Lower Boise River
Aquatox Model segments 8 – 12

Pool/Run/Riffle Ratio
Periphyton Visual Assessment
With notes on turbidity, canopy cover, and wetted width

June 20 – 21, 2013
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Kate Harris, City of Boise
Star Bridge; Riffles 1 - 7

- Depth 0.2 - 0.5 meters
- 82% periphyton
- 1.1 meter visibility
Riffle 5 and Representative Shade
Macrophytes in reach
Apparently ribbon-leaved pondweed
Riffle 7 and Representative Shade
Riffles 8 - 15

- Depth 0.2 to 1.5 meters
- 76% periphyton
- 0.5 to 1.1 meter visibility
Riffle 12
In right channel—also a riffle in left channel
Low visibility of substrate due to macrophytes
Riffle 14
Run downstream had rip-rapped right bank
Riffles 16 - 22

- Depth .3 to >2 meters
- 66% periphyton
- 0.4 to 0.8 meter visibility
- Development west of Can-Ada road
Riffle 19 just below Pool 2
Substrate seemed scoured of periphyton
Cleansing function of pools?
Riffle 20
After this reach with more pools and velocities, diatoms predominated
Riffles 23 - 28

- Depth 0.2 to 1.5 meters
- 76% periphyton
- 0.6 meter visibility

- Ponds at end of Goldie Lane South of Highway 44
Riffle 25
Some eroding banks
Riffles 29 - 33

- Depth .4 to 1.1 meters
- 77% periphyton
- 0.8 meter visibility
Cormorant Rookery
Riffle 31
Rapid velocities in this reach
Riffles 34 - 38

- Depth .4 to 1.5 meters
- 81% periphyton
- 0.5 meter visibility
Long, slow run after south channel return
Riffles 39-46

- Depth .4 to 1.3 meters (>2 m for pool)
- 83% periphyton
- 0.6 meter visibility

NHD indicates unnamed confluence on rb and unnamed canal on lb
Side channel right bank entering from concrete bridge and culvert
Small drain, apparently Mill Slough, right bank
Hat = substrate with periphyton growth
Riffle 43
100% habitat available * 75% periphyton coverage
Riffle 43
100% habitat available * 75% periphyton coverage
Aquatox Model Segment 8 Summary

- Pool/Riffle/Run = 3%/30%/67%
- 78% periphyton coverage, mostly diatoms
- 0.5 to 1.1 meter visibility
Riffles 47-59

- Depth 0.3 to 1.9 meters
- 74% periphyton
- 0.6 meter visibility

Includes Fifteenmile Creek confluence
Confluence with Fifteenmile Creek
Increase in turbidity
Riffle 50
Next three riffles after Fifteenmile confluence
no visibility due to turbidity
Riffle 55
Runs in this reach had patchy macrophytes
Riffles 60-76

- Depth 0.4 to 2.0 meters
- 64% periphyton
- 0.5 meter visibility

Includes Willow and Mason confluences
Riffle 65 - Right channel
43% periphyton coverage
Riffle 69
83% periphyton coverage
Turbidity after Mason confluence
Riffle 76
Old Bridge. Rocky point bar ploughed into diversion
Hartley Drain
Boise River channel takes a 90° turn to the south
Aquatox Model Segment 9 Summary

- Pool/Riffle/Run = 2%/29%/70%
- 69% periphyton coverage, mostly diatoms
- 0.5 meter visibility
Riffles 77-83

- Depth 0.2 to 2.0 meters
- 52% periphyton
- 0.4 meter visibility

June 21st—began survey at Chicago Street bridge in Caldwell

Reach includes Indian Creek confluence
Riffle 78
Railroad bridge downstream of Chicago Street bridge
Riffle 79 upstream of Indian Creek confluence
Indian Creek confluence
Large earthen diversion
North channel was entirely diverted—2 to 8-inch cobbles typical of substrate
South channel all run—2.3 miles long—full of strainers and portages
Artificial diversion created increased velocity—withdrawal at end of south channel
Riffles 84-92

- Depth 0.2 to 1.7 meters
- 31% periphyton
- 0.4 meter visibility
Riffle 86—note eroding bank
Notes of 60° embededness directly downstream
Overland runoff—suspended sediment
Instream erosion—fine sediment in substrate
Riffles 93-104

- Depth 0.2 to 1.7 meters
- 31% periphyton
- 0.25 meter visibility
Unnamed Drain
Turbidity—0.25 meter visibility
Two outfalls between Riffles 96 and 97
Ripple 102
Riparian habitat willows and senescent cottonwoods; reed canary grass and false indigo
Aquatox Model Segment 10 Summary

- Pool/Riffle/Run = 0.5%/19%/80%
- 41% periphyton coverage, mostly diatoms
- 0.4 meter visibility
Riffles 105-112

- Depth 0.3 to 1.3 meters
- 42% periphyton
- 0.3 meter visibility
Riffle 105
Downstream of Notus Road Bridge
Three drains in this reach
Consistently increased turbidity after this confluence
Turbidity plume from marshy north channel
Nearest designation on model schematic is for “Conway Gulch @ Notus”
Riffles 113-122

- Depth 0.4 to 1.1 meters
- 57% periphyton
- 0.15 meter visibility
Riffle 113

Turbidity so high—low visibility—I got out to sample substrate for estimates of habitat and coverage.
Four side channels and/or drains in this reach
Riffles 123-129

- Depth 0.3 to 1.2 meters
- 45% periphyton
- 0.1 meter visibility
Riffle 128
Four drains or side channels in this reach
Aquatox Model Segment 11 Summary

- Pool/Riffle/Run = 0%/27%/73%
- 48% periphyton coverage, mostly diatoms
- 0.1 meter visibility
Aquatox Segment 12

Riffles 130-135

- Depth 0.3 to 1.7 meters
- 30% periphyton
- 0.1 meter visibility
Dixie Drain confluence
Dixie Bridge
Aquatox Model Segment 12 Summary

- Pool/Riffle/Run = 0%/25%/75%
- 30% periphyton coverage, mostly diatoms
- 0.1 meter visibility
## Trends

### Trend of Visibility/Periphyton

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The trend line is given by:

\[ y = 45.971x + 36.59 \]

with

\[ R^2 = 0.5518 \]
Aquatox Model Segment Summaries

* **Segment 8**
  * Pool/Riffle/Run = 3%/30%/67%
  * 78% periphyton coverage
  * 0.5 to 1.1 meter visibility

* **Segment 9**
  * Pool/Riffle/Run = 2%/29%/70%
  * 69% periphyton coverage
  * 0.5 meter visibility

* **Segment 10**
  * Pool/Riffle/Run = 0.5%/19%/80%
  * 41% periphyton coverage
  * 0.4 meter visibility

* **Segment 11**
  * Pool/Riffle/Run = 0%/27%/73%
  * 48% periphyton coverage
  * 0.1 meter visibility

* **Segment 12**
  * Pool/Riffle/Run = 0%/25%/75%
  * 30% periphyton coverage
  * 0.1 meter visibility
Conclusions

* Comfortable with:
  * Synoptic sampling results for species composition
  * Periphyton visual assessment for biomass

* Extrapolation of turbidity/periphyton ratio to segments 1-7?
  * My vote is no—need a survey
  * Unless Mullins (1999) and synoptic sampling provide a comfort level for extrapolation

* Currently working on:
  * Conversion of %periphyton coverage to biomass per unit area
  * Dick Park memo 4/26/2013