Conflict, Resolution & Prioritization Matrix

The prioritisation process scores the top restoration actions to be considered based on a series of ecological and socio-economic criteria. In turn, the development of the initial list of potential restoration actions is based on watershed assessment through the DPSIR Table (*D5.3 Restoration practises climate and land use change* - Appendix 1) and the nested DPSIR approach. Prioritisation structure (Giannico & O'Hanley 2015):

- Step 1 – DPSIR, Identification of prioritization criteria
- Step 2 - Biological criteria and socio-economic criteria (collection of criteria constitute a filter)
- Step 3 - Restoration actions are scored based on degree they satisfy each creation

Step 1
Use the DPSIR and nested DPSIR approach to identify Sector pressures at a catchment scale and how they have changed the ecological status of the watershed. Application of the nested DPSIR at this early stage will allow for synergies to be integrated into decisions making.

Step 2
Outcomes from the DPSIR approach will identify which ecological processes are missing or degraded. This information is then used to build up biological criteria to improve river functioning and socio-economic criteria. An example from Coo Bay is used here (Coos Watershed Association 2006). Biological filters identified are (Giannico & O'Hanley 2015):

- Restore watershed processes
- Restore or improve watershed connectivity
- Remove limiting factors
- Have long lasting effects
- Restore or expand unique habitat
- Have well proven effectiveness

Socio-economic criteria identified are (Giannico & O'Hanley 2015):

- Have a high likelihood of success
- Provide educational benefits
- Address landowner concerns
- Have measurable effects
- Are likely to be feasible
- Are likely to be funded
- Have an acceptable cost/benefit ratio

A group of experts and stakeholders should jointly decide on the importance of each biological and socio-economic criteria by weighing each criteria within each category (Figure 4). It is essential that each criteria has a definition to ensure all decision makers understand the same meaning. For example, 'connectivity' – the action improves or re-establishes habitat connectivity'. In addition, a scoring system and definitions (Table 2 & Table 3) need to be produced and where possible, definitions should be quantitative values such as endpoints (see D5.1).
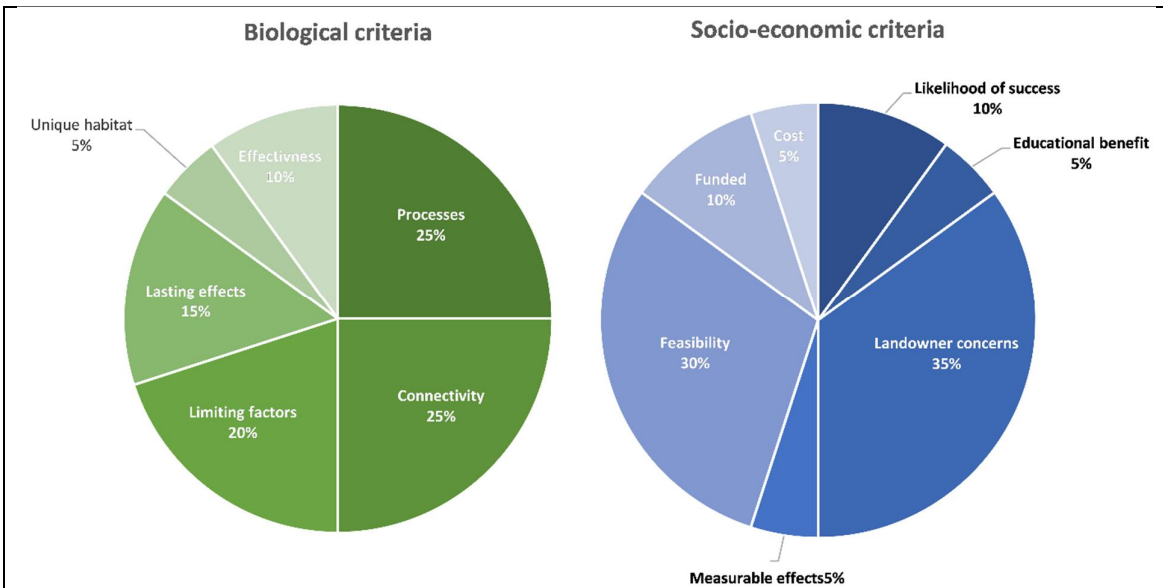
Figure 4. Weighted prioritisation criteria (Giannico & O'Hanley 2015).

Step 3

A weighted matrix can be produced to identify realistic and economically feasible options for restoration. The matrix cross references restoration measures against biological and socio-economic criteria. Score (0-4) each of the restoration measures against the definitions provided in table 1 & 2, decisions for each score can be based on survey data, field knowledge, and experience with landowners. Individual scores for each restoration action are then multiplied by the relative weights of the corresponding criterion and totalled for the two main categories. Using a threshold of two, the aggregated scores for biological and socio-economic criteria were used to determine the level of priority for each action (Coos Watershed Association 2006).

Table 2. Prioritisation score definitions for biological criteria (source: Coos Watershed Association 2006).

Biological criteria			Scores				
Weight	Criterion	Statement	0	1	2	3	4
25%	Processes	This action re-establishes natural watershed processes and maintains functional processes	Does not address any impaired processes	Partially improves at least one impaired process	Significantly improves at least 1 moderately impaired process	Significantly restores at least 1 highly impairs process	Significantly restores 3 or more highly impaired processes
25%	Connectivity	This action improves or re-establishes habitat connectivity	Does not restore any connectivity	Partially restores connectivity for some life stages/species to at least some moderate quality	Significantly restores connectivity for some life stages/species to some high quality or lots of moderate	Significantly restores connectivity of most stages/species to a moderate amount of high quality	Restores full connectivity for all life stages for all species to a large amount of

Weight	Criterion	Statement	0	1	2	3	4
				habitat	quality habitat	habitat	high quality habitat
20%	Limiting factors	This action will promote health coho populations by removing one or more limiting factor(s)	Does not address any coho life-history bottlenecks	Addresses one coho life-history bottleneck, but not the primary one	Addresses the primary coho life-history bottleneck, but low to moderate effect on the bottleneck	Has a high likelihood of significantly relieving the primary life-history bottleneck	Has a high likelihood of significantly relieving the primary and secondary life-history bottlenecks
15%	Longevity	The effects of this action will persist into the future	Expected life span ≤10 years	Expected life span 11-25 years	Expected life span 16-50 years	Expected life span 51-100 years	Project expected to be self-maintaining in perpetuity
5%	Unique habitat type	This action will benefit or provide specifically needed or unique habitat types	Does not address any needed or unique habitat types	Partially addresses one needed or unique habitat type	Partially addresses more than one needed or unique habitat type	Completely addresses one needed or unique habitat type	Completely addresses more than one needed or unique habitat type
10%	Proven technique	This action will use a technique proven to be successful or test the effectiveness of a new restoration technique	Technique known not to be effective	Technique unproven but not experimental or innovative	Technique experimental and/or innovative, but efficacy unknown	Technique proven to be effective	Techniques proven to be effective and innovative

Table 3. Prioritisation score definitions for socio-economic criteria (source: Coos Watershed Association 2006).

Socio-economic			Scores				
Weight	Criterion	Statement	0	1	2	3	4
10%	Likelihood of success	This action is highly likely to fulfil its goals	Not likely to be successful	Small likelihood of success	Project likely to meet some goals	Project likely to meet most goals	Project likely to meet all goals
5%	Educational benefit	This action will provide educational or outreach	No educational or outreach benefits	Few educational or outreach	Local outreach and educatio	Regionally prominent	Nationally prominent

			benefits	benefits	nal benefits	outreach and educational benefits	outreach and educational benefits
355	Landowner concerns	This action addresses a stated landowner concern	Meets no landowner objectives in the sub-basin	Meets at least one landowner's objective. But may conflict with other landowner objectives	Meets more than one landowner's objective. But may conflict with other landowner objectives	Meets the majority of landowners objective and does not conflict with other landowner objectives	Meets all landowners objectives and will result in a synergistic effect for other projects
5%	Measurability	The effects of this action will be measurable through monitoring	Benefits of the project cannot be measures	Monitoring is possible. But beyond the capacity of the organisation to conduct	Monitoring will be expensive and require long-term study	Monitoring is feasible with known protocols	Monitoring has a high likelihood of leading to publishable results
30%	Implementation feasibility	This action is highly likely to be feasible, and political or social resistance to this action is unlikely	Unlikely to be implementable because of political and social constraints	Has potential to be politically or socially disruptive	Some people in the sub-basin will like the project and others will be neutral or oppose it	Most people in the sub-basin will be supportive of the project	Peoples in the sub-basin and local and political leaders will be supportive of the project
10%	Funding	This action is highly likely to be funded. There are no significant social, political, or	This project is un-fundable	This project is unlikely to be funded by known source	The project can probably be funded from known sources,	This project will likely be funded from known sources	This project is highly likely to be funded from a source we

		other constraints to funding this action			but might be difficult		would like to develop
5%	Cost	This action provides an acceptable cost/benefit ratio and is within the abilities of the funding and implementation groups	>$1,000k	$250k-1,000k	$100k-$250k	$50-$100k	<$50k