

4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; 44-45	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/27/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID:2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input checked="" type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input type="checkbox"/> Debris Dam <input type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input type="checkbox"/> Other _____	<input type="checkbox"/> Trash <input type="checkbox"/> Island _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present. <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species <u>Carex sp. on bars</u> Percent of the reach with aquatic vegetation <u>5</u> % (in terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)					P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)				
		P	C	B	D		P	C	B	D
Wall/Rip rap						Railroad (Active)				
Railroad (rails to trails)						Railroad (Inactive)				
Buildings						Landfill/trash				
Pavement						Park/Lawn	R	R	R	R
Road						Row Crops				
Pasture						Feed lots				
Logging operations						Mining activity				

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Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	L	L	L	L	Commercial/Industrial				
	Old field					Hay field				
	Residential					Other				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>21</u> Conductivity uS/cm _____ Dissolved Oxygen mg/L _____ pH _____ Turbidity (mg/L) _____ Secchi depth (m.mm) _____ Meters used: _____ Hach Kit used Yes/No _____ Water Sample Collected for Lab analysis Yes/No _____ Flow at nearest USGS gauging station (cfs) _____ Gauging station: _____
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____
	Turbidity (visual) <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
	Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input checked="" type="checkbox"/> None <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input type="checkbox"/> Other _____

Section G	
Sediment/ Substrate	Odors <input type="checkbox"/> Normal <input checked="" type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sludge <input type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Relict Shells <input type="checkbox"/> Other _____ <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____
	Deposits <input type="checkbox"/> Sand <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____
	Substrate Type (rank top three, 1 being dominant) Bedrock <u> </u> Boulder <u> </u> Cobble <u> </u> 1 Gravel <u> </u> 2 Sand <u> </u> 3 Silt/clay <u> </u>

Section H	
Streambank and Riparian Zone Characterization	Canopy Cover <input checked="" type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input type="checkbox"/> Mostly Shaded <input type="checkbox"/> None
	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No <u> </u> Left Descending Bank Yes/No <u> </u>
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No <u> </u> Left Descending Bank Yes/No <u> </u>

Notes: _____

23m wetted-width _____

5-15' banks _____

6-9" deep _____

Appendix A
Digital Images Recorded from the Quantitative Freshwater Mussel Surveys for the Monitoring
of the North Fork Hughes River, Ritchie County, West Virginia



1. Looking north (downstream) at the 44-45 Site in the North Fork Hughes River in Ritchie County, West Virginia.



2. Looking south (upstream) at the 44-45 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Mussel Survey Summary Data Sheet

[illegible]

4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; 45-46	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/27/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID:2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input checked="" type="checkbox"/> Debris Dam <input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input checked="" type="checkbox"/> Other Man-made wier	<input type="checkbox"/> Trash <input type="checkbox"/> Island _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present. <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species _____ Percent of the reach with aquatic vegetation _____ % (in terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)					P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)				
		P	C	B	D		P	C	B	D
Wall/Rip rap						Railroad (Active)				
Railroad (rails to trails)						Railroad (Inactive)				
Buildings						Landfill/trash				
Pavement						Park/Lawn				R
Road						Row Crops				
Pasture						Feed lots				
Logging operations						Mining activity				

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Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	L	L	L	L	Commercial/Industrial				
	Old field					Hay field				
	Residential					Other				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>21</u> Conductivity uS/cm _____ Dissolved Oxygen mg/L _____ pH _____ Turbidity (mg/L) _____ Secchi depth (m.mm) _____ Meters used: _____ Hach Kit used Yes/No _____ Water Sample Collected for Lab analysis Yes/No _____ Flow at nearest USGS gauging station (cfs) _____ Gauging station: _____
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____
	Turbidity (visual) <input checked="" type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
	Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input checked="" type="checkbox"/> None <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input type="checkbox"/> Other _____

Section G	
Sediment/Substrate	Odors <input type="checkbox"/> Normal <input checked="" type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sludge <input checked="" type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Relict Shells <input type="checkbox"/> Other _____ <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____
	Substrate Type (rank top three, 1 being dominant) Bedrock _____ Boulder _____ 2 Cobble _____ 1 Gravel _____ 3 Sand _____ Silt/clay _____

Section H	
Streambank and Riparian Zone Characterization	Canopy Cover <input type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Mostly Shaded <input type="checkbox"/> None
	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No _____ Left Descending Bank Yes/No _____
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No _____ Left Descending Bank Yes/No _____

Notes: _____

23m wetted-width _____

3 - 15' banks _____

6" - 1.5' deep _____

Appendix A
Digital Images Recorded from the Quantitative Freshwater Mussel Surveys for the Monitoring
of the North Fork Hughes River, Ritchie County, West Virginia



1. Looking north (downstream) at the 45-46 Site in the North Fork Hughes River in Ritchie County, West Virginia.



2. Looking south (upstream) at the 45-46 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Mussel Survey Summary Data Sheet

[illegible]

4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; 36-37	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/29/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID:2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input checked="" type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input type="checkbox"/> Debris Dam <input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input type="checkbox"/> Other	<input type="checkbox"/> Trash <input type="checkbox"/> Island _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present. <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input checked="" type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species <u>Hydrilla</u> Percent of the reach with aquatic vegetation <u>30</u> % (in terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)					P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)				
		P	C	B	D		P	C	B	D
Wall/Rip rap						Railroad (Active)				
Railroad (rails to trails)						Railroad (Inactive)				
Buildings						Landfill/trash				
Pavement						Park/Lawn				
Road						Row Crops				
Pasture						Feed lots				
Logging operations						Mining activity				

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Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	X		X	X	Commercial/Industrial				
	Old field		X			Hay field				
	Residential					Other				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>20</u>
	Conductivity uS/cm _____
	Dissolved Oxygen mg/L _____
	pH _____
	Turbidity (mg/L) _____
	Secchi depth (m.mm) _____
	Meters used: _____
	Hach Kit used Yes/No _____
	Water Sample Collected for Lab analysis Yes/No _____
	Flow at nearest USGS gauging station (cfs) _____
Gauging station: _____	

Section G	
Sediment/ Substrate	Odors <input type="checkbox"/> Normal <input checked="" type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sludge <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Relict Shells <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____
	Deposits <input type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Other _____
	Substrate Type (rank top three, 1 being dominant) Bedrock Boulder Cobble 1 Gravel 2 Sand 3 Silt/clay

Section H	
Streambank and Riparian Zone Characterization	Canopy Cover <input checked="" type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input type="checkbox"/> Mostly Shaded <input type="checkbox"/> None
	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No Left Descending Bank Yes/No
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No Left Descending Bank Yes/No

Notes: _____

18m wetted-width _____

1-6' banks _____

6"-2' deep _____

Appendix A
Digital Images Recorded from the Quantitative Freshwater Mussel Surveys for the Monitoring
of the North Fork Hughes River, Ritchie County, West Virginia



1. Looking southwest (downstream) at the 30-31 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Mussel Survey Summary Data Sheet

[illegible]

4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; 44-45	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/27/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID: 2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input checked="" type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input type="checkbox"/> Debris Dam <input type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input type="checkbox"/> Other _____	<input type="checkbox"/> Trash <input type="checkbox"/> Island _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present. <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species <u>Carex sp. on bars</u> Percent of the reach with aquatic vegetation <u>5</u> % (in terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)					P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)				
		P	C	B	D		P	C	B	D
Wall/Rip rap						Railroad (Active)				
Railroad (rails to trails)						Railroad (Inactive)				
Buildings						Landfill/trash				
Pavement						Park/Lawn	R	R	R	R
Road						Row Crops				
Pasture						Feed lots				
Logging operations						Mining activity				

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Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	L	L	L	L	Commercial/Industrial				
	Old field					Hay field				
	Residential					Other				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>21</u> Conductivity uS/cm _____ Dissolved Oxygen mg/L _____ pH _____ Turbidity (mg/L) _____ Secchi depth (m.mm) _____ Meters used: _____ Hach Kit used Yes/No _____ Water Sample Collected for Lab analysis Yes/No _____ Flow at nearest USGS gauging station (cfs) _____ Gauging station: _____
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____
	Turbidity (visual) <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
	Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input checked="" type="checkbox"/> None <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input type="checkbox"/> Other _____

Section G	
Sediment/Substrate	Odors <input type="checkbox"/> Normal <input checked="" type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sludge <input type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Relict Shells <input type="checkbox"/> Other _____ <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____
	Deposits <input type="checkbox"/> Sand <input type="checkbox"/> Silt/clay
	Substrate Type (rank top three, 1 being dominant) Bedrock _____ Boulder _____ Cobble _____ 1 Gravel _____ 2 Sand _____ 3 Silt/clay _____

Section H	
Streambank and Riparian Zone Characterization	Canopy Cover <input checked="" type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input type="checkbox"/> Mostly Shaded <input type="checkbox"/> None
	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No _____ Left Descending Bank Yes/No _____
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No _____ Left Descending Bank Yes/No _____

Notes: _____

23m wetted-width _____

5-15' banks _____

6-9" deep _____

Appendix A
Digital Images Recorded from the Quantitative Freshwater Mussel Surveys for the Monitoring
of the North Fork Hughes River, Ritchie County, West Virginia



1. Looking north (downstream) at the 33 Site in the North Fork Hughes River in Ritchie County, West Virginia.



2. Looking south (upstream) at the 33 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Mussel Survey Summary Data Sheet

[illegible]

4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; 44-45	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/27/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID: 2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input checked="" type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input type="checkbox"/> Debris Dam <input type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input type="checkbox"/> Other _____	<input type="checkbox"/> Trash <input type="checkbox"/> Island _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present. <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species <u>Carex sp. on bars</u> Percent of the reach with aquatic vegetation <u>5</u> % (In terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)					P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)				
		P	C	B	D		P	C	B	D
Wall/Rip rap						Railroad (Active)				
Railroad (rails to trails)						Railroad (Inactive)				
Buildings						Landfill/trash				
Pavement						Park/Lawn	R	R	R	R
Road						Row Crops				
Pasture						Feed lots				
Logging operations						Mining activity				

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Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	L	L	L	L	Commercial/Industrial				
	Old field					Hay field				
	Residential					Other				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>21</u> Conductivity uS/cm _____ Dissolved Oxygen mg/L _____ pH _____ Turbidity (mg/L) _____ Secchi depth (m.mm) _____ Meters used: _____ Hach Kit used Yes/No _____ Water Sample Collected for Lab analysis Yes/No _____ Flow at nearest USGS gauging station (cfs) _____ Gauging station: _____
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____
	Turbidity (visual) <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
	Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input checked="" type="checkbox"/> None <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input type="checkbox"/> Other _____

Section G	
Sediment/ Substrate	Odors <input type="checkbox"/> Normal <input checked="" type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sludge <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Relict Shells <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____
	Deposits <input type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Other _____
	Substrate Type (rank top three, 1 being dominant) Bedrock Boulder Cobble 1 Gravel 2 Sand 3 Silt/clay

Section H		
Streambank and Riparian Zone Characterization	Canopy Cover <input checked="" type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input type="checkbox"/> Mostly Shaded <input type="checkbox"/> None	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No Left Descending Bank Yes/No
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No Left Descending Bank Yes/No	

Notes: _____

23m wetted-width _____

5-15' banks _____

6-9" deep _____

Appendix A
Digital Images Recorded from the Quantitative Freshwater Mussel Surveys for the Monitoring
of the North Fork Hughes River, Ritchie County, West Virginia



1. Looking northwest (downstream) at the 34-43 Site in the North Fork Hughes River in Ritchie County, West Virginia.



2. Looking southeast (upstream) at the 34-43 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Appendix A

Digital Images Recorded from the Quantitative Freshwater Mussel Surveys for the Monitoring of the North Fork Hughes River, Ritchie County, West Virginia



3. Looking east (upstream) at the 34-43 Site in the North Fork Hughes River in Ritchie County, West Virginia.



4. Looking southwest (downstream) at the 34-43 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Mussel Survey Summary Data Sheet

[illegible]

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4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; 44-45	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/27/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID: 2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input checked="" type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input type="checkbox"/> Debris Dam <input type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input type="checkbox"/> Other _____	<input type="checkbox"/> Trash <input type="checkbox"/> Island _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present.
	<input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species <u>Carex sp. on bars</u> Percent of the reach with aquatic vegetation <u>5</u> % (In terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)					P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)				
		P	C	B	D		P	C	B	D
Wall/Rip rap						Railroad (Active)				
Railroad (rails to trails)						Railroad (Inactive)				
Buildings						Landfill/trash				
Pavement						Park/Lawn	R	R	R	R
Road						Row Crops				
Pasture						Feed lots				
Logging operations						Mining activity				

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4/29/2016

Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	L	L	L	L	Commercial/Industrial				
	Old field					Hay field				
	Residential					Other				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>21</u> Conductivity uS/cm _____ Dissolved Oxygen mg/L _____ pH _____ Turbidity (mg/L) _____ Secchi depth (m.mm) _____ Meters used: _____ Hach Kit used Yes/No _____ Water Sample Collected for Lab analysis Yes/No _____ Flow at nearest USGS gauging station (cfs) _____ Gauging station: _____
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____
	Turbidity (visual) <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
	Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input checked="" type="checkbox"/> None <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input type="checkbox"/> Other _____

Section G	
Sediment/Substrate	Odors <input type="checkbox"/> Normal <input checked="" type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Other _____
	Deposits <input type="checkbox"/> Sludge <input type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Relict Shells <input type="checkbox"/> Other _____ <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____
	Substrate Type (rank top three, 1 being dominant) Bedrock Boulder Cobble <u>1</u> Gravel <u>2</u> Sand <u>3</u> Silt/clay

Section H		
Streambank and Riparian Zone Characterization	Canopy Cover <input checked="" type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input type="checkbox"/> Mostly Shaded <input type="checkbox"/> None	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No Left Descending Bank Yes/No
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No Left Descending Bank Yes/No	

Notes: _____

23m wetted-width _____

5-15' banks _____

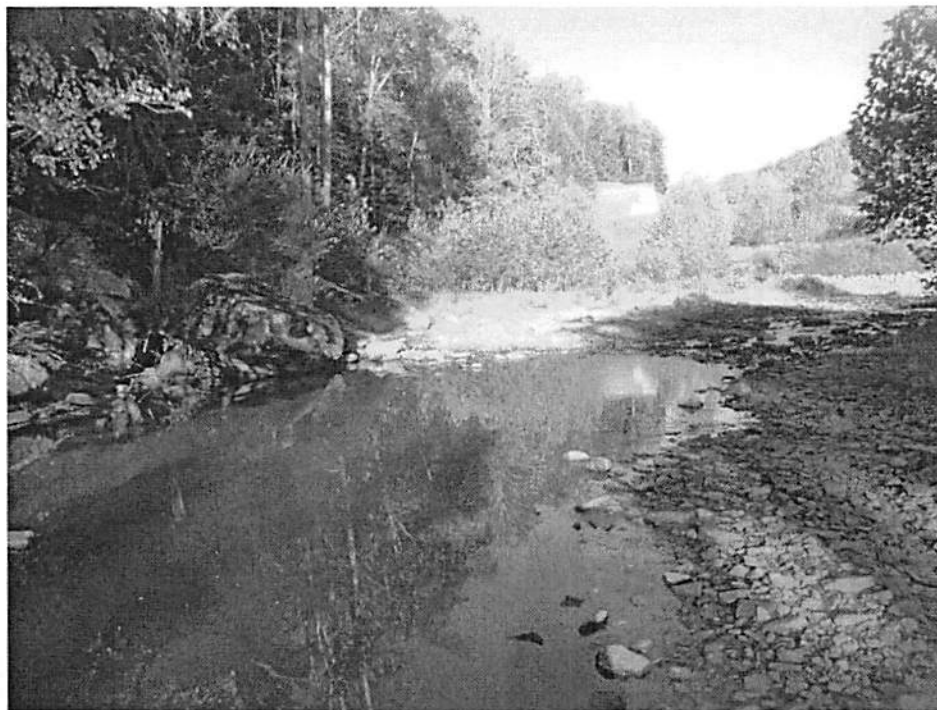
6-9" deep _____

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Appendix A
Digital Images Recorded from the Quantitative Freshwater Mussel Surveys for the Monitoring
of the North Fork Hughes River, Ritchie County, West Virginia



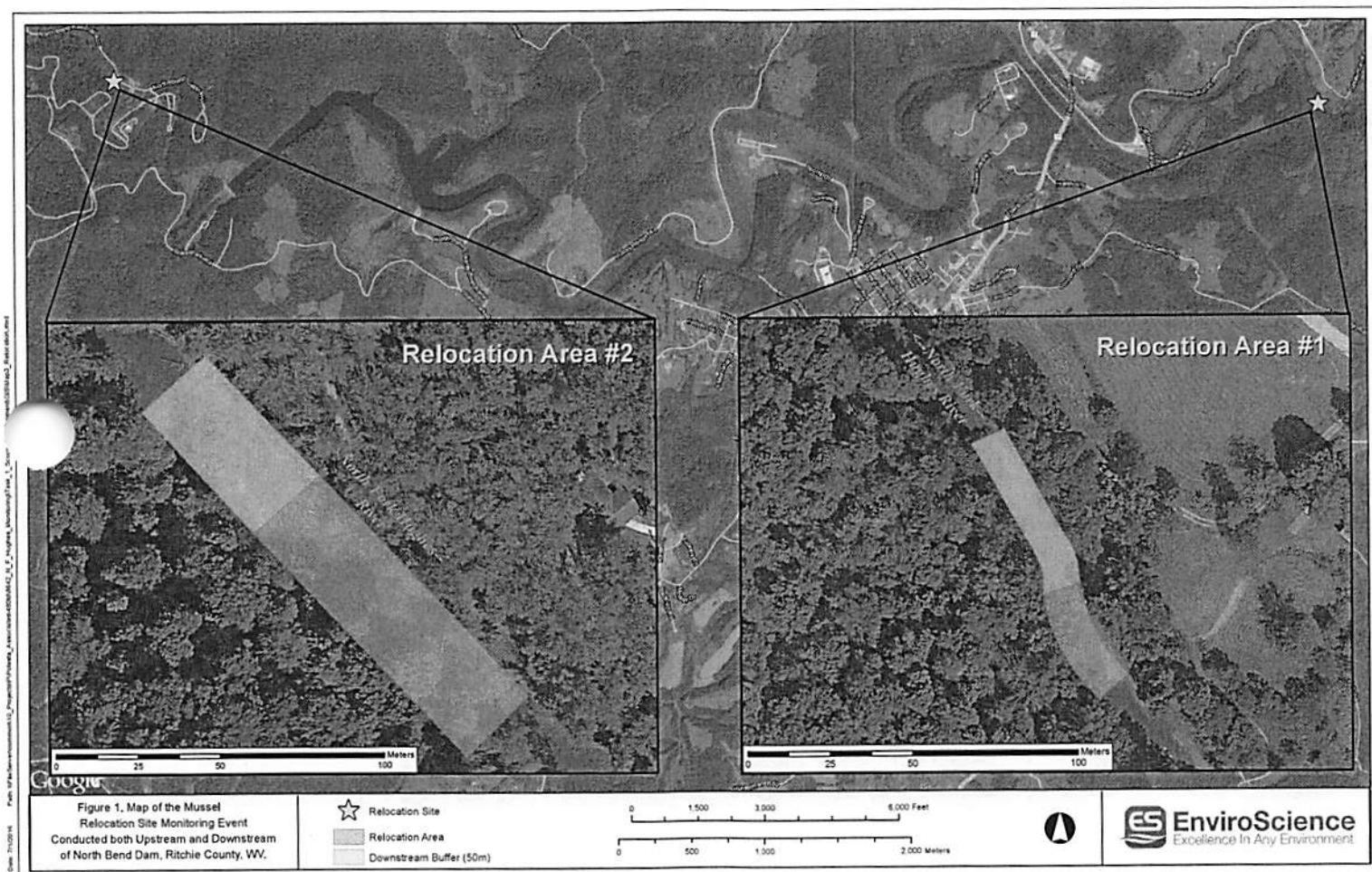
1. Looking west (downstream) at the 35 Site in the North Fork Hughes River in Ritchie County, West Virginia.



2. Looking east (upstream) at the 35 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Appendix B

Relocation Area Monitoring



[illegible]

4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; Relocation Area #1	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/29/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID: 2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input type="checkbox"/> Debris Dam <input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input type="checkbox"/> Other _____	<input type="checkbox"/> Trash <input type="checkbox"/> Island _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present. <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species <u>Water willow</u> Percent of the reach with aquatic vegetation <u>5</u> % (in terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)					P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)				
		P	C	B	D		P	C	B	D
Wall/Rip rap						Railroad (Active)				
Railroad (rails to trails)						Railroad (Inactive)				
Buildings						Landfill/trash				
Pavement						Park/Lawn				
Road						Row Crops				
Pasture						Feed lots				
Logging operations						Mining activity				

4/29/2016

Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	R	R	R	R	Commercial/Industrial				
	Old field		L	L	L	Hay field				
	Residential	L				Other				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>16</u> Conductivity uS/cm _____ Dissolved Oxygen mg/L _____ pH _____ Turbidity (mg/L) _____ Secchi depth (m.mm) _____ Meters used: _____ Hach Kit used Yes/No _____ Water Sample Collected for Lab analysis Yes/No _____ Flow at nearest USGS gauging station (cfs) _____ Gauging station: _____
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____
	Turbidity (visual) <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
	Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> None <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input type="checkbox"/> Other _____

Section G	
Sediment/ Substrate	Odors <input checked="" type="checkbox"/> Normal <input type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sludge <input type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Relict Shells <input type="checkbox"/> Other _____ <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____
	Deposits <input type="checkbox"/> Sand <input type="checkbox"/> Silt/clay
	Substrate Type (rank top three, 1 being dominant) 1 <u>Bedrock</u> <u>Boulder</u> 2 <u>Cobble</u> 3 <u>Gravel</u> <u>Sand</u> <u>Silt/clay</u>

Section H	
Streambank and Riparian Zone Characterization	Canopy Cover <input checked="" type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input type="checkbox"/> Mostly Shaded <input type="checkbox"/> None
	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No _____ Left Descending Bank Yes/No _____
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No _____ Left Descending Bank Yes/No _____

Notes: _____

12m wetted-width _____

1-5' banks _____

6" – 3' deep _____

Appendix B
Digital Images Recorded from the Relocation Area Freshwater Mussel Surveys for the
Monitoring of the North Fork Hughes River, Ritchie County, West Virginia



1. Looking at the dominant substrate in the downstream portion of the Relocation Area #1 Site in the North Fork Hughes River in Ritchie County, West Virginia.



2. Looking southeast (upstream) at the upstream portion of the Relocation Area #1 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Mussel Survey Summary Data Sheet

[illegible]

4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; Relocation Area #2	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/27/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID: 2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input type="checkbox"/> Debris Dam <input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input type="checkbox"/> Other	<input type="checkbox"/> Trash <input type="checkbox"/> Island <input type="checkbox"/> Other <input type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present. <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species <u>Water willow</u> Percent of the reach with aquatic vegetation <u>5</u> % (in terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)					P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)				
		P	C	B	D		P	C	B	D
Wall/Rip rap						Railroad (Active)				
Railroad (rails to trails)						Railroad (Inactive)				
Buildings						Landfill/trash				
Pavement						Park/Lawn	L	L	L	L
Road						Row Crops				
Pasture						Feed lots				
Logging operations						Mining activity				

4/29/2016

Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	R	R	R	R	Commercial/Industrial				
	Old field					Hay field				
	Residential					Othre				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>19</u> Conductivity uS/cm _____ Dissolved Oxygen mg/L _____ pH _____ Turbidity (mg/L) _____ Secchi depth (m.mm) _____ Meters used: _____ Hach Kit used Yes/No _____ Water Sample Collected for Lab analysis Yes/No _____ Flow at nearest USGS gauging station (cfs) _____ Gauging station: _____
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____
	Turbidity (visual) <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
	Water Surface Oils <input type="checkbox"/> Slick <input checked="" type="checkbox"/> Sheen <input type="checkbox"/> None <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input type="checkbox"/> Other _____

Section G	
Sediment/ Substrate	Odors <input checked="" type="checkbox"/> Normal <input type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sludge <input type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Relict Shells <input type="checkbox"/> Other _____ <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____
	Substrate Type (rank top three, 1 being dominant) Bedrock _____ Boulder _____ 3 Cobble _____ 1 Gravel _____ 2 Sand _____ Silt/clay _____

Section H		
Streambank and Riparian Zone Characterization	Canopy Cover <input checked="" type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input type="checkbox"/> Mostly Shaded <input type="checkbox"/> None	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No _____ Left Descending Bank Yes/No _____
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No _____ Left Descending Bank Yes/No _____	

Notes: _____

23m wetted-width _____

5-15' banks _____

6" - 2' deep _____

Appendix B
Digital Images Recorded from the Relocation Area Freshwater Mussel Surveys for the
Monitoring of the North Fork Hughes River, Ritchie County, West Virginia

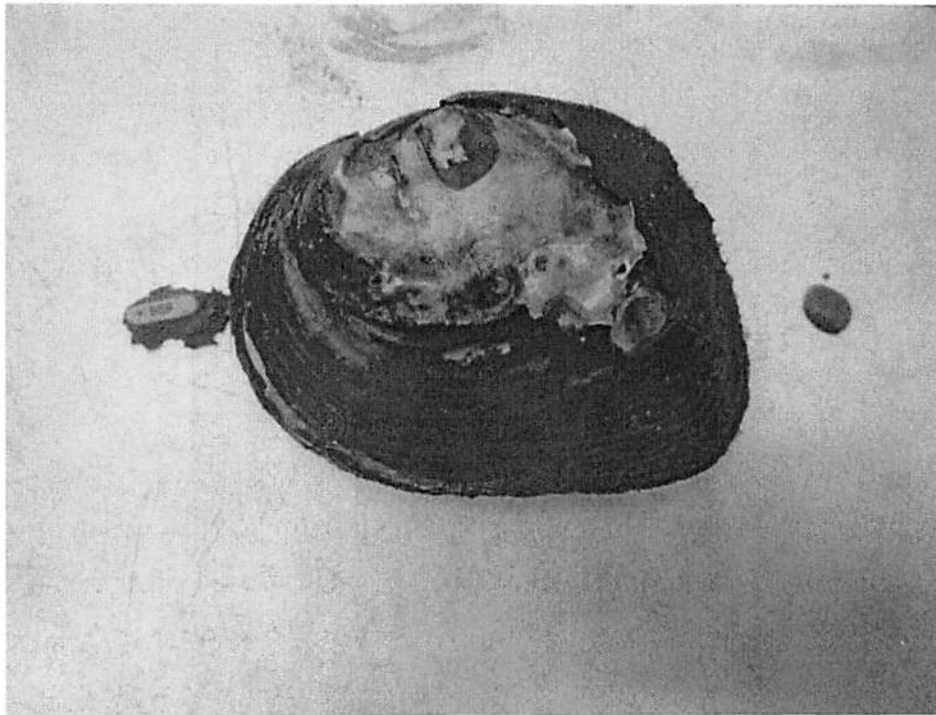


1. Looking southeast (downstream) at the Relocation Area #2 Site in the North Fork Hughes River in Ritchie County, West Virginia.



2. Looking southeast (upstream) at the Relocation Area #2 Site in the North Fork Hughes River in Ritchie County, West Virginia.

Appendix B
Digital Images Recorded from the Relocation Area Freshwater Mussel Surveys for the
Monitoring of the North Fork Hughes River, Ritchie County, West Virginia



3. A single, tagged mussel (*F. flava*, Tag# Blue 959) was collected during relocation monitoring sampling. The piece of periostracum containing the tag broke off during handling. The detached piece was re-affixed to the shell.

Appendix C

Bank Stabilization/Outlet Repair Project Monitoring

Table 1. Species, Status, Numbers, and Relative Abundance of Freshwater Mussels Collected during Transect Sampling from the Mussel Survey for the North Fork Hughes River Freshwater Mussel Monitoring in Ritchie County, WV, September 2016.

Species	Common Name	Federal Status ¹	WV Status ¹	Best Condition ²			Relative frequency (% total)	Length (mm)			Sex	
				USB	ADI	DSB		Min	Max	Average	Male	Female
<i>Ambleria plicata</i>	Threeridge				21	2	13.0%	40	132	91.72	-	-
<i>Elliptio dilatata</i>	Spike		S2/S3		1		0.6%	79	79	79.00	-	-
<i>Fusconaia flava</i>	Wabash Pigtoe				7	1	4.5%	40	103	66.57	-	-
<i>Lampsilis silquidea</i>	Fatmucket				11	5	9.0%	58	129	100.94	9	7
<i>Lasmigona costata</i>	Flutedshell				5		2.8%	92	154	122.40	-	-
<i>Leptodea fragilis</i>	Fragile Papershell		S2 (T)	1	35	10	26.0%	70	166	108.68	-	-
<i>Potamilius alatus</i>	Pink Heelsplitter				8	2	5.6%	110	171	146.80	-	-
<i>Pyganodon grandis</i>	Giant Floater			2	40	8	28.2%	63	161	111.54	-	-
<i>Quadrula pustulosa</i>	Pimpleback					1	0.6%	72	72	72.00	-	-
<i>Quadrula quadrata</i>	Mapleleaf		S2 (T)		7	1	4.5%	32	111	80.38	-	-
<i>Strophitus undulatus</i>	Creeper				1		0.6%	74	74	74.00	-	-
<i>Tritogonia verrucosa</i>	Pistolgrip		S2 (T)		5	1	3.4%	100	145	128.00	2	4
<i>Truncilla truncata</i>	Deertoe		S1 (E)		2		1.1%	44	50	47.00	-	-
Total:				3	143	31	100.0%					
No. of Species (Total Live + Dead):				2	12	9						

¹ E = Endangered, SC = Special Concern, T = Threatened, S1(E) = WV Endangered, S2(T) = WV Threatened, EXTIR = Extirpated

² PD=fresh dead shell, D=includes weathered dead and subfossil shells

Table 2. Species, Status, Numbers, and Relative Abundance of Freshwater Mussels Collected during Qualitative Species Accumulation Curve sampling during the Mussel Survey for the North Fork Hughes River Freshwater Mussel Monitoring in Ritchie County, WV, September 2016.

Species	Common Name	Federal Status ¹	WV Status ¹	Live	Relative frequency (% total)
<i>Ambelma plicata</i>	Threeridge			45	17.4%
<i>Epioblasma triquetra</i>	Snuffbox	E		1	0.4%
<i>Fusconaia flava</i>	Wabash Pigtoe			19	7.4%
<i>Lampsilis siliquoidea</i>	Fatmucket			26	10.1%
<i>Lasmigona costata</i>	Flutedshell			3	1.2%
<i>Lasmigona complanata</i>	White Heelsplitter			1	0.4%
<i>Leptodea fragilis</i>	Fragile Papershell		S2 (T)	54	20.9%
<i>Obliquaria reflexa</i>	Threehorned Wartyback			1	0.4%
<i>Potamilus alatus</i>	Pink Heelsplitter			9	3.5%
<i>Pyganodon grandis</i>	Giant Floater			73	28.3%
<i>Quadrula pustulosa</i>	Pimpleback			4	1.6%
<i>Quadrula quadrula</i>	Mapleleaf		S2 (T)	7	2.7%
<i>Tritogonia verrucosa</i>	Pistolgrip		S2 (T)	13	5.0%
<i>Truncilla truncata</i>	Deertoe		S1 (E)	2	0.8%
Total:				258	100.0%
No. of Species (Total Live + Dead):				14	

¹ E = Endangered; SC = Special Concern; T = Threatened; S1(E) = WV Endangered; S2(T) = WV Threatened; EXTIR = Extirpated

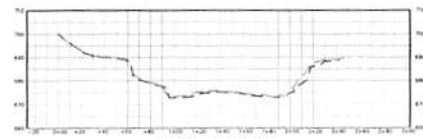
² FD=fresh dead shell, D=includes weathered dead and subfossil shells

Table 3. Total of Number Individuals Located Within Each Transect Segment for All Species from the Qualitative Survey

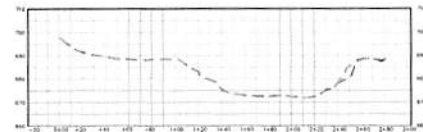
Transect No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Grand Total
0-5m																																	
<i>A. plicata</i>																	1		1					1									1
<i>L. siliquoides</i>					1													2		1		3							1				4
<i>L. fragilis</i>																																	5
<i>P. grandis</i>					1	1			1								2	1		2									1				9
0-5m Total					2	1			1							2	4		3		3				1		1		1				19
5-10m																																	
<i>F. flava</i>																				2													2
<i>L. fragilis</i>												1			1			1									1						4
<i>L. costata</i>													1																				1
<i>P. alatus</i>												1			1																		2
<i>P. grandis</i>																													1				1
<i>Q. quadrula</i>										1		1																					2
5-10m Total									1		1	2	1		2			1		2							1	1					12
10-15m																																	
<i>A. plicata</i>								1			1	1					1		2								1	1					8
<i>L. siliquoides</i>			1	1																						1							3
<i>L. fragilis</i>			1	1				2		2	1			2					1				2				1						13
<i>L. costata</i>														1																			1
<i>P. alatus</i>										1								1															2
<i>P. grandis</i>				1																1			1	1			2		1				7
<i>Q. pustulosa</i>									1																								1
<i>Q. quadrula</i>																				1								1					2
<i>T. verrucosa</i>																													1				1
10-15m Total			2	3				3	1	1	3		2		3		1	1	4	1		1	3			3	4	2					38
15-20m																																	
<i>A. plicata</i>										1							1			2	1			1									6
<i>F. flava</i>												1												1		1							3
<i>L. siliquoides</i>																				1			1					1					3
<i>L. fragilis</i>				1		1		1	1	1	1						1				1						1	2	1		1		13
<i>P. alatus</i>																											1						1
<i>P. grandis</i>										1											1	1	1				2			1			9
<i>Q. quadrula</i>												1	1							1	1	1										4	
<i>S. undulatus</i>																													1				1
<i>T. truncata</i>																	1																2
<i>T. verrucosa</i>																					1							2					3
15-20m Total			1		1	2	1	1	2	2	1	1			3	1			2	5	5	1		2			2	7	3	2		2	45
20-25m																																	
<i>A. plicata</i>																			2									2					4
<i>F. flava</i>				1																								1					2
<i>L. fragilis</i>								1				1						1															3
<i>L. costata</i>												1								1	1												3
<i>P. alatus</i>											1																						1
<i>P. grandis</i>									2			2				1													3	1			9
<i>T. verrucosa</i>																														1			1
20-25m Total			1				1	2	1	1	2	1			2			3		1								1	6	1			23
25-30m																																	
<i>A. plicata</i>																				1	1							2					4
<i>E. dilatata</i>																											1						1
<i>F. flava</i>																	1																1
<i>L. siliquoides</i>			1		1						1									1							1				1		6
<i>L. fragilis</i>									1		1	1	1								1				1				1	1			8
<i>P. alatus</i>			1																1		1												4
<i>P. grandis</i>									1			1	1			1		1	1					2	1		1	2	2	1			15
<i>T. verrucosa</i>			1																														1
25-30m Total			3		1				1	1	1	1	2	2		2		2	1	3	2			3	1	2	4	3	4	1			40
Grand Total			5	3	2	3	2	6	4	7	7	6	9	5		6	9	6	4	13	11	11	2	3	6	2	13	14	13	6	3		177



PLAN VIEW



UPSTREAM SECTION



DOWNSTREAM SECTION

GENERAL NOTES

LEGEND

— SURVEYED 2018

- - - SURVEYED 2016

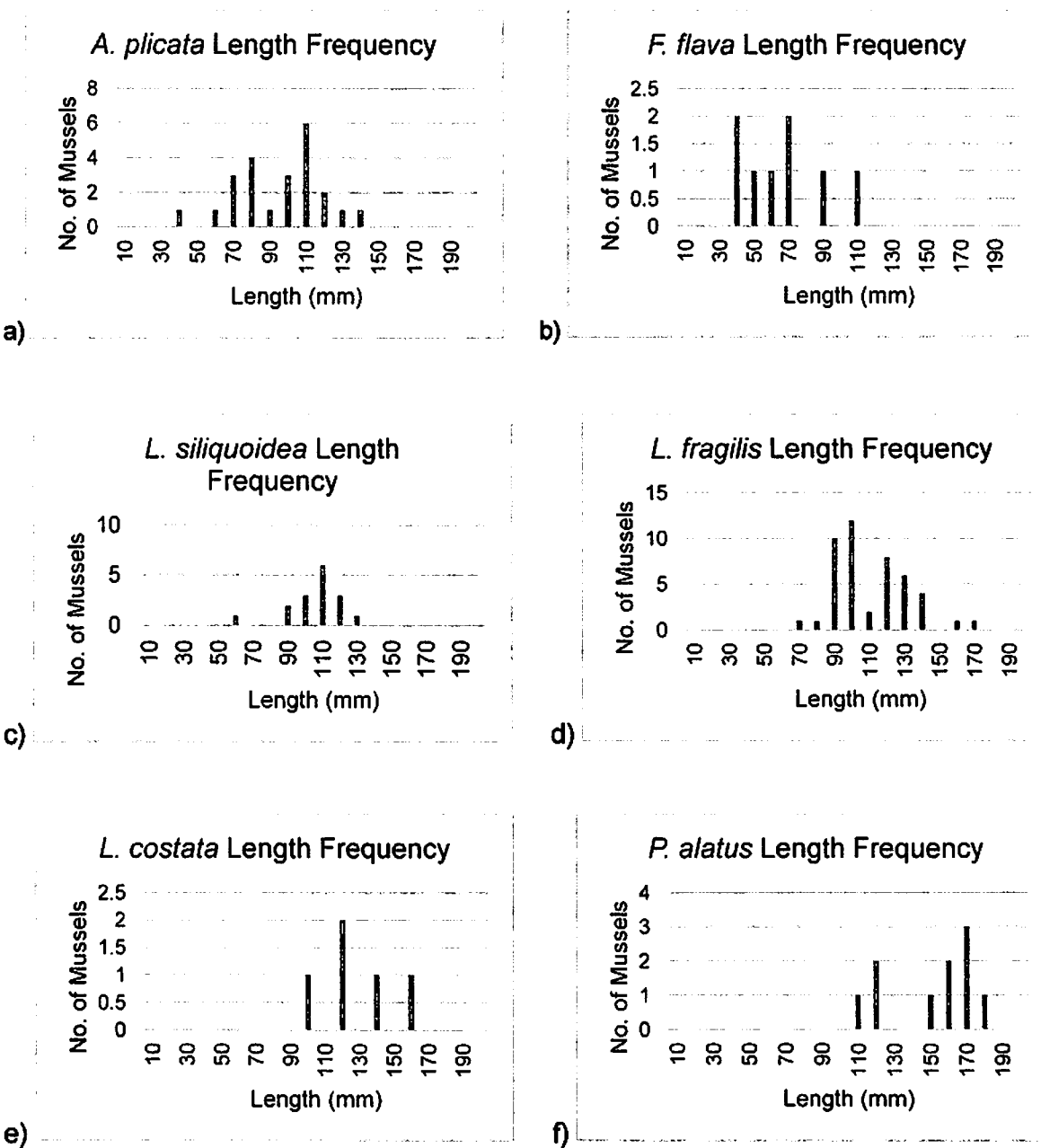
NO.	DESCRIPTION	DATE

EnviroScience
ENVIRONMENTAL SCIENCE & TECHNOLOGY
 10000 Olden Road, Suite 100, Fort Collins, CO 80525
 970.463.4070 | EnviroScience.com

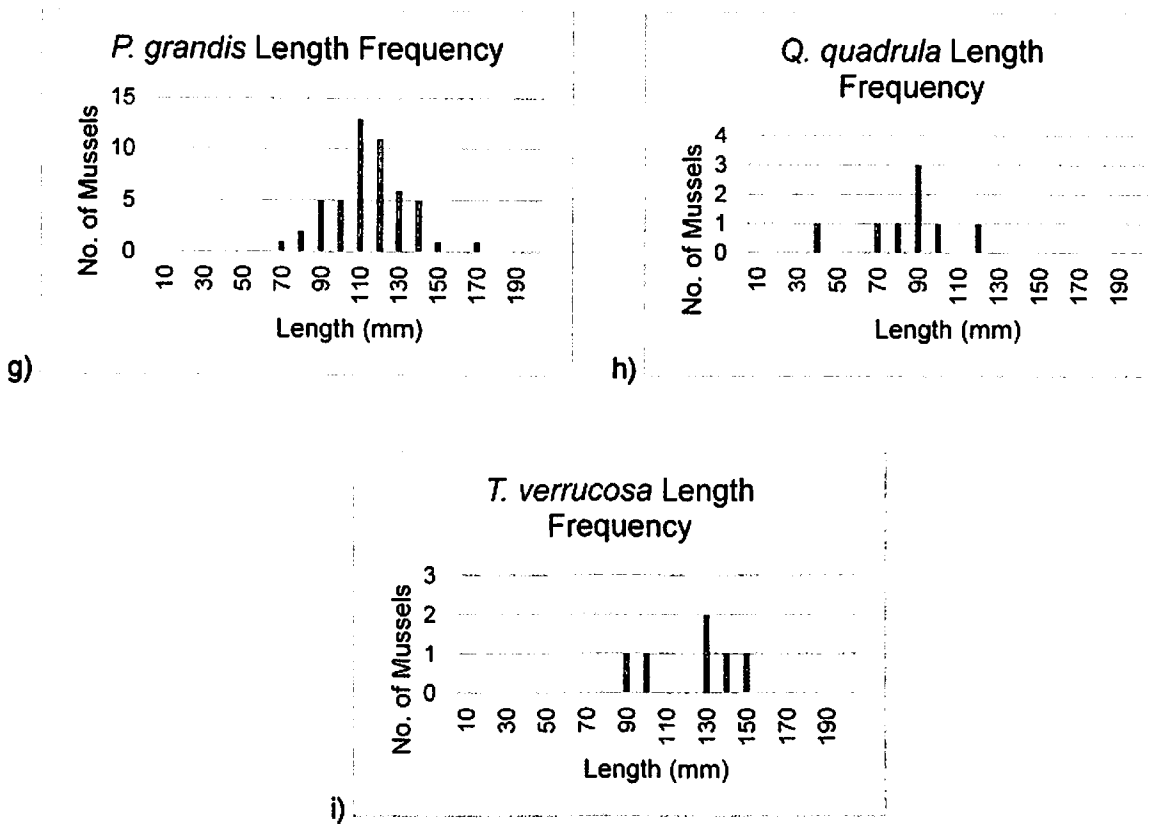
**NORTH FORK HUGHES
 PLAN
 AND
 CROSS SECTIONS**

DESIGNED BY JH	
DRAWN BY JH	
DATE NOV 11, 2019	
WEST SCALE 1"=40'	

SHEET
 1
 1

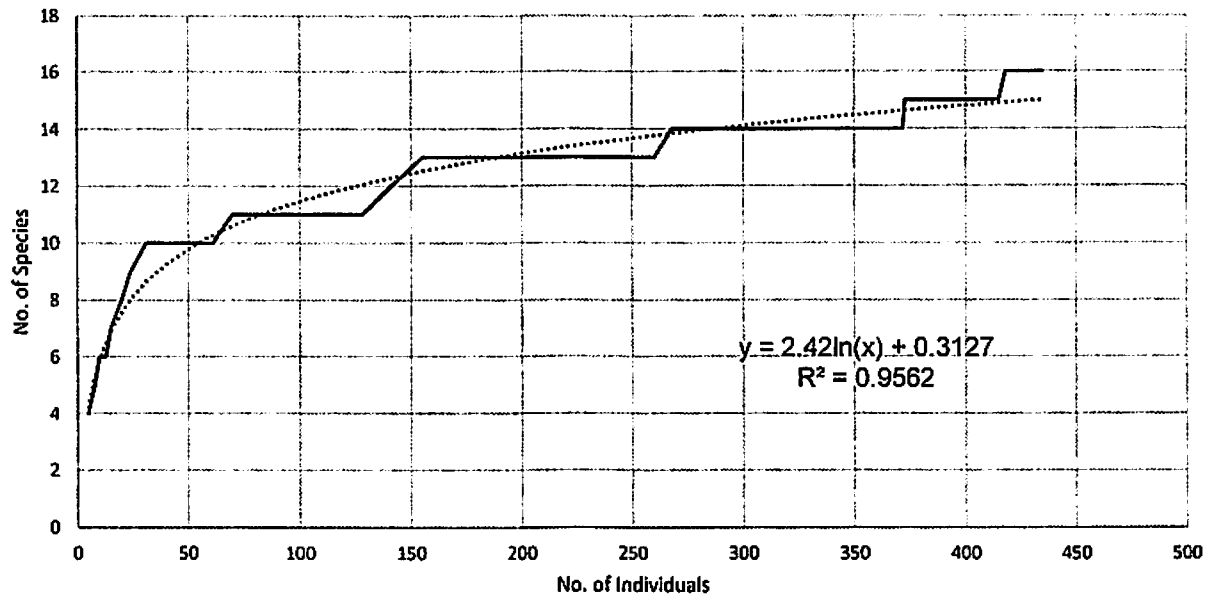


Figures 4a-i. Length frequency histograms for species where a minimum of 3 individuals were collected during transect sampling as part of the freshwater mussel rip rap monitoring within the North Fork Hughes River in Ritchie County, WV.



Figures 4a-i (continued). Length frequency histograms for species where a minimum of 3 individuals were collected during transect sampling as part of the freshwater mussel monitoring within the North Fork Hughes River in Ritchie County, WV.

Figure 5. Species Richness Curve



Mussel Survey Summary Data Sheet

4/29/2016

Section A

1. Collector Name: Matthew Johnson

2. Permit ID:

2016.106

1b. Surveyor(s) (Last Name, First, MI)

Tc. Company: EnviroScience Inc.

Johnson, M.

Mathias, P.

Abramczyk, D.

Walters, S.

3. Stream Name: **North Fork Hughes River**

4. Site Name: Stream Bank Stabilization Area

5. Date: MM/DD/YYYY 9/28-29/2016

6. Project: **North Fork Hughes River Monitoring**

Section B: Survey Method

! Waterscope

! SCUBA /SSA

! Snorkel

! Other

Section C: Survey Time

& Area

Total Effort (min)	1840
---------------------------	-------------

Total Area (m²)	1840
-----------------------------------	-------------

Section D: Surveys Conducted

! Transects

! Cells

1 Quantitative with excavation

Qualitative

[illegible]

NOTES: ADI, USB, and DSB mussel data was collected along transects. Other data was collected during qualitative sampling between selected transects to produce species accumulation curves.

4/29/2016

Current Stream and Weather Conditions

Section A	
1. Collector Name: Matthew Johnson	
3. Stream/Site Name: North Fork Hughes River; Stream Bank Stabilization Area	
4. LLID (dnr use):	
5. Date (MM/DD/YYYY): 09/28-299/2016	
6. Project: North Fork Hughes River Monitoring	
9. Permittee ID: 2016.106	

Section B			
Weather Conditions	Current Conditions	Past 24 Hours	Past Week
	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input checked="" type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Precipitation <input type="checkbox"/> Moderate or heavy rain shower <input checked="" type="checkbox"/> Light rain shower <input type="checkbox"/> Light rain <input type="checkbox"/> Moderate rain <input type="checkbox"/> Heavy rain <input type="checkbox"/> None Sky Conditions 0 25 50 75 100% cloud cover _____ Air temp (°C)	Has there been a heavy rain in the last 7 days? Yes/No

Section C			
Stream Characterization	Human Influence		
	<input type="checkbox"/> Engineered Dam <input type="checkbox"/> Pipeline crossing <input type="checkbox"/> Ford <input type="checkbox"/> Pipeline (parallel to stream) In Stream Cover <input type="checkbox"/> Debris Dam <input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Pipes(inlet/outlet) <input type="checkbox"/> Channelized <input type="checkbox"/> Bridge (pillars in stream) <input type="checkbox"/> Bridge (no pillars in stream) <input type="checkbox"/> Blow Down <input type="checkbox"/> Other	<input type="checkbox"/> Trash <input type="checkbox"/> Island <input checked="" type="checkbox"/> Other Dam Outfall <input checked="" type="checkbox"/> Wall/Dike/Revetment/Riprap <input type="checkbox"/> Beaver Dam

Section D	
Aquatic Vegetation	Indicate the dominant types and record the dominant species present. <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Floating algae <input type="checkbox"/> None <input checked="" type="checkbox"/> Rooted submergent <input type="checkbox"/> Free floating <input type="checkbox"/> Attached algae <input type="checkbox"/> Moss Dominant species <u>Hydrilla</u> Percent of the reach with aquatic vegetation <u>5</u> % (In terms of area)

Section E										
Watershed Features	Human Influence/Watershed Features (within survey reach)				P=>10m from shore, C=within 10m, B=on the bank, D=dominant land use (check no more than two)					
		P	C	B	D		P	C	B	D
	Wall/Rip rap		R	R	R	Railroad (Active)				
	Railroad (rails to trails)					Railroad (Inactive)				
	Buildings					Landfill/trash				
	Pavement					Park/Lawn	L	L	L	L
	Road					Row Crops				
	Pasture					Feed lots				
	Logging operations					Mining activity				

4/29/2016

Watershed Features (Cont.)		P	C	B	D		P	C	B	D
	Forest	R				Commercial/Industrial				
	Old field					Hay field				
	Residential					Other				
	Local Watershed Erosion (pertains to land use, not failing stream banks) <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy									

Section F	
Water Quality	Temperature (°C) <u>20</u> Conductivity uS/cm _____ Dissolved Oxygen mg/L _____ pH _____ Turbidity (mg/L) _____ Secchi depth (m.mm) _____ Meters used: _____ Hach Kit used Yes/No _____ Water Sample Collected for Lab analysis Yes/No _____ Flow at nearest USGS gauging station (cfs) _____ Gauging station: _____
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____
	Turbidity (visual) <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
	Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input checked="" type="checkbox"/> None <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input type="checkbox"/> Other _____

Section G	
Sediment/ Substrate	Odors <input type="checkbox"/> Normal <input checked="" type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sludge <input type="checkbox"/> Leaf Litter <input type="checkbox"/> Sand <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Relict Shells <input type="checkbox"/> Other _____ <input type="checkbox"/> Anaerobic (methane) <input type="checkbox"/> Paper/fiber <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____
	Deposits <input type="checkbox"/> Sand <input type="checkbox"/> Silt/clay
	Substrate Type (rank top three, 1 being dominant) Bedrock <u> </u> Boulder <u> </u> 3 Cobble <u> </u> 1 Gravel <u> </u> 2 Sand <u> </u>

Section H	
Streambank and Riparian Zone Characterization	Canopy Cover <input checked="" type="checkbox"/> Mostly Open <input type="checkbox"/> Shaded <input type="checkbox"/> Mostly Shaded <input type="checkbox"/> None
	Stream Bank Failure Present? (within survey reach only) Right Descending Bank Yes/No <u> </u> Left Descending Bank Yes/No <u> </u>
	Riparian Zone (10 meters) fully intact Right Descending Bank Yes/No <u> </u> Left Descending Bank Yes/No <u> </u>

Notes: _____

30m wetted-width _____

1-6' banks _____

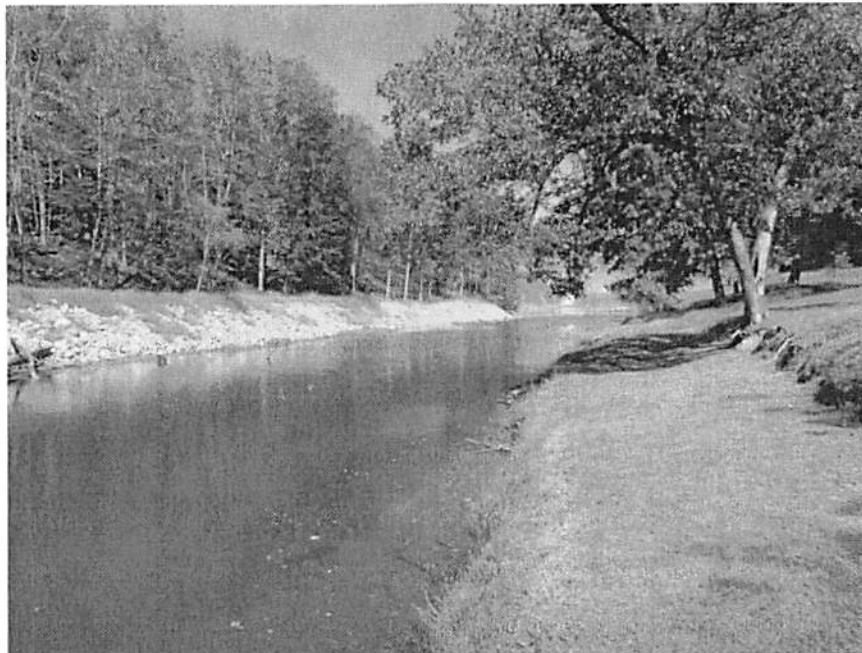
6"-6' deep _____

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



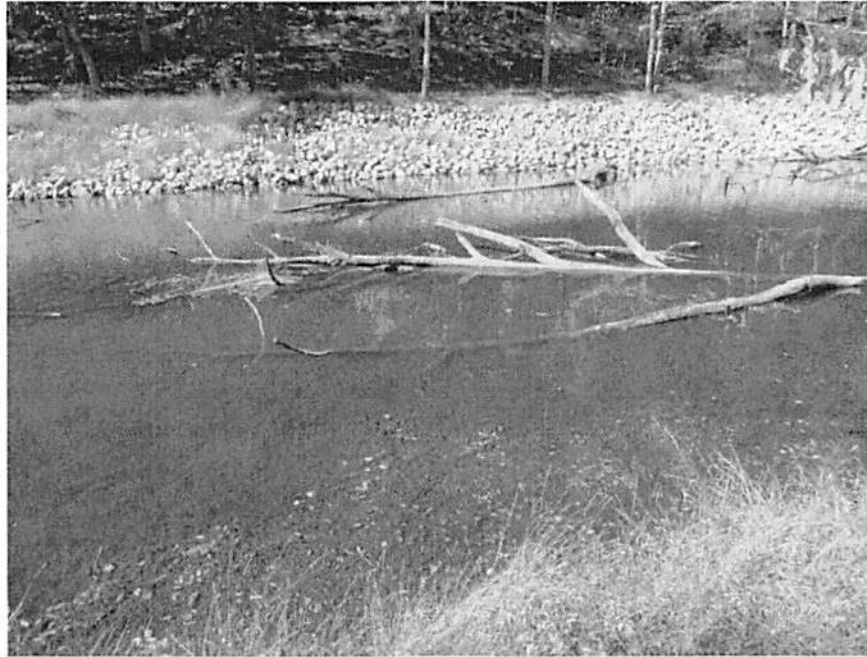
1. Looking west (downstream) at the DS buffer area within the freshwater mussel monitoring site downstream of Hollow Lake on the North Fork Hughes River in Ritchie County, WV.



2. Looking east (upstream) at the DS buffer area and ADI within the freshwater mussel monitoring site downstream of Hollow Lake on the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



3. Looking north (upstream) across the ADI within the freshwater mussel monitoring site downstream of Hollow Lake on the North Fork Hughes River in Ritchie County, WV.



4. Looking northeast (upstream) at the ADI within the freshwater mussel monitoring site downstream of Hollow Lake on the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



5. Looking west (downstream) at the ADI within the freshwater mussel monitoring site downstream of Hollow Lake on the North Fork Hughes River in Ritchie County, WV.



6. Looking east (upstream) at the ADI and US buffer area within the freshwater mussel monitoring site downstream of Hollow Lake on the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



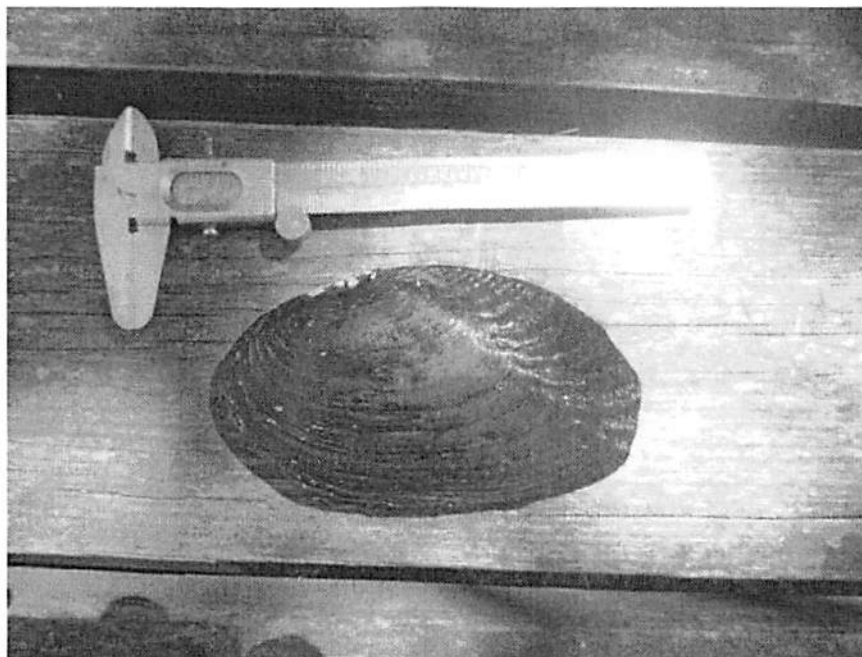
7. ES biologists conducting species accumulation curve sampling between Transects 20-21 within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.



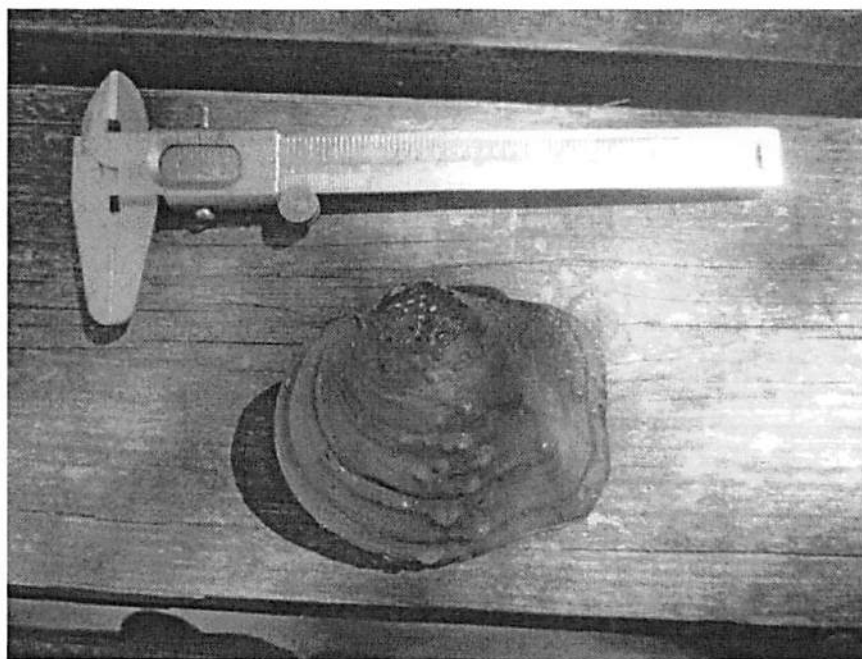
8. The general location where a live Snuffbox (*E. triquetra*) was collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



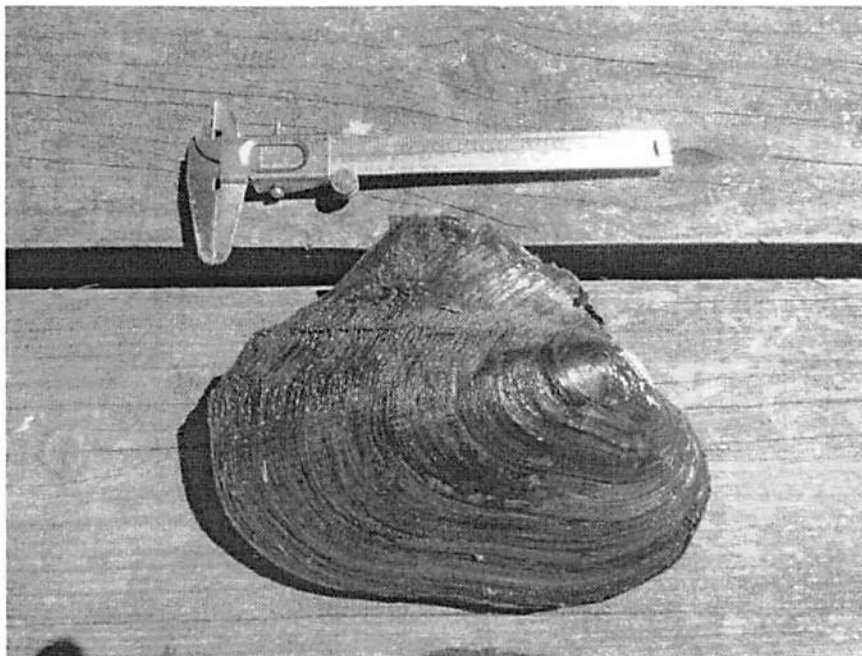
9. A representative Flutedshell (*L. costata*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.



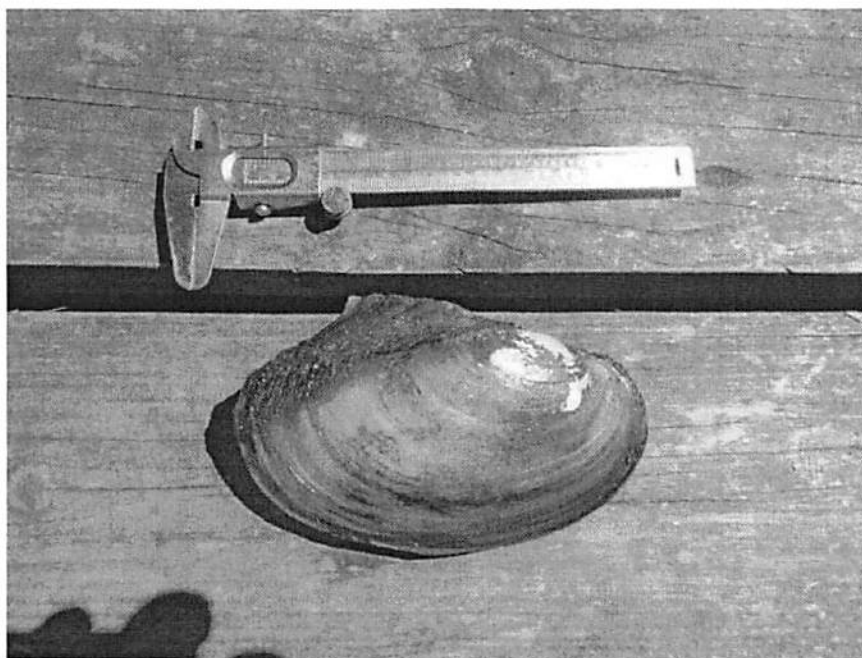
10. A representative Mapleleaf (*Q. quadrula*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



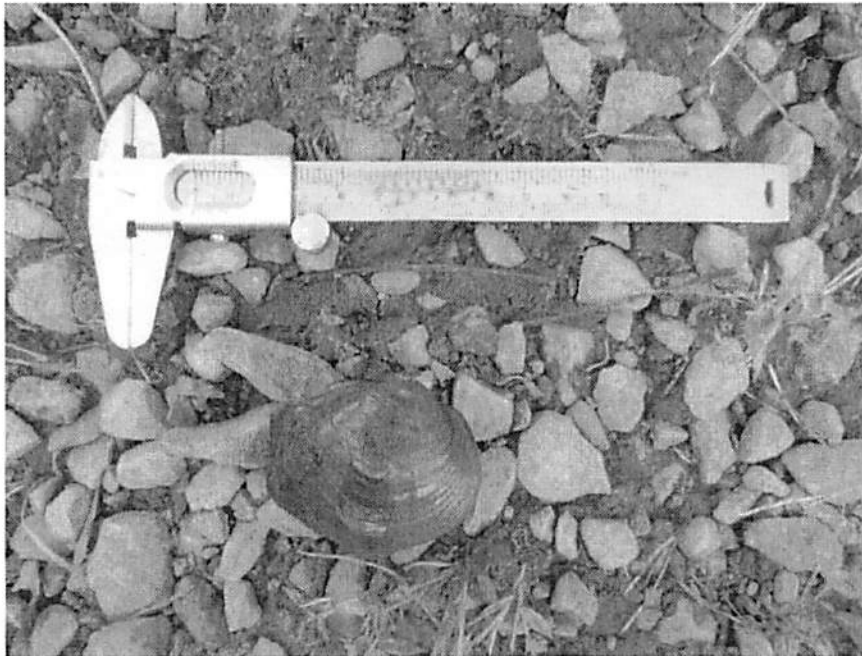
11. A representative Pink Heelsplitter (*P. alatus*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.



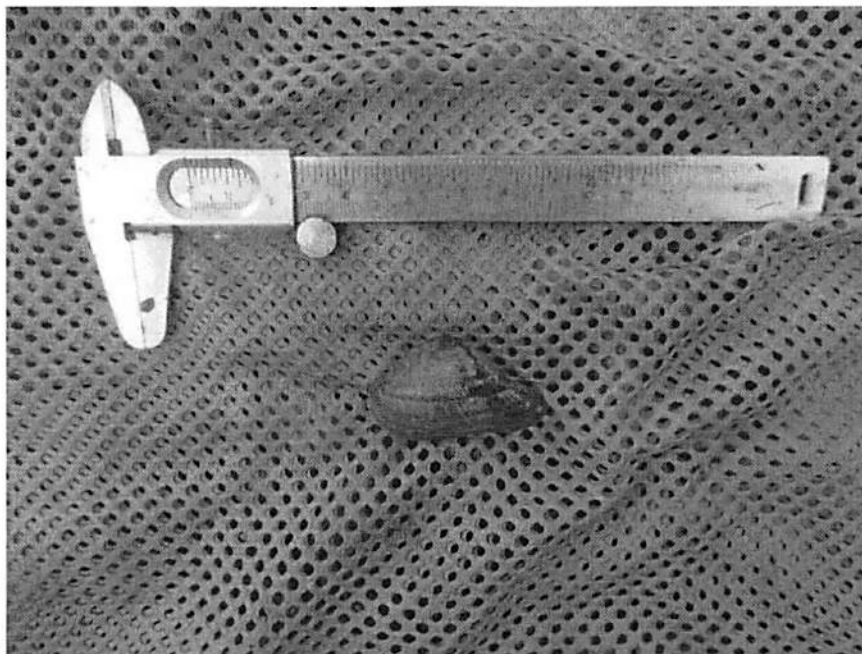
12. A representative Fragile Papershell (*L. fragilis*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



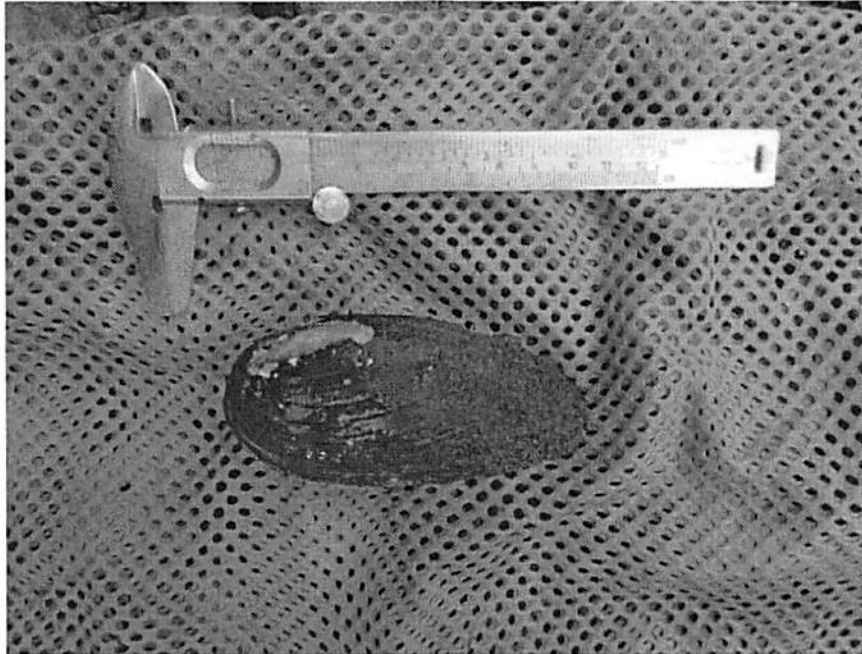
13. A representative (Threehorn Wartyback) *O. reflexa* collected during qualitative, species accumulation curve sampling within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.



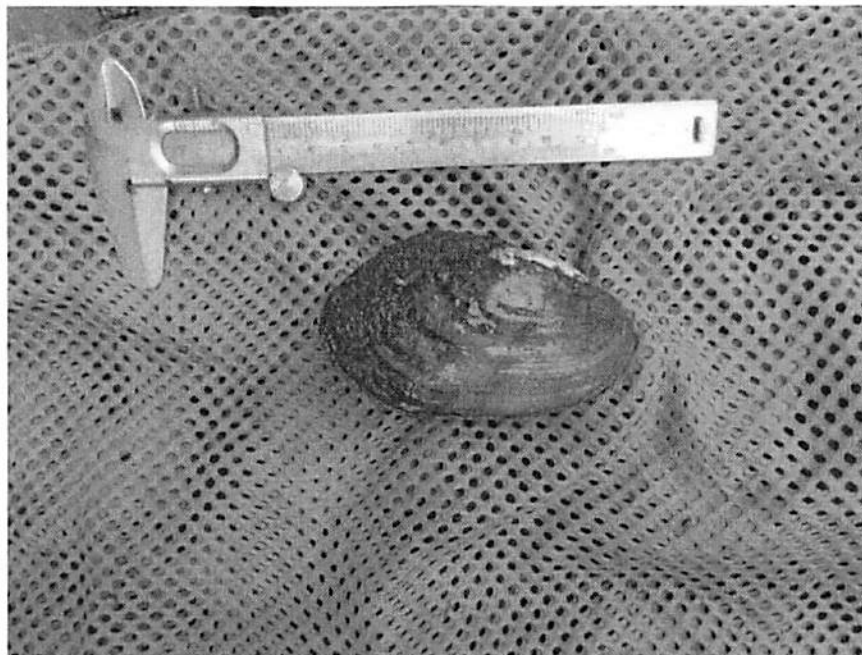
14. A representative Snuffbox (*E. triquetra*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



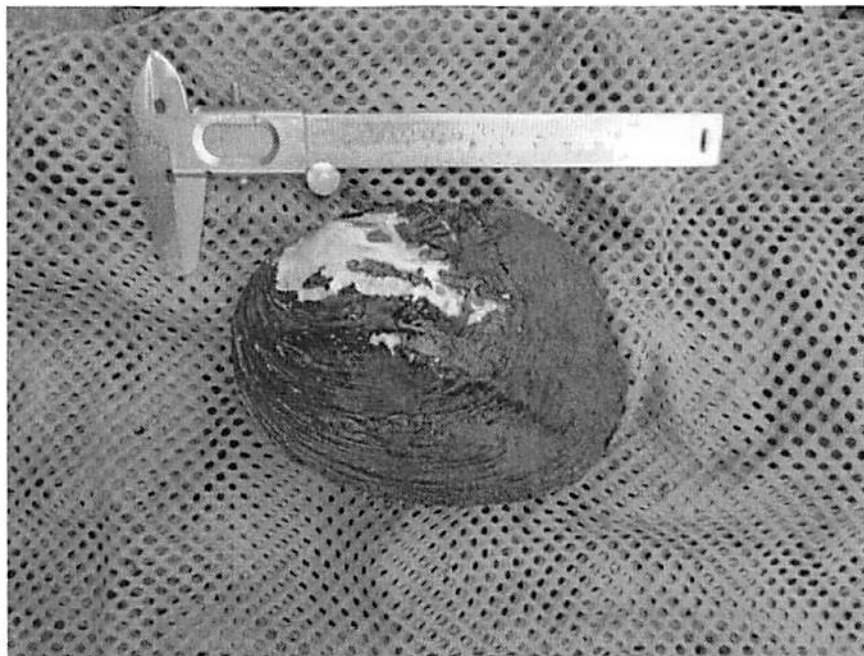
15. A representative Spike (*E. dilatata*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.



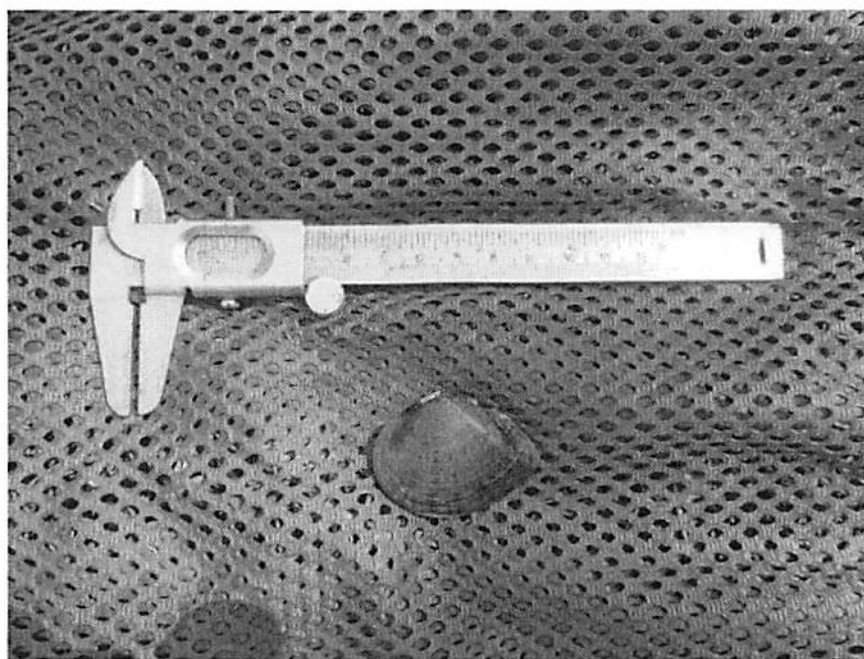
16. A representative Fatmucket (*L. siliquoidea*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



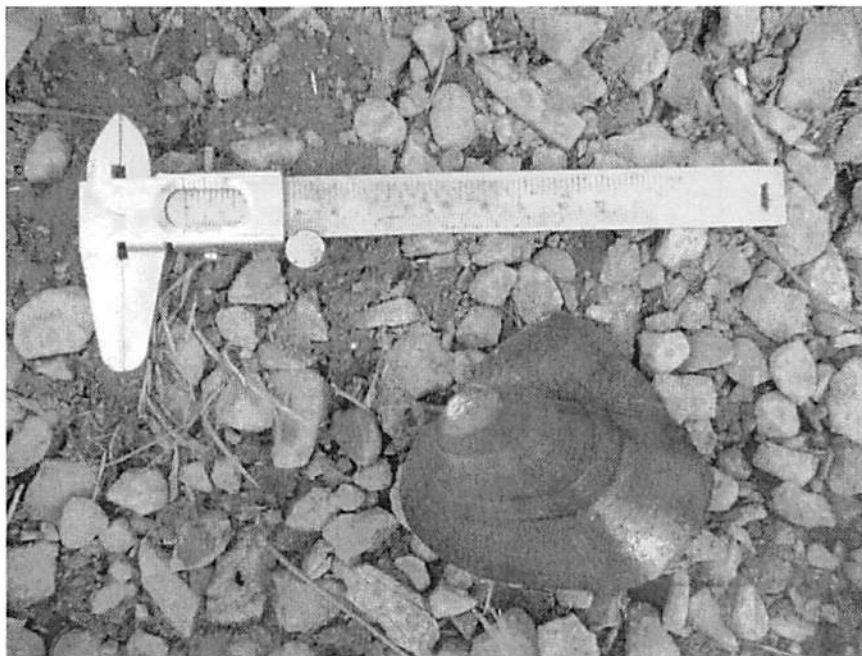
17. A representative Threeeridge (*A. plicata*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.



18. A representative Deertoe (*T. truncata*) collected within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.

Appendix C

Digital Images Recorded from the Freshwater Mussel Monitoring Survey in the North Fork Hughes River, Ritchie County, WV.



19. A representative White Heelsplitter (*L. complanata*) collected during qualitative species accumulation curve sampling within the freshwater mussel monitoring site in the North Fork Hughes River in Ritchie County, WV.

Appendix D.

WVDNR Scientific Collector Permit and Site-Specific
Approval



DIVISION OF NATURAL RESOURCES
Wildlife Resources Section
Operations Center
P.O. Box 67
Elkins, West Virginia 26241-3235
Telephone (304) 637-0245
Fax (304) 637-0250

Earl Ray Tomblin
Governor

Robert A. Fala
Director

NUMBER 2016.106

SCIENTIFIC COLLECTING PERMIT

Under Authority Conferred by Chapter 20, Article 2, Section 50, Code of West Virginia, As Amended

Matt Johnson
EnviroScience, Inc.
5070 Stow Road
Stow, OH 44266

Is hereby permitted to collect specimens according to the attached application and the Special Provisions on the reverse side of this permit.

This permit is not transferable and expires on September 30, 2016.

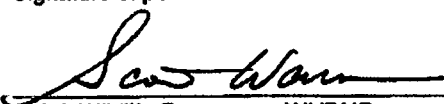
A complete list of all specimens collected will be kept and reported to the Director of the Division of Natural Resources of West Virginia no later than 45 days after the expiration date of this permit.

PERMIT PROVISIONS

I understand that (1) The privileges granted under this permit are not transferable, and to allow anyone other than myself to use my permit is unlawful and will be considered cause for revocation of said permit; (2) A Federal Scientific Collection Permit issued by the U.S. Department of Interior must be obtained before any migratory birds, or their nests or eggs, are collected or held in captivity; (3) The Federal Permit does not extend the privileges of the permittee beyond those granted by the Division of Natural Resources; (4) Permission must be obtained from either the owner or the custodian of any fenced or posted land before entering same for the purpose of collecting scientific specimens; (5) It is unlawful to carry a revolver or pistol contrary to Article VII, Chapter 61, Code of West Virginia; (6) It is unlawful to collect specimens with a gun on a Sunday; (7) It is unlawful to sell, offer for sale, barter, or offer to barter any wild animals, wild birds, fish or frogs collected; (8) When traps or nets or other devices are used UNATTENDED while exercising the privileges of this permit, said traps, nets, or devices must have attached thereto a tag bearing the name, address and number of the Scientific Collecting Permit; (9) It is unlawful to take or attempt to take any wild animals, wild birds, fish or frogs under said permit except for scientific and propagation purposes; (10) A hunting or fishing license must be obtained before specimens may be taken for sport; (11) Only those species or classes of wild birds, wild animals, fish or frogs listed below, and in the numbers stated, may be lawfully taken under said permit; and (12) I am required by law to carry my Scientific Collecting Permit, on my person while exercising the privileges granted thereunder, and to exhibit the permit to anyone requesting to see the same.

Must be signed before valid.

Signature of permittee


Chief, Wildlife Resources, WVDNR

Date of issue 3-9-16

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DIVISION OF NATURAL RESOURCES

Wildlife Resources Section

Operations Center

P.O. Box 67

Elkins, West Virginia 26241-3235

Telephone (304) 637-0245

Fax (304) 637-0250

Earl Ray Tomblin
Governor

Robert Fala
Director

ADDENDUM TO SCIENTIFIC COLLECTING PERMIT NO. 2016.106

Permittee: Matt Johnson
Address: EnviroScience, Inc.
5070 Stow Road
Stow, OH 44266

Expiration Date: September 30, 2016

THE FOLLOWING PROVISIONS ARE ADDED TO THIS PERMIT: Mussel surveys are permitted on the North Fork Hughes River in the vicinity of North Bend State Park, Ritchie County (North Bend Dam and the Bank Stabilization and Outlet Repair).

Concurrence from the US Fish and Wildlife Service is required prior to surveys.

THIS ADDENDUM MUST BE ATTACHED TO ORIGINAL PERMIT.

Must be signed before valid.

Signature of permittee



Scientific Collecting Permit Coordinator

Date of issue 8/30/2016

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Dale Dunford

From: Ryan Schwegman
Sent: Wednesday, January 25, 2017 10:12 AM
To: Dale Dunford
Subject: FW: North Fork Hughes Monitoring

Ryan Schwegman

EnviroScienceInc.com
"Excellence in Any Environment"

From: Douglas, Barbara [mailto:barbara_douglas@fws.gov]
Sent: Tuesday, September 13, 2016 10:45 AM
To: Ryan Schwegman <rschwegman@enviroscienceinc.com>; Sargent, Barbara D <Barbara.D.Sargent@wv.gov>
Cc: Clayton, Janet L <Janet.L.Clayton@wv.gov>; Christina Parsons <ccmoore@potesta.com>
Subject: Re: North Fork Hughes Monitoring

Hi Ryan - I have reviewed your proposed mussel monitoring plan dated August 30, 2016 for the North Fork Hughes River North Bend Dam Construction and Bank Stabilization and Outlet Repair Projects. The Service concurs that it complies with RPM/Terms and Conditions 4.1 and 4.2 of the Biological Opinion associated with this project. You have approval to proceed with the monitoring. Thanks for your efforts putting this together.
Barb

On Tue, Aug 30, 2016 at 10:20 AM, Ryan Schwegman <rschwegman@enviroscienceinc.com> wrote:

Janet and Barb,

Attached is the updated plan. Page 6 was addressed and section "3.1.1 Monitoring Data Analysis" was added to describe how population change will be monitored.

Obviously the sooner we can get this approved the better! The gage in Cairo looks great at the moment and we would like to get this done while conditions are prime.

Thanks

Ryan Schwegman