Appendix L

Example of Prioritizing and Sequencing Recovery Actions in the Upper Columbia Region

INTRODUCTION

This appendix provides an example of implementing the framework for prioritizing and sequencing recovery actions in the Upper Columbia Basin. The framework is science and socio-economically based. The framework seeks to categorize projects based on multiple objectives and characteristics and establish a general model for selecting and implementing projects that will lead to recovery of spring Chinook, steelhead, and bull trout.

SELECTION OF ACTIONS

The framework is organized into four general tiers of priority as depicted in Figure 1**:**

I. Higher biological benefit; lower cost; higher feasibility

II. Higher biological benefit; higher cost; lower feasibility

III. Lower biological benefit; lower cost; higher feasibility

IV. Lower biological benefit; higher cost; lower feasibility

Projects that fall under Tier I would be implemented before projects.

Steps

1. The first step in prioritizing the suite of recommended strategies would be to assign a qualitative ranking of the biological benefit to each strategy (Table 1). This ranking would be based on how well each project addresses the VSP parameters.

2. The second step in prioritizing projects is to qualitatively rank the feasibility of the projects (Tables 1 and 2; Figure 2). Criteria used for ranking could range from input from professionals (e.g., biologist, engineers, etc.) and other stakeholders (e.g., land owner) to an in-depth feasibility study. It is important to define what “feasibility” means. In Table 2, we suggest some criteria that could be used, such as *time of implementation* and acceptance of the various projects by *local stakeholders* and *government*. As previously mentioned, the definition of feasibility should be evaluated for each subbasin within the Upper Columbia region.

3. Third, projects should then be ranked based on cost (Table 1; Figure 2). Various methods can be used to determine cost (eventually this would need solid information based on the feasibility study before a project is proposed for funding), but can at first be qualitatively assessed (i.e., order of magnitude). For example, building a storage reservoir to boost flows would cost more than water conservation measures.

After projects are ranked on feasibility and cost, they can then be compared to biological benefit (Figure 3). Those projects that show the least cost and are relatively highly ranked on feasibility and have high biological benefit will appear in tier I (Figure 1).

The highest priority projects would be grouped in the tier with lowest cost, highest feasibility and biological benefit; the second highest priority would be lower cost, moderate to high feasibility and high biological benefit, etc. (Table 3).

It is not the intent of this exercise to suggest final prioritization through the example below, since this would need to be coordinated with all stakeholders.

Table 1 Example table for ranking biological benefit, feasibility, and relative cost for actions suggested within the action class of "floodplain reconnection/restoration"

		Actions				
		Create diverse channel patterns	*Dike setback (where feasible)*	*Increase flood-prone areas (where feasible)*	*Restore/ reconnect floodplains*	*Decommission/ relocate roads (where feasible)*
Variable	**Rank**					
	1					
	1.5					
Biological Benefit	2					
	2.5					
	3		x	x		x
	3.5	x			x	
	1					
	1.5			x		
Feasibility	2	x	x			x
	2.5				x	
	3					
	3.5					

	1					
	1.5	x	x			
Relative cost	2			x	x	
	2.5					
	3					x
	3.5					

Note: Feasibility values are from Table 2. Relative cost values are inverted on the "x" axis (i.e., higher the value, the lower the cost; Figure 2). This is necessary so the tiers are in accord, e.g., low cost and high feasibility are in the same tier.

Table 2 Example of a matrix of criteria for defining feasibility

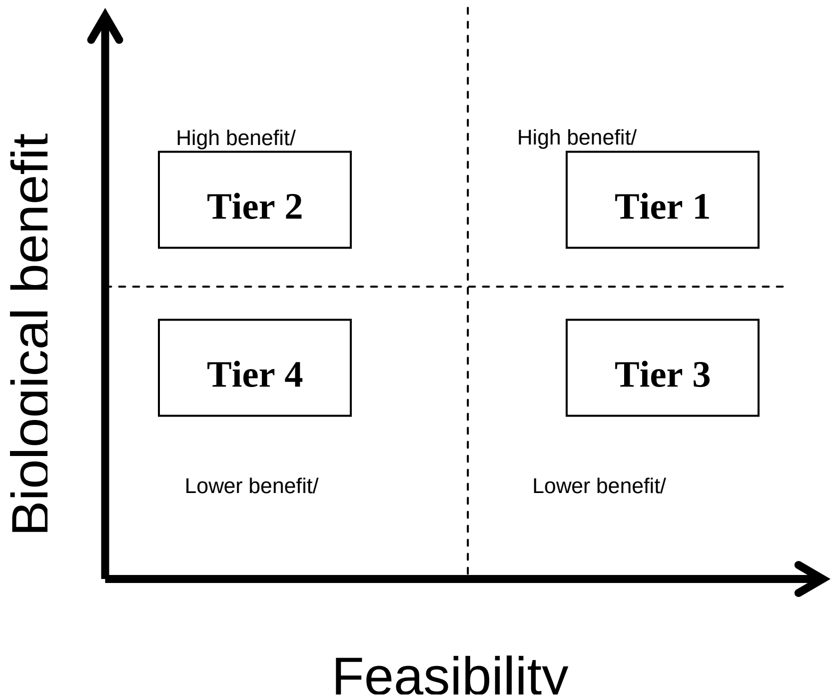
Criteria						
Action	Strategy #	Time to implement[1]	"Constructability"	Acceptance by local govt.	Acceptance from local stakeholders	Avg. score
Create diverse channel patterns	1	2	2.8	2	2	2.2
Dike setback (where feasible)	2	2	2.5	1.8	1.5	1.9
Increase flood-prone areas (where feasible)	3	1	2	1.5	1	1.4
Restore/reconnect floodplains	4	2	2.5	2.5	2.5	2.4
Decommission/relocate roads (where feasible)	5	3	3	1.5	1.5	2.3

[1]Values for time to implement are 1 = > 10 years; 2 = 5-10 years; 3 = < 5 years

Relative numbering: 1=low, 3=high

Table 3 Suggested prioritization of actions based on Figures 3 and 4

Action	Number (from graphs)	Tier
Increase flood-prone areas (where feasible)	3	**I**
Decommission/relocate roads (where feasible)	4	**I**
Create diverse channel patterns	1	**II**
Dike setback (where feasible)	2	**II**



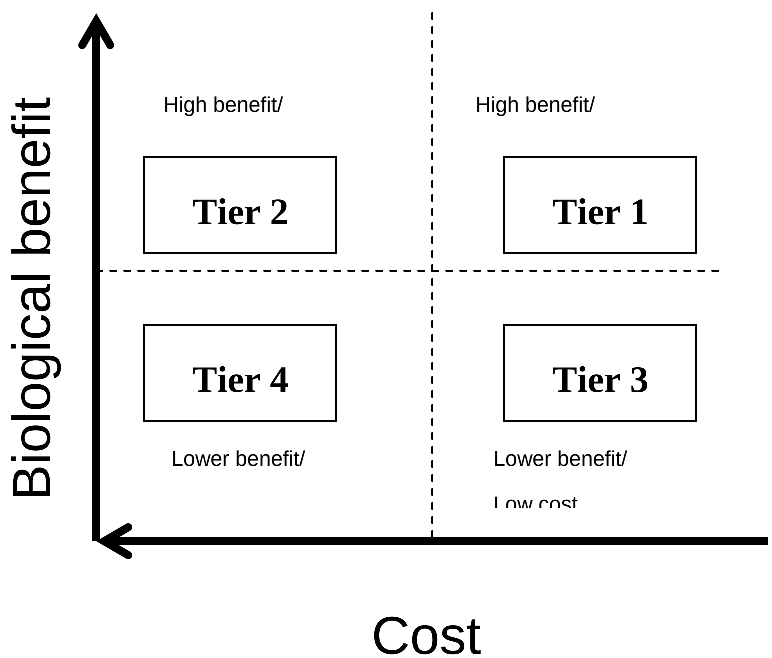


Figure 1 Comparison and prioritization categories.

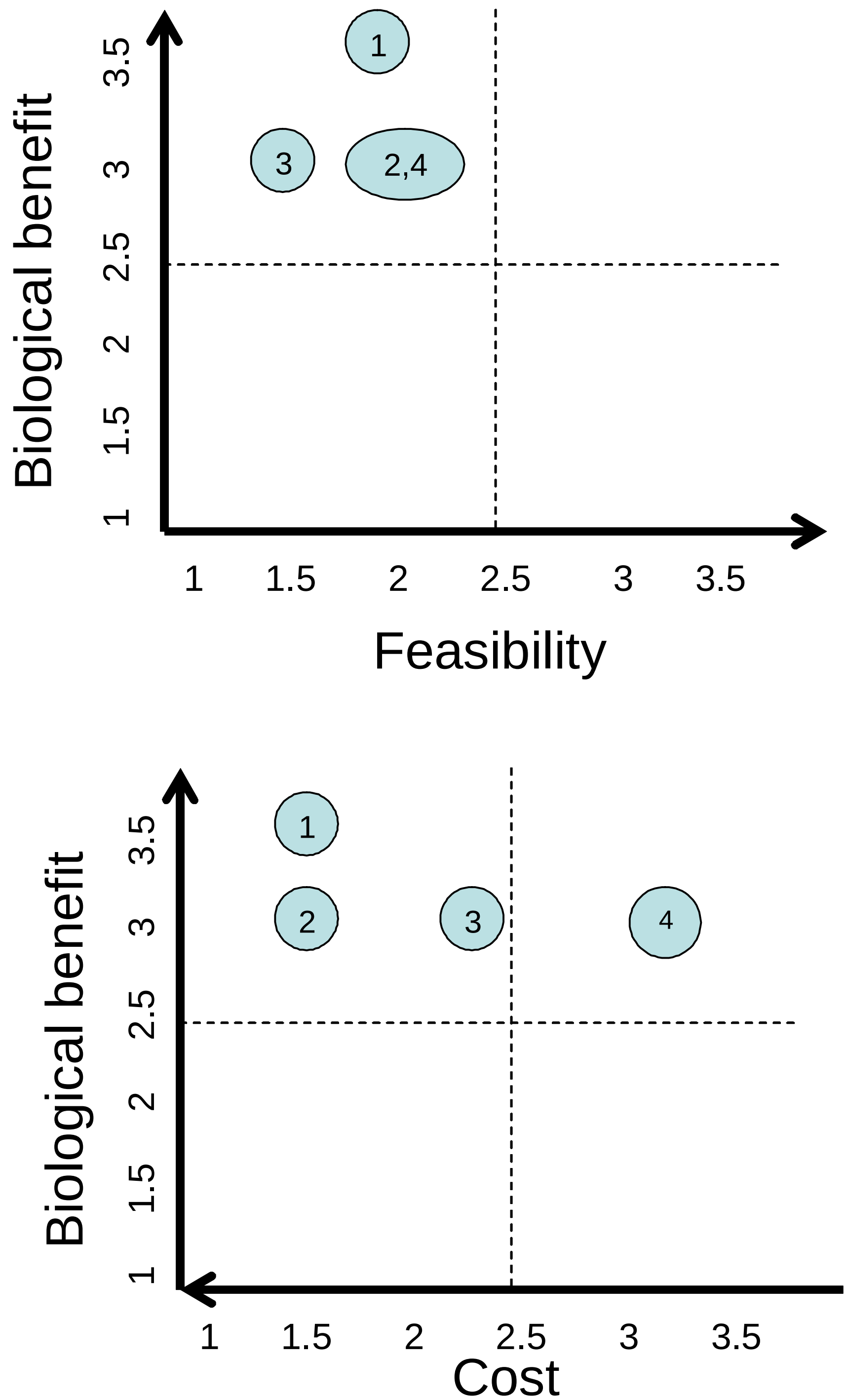


Figure 2 Individual category results (example) from matrix exercise.

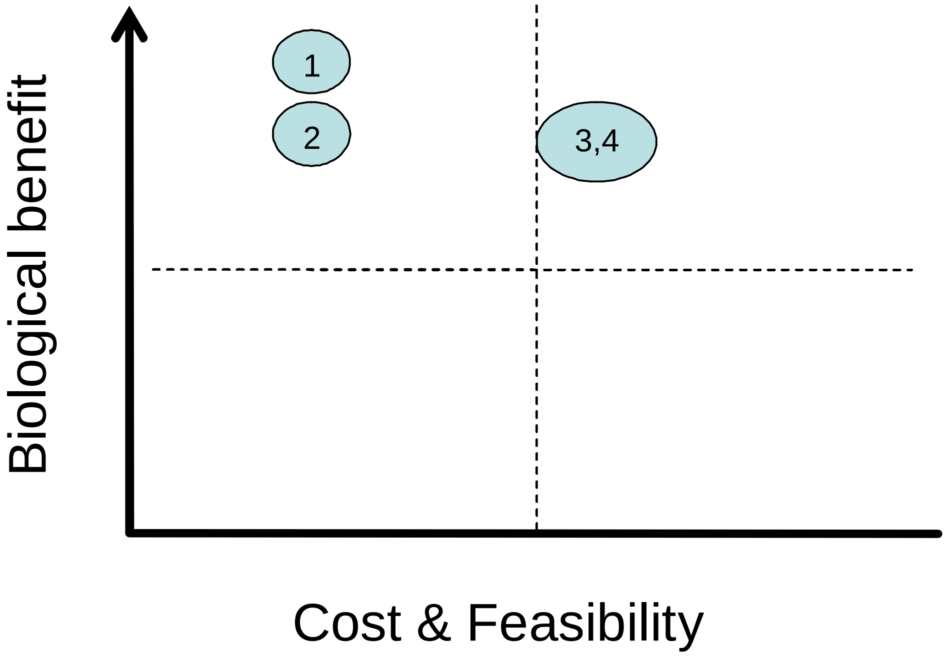


Figure 3 Relative cost and feasibility compared to biological benefit.