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May 1st, 10:30 AM - 12:00 PM

Rewards, Challenges, Approaches and Solutions for Developing the Soos Creek Bioassessment TMDL

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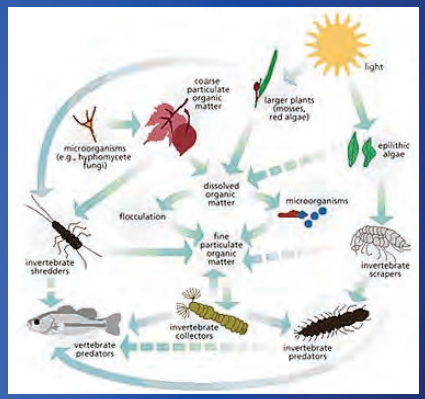
Rewards, Challenges, and Approach for Developing the Soos Creek Bioassessment TMDL

May 1, 2014 ~ Salish Sea Conference

Stephanie Brock
Washington State Department of Ecology



Goal and Purpose

- Expand TMDLs to cover aquatic life beneficial uses and better incorporate stormwater pollutants and impacts
  - Benthic Macroinvertebrate Scores
  - Flow Metrics
  - Land Use
- Develop meaningful measures or targets for allocations/implementation requirements

TMDL Examples from Other States

- Potash Brook, Vermont (7 mi^2)
  - Use an "attainment watershed" approach to set modeled flow reductions for land uses to meet state biocriteria.
- Eagleville Brook, Connecticut (2.4 mi^2)
  - EPA Stressor ID Process indicated stormwater as primary stressor
  - Correlated aquatic life to impervious cover
    - TMDL Target is 12% impervious cover (IC)
- Maine (7 watersheds) - *urban stream syndrome*
  - Combination of pollutants and non-pollutant aquatic life stressors related to stormwater runoff.
  - Loading capacity = greatest amount of impervious cover each watershed can support without violating stream segment's assigned aquatic life criteria.

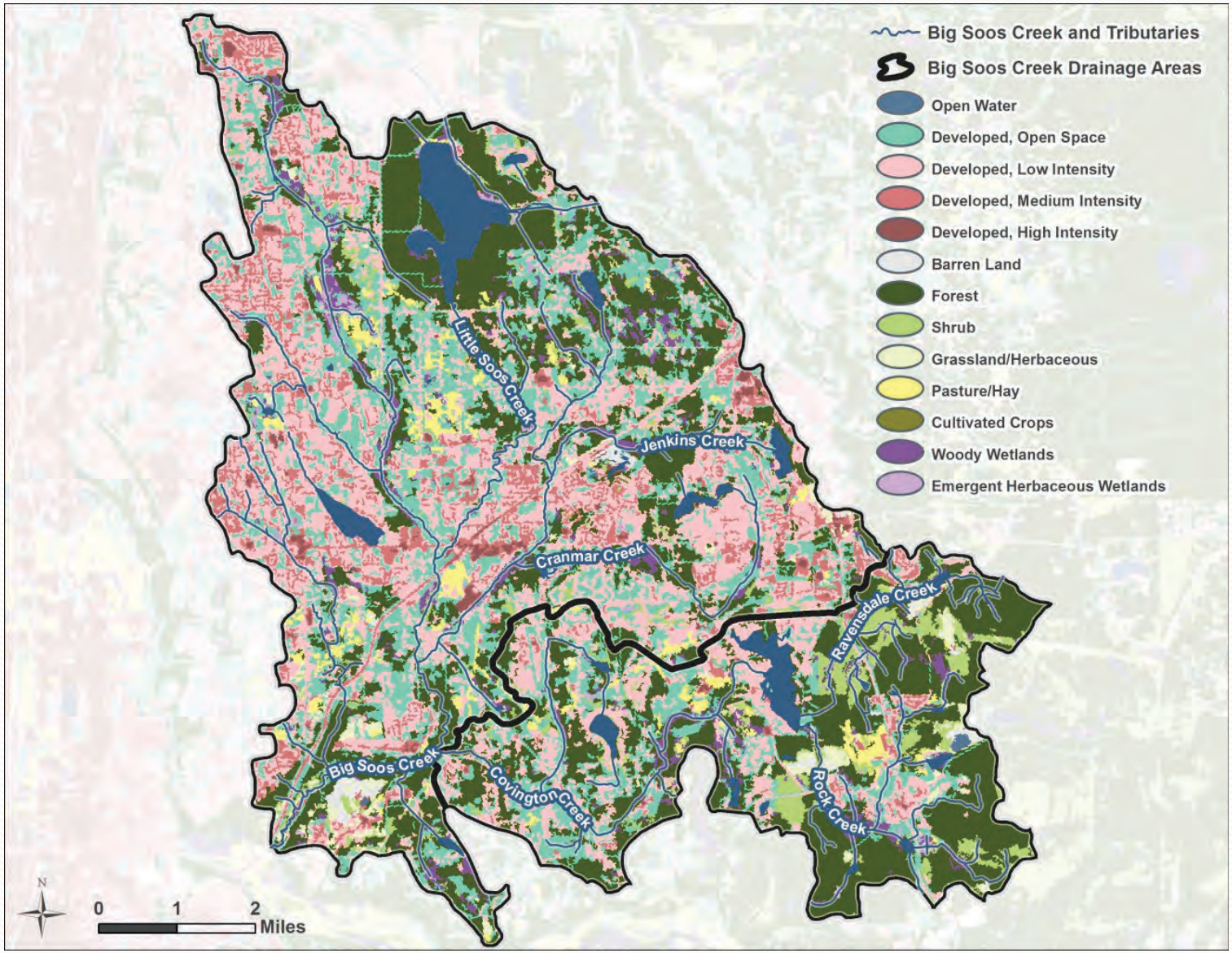
Maine	Class AA/A	Class B	Class C
IC TMDL TARGETS	< 5%	< 9%	< 16%

Soos Creek Pilot TMDL

- Originally, TMDL for temperature and DO
  - (70-mi²)
- Local flow and bug studies - became a pilot for using that data for stormwater allocation development (off critical period)

CATEGORY	WATERBODY NAME	BASIS (B-IBI Scores)
5	BIG SOOS CREEK	24 - 28
5	UNNAMED CREEK (TRIB TO BIG SOOS CREEK)	14 - 16
5	LITTLE SOOS CREEK	18 – 36
2	BIG SOOS CREEK	26 – 32
2	BIG SOOS CREEK	24 – 46
1	BIG SOOS CREEK	32 – 44

Soos Creek Watershed

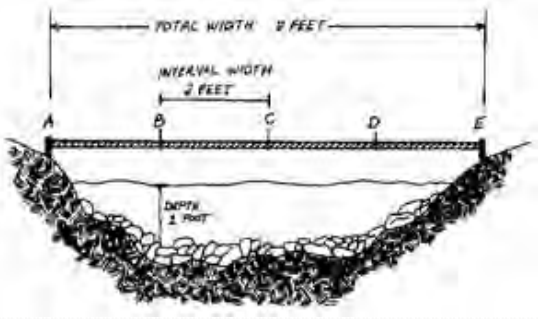



SE 224th St
SE 225th St
164th Ave SE
SE 229th Pl
SE 231st St
SE 232nd St

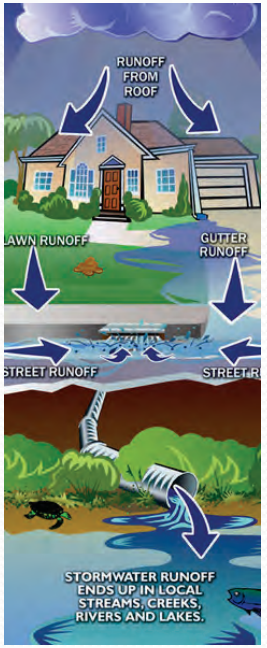

SE 269th Pl
SE 270th Pl
SE 270th St
SE Wax Rd
SE 211st St
166th Pl SE
169th Pl SE
174th Pl SE
SE 272nd St
516
172nd Ave SE
SE 275th St
18

Bioassessment to Support the Soos Creek TMDL

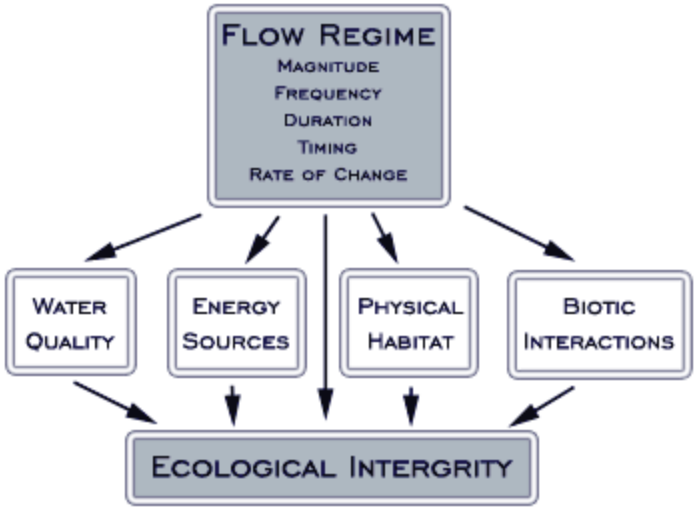
- Contractor collected BMI & periphyton at 6 sites in summer 2012
- B-IBI and RIVPACS scores calculated for each site
- Individual biometrics calculated and compared to determine if correlations exist for the following:
  - Measured physical features (temperature, DO, stream velocity)
  - Streamflow
  - Landuse



Bioassessment - Conclusions

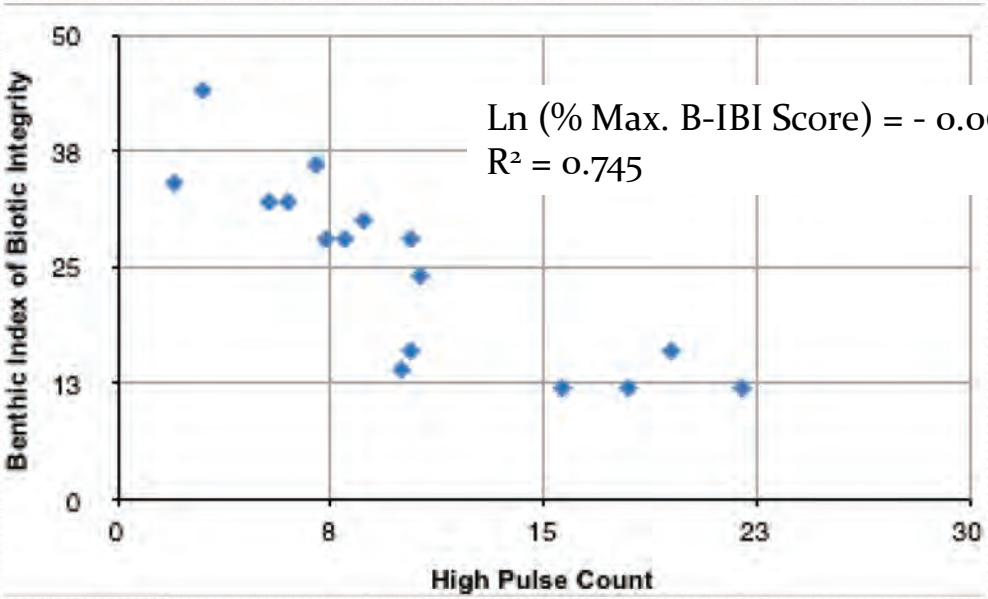


- Statistically significant relationships were observed between a number of the biometrics and the following:
  - Water Quality
    - pH, DO, temperature
  - Stream Geomorphology
    - Gradient, velocity, flow, substrate composition, embeddedness, bank instability
  - Riparian Condition
    - Canopy cover



WRIA9 Retrofit Project – Flow Indicators and Targets

- Use an **indicator** (e.g., 2-year peak:mean winter base flow ratio) to link both watershed conditions and aquatic health and identification of **targets** (e.g., indicator value <10) necessary to meet a protection **goal** (e.g., B-IBI>90 percent of maximum).

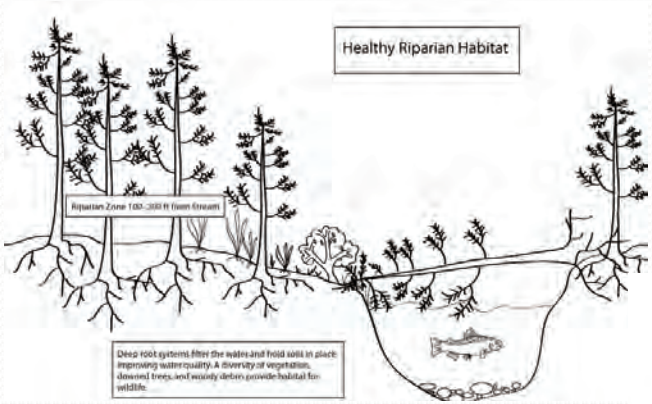


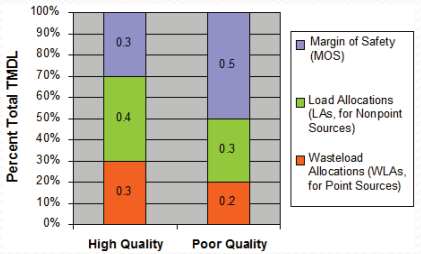
Proposed Approach

- Select a protection **Goal**
  - BIBI score of 38
- Calculate the hydrologic **Indicators** developed by Horner for Soos Creek
  - High Pulse Count and High Pulse Range
- Use the HSPF model to calculate the corresponding **Target**
  - Stormwater Flow Reduction

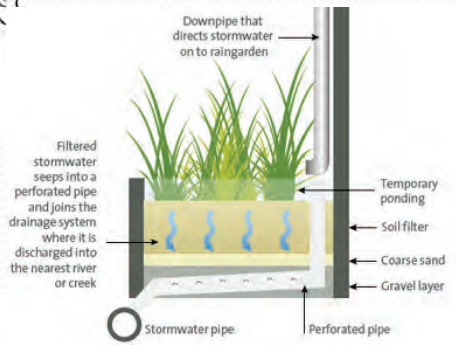
Potential Allocations

- Effective shade

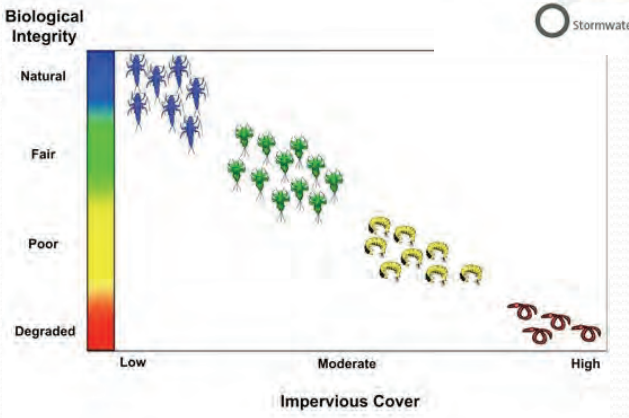




- Stormwater flow treatment or reductions

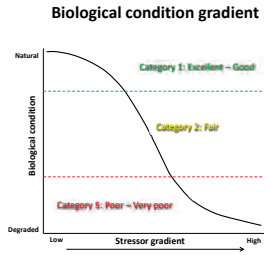


- Biological endpoint targets



Challenges

- First Washington TMDL with B-IBI (bioassessment)
  - Local target for the watershed?
- Policy decisions
  - Surrogates, standards…
- Pilot – 1st TMDL with surrogate hydrologic metric WLAs?
- Level of correlation is good between HPC:B-IBI, but there are other factors affecting aquatic health
  - Meeting the surrogate allocation may not be sufficient to meet the B-IBI target.
- New approach = learning curve



Rewards

- Address all three facets of the Clean Water Act
  - Biological, chemical, and physical
- 1st bioassessment TMDL in Washington state
- Address stressors and allocate meaningful targets contributing to "urban stream syndrome"
- Expand and utilize the bioassessment data collected by Ecology, King County and others
- Teach old TMDL dogs new tricks (expand the knowledge base)

Thanks!

Dept. of Ecology:
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Carla Carlson
Joel Massman

EPA:
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