# OUTCOMES of the Class participation: Appraising Options for Sediment Management

The NORFMA Sediment Issues Group includes individuals from a wide range of disciplinary and professional backgrounds who share a common interest in sediment dynamics, sediment problems and their management. Participants in the Floodplains by Design Meeting, are not generally as focused on sediment, but recognise its importance to sustainable floodplain functions – it is a valuable resource, but one that can pose risks to people, property and infrastructure and species that must be carefully managed.

Recognising the depth of experience and depth of knowledge held by the group of people that chose to participate in the sediment break out session the opportunity was taken to elicit knowledge from participants regarding the wider effectiveness of a range of sediment management actions covered in the presentation on sediment management in the Toutle-Cowlitz River system, draining from Mount St Helens. Based on their engineering/scientific judgement and direct experience in Washington State in general, and watersheds draining to Puget Sound in particular, the group rated the sediment actions listed below as High, Medium or Low in terms of its potential effectiveness for application in watersheds disturbed by volcanoes, earthquakes or other disruptive phenomena. Some comments refer to specific rivers, most did not. Participants were also encouraged to write in additional sediment management actions that were not included in the list but which they have found to be effective. The order of the actions reflects their ranking in terms of overall effectiveness, with High scored as +2, Medium scored as +1 and Low scored as -1.

| **Sediment Management Action** | **High** | **Medium** | **Low** | **Comments** |
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| Reconnect/expand floodplains and side channels | 17 | 6 | 0 | Downstream.<br>Skokomish River: Reduce silt content to increase transport capacity.<br>Depends on design. |
| Stabilise upland source areas (valley and terrace slopes) | 11 | 10 | 2 | Long-term.<br>If it can be done.<br>Skokomish River: limited area in upper watershed due to steep topography.<br>Keeps sediment out of system.<br>White River: Important but low practicality. |
| Install ELJs as grade building structures | 3.5 | 15.5 | 3 | Skokomish River: currently working well.<br>High in vegetation.<br>Some working as building isalnds but not storing sediment.<br>Long-term vs short-term. |
| Protect eroding stream banks | 9 | 6.5 | 7.5 | Expensive.<br>Natural process – only when use changing.<br>Skokomish River: effective in lower valley.<br>Bioengineering.<br>Size/scale dependent. |
| Build a sediment retention structure | 4.5 | 10.5 | 8 | Maintenance nightmare.<br>High maintenance.<br>Skokomish River: No safe place to do this. Risk of failure and endangered species.<br>Mud at dam.<br>Long-term vs short-term.<br>Highly effective short-term, low effectiveness long-term.<br>Tine scale dependent. |
| Dredge sediment from flood control channels | 2.5 | 11.5 | 9 | Skokomish River: channel needs to be deepened to restore sufficient transport. |

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| Use gravel/sand mining for sediment management | 2 | 12 | 9 | 2 x Scale dependent.<br>Skokomish River: difficult to mine proper volume of specific sediment sizes. |
| Raise levees to protect vulnerable communities | 2 | 4 | 17 | Skokomish River: silt-laden sheet flow beneficial to form land, reduces silt in sediment transport.<br>Pierce County: Raises risk upon failure.<br>Failure if breaches.<br>Long-term vs short-term.<br>Short-term.<br>Raising levees raises potential flood damage when failure occurs. Also, added extra expense to buy more land. |
| Flush sediment using dam releases | 1 | 2 | 17 | 3 x 'not applicable'.<br>Skokomish River: Need deeper downstream channel to transport additional sediment.<br>Pierce County: Flushes sediment to Pacific. Kicks can down the road.<br>Causes problems downstream. Remove sediment from behind dam. |
| Narrow the river to increase velocity | 0 | 5 | 18 | Only if channel was normally narrow.<br>Skokomish River: constrained ability to do this in all locations.<br>Tried – it didn't work.<br>Pierce County: Didn't work.<br>Short reaches.<br>The Corps did this on the lower Puyallup (1920's and 1930's). It did not work. |
| Straighten the channel to steepen it | 0 | 2 | 21 | Skokomish River: lose sediment storage capacity due to meandering. |
| **Write-in Options** | | | | |
| Stop/regulate development | 8 | | | |
| Set back levees | 3 | | | |
| Restore veg/riparian corridor | 2 | | | |
| Phased Management Plan | 2 | | | |
| Roughen Floodplain | 1 | | | |
| Stop upland sediment sources | 1 | | | |
| Re-align channel | 1 | | | Skokomish River: need to re-align channel as it is currently preventing sediment transport in lower reaches. |
| Eminent domain | 1 | | | |
| Do Nothing | 1 | | | |
| Infiltration on site | | | | Effectiveness of on-site infiltration not rated. |

Note: the exercise was undertaken as part of a lecture titled '**Sediment Issues and Management in Disturbed Watersheds**' presented by Colin Thorne (cthorne@esassoc.com), ESA Vigil-Agrimis, Portland, OR at the *Floodplains by Design Workshop*, Shoreline WA, 26 February 2015. 