

Presenter	Joe Berg Biohabitats, Inc.
Type	oral presentation
Category	Innovative watershed and stream restoration approaches/methods
Title	<i>Green Stormwater Infrastructure: An Innovative Use of Stream Restoration Techniques</i>
Abstract	<p>This presentation focuses on an approach using stream restoration as a means of integrating stormwater management in new or existing projects. Through replicating elements of headwater streams and adjacent riparian habitat, our approach using open channel collection and conveyance represents a successful example of stormwater green infrastructure. Runoff from increased impervious area was minimized using a design that duplicated the functionality and material processing of headwater streams. This approach increases the project's marketability to the green consumer, capitalizes on ecological engineering and restoration techniques, reduces project costs, and reverses the negative feedback between stormwater runoff and downstream resources. Through an innovative application of stormwater best management practices (BMPs), stream and wetland restoration techniques, and elements of ecological engineering, the impacts typically associated with stormwater runoff can be eliminated or reversed. Using a regenerative concept, it is possible to design stormwater collection and conveyance infrastructure which enhances or initiates ecosystem function, replicating zero and first order streams and their associated values and functions. This approach provides a community amenity in the form of narrow riparian corridors through a project site which typically 'fit' in the narrow road and drainage features established on projects. This approach reduces the peak runoff elevations and increases runoff concentration time as a result of longer and rougher flow paths. As a result, area and volume requirements for peak storage facilities can be reduced or eliminated. Landscaping associated with this approach is an attractive community amenity which appeals to the 'green consumer' and increases the economic value of the project. There are also lower implementation and O&M costs than the buried stormwater infrastructure approach. This design approach is consistent with, meets or exceeds current regulatory stormwater requirements, so it facilitates and shortens the review process. While this design approach fits in new development projects, it can easily be used to repair failing infrastructure in existing projects or restore degraded drainage features associated with older projects. Another application of this approach is to retrofit watersheds developed prior to widespread use of stormwater management practices. With proper design and emphasis, these techniques can result in minimizing runoff increases between the pre- and post-development condition, eliminating the need for stormwater detention facilities. This approach is a high form of stormwater green infrastructure which integrates aquatic, terrestrial, and groundwater resources, maximizing the social value associated with providing stormwater quantity and quality functions, while providing significant aesthetic value. Furthermore, the ecosystem restoration/conservation benefits of the approach are difficult to overestimate. They include rehydration of riparian and wetland areas, suppression of invasive exotics, groundwater recharge and maintenance of stream baseflow, stimulation of biodiversity (e.g., vernal pool, peat production, etc.), water quality improvement, reduced velocity and shear stress of runoff, increased storm flow concentration time, and safe, non-erosive conveyance of runoff. A recent development project will be used to compare and contrast conventional stormwater practices with the design approach presented in this session.</p>