Use Attainability Analysis

1 Water Body Name	Walnut Creek
2 Segment Description	Mouth to confluence with unnamed tributary
3 Segment Length (mi)	63.7
4 Drainage Area (sq. mi.)	224
5 Segment Start Latitude, Longitude (DD)	40.78695, -95.58993
6 Segment End Latitude, Longitude (DD)	41.49348, -95.21235
7 Route of Flow (Next Downstream Adopted Designated Use)	Walnut Creek (A2, BWW2, proposed, to A2, proposed, BWW2, existing, to A1, proposed, BWW1, HH, existing) to West Branch Nishnabotna River (A1, BWW1, HH)
8 NPDES Facility and Permit Number (If Applicable)	Walnut, City of STP (7872001)
9 Sample Site ID(s)	501-1, 501-2, 501-3, 501-4, 501-5, 501-6, 501-8, 501-9, 501-10, 501-11, 501-12
10 Segment County Name(s)	Fremont, Page, Montgomery, Pottawattamie
11 Field Work Date(s)	4/13/2006 (501-1, 501-2, 501-3), 4/12/2006 (501-4), 7/25/2007 (501-5, 501-6, 501-8), 10/4/2011 (501-9, 501-10, 501-11, 501-12)

12 Aquatic Life Use Attainability Analysis - Conclusion

Recommended Highest Attainable Use: Aquatic Life Use	BWW2 (Upper Segment)
40 CFR 131.10(g)(2) (Flow)	The natural low flow conditions of the stream segment are insufficient to create the habitat necessary to support a viable community of game fish. A lack of age ranges and diversity of game fish species indicates a non-reproducing population (see Site Observations Table). A BWW1 designation requires multiple species and age ranges to be viable. Therefore, the highest attainable aquatic life use for this stream segment is BWW2.
40 CFR 131.10(g)(5) (Physical Conditions)	Physical conditions related to the natural features of the water body are insufficient to support a viable community of game fish. Stream width (for 501-8), average depth (for 501-8), and maximum depth (for 501-4, 501-5, 501-6, and 501-8) fall within the “consistently negative” game fish indicator responses (see Table 2 in Appendix I). A lack of age ranges and diversity of game fish species indicates a non-reproducing population (see Site Observations Table). A BWW1 designation requires multiple species and age ranges to be viable. Therefore, the highest attainable aquatic life use for this stream segment is BWW2.

13 Recreational Use Attainability Analysis - Conclusion

Recommended Highest Attainable Use: Recreational Use	A1 (Lower Segment)
Water levels and flow are sufficient to support full body immersion (see Site Observations Table). Therefore, the highest attainable recreational use for this stream segment is A1.	

Recommended Highest Attainable Use: Recreational Use	A2 (Middle and Upper Segments)
40 CFR 131.10(g)(2) (Flow)	The natural low flow conditions and water levels of the stream segment prevent the attainment of an A1 recreational use (see Site Observations Table). An A1 designation requires the ability for full body immersion. Therefore, the highest attainable recreational use is A2.

14 Flow

Field Work Date	Description
10/4/2011	USGS stream gage 06808820 data for the area indicated stream flows were normal at the time of assessment.
4/13/2006	USGS stream gage 06808500 data for the area indicated stream flows were below normal at the time of assessment.
10/11/1996	USGS stream gage 06808500 data for the area indicated stream flows were normal at the time of assessment.
4/12/2006	USGS stream gage 06807410 data for the area indicated stream flows were normal at the time of assessment.
4/13/2006	USGS stream gage 06807410 data for the area indicated stream flows were below normal at the time of assessment.
7/25/2007	USGS stream gage 06807410 data for the area indicated stream flows were normal at the time of assessment.

Use Attainability Analysis - Data

Site Observations

Use	Site parameter	Site ID #501-1
AL/R	**15 Latitude, Longitude (DD)**	40.88925, -95.38807
AL/R	**16 Average Depth (in)**	4
AL/R	**17 Maximum Depth (in)**	7.5
AL/R	**18 Stream Width (ft)**	45
AL/R	**19 Pools Observed?**	No
AL only	**20 Non-Game Fish Present and Counts (Species: Number)**	N/A
	21 Game Fish Present and Counts (Species (Size Range): Number)	N/A
	22 Stream Habitat (See also: #29 Site Photos)	Very channelized, meanders within the channel.
R only	**23 Evidence of Use for Primary Contact Recreation? (Yes*/No)**	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	**26 Additional Description**	Steep slopes, no access.

Use	Site parameter	Site ID #501-2
AL/R	**15 Latitude, Longitude (DD)**	41.08755, -95.26852
AL/R	**16 Average Depth (in)**	19.5
AL/R	**17 Maximum Depth (in)**	>36
AL/R	**18 Stream Width (ft)**	45
AL/R	**19 Pools Observed?**	Yes
AL only	**20 Non-Game Fish Present and Counts (Species: Number)**	N/A
	21 Game Fish Present and Counts (Species (Size Range): Number)	N/A
	22 Stream Habitat (See also: #29 Site Photos)	Sill dam 8 ft below bridge.
R only	**23 Evidence of Use for Primary Contact Recreation? (Yes*/No)**	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	**26 Additional Description**	Fishing area. Path to creek along bridge slope. Fire pit present.

Use	Site parameter	Site ID #501-3
AL/R	15 Latitude, Longitude (DD)	41.25981, -95.21145
AL/R	16 Average Depth (in)	6.5
AL/R	17 Maximum Depth (in)	12
AL/R	18 Stream Width (ft)	19
AL/R	19 Pools Observed?	No
AL only	20 Non-Game Fish Present and Counts (Species: Number)	N/A
	21 Game Fish Present and Counts (Species (Size Range): Number)	N/A
	22 Stream Habitat (See also: #29 Site Photos)	N/A
R only	23 Evidence of Use for Primary Contact Recreation? (Yes*/No)	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	26 Additional Description	Very steep and incised banks.

Use	Site parameter	Site ID #501-4
AL/R	15 Latitude, Longitude (DD)	41.40443, -95.19573
AL/R	16 Average Depth (in)	7
AL/R	17 Maximum Depth (in)	11
AL/R	18 Stream Width (ft)	13.5
AL/R	19 Pools Observed?	No
AL only	20 Non-Game Fish Present and Counts (Species: Number)	Not measured
	21 Game Fish Present and Counts (Species (Size Range): Number)	Not measured
	22 Stream Habitat (See also: #29 Site Photos)	Not measured
R only	23 Evidence of Use for Primary Contact Recreation? (Yes*/No)	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	26 Additional Description	Very rural, very straight channel - no meandering.

Use	Site parameter	Site ID #501-5
AL/R	15 Latitude, Longitude (DD)	41.41828, -95.19438
AL/R	16 Average Depth (in)	10.5
AL/R	17 Maximum Depth (in)	15
AL/R	18 Stream Width (ft)	Not measured
AL/R	19 Pools Observed?	Yes
AL only	20 Non-Game Fish Present and Counts (Species: Number)	Not measured
	21 Game Fish Present and Counts (Species (Size Range): Number)	Not measured
	22 Stream Habitat (See also: #29 Site Photos)	Not measured
R only	23 Evidence of Use for Primary Contact Recreation? (Yes*/No)	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	26 Additional Description	Old washed out bridge present. Scour hole at old bridge piling.

Use	Site parameter	Site ID #501-6
AL/R	15 Latitude, Longitude (DD)	41.46900, -95.18958
AL/R	16 Average Depth (in)	6.5
AL/R	17 Maximum Depth (in)	11
AL/R	18 Stream Width (ft)	12.5
AL/R	19 Pools Observed?	No
AL only	20 Non-Game Fish Present and Counts (Species: Number)	Creek Chub: 30 Bigmouth Shiner: 3 Red Shiner: 2 Fathead Minnow: >50
	21 Game Fish Present and Counts (Species (Size Range): Number)	No
	22 Stream Habitat (See also: #29 Site Photos)	Scoured channel. Many crayfish holes. Meandering with hardpan bed in many locations.
R only	23 Evidence of Use for Primary Contact Recreation? (Yes*/No)	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	26 Additional Description	No access. Vegetation upstream, channelized deep silt downstream.

Use	Site parameter	Site ID #501-8
AL/R	15 Latitude, Longitude (DD)	41.49068, -95.20576
AL/R	16 Average Depth (in)	2
AL/R	17 Maximum Depth (in)	5
AL/R	18 Stream Width (ft)	7
AL/R	19 Pools Observed?	Not measured
AL only	20 Non-Game Fish Present and Counts (Species: Number)	Minnows (number unspecified)
	21 Game Fish Present and Counts (Species (Size Range): Number)	N/A
	22 Stream Habitat (See also: #29 Site Photos)	N/A
R only	23 Evidence of Use for Primary Contact Recreation? (Yes*/No)	Not measured
	24 Evidence of Use by Children? (Yes*/No)	Not measured
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	Not measured
AL/R	26 Additional Description	N/A

Use	Site parameter	Site ID #501-9
AL/R	15 Latitude, Longitude (DD)	41.33203, -95.20844
AL/R	16 Average Depth (in)	27.5
AL/R	17 Maximum Depth (in)	46
AL/R	18 Stream Width (ft)	19.5
AL/R	19 Pools Observed?	No
AL only	20 Non-Game Fish Present and Counts (Species: Number)	N/A
	21 Game Fish Present and Counts (Species (Size Range): Number)	N/A
	22 Stream Habitat (See also: #29 Site Photos)	Approximately 200 ft downstream, there is a weir constructed with concrete banks.
R only	23 Evidence of Use for Primary Contact Recreation? (Yes*/No)	No

Use	Site parameter	Site ID #501-9
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	**26 Additional Description**	N/A

Use	Site parameter	Site ID #501-10
AL/R	**15 Latitude, Longitude (DD)**	41.17400, -95.22952
AL/R	**16 Average Depth (in)**	7
AL/R	**17 Maximum Depth (in)**	24
AL/R	**18 Stream Width (ft)**	27
AL/R	**19 Pools Observed?**	No
AL only	**20 Non-Game Fish Present and Counts (Species: Number)**	N/A
	21 Game Fish Present and Counts (Species (Size Range): Number)	N/A
	22 Stream Habitat (See also: #29 Site Photos)	Channelized stream with steep eroded banks.
R only	**23 Evidence of Use for Primary Contact Recreation? (Yes*/No)**	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	**26 Additional Description**	N/A

Use	Site parameter	Site ID #501-11
AL/R	**15 Latitude, Longitude (DD)**	41.00185, -95.33076
AL/R	**16 Average Depth (in)**	27.5
AL/R	**17 Maximum Depth (in)**	39
AL/R	**18 Stream Width (ft)**	36
AL/R	**19 Pools Observed?**	Yes
AL only	**20 Non-Game Fish Present and Counts (Species: Number)**	N/A
	21 Game Fish Present and Counts (Species (Size Range): Number)	N/A
	22 Stream Habitat (See also: #29 Site Photos)	Steep slopes and riprapped banks.
R only	**23 Evidence of Use for Primary Contact Recreation? (Yes*/No)**	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	**26 Additional Description**	Two riprap flow control dams downstream back up the flow.

Use	Site parameter	Site ID #501-12
AL/R	**15 Latitude, Longitude (DD)**	40.79891, -95.47903
AL/R	**16 Average Depth (in)**	7.5
AL/R	**17 Maximum Depth (in)**	31
AL/R	**18 Stream Width (ft)**	61.5
AL/R	**19 Pools Observed?**	No
AL only	**20 Non-Game Fish Present and Counts (Species: Number)**	N/A
	21 Game Fish Present and Counts (Species (Size Range): Number)	N/A
	22 Stream Habitat (See also: #29 Site Photos)	Mostly wide and shallow with sandy substrate.

Use	Site parameter	Site ID #501-12
R only	**23 Evidence of Use for Primary Contact Recreation? (Yes*/No)**	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	No
AL/R	**26 Additional Description**	Incised and channelized.

AL = Aquatic Life
R = Recreation
*If yes, elaborate

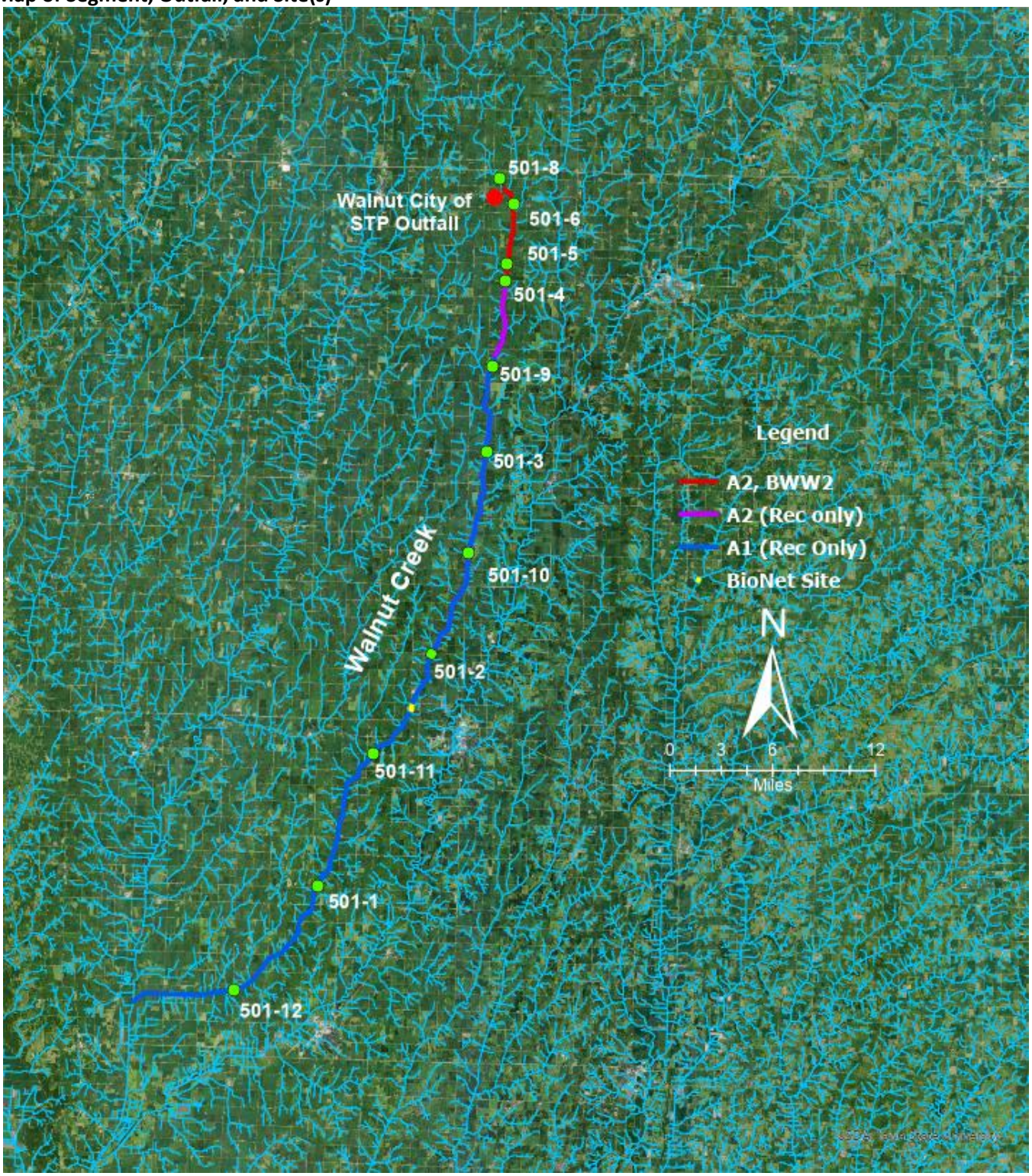
27 Supplemental Data

Use	Site parameter	BioNet Site ID #80
AL/R	**Latitude, Longitude (DD)**	41.04206, -95.28816
AL/R	**Field Work Date**	10/14/1996
AL/R	**Average Depth (in)**	12.6
AL/R	**Maximum Depth (in)**	60
AL/R	**Stream Width (ft)**	37.6
AL/R	**Pools Observed?**	Yes
AL/R	**Additional Description**	https://programs.iowadnr.gov/bionet/Sites/80/Report

Use	Site parameter	BioNet Site ID #81
AL/R	**Latitude, Longitude (DD)**	41.03033, -95.28879
AL/R	**Field Work Date**	10/14/1996
AL/R	**Average Depth (in)**	12.24
AL/R	**Maximum Depth (in)**	45.6
AL/R	**Stream Width (ft)**	34.7
AL/R	**Pools Observed?**	No
AL/R	**Additional Description**	https://programs.iowadnr.gov/bionet/Sites/81/Report

Desktop review verified that the UAA field work and BioNet information is still valid.

28 Map of Segment, Outfall, and Site(s)



29 Site Photos

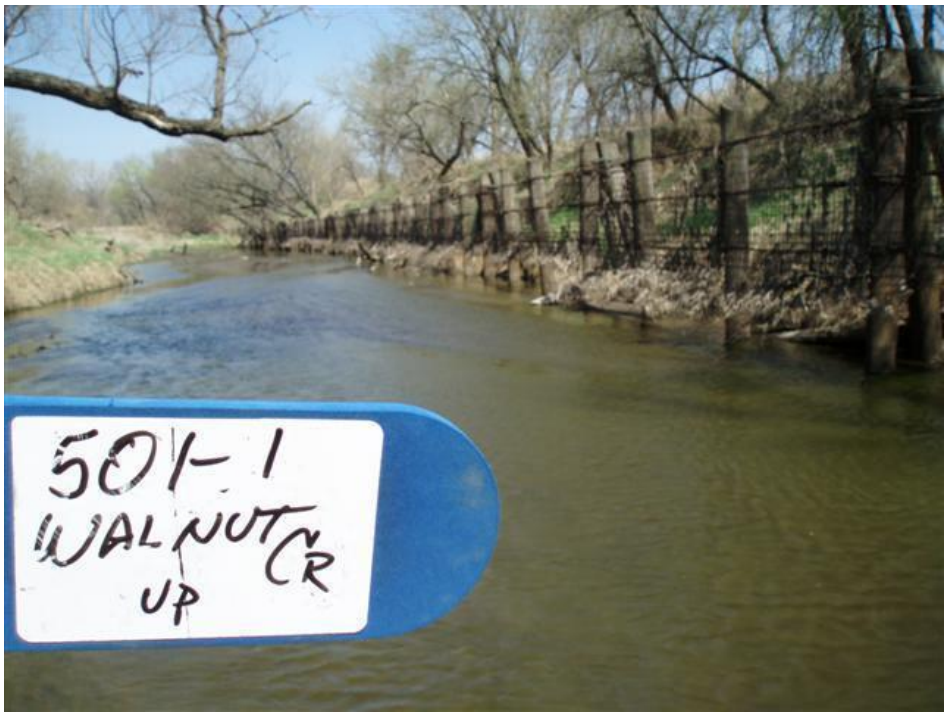


Figure 1. 501-1 Upstream recreation site looking upstream

Figure 2. 501-1 Upstream recreation site looking upstream #2

Figure 3. 501-1 Downstream recreation site looking upstream

Figure 4. 501-1 Downstream recreation site looking downstream

Figure 5. 501-1 Downstream recreation site looking downstream #2

Figure 6. 501-1 Upstream location looking at Bank protection fence

Figure 7. 501-2 Bridge looking upstream

Figure 8. 501-2 Bridge looking downstream

Figure 9. 501-2 Upstream recreation site looking upstream

Figure 10. 501-2 Upstream recreation site looking upstream #2

Figure 11. 501-2 Upstream recreation site looking downstream

Figure 12. 501-2 Downstream recreation site looking upstream

Figure 13. 501-2 Downstream recreation site looking downstream

Figure 14. 501-2 Downstream recreation site looking downstream #2

Figure 15. 501-2 Fire pit present at the assessed location

Figure 16. 501-3 Upstream recreation site looking upstream

Figure 17. 501-3 Upstream recreation site looking upstream #2

Figure 18. 501-3 Upstream recreation site looking downstream

Figure 19. 501-3 Downstream recreation site looking upstream

Figure 20. 501-3 Downstream recreation site looking downstream

Figure 21. 501-3 Downstream recreation site looking downstream #2

Figure 22. 501-4 Bridge looking upstream

Figure 23. 501-4 Bridge looking downstream

Figure 24. 501-4 Upstream recreation site looking upstream

Figure 25. 501-4 Upstream recreation site looking upstream #2

Figure 26. 501-4 Upstream recreation site looking downstream

Figure 27. 501-4 Downstream recreation site looking upstream

Figure 28. 501-4 Downstream recreation site looking downstream

Figure 29. 501-4 Downstream recreation site looking downstream #2

Figure 30. 501-5 Bank looking upstream

Figure 31. 501-5 Bank looking downstream

Figure 32. 501-5 Instream looking upstream

Figure 33. 501-5 Instream looking upstream #2

Figure 34. 501-5 Instream looking downstream

Figure 35. 501-5 Instream looking downstream #2

Figure 36. 501-5 Bridge platform laying in the creek

Figure 37. 501-6 Bridge looking upstream

Figure 38. 501-6 Bridge looking upstream #2

Figure 39. 501-6 Bridge looking downstream

Figure 40. 501-6 Bridge looking downstream #2

Figure 41. 501-6 End of aquatic assessment looking downstream

Figure 42. 501-6 End of aquatic assessment looking downstream #2

Figure 43. 501-6 End of aquatic assessment looking upstream

Figure 44. 501-6 End of aquatic assessment looking upstream #2

Figure 45. 501-6 Upstream recreation site looking upstream

Figure 46. 501-6 Upstream recreation site looking upstream

Figure 47. 501-6 Upstream recreation site looking downstream

Figure 48. 501-6 Upstream recreation site looking downstream #2

Figure 49. 501-6 Downstream recreation site looking upstream

Figure 50. 501-6 Downstream recreation site looking upstream #2

Figure 51. 501-6 Downstream recreation site looking downstream

Figure 52. 501-6 Downstream recreation site looking downstream #2

Figure 53. 501-6 Graffiti present under the bridge

Figure 54. 501-8 Bridge looking upstream

Figure 55. 501-8 Bridge looking upstream #2

Figure 56. 501-8 Bridge looking downstream

Figure 57. 501-8 Bridge looking downstream #2

Figure 58. 501-8 Instream looking upstream

Figure 59. 501-8 Instream looking upstream #2

Figure 60. 501-8 Instream looking downstream

Figure 61. 501-8 Instream looking downstream #2

Figure 62. 501-8 No trespassing sign at the assessed location

Figure 63. 501-9 Recreational use assessment midpoint looking upstream

Figure 64. 501-9 Recreational use assessment midpoint looking downstream

Figure 65. 501-9 Recreational use assessment upstream looking upstream

Figure 66. 501-9 Recreational use assessment upstream looking downstream

Figure 67. 501-9 Recreational use assessment downstream looking upstream

Figure 68. 501-9 Recreational use assessment downstream looking downstream

Figure 69. 501-9 Weir downstream of bridge

Figure 70. 501-10 Recreational use assessment midpoint looking upstream

Figure 71. 501-10 Recreational use assessment midpoint looking downstream

Figure 72. 501-10 Recreational use assessment upstream looking upstream

Figure 73. 501-10 Recreational use assessment upstream looking downstream

Figure 74. 501-10 Recreational use assessment downstream looking upstream

Figure 75. 501-10 Recreational use assessment downstream looking downstream

Figure 76. 501-11 Recreational use assessment midpoint looking upstream

Figure 77. 501-11 Recreational use assessment midpoint looking downstream

Figure 78. 501-11 Recreational use assessment upstream looking upstream

Figure 79. 501-11 Recreational use assessment upstream looking downstream

Figure 80. 501-11 Recreational use assessment downstream looking upstream

Figure 81. 501-11 Recreational use assessment downstream looking downstream

Figure 82. 501-11 Weir downstream

Figure 83. 501-12 Recreational use assessment midpoint looking upstream

Figure 84. 501-12 Recreational use assessment midpoint looking downstream

Figure 85. 501-12 Recreational use assessment upstream looking upstream

Figure 86. 501-12 Recreational use assessment upstream looking downstream

Figure 87. 501-12 Recreational use assessment downstream looking upstream

Figure 88. 501-12 Recreational use assessment downstream looking downstream

Appendix I.

c. Stream Flow and Habitat Data

Data analysis results for stream flow and habitat variables were similar to game fish indicator results. Stream width, average thalweg depth, maximum depth, and flow appear to be the characteristics that correlate the best with consistently positive game fish indicators. Stream flow and habitat dimensions (where available) were consistently larger for streams with watershed sizes exceeding 275 square miles. Habitat measurements are not available for the largest sample sites that were sampled by boat instead of the typical wading method.

Ranges of stream size, habitat and flow associated with varying levels of game fish indicator responses are listed in Table 2. These are general statewide values, which may assist in decision making related to the recommendation of warm water aquatic life use designations. In general terms, stream segments that have watershed area, flow and habitat characteristics in the green shaded boxes have a greater probability that game fish indicators will be consistently positive (i.e., consistent with Class B(WW-1)), while stream habitat and flow levels that equate to the red boxes are much less likely to support game fish populations (i.e., Class B(WW-2) or Class B(WW-3)). Stream segments that have a mixture of characteristics, mainly in the yellow range, may require consideration of the additional habitat features collected during the field assessment, to determine the appropriate aquatic life use designation.

Table 2. Generalized statewide ranges of stream habitat indicator levels and associated game fish indicator responses.

Game Fish Indicator Responses	Stream Watershed Area (sq.mi.)	Stream Flow (typical base flow - cfs)	Stream Width Average (ft)	Average Depth (ft)	Avg. Thalweg Depth (ft)	Maximum Depth (ft)
Consistently Positive	>275	>30	>65	>1.2	>2.2	>4.4
Mixed	25-275	0.8-30	11-65	0.2-1.2	0.8-2.2	1.8-4.4
Consistently Negative	<25	<0.8	<11	<0.2	<0.8	<1.8

Iowa uses U.S. EPA's Level IV Ecoregions as a template for wadeable stream biological condition assessment. Stream flow and habitat characteristics can vary from ecoregion to ecoregion. To provide additional insight into where the area of overlap exists between Class B(LR/WW-2) and Class B(WW/WW-1) streams, a query of Iowa's bioassessment database produced 476 habitat assessment records from which a summary of habitat characteristics was prepared (Table 3a-f) (see appendix for full spreadsheet). The summary is grouped by ecoregion and **former** designated uses in order to illustrate the extremes and ranges of overlap in habitat characteristics.