Erosion Prevention

Hills, Streams & Roads

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Brief Overview of erosion control processes and concepts, including shallow (< 5 feet in depth) debris flows (mudslides) as well.

Before you can prevent or control soil erosion you first need to know ALL the factors that cause it and/or that make it worse. Soil erosion and slope failure is rarely caused by one factor such as a rainfall event, disturbed soil conditions or a plugged drainage system.

“It’s a natural process…..” Soil Type (& condition); Topography (length & steepness of slope); Vegetation (type and amount of cover); Climate (rainfall amount/intensity); and Human Impact.

Some things to expect with an intense rainfall event (especially when ground is already saturated from previous rainfall):

- Intense rainfall events with runoff exceeding design capacities of culverts, drains, roof gutters, ditches, channels, etc.
- Ground saturation causing more runoff and potential for soil erosion, mudslides/debris flows/landslides.
- Slope holding vegetation compromised from years of drought.
- Trees falling from ground saturation especially on mudslide slopes. Other trees falling because of pests/disease/dead because of drought.
- Flooding. Stream flows overtopping banks especially following years of drought. Channels full of debris, dead vegetation, midstream bars with mature vegetation, sediment and unmaintained.
Streambank erosion. Reduced channel capacities, debris jams, diverted flows, overland/bank flows, drought compromised bank vegetation, and changes in surrounding land uses that increase runoff.

How to be ahead of the curve before and when the rain starts falling:

Soil Erosion Control and Prevention Practices for hillside properties, streamside properties and properties accessible by a public or a privately maintained road.

Hillside Erosion and Surface Soil Slope Failure (Debris Flow/Mudslide):

- Limit disturbance. Do NOT terrace in an attempt to make more stable.
- Maintain existing vegetative cover. Protect any bare or disturbed soil with vegetation and/or mulch (NOT plastic tarps or sheeting).
- Do not release concentrations of water from roof drainage systems, driveways, etc. over slopes. Keep slopes as dry as possible over the winter.
- Monitor rainfall and ground saturation.

Stream Bank Erosion:

- Don’t dump anything over streambanks in an attempt to control erosion. This practice is actually counter intuitive and will almost always make the situation worse. Keep a watchful eye for debris jams forming and trees falling into stream course affecting flows.
- Work with streamside neighbors as much as possible. Streams are very dynamic and erosion issues have to be approached on a stream reach basis and not by “spot treating”.
- Maintain bank vegetation and buffer of grasses and other plants on land surrounding streambanks.
- Reduce runoff, especially concentrated flows, over streambanks.
Road Related Erosion and Road Bank/Fill slope Failure:

Monitor and maintain road drainage facilities during and after every major storm event this winter. Make sure there are responsible parties identified for maintenance. It takes an all-out effort to keep things clean and functioning. Consider critical dips at all culverts and cross drains, especially on unpaved roads. Make sure all road culverts have properly sized and installed inlet and outlet control devices.

Reduce the amount of water that makes it way to roads by improving home and property drainage/runoff control practices.

Fix problems when they are small! When it comes to roads: be proactive not reactive. Taking a preventive approach will extend the life of your road, be way less expensive and ensure safe access to your home.

Take Home Points

*The Top TEN Things you should know and/or do before (and during) the winter.*

- Consult with an expert for advice, design and installation assistance
- Work with neighbors, homeowner and/or road association
- Keep bare and disturbed soil protected during the rainy season. Do not disturb existing vegetation especially on streambanks and slopes unless advised to by a licensed professional (dangerous tree, etc.)
- Do not disturb soil, slopes or streambank during the winter months if at all possible. Keep dry as possible. Bare, disturbed and over saturated soil/slopes is more susceptible to erosion and sliding than soil/slopes with vegetative cover and proper drainage provisions.
- Be extremely careful with emergency/temporary practices (especially plastic sheeting). Sometimes fewer practices or no practice at all is better than high risk temporary practices that have been improperly designed and/or installed (especially in preparation for any major rainfall event). *Note: Emergency practices can give a false sense of security which can be worse than knowing that a hazard exists.*
• Design with nature. In other words use and understand natural processes when designing practices to control runoff and erosion. Just remember when you control natural runoff you are controlling nature and that offers never ends well.
• Monitor, Maintain and correct deficiencies ASAP and especially when they are small.
• Have an emergency plan including a “Plan B” for practices with a design capacity. Be prepared to leave your home if your property becomes unsafe because of soil, slope and/or stream movement processes.
• Take a holistic approach being careful not to cause new problems at the expense of controlling or preventing one. “Connect all the dots”
• One size does not fit all. In other words every soil erosion problem or issue is unique and often requires a site specific assessment and treatment. What worked for your neighbor may or may not work in your particular case.
• Contact the RCD of Santa Cruz County and/or the USDA Natural Resources Conservation Service for free information and assistance.