

### Iowa's River Restoration Toolbox

Iowa's River Restoration Toolbox was developed to assist designers in stream stabilization and restoration projects in Iowa with proven techniques with emphasis on incorporating natural materials, such as logs, stone, and live plantings. Among the dozens of techniques described in the Toolbox are longitudinal peaked stone toe protection, j-hook vanes, rock arch rapids, oxbows, riparian corridor restorations, and tree/shrub plantings. It delivers a consistent, relevant assessment method and reviewable design checklists to aid decision making among multidisciplinary teams (i.e. – restoration practitioner, engineer, project manager, funder, biologist, etc.). The Toolbox also provides detailed drawings and specification requirements to make natural stabilization projects more biddable.

The Toolbox effort initially researched and merged common engineering and restoration practices. It was then reviewed and adapted by a statewide team of Iowa engineering, river restoration, project management, and aquatic habitat professionals from various cities, state agencies, federal, and non-governmental organizations with a stake in its development. This resource helps design teams evaluate streams and apply successful practices. Just as important, the Toolbox will help design teams avoid implementing practices that are likely to be less successful or more destructive. Efficiencies are anticipated from inception to permitting, because reviewers can work from generally accepted design assumptions and calculations to support the selected practices.

The Toolbox contains two main components: An assessment tool, and a series of practice guidelines. The assessment tool is an interactive spreadsheet. Users input characteristics of the existing site from desktop and field reviews. The assessment tool then flags key drivers of instability and ranks practices and techniques to inform design decisions. This tool also allows users to see the predicted effect of design changes on stream parameters and functions as a review checklist for funders, land managers, or technical reviewers.

Each restoration practice listed in the Toolbox contains guidelines and drawings. Best site applications and detailed dimension ranges support appropriate implementation. The practices were reviewed and adapted to conditions common in Iowa, considering factors such as dominant sediments, geology, materials availability, prevailing soil types, land use constraints, and needs of aquatic life.

Improvements and refinements continue to arise in the stream and watershed restoration fields. As such, the Toolbox will be periodically reviewed and updated. Promising techniques will be added, and underperforming techniques will be adjusted or removed. Project managers are encouraged to share any post-project monitoring data or reports to assist future revisions of assessment and techniques. Through careful evaluation, the Toolbox can continue to be the repository of best practices used on streams in Iowa.