Landowner's Best Management Practices (BMPs) For Erosion and Stormwater Control

Las Huertas Watershed Project
Placitas, New Mexico

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Introduction

The Las Huertas Creek watershed occupies approximately 31 square miles in southeastern Sandoval County, New Mexico. The watershed reaches from the Crest of the Sandia mountains to its final outflow point at the Rio Grande. Due to the impacts of past land use practices and urbanizing development, the Las Huertas Creek is accumulating excessive amounts of sediment. Stormwater drainage off of dirt roads, man-made impervious surfaces (rooftops and paved areas), and drought-stressed landscapes is accumulating in the Creek and its receiving river, the Rio Grande, impairing its function as a surface water conveyance and riparian ecosystem. Due to these excessive levels of sediment in the stream, the Las Huertas Creek has been listed as an impaired stream by the U.S. Environmental Protection Agency and the New Mexico Environment Department (NMED). The Las Placitas Association, a local conservation organization, is taking steps to address this problem, aided by a grant from the NMED.

This simple, illustrative manual is meant to serve the Placitas-area residential landowner with a few practical techniques for controlling drainage in such a way as to retain water for use by vegetation, and minimize stormwater drainage and sediment off-property. These techniques are referred to as "Best Management Practices" (BMPs) by stormwater drainage engineers. By employing these simple but effective BMPs, area landowners can reduce erosion of their own property, and retain water for landscape-enhancing vegetation and wildlife habitat.

The BMPs described in this handbook are also used at a larger scale in controlling erosion in the riparian and upland zones of the watershed. We hope you find the scaled-down versions as useful in your yard as we have in our watershed restoration efforts.

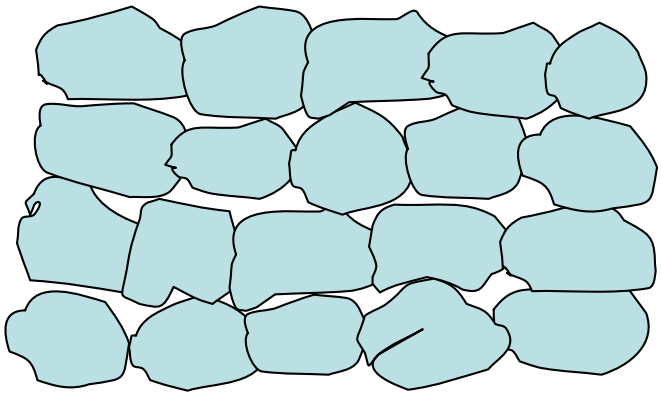
Please note that implementation of these measures in arroyos may be subject to permitting by the Army Corps of Engineers. Please call the Army Corps Regulatory Branch at 505-342-3279 for approval prior to implementing any of these remedies in arroyos on your property. For more in depth and detailed explanations of these measures, please refer to the documents listed in the reference section at the end of the manual.

S**tructure 1. Rock Mulch**

Place of Use: Anyplace where overland flow is concentrated.

Purpose: Slows drainage flows, traps suspended sediment, builds substrate for vegetation.

Description: Rock mulch is simply a one rock dam used in an upland zone to catch drainage water. The rock mulch structure, composed of cobbles or small boulders, catches fine sediment, seeds and mulch brought by stormwater flows and naturally forms a substrate for vegetation. The vegetation, which may become established after only one runoff event, further retards the overland drainage and controls erosion. Rock mulch has been used by New Mexico Pueblo cultures for centuries as an erosion control and landscape stabilization measure.



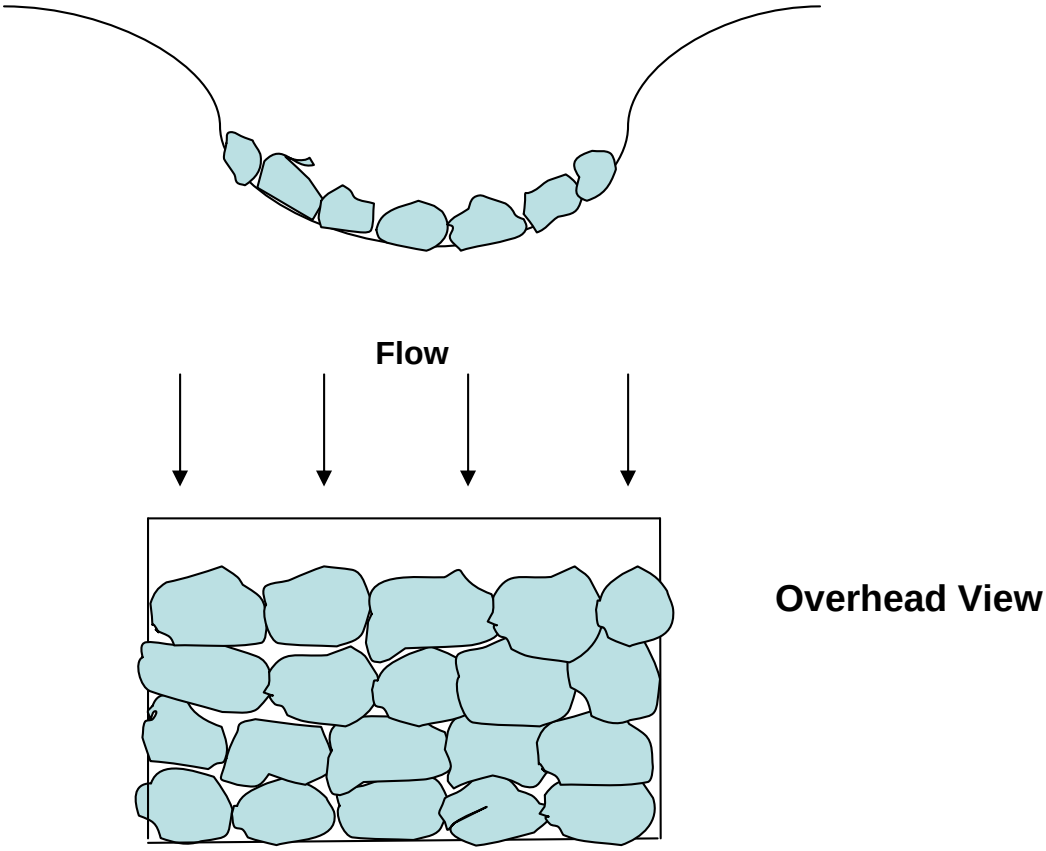
Rock Mulch

Structure 2: The One-Rock Dam

Place of Use: Rills, rivulets or small arroyos.

Purpose: Slows drainage flows, traps suspended sediment, increases local recharge.

Description: A one-rock dam derives its name from its height, which is specified as one rock tall. Additional rocks above this height are discouraged, as they are likely to be carried away by flood flows. Several rows of rocks should be used to hold the structure in place and for trapping sediment (See Figure 1). Rock size should be selected according to the size of the channel and the level of flow expected. A good rule of thumb is to gauge approximately 3 pounds of rock for every inch of flow expected. For example, a channel that runs six-inches deep should use approximately 18 pound rocks.



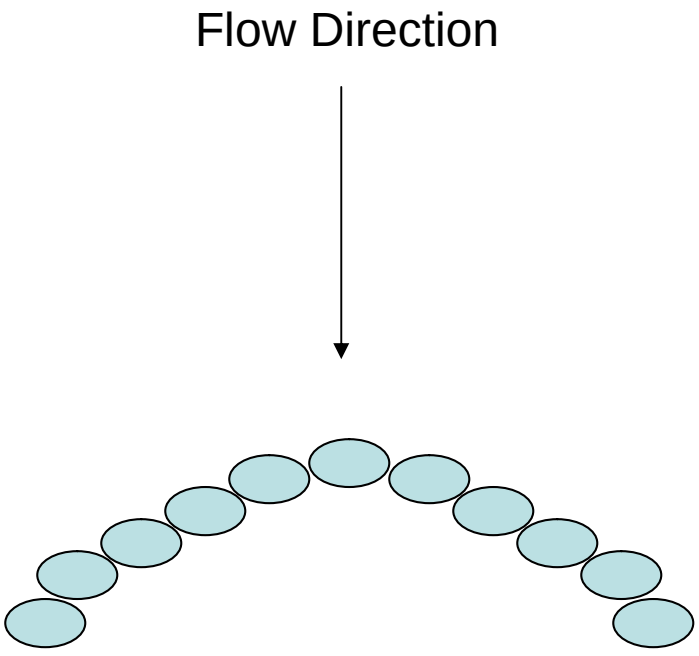
One Rock Dam Profile and Plan Views

Structure 3. The Media Luna

Place of Use: Valley bottoms, swales or drainage fans.

Purpose: Spreads runoff flows, prevents rill and gully formation.

Description: A media luna (i.e. half moon) is a curved section of rock mulch placed along a contour line in a valley bottom or locally depressed upland area that is a collection for local drainage. As with rock mulch, the structure catches materials that foster vegetative colonization that further stabilizes the drainage. The orientation of the media luna depends on the orientation of the contour line. The points or "horns" of the half moon structure will point in the downstream direction for a typical draining valley bottom (Figure 3a). In a drainage fan situation, where sediment deposition has raised the grade of the drainage, the horns should point in the upstream direction (Figure 3b). In both cases, the media luna stabilizes the prevailing contour of the subject drainage.



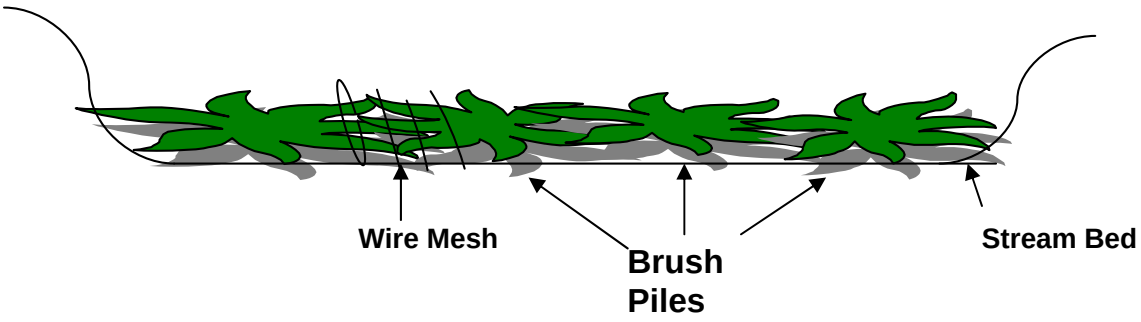
Typical Media Luna Design

Structure 4. The Brush Dam

Place of Use: Eroding Gullies.

Purpose: Slows drainage flows, traps suspended sediment, increases local recharge, retards gully formation.

Description: Brush dams are a convenient use for scrap brush from prunings and trimmings of shrubs and small trees. They are typically constructed of a low, loose pile of branches and/or brush in a gully bottom. The branches can be intertwined or even wired together for added stability. The structure should be kept low in the stream profile so as to accumulate sediment and mulch that can serve as the substrate for new vegetation.



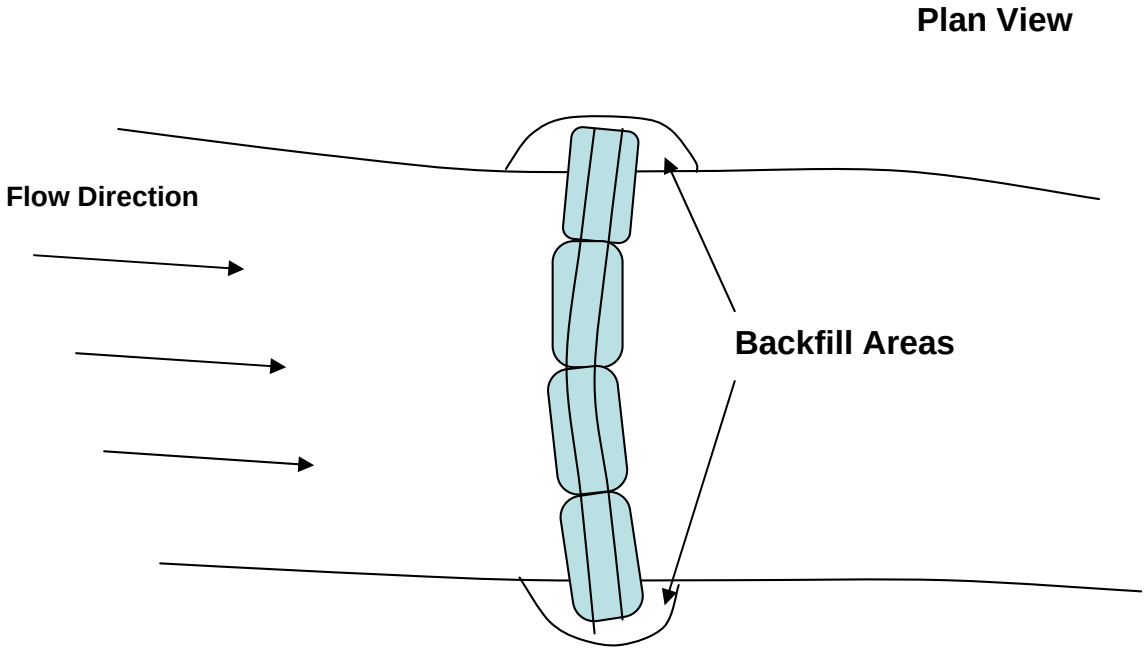
Typical Brush Dam Design

Structure 5. Straw Bale Dams

Place of Use: Eroding Gullies.

Purpose: Slows drainage flows, traps suspended sediment, increases local recharge, retards gully formation.

Description: Straw bale dams are constructed of a single row of standard sized straw bales placed end to end across the width of a drainage channel, perpendicular to the direction of flow, and staked in place. The straw bales absorb moisture, accumulate sediments and form a substrate for new vegetation, which further stabilizes the channel. An important feature is to embed the bale in the stream channel up to 80% of its height, before staking in place. The trench should be deeper at the center of the gully, and curve slightly in the upstream direction. Use the trench backfill and additional cobbles to stabilize the intersection of the bale (or bales) with the wall of the gully, which can be susceptible to end cutting.



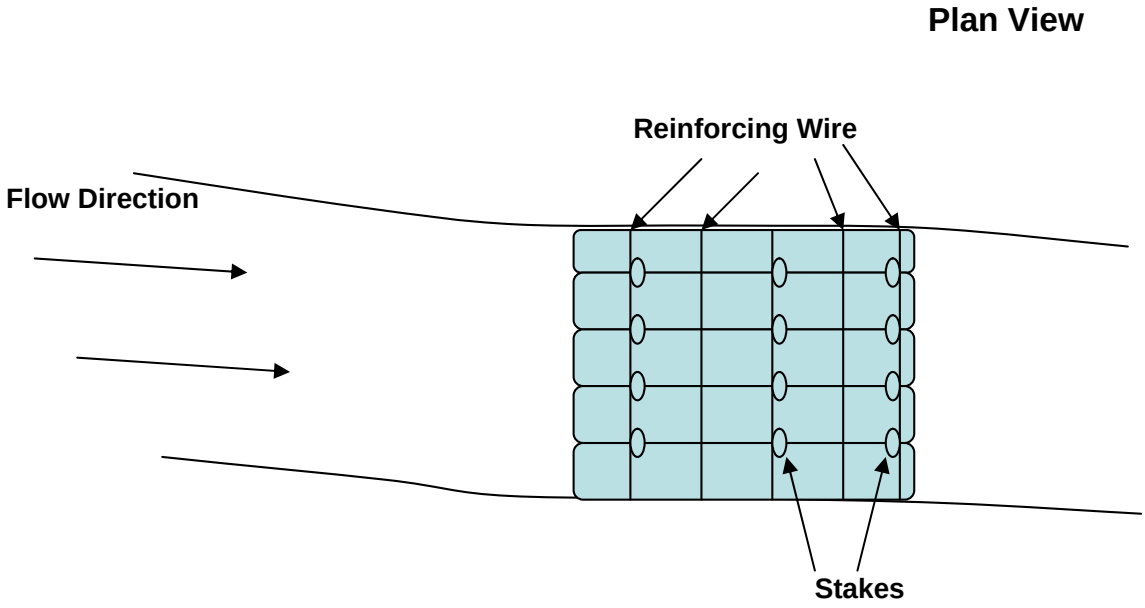
Straw Bale Dam

Structure 6. Log Mats

Place of Use: Eroding Gullies.

Purpose: Slows drainage flows, traps suspended sediment, increases local recharge, retards gully formation.

Description: Log mats are comprised of a single layer of small logs placed length-wise within the gully channel (i.e. parallel to direction of flow) wired together and staked in place. Similar to straw bale mats, log mats absorb moisture, accumulate sediments and form a substrate for new vegetation.



Log Mat

References

Sponholtz, Craig, 2007. ***Conserving Soil and Water in Drylands*** Dryland Solutions, Santa Fe, New Mexico. March 2007.

Zeedyk, Bill and Jan Willem Jansens, 2004. ***An Introduction to Erosion Control***. Earth Works Institute and Quivira Coalition, Santa Fe, NM. May 2004.