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Stream Assessment Photographs

Subshed 440

<u>Stream</u>	<u>Photo #</u>
1	No photo
2	1-2
3	3-8
4	9-11
5	12-17
6A	18-21
6B	22-23
7	24-25
8A	26-28
8B	29-30
9	31-34

Subshed 444

<u>Stream</u>	<u>Photo #</u>
10	35-38
11	39-41
12	42-45
13	No photo

Subshed 448

<u>Stream</u>	<u>Photo #</u>
14	No photo
15	46-48
16	49-50
17A	51-52
17B	53-54
18A	55-57
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Subshed 450

<u>Stream</u>	<u>Photo #</u>
19A	61-63
19B	64-66
20A	67-68
20B	69-70
21	71-74
22	75-77
23	78-80

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1. Looking downstream at Stream Reach 2. This is a typical view of Stream Reach 2, showing some incision and bank instability throughout the reach.



2. Looking downstream at failing piers of an elevated utility that crosses Stream Reach 2, a result of the active incision and widening of this reach.

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3. Looking downstream at Stream Reach 3. This is a typical view of Stream Reach 3, showing incision and bank instability throughout the reach.



4. Looking downstream at an exposed utility within Stream Reach 3.

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5. Looking upstream at an exposed sanitary sewer manhole along Stream Reach 3. The stream is migrating toward the manhole, exposing it.



6. Looking downstream at a completely exposed and undercut utility in Stream Reach 3. This utility is at risk of failing if the erosion and incision continues.

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7. Looking upstream at an exposed concrete-capped utility in Stream Reach 3. This utility is being actively undercut.



8. Looking downstream at a failing pier of an elevated utility that crosses Stream Reach 3, a result of the active incision and widening of this reach.

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9. Looking upstream at a typical view of Stream Reach 4. This stream has only a few areas of active erosion, and a relatively stable streambed.



10. Looking downstream at an elevated utility that crosses Stream Reach 4. The pier in the stream has resulted in some instability and active erosion along the banks in this area, and some spot-improvements may be warranted.

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11. Looking upstream at a streambend showing some significant erosion in Stream Reach 4.



12. Looking downstream at an elevated utility crossing over Stream Reach 5. Some erosion is present around these piers.

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13. Looking upstream at a severely eroding bank downslope of a stormwater pond outfall located on-line with Stream Reach 5.



14. Looking across the stormwater management pond located on-line with Stream Reach 5.

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15. Looking upstream at a typical section of Stream Reach 5. This stream exhibits significant erosion and incision, with large amounts of deposition in the streambed.



16. Looking upstream at a severely eroding streambank in Stream Reach 5.

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17. Looking upstream at an area of exposed bedrock within Stream Reach 5. This small section of the stream is stable.



18. Looking downstream at the blocked culvert of Stream Reach 6A, under Colby Dr. This blockage has contributed to the aggrading of this portion of the stream.

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19. Looking upstream at a typical view of Stream Reach 6A. This portion of the stream is incised, and is aggrading at the downstream end.



20. Looking upstream at an area of significant erosion in Stream Reach 6A. Several pipes were in this area in the past, but have since washed out of their location, leaving a very unstable bank.

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21. Looking upstream at an exposed and undercut utility crossing a tributary to Stream Reach 6A. This has the potential for failure, if left unmitigated.



22. Looking downstream at a typical section of Stream Reach 6B. This stream has incised some, but has also been aggrading due to the large amounts of erosion present in Stream Reach 6A.

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23. Looking downstream at another typical view of Stream Reach 6B.



24. Looking downstream at typical section of Stream Reach 7. This stream shows instability along the majority of both banks.

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25. Looking downstream at a section of severely eroding bank at a stream bend in Stream Reach 7.



26. Looking downstream at a typical section of Stream Reach 8A. This stream is incised with erosion present along both banks.

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27. Looking downstream at a sanitary sewer line crossing of Stream Reach 8A. This crossing is stable now, but could be compromised in the future, depending on the erosion rate of the stream.



28. Looking upstream at an exposed utility line crossing on Hoes Run, immediately adjacent to its confluence with Stream 8A. This crossing is undercut and could become compromised in the near future.

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29. Looking upstream at a typical section of Stream Reach 8B. An exposed sanitary sewer line is present in this location, due to the increased incision and erosion occurring along this stream.



30. Looking upstream at a typical section of Stream Reach 8B.

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31. Looking downstream at a typical section of Stream Reach 9. There is significant erosion along this stream due to residential encroachment and stormwater outfalls along the majority of the stream.



32. Looking upslope at a stormwater outfall along Stream Reach 9. Stormwater flows unchecked from the streets in the surrounding development.

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33. Looking downstream at massive erosion present along a section of Stream Reach 9.



34. Looking upstream at a typical section of the downstream portion of Stream Reach 9.

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35. Looking upstream at a portion of Stream Reach 10 within a powerline easement. This section is significantly aggraded due to upstream erosion.



36. Looking upstream at a typical section of Stream Reach 10. High amounts of deposition are present in this stream channel.

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37. Looking upstream at a typical section of the upstream portion of Stream Reach 10. This section is significantly eroding and unstable.



38. Looking upstream at an area of significant erosion along the upstream portion of Stream Reach 10. Some exposed utilities (cable, telephone) are also present in this area.

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39. Looking upstream at a section of Stream Reach 11 within a powerline easement. This section is relatively stable.



40. Looking upstream at an exposed sanitary sewer line along Stream Reach 11. It appears that some unsuccessful stabilization measures have been attempted in this area.

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41. Looking upstream at a typical section of Stream Reach 11. This portion is incised, but only exhibits instability along one bank. Residential development is visible in the background.



42. Looking upstream at a typical section of Stream Reach 12. Incision is present along most of this stream.

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43. Looking upstream at a typical section of Stream Reach 12. This portion shows significant incision along the banks.



44. Looking downstream at a typical section of the downstream portion of Stream Reach 12. This portion shows significant incision. The area below this section is severely aggrading.

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45. Looking downstream at a fully aggraded portion of Stream Reach 12. Due to the aggradation, a channel is not visible in this area.



46. Looking downstream at a culvert which carries Stream Reach 15 under Tanyard Hill Road, into the Town of Occoquan. This portion of the stream is hardened and channelized.

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47. Looking upstream at a typical section of Stream Reach 15. Some erosion is present along this stream, but it is mostly stable, due to the presence of shallow bedrock.



48. Looking upstream at a typical section of Stream Reach 15. A utility crossing has been exposed in this area, and is one of several such exposed lines.

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49. Looking upstream at a typical section of Stream Reach 16. This stream is relatively stable, due, in large part, to the presence of shallow bed rock.



50. Looking upstream at a typical section of Stream Reach 16.

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51. Looking upstream at Stream Reach 17A. This stream has been encroached upon by adjacent residential development.



52. Looking upstream at a typical section of Stream Reach 17A. This section is somewhat incised, partially exposing at least one sanitary sewer line.

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53. Looking downstream at Stream Reach 17B. The downstream portion of the channel is aggrading near this culvert.



54. Looking upstream at a typical section of Stream Reach 17B. This section is eroding and unstable, and could pose a threat to the encroaching adjacent residences.

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55. Looking upstream at a typical section of Stream Reach 18A. This portion of the stream is somewhat incised.



56. Looking upslope at a failing section of pipe adjacent to Stream Reach 18A. The pipe has undercut itself and the end-section has fallen off.

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57. Looking upstream at an exposed sanitary sewer line in Stream Reach 18A. This utility is beginning to be undercut, with the possibility of future failure.



58. Looking upstream at a typical section of Stream Reach 18B. This stream is incised with areas of instability throughout.

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59. Looking upstream at a concrete flume that carries stormwater to Stream Reach 18B. These flumes are likely responsible for at least some of the erosion seen in this channel.



60. Looking upstream at a typical section of the upstream portion of Stream Reach 18B. This section is incised and has been affected by adjacent residential development.

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61. Looking upstream at Stream Reach 19A. The end of the rip-rap channel lacks a stable transition to the stream channel, and is starting to fail.



62. Looking downstream at a typical section of Stream Reach 19A. Residential encroachment along this stream has compromised the riparian zone.

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63. Looking downstream at Stream Reach 19A. This section of channel is severely aggrading.



64. Looking downstream at an exposed utility within Stream Reach 19B. This stream has been significantly altered in order to stabilize the left bank, along Devils Reach Road.

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65. Looking downstream at a typical section of Stream Reach 19B.



66. Looking downstream at a typical section of Stream Reach 19B, where it flows into a stormwater management basin.

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67. Looking downstream at a typical section of Stream Reach 20A. This section is somewhat incised, but has areas of exposed bed rock, which contribute to stability.



68. Looking upstream at a typical section of the upstream portion of Stream Reach 20A. This portion is incised, with areas of instability.

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69. Looking downstream at a typical section of Stream Reach 20B. This stream is somewhat incised, with residential encroachment on all sides.



70. Looking upstream at a concrete channel that concentrates water into Stream Reach 20B.

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71. Looking downstream at a typical section of Stream Reach 21. This section is incised, with areas of instability.



72. Looking upstream at Stream Reach 21, east of Occoquan Road. This section of the stream has been heavily armored, yet several exposed and undercutting utilities are present. Encroachment from development is present on both sides of the stream channel.

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73. Looking downstream at a typical section of Stream Reach 21. This section is unstable, with incision and deposition throughout.



74. Looking upstream at the downstream end of Stream Reach 21. This section is severely eroding behind the wing-wall under a ramp for I-95. This stream poses a danger to the ramp itself.

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75. Looking downstream at a typical section of Stream Reach 22. This stream reach typically shows incision on one side of the channel.



76. Looking upstream at a utility crossing over Stream Reach 22. The concrete apron is starting to undercut.

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77. Looking upstream at a typical section of Stream Reach 22.



78. Looking downstream at a typical section of Stream Reach 23. This stream is unstable, with significant erosion and undercutting.

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79. Looking upstream at a typical section of Stream Reach 23.



80. Looking upstream at the downstream end of Stream Reach 23, where a sanitary sewer line crosses above the stream and the corrugated metal pipes. This area has been stabilized with gabion baskets, which have shifted the areas of erosion. This area could be compromised in the future.