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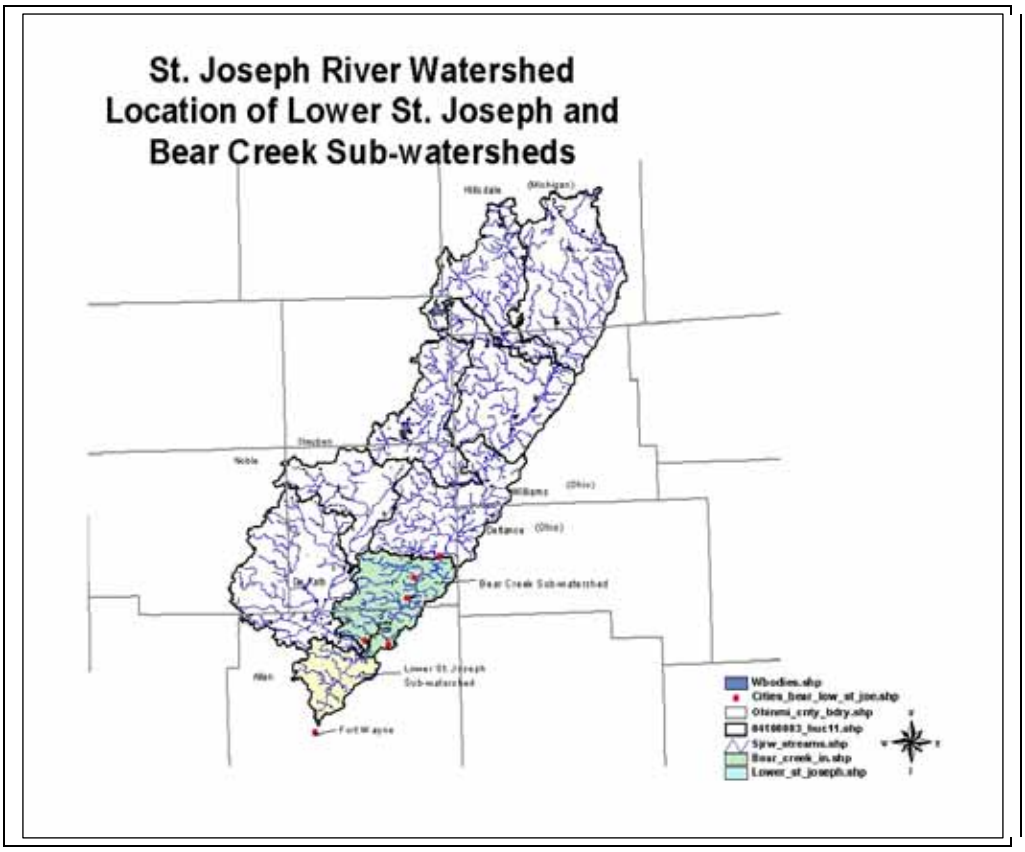
Appendix A Stakeholder groups – Call to Action

A call to Action: What can your neighborhood do?

River Clean-up Days ☼ Volunteer water monitoring ☼ Storm drain marking
Riverside beautification efforts ☼ Erosion reduction ☼
Rain garden demonstrations ☼ Native plant & landscaping workshops ☼
Awareness Projects: Lawn & garden chemical pollution ☼ Pet-waste
☼ (Home) Car wash runoff ☼ Watershed education
☼ National Drinking Water Week (May) ☼
National water quality monitoring day (October) ☼ Earth Day (April)



St. Joseph River	HUC	04100003	(8 digit)
Lower St. Joseph River watershed	HUC	04100003100	(11 digit)
Bear Creek watershed	HUC	04100003070	(11 digit)

St. Joseph River Watershed Initiative
3718 New Vision Drive Fort Wayne, IN 46845
260-484-5848 x120 Fax 260-484-5080 www.sjrwi.org

Our Mission:
To develop partnerships to promote economical and environmentally compatible land uses that improve water quality in the St. Joseph River Watershed.

5 Recreation
6 Industry & commerce
7 Agriculture
8 Aquatic/wildlife habitat
9 Transportation

Environmental Alphabet Soup

ARS	Agricultural Research Service; part of USDA
CES	Cooperative Extension Service
CWA	Clean Water Act
EPA	Environmental Protection Agency
Groundwater	Underground water sources; occurs in aquifers
HUC	Hydrologic Unit Code. A way of cataloguing portions of the landscape according to their drainage
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
ISDA	Indiana Department of Agriculture
NFP	Not-for-profit (organization)
NGO	Non-governmental organization
NPS	Non-point source pollution. Widespread & diffuse, not from a single point or pipe
NRCS	Natural Resource Conservation Service (Part of USDA)
Point source	(pollution) Identifiable source or location of pollution, end of a pipe
SDWA	Safe Drinking Water Act
SJRWI	St. Joseph River Watershed Initiative
Stakeholders	Anyone who lives, works, recreates, or has other interest in the watershed area.
Steering Committee	Small group of stakeholders that helps to guide the watershed management process
SWPI	Source Water Protection Initiative
SWCD	Soil & Water Conservation District
TMDL	Total Maximum Daily Load – the amount of pollution a water body can absorb without violating water quality standards
TNC	The Nature Conservancy
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
Watershed	All of the landscape that drains to a specific point (surface water body)
WMP	Watershed Management Plan
WMS	Watershed Management Section (IDEM)

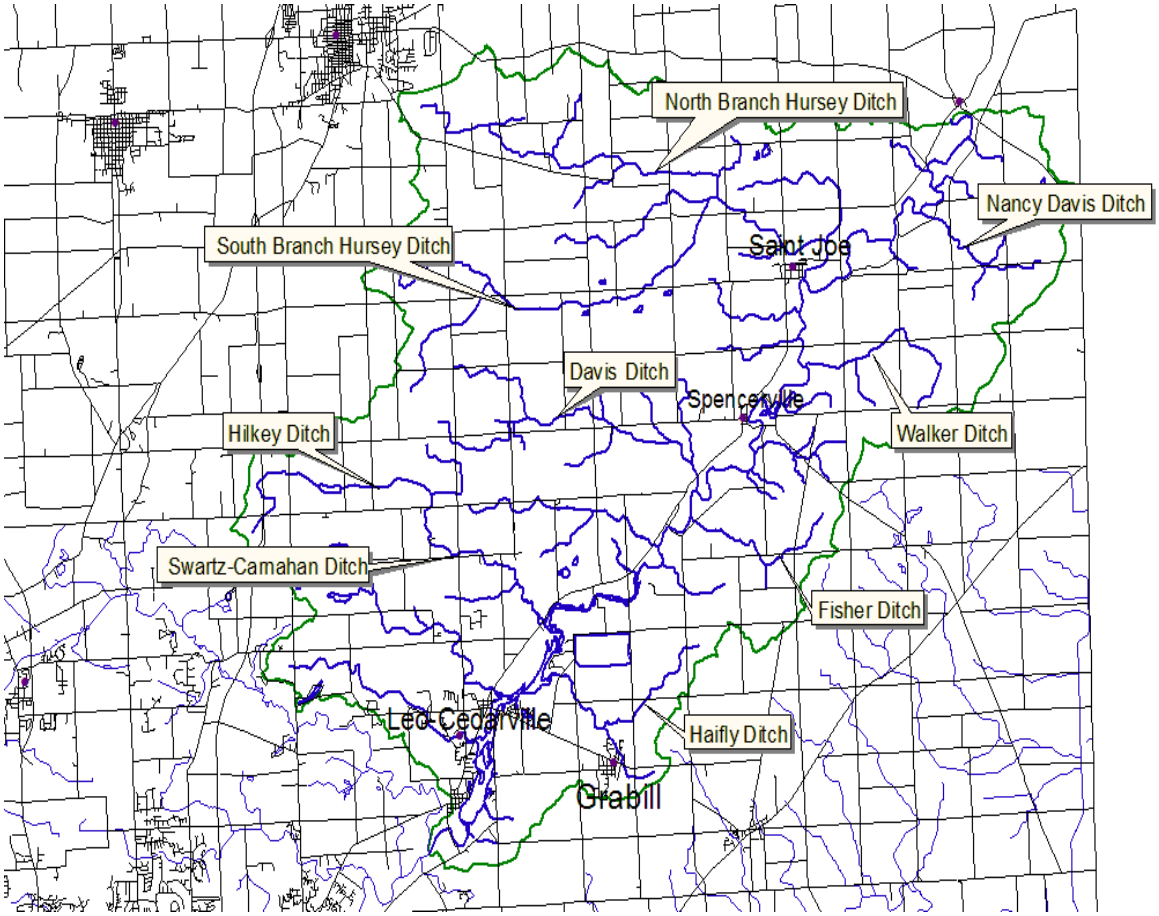
Top 10 reasons for developing a watershed plan:

10 To be able to use grant funds to leverage existing programs
9 To provide the partners with a tangible success story
8 To make it easier to obtain grant funds
7 To empower the local community to create change
6 To enable the community to get additional agency support
5 To provide a way to track progress with measurable results
4 To help the project grow bigger and last longer
3 To inform the community, and market the project to new partners
2 To record the group's decisions; and
#1 To improve the quality of life for people in the watershed by helping ensure clean water and healthy natural resources!

Indiana Watershed Planning Guide, IDEM, Office of Watershed Management Section, 2003

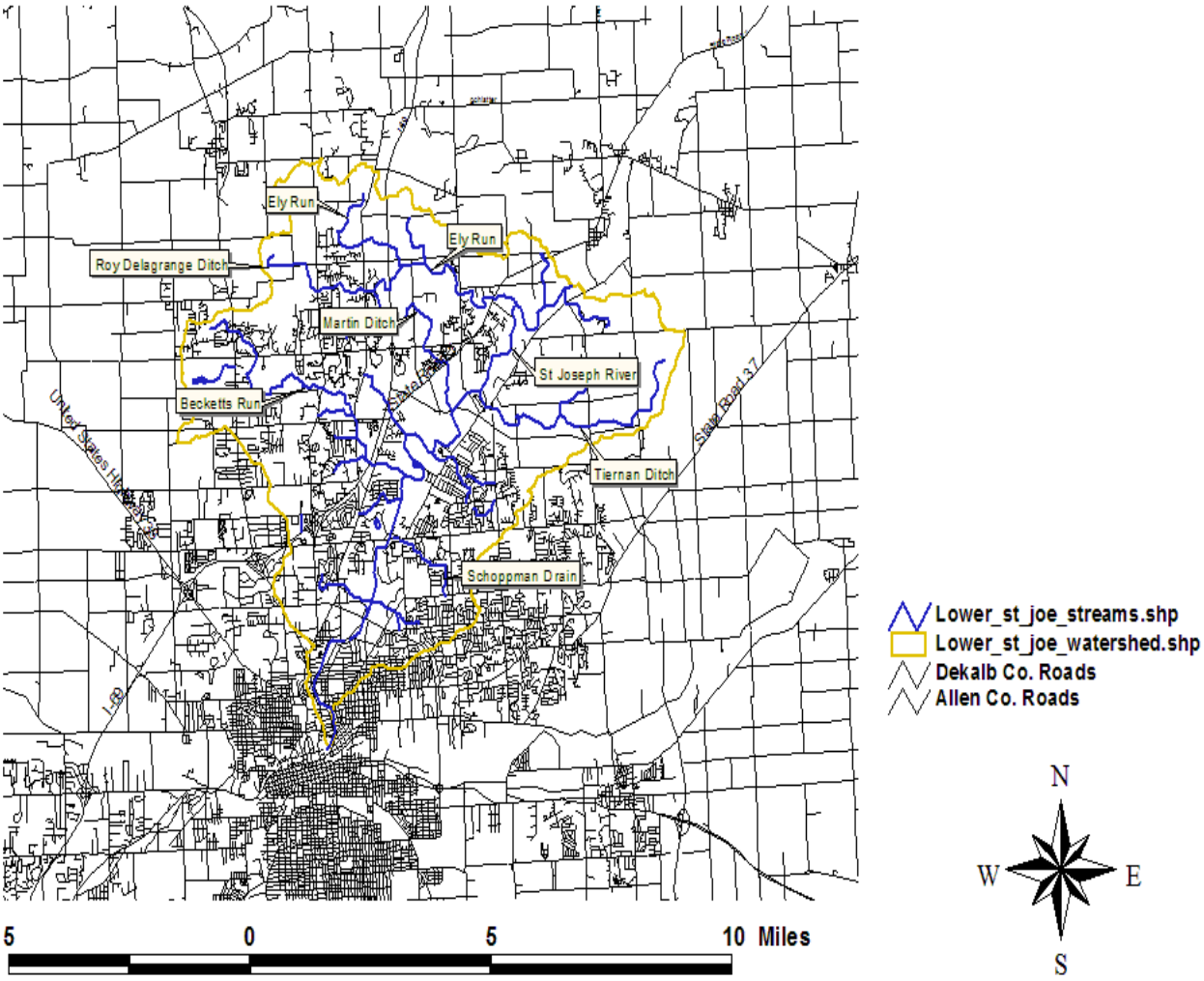
Appendix B Stream Maps

Stream map of the Bear Creek (IN) Watershed

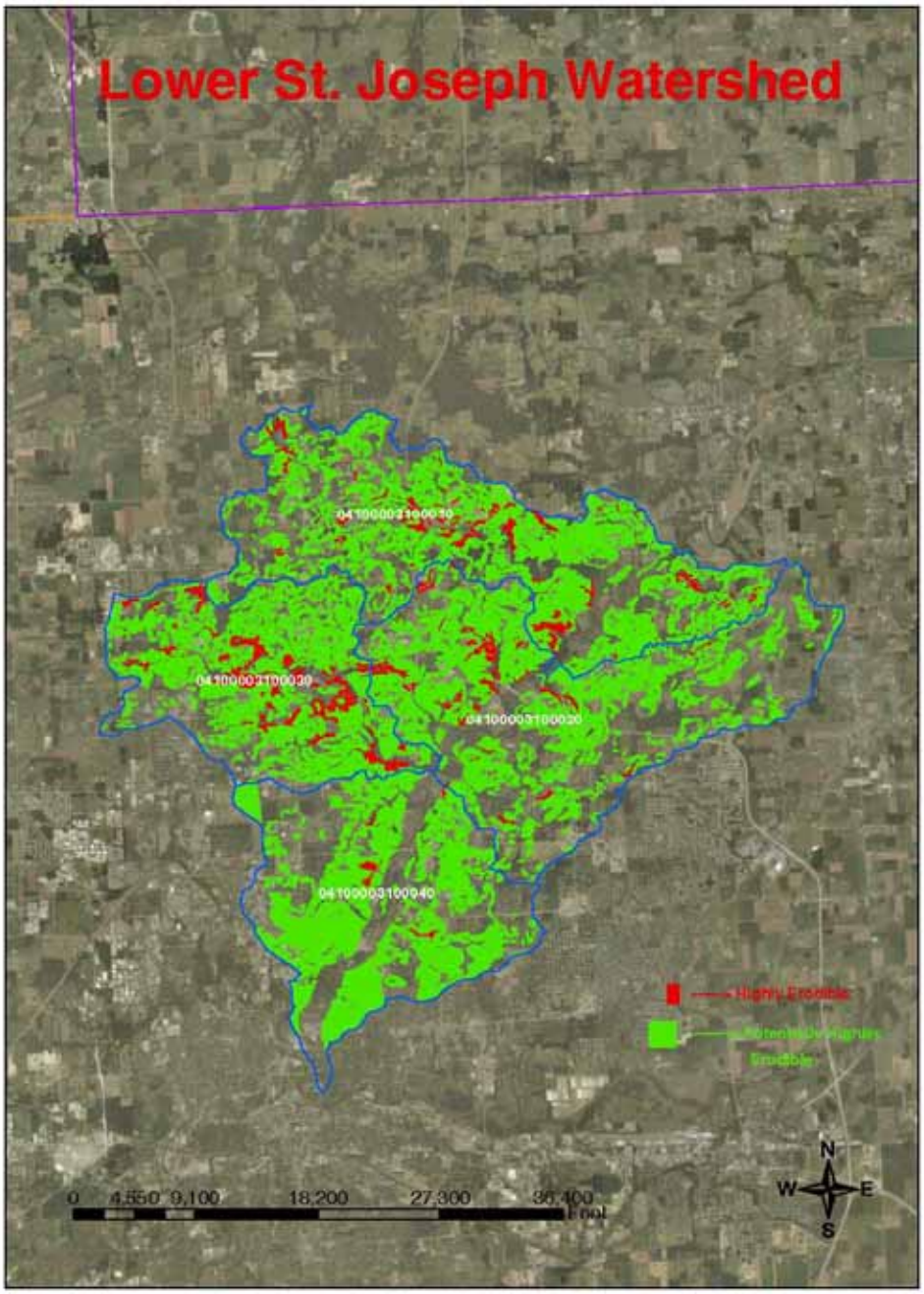


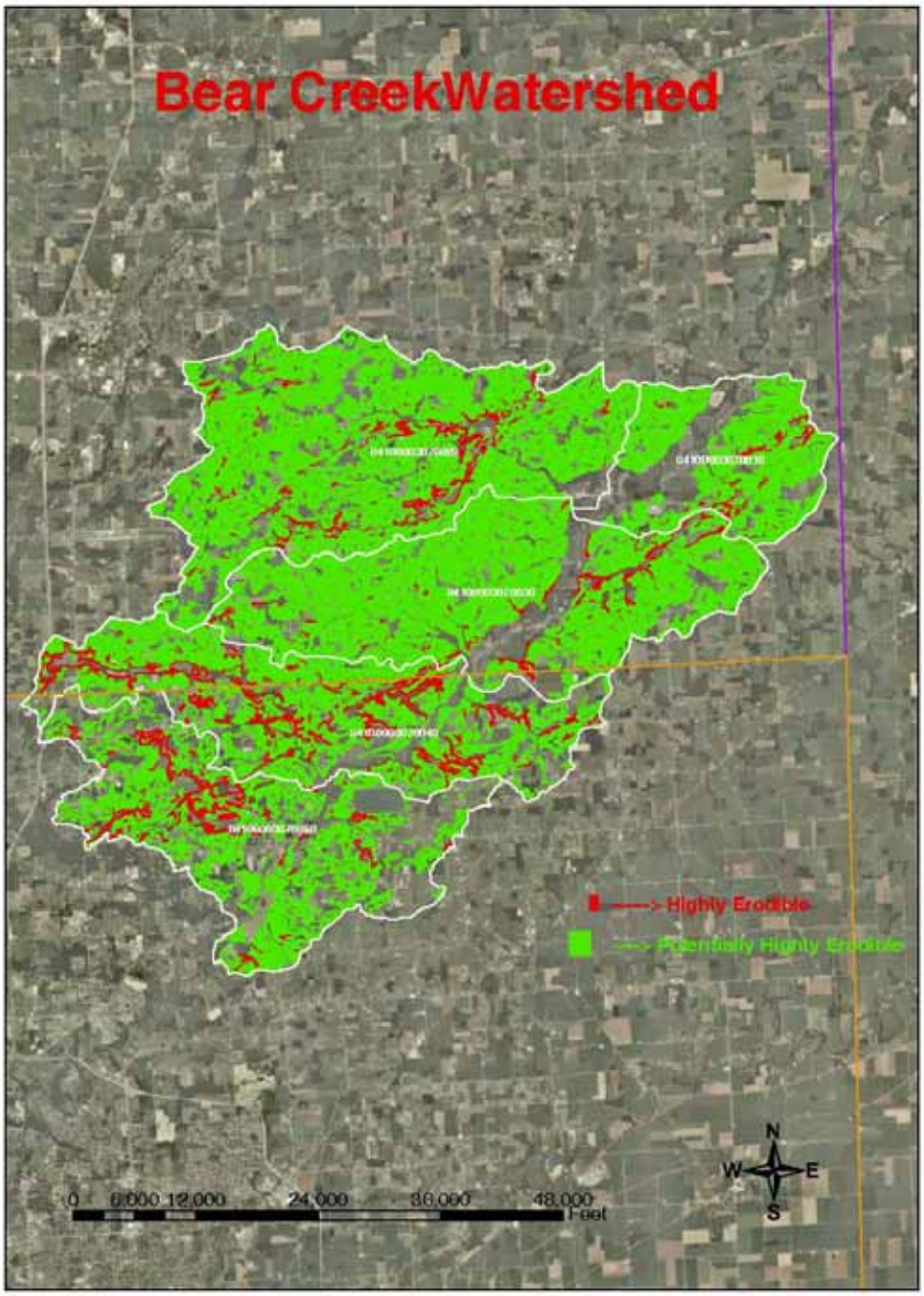
Stream map of the Lower St. Joseph (Allen) Watershed

Lower St. Joseph River Watershed



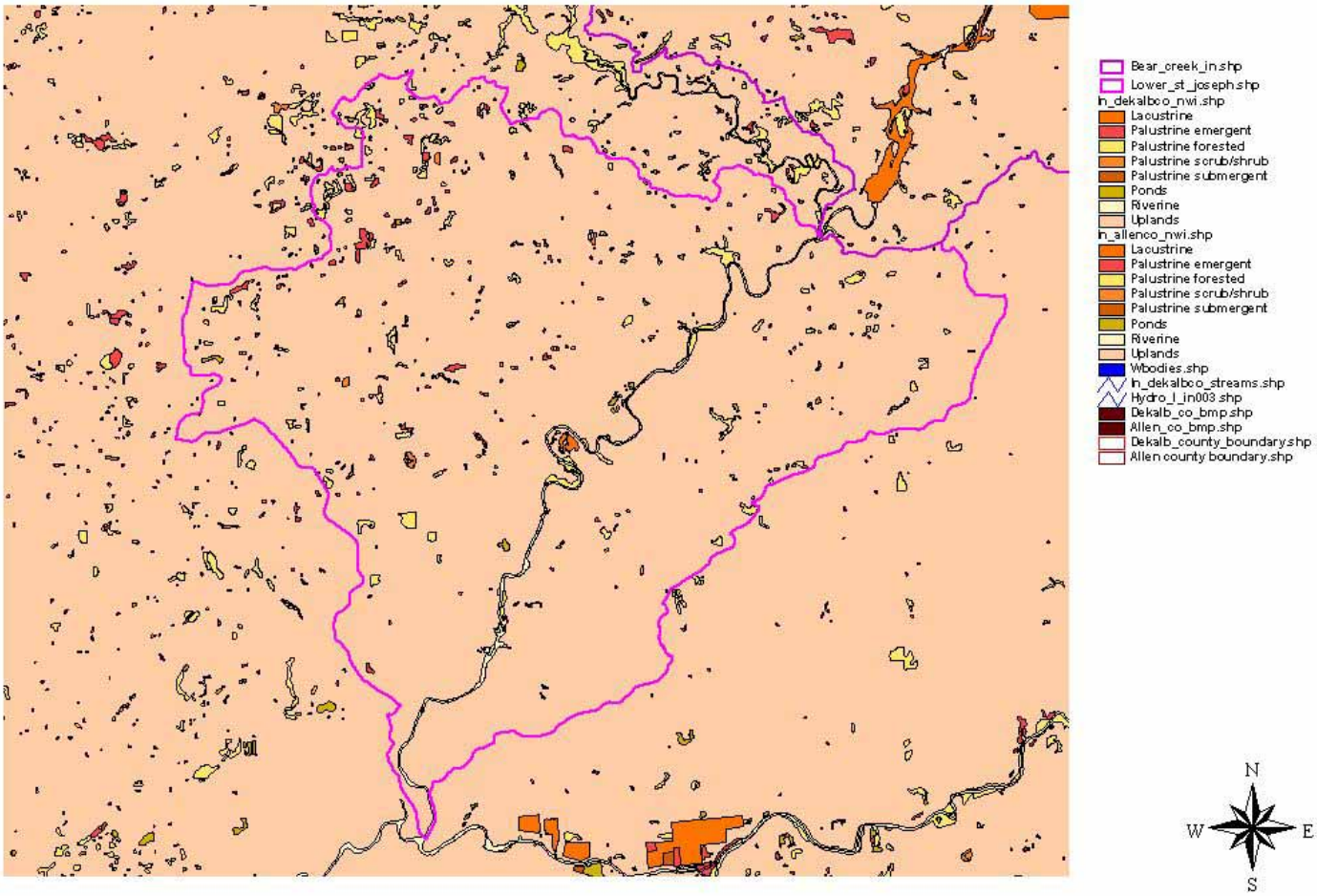
Appendix C Highly Erodible Soils



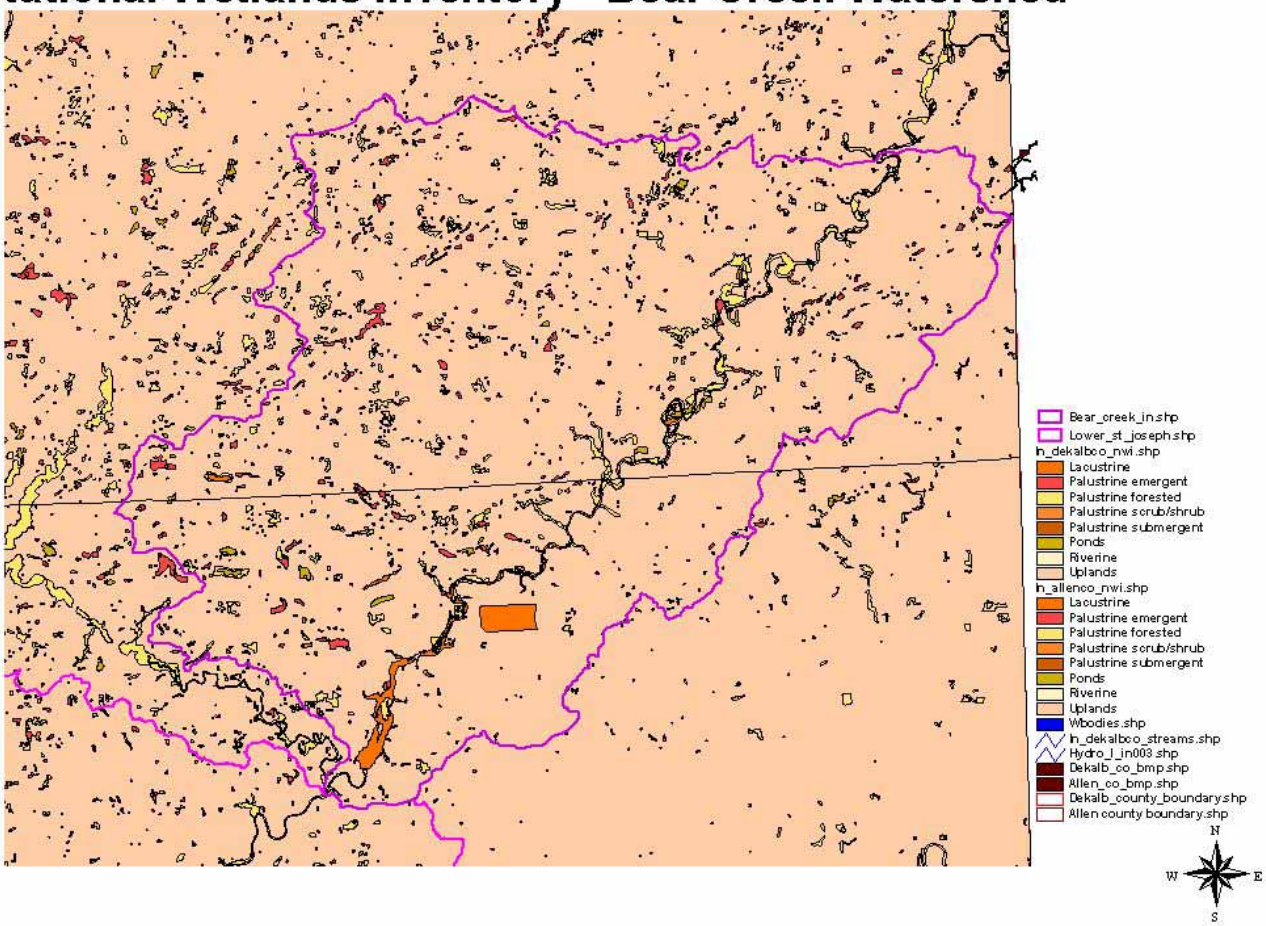

Bear CreekWatershed
Highly Erodible
Potentially Highly Erodible
0 6,000 12,000 24,000 36,000 48,000
Feet
N
W
E
S

Appendix D Wetland Inventory
Maps created by Aaron Wartenberg, 2006

National Wetlands Inventory - Lower St. Joseph watershed



National Wetlands Inventory - Bear Creek Watershed



Appendix E Indiana Fish Consumption Advisory

Group 1	Group 2	Group 3	Group 4	Group 5
Unrestricted consumption One meal per week for women who are pregnant or breast-feeding, women who plan to have children, and children under the age of 15.	Limit to one meal per week (52 meals per year) for adult males and females. One meal per week for women who are pregnant or breast-feeding, women who plan to have children, and children under the age of 15.	Limit to one meal per month (12 meals per year) for adult males and females. Women who are pregnant or breast-feeding, women who plan to have children, and children under the age of 15 do not eat.	Limit to one meal every 2 months (6 meals per year) for adult males and females. Women who are pregnant or breast-feeding, women who plan to have children, and children under the age of 15, do not eat	No consumption (DO NOT EAT).

Appendix F LSJ-BC sub-watershed discharge on local sampling dates

SJRWI sampling dates

dv_dt	Discharge Fort Wayne
10d	12n
4/3/2001	530
4/10/2001	2220
4/17/2001	1120
4/24/2001	1560
5/1/2001	636
5/8/2001	389
5/15/2001	373
5/22/2001	1300
5/29/2001	2390
6/5/2001	1760
6/12/2001	926
6/19/2001	519
6/26/2001	737
7/3/2001	306
7/10/2001	237
7/17/2001	185
7/24/2001	279
7/31/2001	204
8/7/2001	74
8/14/2001	128
8/21/2001	153
8/28/2001	195
9/4/2001	144
9/11/2001	208
9/18/2001	149
9/25/2001	223
10/2/2001	153
10/9/2001	394
10/16/2001	5370
10/23/2001	4980
10/30/2001	1820
4/2/2002	3870
4/9/2002	4810
4/16/2002	2880
4/23/2002	1390
4/30/2002	877
5/7/2002	700
5/14/2002	4370
5/21/2002	2250
5/28/2002	897
6/4/2002	710
6/11/2002	487
6/18/2002	372
6/25/2002	380
7/2/2002	265
7/9/2002	188
7/16/2002	149
7/23/2002	131
7/30/2002	524
8/6/2002	104
8/13/2002	83
8/20/2002	150
8/27/2002	86
9/3/2002	75
9/10/2002	60
9/17/2002	45
9/24/2002	98
10/1/2002	42
10/8/2002	105
10/15/2002	94
10/22/2002	90
10/29/2002	100
4/1/2003	1460
4/8/2003	3060
4/15/2003	788
4/22/2003	475
4/29/2003	314
5/6/2003	3920
5/13/2003	4850
5/20/2003	1160
5/27/2003	460
6/3/2003	372
6/10/2003	287
6/17/2003	469
6/24/2003	260
7/1/2003	184
7/8/2003	786
7/15/2003	400
7/22/2003	956
7/29/2003	1410
8/5/2003	3590
8/12/2003	756
8/19/2003	305
8/26/2003	283
9/2/2003	5670
9/9/2003	835
9/16/2003	352
9/23/2003	757
9/30/2003	2140
10/7/2003	618
10/14/2003	364
10/21/2003	814
10/28/2003	467
4/6/2004	604
4/13/2004	389

4/20/2004	353
4/27/2004	305
5/4/2004	577
5/11/2004	1020
5/18/2004	673
5/25/2004	3210
6/1/2004	5050
6/8/2004	731
6/15/2004	5100
6/22/2004	1990
6/29/2004	574
7/6/2004	421
7/13/2004	413
7/20/2004	520
7/27/2004	483
8/3/2004	297
8/10/2004	181
8/17/2004	139
8/24/2004	215
8/31/2004	354
9/7/2004	241
9/14/2004	181
9/21/2004	151
9/28/2004	143
10/5/2004	207
10/12/2004	140
10/19/2004	129
10/26/2004	126
4/5/2005	722
4/12/2005	492
4/19/2005	384
4/26/2005	618
5/3/2005	487
5/10/2005	353
5/17/2005	571

5/24/2005	713
5/31/2005	243
6/7/2005	157
6/14/2005	285
6/21/2005	146
6/28/2005	118
7/5/2005	111
7/12/2005	85
7/19/2005	231
7/26/2005	235
8/2/2005	260
8/9/2005	121
8/16/2005	171
8/23/2005	121
8/30/2005	92
9/6/2005	68
9/13/2005	77
9/20/2005	129
9/27/2005	267
10/4/2005	215
10/11/2005	162
10/18/2005	94
10/25/2005	110
4/4/2006	1990
4/11/2006	723
4/18/2006	757
4/25/2006	367
5/2/2006	443
5/9/2006	434
5/16/2006	5040
5/23/2006	1530
5/30/2006	639
6/6/2006	371
6/13/2006	343
6/20/2006	217

6/27/2006	474
7/4/2006	347
7/11/2006	328
7/18/2006	1720
7/25/2006	509
8/1/2006	1090
8/8/2006	285
8/15/2006	226
8/22/2006	228
8/29/2006	674
9/5/2006	228
9/12/2006	162
9/19/2006	155
9/26/2006	203

Appendix G Load calculations for pollutants at the Tennessee Avenue Bridge

E. coli 2005 Sorted by flow

E. Coli	WQS =	235	cfu/100ml	*= Criteria * Flow * ((28317/100)*60*60*24)*		
Date	USGS FLOW CFS	TMDL (cfu/day)	Actual Data (cfu/100 mL)	Actual Load (cfu/day)	Difference	% Reduction
4/4/2005	695	4.00E+12	19	3.23E+11	-3.67E+12	-1136.84
4/11/2005	570	3.28E+12	20	2.79E+11	-3.00E+12	-1075.00
4/18/2005	405	2.33E+12	40	3.96E+11	-1.93E+12	-487.50
4/25/2005	577	3.32E+12	387	5.46E+12	2.15E+12	39.28
5/2/2005	490	2.82E+12	70	8.39E+11	-1.98E+12	-235.71
5/9/2005	373	2.14E+12	18	1.64E+11	-1.98E+12	-1205.56
5/18/2005	570	3.28E+12	110	1.53E+12	-1.74E+12	-113.64
5/23/2005	855	4.92E+12	111	2.32E+12	-2.59E+12	-111.71
5/31/2005	243	1.40E+12	192	1.14E+12	-2.56E+11	-22.40
6/6/2005	186	1.07E+12	5200	2.37E+13	2.26E+13	**95.48**
6/13/2005	226	1.30E+12	1986	1.10E+13	9.68E+12	88.17
6/20/2005	154	8.85E+11	109	4.11E+11	-4.75E+11	-115.60
6/27/2005	104	5.98E+11	50	1.27E+11	-4.71E+11	-370.00
7/5/2005	111	6.38E+11	87	2.36E+11	-4.02E+11	-170.11
7/11/2005	110	6.32E+11	157	4.23E+11	-2.10E+11	-49.68
7/18/2005	118	6.78E+11	210	6.06E+11	-7.22E+10	-11.90
7/25/2005	224	1.29E+12	34	1.86E+11	-1.10E+12	-591.18
8/1/2005	258	1.48E+12	99	6.25E+11	-8.58E+11	-137.37
8/8/2005	208	1.20E+12	921	4.69E+12	3.49E+12	74.48
8/15/2005	196	1.13E+12	249	1.19E+12	6.71E+10	5.62
8/22/2005	122	7.01E+11	140	4.18E+11	-2.84E+11	-67.86
8/29/2005	99	5.69E+11	45	1.09E+11	-4.60E+11	-422.22
9/6/2005	68	3.91E+11	35	5.82E+10	-3.33E+11	-571.43
9/13/2005	77	4.43E+11	14	2.64E+10	-4.16E+11	-1578.57
9/19/2005	108	6.21E+11	28	7.40E+10	-5.47E+11	-739.29
9/26/2005	427	2.46E+12	1300	1.36E+13	1.11E+13	81.92
10/3/2005	188	1.08E+12	68	3.13E+11	-7.68E+11	-245.59
10/10/2005	145	8.34E+11	40	1.42E+11	-6.92E+11	-487.50
10/17/2005	93	5.35E+11	67	1.52E+11	-3.82E+11	-250.75
10/24/2005	101	5.81E+11	199	4.92E+11	-8.90E+10	-18.09
10/31/2005	85	4.89E+11	16	3.33E+10	-4.55E+11	-1368.75

E. coli 2006 Sorted by Flow

E. Coli	WQS =	235	cfu/100ml	*= Criteria * Flow * ((28317/100)*60*60*24)*		
Date	USGS FLOW CFS	TMDL (cfu/day)	Actual Data (cfu/100 mL)	Actual Load (cfu/day)	Difference	% Reduction
08/21/06	110	6.32443E+11	365	9.82305E+11	3.49862E+11	35.61643836
09/11/06	165	9.48665E+11	201	8.11411E+11	-1.37254E+11	-16.9154229
09/26/06	203	1.16715E+12	261	1.29628E+12	1.29131E+11	9.961685824
09/18/06	207	1.19014E+12	3000	1.51933E+13	1.40032E+13	**92.16666667**
08/28/06	222	1.27639E+12	240	1.30354E+12	27157135680	2.083333333
09/05/06	228	1.31088E+12	133	7.41904E+11	-5.68979E+11	-76.6917293
08/14/06	246	1.41437E+12	58	3.49079E+11	-1.06529E+12	-305.172414
10/02/06	251	1.44312E+12	2420	1.48611E+13	1.34179E+13	90.2892562
07/06/06	322	1.85133E+12	66	5.19949E+11	-1.33138E+12	-256.060606
06/19/06	359	2.06406E+12	228	2.00258E+12	-61482776544	-3.07017544
08/07/06	371	2.13306E+12	81	7.35224E+11	-1.39783E+12	-190.123457
07/10/06	379	2.17905E+12	45	4.17266E+11	-1.76179E+12	-422.222222
10/09/06	387	2.22505E+12	205	1.941E+12	-2.84049E+11	-14.6341463
06/12/06	391	2.24805E+12	126	1.20534E+12	-1.04271E+12	-86.5079365
04/24/06	396	2.2768E+12	100	9.68849E+11	-1.30795E+12	-135
05/08/06	402	2.31129E+12	45	4.42588E+11	-1.8687E+12	-422.222222
05/01/06	411	2.36304E+12	308	3.09709E+12	7.3405E+11	23.7012987
06/05/06	454	2.61027E+12	184	2.04378E+12	-5.66483E+11	-27.7173913
07/24/06	460	2.64476E+12	96	1.08041E+12	-1.56435E+12	-144.791667
06/26/06	564	3.24271E+12	122	1.68345E+12	-1.55926E+12	-92.6229508
05/30/06	639	3.67392E+12	86	1.3445E+12	-2.32942E+12	-173.255814
04/10/06	680	3.90965E+12	70	1.16458E+12	-2.74507E+12	-235.714286
10/16/06	762	4.38111E+12	411	7.66228E+12	3.28117E+12	42.82238443
04/17/06	863	4.9618E+12	866	1.82848E+13	1.3323E+13	72.86374134
10/23/06	1130	6.49692E+12	36	9.95272E+11	-5.50164E+12	-552.777778
04/03/06	1640	9.42915E+12	517	2.07441E+13	1.1315E+13	54.54545455
07/31/06	1700	9.77412E+12	488	2.02969E+13	1.05228E+13	51.8442623
05/22/06	1780	1.02341E+13	86	3.74524E+12	-6.48884E+12	-173.255814
07/17/06	2070	1.19014E+13	372	1.88397E+13	6.93828E+12	36.82795699
05/15/06	4190	2.40903E+13	687	7.04258E+13	4.63355E+13	65.79330422

TSS 2005 Tennessee BridgeSorted by Flow

Date	USGS FLOW CFS	TMDL (tons/day)	Actual Data (mg/L)	Actual Load (tons/day)	Difference (tons/day)	% Reduction
9/6/05	68	5.50239	12	2.200956	-3.301434	-150
9/13/05	77	6.2306475	13	2.69994725	-3.53070025	-130.7692308
10/31/05	85	6.8779875	12	2.751195	-4.1267925	-150
10/17/05	93	7.5253275	20	5.016885	-2.5084425	-50
8/29/05	99	8.0108325	14	3.7383885	-4.272444	-114.2857143
10/24/05	101	8.1726675	21	5.72086725	-2.45180025	-42.85714286
6/27/05	104	8.41542	8	2.244112	-6.171308	-275
9/19/05	108	8.73909	8	2.330424	-6.408666	-275
7/11/05	110	8.900925	32	9.49432	0.593395	6.25
7/5/05	111	8.9818425	18	5.3891055	-3.592737	-66.66666667
7/18/05	118	9.548265	20	6.36551	-3.182755	-50
8/22/05	122	9.871935	17	5.5940965	-4.2778385	-76.47058824
10/10/05	145	11.7330375	15	5.86651875	-5.86651875	-100
6/20/05	154	12.461295	24	9.969036	-2.492259	-25
6/6/05	186	15.050655	26	13.043901	-2.006754	-15.38461538
10/3/05	188	15.21249	18	9.127494	-6.084996	-66.66666667
8/15/05	196	15.85983	11	5.815271	-10.044559	-172.7272727
8/8/05	208	16.83084	14	7.854392	-8.976448	-114.2857143
7/25/05	224	18.12552	12	7.250208	-10.875312	-150
6/13/05	226	18.287355	8	4.876628	-13.410727	-275
5/31/05	243	19.6629525	20	13.108635	-6.5543175	-50
8/1/05	258	20.876715	38	26.443839	5.567124	**21.05263158**
5/9/05	373	30.1822275	13	13.0789653	-17.10326225	-130.7692308
4/18/05	405	32.7715875	28	30.586815	-2.1847725	-7.142857143
9/26/05	427	34.5517725	72	82.924254	48.3724815	**58.33333333**
5/2/05	490	39.649575	14	18.503135	-21.14644	-114.2857143
4/11/05	570	46.122975	14	21.524055	-24.59892	-114.2857143
5/18/05	570	46.122975	25	38.4358125	-7.6871625	-20
4/25/05	577	46.6893975	16	24.901012	-21.7883855	-87.5
4/4/05	695	56.2376625	7	13.1221213	-43.11554125	-328.5714286
5/23/05	855	69.1844625	22	50.7352725	-18.44919	-36.36363636

Based on 30 mg/L TSS target

TSS 2006 Tennessee BridgeSorted by Flow

Date	USGS FLOW CFS	TMDL (tons/day)	Actual Data (mg/L)	Actual Load (tons/day)	Difference (tons/day)	% Reduction
8/21/06	110	8.900925	18	5.340555	-3.56037	-66.67
9/11/06	165	13.3513875	35	15.5766188	2.22523125	14.29
9/26/06	203	16.4262525	31	16.9737943	0.54754175	3.23
9/18/06	207	16.7499225	36	20.099907	3.3499845	16.67
8/28/06	222	17.963685	33	19.7600535	1.7963685	9.09
9/5/06	228	18.44919	23	14.144379	-4.304811	-30.43
8/14/06	246	19.905705	27	17.9151345	-1.9905705	-11.11
10/2/06	251	20.3102925	29	19.6332828	-0.67700975	-3.45
7/6/06	322	26.055435	31	26.9239495	0.8685145	3.23
6/19/06	359	29.0493825	16	15.493004	-13.5563785	-87.50
8/7/06	371	30.0203925	40	40.02719	10.0067975	25.00
7/10/06	379	30.6677325	42	42.9348255	12.267093	28.57
10/9/06	387	31.3150725	34	35.4904155	4.175343	11.76
6/12/06	391	31.6387425	20	21.092495	-10.5462475	-50.00
4/24/06	396	32.04333	37	39.520107	7.476777	18.92
5/8/06	402	32.528835	28	30.360246	-2.168589	-7.14
5/1/06	411	33.2570925	28	31.039953	-2.2171395	-7.14
6/5/06	454	36.736545	28	34.287442	-2.449103	-7.14
7/24/06	460	37.22205	24	29.77764	-7.44441	-25.00
6/26/06	564	45.63747	34	51.722466	6.084996	11.76
5/30/06	639	51.7062825	20.5	35.3326264	-16.37365613	-46.34
4/10/06	680	55.0239	42	77.03346	22.00956	28.57
10/16/06	762	61.659135	52	106.875834	45.216699	42.31
4/17/06	863	69.8318025	28	65.176349	-4.6554535	-7.14
10/23/06	1130	91.436775	46	140.203055	48.76628	34.78
4/3/06	1640	132.7047	30	132.7047	0	0
7/31/06	1700	137.55975	35	160.486375	22.926625	14.29
5/22/06	1780	144.03315	46	220.85083	76.81768	34.78
7/17/06	2070	167.499225	59	329.415143	161.9159175	49.15
5/15/06	4190	339.044325	54.4	614.800376	275.756051	44.85
5/15/06	4190	226.02955	54.4	614.800376	388.770826	**63.24**

Phosphorus 2005 Sorted by flow

Phosphorous	Your Target =	0.3	mg/L	*Load (lb/day) = Criteria * Flow * (5.3945)*		
Date	USGS FLOW CFS	TMDL Lbs/Day	Actual Data (mg/L)	Actual Load (lbs/day)	Difference (lbs/day)	% Reduction
9/6/05	68	110.0478	0.258	94.641108	-15.406692	-16.27906977
9/13/05	77	124.61295	0.107	44.4452855	-80.1676645	-180.3738318
10/31/05	85	137.55975	0.023	10.5462475	-127.0135025	-1204.347826
10/17/05	93	150.50655	0.09	45.151965	-105.354585	-233.3333333
8/29/05	99	160.21665	0.105	56.0758275	-104.1408225	-185.7142857
10/24/05	101	163.45335	0.077	41.9530265	-121.5003235	-289.6103896
6/27/05	104	168.3084	0.024	13.464672	-154.843728	-1150
9/19/05	108	174.7818	0.1	58.2606	-116.5212	-200
7/11/05	110	178.0185	0.155	91.976225	-86.042275	-93.5483871
7/5/05	111	179.63685	0.05	29.939475	-149.697375	-500
7/18/05	118	190.9653	0.129	82.115079	-108.850221	-132.5581395
8/22/05	122	197.4387	0.112	73.710448	-123.728252	-167.8571429
10/10/05	145	234.66075	0.116	90.73549	-143.92526	-158.6206897
6/20/05	154	249.2259	0.09	74.76777	-174.45813	-233.3333333
6/6/05	186	301.0131	0.089	89.300553	-211.712547	-237.0786517
10/3/05	188	304.2498	0.073	74.034118	-230.215682	-310.9589041
8/15/05	196	317.1966	0.14	148.02508	-169.17152	-114.2857143
8/8/05	208	336.6168	0.088	98.740928	-237.875872	-240.9090909
7/25/05	224	362.5104	0.13	157.08784	-205.42256	-130.7692308
6/13/05	226	365.7471	0.102	124.354014	-241.393086	-194.1176471
5/31/05	243	393.25905	0.05	65.543175	-327.715875	-500
8/1/05	258	417.5343	0.135	187.890435	-229.643865	-122.2222222
5/9/05	373	603.64455	0.078	156.947583	-446.696967	-284.6153846
4/18/05	405	655.43175	0.06	131.08635	-524.3454	-400
9/26/05	427	691.03545	0.185	426.138528	-264.8969225	-62.16216216
5/2/05	490	792.9915	0.09	237.89745	-555.09405	-233.3333333
4/11/05	570	922.4595	0.075	230.614875	-691.844625	-300
5/18/05	570	922.4595	0.1	307.4865	-614.973	-200
4/25/05	577	933.78795	0.006	18.675759	-915.112191	-4900
4/4/05	695	1124.75325	0.196	734.83879	-389.91446	-53.06122449
5/23/05	855	1383.68925	0.096	442.78056	-940.90869	-212.5

Phosphorus 2006 Sorted by flow

Phos	Your Target =	0.3	mg/L	Load (lb/day) = Criteria * Flow * (5.3945)		
Date	USGS FLOW CFS	TMDL Lbs/Day	Actual Data (mg/L)	Actual Load (lbs/day)	Difference (lbs/day)	% Reduction
8/21/06	110	178.0185	0.13	77.14135	-100.87715	-130.7692308
9/11/06	165	267.02775	0.156	138.85443	-128.17332	-92.30769231
9/26/06	203	328.52505	0.102	111.698517	-216.826533	-194.1176471
9/18/06	207	334.99845	0.1	111.66615	-223.3323	-200
8/28/06	222	359.2737	0.093	111.374847	-247.898853	-222.5806452
9/5/06	228	368.9838	0.081	99.625626	-269.358174	-270.3703704
8/14/06	246	398.1141	0.209	277.352823	-120.761277	-43.54066986
10/2/06	251	406.20585	0.162	219.351159	-186.854691	-85.18518519
7/6/06	322	521.1087	0.25	434.25725	-86.85145	-20
6/19/06	359	580.98765	0.9	1742.96295	1161.9753	**66.66666667**
8/7/06	371	600.40785	0.162	324.220239	-276.187611	-85.18518519
7/10/06	379	613.35465	0.095	194.228973	-419.1256775	-215.7894737
10/9/06	387	626.30145	0.62	1294.35633	668.05488	**51.61290323**
6/12/06	391	632.77485	0.063	132.882719	-499.8921315	-376.1904762
4/24/06	396	640.8666	0.14	299.07108	-341.79552	-114.2857143
5/8/06	402	650.5767	0.308	667.925412	17.348712	**2.597402597**
5/1/06	411	665.14185	0.175	387.999413	-277.1424375	-71.42857143
6/5/06	454	734.7309	0.057	139.598871	-595.132029	-426.3157895
7/24/06	460	744.441	0.138	342.44286	-401.99814	-117.3913043
6/26/06	564	912.7494	0.188	571.989624	-340.759776	-59.57446809
5/30/06	639	1034.12565	0.025	86.1771375	-947.9485125	-1100
4/10/06	680	1100.478	0.113	414.51338	-685.96462	-165.4867257
10/16/06	762	1233.1827	0.15	616.59135	-616.59135	-100
4/17/06	863	1396.63605	0.1	465.54535	-931.0907	-200
10/23/06	1130	1828.7355	0.191	1164.29494	-664.440565	-57.06806283
4/3/06	1640	2654.094	0.045	398.1141	-2255.9799	-566.6666667
7/31/06	1700	2751.195	0.192	1760.7648	-990.4302	-56.25
5/22/06	1780	2880.663	0.12	1152.2652	-1728.3978	-150
7/17/06	2070	3349.9845	0.21	2344.98915	-1004.99535	-42.85714286
5/15/06	4190	6780.8865	0.293	6622.66582	-158.220685	-2.389078498

Appendix H Atrazine Loads and Targets, Tennessee Avenue Bridge

Atrazine Loads, Targets and Reduction based on Tennessee Bridge sampling by City of Fort Wayne
April 17, 2007

Load Calculation Tool *

mass based pollutants

input	
Atrazine (mg/l)	0.00028
Flow (cfs)	1140
Target Concentration 3 ppb	
(mg/l)	*0.003*

output	
Current Load (lb/day)	1.72
Current Load (ton/year)	0.31
Target Load (lb/day)	18.44
Target Load (ton/year)	3.36

load reduction needed	
(ton/year)	-3.05
% reduction	-971.4

Atrazine 6/19/07 Tennessee Ave Bridge

Load Calculation Tool *

mass based pollutants

input	
Atrazine (mg/l)	0.0018
Flow (cfs)	153
Target Concentration 3 ppb	
(mg/l)	*0.003*

output	
Current Load (lb/day)	1.48
Current Load (ton/year)	0.27
Target Load (lb/day)	2.47
Target Load (ton/year)	0.45

load reduction needed	
(ton/year)	-0.18
% reduction	-66.7

Atrazine 8/21/07 Tennessee Ave Bridge

Load Calculation Tool *

mass based pollutants

input	
Atrazine (mg/l)	0.00056
Flow (cfs)	6230
Target Concentration 3 ppb	
(mg/l)	*0.003*

output	
Current Load (lb/day)	18.81
Current Load (ton/year)	3.43
Target Load (lb/day)	100.75
Target Load (ton/year)	18.39

load reduction needed	
(ton/year)	-14.95
% reduction	-435.7

Appendix I Water Quality Data – City of Fort Wayne

City of Fort Wayne River Survey 2003
St. Joseph River @ Mayhew Road

Wk	Date	ECOLI	Depth(ft)	PHOS	NH3-N	TSS
1	04/07/03	Test Failed	6.52	0.320	0.190	74
2	04/14/03	16	3.41	No Sample	0.427	30
3	04/21/03	9	2.88	0.110	0.100	40
4	04/28/03	4	1.91	0.190	0.003	23
5	05/05/03	8	7.58	0.411	0.219	372
6	05/12/03	1300	9.58	0.263	0.174	144
7	05/19/03	62	4.19	0.160	0.100	57
8	05/27/03	94	3.06	0.241	0.098	39
9	06/02/03	30	2.73	0.219	0.003	35
10	06/09/03	54	3.01	0.020	0.007	18
11	06/16/03	150	3.34	0.160	0.200	45
12	06/23/03	60	2.69	0.139	0.037	59
13	06/30/03	100	2.37	0.187	0.099	29
14	07/07/03	1040	12.57	0.124	0.119	116
15	07/15/03	100	2.97	1.426	0.024	58
16	07/21/03	340	5.04	0.400	0.100	246
17	07/28/03	10	5.08	0.494	0.063	196
18	08/04/03	780	6.52	0.495	0.060	89
19	08/11/03	190	3.66	0.225	0.029	35
20	08/18/03	52	2.42	0.110	0.100	35
21	08/25/03	35	3.09	0.081	0.027	14
22	09/02/03	2	10.54	0.518	0.119	103
23	09/08/03	48	3.55	0.150	0.047	26
24	09/15/03	168	3.44	0.085	0.022	44
25	09/22/03	132	3.15	0.120	0.100	28
26	09/29/03	176	5.98	0.331	0.052	65
27	10/06/03	76	3.49	0.181	0.051	31
28	10/13/03	106	1.67	0.132	0.004	19
29	10/27/03	18	2.38	0.112	0.018	18
	Max.	1300	12.57	1.426	0.427	372
	Min.	2	1.67	0.020	0.003	14
	Avg.	184	4.44	0.264	0.089	72

E.Coli = colonies per 100 mls, yellow indicates >235

PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l,
TSS = Total Suspended Solids mg/l

Jim Cornell

City of Fort Wayne River Survey 2003

St. Joseph River @ Tennessee Street

Wk	Date	ECOLI	Depth(ft)	PHOS	NH3-N	TSS
1	04/07/03	8	13.53	0.348	0.181	90
2	04/14/03	34	11.69	No Sample	0.081	25
3	04/21/03	5	11.55	0.130	0.100	9
4	04/28/03	3	11.31	0.079	0.003	26
5	05/05/03	12	14.12	0.174	0.062	124
6	05/12/03	700	18.73	0.358	0.313	176
7	05/19/03	78	12.27	0.140	0.100	39
8	05/27/03	76	11.01	0.225	0.027	28
9	06/02/03	38	11.30	0.057	0.003	27
10	06/09/03	80	11.32	0.021	0.003	14
11	06/16/03	130	13.38	0.100	0.100	22
12	06/23/03	40	11.92	0.120	0.018	35
13	06/30/03	190	11.29	0.131	0.053	26
14	07/07/03	360	15.36	0.136	0.047	54
15	07/15/03	500	13.91	0.793	0.011	42
16	07/21/03	440	14.37	0.350	0.100	236
17	07/28/03	60	12.95	0.192	0.023	72
18	08/04/03	640	14.46	0.316	0.077	87
19	08/11/03	120	12.01	0.145	0.012	31
20	08/18/03	54	11.51	0.100	0.100	28
21	08/25/03	20	11.20	0.126	0.155	13
22	09/02/03	8	15.51	0.541	0.076	200
23	09/08/03	96	12.16	0.110	0.029	20
24	09/15/03	92	12.07	0.009	0.024	38
25	09/22/03	92	11.93	0.110	0.100	25
26	09/29/03	184	14.30	0.279	0.043	63
27	10/06/03	104	11.96	0.153	0.039	22
28	10/13/03	20	11.58	0.107	0.009	18
29	10/27/03	23	11.69	0.062	0.034	22
	Max.	700	18.73	0.793	0.313	236
	Min.	3	11.01	0.009	0.003	9
	Avg.	145	12.77	0.193	0.066	56

E.Coli = colonies per 100 mls, yellow indicates >235

PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l,

TSS = Total Suspended Solids mg/l

Jim Cornell

City of Fort Wayne River Survey 2004

St. Joseph River @ Mayhew Road

Wk	Date	ECOLI	Depth(ft)	PHOS	NH3-N	TSS
1	04/05/04	74	1.74	0.17	0.009	25
2	04/12/04	24	3.00	0.09	0.009	28
3	04/19/04	25	2.73	0.12	0.100	43
4	04/26/04	58	1.97	0.17	0.060	68
5	05/03/04	1298	3.41	0.10	0.110	48
6	05/11/04	839	3.46	0.19	0.150	79
7	05/17/04	152	3.51	0.16	0.060	45
8	05/24/04	9680	10.24	0.50	0.200	312
9	06/01/04	7740	10.44	0.45	0.160	180
10	06/07/04	346	3.22	0.39	0.030	62
11	06/14/04	2324	12.47	0.18	0.210	108
12	06/21/04	312	6.15	0.21	0.100	73
13	06/28/04	107	2.95	0.08	0.010	36
14	07/06/04	126	4.38	0.08	0.008	20
15	07/12/04	104	4.43	0.14	0.008	60
16	07/19/04	537	3.35	0.16	0.100	55
17	07/26/04	214	3.42	0.27	0.090	77
18	08/02/04	62	3.52	0.10	0.010	24
19	08/09/04	40	2.65	0.16	0.009	52
20	08/16/04	Failed	3.87	0.08	0.020	47
21	08/23/04	422	3.50	0.16	0.100	44
22	08/30/04	196	3.87	0.08	0.030	36
23	09/07/04	786	4.05	0.09	0.009	29
24	09/13/04	220	3.92	0.10	0.008	34
25	09/21/04	146	3.87	0.12	0.014	19
26	09/27/04	166	3.56	0.14	0.100	29
27	10/04/04	110	3.50	0.09	0.020	26
28	10/11/04	88	2.95	0.17	0.026	22
29	10/18/04	53	1.91	0.10	0.100	14
30	10/25/04	99	1.93	0.13	0.016	21
	Max.	9680	10.44	0.50	0.210	312
	Min.	24	1.74	0.08	0.008	14
	Avg.	909	4.13	0.17	0.062	57

E.Coli = colonies per 100 mls, yellow indicates >235

PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l,

TSS = Total Suspended Solids mg/l

City of Fort Wayne River Survey 2004

St. Joseph River @ Tennessee Street

Wk	Date	ECOLI	Depth(ft)	PHOS	NH3-N	TSS
1	04/05/04	20	11.62	0.13	0.009	22
2	04/12/04	21	11.70	0.12	0.009	25
3	04/19/04	14	11.73	0.09	0.100	30
4	04/26/04	36	11.87	0.10	0.040	21
5	05/03/04	1454	12.09	0.08	0.070	30
6	05/11/04	238	12.18	0.10	0.110	39
7	05/17/04	93	12.03	0.15	0.160	33
8	05/24/04	9680	14.61	0.57	0.200	434
9	06/01/04	6520	15.57	0.44	0.120	230
10	06/07/04	218	12.01	0.33	0.030	48
11	06/14/04	3309	20.83	0.17	0.190	180
12	06/21/04	126	13.22	0.20	0.100	8
13	06/28/04	190	11.92	0.08	0.008	34
14	07/06/04	20	11.57	0.08	0.008	22
15	07/12/04	1288	11.78	0.13	0.008	66
16	07/19/04	85	11.56	0.13	0.100	31
17	07/26/04	320	12.18	0.15	0.080	50
18	08/02/04	82	12.12	0.13	0.010	16
19	08/09/04	104	11.71	0.11	0.009	33
20	08/16/04	Failed	11.30	0.05	0.020	33
21	08/23/04	190	11.95	0.12	0.100	30
22	08/30/04	1488	13.27	0.11	0.010	30
23	09/07/04	840	12.74	0.09	0.009	13
24	09/13/04	82	11.74	0.12	0.008	24
25	09/21/04	85	6.68	0.17	0.023	32
26	09/27/04	66	5.83	0.12	0.100	41
27	10/04/04	110	6.35	0.15	0.020	35
28	10/11/04	58	11.72	0.21	0.022	31
29	10/18/04	39	11.74	0.10	0.100	23
30	10/25/04	613	8.75	0.11	0.008	28
	Max.	9680	20.83	0.57	0.200	434
	Min.	14	5.83	0.05	0.008	8
	Avg.	944	11.81	0.15	0.059	56

E.Coli = colonies per 100 mls, yellow indicates >235

PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l,

TSS = Total Suspended Solids mg/l

City of Fort Wayne River Survey 2005

St. Joseph River @ Mayhew Road

Wk	Date	Depth(ft)	ECOLI	DO	Temp(F)	pH	PHOS	NH3-N	TSS
1	04/04/05	3.29	37	12.27	47.2	6.87	0.15	0.020	8
2	04/11/05	2.92	37	10.53	56.9	7.28	0.09	0.024	28
3	04/18/05	2.54	32	11.7	58.4	7.72	0.05	0.100	32
4	04/25/05	2.95	179	12.71	45.7	7.01	0.03	0.061	16
5	05/02/05	2.39	40	12.18	49.6	7.06	0.07	0.020	17
6	05/09/05	2.14	43	10.74	61.1	7.34	0.07	0.020	19
7	05/18/05	3.06	73	9.31	59.7	7.47	0.70	0.100	37
8	05/23/05	3.96	68	5.46	62.0	8.16	0.14	0.020	30
9	05/31/05	3.02	44	No Data	65.2	8.12	0.11	0.027	26
10	06/06/05	3.03	96	No Data	70.3	7.92	0.08	0.080	18
11	06/13/05	3.22	727	No Data	75.5	7.74	0.09	0.181	38
12	06/20/05	2.23	73	8.32	70.0	8.12	0.12	0.100	37
13	06/27/05	2.35	62	6.48	78.0	7.86	0.03	0.050	17
14	07/05/05	2.31	96	5.68	76.0	7.97	0.03	0.002	32
15	07/11/05	2.57	57	5.34	76.6	7.93	0.13	0.002	23
16	07/18/05	1.59	548	5.07	76.4	7.68	0.15	0.002	30
17	07/25/05	3.46	43	9.44	81.3	8.04	0.21	0.100	47
18	08/01/05	1.43	88	5.14	74.3	7.82	0.16	0.092	53
19	08/08/05	2.23	61	7.31	78.1	7.92	0.13	0.100	16
20	08/15/05	2.70	119	5.03	74.5	7.79	0.15	0.100	26
21	08/22/05	1.46	158	7.51	73.5	7.76	0.19	0.100	34
22	08/29/05	2.14	79	7.53	73.1	7.86	0.17	0.100	33
23	09/06/05	1.49	88	7.21	70.6	7.89	0.21	0.030	20
24	09/13/05	1.98	727	6.86	71.8	7.89	0.13	0.100	37
25	09/19/05	2.09	162	7.53	67.2	7.95	0.14	0.100	32
26	09/26/05	1.86	2420	7.92	69.1	7.68	0.32	0.100	116
27	10/03/05	2.46	87	8.31	64.2	7.57	0.12	0.100	87
28	10/10/05	3.18	67	9.19	57.8	7.52	0.14	0.100	25
29	10/17/05	1.36	115	9.52	54.9	8.09	0.10	0.100	30
30	10/24/05	1.12	120	10.01	50.2	7.97	0.12	0.100	75
31	10/31/05	0.07	46	10.64	49.2	7.69	0.05	0.100	17
	Max.	3.96	2420	12.71	81.30	8.16	0.70	0.181	116
	Min.	0.07	32	5.03	45.70	6.87	0.03	0.002	8
	Avg.	2.34	213	8.39	65.70	7.73	0.14	0.072	34

E.Coli = colonies per 100 mls, yellow indicates >235

PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l, DO = Dissolved Oxygen mg/l

TSS = Total Suspended Solids mg/l

City of Fort Wayne River Survey 2005

St. Joseph River @ Tennessee Street

Wk	Date	Depth(ft)	ECOLI	DO	Temp(F)	pH	PHOS	NH3-N	TSS
1	04/04/05	12.09	19	12.45	47.5	6.76	0.20	0.020	7
2	04/11/05	11.74	20	10.84	57.3	7.27	0.08	0.020	14
3	04/18/05	8.39	40	12.45	57.8	7.84	0.06	0.100	28
4	04/25/05	12.74	387	12.29	47.1	6.62	0.01	0.030	16
5	05/02/05	11.11	70	12.49	51.0	6.62	0.09	0.020	14
6	05/09/05	8.50	18	11.18	62.8	7.46	0.08	0.020	13
7	05/18/05	8.89	110	9.93	59.0	7.56	0.10	0.100	25
8	05/23/05	9.38	111	6.45	62.4	8.06	0.10	0.020	22
9	05/31/05	7.94	192	5.54	65.5	8.23	0.05	0.026	20
10	06/06/05	7.11	5200	No Data	69.8	7.87	0.09	0.045	26
11	06/13/05	8.44	1986	No Data	76.7	7.48	0.10	0.103	8
12	06/20/05	6.96	109	8.01	69.7	8.03	0.09	0.100	24
13	06/27/05	10.53	50	14.38	82.3	8.37	0.02	0.020	8
14	07/05/05	6.59	87	5.41	76.7	7.85	0.05	0.002	18
15	07/11/05	5.05	157	6.02	77.5	7.82	0.16	0.002	32
16	07/18/05	10.73	210	7.08	78.5	8.13	0.13	0.002	20
17	07/25/05	11.21	34	9.78	81.9	7.98	0.13	0.100	12
18	08/01/05	10.94	99	6.07	76.1	7.88	0.14	0.148	38
19	08/08/05	10.14	921	8.41	79.9	8.66	0.09	0.100	14
20	08/15/05	6.51	249	No Data	77.6	7.78	0.14	0.100	11
21	08/22/05	10.70	140	7.44	77.3	7.93	0.11	0.100	17
22	08/29/05	10.17	45	7.20	76.5	8.18	0.11	0.100	14
23	09/06/05	10.50	35	8.79	73.5	7.92	0.26	0.421	12
24	09/13/05	10.43	14	12.71	75.8	8.16	0.11	0.100	13
25	09/19/05	10.89	28	8.58	70.1	8.00	0.10	0.100	8
26	09/26/05	11.54	1300	8.50	70.7	8.82	0.19	0.100	72
27	10/03/05	11.26	68	9.13	71.6	8.95	0.07	0.100	18
28	10/10/05	11.23	40	8.16	60.8	7.16	0.12	0.100	15
29	10/17/05	11.20	67	10.29	58.4	8.19	0.09	0.100	20
30	10/24/05	10.34	199	8.41	53.2	7.78	0.08	0.103	21
31	10/31/05	11.29	16	11.77	50.7	7.49	0.02	0.100	12
	Max.	12.74	5200	14.38	81.90	8.82	0.260	0.421	72
	Min.	5.05	14	5.41	47.10	6.62	0.01	0.002	7
	Avg.	9.82	388	9.28	67.60	7.83	0.10	0.081	19

E.Coli = colonies per 100 mls, yellow indicates >235

PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l, DO = Dissolved Oxygen mg/l

TSS = Total Suspended Solids mg/l

City of Fort Wayne River Survey 2006

St. Joseph River @ Mayhew Road

Wk	Date	Depth(ft)	pH	DO	Temp(F)	ECOLI	NH3-N	PHOS	TSS
1	04/03/06	4.13	7.28	11.45	49.97	613	0.05	0.15	72
2	04/10/06	3.23	7.32	10.99	50.65	88	0.05	0.15	38
3	04/17/06	3.16	7.46	10.34	57.11	579	0.05	0.13	62
4	04/24/06	2.63	7.65	9.46	58.95	100	0.05	0.03	45
5	05/01/06	1.55	7.27	9.88	56.71	124	0.05	0.15	31
6	05/08/06	1.72	7.87	9.64	60.75	63	0.05	0.62	32
7	05/15/06	8.32	7.30	10.17	52.50	1986	0.22	0.18	70
8	05/22/06	5.47	7.29	9.85	56.48	126	0.05	0.15	62
9	05/30/06	3.43	7.80	8.48	73.52	54	0.05	0.03	31
10	06/05/06	3.54	7.10	8.53	67.62	104	0.05	0.03	56
11	06/12/06	3.46	7.42	8.41	65.86	105	0.05	0.23	21
12	06/19/06	1.91	7.43	6.53	71.57	36	0.05	0.12	27
13	06/26/06	3.81	6.81	9.46	73.64	108	0.05	0.23	63
14	07/06/06	2.80	7.80	9.16	72.12	72	0.05	0.29	47
15	07/10/06	3.56	7.47	7.11	74.15	112	0.05	0.41	80
16	07/17/06	6.16	6.90	7.28	75.22	238	0.05	0.28	122
17	07/24/06	3.61	7.40	7.31	74.27	71	0.05	0.12	20
18	07/31/06	5.68	7.24	7.45	76.31	387	0.05	0.21	63
19	08/07/06	3.67	6.93	7.09	77.93	345	0.05	0.25	56
20	08/14/06	2.45	7.52	7.03	71.91	62	0.05	0.30	31
21	08/21/06	2.23	7.91	6.70	71.53	99	0.05	0.14	38
22	08/28/06	2.19	7.65	6.21	74.56	172	0.05	0.29	40
23	09/05/06	2.77	7.13	8.17	66.40	219	0.05	0.17	33
24	09/11/06	2.91	7.26	7.39	65.82	50	0.05	0.18	21
25	09/18/06	2.61	7.68	7.16	68.00	206	0.05	0.11	30
26	09/26/06	2.43	7.63	10.63	59.58	485	0.05	0.16	54
27	10/02/06	2.16	7.27	9.07	58.51	2420	0.05	0.21	38
28	10/09/06	2.15	6.75	9.49	57.25	145	0.05	0.37	36
29	10/16/06	3.02	6.76	7.91	48.45	159	0.30	0.91	856/59
30	10/23/06	3.03	6.61	9.60	48.50	145	0.05	0.33	82
	Max.	8.32	7.91	11.45	77.93	2420	0.30	0.91	122
	Min.	1.55	6.61	6.21	48.45	36	0.05	0.03	20
	Avg.	3.33	7.33	8.60	64.53	316	0.06	0.23	49

DO = Dissolved Oxygen mg/l, E.Coli = colonies per 100 mls (yellow indicates >235)
NH3-N = Ammonia Nitrogen mg/l, PHOS = Total Phosphorus mg/l
TSS = Total Suspended Solids mg/l
Original TSS value of 856 mg/l on 10/16/06 was caused by short-term maintenance at the Cedarville Dam.
TSS value of 59 mg/l (average of 10/09/06 and 10/23/06) was used for Max., Min., and Avg. calculations.

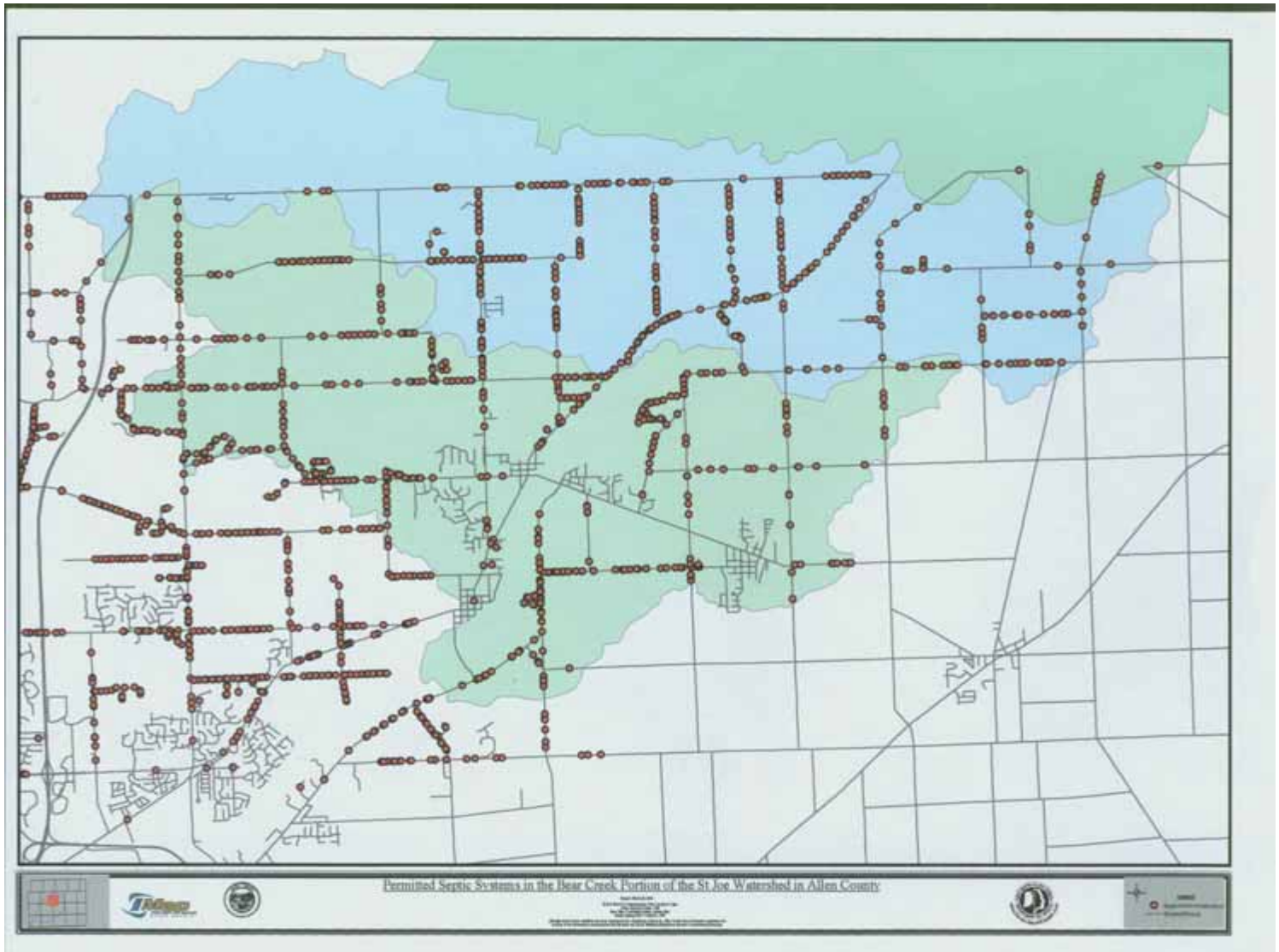
City of Fort Wayne River Survey 2006

St. Joseph River @ Tennessee Street

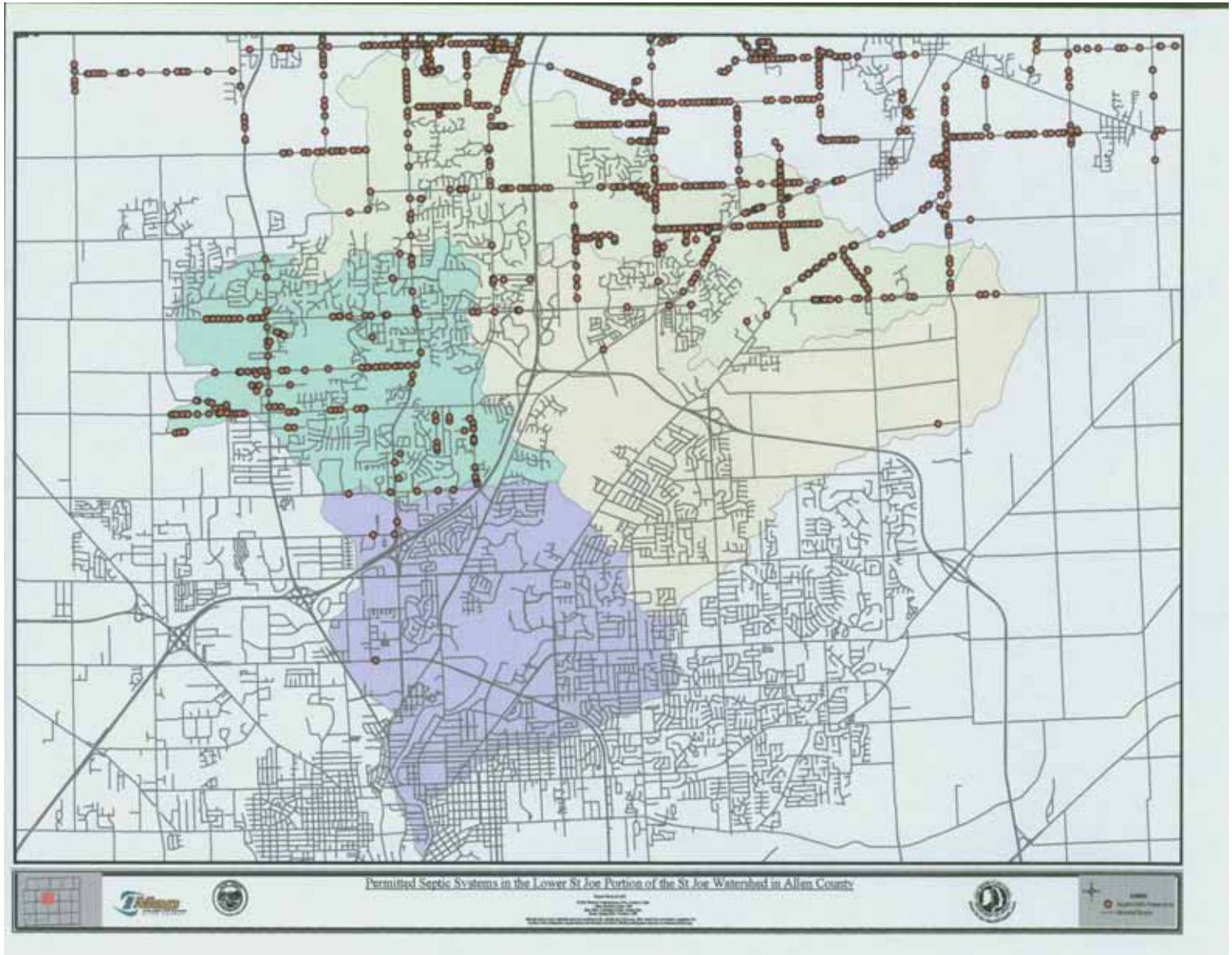
Wk	Date	Depth(ft)	pH	DO	Temp(F)	ECOLI	NH3-N	PHOS	TSS
1	04/03/06	11.56	7.25	12.19	50.28	517	0.05	0.05	30
2	04/10/06	10.66	7.43	11.51	51.09	70	0.05	0.11	42
3	04/17/06	12.9	7.48	10.40	60.07	866	0.05	0.10	28
4	04/24/06	9.92	7.51	9.69	60.61	100	0.05	0.14	37
5	05/01/06	8.48	7.43	9.67	57.68	308	0.05	0.18	28
6	05/08/06	9.32	8.07	10.45	62.44	45	0.05	0.31	28
7	05/15/06	13.97	7.38	10.60	52.80	687	0.24	0.29	54
8	05/22/06	12.78	7.47	10.28	59.29	86	0.05	0.12	46
9	05/30/06	11.02	7.99	9.65	73.64	86	0.05	0.03	21
10	06/05/06	11.14	7.21	8.80	68.74	184	0.05	0.06	28
11	06/12/06	10.97	7.49	8.65	67.46	126	0.05	0.06	20
12	06/19/06	10.81	7.61	6.84	73.81	228	0.05	0.90	16
13	06/26/06	11.54	7.28	7.51	74.57	122	0.05	0.19	34
14	07/06/06	10.89	7.91	9.88	73.45	66	0.05	0.25	31
15	07/10/06	11.48	7.36	7.53	74.55	45	0.05	0.10	42
16	07/17/06	12.56	7.12	8.16	76.76	372	0.05	0.21	59
17	07/24/06	10.19	7.56	7.48	75.88	96	0.05	0.14	24
18	07/31/06	11.35	7.49	7.74	78.00	488	0.05	0.19	35
19	08/07/06	8.29	7.19	7.10	78.86	81	0.05	0.16	40
20	08/14/06	5.24	7.84	6.66	73.73	58	0.05	0.21	27
21	08/21/06	6.92	7.91	7.37	73.73	365	0.05	0.13	18
22	08/28/06	4.19	7.67	6.27	75.03	240	0.05	0.09	33
23	09/05/06	6.50	7.27	8.64	69.15	133	0.05	0.08	23
24	09/11/06	5.62	7.53	8.96	67.34	201	0.05	0.16	35
25	09/18/06	7.61	7.60	8.06	68.09	3000	0.05	0.10	36
26	09/26/06	10.75	7.80	11.27	61.14	261	0.05	0.10	31
27	10/02/06	11.48	7.50	10.99	60.40	2420	0.05	0.16	29
28	10/09/06	11.13	7.17	9.58	57.94	205	0.05	0.62	34
29	10/16/06	11.44	7.08	11.55	49.70	411	0.05	0.15	52
30	10/23/06	12.30	6.87	11.03	49.20	36	0.05	0.19	46
	Max.	13.97	8.07	12.19	78.86	3000	0.24	0.90	59
	Min.	4.19	6.87	6.27	49.20	36	0.05	0.03	16
	Avg.	10.10	7.48	9.15	65.85	397	0.06	0.18	34

DO = Dissolved Oxygen mg/l, E.Coli = colonies per 100 mls (yellow indicates >235)
NH3-N = Ammonia Nitrogen mg/l, PHOS = Total Phosphorus mg/l
TSS = Total Suspended Solids mg/l

Appendix J Permitted Septic Systems, Allen County



Permitted septic systems in the Bear Creek sub-watershed within Allen county are shaded blue and green in this map. (Allen Co. I-Map)



Permitted septic systems in the Lower St. Joseph sub-watershed, Allen County are shown in the lavender, dark green, light green and yellow sections of this map. (Allen Co. I-Map)

Rare and Endangered Animals of Indiana

Revised 09/04

The Wildlife Diversity Section protects and manages over 700 animal species in Indiana including those on this list. You can support these efforts by donating to the Indiana Nongame Fund on the Indiana State income tax form or through a direct donation.

Indiana Protection

Vertebrates, mollusks and crustaceans classified as endangered in Indiana are protected from taking pursuant to the Nongame and Endangered Species Act of 1973 (IC 14-22-34) and Fish and Wildlife Administrative Rules (312 IAC).

Indiana Classifications

Endangered- Any animal species whose prospects for survival or recruitment within the state is in immediate jeopardy and is in danger of disappearing from the state. This includes all species classified as endangered by the federal government that occur in Indiana.

Special Concern- Any animal species about which some problems of limited abundance or distribution in Indiana is known or suspected and should be closely monitored.

Federal Classifications

Endangered- Any species that is in danger of extinction throughout all or a significant portion of its range. Federal-endangered species are designated with "FE."

Threatened- Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Federal-threatened species are designated with "FT."

Candidate- Any species that has been submitted for review for protection under the Federal Endangered Species Act. If added to the federal list, it will automatically be considered a state-endangered species in Indiana. Candidates for the Federal list are designated with "FC."

AMPHIBIANS

Endangered

Crawfish frog	*Rana areolata*
Four-toed salamander	*Hemidactylium scutatum*
Green salamander	*Aneides aeneus*
Hellbender	*Cryptobranchus alleganiensis*
Red salamander	*Pseudotriton ruber*

Special Concern

Blue-spotted salamander	*Ambystoma laterale*
Eastern spadefoot	*Scaphiopus holbrookii*
Common mudpuppy	*Necturus maculosus*
Northern leopard frog	*Rana pipiens*
Plains leopard frog	*Rana blairi*

BIRDS

Endangered

American bittern	*Botaurus lentiginosus*
Bald eagle (FT)	*Haliaeetus leucocephalus*
Barn owl	*Tyto alba*
Black rail	*Laterallus jamaicensis*
Black tern	*Chlidonias niger*
Black-crowned night-heron	*Nycticorax nycticorax*
Common moorhen	*Gallunula chloropus*
Golden-winged warbler	*Vermivora chrysoptera*
Henslow's sparrow	*Ammodramus henslowii*
King rail	*Rallus elegans*
Kirtland's warbler (FE)	*Dendroica kirtlandii*

BIRDS (cont.)

Least bittern	*Ixobrychus exilis*
Least tern (FE)	*Sterna antillarum*
Loggerhead shrike	*Lanius ludovicianus*
Marsh wren	*Cistothorus palustris*
Northern harrier	*Circus cyaneus*
Osprey	*Pandion haliaetus*
Peregrine falcon	*Falco peregrinus*
Piping plover (FE)	*Charadrius melodus*
Sedge wren	*Cistothorus platensis*
Short-eared owl	*Asio flammeus*
Trumpeter swan	*Cygnus buccinator*
Upland sandpiper	*Bartramia longicauda*
Virginia rail	*Rallus limicola*
Whooping crane (FE)	*Grus americana*
Yellow-crowned night-heron	*Nyctanassa violacea*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*

Special Concern

Black-and-white warbler	*Mniotilta varia*
Broad-winged hawk	*Buteo platypterus*
Cerulean warbler	*Dendroica cerulea*
Common nighthawk	*Chordeiles minor*
Great egret	*Ardea alba*
Hooded warbler	*Wilsonia citrina*
Mississippi kite	*Ictinia mississippiensis*
Red-shouldered hawk	*Buteo lineatus*
Sandhill crane	*Grus canadensis*
Sharp-shinned hawk	*Accipiter striatus*
Western meadowlark	*Sturnella neglecta*
Whip-poor-will	*Caprimulgus vociferus*
Worm-eating warbler	*Helmitheros vermivorum*

FISHES

Endangered

Bantam sunfish	*Lepomis symmetricus*
Channel darter	*Percina copelandi*
Gilt darter	*Percina evides*
Greater redhorse	*Moxostoma valenciennesi*
Lake sturgeon	*Acipenser fulvescens*
Northern brook lamprey	*Ichthyomyzon fossor*
Northern cavefish	*Amblyopsis spelaea*
Pallid shiner	*Hybopsis amnis*
Redside dace	*Clinostomus elongatus*
Variegate darter	*Etheostoma variatum*

Special Concern

Banded pygmy sunfish	*Elassoma zonatum*
Bigmouth shiner	*Notropis dorsalis*
Cisco	*Coregonus artedi*
Cypress darter	*Etheostoma proeliare*
Lake whitefish	*Coregonus clupeaformis*
Longnose dace	*Rhinichthys cataractae*
Longnose sucker	*Catostomus catostomus*
Northern madtom	*Noturus stigmosus*
Ohio River muskellunge	*Esox masqinongy ohioensis*
Pugnose shiner	*Notropis anogenus*
Slimy sculpin	*Cottus cognatus*
Spotted darter	*Etheostoma maculatum*
Tippecanoe darter	*Etheostoma tippecanoe*
Trout-perch	*Percopsis omiscomaycus*
Western sand darter	*Ammocrypta clara*

MAMMALS

Endangered

Allegheny woodrat	*Neotoma magister*
Badger	*Taxidea taxus*
Bobcat	*Lynx rufus*
Evening bat	*Nycticeius humeralis*
Franklin's ground squirrel	*Spermophilus franklinii*
Gray myotis (FE)	*Myotis grisescens*
Indiana myotis (FE)	*Myotis sodalis*
River otter	*Lontra canadensis*
Southeastern myotis	*Myotis austroriparius*
Swamp rabbit	*Syivilagus aquaticus*

Special Concern

Eastern pipistrelle	*Pipistrellus subflavus*
Eastern red bat	*Lasiurus borealis*
Hoary bat	*Lasiurus cinereus*
Least weasel	*Mustela nivalis*
Little brown myotis	*Myotis lucifugus*
Northern myotis	*Myotis septentrionalis*
Plains pocket gopher	*Geomys bursarius*
Pygmy shrew	*Sorex hoyi*
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*
Silver-haired bat	*Lasionycteris noctivagans*
Smoky shrew	*Sorex fumeus*
Star-nosed mole	*Condylura cristata*

MOLLUSKS

Endangered

Clubshell (FE)	*Pleurobema clava*
Eastern fanshell (FE)	*Cyprogenia stegaria*
Fat pocketbook (FE)	*Potamilus capax*
Longsolid	*Fusconaia subrotunda*
Northern riffleshell (FE)	*Epioblasma torulosa rangiana*
Orangefoot pimpleback (FE)	*Plethobasus cooperianus*
Pink mucket (FE)	*Lampsilis abrupta*
Pyramid pigtoe	*Pleurobema rubrum*
Rabbitsfoot	*Quadrula cylindrica cylindrica*

MOLLUSKS (cont.)

Rough pigtoe (FE)	*Pleurobema plenum*
Sheepnose (FC)	*Plethobasus cyphyus*
Snuffbox	*Epioblasma triquetra*
Tubercled blossom (FE)	*Epioblasma torulosa torulosa*
White catspaw (FE)	*Epioblasma obliquata perobliqua*
White wartyback (FE)	*Plethobasus cicatricosus*

Special Concern

Ellipse	*Venustaconcha ellipsiformis*
Kidneyshell	*Ptychobranchus fasciolaris*
Little spectaclecase	*Villosa lienosa*
Ohio pigtoe	*Pleurobema cordatum*
Pointed campeloma	*Campeloma decisum*
Purple lilliput	*Toxolasma lividus*
Rayed bean (FC)	*Villosa fabalis*
Round hickorynut	*Obovaria subrotunda*
Salamander mussel	*Simpsonaias ambigua*
Swamp lymnaea	*Lymnaea stagnalis*
Wavyrayed lampmussel	*Lampsilis fasciola*

REPTILES

Endangered

Alligator snapping turtle	*Macrochelys temminckii*
Blanding's turtle	*Emydoidea blandingii*
Butler's garter snake	*Thamnophis butleri*
Copperbelly water snake (FT*)	*Nerodia erythrogaster neglecta*
Cottonmouth	*Agkistrodon piscivorus*
Eastern mud turtle	*Kinosternon subrubrum*
Hieroglyphic river cooter	*Pseudemys concinna*
Kirtland's snake	*Clonophis kirtlandii*
Massasauga (FC)	*Sistrurus catenatus*
Ornate box turtle	*Terrapene ornate*
Scarlet snake	*Cemophora coccinea*
Smooth green snake	*Liochlorophis vernalis*
Southeastern crowned snake	*Tantilla coronata*
Spotted turtle	*Clemmys guttata*
Timber rattlesnake	*Crotalus horridus*
Western mud snake	*Farancia abacura*

Special Concern

Rough green snake	*Opheodrys aestivus*
Western ribbon snake	*Thamnophis proximus*

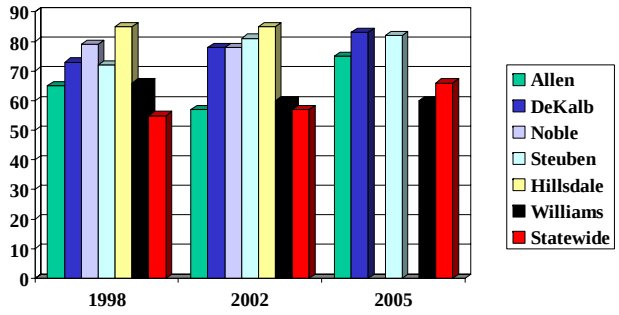
*Northern population only

Wildlife Diversity Section
Division of Fish and Wildlife
402 W. Washington St., W273
Indianapolis, IN 46204
317-232-4080

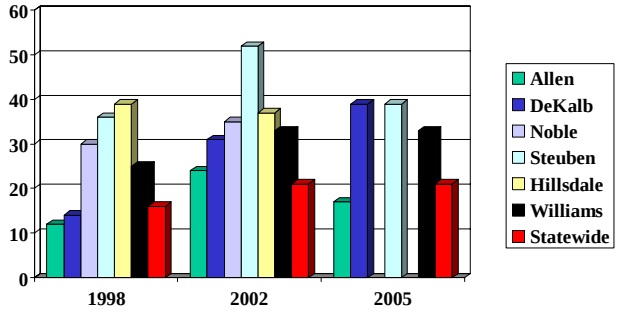
www.IN.gov/dnr/fishwild/endangered/

Appendix L Tillage Transects

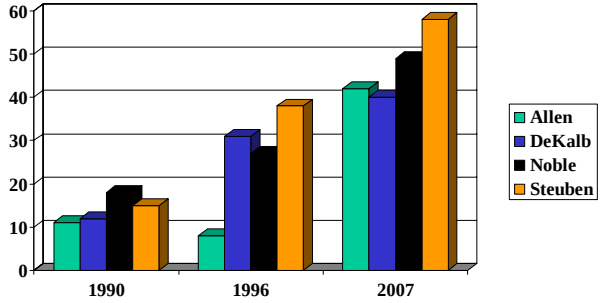
No-till Soybean Adoption Trends in the St. Joseph River Watershed



No-till Corn Trends in the St. Joseph River Watershed



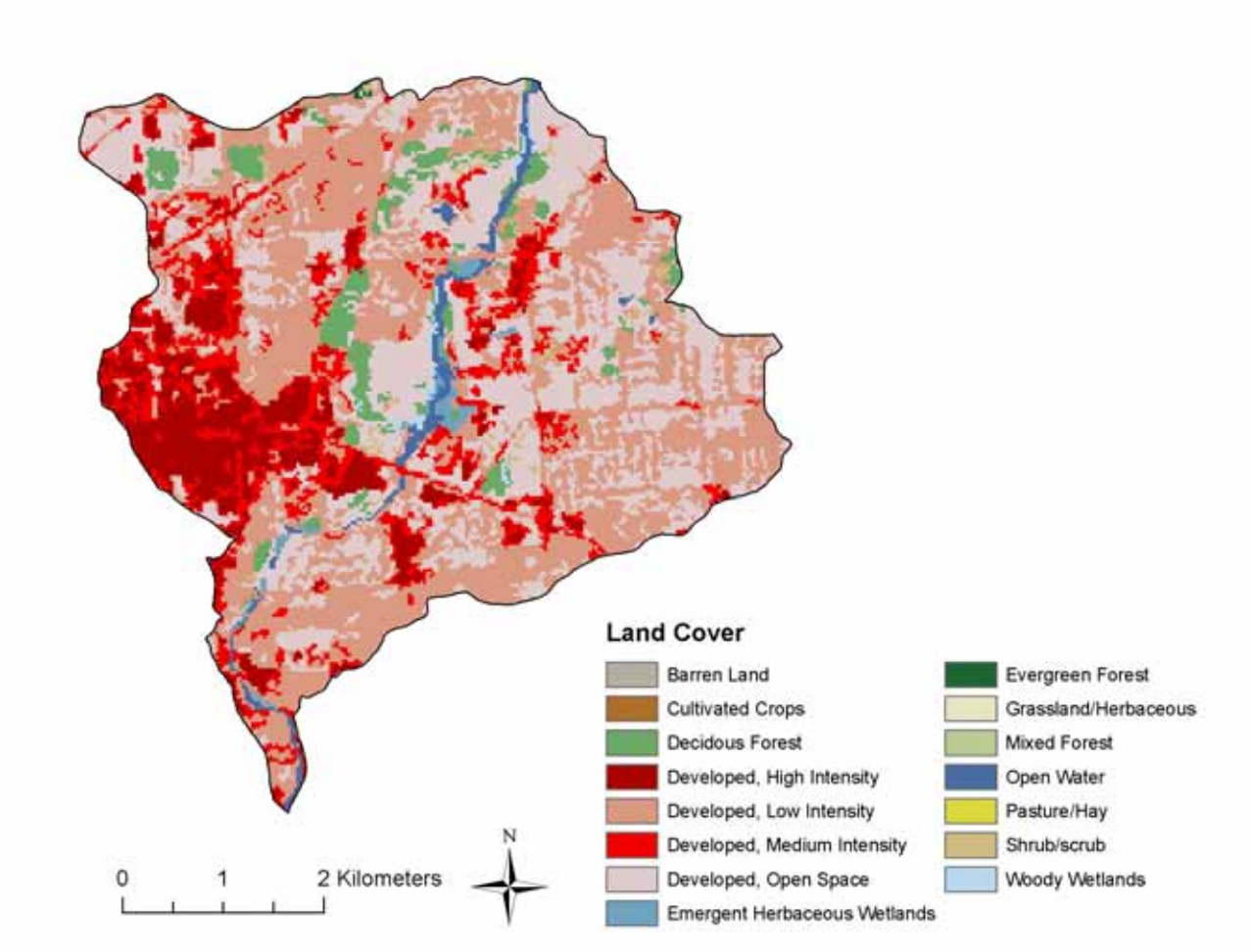
No-till Corn Adoption Trends in the St. Joseph River Watershed



Source: J. Lake, Indiana State Department of Agriculture, 2007.

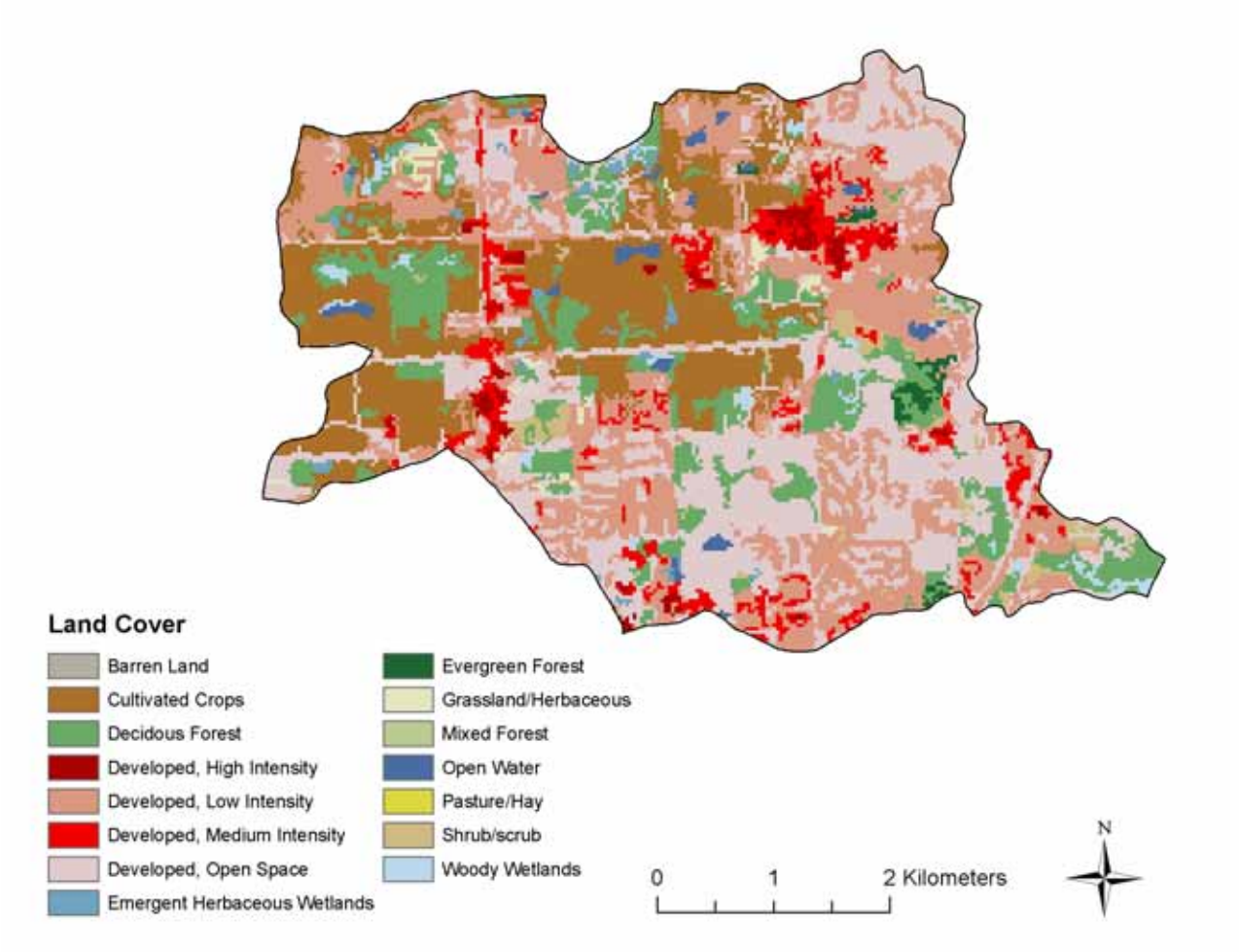
Appendix M Land use maps and tables, 14-Digit HUC areas

M-1 Land Use 2001, Schoppman Drain



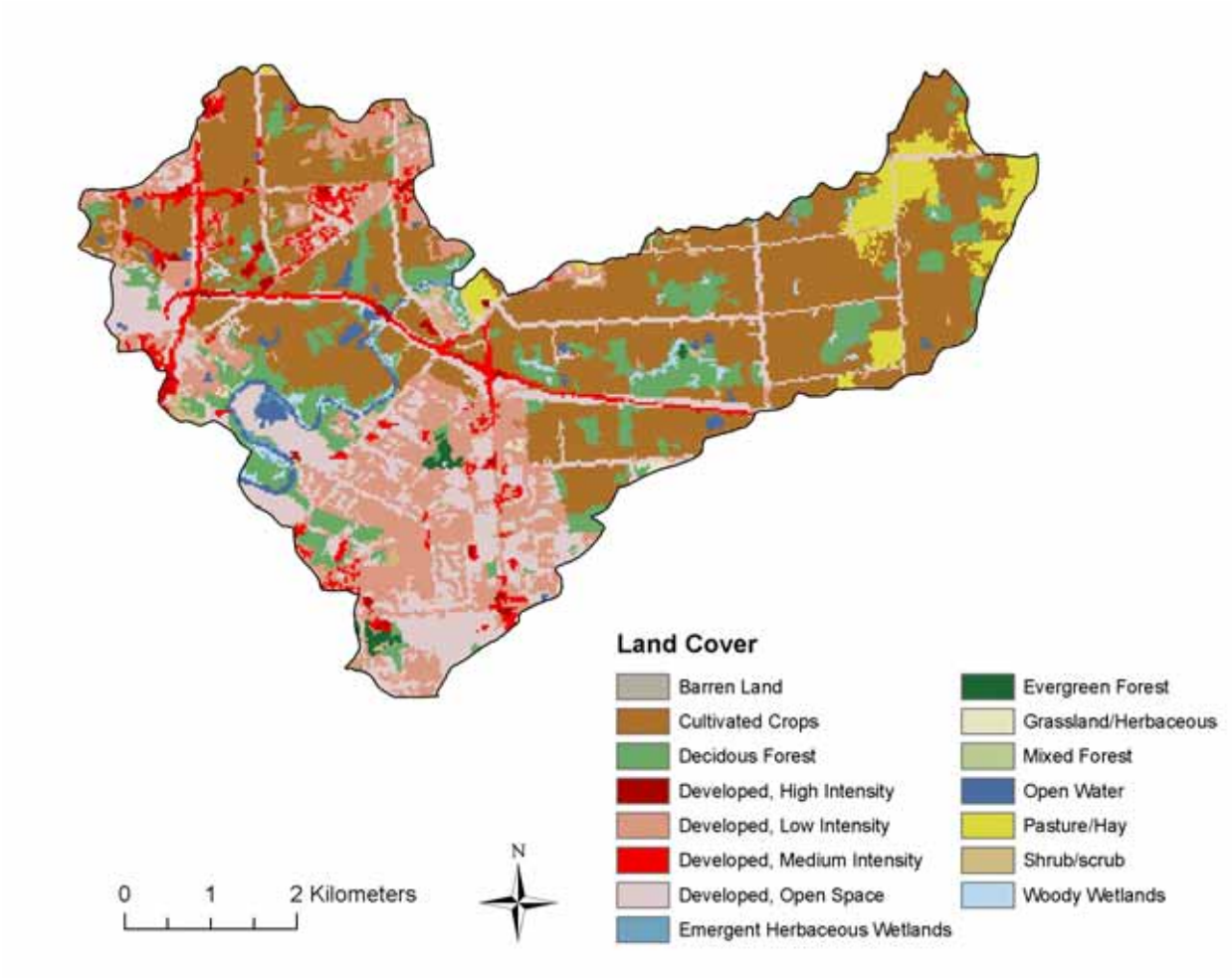
HABITAT within the Schoppman Drain Subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	549900.0	55.0	135.9	1.9
Developed, Open Space	8575200.0	857.5	2119.0	29.7
Developed, Low Intensity	11544300.0	1154.4	2852.7	40.0
Developed, Medium Intensity	3475800.0	347.6	858.9	12.0
Developed, High Intensity	2793600.0	279.4	690.3	9.7
Decidous Forest	1299600.0	130.0	321.1	4.5
Evergreen Forest	18000.0	1.8	4.4	0.1
Shrub/scrub	241200.0	24.1	59.6	0.8
Woody Wetlands	115200.0	11.5	28.5	0.4
Emergent Herbaceous Wetlands	238500.0	23.9	58.9	0.8
TOTAL	28851300.0	2885.1	7129.3	

M-2 Land Use 2001- Beckett's Run



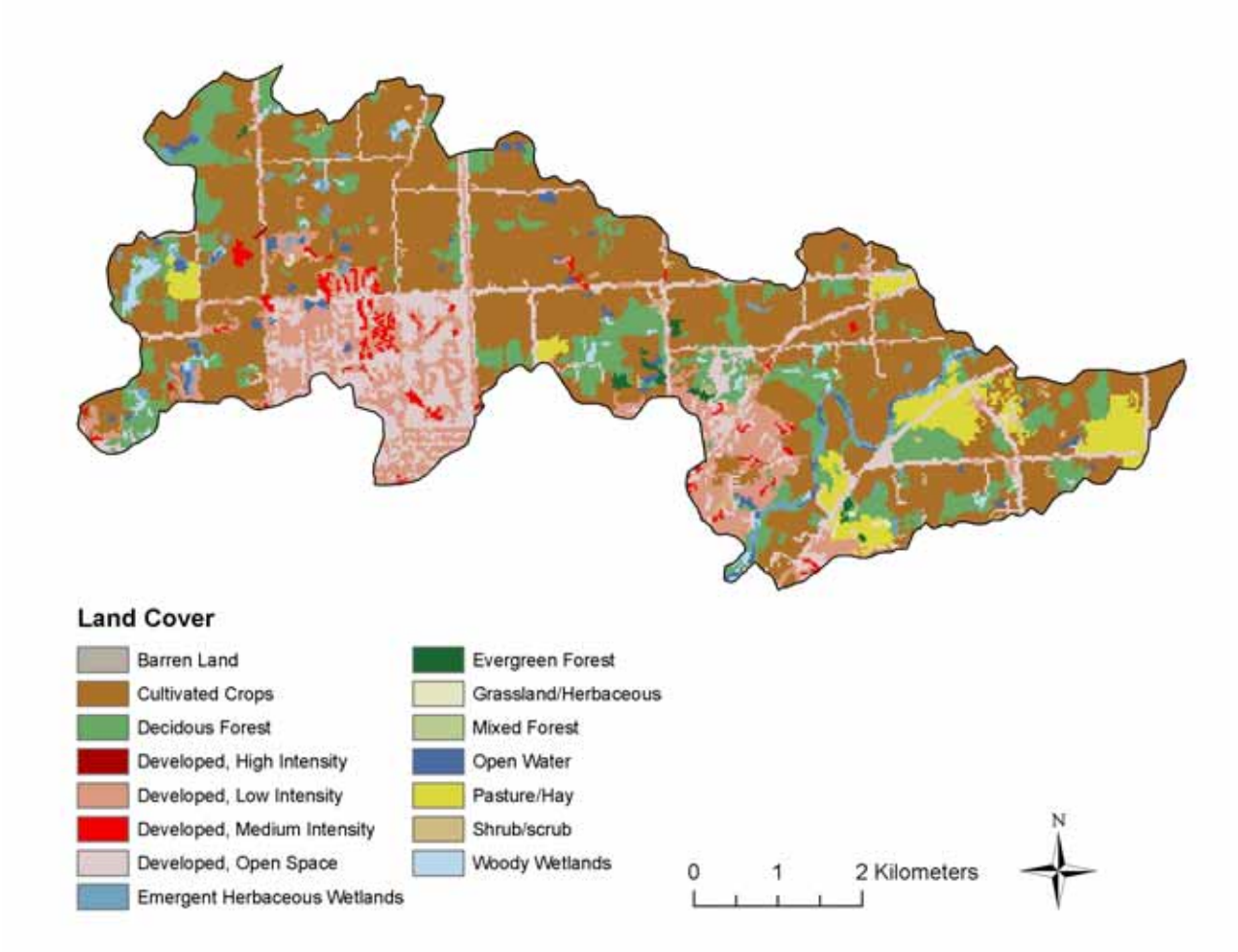
HABITAT within the Beckett's Run Subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	268200.0	26.8	66.3	1.1
Developed, Open Space	6298200.0	629.8	1556.3	25.9
Developed, Low Intensity	6804000.0	680.4	1681.3	28.0
Developed, Medium Intensity	1255500.0	125.6	310.2	5.2
Developed, High Intensity	334800.0	33.5	82.7	1.4
Decidous Forest	3024900.0	302.5	747.5	12.4
Evergreen Forest	162900.0	16.3	40.3	0.7
Shrub/scrub	398700.0	39.9	98.5	1.6
Grassland/Herbaceous	207000.0	20.7	51.2	0.9
Cultivated Crops	5041800.0	504.2	1245.9	20.7
Woody Wetlands	311400.0	31.1	76.9	1.3
Emergent Herbaceous Wetlands	208800.0	20.9	51.6	0.9
TOTAL	24316200.0	2431.6	6008.7	

M-3 Land Use 2001 - Tiernan Ditch



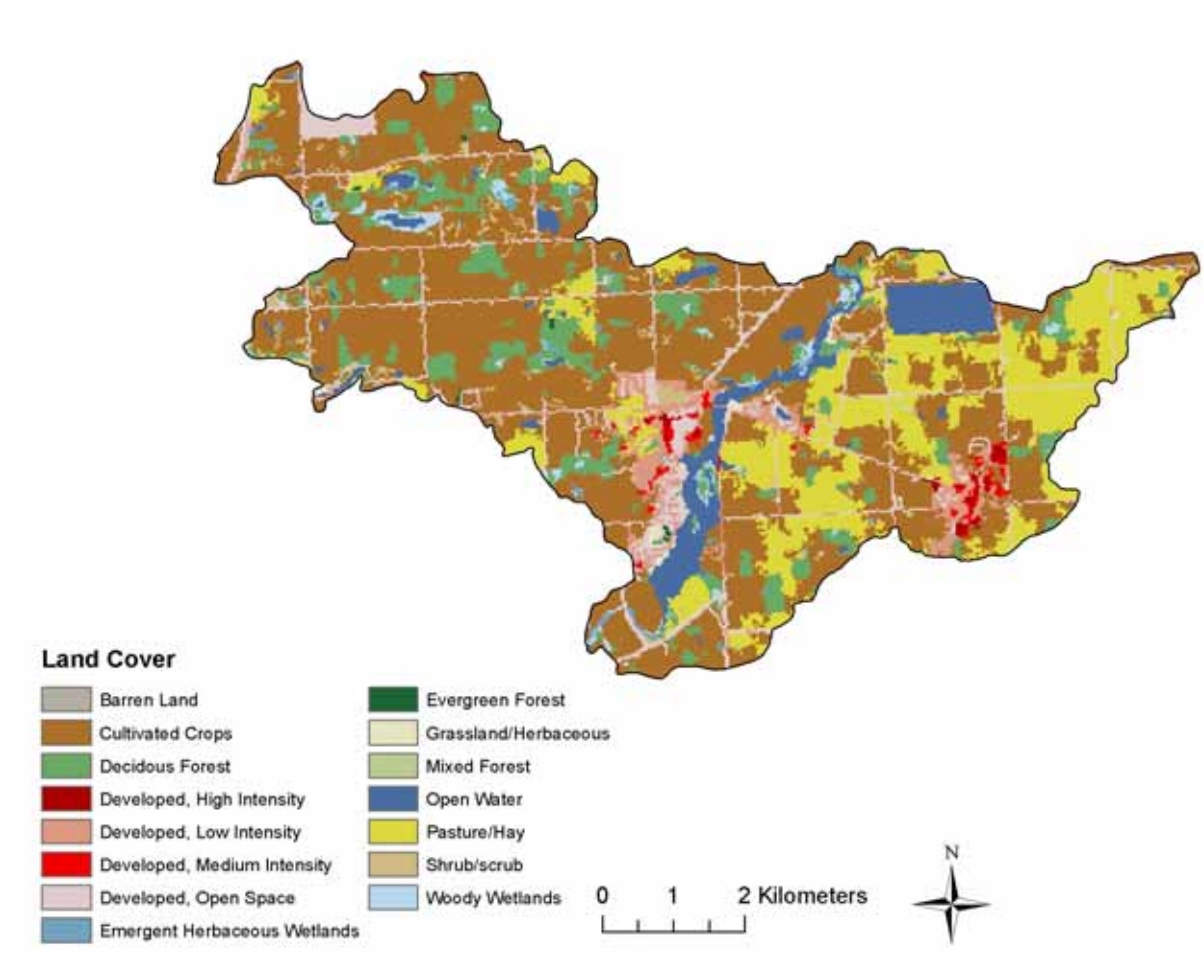
HABITAT within the Tiernan Ditch Subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	657000.0	65.7	162.3	1.7
Developed, Open Space	6411600.0	641.2	1584.3	17.0
Developed, Low Intensity	6474600.0	647.5	1599.9	17.1
Developed, Medium Intensity	1602900.0	160.3	396.1	4.2
Developed, High Intensity	263700.0	26.4	65.2	0.7
Decidous Forest	4227300.0	422.7	1044.6	11.2
Evergreen Forest	177300.0	17.7	43.8	0.5
Shrub/scrub	392400.0	39.2	97.0	1.0
Grassland/Herbaceous	92700.0	9.3	22.9	0.2
Pasture/Hay	1432800.0	143.3	354.1	3.8
Cultivated Crops	15502500.0	1550.3	3830.8	41.0
Woody Wetlands	408600.0	40.9	101.0	1.1
Emergent Herbaceous Wetlands	147600.0	14.8	36.5	0.4
TOTAL	37791000.0	3779.1	9338.4	

M-4 Land Use 2001 - Ely Run



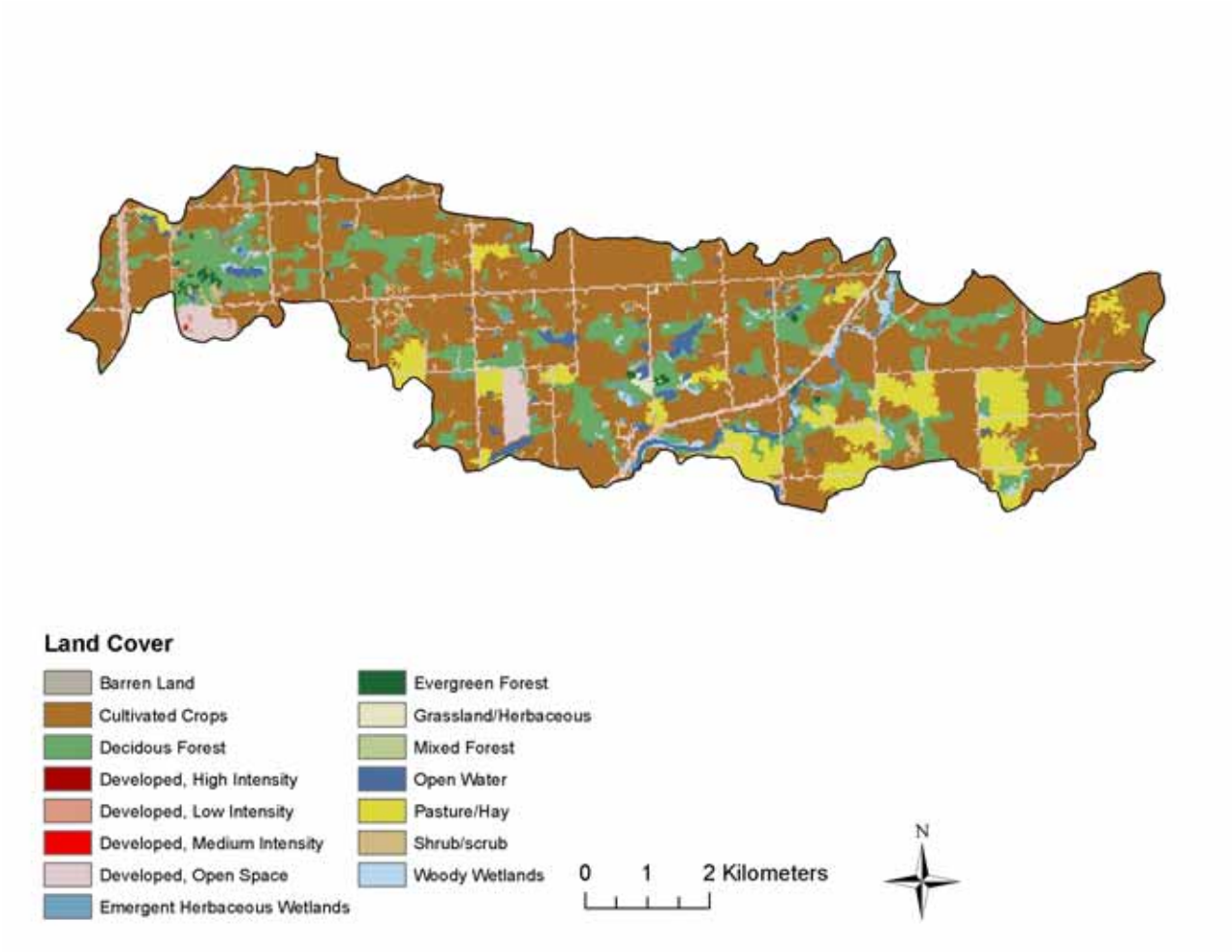
HABITAT within the Ely Run Subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	522900.0	52.3	129.2	1.5
Developed, Open Space	4543200.0	454.3	1122.6	12.7
Developed, Low Intensity	4064400.0	406.4	1004.3	11.3
Developed, Medium Intensity	496800.0	49.7	122.8	1.4
Developed, High Intensity	14400.0	1.4	3.6	0.0
Decidous Forest	4941000.0	494.1	1220.9	13.8
Evergreen Forest	152100.0	15.2	37.6	0.4
Shrub/scrub	256500.0	25.7	63.4	0.7
Grassland/Herbaceous	67500.0	6.8	16.7	0.2
Pasture/Hay	1649700.0	165.0	407.6	4.6
Cultivated Crops	18216000.0	1821.6	4501.3	50.8
Woody Wetlands	438300.0	43.8	108.3	1.2
Emergent Herbaceous Wetlands	510300.0	51.0	126.1	1.4
TOTAL	35873100.0	3587.3	8864.4	

M-5 Land Use -St. Joseph River -Cedarville Reservoir



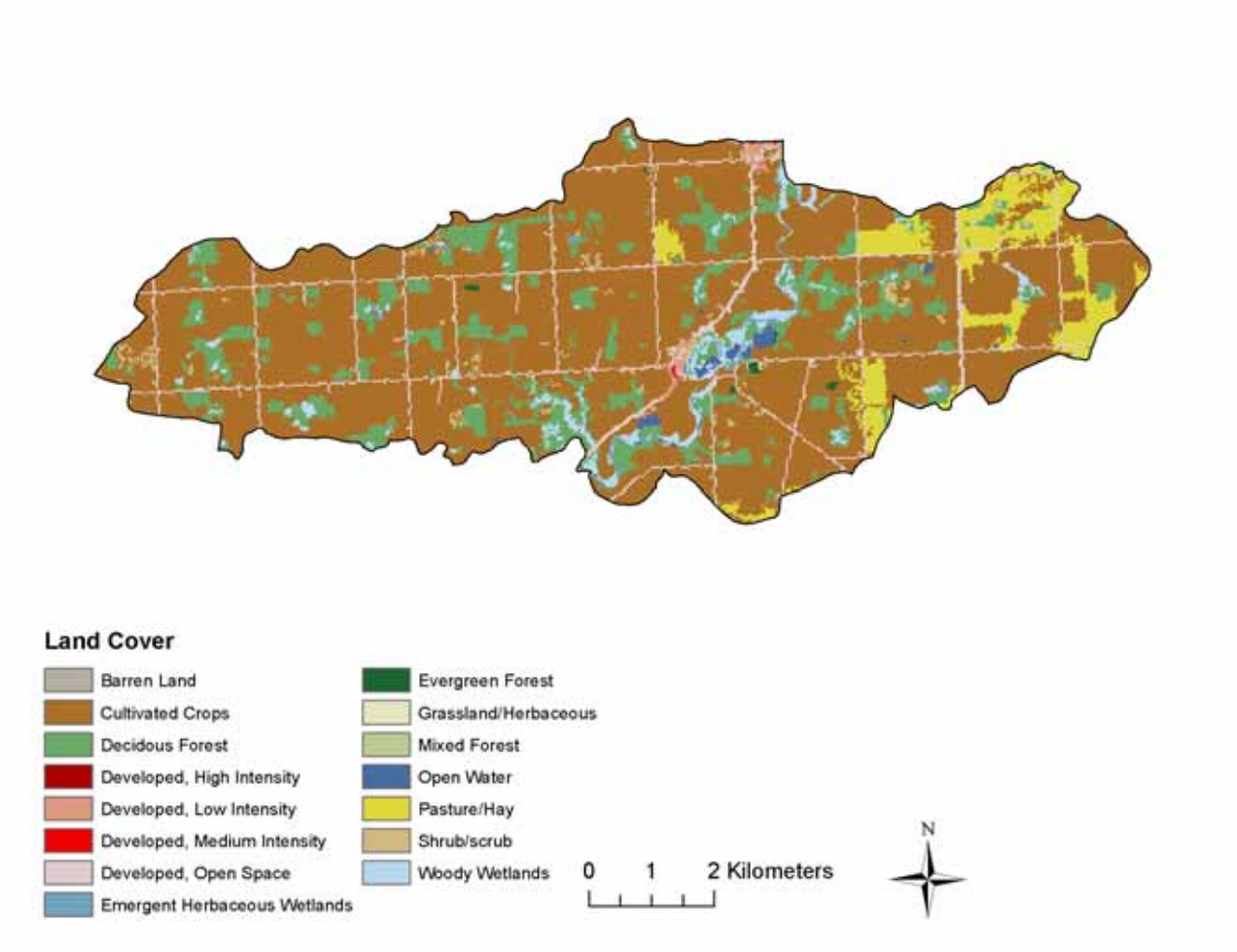
HABITAT within the Cedarville Reservoir subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	3131100.0	313.1	773.7	6.0
Developed, Open Space	3783600.0	378.4	934.9	7.2
Developed, Low Intensity	2007900.0	200.8	496.2	3.8
Developed, Medium Intensity	383400.0	38.3	94.7	0.7
Developed, High Intensity	187200.0	18.7	46.3	0.4
Decidous Forest	5229000.0	522.9	1292.1	10.0
Evergreen Forest	53100.0	5.3	13.1	0.1
Shrub/scrub	947700.0	94.8	234.2	1.8
Grassland/Herbaceous	225900.0	22.6	55.8	0.4
Pasture/Hay	8917200.0	891.7	2203.5	17.1
Cultivated Crops	26344800.0	2634.5	6509.9	50.4
Woody Wetlands	699300.0	69.9	172.8	1.3
Emergent Herbaceous Wetlands	341100.0	34.1	84.3	0.7
TOTAL	52251300.0	5225.1	12911.6	

M-6 Land Use 2001 Swartz-Carnahan Ditch



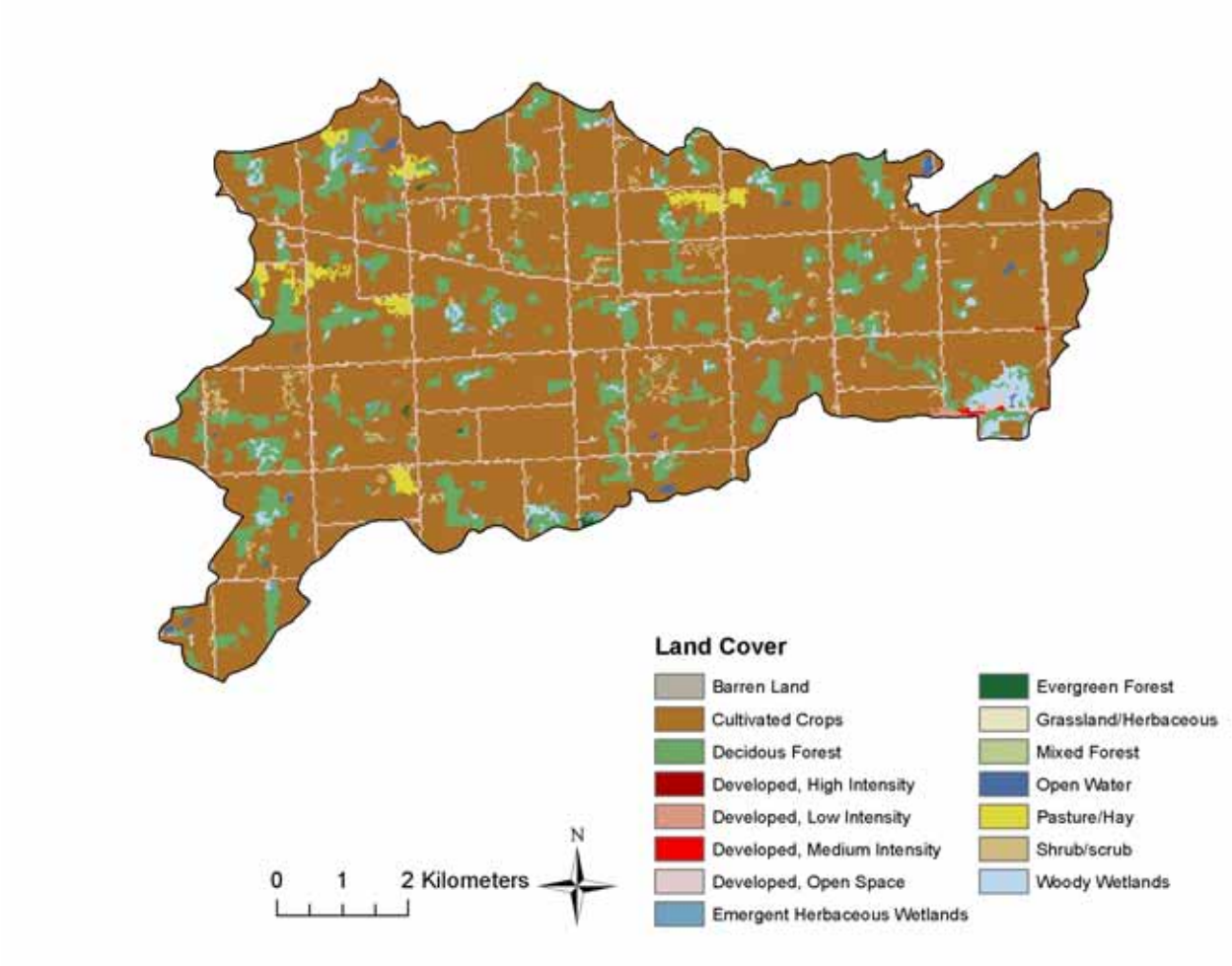
HABITAT within Swartz-Carnahan Subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	1032300.0	103.2	255.1	2.0
Developed, Open Space	3707100.0	370.7	916.0	7.2
Developed, Low Intensity	212400.0	21.2	52.5	0.4
Developed, Medium Intensity	6300.0	0.6	1.6	0.0
Decidous Forest	8429400.0	842.9	2083.0	16.4
Evergreen Forest	200700.0	20.1	49.6	0.4
Shrub/scrub	969300.0	96.9	239.5	1.9
Grassland/Herbaceous	106200.0	10.6	26.2	0.2
Pasture/Hay	4227300.0	422.7	1044.6	8.2
Cultivated Crops	31384800.0	3138.5	7755.4	61.1
Woody Wetlands	591300.0	59.1	146.1	1.2
Emergent Herbaceous Wetlands	521100.0	52.1	128.8	1.0
TOTAL	51388200.0	5138.8	12698.3	

M-7 Land Use 2001 - Walker-Metcalf Ditches



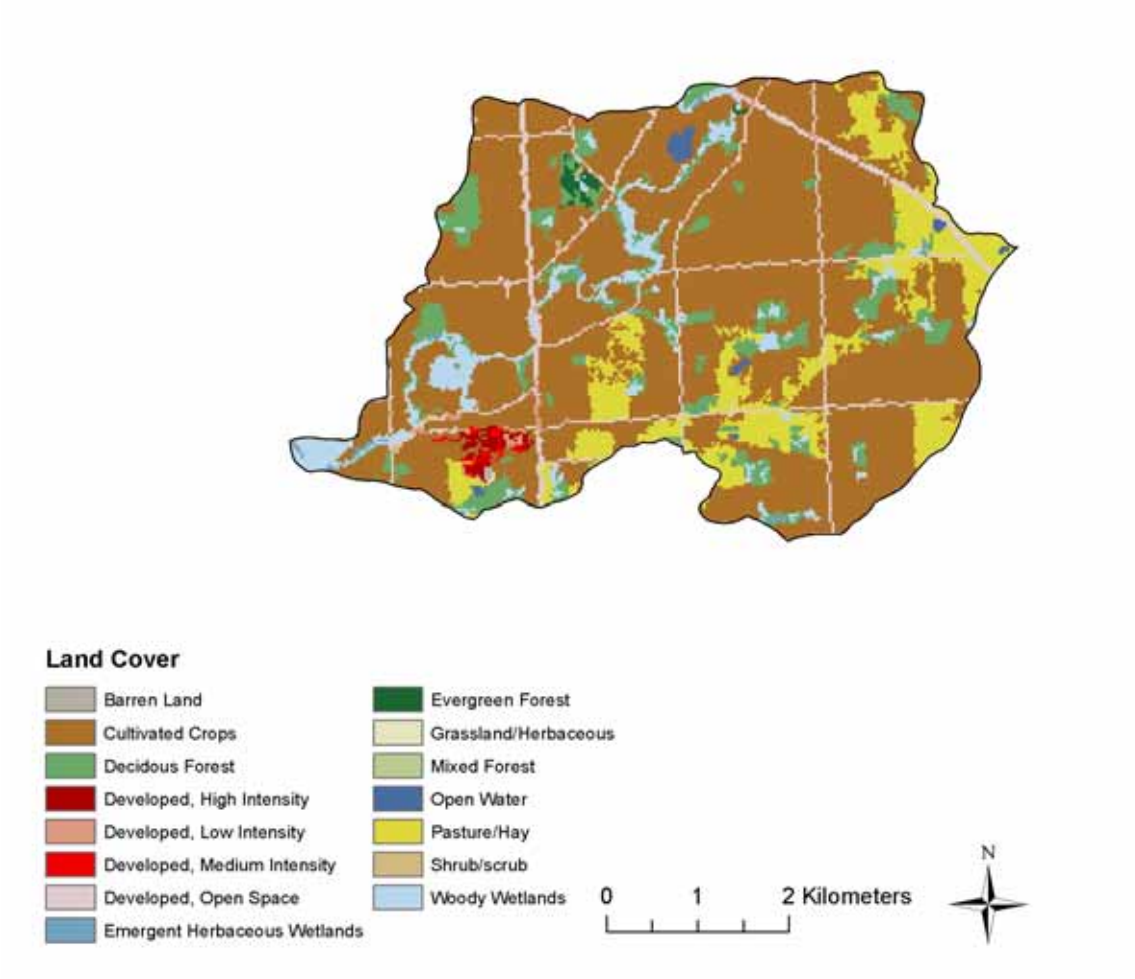
HABITAT within the Walker-Metcalf Subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	357300.0	35.7	88.3	0.6
Developed, Open Space	2918700.0	291.9	721.2	4.8
Developed, Low Intensity	288900.0	28.9	71.4	0.5
Developed, Medium Intensity	19800.0	2.0	4.9	0.0
Decidous Forest	7937100.0	793.7	1961.3	13.1
Evergreen Forest	90000.0	9.0	22.2	0.1
Shrub/scrub	684900.0	68.5	169.2	1.1
Pasture/Hay	3846600.0	384.7	950.5	6.4
Cultivated Crops	42390000.0	4239.0	10474.8	70.0
Woody Wetlands	1722600.0	172.3	425.7	2.8
Emergent Herbaceous Wetlands	280800.0	28.1	69.4	0.5
TOTAL	60536700.0	6053.7	14958.9	

M-8 Land Use 2001 - St. Joseph River - Hursey Ditches



HABITAT within the Hursey Ditches Subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	215100.0	21.5	53.2	0.3
Developed, Open Space	3643200.0	364.3	900.3	5.1
Developed, Low Intensity	135000.0	13.5	33.4	0.2
Developed, Medium Intensity	35100.0	3.5	8.7	0.0
Developed, High Intensity	5400.0	0.5	1.3	0.0
Decidous Forest	8596800.0	859.7	2124.3	12.1
Evergreen Forest	54900.0	5.5	13.6	0.1
Shrub/scrub	986400.0	98.6	243.7	1.4
Grassland/Herbaceous	3600.0	0.4	0.9	0.0
Pasture/Hay	920700.0	92.1	227.5	1.3
Cultivated Crops	54715500.0	5471.6	13520.5	77.2
Woody Wetlands	1201500.0	120.2	296.9	1.7
Emergent Herbaceous Wetlands	346500.0	34.7	85.6	0.5
TOTAL	70859700.0	7086.0	17509.8	

M-9 Land Use 2001 - St. Joseph River - Davis Ditch

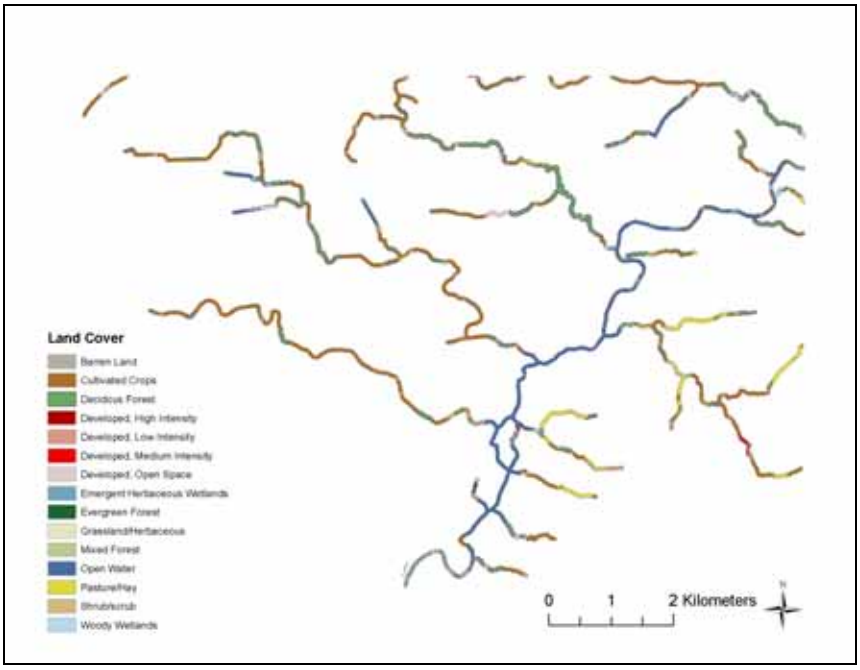


HABITAT within the Davis Ditch Subwatershed	Square Meters	Hectares	Acres	% of total
Open Water	141300.0	14.1	34.9	0.5
Developed, Open Space	1398600.0	139.9	345.6	5.3
Developed, Low Intensity	100800.0	10.1	24.9	0.4
Developed, Medium Intensity	74700.0	7.5	18.5	0.3
Developed, High Intensity	135900.0	13.6	33.6	0.5
Barren Land	15300.0	1.5	3.8	0.1
Decidous Forest	2203200.0	220.3	544.4	8.3
Evergreen Forest	108900.0	10.9	26.9	0.4
Shrub/scrub	32400.0	3.2	8.0	0.1
Grassland/Herbaceous	6300.0	0.6	1.6	0.0
Pasture/Hay	3129300.0	312.9	773.3	11.8
Cultivated Crops	17692200.0	1769.2	4371.8	66.8
Woody Wetlands	1386000.0	138.6	342.5	5.2
Emergent Herbaceous Wetlands	76500.0	7.7	18.9	0.3
TOTAL	26501400.0	2650.1	6548.6	

Appendix N Land use in the Buffer Zones

Land use in the buffer zones of the Bear Creek and Lower St. Joseph sub-watersheds

The tables in this section were created by Scott Gibson (2007) using Arcview GIS and a stream layer from the national hydrography dataset. All streams were buffered by 30m on each side, then those buffers were overlaid on top of the 2001 national land cover dataset and clipped. Acreage for all land uses within the riverine corridor on all streams in each of the HUC-14 sub-watersheds were compiled into these tables. The map below is an exmple of the clipped buffers with their land usage.



Bear Creek Southwest: Land Use in the buffer zone (S. Gibson, 2007)

N-1 Schoppman Drain: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Open Water	326194.5	80.6	32.6	19.8
Developed, Open Space	481905.7	119.1	48.2	29.3
Developed, Low Intensity	389491.7	96.2	38.9	23.7
Developed, Medium Intensity	113658.5	28.1	11.4	6.9
Developed, High Intensity	73500.5	18.2	7.4	4.5
Decidous Forest	111647.5	27.6	11.2	6.8
Shrub/scrub	35247.6	8.7	3.5	2.1
Woody Wetlands	36357.0	9.0	3.6	2.2
Emergent Herbaceous Wetlands	75650.7	18.7	7.6	4.6
TOTAL	1643653.5	406.2	164.4	

N-2 Beckett's Run: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Open Water	12929.7	3.2	1.3	0.9
Developed, Open Space	428208.8	105.8	42.8	28.7
Developed, Low Intensity	223262.3	55.2	22.3	15.0
Developed, Medium Intensity	25785.5	6.4	2.6	1.7
Developed, High Intensity	3190.0	0.8	0.3	0.2
Decidous Forest	416366.1	102.9	41.6	27.9
Evergreen Forest	12624.4	3.1	1.3	0.8
Shrub/scrub	33674.5	8.3	3.4	2.3
Grassland/Herbaceous	19659.2	4.9	2.0	1.3
Cultivated Crops	210685.4	52.1	21.1	14.1
Woody Wetlands	74876.1	18.5	7.5	5.0
Emergent Herbaceous Wetlands	31618.5	7.8	3.2	2.1
TOTAL	1492880.5	368.9	149.3	

N-3 Tiernan Ditch: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Open Water	244220.2	60.3	24.4	11.3
Developed, Open Space	370213.0	91.5	37.0	17.1
Developed, Low Intensity	210061.0	51.9	21.0	9.7
Developed, Medium Intensity	45804.6	11.3	4.6	2.1
Developed, High Intensity	7944.5	2.0	0.8	0.4
Decidous Forest	430551.8	106.4	43.1	19.9
Evergreen Forest	1022.8	0.3	0.1	< 0.1
Shrub/scrub	12285.7	3.0	1.2	0.6
Grassland/Herbaceous	4720.9	1.2	0.5	0.2
Pasture/Hay	39056.6	9.7	3.9	1.8
Cultivated Crops	566828.2	140.1	56.7	26.2
Woody Wetlands	171304.2	42.3	17.1	7.9
Emergent Herbaceous Wetlands	62796.5	15.5	6.3	2.9
TOTAL	2166810.0	535.4	216.7	

N-4 Ely Run: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Open Water	117590.5	29.1	11.8	5.9
Developed, Open Space	315476.9	78.0	31.5	15.8
Developed, Low Intensity	117159.6	29.0	11.7	5.9
Developed, Medium Intensity	10008.9	2.5	1.0	0.5
Decidous Forest	367525.5	90.8	36.8	18.4
Evergreen Forest	434.3	0.1	< 0.1	< 0.1
Shrub/scrub	24522.4	6.1	2.5	1.2
Grassland/Herbaceous	2502.0	0.6	0.3	0.1
Pasture/Hay	41289.9	10.2	4.1	2.1
Cultivated Crops	735636.7	181.8	73.6	36.8
Woody Wetlands	101972.0	25.2	10.2	5.1
Emergent Herbaceous Wetlands	162885.5	40.3	16.3	8.2
TOTAL	1997004.2	493.5	199.7	

N-5 Lower St. Joseph-Cedarville Reservoir: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Open Water	619815.9	153.2	62.0	19.7
Developed, Open Space	122056.5	30.2	12.2	3.9
Developed, Low Intensity	73709.4	18.2	7.4	2.3
Developed, Medium Intensity	12574.2	3.1	1.3	0.4
Developed, High Intensity	5707.5	1.4	0.6	0.2
Decidous Forest	364633.3	90.1	36.5	11.6
Evergreen Forest	9681.5	2.4	1.0	0.3
Shrub/scrub	41739.1	10.3	4.2	1.3
Grassland/Herbaceous	5043.1	1.2	0.5	0.2
Pasture/Hay	419294.0	103.6	41.9	13.3
Cultivated Crops	1307127.8	323.0	130.7	41.4
Woody Wetlands	101074.9	25.0	10.1	3.2
Emergent Herbaceous Wetlands	71624.1	17.7	7.2	2.3
TOTAL	3154081.3	779.4	315.4	

N-6 Swartz-Carnahan Ditch: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Open Water	294461.9	72.8	29.4	9.6
Developed, Open Space	174839.7	43.2	17.5	5.7
Developed, Low Intensity	12988.2	3.2	1.3	0.4
Decidous Forest	834389.5	206.2	83.4	27.2
Evergreen Forest	1525.0	0.4	0.2	0.0
Shrub/scrub	48198.5	11.9	4.8	1.6
Grassland/Herbaceous	4178.6	1.0	0.4	0.1
Pasture/Hay	128699.7	31.8	12.9	4.2
Cultivated Crops	1316523.7	325.3	131.7	43.0
Woody Wetlands	144216.3	35.6	14.4	4.7
Emergent Herbaceous Wetlands	103176.7	25.5	10.3	3.4
TOTAL	3063197.7	756.9	306.3	

N-7 St. Joseph River-Walker-Metcalf Ditch: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Open Water	60765.3	15.0	6.1	1.6
Developed, Open Space	181585.1	44.9	18.2	4.7
Developed, Low Intensity	1195.3	0.3	0.1	0.0
Decidous Forest	878507.3	217.1	87.9	22.9
Evergreen Forest	177.1	0.0	0.0	0.0
Shrub/scrub	21826.7	5.4	2.2	0.6
Pasture/Hay	115681.3	28.6	11.6	3.0
Cultivated Crops	1888777.4	466.7	188.9	49.2
Woody Wetlands	534556.6	132.1	53.5	13.9
Emergent Herbaceous Wetlands	152745.4	37.7	15.3	4.0
TOTAL	3835817.568	947.845	383.585	

N-8 Bear Creek-Hursey Ditches: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Open Water	1601.5	0.4	0.2	0.1
Developed, Open Space	143045.8	35.3	14.3	4.6
Developed, Low Intensity	1523.5	0.4	0.2	0.0
Decidous Forest	612058.5	151.2	61.2	19.6
Shrub/scrub	65822.2	16.3	6.6	2.1
Cultivated Crops	2171235.5	536.5	217.1	69.4
Woody Wetlands	123502.7	30.5	12.4	3.9
Emergent Herbaceous Wetlands	10422.9	2.6	1.0	0.3
TOTAL	3129212.5	773.2	312.9	

N-9 St. Joseph River-Davis Ditch: Land use within 30-meter stream buffers

Habitat	Square Meters	Acres	Hectares	% of total
Developed, Open Space	89289.6	22.1	8.9	6.1
Developed, Low Intensity	6463.8	1.6	0.6	0.4
Decidous Forest	189368.6	46.8	18.9	12.9
Evergreen Forest	20058.6	5.0	2.0	1.4
Shrub/scrub	728.1	0.2	0.1	<0.1
Pasture/Hay	140087.3	34.6	14.0	9.6
Cultivated Crops	481931.9	119.1	48.2	32.9
Woody Wetlands	486207.2	120.1	48.6	33.2
Emergent Herbaceous Wetlands	48523.7	12.0	4.9	3.3
TOTAL	1462658.8	361.4	146.3	