Stream Habitat Assessments

Learning Module #4

WATER DAWGS

Agenda

Time	Length	Activity
1:00	**20 min**	**Opening Activity**
1:20	**55 min**	**Stream Habitat Assessment Activity**
2:15	**15 min**	**Pros and Cons of Habitat Assessments**
2:30	*15 min*	*BREAK*
2:45	**1 hour, 25 min**	**Habitat Assessment of Campus Stream**
4:10	**15 Min**	**Closing Activity**

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Opening Activity

Instructions:

For each image of a stream, please:

1. Draw a circle around things they see in the image that could indicate is unhealthy/has poor water quality
2. Draw a square around things they see in the image that could indicate that the stream is healthy/has better water quality
3. Place a star by their favorite part of the stream

Opening Activity

Stream A:

Image credit: Kondah, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons

Stream B:

Image credit: Hamad Darwish from Medford, Oregon, USA, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons

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Opening Activity: Discussion

Stream A:

Image credit: Kondah, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons

Stream B:

Image credit: Hamad Darwish from Medford, Oregon, USA, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons

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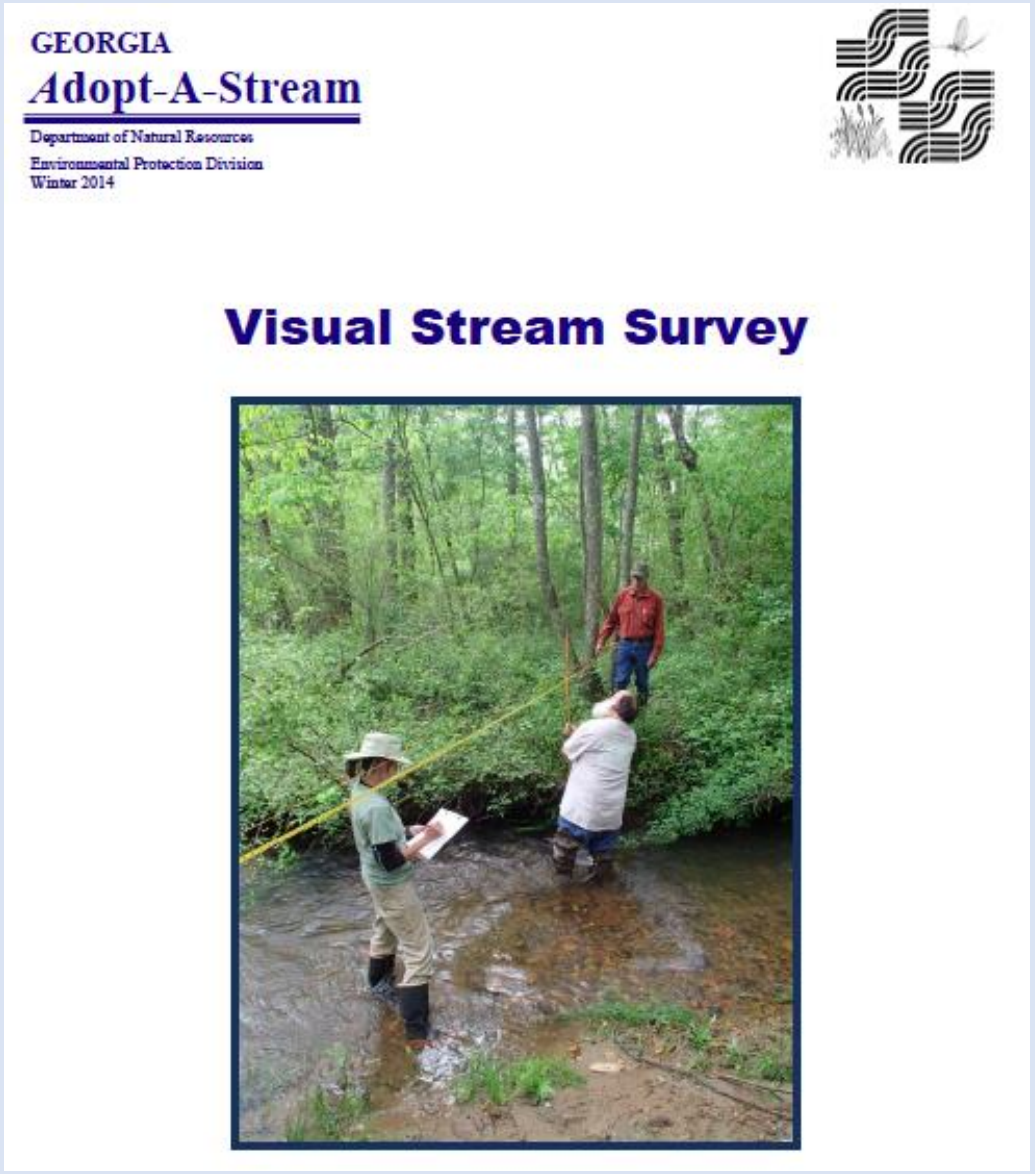
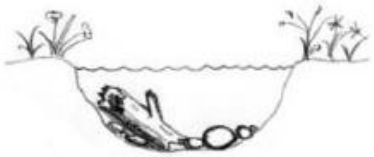
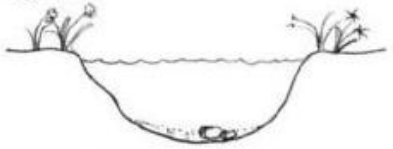
Stream Habitat Assessments Activity



Images from: Georgia Adopt-A-Stream

WATER DAWGS

#1 EPIFAUNAL SUBSTRATE: What types of submerged materials are on the channel bottom?

Habitat Parameter	Excellent ---------- Poor			
1. Epifaunal Substrate **What types of submerged materials are on the channel bottom?**	**Abundant stable** habitat cover for colonization by macroinvertebrates and fish: submerged roots, woody and vegetative debris, cobbles, leaf packs and undercut banks. 	**Adequate stable** habitat cover for colonization by macroinvertebrates and fish: submerged roots, woody and vegetative debris, cobbles, leaf packs and undercut banks. 	**Little or no stable** habitat cover available for colonization by macroinvertebrates and fish: submerged roots, woody and vegetative debris, cobbles, leaf packs and undercut banks; habitat may move during high flows. 	What did you see?
	10 9 8 7	6 5 4 3	2 1 0	Score

Images from: Georgia Adopt-A-Stream

#1 EPIFAUNAL SUBSTRATE: What types of submerged materials are on the channel bottom?

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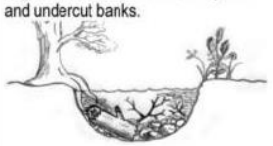
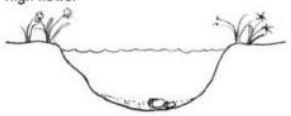
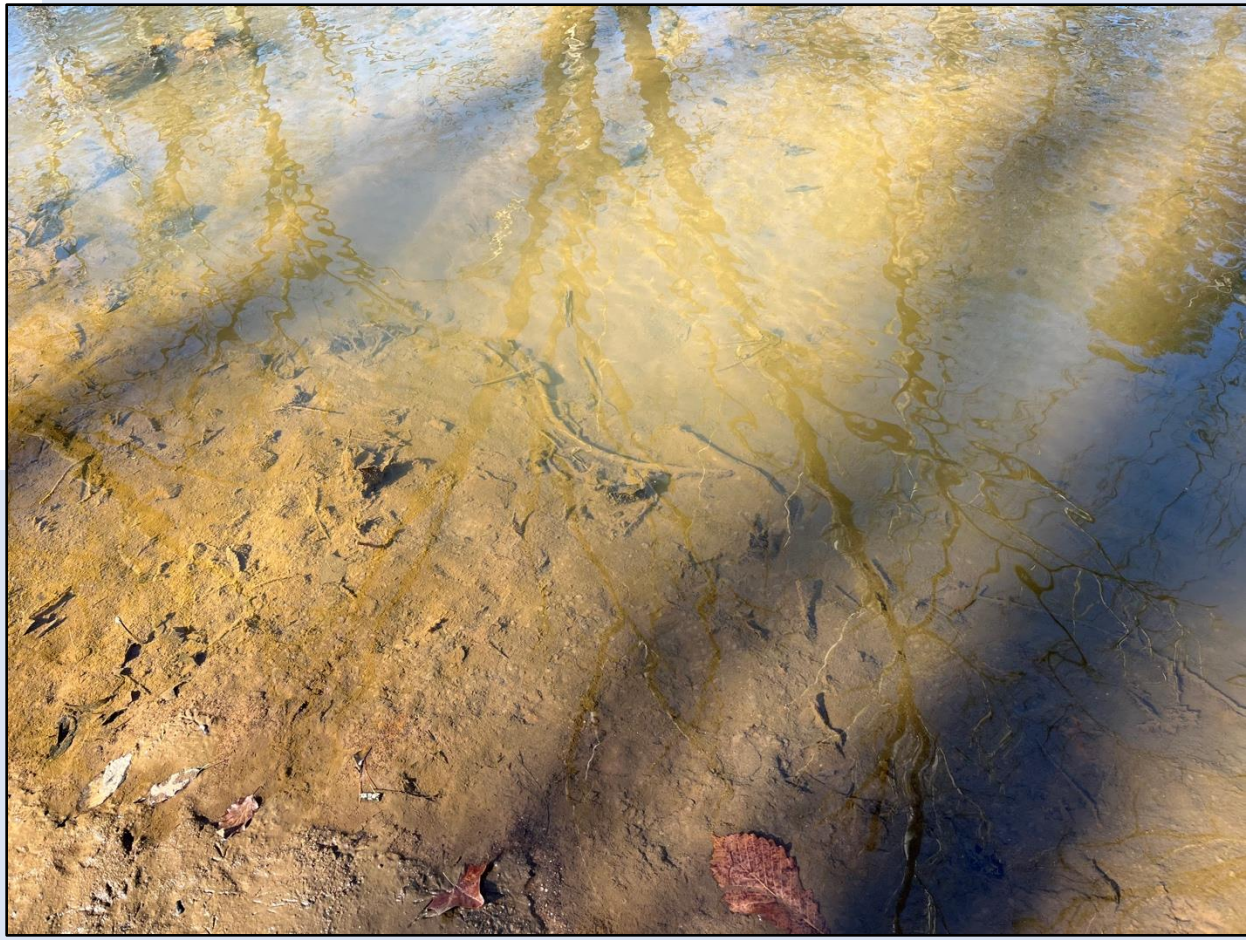
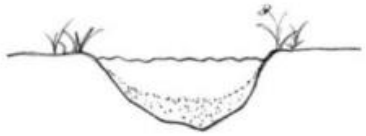
1. Epifaunal Substrate	**Abundant stable** habitat cover for colonization by macroinvertebrates and fish: submerged roots, woody and vegetative debris, cobbles, leaf packs and undercut banks. 	**Adequate stable** habitat cover for colonization by macroinvertebrates and fish: submerged roots, woody and vegetative debris, cobbles, leaf packs and undercut banks. 	**Little or no stable** habitat cover available for colonization by macroinvertebrates and fish: submerged roots, woody and vegetative debris, cobbles, leaf packs and undercut banks; habitat may move during high flows. 	What did you see?
What types of submerged materials are on the channel bottom?	10 9 8 7	6 5 4 3	2 1 0	Score



WATER DAWGS

#2 EMBEDDEDNESS: Are fine sediments being deposited in the riffle/run area? (Score for ROCKY BOTTOM streams only)

Habitat Parameter	Excellent ---------- Poor			
2. Embeddedness	Gravel and cobble are **slightly** embedded in riffle area. 	Gravel and cobble are **partially** embedded in riffle area. 	Gravel and cobble are **completely** embedded in riffle area. 	What did you see?
* For ROCKY BOTTOM streams only **Are fine sediments being deposited in riffle/run area?**	10 9 8 7	6 5 4 3	2 1 0	Score

Images from: Georgia Adopt-A-Stream

WATER DAWGS

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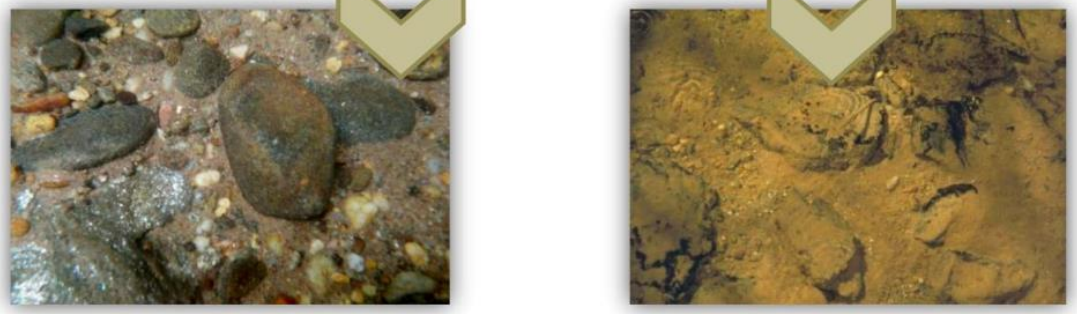


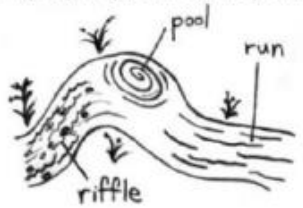
Images from: Georgia Adopt-A-Stream

#2 =

Non-applicable!!

WATER DAWGS

#3 RIFFLE/RUN/POOL: Is a diversity of instream habitats available: riffle, runs and pools?

Habitat Parameter	Excellent ---------- Poor			
3. Riffle/Run/Pool	Yes, all **three (3)** habitat types (riffle, run, pool) are present and frequent.	**Two (2)** habitat types are present.	Only **one (1)** habitat type present and dominant.	What did you see?
Is a diversity of instream habitats available: riffle, runs and pools?				
	10 9 8 7	6 5 4 3	2 1 0	Score

Images from: Georgia Adopt-A-Stream

WATER DAWGS

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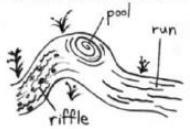
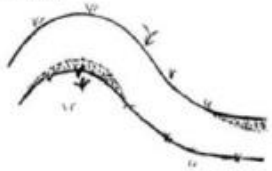
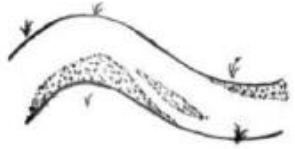
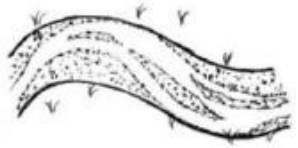
Is a diversity of instream habitats available: riffle, runs and pools?				
	10 9 8 7	6 5 4	3 2 1 0	Score

Images from: Georgia Adopt-A-Stream

WATER DAWGS

#4 SEDIMENT DEPOSITION: Are point bars and islands present?

Habitat Parameter	Excellent ---------- Poor			
4. Sediment Deposition **Are point bars and islands present?**	**Point bars and islands stable** and of small size and frequency with some vegetation. Composed mostly of gravel and cobble. 	**Point bars and islands less stable** and of moderate size and frequency with some sparse vegetation. Composed mostly of some gravel ad finer sediment. 	**Point bars and islands unstable** and of a large size with little or no vegetation. Composed almost entirely of fine sediment. 	What did you see?
	10 9 8 7 6 5 4 3 2 1 0			Score

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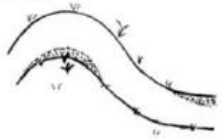
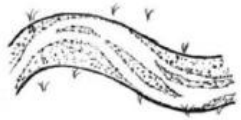
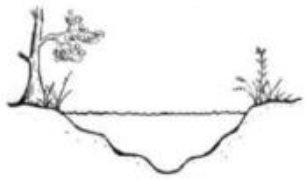
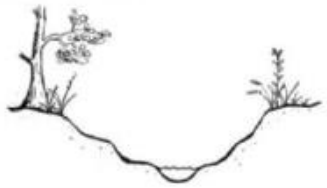
4. Sediment Deposition Are point bars and islands present?	**Point bars and islands stable** and of small size and frequency with some vegetation. Composed mostly of gravel and cobble. 	**Point bars and islands less stable** and of moderate size and frequency with some sparse vegetation. Composed mostly of some gravel ad finer sediment. 	**Point bars and islands unstable** and of a large size with little or no vegetation. Composed almost entirely of fine sediment. 	What did you see?
	10 9 8 7	6 5 4 3	2 1 0	Score

Images from: Georgia Adopt-A-Stream

WATER DAWGS

#5 CHANNEL FLOW STATUS: How much water is in the stream channel?

Habitat Parameter	Excellent ---------- Poor			
5. Channel Flow Status	Water reaches base **of both lower** banks; little substrate exposed.	**Some substrate is exposed** and water partially fills channel.	**Most substrate is exposed** and very little water in channel.	What did you see?
How much water is in the stream channel?				
	10 9 8 7	6 5 4 3	2 1 0	Score

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WATER DAWGS

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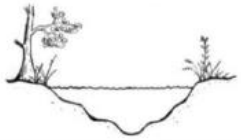
5. Channel Flow Status	Water reaches base **of both lower** banks; little substrate exposed. 	**Some substrate is exposed** and water partially fills channel. 	**Most substrate is exposed** and very little water in channel. 	What did you see?
How much water is in the stream channel?	10 9 8 7	6 5 4 3	2 1 0	Score

Images from: Georgia Adopt-A-Stream

WATER DAWGS

#6 CHANNEL ALTERATION: Is the stream channel altered by humans?

Habitat Parameter	Excellent ---------- Poor			
6. Channel Alteration	**No evidence** of channelization (straightening) or alterations such as dredging, agriculture, concrete banks or construction activities.	**Some evidence** of channelization (straightening) and/or alterations such as dredging, agriculture, concrete banks or construction activities.	**Most of stream reach** channelized and/or many alterations present such as dredging, agriculture, concrete banks or construction activities.	What did you see?
Is the stream channel altered by humans?				
	10 9 8 7	6 5 4 3	2 1 0	Score

Images from: Georgia Adopt-A-Stream

WATER DAWGS

#6 CHANNEL ALTERATION: Is the stream channel altered by humans?

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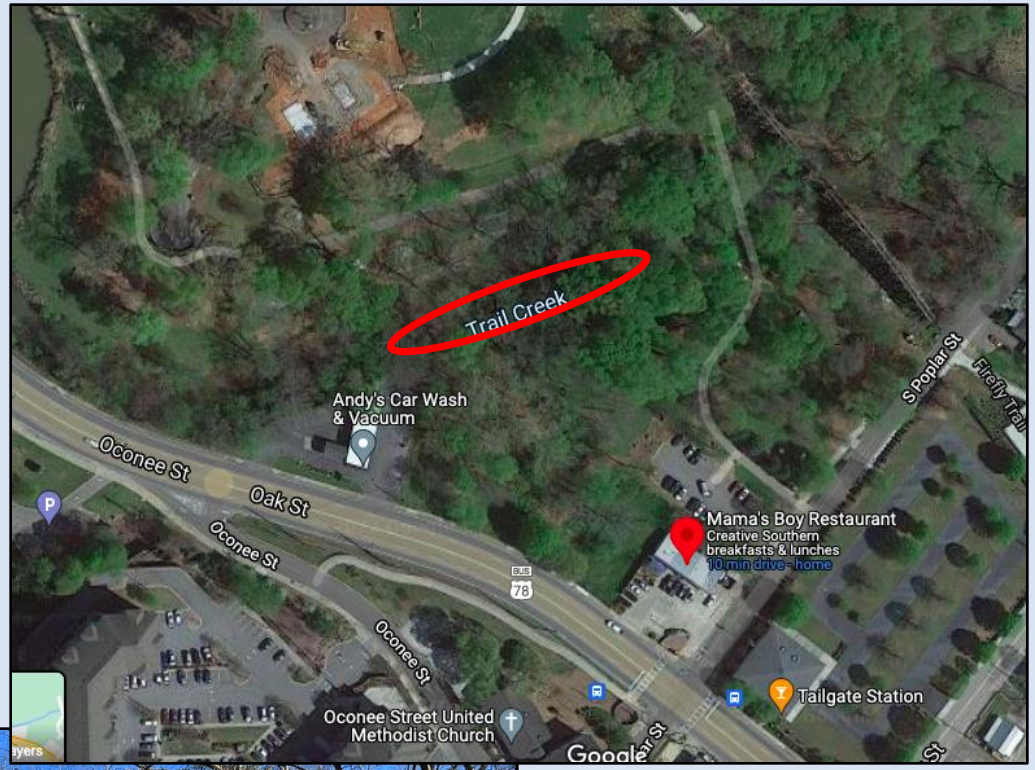
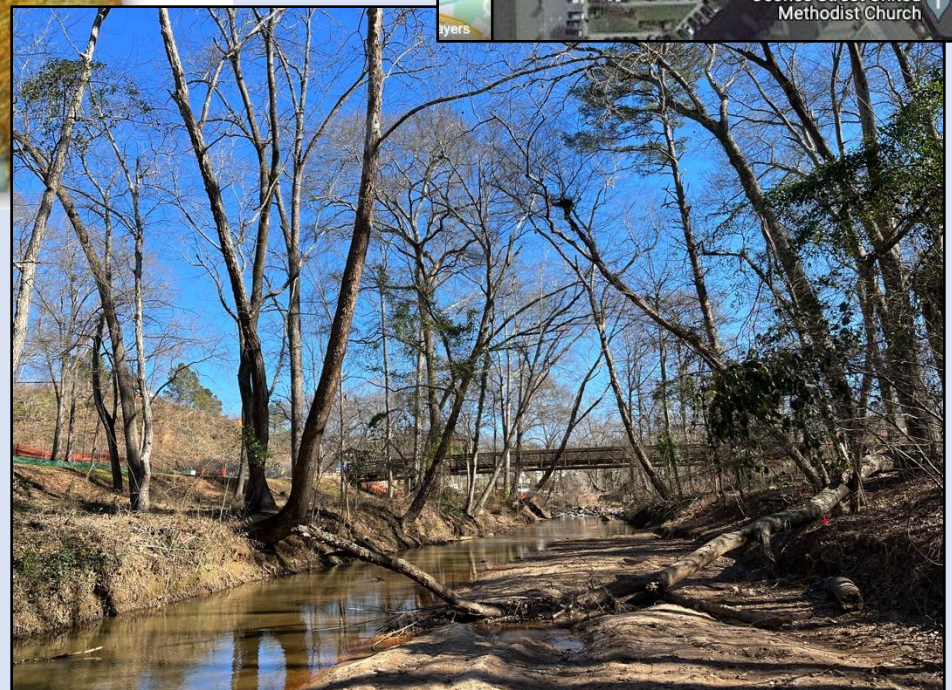
Is the stream channel altered by humans?	**No evidence** of channelization (straightening) or alterations such as dredging, agriculture, concrete banks or construction activities. 	**Some evidence** of channelization (straightening) and/or alterations such as dredging, agriculture, concrete banks or construction activities. 	**Most of stream reach** channelized and/or many alterations present such as dredging, agriculture, concrete banks or construction activities. 	What did you see?
	10 9 8 7	6 5 4 3	2 1 0	Score





Images from: Georgia Adopt-A-Stream

WATER DAWGS

#7 CHANNEL SINUOSITY: Does the channel have lots of curves and bends?
(Score for MUDDY BOTTOM streams only)

Habitat Parameter	Excellent ---------- Poor			
7. Channel Sinuosity * For MUDDY BOTTOM streams only **Does the channel have lots of curves and bends?**	Yes, bends in the channel are **frequent.** 	There are **more bends than straight** sections. 	There are **more straight sections** than sections with bends or channel is entirely straight. 	What did you see? **Score**
	10 9 8 7	6 5 4	3 2 1 0	

Images from: Georgia Adopt-A-Stream

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(Score for MUDDY BOTTOM streams only)

Habitat Parameter	Excellent ---------- Poor			
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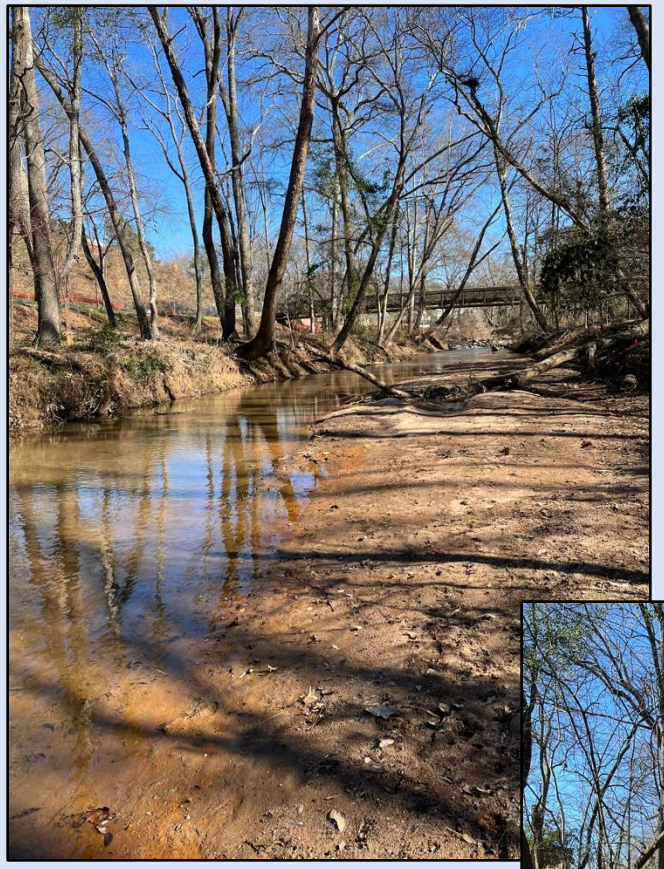
	10 9 8 7 6 5 4 3 2 1 0			Score



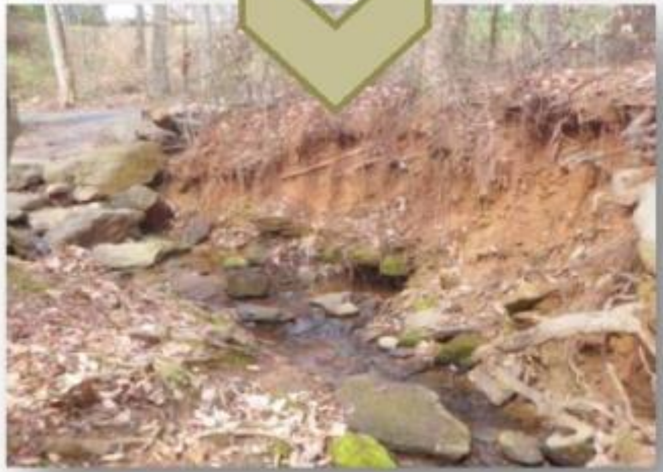
Images from: Georgia Adopt-A-Stream

WATER DAWGS

#8 BANK STABILITY: How stable are the streambanks?

(Look at both left and right banks)

Habitat Parameter	Excellent -Poor			
8. Bank Stability **How stable are the streambanks?** Determine right/left bank by facing downstream	**Bank stable**; erosion, scouring, undercutting or bank failure absent or minimal. Vegetation overhanging the stream is abundant. 	**Bank moderately stable**; evidence of small areas of erosion, undercutting and scouring, or bank failure present. Moderate amounts of overhanging vegetation present. 	**Bank unstable**; many eroded and scoured areas with undercutting; bank failure present; steep banks. Little over hanging vegetation present. 	What did you see?
Left bank Right bank	5 4.5 4 3.5 5 4.5 4 3.5	3 2.5 2 1.5 3 2.5 2 1.5	1 .5 0 1 .5 0	**Score** (Add both banks)

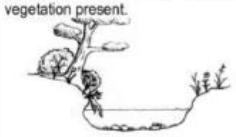


Images from: Georgia Adopt-A-Stream

WATER DAWGS

#8 BANK STABILITY: How stable are the streambanks?

(Look at both left and right banks)

Habitat Parameter	Excellent ---------- Poor											
8. Bank Stability	**Bank stable**; erosion, scouring, undercutting or bank failure absent or minimal. Vegetation overhanging the stream is abundant. 			**Bank moderately stable**; evidence of small areas of erosion, undercutting and scouring, or bank failure present. Moderate amounts of overhanging vegetation present. 			**Bank unstable**; many eroded and scoured areas with undercutting; bank failure present; steep banks. Little over hanging vegetation present. 				What did you see?
How stable are the streambanks? Determine right/left bank by facing downstream												
Left bank	5	4.5	4	3.5	3	2.5	2	1.5	1	.5	0	Score (Add both banks)
Right bank	5	4.5	4	3.5	3	2.5	2	1.5	1	.5	0	

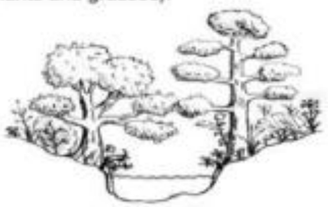
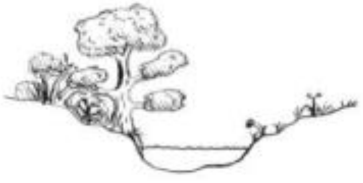
Images from: Georgia Adopt-A-Stream

Left bank

Right bank

WATER DAWGS

#9 VEGETATIVE PROTECTION: Are streambanks covered & shaded by a variety of vegetation? (Look at both left and right banks)

Habitat Parameter	Excellent -Poor			
9. Vegetative Protection **Are streambanks covered & shaded by a variety of vegetation?** Determine right/left bank by facing downstream	Most streambank surfaces covered and shaded by a **large variety** of vegetation (trees, shrubs, flowering plants and grasses). 	Some streambank surfaces covered and shaded by **some variety** of vegetation (trees, shrubs, flowering plants and grasses). 	Few streambank surfaces covered and shaded by vegetation. **Little variety** of vegetation. Streambank dominated by one type of vegetation (trees, shrubs, flowering plants and grasses). 	What did you see? Did you see any nonnative vegetation? Check here if YES ☐
Left bank **Right bank**	**5 4.5 4 3.5** **5 4.5 4 3.5**	**3 2.5 2 1.5** **3 2.5 2 1.5**	**1 .5 0** **1 .5 0**	**Score** (Add both banks)

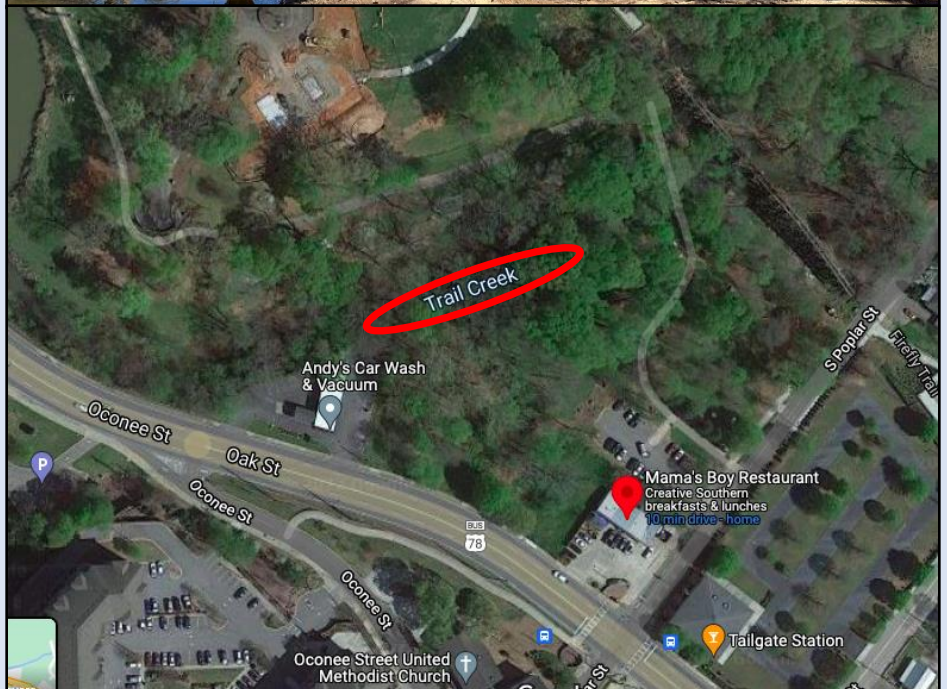
Images from: Georgia Adopt-A-Stream

WATER DAWGS

#9 VEGETATIVE PROTECTION: Are streambanks covered & shaded by a variety of vegetation? (Look at both left and right banks)

Habitat Parameter	Excellent ---------- Poor			
9. Vegetative Protection	Most streambank surfaces covered and shaded by a **large variety** of vegetation (trees, shrubs, flowering plants and grasses).	Some streambank surfaces covered and shaded by **some variety** of vegetation (trees, shrubs, flowering plants and grasses).	Few streambank surfaces covered and shaded by vegetation. **Little variety** of vegetation. Streambank dominated by one type of vegetation (trees, shrubs, flowering plants and grasses).	What did you see?
Are streambanks covered & shaded by a variety of vegetation? Determine right/left bank by facing downstream				Did you see any nonnative vegetation? Check here if YES ☐
Left bank	5 4.5 4 3.5 3 2.5 2 1.5 1 .5 0			**Score** (Add both banks)
Right bank	5 4.5 4 3.5 3 2.5 2 1.5 1 .5 0			

Images from: Georgia Adopt-A-Stream



WATER DAWGS

#10 RIPARIAN VEGETATIVE ZONE WIDTH: What is the amount of buffer available? (Look at both left and right banks)

Habitat Parameter	Excellent ---------- Poor			
10. Riparian Vegetative Zone Width	Buffer present; a large variety of vegetation extends at least **three channel widths** on each side.	Some buffer present; some variety of vegetation extends **two to one channel width** on each side. Human activities have impacted buffer zone.	Little or no buffer present; vegetation extends **less than one channel width** on each side. Human activities substantially impact buffer zone.	What did you see? Did you see any nonnative vegetation? Check here if YES ☐
What is the amount of buffer available? Determine right/left bank by facing downstream				
Left bank	5 4.5 4 3.5	3 2.5 2 1.5	1 .5 0	**Score** (Add both banks)
Right bank	5 4.5 4 3.5	3 2.5 2 1.5	1 .5 0	

Images from: Georgia Adopt-A-Stream

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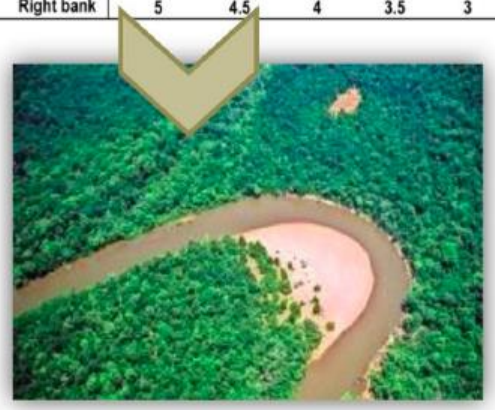
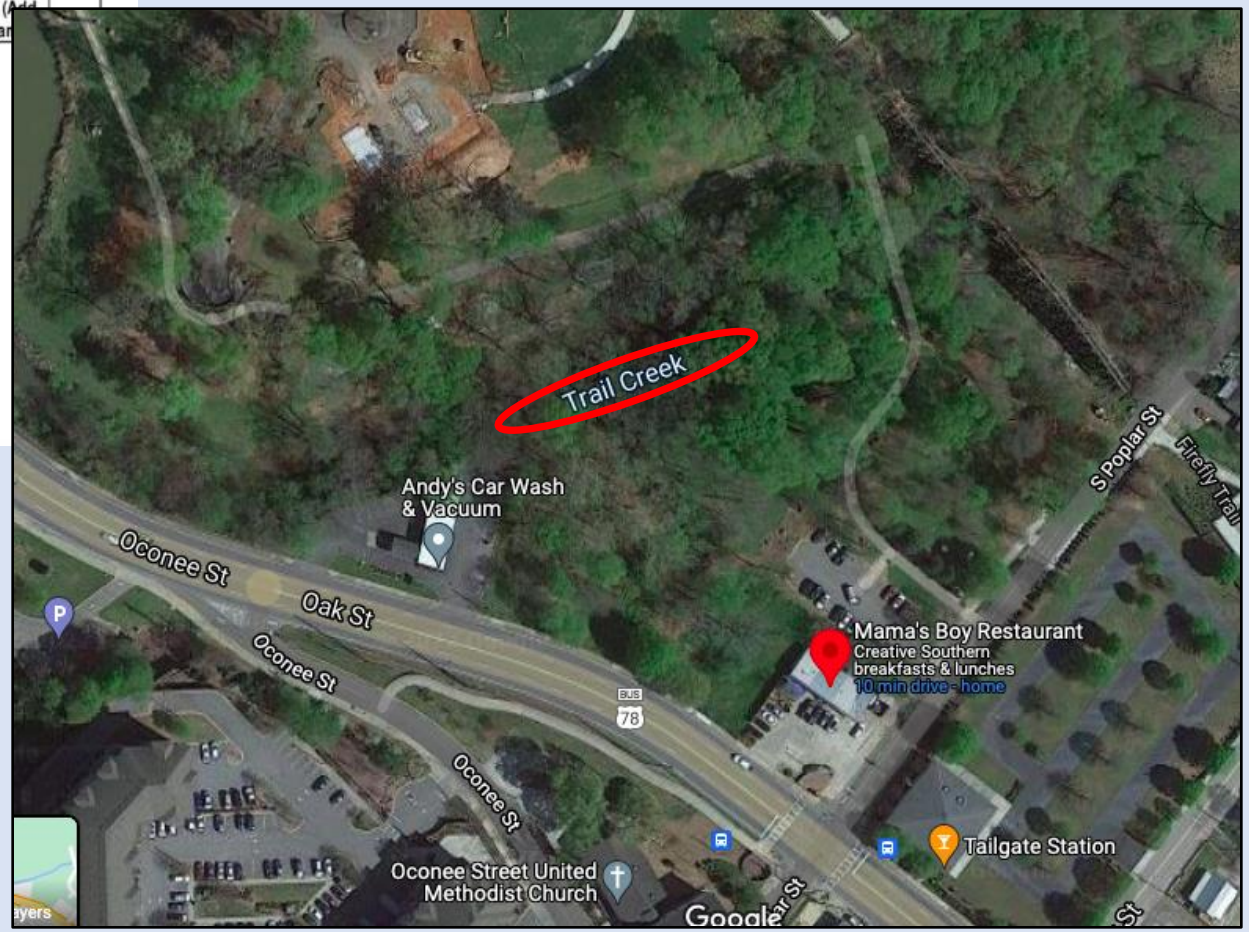
What is the amount of buffer available? Determine right/left bank by facing downstream				
Left bank	5 4.5 4	3.5 3 2.5	2 1.5 1	.5 0
Right bank	5 4.5 4	3.5 3 2.5	2 1.5 1	.5 0



Images from: Georgia Adopt-A-Stream



WATER DAWGS

Pros and Cons of Stream Habitat Assessment

<u>Instructions</u>

1. Working with a partner, brainstorm at least one PRO and at least one CON of using a Stream Habitat Survey as a method to assess water quality. Feel free to come up with more than one!
2. Write each PRO and each CON on a separate sticky note.

3. After work time, each group will present their pros and cons to the whole group.

WATER DAWGS

Take a break!

WATER DAWGS

Habitat Assessment of Campus Stream

What you will need:

- Clipboards
- Basic Visual form - p. 24 of Visual Stream Survey PDF (H1])
- Stream Habitat Survey (Handout 2 [H2])
- Pencil
- *Optional: Backpack*
- *Optional: Wading boots*

WATER DAWGS

Habitat Assessment of Campus Stream

SAFETY
FIRST

WATER DAWGS

Closing Activity

Instructions:

1. Write your response to the questions on the lesson worksheet.

WATER DAWGS

Closing Activity

1. **Why can stream habitat assessments be useful in assessing stream health? (In other words, what is an advantage of using stream habitat assessments to assess stream health?)**

2. **What is a disadvantage of using a stream habitat assessment to assess stream health?**

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