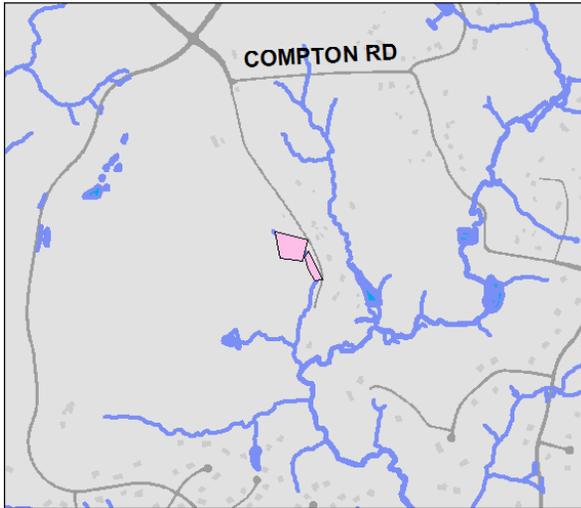


JM9100 Pond Retrofit



Vicinity Map

Address	7005 Union Mill Rd
Location	Golf course
Landowner	Balmoral Golf Assoc LC Garfield Henry TR
PIN	0742 05 B1 0751 06 F
Control Type	Water quality and quantity control
Drainage Area	63 acres
Receiving Waters	Unnamed tributary to Johnny Moore Creek

Description: Pond retrofit JM9100 addresses a stormwater pond that has fallen into disrepair and currently provides little to no detention or treatment. JM9100 calls for pond embankment repairs, new micropools and wetland plantings, and removal of debris downstream of the pond.



Grading Dump Site Micropools Wetland Plantings Repair Embankment Property Lines

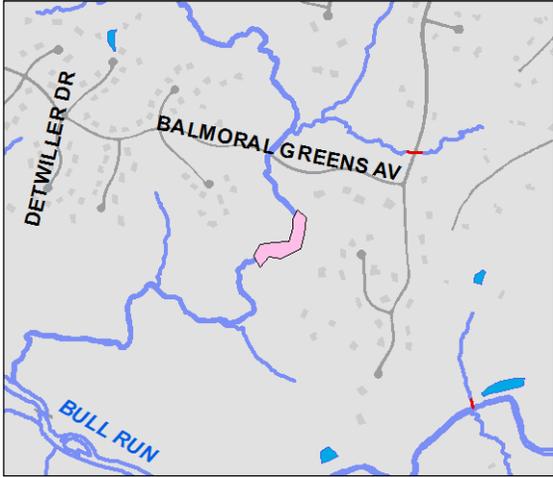
Project Area Map

Project Benefits: JM9100 will eliminate approximately 3 lbs/yr of phosphorus pollution, and will improve wildlife habitat by restoring a wetland area.

Project Design Considerations: Stream restoration JM9202 is located approximately 1200 feet downstream of JM9100. Coordination and sequencing of these projects must be considered. The pond retrofit portion of JM9100 is located on Balmoral Golf Association property and is surrounded by conservation easements. The debris removal portion of JM9100 is located on private property, and is not within any easements.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Access Road	100	SY	\$25.00	\$2,500.00
Access Road Gate	1	EA	\$2,500.00	\$2,500.00
Clear and Grub	0.4	AC	\$8,500.00	\$3,400.00
Structural BMP and Incidentals	1	LS	\$10,000 - \$20,000	\$15,000.00
New Storm Pipe	30	LF	\$100 - \$300	\$6,000.00
Grading and Excavation	700	CY	\$35.00	\$24,500.00
Embankment	500	CY	\$50.00	\$25,000.00
Organic Compost Soil Amendment	175	CY	\$40.00	\$7,000.00
			Base Construction Cost	\$85,900.00
			Mobilization (5%)	\$4,295.00
			Plantings (5%)	\$4,295.00
			Ancillary Items (5%)	\$4,295.00
			Erosion & Sediment Control (10%)	\$8,590.00
			Subtotal 1	\$107,375.00
			Contingency (25%)	\$26,843.75
			Subtotal 2	\$134,218.75
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	\$60,398.44
			Total	\$194,617.19
			Estimated Project Cost	\$200,000.00

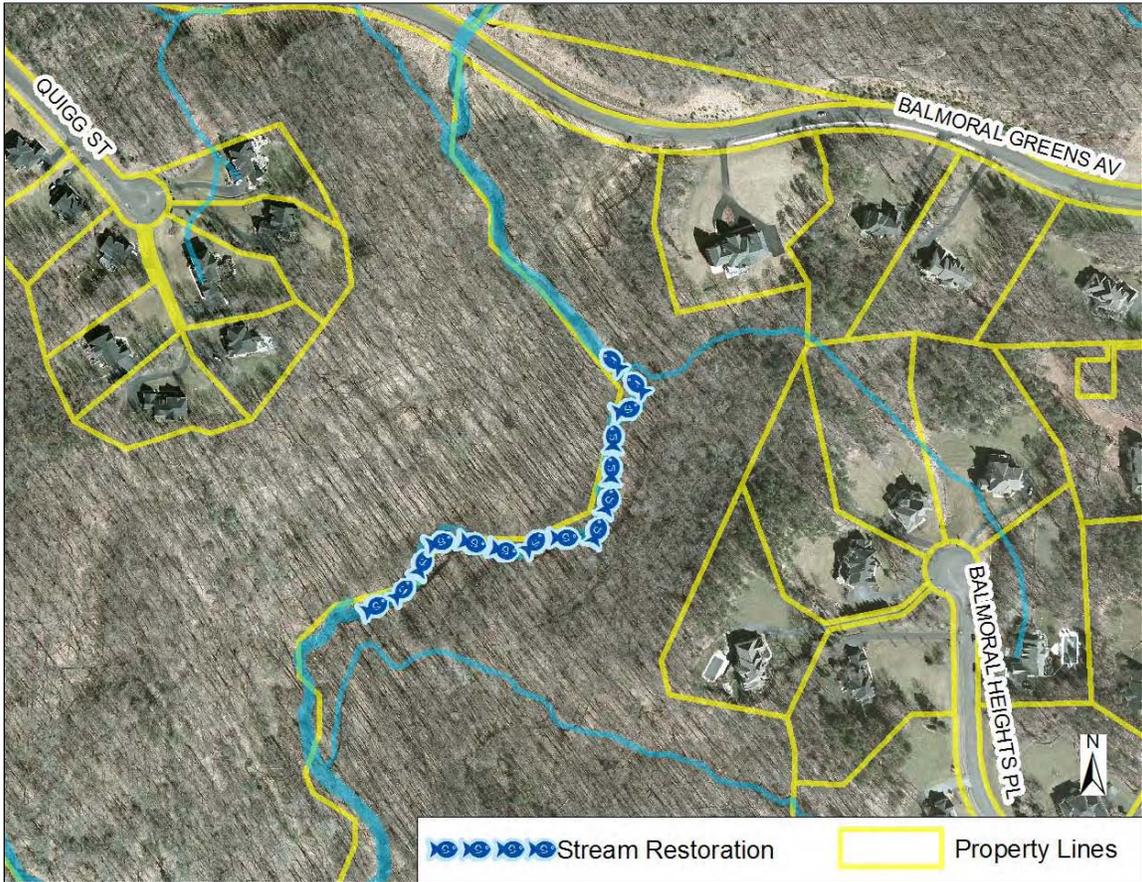
JM9200 Stream Restoration



Vicinity Map

Address	13309 Balmoral Greens Ave
Location	Stream valley park
Landowner	Fairfax County Park Authority
PIN	0744 03 V 0851 07 G
Control Type	Water quality control
Drainage Area	2984 acres
Receiving Waters	Johnny Moore Creek

Description: Johnny Moore Creek suffers from severe bank erosion in the area shown below. Project JM9200 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



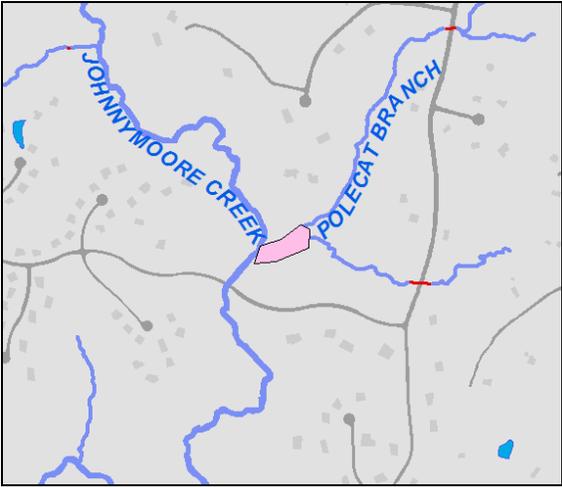
Project Area Map

Project Benefits: JM9200 will remove approximately 116 lbs/yr of phosphorus and 187 tons/yr of sediment by restoring about 1000 linear feet of stream channel. Higher quality habitat for fish and wildlife will also be provided.

Project Design Considerations: Buffer restoration JM8800 is located just upstream of the project site, where Balmoral Greens Avenue crosses Johnny Moore Creek. Stream restoration JM9201 is also located further upstream. Coordination of these three projects should be considered. The project site can be accessed from Balmoral Greens Avenue, and is located within floodplain/stormwater and conservation easements. Significant construction issues exist – especially site access – such that it may be worthwhile to extend the restoration project even further upstream to where Balmoral Greens Avenue crosses Johnny Moore Creek. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of the Johnny Moore Creek Stream Restoration will outweigh the short-term environmental costs.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	1.5	AC	\$10,000.00	\$15,000.00
Construct New Channel	1000	LF	\$200.00	\$200,000.00
Add'l Cost, first 500 LF	500	LF	\$200.00	\$100,000.00
Plantings	1.5	AC	\$25,000.00	\$37,500.00
			Base Construction Cost	\$352,500.00
			Mobilization (5%)	\$17,625.00
			Ancillary Items (5%)	\$17,625.00
			Erosion & Sediment Control (10%)	\$35,250.00
			Subtotal 1	\$423,000.00
			Contingency (25%)	\$105,750.00
			Subtotal 2	\$528,750.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$237,937.50
			Total	\$766,687.50
			Estimated Project Cost	\$770,000.00

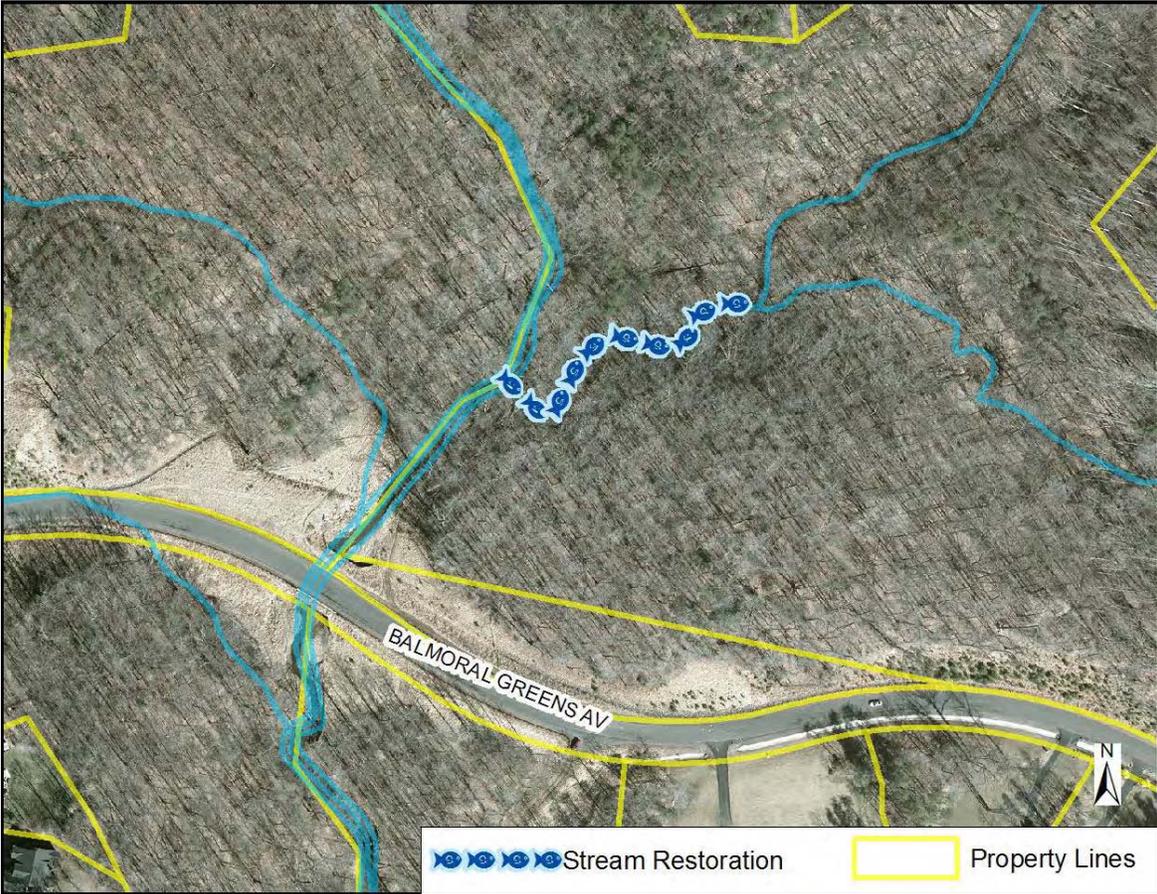
JM9201 Stream Restoration



Vicinity Map

Address	13309 Balmoral Greens Ave
Location	Wooded area
Landowner	Fairfax County Park Authority
PIN	0753 08 A
Control Type	Water quality control
Drainage Area	310 acres
Receiving Waters	Johnny Moore Creek

Description: Stream restoration project JM9201 addresses erosion in the downstream portion of Polecat Branch. Project JM9201 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



Project Area Map

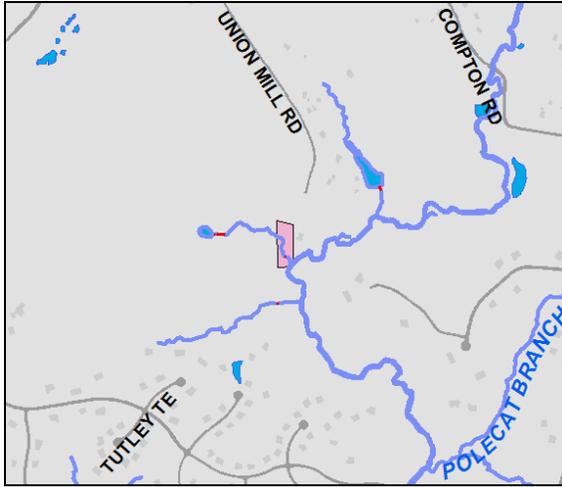
Project Benefits: Project JM9201 will reduce phosphorus and nitrogen loading in the Polecat Branch. Higher quality habitat for wildlife will also be provided.

Project Design Considerations: Buffer restoration JM8800 is located about 250 feet downstream of the project site, where Balmoral Greens Avenue crosses Johnny Moore Creek. Stream restoration JM9200 is also located further downstream on Johnny Moore Creek. Coordination and sequencing of these three projects should be considered, especially due to site access issues for JM9201 and JM9200 – both are densely wooded and somewhat remote. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to mature trees will be inevitable, but the long-term environmental benefits of the Polecat Creek Stream Restoration will outweigh its short-term environmental costs.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.57	AC	\$10,000.00	\$5,700.00
Construct New Channel	425	LF	\$200.00	\$85,000.00
Add'l Cost, first 500 LF	425	LF	\$200.00	\$85,000.00
Plantings	0.57	AC	\$25,000.00	\$14,250.00
		Base Construction Cost		\$189,950.00
		Mobilization (5%)		\$9,497.50
		Ancillary Items (5%)		\$9,497.50
		Erosion & Sediment Control (10%)		\$18,995.00
		Subtotal 1		\$227,940.00
		Contingency (25%)		\$56,985.00
		Subtotal 2		\$284,925.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$128,216.25
		Total		\$413,141.25
		Estimated Project Cost		\$420,000.00

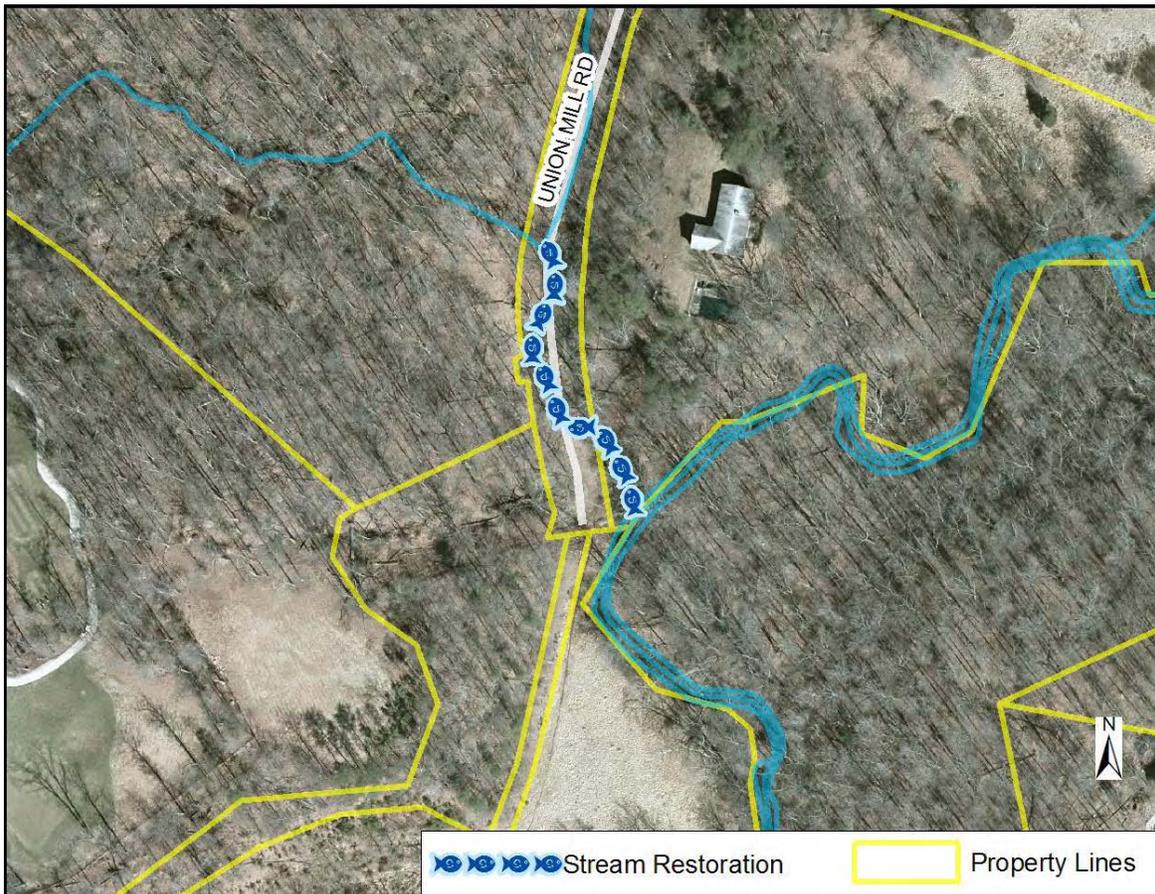
JM9202 Stream Restoration



Vicinity Map

Address	7029 Union Mill Rd
Location	Stream valley park
Landowner	Fairfax County Park Authority Garfield Henry TR
PIN	0744 03 S 0751 06 E
Control Type	Water quality control
Drainage Area	174 acres
Receiving Waters	Johnny Moore Creek

Description: The tributary to Johnny Moore Creek that crosses Union Mill Rd (as shown below) suffers from erosion. Project JM9202 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



Project Area Map

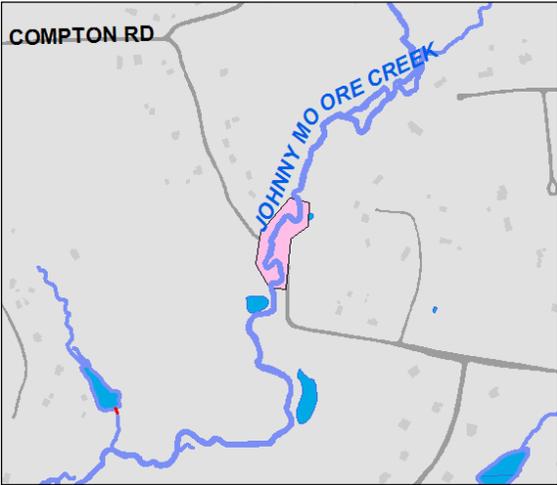
Project Benefits: The Tributary to Johnny Moore Creek Stream Restoration (JM9202) will reduce phosphorus, nitrogen and sediment loading, and restore approximately 325 linear feet of degraded stream channel. Higher quality habitat for fish and wildlife will also be provided.

Project Design Considerations: Buffer restoration JM8801 is located approximately 500' downstream of JM9202 – coordination of these two projects should be considered. JM9202 is located partially within floodplain/stormwater and conservation easements, and is also partially located on private property. The project site can be accessed from Union Mill Rd. Significant construction issues exist – especially site access. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of the Johnny Moore Creek Stream Restoration will outweigh its short-term environmental costs.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.45	AC	\$10,000.00	\$4,500.00
Construct New Channel	325	LF	\$200.00	\$65,000.00
Add'l Cost, first 500 LF	325	LF	\$200.00	\$65,000.00
Plantings	0.45	AC	\$25,000.00	\$11,250.00
		Base Construction Cost		\$145,750.00
		Mobilization (5%)		\$7,287.50
		Ancillary Items (5%)		\$7,287.50
		Erosion & Sediment Control (10%)		\$14,575.00
		Subtotal 1		\$174,900.00
		Contingency (25%)		\$43,725.00
		Subtotal 2		\$218,625.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$98,381.25
		Total		\$317,006.25
		Estimated Project Cost		\$320,000.00

JM9203 Stream Restoration



Vicinity Map

Address	13400 Compton Rd
Location	Private property
Landowner	Boyd, Donald E. TR MA Properties
PIN	0751 01 0026 0751 01 0011Z
Control Type	Water quality control
Drainage Area	2022 acres
Receiving Waters	Bull Run

Description: Johnny Moore Creek suffers from moderate bank erosion in this area. Project JM9203 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



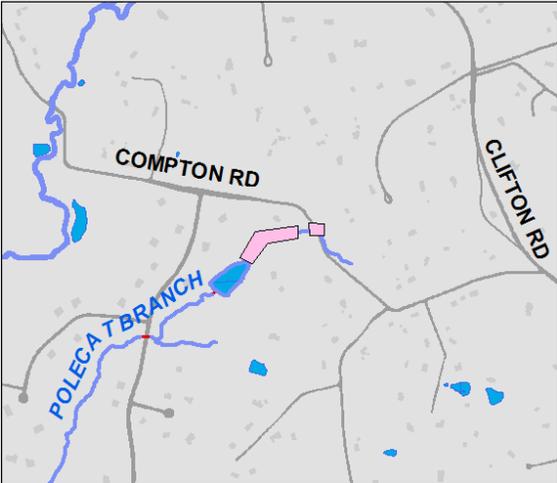
Project Area Map

Project Benefits: Stream restoration JM9203 will remove approximately 6 lbs/yr of phosphorus and 10 tons/yr of sediment by restoring about 1070 linear feet of stream channel. Higher quality habitat for fish and wildlife will also be provided.

Project Design Considerations: Culvert retrofit JM9400 is located approximately 0.6 miles east of JM9203 on Compton Rd. Although these projects are located in separate sub-watersheds, their proximity to each other along Compton Rd. warrants consideration of coordination and sequencing. JM9203 is located on private property. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of the Johnny Moore Creek Stream Restoration will outweigh the short-term environmental costs.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	1.1	AC	\$10,000.00	\$11,000.00
Construct New Channel	1070	LF	\$200.00	\$214,000.00
Add'l Cost, first 500 LF	500	LF	\$200.00	\$100,000.00
Plantings	1.1	AC	\$25,000.00	\$27,500.00
		Base Construction Cost		\$352,500.00
		Mobilization (5%)		\$17,625.00
		Ancillary Items (5%)		\$17,625.00
		Erosion & Sediment Control (10%)		\$35,250.00
		Subtotal 1		\$423,000.00
		Contingency (25%)		\$105,750.00
		Subtotal 2		\$528,750.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$237,937.50
		Total		\$766,687.50
		Estimated Project Cost		\$770,000.00

JM9400 Culvert Retrofit



Vicinity Map

Address	13165 Compton Rd
Location	Open space
Landowner	Feriozi, Dan J and Anne T Gallotta, Mark A and Pamela Deal, Bruce C and Ilysia D Witschey, John F and Robyn N
PIN	0751 01 0021 0751 01 0034B 0751 01 0033B 0753 01 0018A
Control Type	Water quality control
Drainage Area	75 acres
Receiving Waters	Polecat Branch

Description: Project JM9400 consists of a culvert retrofit where a tributary of Polecat Branch crosses Compton Rd. A small buffer restoration downstream of the culvert retrofit site is also included.



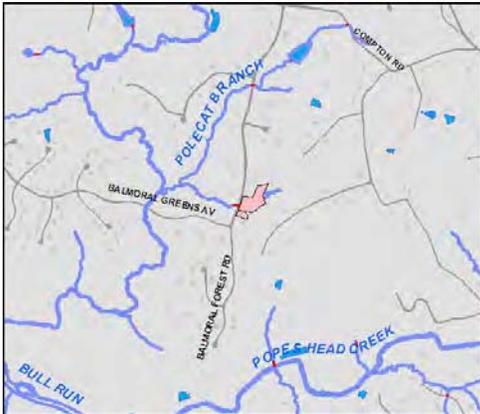
Project Area Map

Project Benefits: JM9400 will address flooding issues along Compton Rd by providing more efficient stormwater conveyance at the culvert retrofit site. The buffer restoration portion of the project will reduce erosion and pollutant loading in addition to providing higher quality habitat for native wildlife. Increased shade will also decrease water temperatures, which will better maintain dissolved oxygen, providing better conditions for aquatic life.

Project Design Considerations: As the buffer restoration portion of JM9400 is located partially on private property, the project will need to be coordinated with the landowners. Coordination with adjacent landowners and VDOT regarding the culvert retrofit may also be required, depending on site topography and access constraints. Permitting requirements for both the culvert retrofit and buffer restoration should be minimal.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.05	AC	\$8,500.00	\$425.00
Grading and Excavation	100	CY	\$35.00	\$3,500.00
New Storm Pipe	40	LF	\$100 - \$300	\$8,000.00
Organic Compost Soil Amendment	122	CY	\$40.00	\$4,880.00
Plantings	0.3	AC	\$114,030.00	\$34,209.00
			Base Construction Cost	\$51,014.00
			Mobilization (5%)	\$2,550.70
			Plantings (5%)	\$2,550.70
			Ancillary Items (5%)	\$2,550.70
			Erosion & Sediment Control (10%)	\$5,101.40
			Subtotal 1	\$63,767.50
			Contingency (25%)	\$15,941.88
			Subtotal 2	\$79,709.38
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$35,869.22
			Total	\$115,578.59
			Estimated Project Cost	\$120,000.00

JM9500 BMP/LID



Vicinity Map

Address	7051 Balmoral Forest Road
Location	Open Space
Landowner	Fairfax County Park Authority
PIN	0753 08 C
Control Type	Water quality control
Drainage Area	78 Acres
Receiving Waters	Unnamed Tributary to Polecat Branch

Description: Project JM9500 is a culvert retrofit upstream of Balmoral Forest Road on Polecat Branch. The culvert retrofit will provide water quality treatment for an uncontrolled area. Road drainage infrastructure may need to be realigned to allow for berm construction.



Property Lines Grading Berm

Project Area Map

Project Benefits: An estimated 12.5 lbs/yr of phosphorus will be removed. Project takes advantage of 'free' storage on upstream side of culvert. The project will provide water quality treatment for possible future estate residential development upstream, which is often exempt from stormwater regulations..

Project Design Considerations: There are access issues owing to steep slopes off the road. The stream valley is also very steep and in a forested area, requiring a clearing/grading effort of the access route as well as for construction of the berm. Consider gabion wall over earthen embankment to reduce footprint. Although it is zoned as Estate residential, the models show a large pollutant removal capacity at this site. There are no sequencing issues. By nature with any culvert retrofit, the project is in-line and more permitting requirements are likely. This is a perennial stream at this location.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Access Road	1000	SY	\$25.00	\$25,000.00
Access Road Gate	1	EA	\$2,500.00	\$2,500.00
Clear and Grub	0.3	AC	\$8,500.00	\$2,550.00
Structural BMP and Incidentals	1	LS	\$10,000 - \$20,000	\$10,000.00
New Storm Pipe		LF	\$100 - \$300	\$0.00
Grading and Excavation		CY	\$35.00	\$0.00
Embankment	200	CY	\$50.00	\$10,000.00
Organic Compost Soil Amendment		CY	\$40.00	\$0.00
		Base Construction Cost		\$50,050.00
		Mobilization (5%)		\$2,502.50
		Plantings (5%)		\$2,502.50
		Ancillary Items (5%)		\$2,502.50
		Erosion & Sediment Control (10%)		\$5,005.00
		Subtotal 1		\$62,562.50
		Contingency (25%)		\$15,640.63
		Subtotal 2		\$78,203.13
		Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)		\$35,191.41
		Total		\$113,394.53
		Estimated Project Cost		\$120,000.00