

Interpreting Value

URBAN STREAM BIOASSESSMENTS
IN GARLAND AND PLANO

Freese and Nichols, Inc.

Aaron Petty

ATKINS

Member of the SNC-Lavalin Group



North Central Texas
Council of Governments

**FREESE
AND
NICHOLS**



Background

- **MS4 regulated entities monitor stormwater during runoff events**
 - Dallas, Fort Worth, Arlington, Garland, Plano, Irving, Mesquite, TxDOT and NTTA
- **NCTCOG assists local entities through the Regional Wet Weather Characterization Program (RWWCP)**



Background

- **RWWCP 3rd Permit Term (2011-2016)**
 - 24 watersheds in-stream chemical and 12 watershed bioassessments
 - Assess urban impact on receiving water quality
- **Bioassessments help interpret factors on health and function of streams**

Assessment Indices:

- Fish assemblage
- Benthic macroinvertebrates
- Physical habitat
- Instant field measurements
- Flow discharge
- 24-hour DO
- Water chemistry sampling

<i>Index Period</i>													
<i>Jan</i>	<i>Feb</i>		<i>Mar 15</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul 1</i>	<i>Aug</i>	<i>Sep 30</i>	<i>Oct 15</i>		<i>Nov</i>	<i>Dec</i>
<i>Non-Critical Period</i>							<i>Critical Period</i>			<i>Non-Critical Period</i>			

Aquatic Life Use (ALU)

- Minimal, Limited, Intermediate, High, Exceptional
- ALU values reflect habitat, fish and benthic species and water quality

Rowlett Creek – Garland

Intermediate ALU and 4.0 mg/l DO

Spring Creek – Plano

Unclassified

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Electrofishing a minimum 900 seconds



Minimum of 6 seine hauls totaling 60 meters

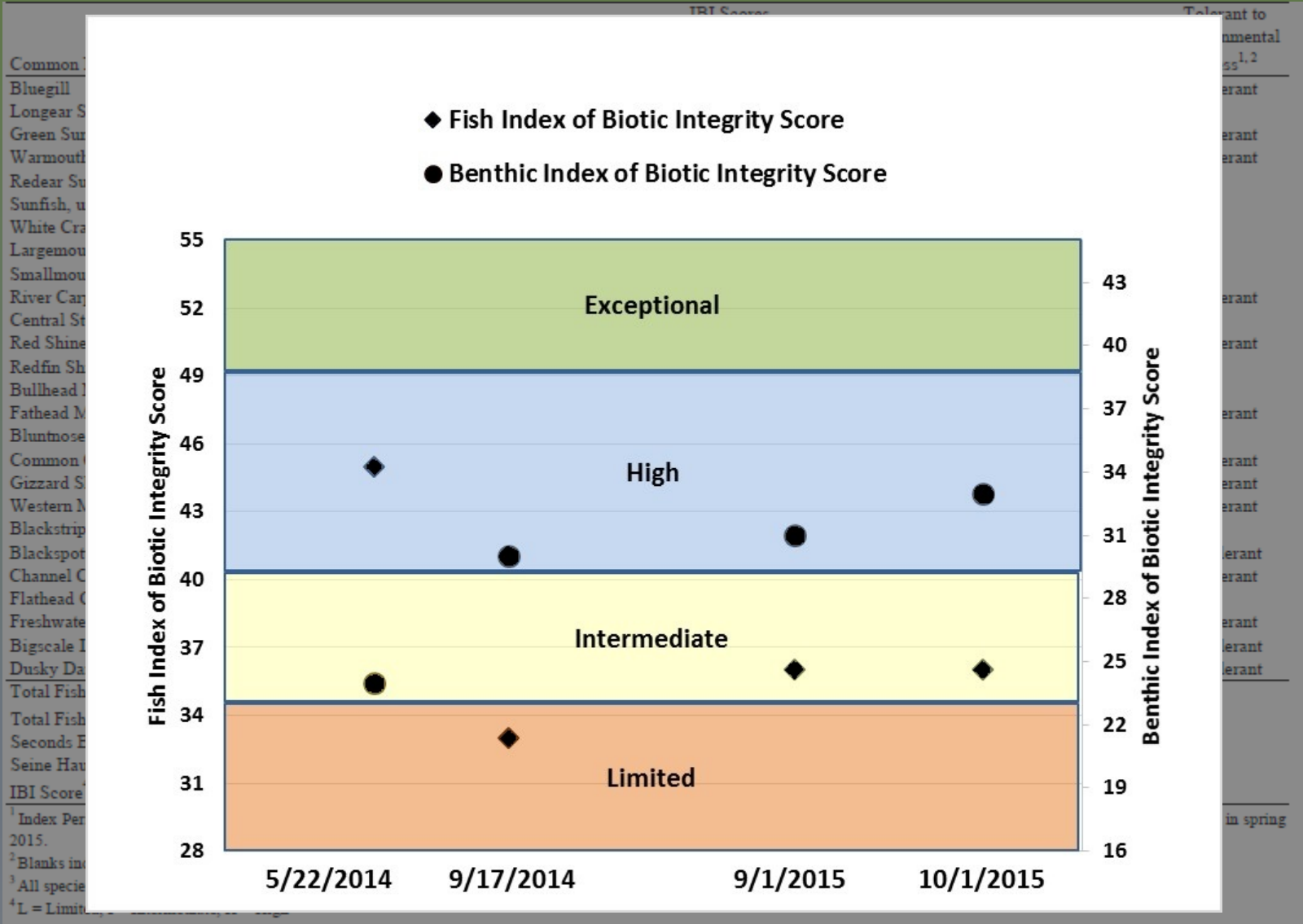
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Benthic macroinvertebrates: 5-minute kick net sample and snag sampling



Rowlett Creek Fish and Benthics

Common Name

Bluegill

Longear Sunfish

Green Sunfish

Sunfish, unident

Largemouth Bas

Smallmouth Buf

Central Stonerol

Red Shiner

Blackspot Shiner

Mimic Shiner

Bullhead Minno

Western Mosqui

Yellow Bullhead

Total Fish

Total Fish Speci

Seconds Electro

Seine Hauls

IBI Score³

¹ Blanks indicate s

² All species are na

³ I = Intermediate,

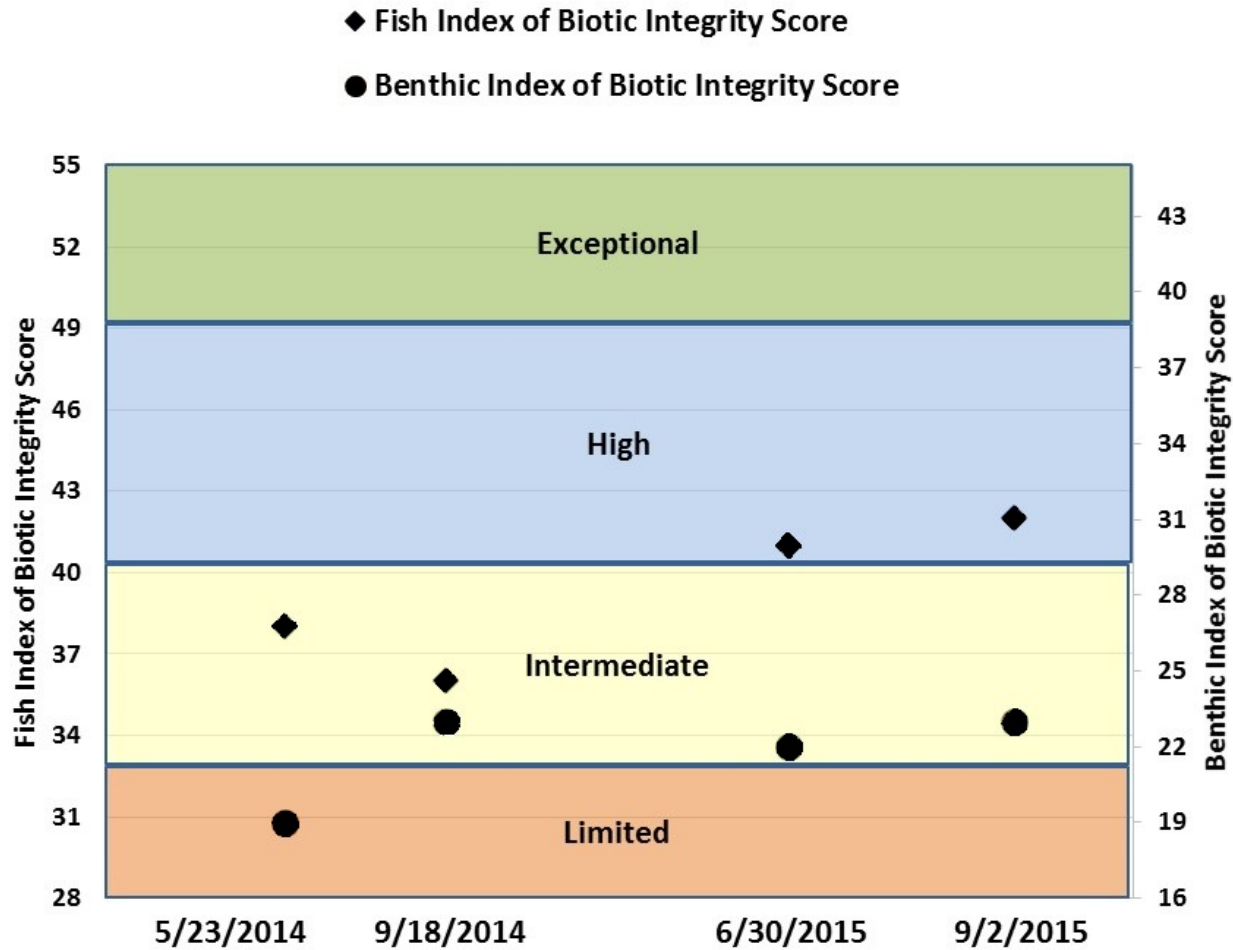
Tolerant to
Environmental
Stress¹

Tolerant

Tolerant

Tolerant

Tolerant



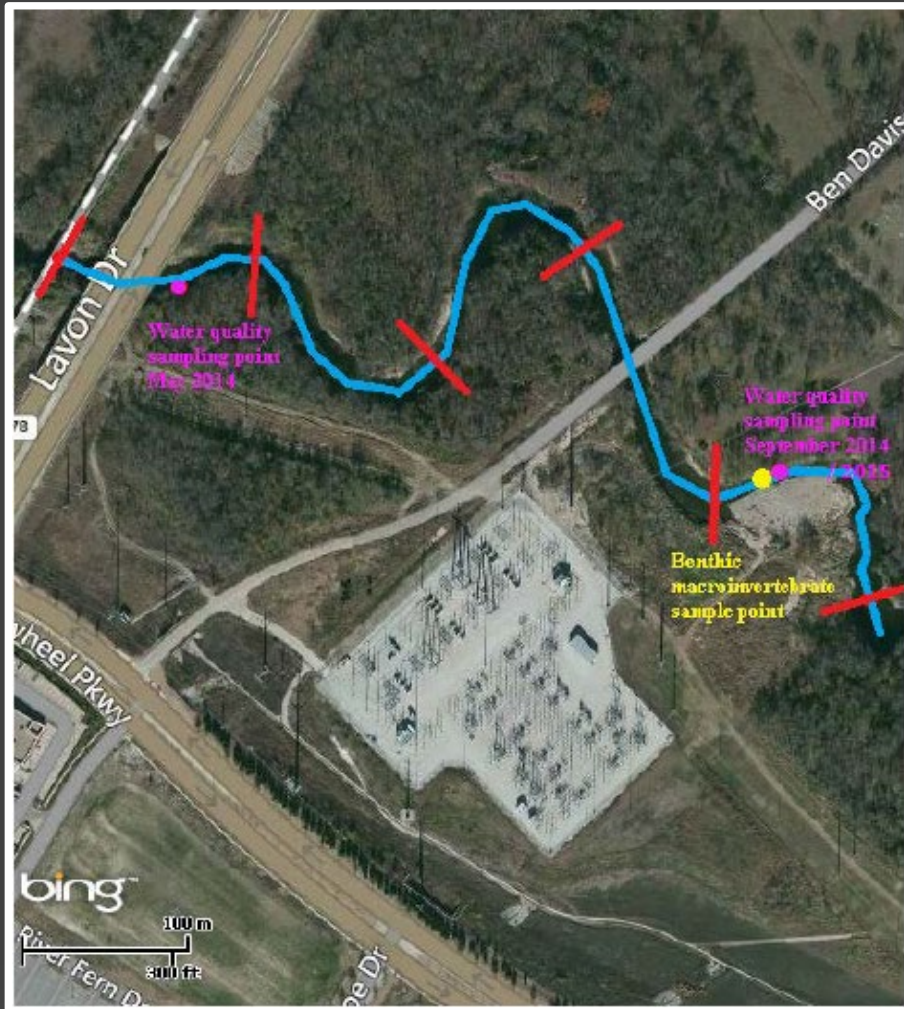
Spring Creek Fish and Benthics

Assessment Indices:

- Fish assemblage
- Benthic macroinvertebrates
- **Physical habitat**
- Instant field measurements
- Flow discharge
- 24-hour DO
- Water chemistry sampling

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Rowlett Creek



Spring Creek



Habitat Results: Mapping



Habitat Transects

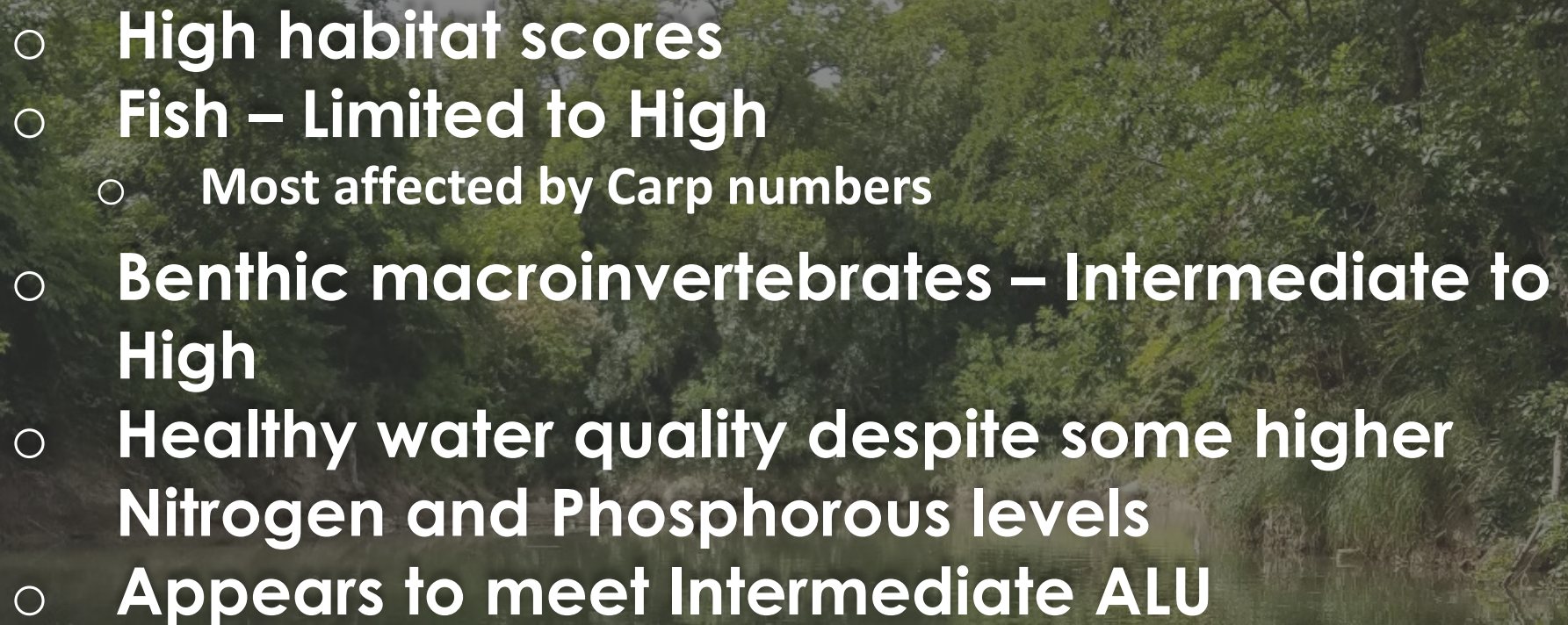
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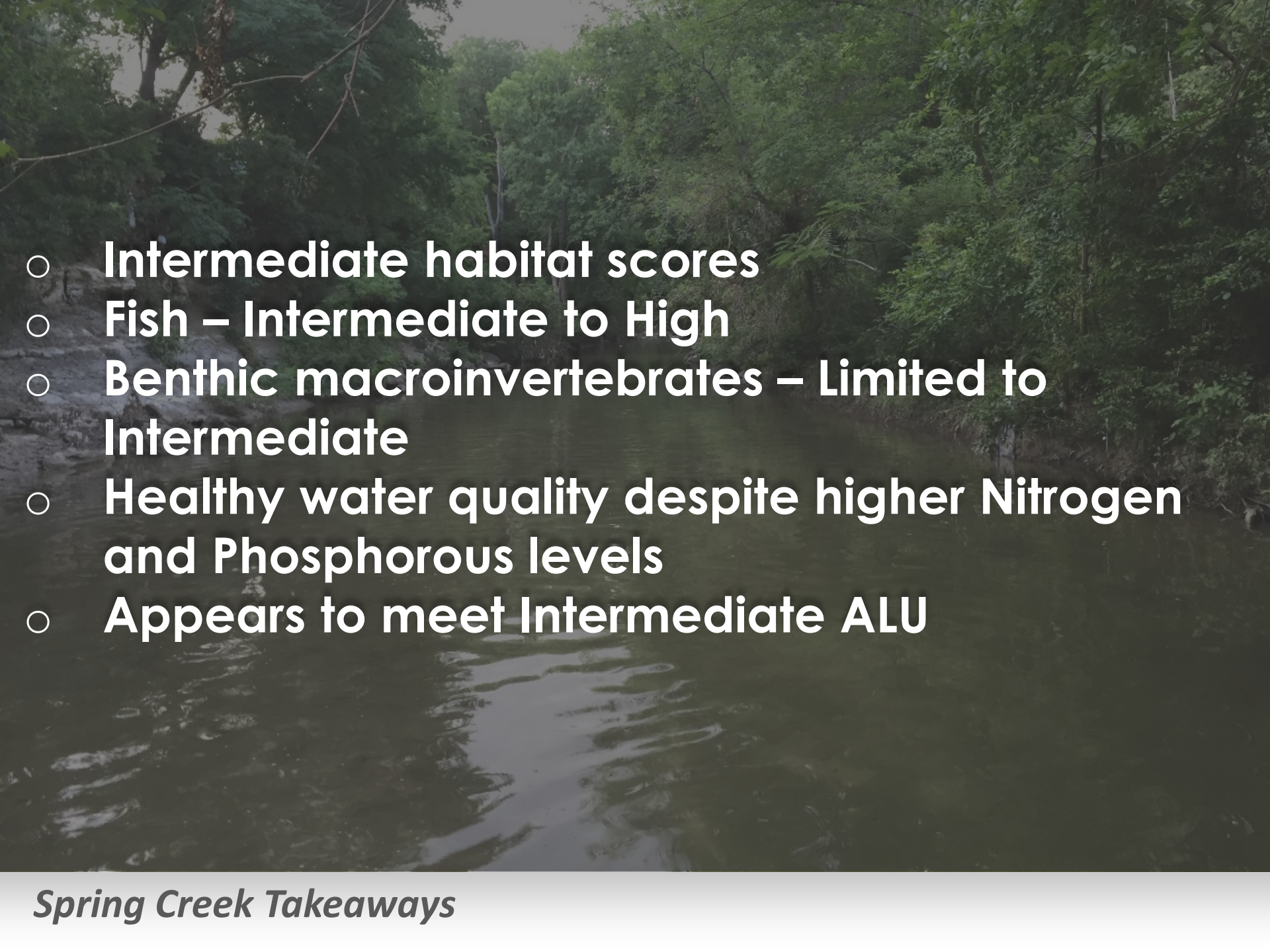
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24-hr water quality, instant, and water chemistry

- 
- **High habitat scores**
 - **Fish – Limited to High**
 - **Most affected by Carp numbers**
 - **Benthic macroinvertebrates – Intermediate to High**
 - **Healthy water quality despite some higher Nitrogen and Phosphorous levels**
 - **Appears to meet Intermediate ALU**

- 
- **Intermediate habitat scores**
 - **Fish – Intermediate to High**
 - **Benthic macroinvertebrates – Limited to Intermediate**
 - **Healthy water quality despite higher Nitrogen and Phosphorous levels**
 - **Appears to meet Intermediate ALU**

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