Lake Red Rock Bedload Interception for Reservoir Sustainability and Commercial Soil Manufacturing

Response Summary:

Lake Red Rock on the Des Moines River at Des Moines, Iowa has lost storage capacity to excessive delta sedimentation and has had pool raises to counteract the impact. Future pool raises are unlikely, so alternative means to extend the life of the flood protection function must be considered. A sustainability approach to reservoir management was investigated to identify sediment sources and devise strategies for selective bedload capture to reduce sedimentation rates. This study primarily considered beneficial uses for sediment that can help reduce municipal operating costs and spur economic activity through integrated waste management.

Rock Island District has identified three major sediment sources to Lake Red Rock: Raccoon River (1.5 million tons), Middle River (1 million tons), and South River (1 million tons). A bedload collector could be placed below these tributaries where sand stockpiles could be located on Corps fee title property on the Des Moines River above Lake Red Rock (see figure).

Outreach to public entities to identify beneficial use for the dredged material included: Iowa DNR Stormwater Management, Iowa DNR Abandoned Mine Land Reclamation program, Iowa Department of Transportation (IDOT), Iowa Department of Agriculture and Land Stewardship (IDALS) Urban Conservation, and municipal agencies following recommendations and contacts provided. Iowa DNR regulations are recently updated and support beneficial use of dredged material, but demand for topsoil is not high because local soils are reused in construction projects. Local aggregate dealers did, however, express interest in sustainable sand resources. One company is in permit negotiations to open a new sand and gravel mine on Corps property in the Lake Red Rock Delta where they are also receptive to future opportunities to source sand for reservoir sustainability. The positive response from industry provides good reasons to advance planning for reservoir bedload collector technology with a pilot study.

Period of Performance:

January FY20 – May FY20

Benefits of the Response to the USACE Dredging/Navigation Program:

Innovations for reservoir sustainability; Private-public partnership opportunities; Coordination with Natural Infrastructure Initiative partners; Recommend bedload collector pilot study to estimate bedload collector volume.

Deliverable:

A letter report to the Lake Red Rock manager and DOTS PM was completed for the record; Industry contacts

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