RIPARIAN ECOSYSTEM RESTORATION INSTEAD OF DETENTION PONDS AS A METHOD TO MITIGATE FOR ADDED IMPERVIOUS SURFACE

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Comparison of Riparian Restoration vs. Ponds
Stormwater Policies Focus on Impervious Area and Neglect Riparian Ecology

Riparian Ecosystems are Important to Stream Quality and Function
Riparian Ecosystems Extend Beyond the Stream

We also know what happens when Riparian Buffers are removed
...or when channels are straightened and banks are hardened

Watershed Studies Analyzed Impacts
(Alsea Watershed ‘1969)
Study Treatments Included
Clearcutting to Streambanks

also Removed LWD
and Included Various Buffer Treatments

Removing Riparian Buffers and LWD result in the following:

- Channels become Unstable
- Streambank Erosion Increases
- Channels Incise and Widen
- Temperature Increases – Dissolved Oxygen Decreases
- Water Quality Decreases
- Food Supply and Trophic Levels Change
- Habitat is lost
Studies of Urbanized Streams

Correlations of % Impervious Area in the Watershed
Correlations of % Impervious Area in the Watershed

Comparison of Studies

Controlled Studies that Removed Riparian Buffers and LWD show:
- Channel Instability
- Streambank Erosion
- Channels Incise & Widen
- Temperatures Increase
- Water Quality Decreases
- Food Supply and Trophic Levels Change
- Habitat is lost

Correlations of Impervious Area claim Urbanization Results in the Following:
- Channel Instability
- Streambank Erosion
- Channels Incise & Widen
- Temperatures Increase
- Water Quality Decreases
- Food Supply and Trophic Levels Change
- Habitat is lost
- Riparian Buffers and LWD are Removed
Urban Stream Classification Model

Caveats of Urban Stream Classification Model

- Streams with good riparian cover tend to score higher than streams where this cover is absent
- Streams with less than 10% impervious cover are not necessarily high quality streams
Why care?
Because stormwater policies focus only on the perceived %TIA problem and neglect the riparian ecosystem.

Ponds Create Impacts too!
The Project: A new 7-mile long freeway that impacts 3 salmon bearing streams

Lower Hylebos Creek
(Fife Drainage Ditch #1)
Surprise Lake Drainage
(Fife Drainage Ditches #3, 4 & 7)

I-5 / SR 167 Interchange
- **Hylebos Creek**
  - 1.5 miles
  - 88 Acres

- **Surprise Lake Drainage**
  - 1.0 miles
  - 36 acres
Valley Ave. I/C – w/ Conventional Detention Ponds
=> 25 Acres of Ponds

Valley Ave. I/C w/ RRP = 1.5 Miles and 128 Acres
Wildlife Linkage

Salmon Recovery
Public Recreation and Environmental Education Opportunities

Riparian Restoration Modeling

- Hydrology: HSPF Continuous Flow Hydrology (Must meet flow and duration requirements)

- Channel Hydraulics: HEC-RAS to estimate floodplain usage, profiles, velocity and energy.

- Geomorphology: Sediment transport and stable channel design.
Baseline Monitoring

- Channel Characterization
- Flow Data
- Water Quality
- Aquatic Macro-Invertebrates
- Salmon Spawning Counts
- Smolt Trapping