plant mortality and vigor by species in spring after leaf emergence. Assess cause of mortality and replace plants following winter changing species as necessary. Assess plants for water stress early summer. Establish watering regime and apply additional mulch as necessary.

In the Maintenance and Monitoring Plan that you will write spring quarter, we will expect your approaches to be justified based upon sources (as you did above). That is optional for this section of the Work Plan.

6. Literature Cited

Alphabetically list all sources cited in the work plan using a consistent format (CBE name-date format preferred, such as that used in the journal *Ecology*).