

Table 1-1. MKARNS dredging areas by reach, pool, and navigation mile (page 1 of 4).

Reach	Pool	Maintenance Dredge (NM) ¹				Proposed dredge areas (NM)								
		Dnstream	Upstream	River miles	Year dredged	River	DR no. ²	Dnstream	Upstream	River miles	11 ft channel ³	Routine ⁴	12 ft channel ³	Routine ⁴
1	1	-	-	-	-	Arkansas	1	10.3	13.3	3.0	x	x	x	x
1	2	18.8	18.9	0.1	1995	Arkansas	2	13.3	19.0	5.7	x	-	x	-
1	2	23.1	23.7	0.6	1996	Arkansas	3	22.5	23.7	1.2	x	x	x	x
1	2	-	-	-	-	Arkansas	4	27.5	29.0	1.5	x	x	x	x
1	2	-	-	-	-	Arkansas	5	31.0	32.0	1.0	x	-	x	-
1	2	-	-	-	-	Arkansas	6	32.8	33.7	0.9	x	x	x	x
1	2	-	-	-	-	Arkansas	7	36.0	38.2	2.2	x	x	x	x
1	2	-	-	-	-	Arkansas	8	39.8	41.0	1.2	x	x	x	x
1	2	43.0	44.8	1.8	2003 ^{5,6}	Arkansas	9	42.8	45.0	2.2	x	x	x	x
1	2	46.2	46.6	0.4	2003	Arkansas	10	46.0	47.0	1.0	x	x	x	x
1	2	48.3	48.9	0.6	2003	Arkansas	11	48.0	49.0	1.0	x	x	x	x
1	2	49.5	50.0	0.5	2003 ^{5,6}	Arkansas	12	49.5	50.0	0.5	x	x	x	x
1	3	-	-	-	-	Arkansas	13	61.0	62.0	1.0	x	x	x	x
1	3	65.1	65.8	0.7	2003 ^{5,6}	Arkansas	14	65.4	65.9	0.5	x	x	x	x
Reach 1	Miles			4.7						22.9	22.9	16.2	22.9	16.2
	No. of sites			7						-	14	12	14	12
2	4	-	-	-	-	Arkansas	15	79.0	80.0	1.0	x	x	x	x
2	4	85.8	86.2	0.4	2003 ^{5,6}	Arkansas	16	85.8	86.2	0.4	x	x	x	x
2	5	-	-	-	-	Arkansas	17	91.0	92.0	1.0	x	-	x	-
2	5	94.8	95.2	0.4	1998	Arkansas	18	95.0	97.0	2.0	x	x	x	x
2	5	96.2	97.0	0.8	2003									
2	5	-	-	-	-	Arkansas	19	101.0	102.4	1.4	x	x	x	x
2	5	107.6	107.9	0.3	2003 ⁶	Arkansas	20	107.6	107.9	0.3	x	x	x	x
Reach 2	Miles			1.9						6.1	6.1	5.1	6.1	5.1
	No. of sites			4						-	6	5	6	5
3	6	124.8	125.1	0.3	2003	Arkansas	21	124.8	125.1	0.3	x	x	x	x
3	7	-	-	-	-	Arkansas	22	126.6	126.8	0.2	x	-	x	-
3	7	-	-	-	-	Arkansas	23	135.0	135.2	0.2	-	-	x	-
3	7	-	-	-	-	Arkansas	24	137.3	137.4	0.1	-	-	x	-
3	7	-	-	-	-	Arkansas	25	139.8	140.2	0.4	-	-	x	-
3	7	-	-	-	-	Arkansas	26	140.6	140.9	0.3	-	-	x	-
3	7	-	-	-	-	Arkansas	27	141.9	142.1	0.2	-	-	x	-
3	7	-	-	-	-	Arkansas	28	142.2	142.3	0.1	-	-	x	x
3	7	-	-	-	-	Arkansas	29	142.5	143.2	0.7	x	x	x	x
3	7	-	-	-	-	Arkansas	30	143.4	143.4	0.0	-	-	x	x
3	7	-	-	-	-	Arkansas	31	144.0	144.1	0.1	x	x	x	x
3	7	-	-	-	-	Arkansas	32	144.5	144.8	0.3	x	x	x	x
3	7	-	-	-	-	Arkansas	33	145.0	145.5	0.5	x	x	x	x
3	7	-	-	-	-	Arkansas	34	145.5	145.7	0.2	-	-	x	-
3	7	-	-	-	-	Arkansas	35	145.9	146.0	0.1	-	-	x	-
3	7	146.0	146.6	0.6	2002 ⁶	Arkansas	36	146.1	146.3	0.2	x	x	x	x

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Table 1-1. MKARNS dredging areas by reach, pool, and navigation mile (page 2 of 4).

Reach	Pool	Maintenance Dredge (NM) ¹				Proposed dredge areas (NM)								
		Dnstream	Upstream	River miles	Year dredged	River	DR no. ²	Dnstream	Upstream	River miles	11 ft channel ³	Routine ⁴	12 ft channel ³	Routine ⁴
3	7	-	-	-	-	Arkansas	37	146.3	147.1	0.8	x	x	x	x
3	7	-	-	-	-	Arkansas	38	149.1	149.2	0.1	-	-	x	-
3	7	-	-	-	-	Arkansas	39	149.3	149.6	0.3	x	-	x	-
3	7	-	-	-	-	Arkansas	40	149.6	150.1	0.5	x	-	x	-
3	7	-	-	-	-	Arkansas	41	150.4	150.5	0.1	x	-	x	-
3	7	-	-	-	-	Arkansas	42	154.5	154.7	0.2	-	-	x	-
3	7	-	-	-	-	Arkansas	43	155.4	155.5	0.1	x	x	x	x
3	8	-	-	-	-	Arkansas	44	158.4	158.7	0.3	-	-	x	-
3	8	-	-	-	-	Arkansas	45	159.3	159.4	0.1	-	-	x	-
3	8	-	-	-	-	Arkansas	46	160.2	160.6	0.4	-	-	x	-
3	8	-	-	-	-	Arkansas	47	164.4	164.6	0.2	x	-	x	-
3	8	-	-	-	-	Arkansas	48	164.7	165.1	0.4	x	-	x	-
3	8	-	-	-	-	Arkansas	49	165.9	166.0	0.1	-	-	x	-
3	8	-	-	-	-	Arkansas	50	168.4	169.1	0.7	x	-	x	-
3	8	-	-	-	-	Arkansas	51	169.2	169.5	0.3	x	-	x	-
3	8	-	-	-	-	Arkansas	52	174.0	174.3	0.3	x	-	x	-
3	8	175.2	175.5	0.3	1995	Arkansas	53	174.9	175.2	0.3	x	-	x	-
3	8	-	-	-	-	Arkansas	54	176.4	176.5	0.1	-	-	x	x
3	9	-	-	-	-	Arkansas	55	178.7	179.2	0.5	x	-	x	-
3	9	-	-	-	-	Arkansas	56	179.5	179.7	0.2	x	-	x	-
3	9	-	-	-	-	Arkansas	57	180.8	180.9	0.1	x	-	x	-
3	9	-	-	-	-	Arkansas	58	181.6	182.0	0.4	x	-	x	-
3	9	-	-	-	-	Arkansas	59	184.3	184.8	0.5	-	-	x	-
3	9	-	-	-	-	Arkansas	60	184.9	185.3	0.4	x	-	x	-
3	9	-	-	-	-	Arkansas	61	186.1	187.4	1.3	x	x	x	x
3	9	-	-	-	-	Arkansas	62	191.3	192.4	1.1	x	-	x	-
3	9	-	-	-	-	Arkansas	63	199.1	199.8	0.7	x	-	x	-
3	9	205.0	205.3	0.3	1998	Arkansas	64	204.5	205.0	0.5	x	x	x	x
3	10	-	-	-	-	Arkansas	65	205.9	206.5	0.6	x	-	x	-
3	10	-	-	-	-	Arkansas	66	207.0	207.6	0.6	x	-	x	-
Reach 3	Miles			1.5						16.1	12.7	4.8	16.1	6.0
	No. of sites			4						-	29	10	46	13
4	10	222.0	222.3	0.3	2002	Arkansas	67	221.5	221.9	0.4	x	x	x	x
4	10	225.2	225.7	0.5	1995	Arkansas	68	225.2	225.4	0.2	x	x	x	x
4	10	-	-	-	-	Arkansas	69	226.7	226.9	0.2	-	-	x	x
4	10	-	-	-	-	Arkansas	70	228.5	228.8	0.3	x	-	x	-
4	10	-	-	-	-	Arkansas	71	229.5	230.1	0.6	-	-	x	x
4	10	-	-	-	-	Arkansas	72	232.8	233.4	0.6	-	-	x	-
4	10	-	-	-	-	Arkansas	73	233.5	233.9	0.4	-	-	x	-
4	10	-	-	-	-	Arkansas	74	235.9	236.4	0.5	x	-	x	-
4	10	239.0	239.2	0.2	2002	Arkansas	75	237.3	239.1	1.8	x	-	x	-
4	10	240.6	241.2	0.6	2000	Arkansas	76	240.6	240.9	0.3	-	-	x	-

Table 1-1. MKARNS dredging areas by reach, pool, and navigation mile (page 3 of 4).

Reach	Pool	Maintenance Dredge (NM) ¹				Proposed dredge areas (NM)								
		Dnstream	Upstream	River miles	Year dredged	River	DR no. ²	Dnstream	Upstream	River miles	11 ft channel ³	Routine ⁴	12 ft channel ³	Routine ⁴
4	10	-	-	-	-	Arkansas	77	241.0	241.1	0.1	-	-	x	-
4	10	-	-	-	-	Arkansas	78	241.6	242.1	0.5	x	x	x	x
4	10	-	-	-	-	Arkansas	79	249.5	249.9	0.4	x	x	x	x
4	10	-	-	-	-	Arkansas	80	253.7	253.9	0.2	x	-	x	-
4	10	-	-	-	-	Arkansas	81	256.2	256.2	0.0	-	-	x	x
4	12	-	-	-	-	Arkansas	82	271.4	271.9	0.5	x	-	x	-
4	12	-	-	-	-	Arkansas	83	272.0	273.0	1.0	x	-	x	-
4	12	275.0	275.6	0.6	2002 ⁶	Arkansas	84	274.9	275.3	0.4	x	-	x	-
4	12	-	-	-	-	Arkansas	85	275.4	276.0	0.6	x	x	x	x
4	12	-	-	-	-	Arkansas	86	276.5	276.7	0.2	-	-	x	-
4	12	-	-	-	-	Arkansas	87	276.9	277.3	0.4	-	-	x	-
4	12	-	-	-	-	Arkansas	88	277.5	278.4	0.9	x	-	x	-
4	12	-	-	-	-	Arkansas	89	278.7	278.8	0.1	-	-	x	-
4	12	279.5	280.2	0.7	1995	Arkansas	90	279.2	281.0	1.8	x	x	x	x
4	12	280.6	280.9	0.3	2002	Arkansas	91	281.9	282.9	1.0	x	-	x	-
4	12	-	-	-	-	Arkansas	92	283.6	284.5	0.9	x	-	x	-
4	12	-	-	-	-	Arkansas	93	285.2	285.4	0.2	-	-	x	x
4	12	-	-	-	-	Arkansas	94	289.0	289.4	0.4	x	-	x	-
4	12	-	-	-	-	Arkansas	95	291.8	292.4	0.6	x	x	x	x
Reach 4	Miles			3.2						15.5	12.4	4.5	15.5	5.5
	No. of sites			7						-	18	7	29	11
Arkansas	Miles			11.3						60.6	54.1	30.6	60.6	32.8
	No. of sites			22						-	67	34	95	41
5	13	0	0.3	0.3	1995	Poteau	96	0.0	0.4	0.4	x	-	x	-
5	13	-	-	-	-	Poteau	97	1.2	2.0	0.8	x	-	x	-
5	13	311.5	312.0	0.5	1995	Arkansas	98	311.3	312.6	1.3	x	-	x	-
5	13	-	-	-	-	Arkansas	99	314.2	315.4	1.2	x	-	x	-
5	13	-	-	-	-	Arkansas	100	315.4	317.4	2.0	x	-	x	-
5	13	319.0	319.0	0.0	1999	Arkansas	101	317.4	319.5	2.1	x	-	x	-
5	14	-	-	-	-	Arkansas	102	334.0	336.1	2.1	x	-	x	-
5	15	-	-	-	-	Arkansas	103	337.7	338.8	1.1	x	-	x	-
5	15	-	-	-	-	SM Cove	104	0.0	0.5	0.5	x	-	x	-
5	15	-	-	-	-	Alt. channel	105	0.0	0.3	0.3	x	-	x	-
5	15	-	-	-	-	Alt. channel	106	3.5	4.9	1.4	x	-	x	-
5	15	-	-	-	-	San Bois Creek	107	0.0	1.3	1.3	x	-	x	-
5	15	-	-	-	-	San Bois Creek	108	4.0	8.2	4.2	x	-	x	-
5	15	-	-	-	-	Arkansas	109	342.3	344.5	2.2	x	-	x	-
5	15	-	-	-	-	Sallisaw Creek	110	344.5	345.0	0.5	x	-	x	-
5	15	-	-	-	-	Arkansas	111	346.5	347.4	0.9	x	-	x	-
5	15	-	-	-	-	Arkansas	112	347.8	349.4	1.6	x	-	x	-
5	15	-	-	-	-	Arkansas	113	355.4	356.4	1.0	x	-	x	-

Table 1-1. MKARNS dredging areas by reach, pool, and navigation mile (page 4 of 4).

Reach	Pool	Maintenance Dredge (NM) ¹				Proposed dredge areas (NM)								
		Dnstream	Upstream	River miles	Year dredged	River	DR no. ²	Dnstream	Upstream	River miles	11 ft channel ³	Routine ⁴	12 ft channel ³	Routine ⁴
5	15	-	-	-	-	Arkansas	114	361.2	363.3	2.1	x	-	x	-
5	15	-	-	-	-	Arkansas	115	363.9	366.5	2.6	x	-	x	-
5	16	-	-	-	-	Arkansas	116	366.6	367.6	1.0	x	-	x	-
5	16	-	-	-	-	Arkansas	117	374.0	375.3	1.3	x	-	x	-
5	16	-	-	-	-	Arkansas	118	379.1	379.9	0.8	x	-	x	-
5	16	-	-	-	-	Arkansas	119	380.3	381.8	1.5	x	-	x	-
5	16	-	-	-	-	Boudinot	120	0.0	0.2	0.2	x	-	x	-
5	16	-	-	-	-	Arkansas	121	382.9	384.4	1.5	x	-	x	-
5	16	-	-	-	-	Arkansas	122	389.2	391.5	2.3	x	-	x	-
5	16	393.0	393.0	0.0	1999	Arkansas	123	391.5	393.4	1.9	x	-	x	-
Reach 5	Miles			0.8						40.1	40.1	0	40.1	0
	No. of sites			4						-	30	0	30	0
6	16	394.0	395.0	1.0	2002	Arkansas	124	394.0	395.2	1.2	x	-	x	-
6	16	-	-	-	-	Verdigris	125	395.2	398.0	2.8	x	-	x	-
6	16	-	-	-	-	Verdigris	126	398.0	400.3	2.3	x	-	x	-
6	16	400.0	400.6	0.6	1999	Verdigris	127	400.3	401.5	1.2	x	-	x	-
6	17	402.7	403.0	0.3	1996	Verdigris	128	401.6	403.3	1.7	x	-	x	-
6	17	-	-	-	-	Verdigris	129	407.4	407.9	0.5	x	-	x	-
6	17	-	-	-	-	Verdigris	130	414.1	414.5	0.4	x	-	x	-
6	17	-	-	-	-	Verdigris	131	416.3	416.7	0.4	x	-	x	-
6	17	-	-	-	-	Verdigris	132	418.4	420.0	1.6	x	-	x	-
6	17	421.0	421.6	0.6	2002	Verdigris	133	420.0	421.5	1.5	x	-	x	-
6	18	-	-	-	-	Verdigris	134	421.7	422.3	0.6	x	-	x	-
6	18	-	-	-	-	Verdigris	135	427.5	427.9	0.4	x	-	x	-
6	18	-	-	-	-	Verdigris	136	428.9	429.7	0.8	x	-	x	-
6	18	-	-	-	-	Verdigris	137	433.4	434.5	1.1	x	-	x	-
6	18	-	-	-	-	Verdigris	138	436.0	436.8	0.8	x	-	x	-
6	18	-	-	-	-	Verdigris	139	440.0	441.6	1.6	x	-	x	-
6	18	-	-	-	-	Verdigris	140	441.6	443.3	1.7	x	-	x	-
6	18	444.6	445.1	0.5	1995	Verdigris	141	443.3	445.0	1.7	x	-	x	-
Reach 6	Miles			3.0						22.3	22.3	0	22.3	0
	No. of sites			5						-	18	0	18	0
Oklahoma	Miles			3.8						62.4	62.4	0.0	62.4	0.0
	No. of sites			9						-	48	0	48	0
MKARNS	Miles			15.1						123.0	116.5	30.6	123.0	32.8
	No. of sites			31						-	113	34	141	41

¹Modified from Draft EIS Table 4-7

²Dredge areas labeled downstream to upstream for purposes of discussion

³Modified from table provided by Little Rock District, working draft, subject to review and revisions (April 15, 2004)

⁴Modified from table provided by Little Rock District, working draft, subject to review and revisions (May 26, 2004)

⁵Dredged >5x between 1995 and 2003

⁶Dredged >2x between 2000 and 2003

Table 1-2. Disposal sites in the MKARNS by reach, pool, and navigation mile (page 1 of 4).

Reach	Pool	DI no. ¹	Permitted	Proposed	Bank ²	Navigation mile		Distance (NM)
						Dnstream	Upstream	
1	2	1	x		LDB	-1.0	19.0	1.0
1	2	2	x		LDB	23.0	23.4	0.4
1	2	3	x		LDB	23.4	24.0	0.6
1	2	4	x		RDB	23.4	23.8	0.4
1	2	5		x	LDB	24.0	25.0	1.0
1	2	6	x		LDB	26.9	27.4	0.5
1	2	7	x		LDB	27.8	28.3	0.5
1	2	8	x		RDB	27.5	29.0	1.5
1	2	9	x		RDB	31.8	32.6	0.8
1	2	10	x		LDB	31.9	32.8	0.9
1	2	11	x		RDB	35.3	36.6	1.3
1	2	12	x		RDB	36.5	37.1	0.6
1	2	13	x		LDB	37.7	38.3	0.6
1	2	14	x		LDB	38.8	39.1	0.3
1	2	15	x		RDB	38.8	39.5	0.7
1	2	16	x		LDB	39.8	40.0	0.2
1	2	17	x		LDB	42.2	42.8	0.6
1	2	18	x		RDB	42.6	43.0	0.4
1	2	19	x		LDB	43.5	44.2	0.7
1	2	20	x		RDB	44.0	44.6	0.6
1	2	21	x		LDB	45.3	46.0	0.7
1	2	22	x		RDB	45.5	47.5	2.0
1	2	23	x		RDB	45.9	47.4	1.5
1	2	24	x		LDB	46.7	49.2	2.5
1	2	25	x		RDB	48.7	50.2	1.5
1	3	26	x		RDB	55.0	56.5	1.5
1	3	27	x		LDB	55.1	56.2	1.1
1	3	28	x		LDB	61.0	62.1	1.1
1	3	29	x		RDB	64.1	64.9	0.8
1	3	30	x		LDB	64.9	65.3	0.4
1	3	31	x		Channel	65.3	65.6	0.3
1	4	32	x		LDB	69.2	70.1	0.9
1	4	33	x		RDB	71.1	71.2	0.1
Reach 1		Miles						28.0
		No. of sites	32	1				33
2	4	34		x	LDB	79.0	79.8	0.8
2	4	35	x		RDB	85.4	85.7	0.3
2	4	36	x		Channel	85.5	85.8	0.3
2	5	37		x	RDB	91.3	91.7	0.4
2	5	38	x		LDB	95.2	96.3	1.1
2	5	39	x		LDB	101.5	103.8	2.3
2	5	40	x		LDB	106.5	107.7	1.2
Reach 2		Miles						6.4
		No. of sites	5	2				7

Table 1-2. Disposal sites in the MKARNS by reach, pool, and navigation mile (page 2 of 4).

Reach	Pool	DI no. ¹	Permitted	Proposed	Bank ²	Navigation mile		Distance (NM)
						Dnstream	Upstream	
3	6	41	x		RDB	122.7	123.3	0.6
3	6	42	x		LDB	124.1	124.5	0.4
3	6	43	x		Channel	124.3	125.0	0.7
3	7	44	x		LDB	126.5	126.8	0.3
3	7	45	x		RDB	126.5	127.9	1.4
3	7	46	x		RDB	128.0	129.0	1.0
3	7	47	x		LDB	129.9	130.0	0.1
3	7	48	x		LDB	130.3	130.5	0.2
3	7	49	x		LDB	130.8	131.2	0.4
3	7	50	x		LDB	133.7	135.1	1.4
3	7	51	x		RDB	135.0	139.0	4.0
3	7	52	x		LDB	137.4	139.5	2.1
3	7	53	x		RDB	139.7	140.1	0.4
3	7	54	x		RDB	140.1	141.0	0.9
3	7	55	x		RDB	141.5	142.6	1.1
3	7	56	x		RDB	146.0	146.7	0.7
3	7	57	x		LDB	146.5	147.6	1.1
3	7	58	x		RDB	146.7	147.8	1.1
3	7	59	x		LDB	147.7	151.7	4.0
3	7	60	x		RDB	148.4	150.0	1.6
3	7	61	x		RDB	151.6	155.6	4.0
3	8	62		x	RDB	158.9	159.2	0.3
3	8	63	x		LDB	164.1	164.9	0.8
3	8	64	x		RDB	165.4	166.2	0.8
3	8	65	x		LDB	165.9	167.0	1.1
3	8	66	x		LDB	168.7	169.5	0.8
3	8	67	x		RDB	169.1	169.9	0.8
3	8	68	x		LDB	169.7	172.0	2.3
3	8	69	x		RDB	171.5	172.0	0.5
3	8	70	x		RDB	174.0	176.6	2.6
3	8	71	x		LDB	176.0	176.5	0.5
3	9	72	x		RDB	180.4	181.3	0.9
3	9	73	x		RDB	181.8	184.9	3.1
3	9	74	x		LDB	185.9	186.5	0.6
3	9	75	x		RDB	186.9	189.9	3.0
3	9	76	x		LDB	189.0	190.5	1.5
3	9	77	x		LDB	193.6	195.0	1.4
3	9	78	x		LDB	200.0	202.0	2.0
3	9	79	x		RDB	203.7	205.4	1.7
3	10	80		x	RDB	206.4	207.0	0.6
Reach 3	Miles							52.8
	No. of sites		38	2				40
4	10	81	x		LDB	232.4	233.4	1.0
4	10	82	x		RDB	235.0	236.9	1.9
4	10	83	x		LDB	238.5	239.9	1.4

Table 1-2. Disposal sites in the MKARNS by reach, pool, and navigation mile (page 3 of 4).

Reach	Pool	DI no. ¹	Permitted	Proposed	Bank ²	Navigation mile		Distance (NM)
						Dnstream	Upstream	
4	10	84	x		LDB	240.9	241.4	0.5
4	10	85	x		RDB	241.7	242.4	0.7
4	10	86	x		LDB	242.0	242.7	0.7
4	10	87	x		RDB	243.5	244.5	1.0
4	10	88	x		LDB	243.7	246.3	2.6
4	10	89	x		RDB	246.9	248.7	1.8
4	10	90	x		RDB	255.8	256.1	0.3
4	10	91	x		LDB	256.0	256.2	0.2
4	12	92	x		LDB	274.7	276.0	1.3
4	12	93	x		RDB	275.8	276.4	0.6
4	12	94	x		RDB	276.7	277.5	0.8
4	12	95	x		RDB	279.0	280.1	1.1
4	12	96	x		LDB	279.0	280.4	1.4
4	12	97	x		LDB	281.9	283.4	1.5
4	12	98	x		RDB	282.0	283.3	1.3
4	12	99	x		RDB	284.3	287.4	3.1
4	12	100	x		LDB	285.6	286.0	0.4
4	12	101	x		LDB	288.4	289.0	0.6
4	12	102	x		RDB	290.4	291.5	1.1
4	12	103	x		LDB	291.9	292.2	0.3
4	13	104	x		LDB	296.6	297.3	0.7
4	13	105	x		RDB	297.5	297.9	0.4
4	13	106	x		RDB	299.4	299.8	0.4
4	13	107	x		LDB	302.5	303.0	0.5
4	13	108	x		RDB	306.3	306.7	0.4
4	13	109	x		LDB	306.5	307.4	0.9
Reach 4		Miles						28.9
		No. of sites	30	1				29
Arkansas		Miles						116.1
		No. of sites	105	6				109.0
5	13	110	x		RDB	308.9	309.2	0.3
5	14	111	x		LDB	319.6	320.8	1.2
5	14	112	x		LDB	321.4	322.9	1.5
5	14	113	x		RDB	322.0	324.4	2.4
5	14	114	x		RDB	323.4	324.4	1.0
5	15	115		x	LDB	336.2	336.4	0.2
5	15	116		x	RDB	336.4	336.5	0.1
5	SBC	117		x	LDB	0.2	1.0	0.8
5	SBC	118	x		LDB	2.0	2.6	0.6
5	SBC	119		x	LDB	4.6	5.4	0.8
5	SBC	120		x	RDB	5.7	6.0	0.3
5	SBC	121	x		LDB	6.4	6.7	0.3
5	SBC	122		x	LDB	6.7	6.9	0.2
5	SBC	123	x		LDB	7.2	7.4	0.2
5	15	124	x		LDB	348.4	348.8	0.4

Table 1-2. Disposal sites in the MKARNS by reach, pool, and navigation mile (page 4 of 4).

Reach	Pool	DI no. ¹	Permitted	Proposed	Bank ²	Navigation mile		Distance (NM)
						Dnstream	Upstream	
5	15	125		x	LDB	348.4	348.8	0.4
5	15	126		x	LDB	348.5	348.6	0.1
5	15	127		x	LDB	348.4	348.9	0.5
5	15	128		x	LDB	348.9	349.1	0.2
5	15	129		x	LDB	349.0	349.3	0.3
5	15	130	x		LDB	349.5	349.8	0.3
5	15	131	x		RDB	351.0	351.4	0.4
5	15	132	x		LDB	353.1	354.2	1.1
5	15	133	x		RDB	354.1	356.5	2.4
5	16	134		x	RDB	367.1	367.4	0.3
5	16	135	x		LDB	393.3	393.8	0.5
Reach 5	Miles							16.8
	No. of sites		15	13				26
Reach 6	Miles							0
	No. of sites		0	0				0
Oklahoma	Miles							16.8
	No. of sites		15	13				26
Total	Miles							132.9
	No. of sites		120	19				135

¹Disposal areas labeled downstream to upstream for purposes of discussion

²LDB=left descending bank; RDB=right descending bank

Table 1-3. Species historically recorded from the Arkansas River drainage (page 1 of 2).

Species ¹	AR ²	OK ³	Arkansas River			Verdigris River ⁶			Total MKARNS
			Pool 10 ⁴	Pool 12 ⁵	Total	Pool 17	Pool 18	Total	
			Dardenell	Ozark		Chouteau	N. Graham		
<i>Actinonaias ligamentina</i>	x	x	-	-	-	-	-	-	-
<i>Alasmidonta marginata</i>	x	x	-	-	-	-	-	-	-
<i>Amblema plicata</i>	x	x	3	1	4	7	159	166	170
<i>Anodonta suborbiculata</i>	x	-	6	5	11	-	-	-	11
<i>Arcidens confragosus</i>	x	x	6	5	11	-	-	-	11
<i>Cyprogenia aberti</i> (OK II)	x	x	-	-	-	-	-	5	-
<i>Ellipsaria lineolata</i>	x	x	-	-	-	-	8	8	8
<i>Elliptio complanata</i>	-	x	-	-	-	-	-	-	-
<i>Elliptio dilatata</i>	x	x	-	-	-	-	-	-	-
<i>Fusconaia ebena</i>	x	-	-	-	-	-	-	-	-
<i>Fusconaia flava</i>	x	x	7	-	7	-	9	9	16
<i>Lampsilis abrupta</i> (FE)	x	-	-	-	-	-	-	-	-
<i>Lampsilis cardium</i>	x	x	-	-	-	4	-	4	4
<i>Lampsilis hydiana</i>	x	x	-	-	-	-	-	-	-
<i>Lampsilis rafinesqueana</i> (FC)	-	x	-	-	-	-	-	-	-
<i>Lampsilis saturata</i>	-	-	D	-	D	-	-	-	D
<i>Lampsilis siliquoidea</i>	x	x	-	-	-	-	-	-	-
<i>Lampsilis teres</i>	x	x	1	-	1	9	3	12	13
<i>Lasmigona complanata</i>	x	x	1	1	2	-	-	-	2
<i>Lasmigona costata</i>	x	x	-	-	-	-	-	-	-
<i>Leptodea fragilis</i>	x	x	9	1	10	8	-	8	18
<i>Ligumia recta</i>	x	x	-	-	-	-	-	-	-
<i>Ligumia subrostrata</i>	-	x	-	-	-	-	-	-	-
<i>Megaloniaias nervosa</i>	x	x	2	-	2	2	15	17	19
<i>Obliquaria reflexa</i>	x	x	61	21	82	12	9	21	103
<i>Obovaria jacksoniana</i>	x	x	-	-	-	-	-	-	-
<i>Obovaria olivaria</i>	x	-	-	-	-	-	-	-	-
<i>Plectomerus dombeyanus</i>	x	-	477	-	477	-	-	-	477
<i>Pleurobema cordatum</i>	x	x	-	-	-	-	-	-	-
<i>Pleurobema rubrum</i>	-	x	-	-	-	7	178	185	185
<i>Pleurobema sintoxia</i>	-	x	-	-	-	-	135	135	135
<i>Potamilus alatus</i>	-	x	-	-	-	-	-	-	-
<i>Potamilus capax</i> (FE) ⁷	-	x	-	-	-	-	-	-	-
<i>Potamilus ohioensis</i>	x	x	7	6	13	-	-	-	13
<i>Potamilus purpuratus</i>	x	x	-	-	-	2	-	2	2
<i>Ptychobranchus occidentalis</i>	-	x	-	-	-	-	5	5	5
<i>Pyganodon grandis</i>	x	x	23	38	61	-	-	-	61

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Table 1-3. Species historically recorded from the Arkansas River drainage (page 2 of 2).

Species ¹	AR ²	OK ³	Arkansas River			Verdigris River ⁶			Total MKARNS
			Pool 10 ⁴ Dardenell	Pool 12 ⁵ Ozark	Total	Pool 17 Chouteau	Pool 18 N. Graham	Total	
<i>Quadrula cylindrica</i> (OK II)	x	x	-	-	-	-	-	-	-
<i>Quadrula nobilis (aspera)</i>	-	x	-	-	-	12	-	12	12
<i>Quadrula metanevra</i>	x	x	-	-	-	-	15	15	15
<i>Quadrula nodulata</i>	x	x	-	-	-	-	-	-	-
<i>Quadrula p. pustulosa</i>	x	x	20	-	20	12	5	17	37
<i>Quadrula quadrula</i>	x	x	395	54	449	-	-	-	449
<i>Strophitus undulatus</i>	-	x	-	-	-	-	-	-	-
<i>Toxolasma lividus</i>	-	x	-	2	2	-	-	-	2
<i>Toxolasma parvus</i>	-	x	-	-	-	-	-	-	-
<i>Tritigonia verrucosa</i>	x	x	-	-	-	-	4	4	4
<i>Truncilla donaciformis</i>	-	x	-	-	-	12	-	12	12
<i>Truncilla truncata</i>	x	x	-	-	-	38	-	38	38
<i>Uniomerus tetralasmus</i>	x	x	-	-	-	-	-	-	-
<i>Utterbackia imbecillis</i>	x	x	D	-	D	-	-	-	D
<i>Villosa arkansasensis</i>	-	x	-	-	-	-	-	-	-
<i>Villosa iris</i>	-	x	-	-	-	-	-	-	-
<i>Villosa lienosa</i>	-	x	-	-	-	-	-	-	-
Total			1018	134	1152	125	545	675	1827
No. species = 54	37	48	14	10	15	12	12	19	26

¹Nomenclature follows Turgeon *et al.* (1998), except *Q. aspera (=nobilis)* follows Watters (OSU, pers. comm. 2004)

FE=federally endangered (USFWS, 2004a), FC=federal candidate (USFWS, 2004b), OK II=Oklahoma category II (ODWC, 2005)

²Arkansas (Gordon, 1982, 1983-1984-White River site below Newport included; Harris and Gordon, 1986); Harris (pers. comm 2005)

³Oklahoma (Branson, 1982, 1983, 1984; Shepard and Covich, 1982; Vaughan and Spooner, 2004)

⁴Pool 10 (Harris, 1992; Davidson, 1997-Lake Dardenelle)

⁵Pool 12 (Davidson, 1997-Ozark Lake)

⁶Verdigris River (Isley, 1925)

⁷Verdigris River record may be in error (USFWS, 1989)

D = dead shell

Table 2-1. Unionid sample sites in the MKARNS, 2004 (page 1 of 2).

Site no.	Reach	Pool	Navigation Mile		Miles Sampled	No. of samples	Proposed		Existing		Historic Bed/Patch
			Dnstream	Upstream			Dredge 11ft/12ft	Disposal	Maint. dredge	Permitted disposal	
1	1	Open reach	8.0	10.0	2.0	26	-	-	-	-	-
2	1	Pool 1 (Nordell)/Pool 2	11.0	19.0	8.0	49	2/2	-	1	-	-
3	1	Pool 2	-1.0	19.0	1.0	3	-	-	-	1	-
4	1	Pool 2	23.0	24.0	1.0	34	1/1	-	1	3	-
5	1	Pool 2	30.0	32.5	2.5	23	1/1	-	-	2	-
6	1	Pool 2	35.0	40.0	5.0	33	2/2	-	-	6	-
7	1	Pool 2	44.0	50.0	6.0	34	4/4	-	4	7	-
Total	Reach 1				25.5	202	10/10	0	6	19	0
8	2	Pool 5	100.8	104.0	3.2	12	1/1	-	-	1	-
9	2	Pool 5	107.0	107.6	0.6	6	1/1	-	-	1	-
Total	Reach 2				3.8	18	2/2	0	0	2	0
11	3	Pool 7 (Murray)	126.5	127.0	0.5	20	1/1	-	-	2	-
12	3	Pool 7 (Murray)	134.2	134.8	0.6	20	-	-	-	1	-
13	3	Pool 7 (Murray)	139.9	148.0	8.1	68	6/13	-	1	7	-
14	3	Pool 7 (Murray)	152.5	155.5	3.0	21	1/2	-	-	1	-
15	3	Pool 8 (Toad Suck Ferry)	164.0	165.3	1.3	13	2/2	-	-	1	-
16	3	Pool 8 (Toad Suck Ferry)	174.0	176.0	2.0	20	2/2	-	1	1	-
18	3	Pool 9 (Ormond)	181.5	185.5	4.0	19	2/3	-	-	1	-
22	3	Pool 10 (Dardenelle)	206.5	208.0	1.5	34	1/1	1	-	-	1
Total	Reach 3				21.0	215	15/24	1	2	14	1
23	4	Pool 10 (Dardenelle)	225.0	231.0	6.0	49	2/4	-	1	-	1
26	4	Pool 12 (Ozark)	269.5	273.0	3.5	24	2/2	-	-	-	2
27	4	Pool 12 (Ozark)	281.0	284.1	3.1	22	2/2	-	1	2	-
28	4	Pool 12 (Ozark)	289.9	292.1	2.2	17	1/1	-	-	2	-
Total	Reach 4				14.8	112	7/9	0	2	4	3

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Table 2-1. Unionid sample sites in the MKARNS, 2004 (page 2 of 2).

Site no.	Reach	Pool	Navigation Mile		Miles Sampled	No. of samples	Proposed		Existing		Historic Bed/Patch
			Dnstream	Upstream			Dredge 11ft/12ft	Disposal	Maint. dredge	Permitted disposal	
30	5	Poteau River	0.0	2.0	2.0	57	2/2	-	1	-	-
31	5	Pool 13 (Trimble)	314.0	319.5	5.5	26	3/3	-	1	-	-
32	5	Pool 14 (Mayo)	334.0	335.5	1.5	19	1/1	-	-	-	-
33	5	Pool 15 (Kerr)	336.4	336.5	0.1	23	-	2	-	-	-
34	5	Pool 15 (Kerr)	337.5	339.0	1.5	14	3/3	-	-	-	-
35	5	Sans Bois Creek/Alt. channel	0.0	8.0	8.0	95	3/3	4	-	3	-
36	5	Pool 15 (Kerr)	341.5	345.0	3.5	40	2/2	-	-	-	-
37	5	Pool 15 (Kerr)	348.0	349.5	1.5	17	1/1	5	-	2	-
38	5	Pool 15 (Kerr)	354.0	357.5	3.5	17	1/1	-	-	2	-
39	5	Pool 15 (Kerr)	363.0	366.0	3.0	47	1/1	-	-	-	-
40	5	Pool 16 (Webbers Falls)	366.5	367.8	1.3	16	1/1	1	-	-	-
41	5	Pool 16 (Webbers Falls)	373.0	374.0	1.0	10	-	-	-	-	-
42	5	Oxbow	379.0	380.0	1.0	15	-	-	-	-	-
43	5	Pool 16 (Webbers Falls)	379.0	380.0	1.0	6	1/1	-	-	-	-
44	5	Pool 16 (Webbers Falls)	388.0	391.5	3.5	5	1/1	-	-	-	-
Total	Reach 5				37.9	407	20/20	12	2	7	0
45	6	Pool 16 (Webbers Falls)	394.5	401.5	7.0	42	4/4	-	2	-	-
46	6	Pool 17 (Choteau)	402.0	403.5	1.5	17	1/1	-	1	-	-
47	6	Pool 17 (Choteau)	411.5	421.0	9.5	72	4/4	-	1	-	1
48	6	Pool 18 (Graham)	427.0	427.5	0.5	8	1/1	-	-	-	-
49	6	Pool 18 (Graham)	433.0	437.0	4.0	53	2/2	-	-	-	1
50	6	Pool 18 (Graham)	440.0	445.0	5.0	35	3/3	-	1	-	-
Total	Reach 6				27.5	227	15/15	0	5	0	2
51	NA	Above navigation	0.0	1.0	1.0	21	0	0	0	0	0
Total					129.9	1202	69/82	13	17	46	6

Table 2-2. Habitats of channel modification¹ and unaffected areas within and between sites, MKARNS, 2004 (page 1 of 3).

Habitat type	Within sites						Between sites				
	Dredge		Disposal		Not affected	Total	Dredge		Disposal		Total
	Maint.	Prop.	Perm.	Prop.			Maint.	Prop.	Perm.	Prop.	
<u>Reach 1 (NM 0.0-75.2)</u>											
Channel	4	7	-	-	2	13	-	2	-	-	2
Cove	-	-	-	-	-	-	-	-	-	-	-
Inside bend	-	-	8	-	3	11	-	-	5	-	5
Island	-	-	2	-	4	6	-	-	-	-	-
Outside bend	-	-	6	-	8	14	-	1	3	-	4
Oxbow	-	-	-	-	-	-	-	-	1	-	1
Peninsula	-	-	-	-	-	-	-	-	-	-	-
Straight	1	2	2	-	8	13	-	-	3	1	4
Tailwater	1	1	-	-	1	3	1	1	1	-	3
Tributary	-	-	1	-	2	3	-	-	-	-	-
Reach 1 total	6	10	19	0	28	63	1	4	13	1	19
<u>Reach 2 (NM 75.2-119.5)</u>											
Channel	-	1	-	-	2	3	2	3	-	1	6
Cove	-	-	-	-	-	-	-	-	-	-	-
Inside bend	-	-	-	-	1	1	-	-	1	1	2
Island	-	-	1	-	1	2	-	-	-	-	-
Outside bend	-	-	-	-	-	-	-	-	-	-	-
Oxbow	-	-	-	-	-	-	-	-	-	-	-
Peninsula	-	-	-	-	-	-	-	-	-	-	-
Straight	-	-	-	-	-	-	-	-	-	-	-
Tailwater	1	1	1	-	1	4	1	1	2	-	4
Tributary	-	-	-	-	-	-	-	-	-	-	-
Reach 2 total	1	2	2	0	5	10	3	4	3	2	12

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Table 2-2. Habitats of channel modification¹ and unaffected areas within and between sites, MKARNS, 2004 (Page 2 of 3).

Habitat type	Within sites						Between sites				
	Dredge		Disposal		Not affected	Total	Dredge		Disposal		Total
	Maint.	Prop.	Perm.	Prop.			Maint.	Prop.	Perm.	Prop.	
<u>Reach 3 (NM 199.5-220.3)</u>											
Channel	1	18	-	-	3	22	-	16	-	-	16
Cove	-	-	-	-	-	-	-	-	-	-	-
Inside bend	1	3	8	-	2	14	-	-	4	1	5
Island	-	-	1	-	1	2	-	-	5	-	5
Outside bend	-	1	1	-	5	7	-	1	2	-	3
Oxbow	-	-	-	-	-	-	-	-	-	-	-
Peninsula	-	-	1	-	-	1	-	-	-	-	0
Straight	-	2	3	1	5	11	-	1	9	-	10
Tailwater	-	-	-	-	-	-	1	2	4	-	7
Tributary	-	-	-	-	2	2	-	-	-	-	-
Reach 3 total	2	24	14	1	18	59	1	20	24	1	46
<u>Reach 4 (NM 220.3-308.7)</u>											
Channel	2	5	-	-	4	11	5	18	-	-	23
Cove	-	-	-	-	-	-	-	-	-	-	-
Inside bend	-	-	2	-	3	5	-	-	12	-	12
Island	-	-	-	-	7	7	-	-	-	-	-
Outside bend	-	-	2	-	4	6	-	1	5	-	6
Oxbow	-	-	-	-	-	-	-	-	-	-	-
Peninsula	-	-	-	-	-	-	-	-	-	-	-
Straight	-	3	-	-	6	9	-	-	7	-	7
Tailwater	-	1	-	-	-	1	-	1	1	-	2
Tributary	-	-	-	-	3	3	-	-	-	-	-
Reach 4 total	2	9	4	0	27	42	5	20	25	0	50

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Table 2-2. Habitats of channel modification¹ and unaffected areas within and between sites, MKARNS, 2004 (Page 3 of 3).

Habitat type	Within sites						Between sites				
	Dredge		Disposal		Not affected	Total	Dredge		Disposal		Total
	Maint.	Prop.	Perm.	Prop.			Maint.	Prop.	Perm.	Prop.	
<u>Reach 5 (NM 308.7-394.0)</u>											
Channel	-	12	-	-	6	18	1	6	-	-	7
Cove	-	1	-	5	11	17	-	1	1	-	2
Inside bend	-	-	2	-	5	7	-	-	1	-	1
Island	-	-	2	5	10	17	-	-	-	-	-
Outside bend	1	3	1	1	5	11	1	1	1	-	3
Oxbow	-	-	-	-	1	1	-	-	-	-	-
Peninsula	-	1	-	-	3	4	-	-	-	-	-
Straight	-	-	2	1	1	4	-	-	3	-	3
Tailwater	-	1	-	-	2	3	-	-	-	-	-
Tributary	1	2	-	-	2	5	-	-	-	-	-
Total	2	20	7	12	46	87	2	8	6	0	16
<u>Reach 6 (NM 394.0-445.2)</u>											
Channel	3	11	-	-	5	19	-	1	-	-	1
Cove	-	-	-	-	-	-	-	-	-	-	-
Inside bend	-	1	-	-	8	9	-	1	-	-	1
Island	-	-	-	-	-	-	-	-	-	-	-
Outside bend	-	1	-	-	9	10	-	-	-	-	-
Oxbow	-	-	-	-	3	3	-	-	-	-	-
Peninsula	-	-	-	-	-	-	-	-	-	-	-
Straight	1	1	-	-	13	15	-	1	-	-	1
Tailwater	1	1	-	-	-	2	-	-	-	-	-
Tributary	-	-	-	-	1	1	-	-	-	-	-
Total	5	15	0	0	39	59	0	3	0	0	3

¹Maint. = maintenance dredge areas (see Table 1-1), Prop. = proposed, Perm. = permitted

Table 2-3. Characteristics used in defining unionid beds and patches in the MKARNS, 2004 (page 1 of 2).

Reach	Name	No. samples	CPU ¹	Species	% of species w/juvs	Length (m)	Width (m)	Area (m ²)	Ave. Depth (m)	Comments
1	P1-1	3	5.7	5	40.0	50	150	7500	7.6	
1	P4-1	3	4.3	6	33.3	55	20	1100	3.1	
1	P4-2	2	3.5	3	0.0	15	30	450	--	
1	P5-1	3	7.7	4	0.0	140	80	11200	0.9	
1	P5-2	9	8.9	8	12.5	150	55	8250	1.4	
1	P6-1	4	16.3	7	14.3	35	35	1225	0.9	
1	P6-2	3	8.3	7	14.3	260	130	33800	3.3	
1	P6-3	2	5.5	3	0.0	260	35	9100	0.9	
1	P7-1	4	15.0	8	14.3	50	25	1250	2.1	
1	P7-2	4	16.0	6	33.3	60	45	2700	3.7	
2	P8-1	4	3.3	2	50.0	60	55	3300	2.9	
3	P12-1	8	6.8	9	22.2	85	80	6800	0.9	
3	P12-2	3	4.0	6	50.0	15	5	75	1.8	
3	P12-3	3	5.3	3	0.0	60	35	2100	--	
3	P12-4	1	15.0	3	66.7	20	20	400	1.8	
3	P12-5	1	14.0	4	50.0	25	20	500	--	
3	P12-6	1	11.0	7	57.1	30	20	600	--	
3	P13-1	5	7.6	4	0.0	500	165	82500	1.1	Three patches found within this area
3	P13-2	6	31.0	8	37.5	450	60	27000	1.3	
4	P26-1	3	5.7	5	40.0	285	60	17100	4.1	
4	P26-2	3	7.3	3	33.3	260	75	19500	3.9	
5	P30-1	6	4.5	6	66.7	70	15	1050	0.9	
5	P31-1	4	9.3	2	0.0	345	55	18975	0.9	
5	P32-1	5	5.4	7	42.9	60	30	1800	1.7	
5	P35-1	9	7.0	9	33.3	450	65	29250	1.3	
5	P35-2	2	11.0	5	20.0	40	30	1200	1.7	
5	P35-3	7	3.7	6	50.0	280	60	16800	1.1	
5	P35-4	6	8.2	8	12.5	20	15	300	1.6	
5	P35-5	3	5.7	3	0.0	95	25	2375	1.1	
5	P35-6	2	4.5	3	0.0	100	30	3000	0.6	
5	P35-7	2	4.5	3	0.0	50	20	1000	0.9	
5	P36-1	3	13.3	4	0.0	155	75	11625	3.0	
5	P39-1	3	5.3	6	33.3	80	30	2400	3.8	
5	P39-2	3	4.3	4	50.0	60	35	2100	2.3	

Table 2-3. Characteristics used in defining unionid beds and patches in the MKARNS, 2004 (page 2 of 2).

Reach	Name	No. samples	CPU ¹	Species	% of species w/juvs	Length (m)	Width (m)	Area (m ²)	Ave. Depth (m)	Comments
5	P39-3	3	9.3	5	20.0	55	25	1375	3.0	
5	P39-4	3	15.0	4	50.0	55	25	1375	1.5	
5	P39-5	2	6.0	6	16.7	10	10	100	2.5	
5	P39-6	3	3.0	2	100.0	160	40	6400	1.1	
6	P49-1	3	8.3	3	0.0	155	10	1550	4.6	
6	P49-2	4	5.0	5	40.0	125	15	1875	3.9	
6	P50-1	5	6.2	7	28.6	185	20	3700	2.1	
Average		3.7 ^A	8.3 ^A	5.1 ^A	27.6 ^A	132.1	44.6	8407 ^A	2.2 ^A	
Minimum		1	3.0	2	0	10	5	75	0.6	
Maximum		9	31.0	9	100	500	165	82500	7.6	
1	B1-1	11	35.5	14	42.9	60	15	900	10.7	Only small area of bed was sampled
1	B2-1	16	38.0	16	62.5	3100	60	186000	3.6	
1	B2-2	4	14.8	8	50.0	2050	25	51250	3.7	
1	B2-3	27	17.1	13	38.5	6650	130	864500	2.9	
1	B4-1	23	36.7	13	69.2	1225	60	73500	4.0	
1	B5-1	6	12.8	9	44.4	90	55	4950	7.6	Tributary mouth bed
1	B6-1	7	17.0	10	30.0	160	35	5600	1.7	Tributary mouth bed
1	B7-1	6	19.0	5	60.0	135	35	4725	1.8	Tributary mouth bed
3	B11-1	15	9.1	9	77.8	510	100	51000	2.2	
3	B22-1	25	12.0	8	37.5	1100	295	324500	4.8	
3	B22-2	8	8.1	8	0.0	685	75	51375	6.9	
4	B23-1	12	14.5	11	54.5	2500	175	437500	4.1	
4	B23-2	7	10.0	8	37.5	2100	250	525000	3.9	
5	B33-1	12	13.4	9	88.9	425	280	119000	2.9	
Average		12.8 ^B	18.4 ^B	10.1 ^B	49.6 ^B	1485.0	113.6	192843 ^B	4.3 ^B	
Minimum		4	8.1	5	0	60	15	900	1.7	
Maximum		27	38.0	16	89	6650	295	864500	10.7	

Different letters within a column indicate a significant difference between Beds and Patches (Students t-test; Bonferroni p<0.05)

¹CPU = catch per 5 min sample

Table 3-1. Number of unionids and species collected within each MKARNS Reach, 2004.

Species	Reach 1		Reach 2		Reach 3		Reach 4		Reach 5		Reach 6		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<i>Amblema plicata</i>	541	17.7	-	-	6	0.6	2	0.5	21	2.3	3	1.695	573	10.5
<i>Anodonta suborbiculata</i>	1	0.0	-	-	10	1.1	1	0.3	9	1.0	-	-	21	0.4
<i>Arcidens confragosus</i>	11	0.4	-	-	-	-	5	1.3	4	0.4	-	-	20	0.4
<i>Fusconaia ebena</i>	8	0.3	-	-	-	-	-	-	2	0.2	-	-	10	0.2
<i>Fusconaia flava</i>	1	0.0	-	-	-	-	-	-	8	0.9	-	-	9	0.2
<i>Lampsilis cardium</i>	2	0.1	-	-	-	-	-	-	-	-	-	-	2	0.0
<i>Lampsilis siliquoidea</i>	1	0.0	-	-	-	-	-	-	-	-	-	-	1	0.0
<i>Lampsilis teres</i>	117	3.8	-	-	7	0.8	-	-	1	0.1	1	0.565	126	2.3
<i>Lasmigona c. complanata</i>	2	0.1	-	-	-	-	-	-	WD	-	-	-	2	0.0
<i>Leptodea fragilis</i>	17	0.6	1	5.0	34	3.7	4	1.0	25	2.8	17	9.605	98	1.8
<i>Megaloniais nervosa</i>	119	3.9	-	-	31	3.3	1	0.3	9	1.0	WD	-	160	2.9
<i>Obliquaria reflexa</i>	250	8.2	4	20.0	207	22.3	84	21.6	213	23.6	88	49.72	846	15.5
<i>Obovaria olivaria</i>	5	0.2	-	-	-	-	-	-	-	-	-	-	5	0.1
<i>Plectomerus dombeyanus</i>	909	29.8	-	-	238	25.7	132	34.0	1	0.1	-	-	1280	23.4
<i>Pleurobema cordatum</i>	-	-	-	-	-	-	-	-	-	-	WD	-	WD	-
<i>Potamilus ohioensis</i>	2	0.1	FD	-	29	3.1	2	0.5	37	4.1	9	5.085	79	1.4
<i>Potamilus purpuratus</i>	204	6.7	WD	-	27	2.9	-	-	7	0.8	12	6.78	250	4.6
<i>Pyganodon grandis</i>	50	1.6	1	5.0	50	5.4	19	4.9	31	3.4	WD	-	151	2.8
<i>Quadrula aspera</i>	122	4.0	-	-	28	3.0	15	3.9	26	2.9	-	-	191	3.5
<i>Quadrula nodulata</i>	27	0.9	-	-	-	-	-	-	-	-	8	4.52	35	0.6
<i>Quadrula p. pustulosa</i>	13	0.4	-	-	1	0.1	-	-	12	1.3	15	8.475	41	0.7
<i>Quadrula quadrula</i>	636	20.8	14	70.0	248	26.8	117	30.2	482	53.4	10	5.65	1507	27.6
<i>Strophitus undulatus</i>	-	-	-	-	-	-	-	-	1	0.1	-	-	1	0.0
<i>Toxolasma parvus</i>	-	-	-	-	-	-	-	-	1	0.1	-	-	1	0.0
<i>Toxolasma sp.</i>	WD	WD	-	-	-	-	-	-	-	-	-	-	WD	-
<i>Tritogonia verrucosa</i>	8	0.3	-	-	-	-	-	-	8	0.9	14	7.91	30	0.5
<i>Truncilla donaciformis</i>	1	0.0	-	-	2	0.2	3	0.8	2	0.2	-	-	8	0.1
<i>Truncilla truncata</i>	1	0.0	-	-	1	0.1	1	0.3	-	-	-	-	3	0.1
<i>Utterbackia imbecillis</i>	5	0.2	-	-	8	0.9	2	0.5	2	0.2	-	-	17	0.3
Total	3053		20		927		388		902		177		5467	
No. live species	25		4		16		14		21		10		27	
Total no. species	26		6		16		14		22		13		29	

FD = freshly dead shell, WD = weathered dead shell

Table 3-2. MKARNS proposed dredge and permitted disposal areas with respect to unionid sample sites in Reach 1, 2004.

Reach	Pool	DR/DI ¹	Proposed dredge and permitted disposal areas						Unionids near proposed dredge and permitted disposal areas										
			Dn NM ²	Up NM	Dist.	Site	Habitat	Substrate	B/P ³	Habitat	Depth	Substrate	Dist from DR/DI (m)		Direction	CPUE	Species	% Juv.	
1	0						1	Channel	Sd	B1-1 P1-1	Straight Straight	10.5-11.1 7.6	Sd/Gr Sd/St/Cl/Dt				36 6	14 5	3 12
1	1	DR-1	10.3	13.3	3.0	2	Straight	Sd/St/Cl		B2-1 B2-2	Straight Straight	2.4-4.9 2.4-4.9	Cl/Sd/St Cl/St/Sd	0 0	In In	38 15	16 8	22 26	
1	2	DR-2	13.3	19.0	5.7	2	Straight	St/Cl		B2-3	Straight	0.9-4.6	Cl/St	0	In	16	13	4	
1	2	DI-1	-1.0	19.0	0.5	3	Outside				Outside	3.1-12.6	Bd/Sd/Cl	0	In	0	0	0	
1	2	DI-2	23.0	23.4	0.4	4	Straight	Sd/St/Cl		B4-1	Str., Ins.	1.1-7.6	Cl/Sd/Bd/St/Gr	0	In	37	13	9	
1	2	DR-3	23.4	23.8	0.4	4	Outside	Bd/Sd/St		P4-1 P4-2	Straight Tributary	3.1 -	Cl/Sd -	100 200	Shoreward Shoreward	4 4	6 3	15 0	
		DI-3	23.4	24.0	0.6	4	Straight	Sd/St		P4-1 P4-2	Straight Tributary	3.1 -	Cl/Sd -	80 30	Shoreward Dnstream	4 4	6 3	15 0	
1	2	DI-10	31.9	32.8	0.9	5	Outside	Sd/Cl/St		P5-1	Outside	0.6-1.1	Sd/Cl/St	0	In	8	4	0	
1	2	DR-5	31.0	32.0	1.0	5	Channel	Sd		B5-1 P5-2	Tributary Inside	7.6 1.5-2.7	Sd/Cl/St Sd/Cl/St	200 400	Shoreward Dnstream	13 10	9 8	16 5	
1	2	DR-8	39.8	41.0	1.2	6	Channel	Sd			Channel	4.6	Sd	0	In	0	0	0	
1	2	DI-16	39.8	40.0	0.2	6	Outside	Sd/St/Cl			Outside	1.5	Sd/St	0	In	1	2	0	
1	2	DI-15	38.8	39.6	0.8	6	Inside	Gr/Sd			Inside	2.4	Gr/Sd	0	In	0	0	0	
1	2	DI-14	38.8	39.1	0.3	6	Outside	Sd/Cl		P6-1	Outside	0.9	Sd/St/Cl	285	Dnstream	16	7	2	
1	2	DI-13	37.7	38.3	0.6	6	Outside	Sd/St/Cl			Outside	0.8-4.6	Sd/St/Cl	0	In	3	5	0	
1	2	DR-7	36.0	38.2	2.2	6	Channel	Sd			Channel	2.4-4.9	Sd	0	In	0	0	0	
										P6-2	Outside	1.8-3.7	Cl/Sd/St	110	Shoreward	8	7	4	
										P6-3	Inside	0.6-4.0	Cl/Sd/St	190	Shoreward	6	3	0	
										B6-1	Straight	0.6-3.1	Cl/St/Sd/Dt	170	Shoreward	17	10	4	
1	2	DI-12	36.5	37.1	0.6	6	Straight	Cl/St/Sd		B6-1	Straight	0.6-3.1	Cl/St/Sd/Dt	0	Dnstream	1	1	1	
1	2	DI-11	35.3	36.6	1.3	6	Straight	Bd/Cb/Sd/St		P6-3	Inside	0.6-1.2	Cl/Sd/St	0	In	6	3	0	
1	2	DR-12	49.5	50.0	0.5	7	TW	Bd/Cb/Gr/Sd			TW	4.9	Bd/Cb/Gr/Sd	0	In	0	0	0	
1	2	DI-25	48.7	50.2	1.5	7	Islands	Sd/Gr		P7-1	Island	1.2-3.7	Sd/Gr/Cl/St/Cb	0	In	15	8	2	
1	2	DI-24	46.7	49.2	2.5	7	Inside	Sd/Cl		P7-2	Inside	3.1-5.0	Sd/Cl/Gr	0	In	16	6	3	
1	2	DR-11	48.0	49.0	1.0	7	Channel	Sd/Gr			Channel	6.1	Sd/Gr	0	In	0	0	0	
1	2	DI-22/23	45.5	47.5	2.0	7	Inside	Sd/Cl/Gr			Inside	5.2-8.5	Sd/Cl/Gr	0	In	0	0	0	
1	2	DR-10	46.0	47.0	1.0	7	Channel	Sd/Gr/Cb			Channel	2.1-6.1	Sd/Gr/Cb	0	In	0	0	0	
1	2	DI-21	45.3	46.0	0.7	7	Outside	Sd/Bd/Cb/St/Cl			Outside	8.5-7.6	Sd/Bd/Cb/St/Cl	0	In	0	0	0	
1	2	DR-9	42.8	45.0	2.2	7	Channel	Sd/Gr		B7-1	Tributary	0.8-3.4	Cl/Sd/St/Gr	<10	Shoreward	19	5	9	
1	2	DI-20	44.0	44.6	0.6	7	Inside	Gr/Sd/St			Inside	1.2	Gr/Sd/St	0	In	0	0	0	
1	2	DI-19	43.5	44.2	0.7	7	Island	NS											
Total DI										14.2									
Total DR										18.2									

¹DR = proposed dredge, DI = permitted disposal (see Tables 1-1 and 1-2)

²NM = navigation mile

³B = bed, P = patch

Br = bedrock, Bd = boulder, Cb = cobble, Gr = gravel, Sd = sand, St = silt, Cl = clay, Dt = detritus, TW = tailwaters, Str. = straight, Ins. = inside bend, NS = not sampled

Table 3-3. Species composition and CPUE¹ within unionid beds and patches, Reach 1.

Pool	0	1	1	2	2	2	2	2		0	2	2	2	2	2	2	2	2	2		Total	Total	
Site	1	2	2	2	4	5	6	7	Total	1	4	4	5	5	6	6	6	7	7	Total	Total		
Bed/Patch no.	B1-1	B2-1	B2-2	B2-3	B4-1	B5-1	B6-1	B7-1	Beds	P1-1	P4-1	P4-2	P5-1	P5-2	P6-1	P6-2	P6-3	P7-1	P7-2	Patches	CPUE	%	
<i>Amblema plicata</i>	0.2	13.8	4.3	2.0	2.5	2.0	5.1	4.2	4.2	-	0.7	1.5	5.7	6.3	2.8	2.0	0.3	2.3	3.3	2.7	3.9	17.3	
<i>Anodonta suborbiculata</i>	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.2
<i>Arcidens confragosus</i>	0.1	0.1	-	-	0.1	0.2	0.4	-	0.1	-	-	-	-	0.2	-	-	-	0.5	-	0.1	0.1	0.4	
<i>Fusconaia ebena</i>	0.5	0.1	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	
<i>Fusconaia flava</i>	-	0.1	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	
<i>Lampsilis cardium</i>	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	
<i>Lampsilis siliquoidea</i>	-	0.1	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	
<i>Lampsilis teres</i>	-	0.5	2.8	2.0	1.0	0.3	0.7	-	1.0	1.0	1.5	-	0.2	-	-	0.5	0.3	-	-	0.4	0.9	4.0	
<i>Lasmigona c. complanata</i>	0.2	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	
<i>Leptodea fragilis</i>	0.5	0.1	0.5	-	0.3	-	-	-	0.2	-	0.3	-	-	-	-	-	0.3	-	-	0.1	0.1	0.4	
<i>Megaloniais nervosa</i>	2.2	0.9	0.5	0.1	2.5	1.8	0.3	-	1.1	-	-	-	-	-	0.3	-	-	-	-	0.0	0.9	4.0	
<i>Obliquaria reflexa</i>	1.5	4.4	0.5	0.1	1.1	1.0	3.6	5.2	1.8	1.0	-	-	-	0.5	6.8	1.3	3.3	0.8	3.0	1.9	1.8	8.0	
<i>Obovaria olivaria</i>	0.5	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	
<i>Plectomerus dombeyanus</i>	0.3	11.3	4.5	9.7	16.9	2.7	2.4	0.3	8.9	-	0.3	0.5	-	0.2	0.3	0.3	-	2.3	1.8	0.6	6.8	30.2	
<i>Potamilus ohioensis</i>	-	-	-	-	0.0	-	-	-	0.0	-	0.3	-	-	-	-	-	-	-	-	-	0.0	0.0	
<i>Potamilus purpuratus</i>	0.5	0.5	1.5	0.8	5.2	1.2	0.3	-	1.7	-	1.7	-	0.7	1.2	1.8	1.0	-	0.8	1.3	0.9	1.5	6.7	
<i>Pyganodon grandis</i>	-	-	-	0.1	0.4	0.7	0.4	2.8	0.4	-	-	-	0.7	0.2	0.3	0.3	0.5	-	1.0	0.3	0.4	1.8	
<i>Quadrula aspera</i>	6.7	1.2	0.3	0.1	0.8	-	0.1	-	1.2	0.3	-	-	-	-	0.3	-	0.3	0.3	-	0.1	0.9	4.0	
<i>Quadrula nodulata</i>	-	1.5	-	0.1	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	0.2	0.9	
<i>Quadrula p. pustulosa</i>	0.5	0.4	-	0.0	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	
<i>Quadrula quadrula</i>	21.2	3.1	-	1.3	5.7	3.0	3.6	6.5	5.3	3.0	-	-	0.7	1.2	4.3	3.0	0.5	8.0	5.8	0.0	4.7	20.9	
<i>Tritogonia verrucosa</i>	0.5	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	
<i>Truncilla donaciformis</i>	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	
<i>Truncilla truncata</i>	-	0.1	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	
<i>Utterbackia imbecillis</i>	-	-	-	-	0.2	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	
Total no. individuals	390	608	59	444	843	77	119	114	2654	17	13	7	23	59	65	25	22	60	64	355	3009		
No. of 5min samples	11	16	4	27	23	6	7	6	100	3	3	2	3	6	4	3	4	4	4	36	136		
Average CPUE	35.5	38.0	14.8	16.4	36.7	12.8	17.0	19.0	26.5	5.7	4.3	3.5	7.7	9.8	16.3	8.3	5.5	15.0	16.0	9.9	22.1		
No. of species	14	16	8	13	13	9	10	5	24	5	6	3	4	8	7	7	3	8	6	13.0	25		
% Juveniles	2.5	21.7	25.8	4.3	9.1	15.6	4.2	8.8	10.6	11.8	15.4	0.0	0.0	5.0	1.5	4.0	0.0	1.7	3.1	3.4	9.7		
% of species w/ juveniles	42.9	62.5	50.0	30.5	69.2	44.4	30.0	60.0	66.7	40.0	33.3	0.0	0.0	12.5	14.3	14.3	0.0	14.3	33.3	38.5	68.0		

¹CPUE = unionids/5min.

Nomenclature follows Turgeon *et al.* (1998) except *Q. aspera* (G.T. Watters, OSU, pers. comm., 2004)

B = bed, P = patch, DI=disposal area, DR=dredge area

Table 3-4. Location, habitat characteristics, and CPUE¹ of unionid beds (B) and patches (P), MKARNS Reach 1, 2004.

Pool	0	1	1	2	2	2	2	2	0	2	2	2	2	2	2	2	2	2
Site	1	2	2	2	4	5	6	7	1	4	4	5	5	6	6	6	7	7
Bed/Patch	B1-1	B2-1	B2-2	B2-3	B4-1	B5-1	B6-1	B7-1	P1-1	P4-1	P4-2	P5-1	P5-2	P6-1	P6-2	P6-3	P7-1	P7-2
Channel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cove	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inside bend	-	-	-	-	10.3	-	-	-	-	-	-	-	9.8	-	-	5.5	-	16.0
Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.0	-
Outside bend	-	-	-	-	-	-	-	-	-	-	-	7.7	-	16.3	8.3	-	-	-
Oxbow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peninsula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Straight	35.5	38.0	14.8	16.4	26.3	-	17.0	-	5.7	4.3	-	-	-	-	-	-	-	-
Tailwater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tributary	-	-	-	-	-	12.8	-	19.0	-	-	3.5	-	-	-	-	-	-	-
Ave. CPUE	35.5	38.0	14.8	16.4	36.7	12.8	17.0	19.0	5.7	4.3	3.5	7.7	9.8	16.3	8.3	5.5	15.0	16.0
Modification ²																		
Existing	-	Canal	Canal	Canal	DI-2/DI-3	-	DI-12	-	-	DI-4	DI-4	DI-10	-	DI-13	-	DI-11	DI-25	DI-24
Proposed	-	DR-1	DR-1	DR-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Depth (m)																		
min	10.5	2.4	2.4	0.9	1.1	-	0.6	0.8	-	-	-	0.6	1.5	-	1.8	0.6	1.2	3.1
max	11.1	4.9	4.9	4.6	7.6	7.6	3.1	3.4	7.6	3.1	-	1.1	2.7	0.9	3.7	1.2	3.7	5.0
Substrate																		
Bedrock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boulder	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobble	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
Gravel	20	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	15	3
Sand	80	30	5	-	25	50	5	30	30	20	-	70	50	80	33	10	55	53
Silt	-	30	45	20	10	20	25	14	20	-	-	10	10	10	10	35	10	-
Clay	-	40	50	80	40	30	65	54	30	80	-	20	40	10	50	55	15	44
Detritus	-	-	-	-	-	-	5	-	20	-	-	-	-	-	-	-	-	-
Shell (Corbicula)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-
zebras/unionid	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹CPUE = unionids/5min.

²DI = disposal, DR = dredge, see Tables 1-1 and 1-2

Table 3-5. Site 1 unionid species and habitat characteristics (page 1 of 2).

Approx. NM	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	WR10	WR10	WR10	9.0
Bank	R	R	R	R	R	R	R	R	R	R	R	L	L	M	R
Bed/Patch	B1-1	B1-1	B1-1	B1-1	B1-1	B1-1	B1-1	B1-1	B1-1	B1-1	B1-1	P1-1	P1-1	P1-1	
<i>Amblema plicata</i>	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Fusconaia ebena</i>	-	-	-	1	2	-	1	-	1	1	-	-	-	-	-
<i>Lampsilis cardium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Lampsilis teres</i>	-	-	-	-	-	-	-	-	-	-	-	1	2	-	1
<i>Lasmigona c. complanata</i>	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
<i>Leptodea fragilis</i>	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-
<i>Megaloniais nervosa</i>	-	1	-	3	1	1	1	2	7	3	5	-	-	-	-
<i>Obliquaria reflexa</i>	4	2	-	2	2	-	2	2	1	-	2	1	2	-	-
<i>Obovaria olivaria</i>	-	-	-	-	3	-	1	1	-	-	-	-	-	-	-
<i>Plectomerus dombeyanus</i>	-	-	-	-	-	1	-	1	1	-	-	-	-	-	-
<i>Potamilus purpuratus</i>	1	1	-	1	-	1	-	-	1	-	-	-	-	-	-
<i>Quadrula aspera</i>	1	-	-	1	5	-	4	18	15	18	12	1	-	-	1
<i>Quadrula p. pustulosa</i>	-	-	-	-	2	-	3	1	-	-	-	-	-	-	-
<i>Quadrula quadrula</i>	8	2	5	12	12	7	1	18	49	68	51	1	6	2	-
<i>Tritogonia verrucosa</i>	-	1	1	-	-	-	-	1	1	-	2	-	-	-	-
<i>Truncilla donaciformis</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Total	14	7	6	21	27	10	17	49	76	91	72	4	11	2	3
No. species live	4	5	2	7	7	4	9	10	8	5	5	4	4	1	3
No. species total	4	5	2	7	7	4	9	10	8	5	5	4	4	1	3
Appr. Density (no. /m ²)	1	1	1	3	-	-	5	5	5	5	5	-	-	-	-
Modification*															
Existing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proposed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Habitat															
Depth (m)	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Inside
Substrate	10.5	10.5	10.5	-	-	-	11.1	10.5	-	-	-	7.6	7.6	7.6	8.5
Bedrock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boulder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60
Cobble	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel	-	-	10	10	10	10	20	20	20	20	20	-	-	-	-
Sand	90	90	80	80	80	80	80	80	80	80	80	30	30	-	-
Silt	5	10	10	10	10	10	-	-	-	-	-	20	20	-	30
Clay	-	-	-	-	-	-	-	-	-	-	-	30	30	-	10
Detritus	-	-	-	-	-	-	-	-	-	-	-	20	20	-	-
Shell	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zebras/unionid	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-
Zeb coverage of substrate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-5. Site 1 unionid species and habitat characteristics (page 2 of 2).

Approx. NM Bank Bed/Patch	9.0	8.5	8.4	8.3	9.2	9.0	8.8	8.4	9.5	8.3	Total	
	R	R	R	R	L	L	L	L	L	L	No.	%
<i>Amblema plicata</i>	-	-	-	-	-	-	-	-	-	-	2	0.5
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	1	0.2
<i>Fusconaia ebena</i>	-	-	-	-	-	-	-	-	-	-	6	1.4
<i>Lampsilis cardium</i>	-	-	-	-	-	-	-	-	-	-	1	0.2
<i>Lampsilis teres</i>	-	-	-	-	-	-	-	-	-	-	4	1.0
<i>Lasmigona c. complanata</i>	-	-	-	-	-	-	-	-	-	-	2	0.5
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	-	-	-	6	1.4
<i>Megaloniais nervosa</i>	WD	-	-	-	-	-	-	-	-	2	26	6.3
<i>Obliquaria reflexa</i>	-	-	-	-	-	-	-	1	-	-	21	5.0
<i>Obovaria olivaria</i>	-	-	-	-	-	-	-	-	-	-	5	1.2
<i>Plectomerus dombeyanus</i>	-	-	-	-	-	-	-	-	-	-	3	0.7
<i>Potamilus purpuratus</i>	-	-	-	-	-	-	-	-	-	-	5	1.2
<i>Quadrula aspera</i>	WD	-	-	-	-	-	-	-	-	-	76	18.3
<i>Quadrula p. pustulosa</i>	-	-	-	-	-	-	-	-	-	-	6	1.4
<i>Quadrula quadrula</i>	-	-	-	-	-	1	-	-	-	-	243	58.4
<i>Tritogonia verrucosa</i>	-	-	-	-	-	-	-	2	-	-	8	1.9
<i>Truncilla donaciformis</i>	-	-	-	-	-	-	-	-	-	-	1	0.2
Total	0	0	0	0	0	1	0	3	0	2	416	
No. species live	0	0	0	0	0	1	0	2	0	1	17	
No. species total	2	0	0	0	0	1	0	2	0	1	17	
Appr. Density (no. /m ²)	-	-	-	-	-	-	-	-	-	-		
Modification*												
Existing	-	-	-	-	-	-	-	-	-	-		
Proposed	-	-	-	-	-	-	-	-	-	-		
Habitat	Inside	Inside	Inside	Straight	Outside	Outside	Outside	Outside	Straight	Straight		
Depth (m)	10.5	5.2	3.7	1.5	8.2	-	15.0	8.8	8.4	8.8		
Substrate												
Bedrock	-	-	-	-	-	-	-	-	-	-		
Boulder	-	-	-	-	-	25	-	25	-	25		
Cobble	-	-	-	-	-	25	-	25	-	25		
Gravel	50	-	-	-	-	25	-	25	-	25		
Sand	50	50	-	10	33	25	33	25	30	25		
Silt	-	20	20	80	33	-	33	-	10	-		
Clay	-	30	80	0	34	-	34	-	60	-		
Detritus	-	-	-	10	-	-	-	-	-	-		
Shell	-	-	-	-	-	-	-	-	-	-		
Zebra/unionid	-	-	-	-	-	-	-	-	-	-		
Zeb coverage of substrate	-	-	-	-	-	-	-	-	-	-		

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-6. Site 2 unionid species and habitat characteristics (page 1 of 4).

Approx. NM	12.5	12.5	11.5	11.5	11.5	11.5	10.5	10.5	10.5	10.5	12.5	12.5	11.5
Bank	R	R	R	R	R	R	R	R	R	R	M	M	M
Bed/Patch	B2-1	B2-1	B2-1	B2-1	B2-1	B2-1	B2-1	B2-1	B2-1	B2-1	B2-1	B2-1	B2-1
<i>Amblema plicata</i>	5	8	1	6	13	2	36	29	30	-	20	36	1
<i>Anodonta suborbiculata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	-	1	-
<i>Fusconaia ebena</i>	1	-	-	-	-	-	-	-	-	-	-	-	1
<i>Fusconaia flava</i>	-	-	-	-	-	-	-	-	-	-	1	-	-
<i>Lampsilis cardium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lampsilis siliquioidea</i>	-	-	-	1	-	-	-	-	-	-	-	-	-
<i>Lampsilis teres</i>	1	-	1	-	1	1	-	-	-	-	1	-	-
<i>Leptodea fragilis</i>	-	-	1	-	-	-	-	-	-	-	-	-	-
<i>Megaloniais nervosa</i>	-	-	-	-	-	-	3	1	1	-	1	4	-
<i>Obliquaria reflexa</i>	3	-	-	1	3	2	9	10	7	5	4	8	1
<i>Plectomerus dombeyanus</i>	3	4	2	7	15	6	20	15	10	6	10	40	1
<i>Potamilus purpuratus</i>	-	-	2	-	-	3	-	-	-	-	-	-	-
<i>Pyganodon grandis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Quadrula aspera</i>	-	-	-	-	-	-	2	3	1	2	2	3	-
<i>Quadrula nodulata</i>	1	-	-	1	-	-	6	5	4	2	-	2	1
<i>Quadrula p. pustulosa</i>	1	-	-	-	-	-	1	3	-	1	-	-	-
<i>Quadrula quadrula</i>	-	-	-	-	-	2	5	12	5	6	1	4	-
<i>Truncilla truncata</i>	-	-	-	-	1	-	-	-	-	-	-	-	-
Total	15	12	7	16	33	16	82	78	58	22	40	98	5
No. species live	7	2	5	5	5	6	8	8	7	6	8	8	5
No. species total	7	2	5	5	5	6	8	8	7	6	8	8	5
Appr. Density (no./m ²)	-	-	1	1	-	2	-	-	-	-	-	-	-
Modification*													
	Existing	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal
	Proposed	DR-1	DR-1	DR-1	DR-1	DR-1	DR-1	DR-1	DR-1	DR-1	DR-1	DR-1	DR-1
Habitat		Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight
Depth (m)		3.1	-	2.4	2.7	3.1	2.7	-	-	-	-	4.3	3.1
Substrate													
	Bedrock	-	-	-	-	-	-	-	-	-	-	-	-
	Boulder	-	-	60	-	-	-	-	-	-	-	-	-
	Cobble	-	-	-	-	-	-	-	-	-	-	-	-
	Gravel	-	-	-	-	-	-	-	-	-	-	-	-
	Sand	30	30	-	10	-	30	-	-	-	30	30	10
	Silt	30	30	20	40	40	30	-	-	-	30	30	50
	Clay	40	40	10	50	50	40	-	-	-	40	40	40
	Detritus	-	-	-	-	-	-	-	-	-	-	-	-
	Shell	-	-	10	-	10	10	-	-	-	-	-	-
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substrate	-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-6. Site 2 unionid species and habitat characteristics (page 2 of 4).

Approx. NM	11.5	11.5	11.5	12.5	12.5	12.5	11.5	18.8	17.8	15.5	15.5	15.5	
Bank	M	M	M	L	L	L	L	R	R	R	R	R	
Bed/Patch	B2-1	B2-1	B2-1	B2-2	B2-2	B2-2	B2-2	B2-3	B2-3	B2-3	B2-3	B2-3	
<i>Amblema plicata</i>	13	19	2	5	4	4	4	1	2	1	-	3	
<i>Anodonta suborbiculata</i>	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Fusconaia ebena</i>	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Fusconaia flava</i>	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Lampsilis cardium</i>	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Lampsilis siliquoidea</i>	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Lampsilis teres</i>	1	1	1	2	-	8	1	-	-	-	2	1	
<i>Leptodea fragilis</i>	-	-	-	2	-	-	-	-	-	-	-	-	
<i>Megalonaias nervosa</i>	1	3	-	1	-	1	-	-	-	-	1	-	
<i>Obliquaria reflexa</i>	8	8	1	2	-	-	-	-	-	-	-	-	
<i>Plectomerus dombeyanus</i>	30	11	1	7	5	4	2	-	5	11	35	22	
<i>Potamilus purpuratus</i>	3	-	-	2	-	2	2	-	-	2	-	3	
<i>Pyganodon grandis</i>	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Quadrula aspera</i>	4	2	-	-	-	-	1	-	-	1	-	1	
<i>Quadrula nodulata</i>	1	1	-	-	-	-	-	-	-	1	-	-	
<i>Quadrula p. pustulosa</i>	-	-	-	-	-	-	-	-	-	-	-	1	
<i>Quadrula quadrula</i>	7	8	-	-	-	-	-	-	-	1	-	2	
<i>Truncilla truncata</i>	-	-	-	-	-	-	-	-	-	-	-	-	
Total	68	53	5	21	9	19	10	1	7	17	38	33	
No. species live	9	8	4	7	2	5	5	1	2	6	3	7	
No. species total	9	8	4	7	2	5	5	1	2	6	3	7	
Appr. Density (no./m ²)	5	2	1	1	1	-	<1	-	<1	<1	5	5	
Modification*													
	Existing Proposed	Canal DR-1	Canal DR-1	Canal DR-1	Canal DR-1	Canal DR-1	Canal DR-1	Canal DR-1	Canal DR-2	Canal DR-2	Canal DR-2	Canal DR-2	Canal DR-2
Habitat		Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight
Depth (m)		-	4.9	-	-	-	-	-	3.7	2.7	4.3	2.4	-
Substrate													
	Bedrock	-	-	-	-	-	-	-	-	-	-	-	-
	Boulder	-	-	-	-	-	-	-	-	-	-	-	-
	Cobble	-	-	-	-	-	-	-	-	-	-	-	-
	Gravel	-	35	-	-	-	-	-	-	-	-	-	-
	Sand	5	-	-	-	-	5	30	30	-	-	-	
	Silt	5	15	-	60	45	-	50	50	-	15	-	
	Clay	90	50	-	40	50	-	20	20	95	80	-	
	Detritus	-	-	-	-	-	-	-	-	-	-	-	
	Shell	-	-	-	-	5	-	-	-	5	5	-	
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	
Zeb coverage of substrate	-	-	-	-	-	-	-	-	-	-	-	-	

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-6. Site 2 unionid species and habitat characteristics (page 3 of 4).

Approx. NM	15.5	14.5	13.8	13.8	13.8	13.8	18.8	17.8	15.5	14.5	14.5	13.8	18.8
Bank	R	R	R	R	R	R	M	M	M	M	M	M	L
Bed/Patch	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3
<i>Amblema plicata</i>	2	1	2	1	-	2	-	-	5	1	1	-	11
<i>Anodonta suborbiculata</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Fusconaia ebena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Fusconaia flava</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lampsilis cardium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lampsilis siliquioidea</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lampsilis teres</i>	2	-	30	4	7	3	-	-	-	-	-	-	-
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Megalonaias nervosa</i>	1	-	-	-	-	-	-	-	1	-	-	-	-
<i>Obliquaria reflexa</i>	-	-	1	-	1	-	-	-	-	-	-	-	-
<i>Plectomerus dombeyanus</i>	31	5	7	7	12	11	5	-	8	14	9	-	10
<i>Potamilus purpuratus</i>	-	-	1	2	3	2	1	-	-	-	-	-	1
<i>Pyganodon grandis</i>	-	-	-	-	-	-	-	-	1	-	-	-	-
<i>Quadrula aspera</i>	1	-	-	-	-	-	-	-	-	-	-	-	-
<i>Quadrula nodulata</i>	-	2	-	-	-	-	-	-	-	-	-	-	-
<i>Quadrula p. pustulosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Quadrula quadrula</i>	1	-	1	1	-	3	4	-	3	2	1	1	4
<i>Truncilla truncata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	38	8	42	15	23	21	10	0	18	17	11	1	27
No. species live	6	3	6	5	4	5	3	0	5	3	3	1	5
No. species total	6	3	6	5	4	5	3	0	5	3	3	1	5
Appr. Density (no./m ²)	5	-	<1	-	-	-	<1	-	-	-	-	<1	1
Modification*													
	Existing	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal
	Proposed	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2
Habitat		Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight
Depth (m)		1.5	-	2.4	-	2.7	-	4.6	2.7	-	4.6	-	1.5
Substrate													
	Bedrock	-	-	-	-	-	-	-	-	-	-	-	-
	Boulder	-	-	-	-	-	-	-	-	20	-	-	-
	Cobble	-	-	-	-	-	-	-	-	5	-	-	-
	Gravel	-	-	-	-	-	-	-	-	10	-	-	-
	Sand	-	-	-	-	-	-	-	-	60	-	-	-
	Silt	10	5	20	20	20	10	-	-	5	-	-	-
	Clay	90	80	80	80	80	90	-	-	-	-	100	-
	Detritus	-	-	-	-	-	-	-	-	-	-	-	-
	Shell	-	15	-	-	-	-	-	-	-	-	-	-
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substrate	-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-6. Site 2 unionid species and habitat characteristics (page 4 of 4).

Approx. NM Bank Bed/Patch	18.8	18.8	17.8	15.5	14.5	14.5	13.8	13.8	13.8	10.5	10.5	Total	
	L	L	L	L	L	L	L	L	L	M	L	No.	%
	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3	B2-3				
<i>Amblema plicata</i>	9	6	-	2	-	2	1	-	1	-	-	292	26.3
<i>Anodonta suborbiculata</i>	-	-	-	-	-	-	-	-	-	-	-	1	0.1
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	-	1	0.1
<i>Fusconaia ebena</i>	-	-	-	-	-	-	-	-	-	-	-	2	0.2
<i>Fusconaia flava</i>	-	-	-	-	-	-	-	-	-	-	-	1	0.1
<i>Lampsilis cardium</i>	-	-	-	-	-	-	1	-	-	-	-	1	0.1
<i>Lampsilis siliquoidea</i>	-	-	-	-	-	-	-	-	-	-	-	1	0.1
<i>Lampsilis teres</i>	-	2	-	-	-	-	1	1	1	-	-	73	6.6
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	-	-	-	-	3	0.3
<i>Megalonaias nervosa</i>	-	-	-	-	-	-	-	-	-	-	-	19	1.7
<i>Obliquaria reflexa</i>	-	-	-	-	1	-	-	-	-	-	-	75	6.8
<i>Plectomerus dombeyanus</i>	6	1	2	9	20	6	7	8	10	-	-	460	41.4
<i>Potamilus purpuratus</i>	-	-	-	-	3	-	1	-	2	-	-	35	3.2
<i>Pyganodon grandis</i>	-	1	-	1	-	-	-	-	-	-	-	3	0.3
<i>Quadrula aspera</i>	-	-	-	-	-	-	-	-	-	-	-	23	2.1
<i>Quadrula nodulata</i>	-	-	-	-	-	-	-	-	-	-	-	27	2.4
<i>Quadrula p. pustulosa</i>	-	-	-	-	-	-	-	-	-	-	-	7	0.6
<i>Quadrula quadrula</i>	1	1	-	3	3	-	1	1	2	-	-	86	7.7
<i>Truncilla truncata</i>	-	-	-	-	-	-	-	-	-	-	-	1	0.1
Total	16	11	2	15	27	8	12	10	16	0	0	1111	
No. species live	3	5	1	4	4	2	6	3	5	0	0	19	
No. species total	3	5	1	4	4	2	6	3	5	0	0	19	
Appr. Density (no./m ²)	<1	-	-	-	-	-	1	-	-	-	-	0 to 5	
Modification*													
	Existing	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal	Canal		
	Proposed	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-2	DR-1	DR-1	
Habitat		Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	
Depth (m)		1.5	-	0.9	2.4	-	-	2.4	1.8	-	4.0	3.1	
Substrate													
	Bedrock	-	-	-	-	-	-	-	-	-	-	-	
	Boulder	-	-	-	-	-	-	-	-	-	-	-	
	Cobble	-	-	-	-	-	-	-	-	-	-	-	
	Gravel	-	-	-	-	-	-	30	30	-	-	-	
	Sand	10	-	-	-	-	-	-	-	-	5	15	
	Silt	10	-	20	50	-	-	40	40	-	5	5	
	Clay	80	-	80	50	-	-	30	30	-	90	80	
	Detritus	-	-	-	-	-	-	-	-	-	-	-	
	Shell	-	-	-	-	-	-	-	-	-	-	-	
Zebras/unionid		-	-	-	-	-	-	-	-	-	-	-	
Zeb coverage of substrate		-	-	-	-	-	-	-	-	-	-	-	

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-7. Site 4 unionid species and habitat characteristics (page 1 of 3).

Approx. NM	24.0	24.0	24.0	24.0	24.0	24.0	23.8	23.8	23.8	23.8	23.8	23.8	23.3
Bank	L	L	L	L	L	L	L	L	L	L	L	L	L
Bed/Patch	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1
<i>Amblema plicata</i>	5	6	6	6	-	1	1	5	3	2	7	2	-
<i>Arcidens confragosus</i>	-	1	-	-	-	-	-	1	-	-	-	-	-
<i>Lampsilis teres</i>	1	1	1	-	2	2	1	1	-	-	-	1	3
<i>Leptodea fragilis</i>	-	-	FD	-	1	-	-	FD	1	1	-	-	-
<i>Megaloniais nervosa</i>	-	5	13	1	1	3	1	8	6	4	4	2	-
<i>Obliquaria reflexa</i>	3	4	4	3	2	-	1	1	-	-	-	-	-
<i>Plectomerus dombeyanus</i>	23	31	28	32	26	21	22	6	4	27	4	14	6
<i>Potamilus ohioensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Potamilus purpuratus</i>	8	11	18	15	10	16	4	1	4	1	3	5	-
<i>Pyganodon grandis</i>	1	-	1	-	-	-	1	-	-	-	1	2	-
<i>Quadrula aspera</i>	-	-	-	2	1	-	1	2	3	2	4	3	-
<i>Quadrula quadrula</i>	12	9	10	1	3	5	8	16	9	12	21	14	-
<i>Utterbackia imbecillis</i>	-	2	-	-	-	-	-	-	-	-	-	-	-
Total	53	70	81	60	46	48	40	41	30	49	44	43	9
No. species live	7	9	8	7	8	6	9	9	7	7	7	8	2
No. species total	7	9	9	7	8	6	9	10	7	7	7	8	2
Appr. Density (no./m ²)	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	-
Modification*													
Existing	-	-	-	-	-	-	-	-	-	-	-	-	DI-2, DF
Proposed	-	-	-	-	-	-	-	-	-	-	-	-	-
Habitat	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Inside
Depth (m)	3.4	3.7	3.6	-	-	-	7.6	7.6	7.6	6.1	6.1	5.8	1.2
Substrate													
Bedrock	-	-	-	-	-	-	-	-	-	-	-	-	-
Boulder	-	-	-	-	-	-	50	75	75	75	75	75	-
Cobble	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel	-	-	-	-	-	-	5	-	-	-	-	-	-
Sand	50	50	50	50	50	50	-	-	-	-	-	-	20
Silt	10	10	20	20	20	20	5	5	5	5	5	5	-
Clay	40	40	30	30	30	30	40	20	20	20	20	20	80
Detritus	-	-	-	-	-	-	-	-	-	-	-	-	-
Shell	-	-	-	-	-	-	-	-	-	-	-	-	-
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substr	-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-7. Site 4 unionid species and habitat characteristics (page 2 of 3).

Approx. NM	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.5	23.5	23.5
Bank	L	L	L	L	L	L	L	L	L	L	L	R	R	R
Bed/Patch	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	B4-1	P4-1	P4-1	P4-1
<i>Amblema plicata</i>	-	1	-	-	-	-	3	3	6	-	-	1	1	-
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lampsilis teres</i>	1	1	1	1	1	1	-	-	2	1	2	-	-	1
<i>Leptodea fragilis</i>	-	-	-	-	-	-	1	1	-	1	-	-	-	1
<i>Megaloniais nervosa</i>	-	2	3	-	1	4	-	-	-	-	-	-	-	-
<i>Obliquaria reflexa</i>	1	1	-	2	3	1	-	-	-	-	-	-	-	-
<i>Plectomerus dombeyanus</i>	9	24	12	30	39	19	1	1	9	1	-	-	-	1
<i>Potamilus ohioensis</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	1
<i>Potamilus purpuratus</i>	4	2	4	2	3	3	2	-	2	1	4	1	-	-
<i>Pyganodon grandis</i>	1	-	-	-	-	-	1	-	1	-	-	-	-	-
<i>Quadrula aspera</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Quadrula quadrula</i>	-	-	3	-	-	4	1	-	2	-	-	-	-	-
<i>Utterbackia imbecillis</i>	-	1	2	-	-	-	-	-	-	-	-	-	-	-
Total	16	32	25	35	47	32	10	5	23	4	7	2	4	4
No. species live	5	7	6	4	5	6	7	3	7	4	3	2	4	4
No. species total	5	7	6	4	5	6	7	3	7	4	3	2	4	4
Appr. Density (no./m ²)	-	-	-	-	-	-	-	<1	2	<1	<1	<1	<1	<1
Modification*														
	Existing	DI-2, DF	DI-2, DF	DI-2, DF	DI-2, DF	DI-2, DF	DI-2, DF	DI-2, DF	DI-2, DF	DI-2, DF	DI-2, DF	-	-	-
	Proposed	-	-	-	-	-	-	-	-	-	-	-	-	-
Habitat		Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Straight	Straight	Straight
Depth (m)		3.7	4.6	3.4	-	-	-	-	1.8	1.1	-	3.1	3.1	3.1
Substrate														
	Bedrock	-	-	-	-	-	-	-	-	-	-	-	-	-
	Boulder	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cobble	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gravel	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sand	-	20	20	-	-	-	70	50	-	20	20	20	20
	Silt	-	-	-	-	-	-	10	25	-	-	-	-	-
	Clay	-	80	80	-	-	-	20	25	-	80	80	80	80
	Detritus	-	-	-	-	-	-	-	-	-	-	-	-	-
	Shell	-	-	-	-	-	-	-	-	-	-	-	-	-
Zebra/unionid		-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substr		-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell
 R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch
 *see Tables 1-1 and 1-2

Table 3-7. Site 4 unionid species and habitat characteristics (page 3 of 3).

Approx. NM Bank Bed/Patch	23.3	23.3	23.8	23.5	23.0	23.0	23.3	23.3	Total	
	R	R	L	L	L	R	R	R	No.	%
	P4-2	P4-2								
<i>Amblema plicata</i>	-	3	-	-	-	-	-	-	62	7.2
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	2	0.2
<i>Lampsilis teres</i>	2	1	-	-	-	-	-	-	28	3.2
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	-	7	0.8
<i>Megaloniaias nervosa</i>	-	-	-	-	-	-	-	-	58	6.7
<i>Obliquaria reflexa</i>	-	-	1	-	-	-	-	-	27	3.1
<i>Plectomerus dombeyanus</i>	-	1	-	-	-	-	-	-	391	45.3
<i>Potamilus ohioensis</i>	-	-	-	-	FD	-	-	-	2	0.2
<i>Potamilus purpuratus</i>	-	-	-	-	-	-	-	-	124	14.4
<i>Pyganodon grandis</i>	-	-	-	-	-	-	-	-	9	1.0
<i>Quadrula aspera</i>	-	-	-	-	-	-	-	-	19	2.2
<i>Quadrula quadrula</i>	-	-	-	-	-	-	-	-	130	15.0
<i>Utterbackia imbecillis</i>	-	-	-	-	-	-	-	-	5	0.6
Total	2	5	1	0	0	0	0	0	864	
No. species live	1	3	1	0	0	0	0	0	13	
No. species total	1	3	1	0	1	0	0	0	13	
Appr. Density (no./m ²)	<1	<1	-	-	-	-	-	-		
Modification*										
Existing	-	-	DI-3, DF	DI-3, DF	DI-3, DF	-	-	-		
Proposed	-	-	-	-	-	DR-3	-	-		
Habitat	Tributary	Tributary	Straight	Straight	Straight	Outside	Outside	Outside		
Depth (m)	-	-	2.3	5.5	1.8	3.1	1.2	-		
Substrate										
Bedrock	-	-	-	-	-	-	-	-		
Boulder	-	-	-	-	-	50	-	-		
Cobble	-	-	-	-	-	-	-	-		
Gravel	-	-	-	-	-	-	-	-		
Sand	-	-	90	80	95	25	80	80		
Silt	-	-	10	10	5	25	20	20		
Clay	-	-	-	10	-	-	-	-		
Detritus	-	-	-	-	-	-	-	-		
Shell	-	-	-	-	-	-	-	-		
Zebras/unionid	-	-	3	-	-	-	-	-		
Zeb coverage of substr	-	-	-	-	-	-	-	-		

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-8. Site 5 unionid species and habitat characteristics (page 1 of 2).

Approx. NM	31.3	31.3	31.3	31.3	31.3	31.3	32.5	32.5	32.5	30.5	30.5	30.5	30.5
Bank	L	L	L	L	L	L	L	L	L	R	R	R	R
Bed/Patch	B5-1	B5-1	B5-1	B5-1	B5-1	B5-1	P5-1	P5-1	P5-1	P5-2	P5-2	P5-2	P5-2
<i>Amblema plicata</i>	2	1	-	5	3	1	7	9	1	21	3	4	3
<i>Arcidens confragosus</i>	FD	-	-	1	-	-	-	-	-	-	-	1	-
<i>Lampsilis teres</i>	-	-	-	-	2	-	-	-	-	-	-	1	-
<i>Megaloniais nervosa</i>	-	-	-	6	4	1	-	-	-	-	-	-	-
<i>Obliquaria reflexa</i>	-	-	-	2	2	2	-	-	-	-	2	-	-
<i>Plectomerus dombeyanus</i>	-	1	1	2	5	7	-	-	-	-	1	-	-
<i>Potamilus purpuratus</i>	-	-	-	1	3	3	2	-	-	1	-	4	-
<i>Pyganodon grandis</i>	-	-	1	1	-	2	-	2	-	1	-	-	-
<i>Quadrula quadrula</i>	3	3	-	6	3	3	2	-	-	2	-	1	-
<i>Toxolasma sp.</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	5	5	2	24	22	19	11	11	1	25	6	11	3
No. species live	2	3	2	8	7	7	3	2	1	4	3	5	1
No. species total	3	3	2	8	7	7	3	2	1	4	3	5	1
Appr. Density (no./m ²)	-	-	-	-	-	-	scattered	scattered	scattered	<1	scattered	scattered	scattered
Mean No./5min (CPUE)	-	-	-	-	-	-	-	-	-	-	-	-	-
Modification*													
Existing	-	-	-	-	-	-	DI-10, DF	DI-10, DF	DI-10, DF	-	-	-	-
Proposed	-	-	-	-	-	-	-	-	-	-	-	-	-
Habitat	Tributary	Tributary	Tributary	Tributary	Tributary	Tributary	Outside	Outside	Outside	Island	Island	Island	Island
Depth (m)	7.6	-	-	-	-	-	0.6	1.1	-	1.5	-	1.5	1.5
Substrate													
Bedrock	-	-	-	-	-	-	-	-	-	-	-	-	-
Boulder	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobble	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand	40	40	-	60	-	-	70	50	70	50	90	-	20
Silt	-	-	-	40	-	-	10	10	10	10	-	-	5
Clay	60	60	-	-	-	-	20	40	20	40	10	-	70
Detritus	-	-	-	-	-	-	-	-	-	-	-	-	-
Shell	-	-	-	-	-	-	-	-	-	-	-	-	5
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substr	-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell
R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch
*see Tables 1-1 and 1-2

Table 3-8. Site 5 unionid species and habitat characteristics (page 2 of 2).

Approx. NM Bank Bed/Patch	30.5	30.5	32.5	31.3	31.3	31.0	30.4	32.3	31.9	30.5	Total	
	R	R	L	M	R	R	R	M	L	L	No.	%
<i>Amblema plicata</i>	6	1	-	-	9	5	1	-	-	-	82	45.6
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	2	1.1
<i>Lampsilis teres</i>	-	-	-	-	-	-	-	-	-	-	3	1.7
<i>Megaloniais nervosa</i>	-	-	-	-	-	-	-	-	-	-	11	6.1
<i>Obliquaria reflexa</i>	1	-	-	-	-	-	-	-	-	-	9	5.0
<i>Plectomerus dombeyanus</i>	-	-	-	-	-	1	-	-	-	-	18	10.0
<i>Potamilus purpuratus</i>	1	1	-	-	-	-	2	-	-	-	18	10.0
<i>Pyganodon grandis</i>	-	-	-	-	-	1	1	-	-	-	9	5.0
<i>Quadrula quadrula</i>	4	-	-	-	1	-	-	-	-	-	28	15.6
<i>Toxolasma sp.</i>	-	-	-	-	-	-	WD	-	-	-	WD	-
Total	12	2	0	0	10	7	4	0	0	0	180	
No. species live	4	2	0	0	2	3	3	0	0	0	9	
No. species total	4	2	0	0	2	3	4	0	0	0	11	
Appr. Density (no./m ²)	scattered	scattered	-	-	<1	<1	scattered	-	-	-		
Mean No./5min (CPUE)	-	-	-	-	-	-	-	-	-	-	7.8	
Modification*												
Existing	-	-	DI-10, DF	-	-	-	-	-	-	-	-	-
Proposed	-	-	-	DR-5	-	-	-	-	-	-	-	-
Habitat	Island	Island	Outside	Channel	Island	Island	Island	Channel	Island	Outside		
Depth (m)	1.5	1.5	3.1	5.2	1.5	2.7	1.5	2.1	3.5	7.3		
Substrate												
Bedrock	-	-	-	-	-	-	-	-	-	-	-	-
Boulder	-	-	-	-	-	-	-	-	-	-	-	-
Cobble	-	-	-	-	-	-	-	-	-	-	-	-
Gravel	-	-	-	-	-	-	-	-	-	-	-	-
Sand	30	70	80	100	95	90	50	100	100	100		
Silt	10	10	20	-	5	10	40	-	-	-		
Clay	60	20	-	-	-	-	10	-	-	-		
Detritus	-	-	-	-	-	-	-	-	-	-	-	-
Shell	-	-	-	-	-	-	-	-	-	-	-	-
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substr	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-9. Site 6 unionid species and habitat characteristics (page 1 of 3).

Approx. NM	36.5	36.5	36.5	36.5	36.5	36.5	36.5	38.8	38.8	38.8	38.8	37.8	37.8
Bank	R	R	R	R	R	R	R	L	L	L	L	L	L
Bed/Patch	B6-1	B6-1	B6-1	B6-1	B6-1	B6-1	B6-1	P6-1	P6-1	P6-1	P6-1	P6-2	P6-2
<i>Amblema plicata</i>	4	3	-	1	6	17	5	2	3	3	3	4	2
<i>Arcidens confragosus</i>	-	1	1	-	-	1	-	-	-	-	-	-	-
<i>Lampsilis teres</i>	WD	2	-	-	1	1	1	-	-	-	-	-	WD
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Megaloniaias nervosa</i>	-	-	-	-	-	1	1	-	-	-	-	-	1
<i>Obliquaria reflexa</i>	WD	-	2	2	8	8	5	15	8	4	-	1	1
<i>Plectomerus dombeyanus</i>	-	1	-	-	9	4	3	1	-	-	-	-	1
<i>Potamilus ohiensis</i>	WD	FD	-	-	-	-	-	-	-	-	-	-	FD
<i>Potamilus purpuratus</i>	WD	-	-	-	-	1	1	-	2	3	2	-	1
<i>Pyganodon grandis</i>	1	-	1	-	-	1	-	1	-	-	-	-	1
<i>Quadrula aspera</i>	-	-	-	-	-	1	-	-	-	1	-	-	-
<i>Quadrula quadrula</i>	3	3	4	2	3	10	-	8	6	3	-	7	1
Total	8	10	8	5	27	45	16	27	19	14	5	12	8
No. species live	3	5	4	3	5	10	6	5	4	5	2	3	7
No. species total	7	6	4	3	5	10	6	5	4	5	2	3	9
Appr. Density (no./m ²)	1	<1	1	<1	1	7	3	-	-	-	-	1	1
Modification*													
Existing	DI-12	DI-12	DI-12	DI-12	-	-	-	-	-	-	-	-	-
Proposed	-	-	-	-	-	-	-	-	-	-	-	-	-
Habitat	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Outside	Outside	Outside	Outside	Outside	Outside
Depth (m)	0.9	1.2	0.6	0.9	2.7	2.4	3.1	0.9	0.9	-	-	3.7	3.7
Substrate													
Boulder	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobble	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand	10	10	10	5	-	5	-	80	80	80	80	40	50
Silt	10	10	15	25	-	35	40	10	10	10	10	20	-
Clay	80	80	75	70	-	60	20	10	10	10	10	30	40
Detritus	-	-	-	-	-	-	40	-	-	-	-	-	-
Shell	-	-	-	-	-	-	-	-	-	-	-	10	10
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substrate	-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell
R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch
*see Tables 1-1 and 1-2

Table 3-9. Site 6 unionid species and habitat characteristics (page 2 of 3).

Approx. NM	37.8	36.5	36.5	36.5	36.5	39.8	38.8	38.3	38.3	36.3	36.0	40.0	38.0
Bank	L	L	L	L	L	R	L	L	L	L	L	L	M
Bed/Patch	P6-2	P6-3	P6-3	P6-3	P6-3								
<i>Amblesma plicata</i>	-	-	-	1	-	-	-	-	2	-	-	-	-
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lampsilis teres</i>	-	1	-	-	1	-	-	WD	-	-	-	-	-
<i>Leptodea fragilis</i>	-	1	-	-	-	-	-	-	-	-	-	-	-
<i>Megaloniaias nervosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Obliquaria reflexa</i>	2	3	1	3	6	-	-	-	1	-	-	-	-
<i>Plectomerus dombeyanus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Potamilus ohiensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Potamilus purpuratus</i>	2	-	-	-	-	-	-	-	1	-	-	-	-
<i>Pyganodon grandis</i>	-	2	-	-	-	-	-	1	-	-	-	-	-
<i>Quadrula aspera</i>	-	1	-	-	-	-	-	-	-	-	-	-	-
<i>Quadrula quadrula</i>	1	2	-	-	-	-	-	-	1	-	-	-	-
Total	5	10	1	4	7	0	0	1	5	0	0	0	0
No. species live	3	6	1	2	2	0	0	1	4	0	0	0	0
No. species total	3	6	1	2	2	0	0	2	4	0	0	0	0
Appr. Density (no./m ²)	1	-	-	<1	<1	-	-	<1	<1	-	-	-	-
Modification*													
Existing	-	DI-11	DI-11	-	-	DI-15	DI-14	DI-13	DI-13	DI-11	DI-11	-	-
Proposed	-	-	-	-	-	-	-	-	-	-	-	DR-8	DR-7
Habitat	Outside	Inside	Inside	Inside	Inside	Inside	Outside	Outside	Outside	Straight	Straight	Channel	Channel
Depth (m)	1.8	4.0	4.0	1.2	0.6	2.4	9.6	4.6	0.8	1.5	1.2	4.6	4.9
Substrate													
Boulder	-	30	30	-	-	-	20	-	-	-	-	-	-
Cobble	-	30	30	-	-	-	-	-	-	-	-	-	-
Gravel	-	-	-	-	-	50	-	-	-	-	-	-	-
Sand	10	20	20	10	10	50	50	30	73	90	90	100	100
Silt	10	20	20	30	40	-	-	30	-	10	10	-	-
Clay	80	-	-	60	50	-	30	40	25	-	-	-	-
Detritus	-	-	-	-	-	-	-	-	2	-	-	-	-
Shell	-	-	-	-	-	-	-	-	-	-	-	-	-
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substrate	-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell
 R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch
 *see Tables 1-1 and 1-2

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Table 3-9. Site 6 unionid species and habitat characteristics (page 3 of 3).

Approx. NM	36.8	40.0	40.0	35.5	35.0	36.3	36.3	Total	
Bank	M	L	R	R	R	R	R	No.	%
Bed/Patch								No.	%
<i>Amblema plicata</i>	-	-	-	-	-	-	-	56	23.0
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	3	1.2
<i>Lampsilis teres</i>	-	-	1	-	-	-	-	8	3.3
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	1	0.4
<i>Megaloniaias nervosa</i>	-	-	-	2	-	-	-	5	2.0
<i>Obliquaria reflexa</i>	-	2	-	-	-	-	-	72	29.5
<i>Plectomerus dombeyanus</i>	-	-	-	-	-	-	-	19	7.8
<i>Potamilus ohiensis</i>	-	-	-	-	-	-	-	FD	
<i>Potamilus purpuratus</i>	-	-	-	1	-	-	-	14	5.7
<i>Pyganodon grandis</i>	-	-	-	-	-	-	-	8	3.3
<i>Quadrula aspera</i>	-	-	-	-	-	-	-	3	1.2
<i>Quadrula quadrula</i>	-	-	-	1	-	-	-	55	22.5
Total	0	2	1	4	0	0	0	244	
No. species live	0	1	1	3	0	0	0	11	
No. species total	0	1	1	3	0	0	0	12	
Appr. Density (no./m ²)	-	-	-	-	-	-	-		
Modification*									
Existing	-	-	-	-	-	-	-		
Proposed	DR-7	-	-	-	-	-	-		
Habitat	Channel	Outside	Inside	Outside	Outside	Straight	Straight		
Depth (m)	2.4	1.5	5.2	2.7	6.1	1.5	3.7		
Substrate									
Boulder	-	-	-	80	-	-	-		
Cobble	-	-	25	-	-	-	-		
Gravel	-	-	-	-	-	-	-		
Sand	100	95	25	10	100	-	-		
Silt	-	5	25	10	-	95	90		
Clay	-	-	25	-	-	5	10		
Detritus	-	-	-	-	-	-	-		
Shell	-	-	-	-	-	-	-		
Zebras/unionid	-	-	-	-	-	-	-		
Zeb coverage of substrate	-	-	-	-	-	-	-		

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell
R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch
*see Tables 1-1 and 1-2

Table 3-10. Site 7 unionid species and habitat characteristics (page 1 of 3).

Approx. NM	44.5	44.5	44.5	44.5	44.5	44.5	48.7	48.7	48.7	48.7	48.0	48.0	48.0	48.0
Bank	L	L	L	L	L	L	R	R	R	R	L	L	L	L
Bed/Patch	B7-1	B7-1	B7-1	B7-1	B7-1	B7-1	P7-1	P7-1	P7-1	P7-1	P7-2	P7-2	P7-2	P7-2
<i>Amblyma plicata</i>	7	3	5	3	2	5	1	6	2	-	1	4	4	4
<i>Anodonta suborbiculata</i>	-	-	-	-	-	WD	-	-	-	-	-	-	-	-
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	1	1	-	-	-	-
<i>Lampsilis teres</i>	-	-	-	-	-	FD	1	-	-	-	-	-	-	-
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	FD	-	FD	-	-	-	-
<i>Obliquaria reflexa</i>	5	2	6	2	10	6	3	-	-	-	1	1	1	9
<i>Plectomerus dombeyanus</i>	-	-	1	-	1	-	5	1	3	-	-	1	2	4
<i>Potamilus ohioensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	FD
<i>Potamilus purpuratus</i>	-	-	-	-	-	-	2	-	1	-	-	3	-	2
<i>Pyganodon grandis</i>	-	-	1	7	2	7	-	-	-	-	2	-	1	1
<i>Quadrula aspera</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Quadrula quadrula</i>	12	2	9	5	5	6	11	11	9	1	5	12	3	3
Total	24	7	22	17	20	24	23	18	17	2	9	21	11	23
No. species live	3	3	5	4	5	4	6	3	6	2	4	5	5	6
No. species total	3	3	5	4	5	6	6	4	6	3	4	5	5	7
Appr. Density (no./m ²)	4	1	2	1	3	1	3	2	2	1	-	-	-	-
Modification*														
Existing	-	-	-	-	-	-	DI-25	DI-25	DI-25	DI-25	DI-24, DF	DI-24, DF	DI-24, DF	DI-24, DF
Proposed	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Habitat	Tributary	Tributary	Tributary	Tributary	Tributary	Tributary	Outside	Outside	Outside	Outside	Inside	Inside	Inside	Inside
Depth (m)	3.4	3.4	1.5	1.8	0.9	0.8	2.7	1.2	1.5	3.7	5.0	3.1	3.1	-
Substrate														
Bedrock	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boulder	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobble	-	-	-	-	-	-	10	-	-	10	-	-	-	-
Gravel	10	-	-	-	-	-	20	-	10	30	5	-	-	-
Sand	50	10	-	10	40	70	60	50	50	60	60	30	30	-
Silt	-	10	10	10	35	20	10	20	10	-	-	-	-	-
Clay	40	80	90	80	25	10	-	30	30	-	35	70	70	-
Detritus	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substrate	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-10. Site 7 unionid species and habitat characteristics (page 2 of 3).

Approx. NM	50.0	50.0	50.0	46.9	46.5	45.8	46.9	46.0	45.3	50.0	48.9	46.9	46.4	46.0
Bank	R	R	R	R	R	R	L	L	L	L	M	M	M	M
Bed/Patch														
<i>Amblema plicata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Anodonta suborbiculata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Arcidens confragosus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lampsilis teres</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Obliquaria reflexa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Plectomerus dombeyanus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Potamilus ohioensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Potamilus purpuratus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pyganodon grandis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Quadrula aspera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Quadrula quadrula</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. species live	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. species total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Appr. Density (no./m ²)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Modification*														
	Existing	DI-25	DI-25	DI-25	DI-23, DF	DI-23, DF	DI-22	DI-24, DF	DI-21, DF	DI-21, DF	-	-	-	-
	Proposed	-	-	-	-	-	-	-	-	-	DR-12	DR-11	DR-10	DR-10
Habitat		TW	TW	TW	Inside	Inside	Inside	Inside	Outside	Outside	TW	Channel	Channel	Outside
Depth (m)		3.7	5.5	3.1	5.2	8.5	1.2	2.1	7.6	8.5	4.9	6.1	4.3	6.1
Substrate														
	Bedrock	-	-	-	-	-	-	-	-	-	-	-	-	-
	Boulder	-	-	-	-	-	-	-	10	-	25	-	-	-
	Cobble	-	-	-	-	-	-	-	10	-	25	-	-	20
	Gravel	10	10	-	30	-	45	-	-	-	25	5	-	30
	Sand	90	90	100	70	50	35	100	80	80	25	95	100	50
	Silt	-	-	-	-	-	20	-	-	10	-	-	-	-
	Clay	-	-	-	-	50	-	-	-	10	-	-	-	-
	Detritus	-	-	-	-	-	-	-	-	-	-	-	-	-
	Shell	-	-	-	-	-	-	-	-	-	-	-	-	-
Zebras/unionid		-	-	-	-	-	-	-	-	-	-	-	-	-
Zeb coverage of substrate		-	-	-	-	-	-	-	-	-	-	-	-	-

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

*see Tables 1-1 and 1-2

Table 3-10. Site 7 unionid species and habitat characteristics (page 3 of 3).

Approx. NM Bank Bed/Patch	44.0	47.5	45.5	49.5	45.1	44.6	Total	
	M	R	M	L	L	L	No.	%
<i>Amblyma plicata</i>	-	-	-	-	-	-	47	19.7
<i>Anodonta suborbiculata</i>	-	-	-	-	-	-	WD	
<i>Arcidens confragosus</i>	-	-	-	-	-	-	2	0.8
<i>Lampsilis teres</i>	-	-	-	-	-	-	1	0.4
<i>Leptodea fragilis</i>	-	-	-	-	-	-	FD	
<i>Obliquaria reflexa</i>	-	-	-	-	-	-	46	19.3
<i>Plectomerus dombeyanus</i>	-	-	-	-	-	-	18	7.6
<i>Potamilus ohiensis</i>	-	-	-	-	-	-	FD	
<i>Potamilus purpuratus</i>	-	-	-	-	-	-	8	3.4
<i>Pyganodon grandis</i>	-	-	-	-	-	-	21	8.8
<i>Quadrula aspera</i>	-	-	-	-	-	-	1	0.4
<i>Quadrula quadrula</i>	-	-	-	-	-	-	94	39.5
Total	0	0	0	0	0	0	238	
No. species live	0	0	0	0	0	0	9	
No. species total	0	0	0	0	0	0	12	
Appr. Density (no./m ²)	-	-	-	-	-	-	0-4	
Modification*								
	Existing	-	-	-	-	-		
	Proposed	DR-9	-	-	-	-		
Habitat		Channel	Outside	Channel	TW	Outside	Outside	
Depth (m)		6.4	9.1	3.4	7.6	6.7	5.8	
Substrate								
	Bedrock	-	-	-	-	-	-	
	Boulder	-	-	-	-	-	-	
	Cobble	-	-	-	-	-	-	
	Gravel	5	10	-	5	5	10	
	Sand	95	90	100	90	95	90	
	Silt	-	-	-	-	-	-	
	Clay	-	-	-	5	-	-	
	Detritus	-	-	-	-	-	-	
	Shell	-	-	-	-	-	-	
Zebras/unionid	-	-	-	-	-	-	-	
Zeb coverage of substrate	-	-	-	-	-	-	-	

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell
R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch
*see Tables 1-1 and 1-2

Table 3-11. MKARNS proposed dredge and permitted disposal areas with respect to unionid sample sites in Reach 2, 2004.

Reach	Pool	Proposed dredge and permitted disposal areas							Unionids near proposed dredge and permitted disposal areas									
		DR/DI ¹	Dn NM	Up NM	Dist.	Site	Habitat	Substrate	B/P	Habitat	Depth	Substrate	Dist from			CPUE ¹	Species	% Juv.
													DR/DI (m)	Direction				
2	4	DR-15	79.0	80.0	1.0		Channel											
2	4	DI-34	79.0	79.8	0.8		Inside (LDB)											
2	4	DI-35	85.4	85.7	0.3		TW (RDB)											
2	4	DI-36	85.5	85.8	0.3		TW (LDB)											
2	4	DR-16	85.8	86.2	0.4		TW											
2	5	DR-17	91.0	92.0	1.0		Channel											
2	5	DI-37	91.3	91.7	0.4		Channel (RDB)											
2	5	DR-18	95.0	97.0	2.0		Channel											
2	5	DI-38	95.2	96.3	1.1		Inside (LDB)											
2	5	DR-19	101.0	102.4	1.4	8	Channel	Sd/Gr	Channel	2.7 - 4.3	Sd/Gr	0	In	0	0	0		
2	5	DI-39	101.5	103.8	2.3	8	Outside (LDB)	Sd/St/Gr/Cb	Outside	3.1 - 9.6	Sd/St/Gr/Cb	0	In	2	2	0		
2	5								P8-1	Island	1.5 - 3.7	Sd/Cl/St/Dt	325	Dnstream	3	2	8	
2	5	DI-40	106.5	107.7	1.2	9	TW (LDB)	Bd/Cb/Gr/Sd	TW	3.7 - 4.6	Bd/Cb/Gr/Sd	0	In	0	0	0		
2	5	DR-20	107.6	107.9	0.3	9	TW	Bd/Cb/Gr/Sd										
Total DI					6.4													
Total DR					6.1													

¹DR = proposed dredge, DI = permitted disposal (see Tables 1-1 and 1-2)

²NM = navigation mile

³B = bed, P = patch

Br = bedrock, Bd = boulder, Cb = cobble, Gr = gravel, Sd = sand, St = silt, Cl = clay, Dt = detritus, TW = tailwaters, Str. = straight, Ins. = inside bend, NS = not sampled

Table 3-12. Site 8 unionid species and habitat characteristics.

Approx. NM	101.7	101.7	101.7	101.7	103.5	103.0	102.5	102.5	101.5	100.8	103.8	101.0	101.1	Total	
Bank	L	L	L	L	L	L	L	M	M	M	M	L	L	No.	%
Bed/Patch	P8-1	P8-1	P8-1	P8-1											
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	-	FD	-	-	-	-	FD	
<i>Obliquaria reflexa</i>	-	-	-	-	-	4	-	-	-	-	-	-	-	4	22.2
<i>Potamilus ohioensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	WD	WD	
<i>Pyganodon grandis</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	1	5.6
<i>Quadrula quadrula</i>	1	1	5	5	-	1	-	-	-	-	-	-	-	13	72.2
Total	2	1	5	5	0	5	0	0	0	0	0	0	0	18	
No. species live	2	1	1	1	0	2	0	0	0	0	0	0	0	3	
No. species total	2	1	1	1	0	2	0	0	1	0	0	0	1	5	
Appr. Density (no./m ²)	<1	<1	<1	<1	-	<1	-	-	-	-	-	-	-		
Modification*	-	-	-	-	-	-	-	-	-	-	-	-	-		
Existing	-	-	-	-	DI-39	DI-39, DF	DI-39, DF	-	-	-	-	DF	-		
Proposed	-	-	-	-	-	-	-	DR-19	DR-19	DR-19	-	-	-		
Habitat	Island	Island	Island	Island	Outside	Outside	Outside	Channel	Channel	Channel	Channel	Inside	Inside		
Depth (m)	3.4	3.7	2.6	1.5	9.6	4.6	3.1	4.3	2.7	4.3	4.3	3.1	1.5		
Substrate															
Bedrock	-	-	-	-	-	-	-	-	-	-	-	-	-		
Boulder	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cobble	-	-	-	-	25	-	-	-	-	-	33	-	-		
Gravel	-	-	-	-	30	-	-	-	15	25	33	50	50		
Sand	50	50	75	75	30	90	90	100	85	75	34	50	50		
Silt	10	10	10	10	15	10	10	-	-	-	-	-	-		
Clay	40	40	10	10	-	-	-	-	-	-	-	-	-		
Detritus	0	0	5	5	-	-	-	-	-	-	-	-	-		
Shell	-	-	-	-	-	-	-	-	-	-	-	-	-		
Zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-	-		
Zeb coverage of substr	-	-	-	-	-	-	-	-	-	-	-	1%	1%		

*see Tables 1-1 and 1-2

DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell

R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

Table 3-13. Species composition and CPUE¹ within unionid beds and patches, Reaches 2 and 3, MKARNS, 2004.

Reach	2	3	3	3	3	3	3	3	3	3	3	3
Pool	5	7	7	7	7	7	7	7	7	7	10	10
Site	8	11	12	12	12	12	12	12	13	13	22	22
Species	P8-1	B11-1	P12-1	P12-2	P12-3	P12-4	P12-5	P12-6	P13-1	P13-2	B22-1	B22-2
<i>Amblema plicata</i>	-	-	-	-	-	-	-	-	0.2	0.8	-	-
<i>Anodonta suborbiculata</i>	-	0.2	-	-	-	-	-	2.0	-	-	0.1	0.1
<i>Lampsilis teres</i>	-	-	0.3	-	-	-	2.0	1.0	-	0.3	-	-
<i>Leptodea fragilis</i>	-	1.2	0.4	-	-	-	-	-	-	-	0.2	0.6
<i>Megaloniais nervosa</i>	-	0.4	-	1.0	-	-	-	2.0	-	-	0.0	0.6
<i>Obliquaria reflexa</i>	-	0.4	1.1	0.3	1.3	-	4.0	2.0	5.4	20.8	0.2	0.1
<i>Plectomerus dombeyanus</i>	-	-	-	0.3	-	1.0	-	-	-	0.8	7.5	6.3
<i>Potamilus ohiensis</i>	-	1.8	0.3	-	-	-	-	-	-	-	-	-
<i>Potamilus purpuratus</i>	-	1.3	0.1	0.3	-	-	-	1.0	-	-	-	-
<i>Pyganodon grandis</i>	0.3	0.6	0.8	-	1.3	-	-	1.0	0.2	0.8	0.6	0.6
<i>Quadrula aspera</i>	-	0.3	0.6	-	-	-	-	-	-	0.3	0.4	0.3
<i>Quadrula p. pustulosa</i>	-	-	-	-	-	-	-	-	-	0.2	-	-
<i>Quadrula quadrula</i>	3.0	2.9	3.1	1.0	2.7	13.0	6.0	2.0	1.8	6.8	2.9	0.7
<i>Utterbackia imbecillis</i>	-	-	0.1	1.0	-	1.0	2.0	-	-	-	-	-
No. of individuals	13	136	54	12	16	15	14	11	38	186	300	65
No. of 5min samples	4	15	8	3	3	1	1	1	5	6	25	7
Average CPUE	3.3	9.1	6.8	4.0	5.3	15.0	14.0	11.0	7.6	31.0	12.0	9.3
No. of species	2	9	9	6	3	3	4	7	4	8	8	8
% Juveniles	7.7	54.4	11.1	41.7	0.0	20.0	28.5	36.3	0.0	3.2	23.4	-
% of species w/ juveniles	50.0	77.8	22.2	50.0	0.0	66.7	50.0	57.1	0.0	37.5	37.5	-

Nomenclature follows Turgeon *et al.* (1998)

¹CPUE = unionids/5min.

Table 3-14. Location, habitat characteristics, and CPUE¹ of unionid beds (B) and patches (P), Reaches 2 and 3, MKARNS, 2004.

Reach	2	3	3	3	3	3	3	3	3	3	3	3
Pool	5	7	7	7	7	7	7	7	7	7	10	10
Site	8	11	12	12	12	12	12	12	13	13	22	22
Habitat	P8-1	B11-1	P12-1	P12-2	P12-3	P12-4	P12-5	P12-6	P13-1	P13-2	B22-1	B22-2
Cove	-	-	-	-	-	-	-	-	-	-	-	-
Inside bend	-	-	-	-	-	-	-	-	-	-	-	-
Island	3.3	-	6.8	4.0	5.3	15.0	14.0	11.0	-	-	-	-
Midchannel	-	-	-	-	-	-	-	-	-	-	-	-
Outside bend	-	-	-	-	-	-	-	-	7.6	-	-	-
Oxbow	-	-	-	-	-	-	-	-	-	-	-	-
Peninsula	-	-	-	-	-	-	-	-	-	-	-	-
Straight reach	-	9.1	-	-	-	-	-	-	-	-	12.0	8.1
Tailwater	-	-	-	-	-	-	-	-	-	-	-	-
Tributary	-	-	-	-	-	-	-	-	-	31.0	-	-
Ave. CPUE ¹	3.3	9.1	6.8	4.0	5.3	15.0	14.0	11.0	7.6	31.0	12.0	8.1
Modification ²	NM		NM	NM	NM	NM	NM	NM		NM		
Existing		DI-44							DI-56, DF			
Proposed												
Depth (m)												
min	1.5	1.2	0.8	0.9	-	-	-	-	0.5	0.9	0.6	3.1
max	3.7	3.7	1.1	3.5	-	1.8	-	-	2.1	2.4	10.5	9.3
Substrate												
Bedrock	-	-	-	-	-	-	-	-	-	-	-	-
Boulder	-	-	-	-	-	-	-	-	-	-	1	-
Cobble	-	-	-	-	-	-	-	-	-	-	1	-
Gravel	-	5	-	-	-	-	-	-	-	2	1	20
Sand	62	25	25	50	73	-	-	-	50	35	30	30
Silt	10	15	40	-	23	-	-	-	30	42	20	1
Clay	25	50	35	50	-	-	-	-	20	21	35	40
Detritus	3	3	-	-	4	-	-	-	-	-	2	-
Shell	-	2	-	-	-	-	-	-	-	-	10	9
zebras/unionid	-	-	-	-	-	-	-	-	-	-	-	-

¹CPUE = unionids/5min.

²See Tables 1-1 and 1-2

DI = disposal, DF = dike field, NM = no modification

Table 3-15. Site 9 unionid species and habitat characteristics.

Approx. NM Bank Bed/Patch	107.3	107.0	107.6	107.5	107.1	107.0	Total	
	L	L	R	R	R	M	No.	%
<i>Leptodea fragilis</i>	-	-	-	1	WD	-	1	50
<i>Potamilus ohioensis</i>	-	-	-	FD	-	-	FD	
<i>Potamilus purpuratus</i>	-	-	-	-	WD	-	WD	
<i>Quadrula quadrula</i>	-	-	-	1	-	-	1	50
Total	0	0	0	2	0	0	2	
No. species live	0	0	0	2	0	0	2	
No. species total	0	0	0	3	2	0	4	
Appr. Density (no./m ²)	-	-	-	<1	-	-		
Mean No./5min (CPUE)	-	-	-	-	-	-	0.3	
Modification ¹								
Existing	DI-40, DF	DI-40, DF	DF	DF	-	-		
Proposed	-	-	-	-	-	-		
Habitat	TW	TW	TW	TW	TW	Channel		
Depth (m)	3.7	4.6	2.1	2.3	3.1	7.3		
Substrate								
Bedrock	-	-	-	-	-	-		
Boulder	-	100	-	-	-	-		
Cobble	60	-	-	70	-	-		
Gravel	20	-	-	-	30	-		
Sand	20	-	100	30	40	100		
Silt	-	-	-	-	-	-		
Clay	-	-	-	-	-	-		
Detritus	-	-	-	-	-	-		
Shell	-	-	-	-	30	-		
Zebras/unionid	-	-	-	-	-	-		
Zeb coverage of substr	-	-	-	-	-	-		

¹see Tables 1-1 and 1-2
 DI=Disposal, DF=Dike Field, DR=Dredge, NM=Navigation Mile, TW=Tailwaters, FD=Fresh Dead Shell, WD=Weathered Dead Shell
 R=Right desc. bank, M=Midchannel, L=Left desc. bank, B=Bed, P=Patch

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