



COLORADO Parks and Wildlife

Department of Natural Resources

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1 January 2015

Ms. Linda Bassi, Chief
Stream and Lake Protection Section
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver CO 80203

SUBJ: Instream Flow Recommendations for Streams and Lakes on the Soapstone Prairie Natural Area (City of Fort Collins); Spottlewood Creek, Graves Creek and Spottlewood Ponds 1-4, Larimer County, Water Division 1, for January 26-27, 2015 CWCB Meeting

Dear Linda:

The information contained in and referred to in this letter and the associated instream flow file folders form the basis for the instream flow and natural lake level recommendations for Spottlewood Creek, Graves Creek, and the Spottlewood Ponds (#1-4) to be considered by the Colorado Water Conservation Board (CWCB or Board) at their January, 2014 regular meeting. The investigations related to these instream flow and lake level recommendations were conducted by City of Fort Collins' Natural Areas Program and Colorado Parks and Wildlife personnel; these investigations were initiated in 2013 and continued into 2014. It is the CPW staff's opinion that the information contained in this letter is sufficient for the Board's staff to initiate instream flow and natural lake level appropriations on the above referenced water bodies and to specifically address the findings required in Rule 5(i) of the Instream Flow Rules.

The State of Colorado's Instream Flow (ISF) Program was created in 1973 when the Colorado General Assembly passed Senate Bill 97 which called for the recognition of "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3) C.R.S.). This statute vests the Board with the exclusive authority to appropriate and acquire instream flow and natural lake level water rights. In order to encourage other entities to participate in Colorado's ISF Program, the statute directs the Board to request instream flow recommendations from other state and federal agencies. The CPW is recommending these segments of Elkhead Creek and Armstrong Creek to the Board for inclusion into the ISF Program. These two segments should be considered for inclusion into the ISF Program because they have natural environments that can be preserved to a reasonable degree with an instream flow water right.

The CPW is forwarding these stream flow recommendations to the Board to meet CPW's legislative declarations "... that the wildlife and their environment are to be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors ... and that, to carry out such program and policy, there shall be a continuous operation of planning,



acquisition, and development of wildlife habitats and facilities for wildlife-related opportunities” (See §33-1-101 (1) C.R.S.) and “... that the natural, scenic, scientific, and outdoor recreation areas ... protected, preserved, enhanced and managed for the use, benefit, and enjoyment of the people of this state and (its) visitors ... and that, to carry out such program and policy, there shall be a continuous operation of acquisition, development, and management of ... lands, waters, and facilities.” (See §33-10-101 (1) C.R.S.). In addition to these statutory directives, the current CPW strategic planning documents (*DOW Strategic Plan*, 2010 and *A Path Forward*, 2014) state that “[h]ealthy aquatic environments are essential to maintain healthy and viable fisheries, and critical for self-sustaining populations...by protecting and enhancing the quality and quantity of aquatic habitats.” and that “Ensuring the long term viability of native fish and wildlife ... and sport fish populations.” – these statements encapsulate CPW’s primary objectives and provide a guide to the agency’s linkage to the goals and objectives of the CWCB ISF Program.

Several years ago, CPW personnel started working with staff from the City of Fort Collins Natural Areas Program (City) to develop ISF recommendations on several streams located on the Soapstone Prairie Natural Area north of Fort Collins in Larimer County. This natural area property is largely prairie grassland with several perennial water features that are somewhat unique for this area and elevation. The streams are all spring driven systems with very stable flows and very stable temperature regimes. Their hydrology is not snowmelt driven like other Colorado streams but are sustained by diffuse spring sources that are scattered throughout the drainages. Of course some snow does accumulate in the area but it is limited and rapidly melts or sublimates (due to persistent winds); spring and summer hydrology is also influenced by storm events that are common to the Colorado front range. These storm events cause short term increases in stream flow but measurements show that these streams return to the spring driven baseflows rapidly. Another characteristic of these stream systems is that they flow and dry up at predictable points along their course. CPW and City personnel are conducting ISF quantification investigations on several streams on the Soapstone Prairie; two of the streams – Spottletwood Creek and Graves Creek currently have adequate data for ISF recommendations.

Graves Creek is a stream that emerges and flows for a short distance before going underground. Due to its isolated nature, Graves Creek does not have a fish population but it is habitat to a large number of aquatic macroinvertebrate taxa – some of which are uncommon and/or unique to this stream system. Due to the hydrologic characteristics described above (isolation, stable flows, and stable temperatures), CPW biologists are currently studying and evaluating Graves Creek as a possible re-introduction site for native fish.

Upper Spottletwood Creek is similar to Graves Creek in that it flows in very predictable places and then goes underground at a predictable place. The upper reach of Spottletwood Creek has recently been stocked with native northern redbelly dace. Since this stocking event in 2012, Spottletwood Creek has been sampled once (in 2013) and the fish have persisted but no reproduction has been confirmed. The Spottletwood Creek water then re-emerges some distance downstream. Originally, CPW and City personnel investigated this lower Spottletwood Creek area for an ISF filing but came to the conclusion that there is very little flowing water in this lower Spottletwood Creek environment. Rather than it being a stream, the water actually re-emerges in a series of small ponds; the number of individual ponds in the complex ranges from 12 to 15. So, CPW and CWCB staff came to the conclusion that rather than an ISF recommendation, we would develop natural lake level (NLL) recommendations for the ponds. After mapping the pond complex, CPW and City personnel decided to develop NLL recommendations on the two ponds that define the upstream and downstream extent of the pond complex and then we selected two additional ponds in the middle of the complex that we thought

were the largest of the group. The Spottlewood Ponds have also been the site of intense investigation by CPW and City biologists; the ponds had resident populations of Iowa darters, brassy minnows, and fathead minnows (all native species); in 2012, CPW stocked two additional native species in the ponds – northern redbelly dace and plains top minnow. The presence on all species was confirmed during 2013 and 2014 sampling events. Northern leopard frogs have also been collected in the Spottlewood Ponds.

All of the Soapstone creeks and ponds have lush riparian wetlands and are undoubtedly important for terrestrial wildlife species and avian species. Several sites near these water features have a federally threatened plant species present – the Colorado butterfly plant.

As stated above, the purpose of this letter is to formally transmit ISF and NLL recommendations from CPW to CWCB for the Board's consideration for the 2015 appropriation year. Please refer to the following fact sheets and the recommendation summary table (attached) for additional information.

CPW personnel will be present at the January, 2015 CWCB meeting to answer any questions that the Board might have regarding these flow recommendations. We appreciate your consideration.

Sincerely,

Jay W. Skinner
CPW Instream Flow Program Coordinator

Attachments

FACT SHEET

Spottlewood Creek

Upper Terminus: A point where surface flow emerges (see Recommendation Summary Table for legal description)

Lower Terminus: A point where surface flow ceases (see Recommendation Summary Table for legal description)

Natural Environment:

Spottlewood Creek has a natural environment consisting of a population of northern redbelly dace, a fish species native to the eastern plains of Colorado. CPW stocked these fish in Spottlewood Creek in 2012 and resampled the stream in 2013 to find them persisting. No reproduction has been documented at the present time. Spottlewood Creek also has a very diverse macroinvertebrate community consisting of 158 taxa some of which are sensitive to perturbations, uncommon for the area, or previously undescribed. The Spottlewood riparian zone includes one species listed as “threatened” under the Endangered Species Act, the Colorado butterfly plant. Due to the relative rarity of water features such as this on the high prairie, it is reasonable to assume that this feature is important to both terrestrial wildlife and avian species.

R2CROSS Results:

In 2014, CPW, CWCB, and City of Fort Collins personnel collected R2CROSS data at 2 sites within the proposed ISF segment. Due to the gradient of Spottlewood Creek, the water velocity at the cross sections did not reach the 1.00 fps criterion so the resulting flow recommendations were developed using only the average depth and percent wetted perimeter criteria. The results of the R2CROSS modeling is summarized below:

Date	Q Measured	250% - 40%	Flow meeting two criteria
6/11/2014	0.02 cfs	0.1 – 0.0 cfs	0.05 cfs
6/11/2014	0.11 cfs	0.3 – 0.0 cfs	0.15 cfs

The average of the individual R2CROSS driven flow recommendations is 0.1 cfs. Due to the spring driven nature of Spottlewood Creek’s hydrology and the nature of the natural environment present, CPW is of the opinion that it is appropriate to recommend a single year-round instream flow amount of 0.1 cfs to be sufficient to preserve the natural environment to a reasonable degree. Site specific water availability data collected by CWCB staff suggests this water to be available.

FACT SHEET

Graves Creek

Upper Terminus: The Colorado – Wyoming state line (see Recommendation Summary Table for legal description)

Lower Terminus: The confluence with an un-named tributary (see Recommendation Summary Table for legal description)

Natural Environment:

While Graves Creek does not currently have a fishery present, it is being studied and investigated as a possible reintroduction site for northern redbelly dace and/or common shiner. Its stable hydrology and temperature regime and its relative isolation make it particularly suitable for active native fishery management activities. Graves Creek is habitat for a diverse community of macroinvertebrates (58 taxa) including several species considered to be uncommon. The Graves Creek riparian zone includes one species listed as “threatened” under the Endangered Species Act, the Colorado butterfly plant. Due to the relative rarity of water features such as this on the high prairie, it is reasonable to assume that this feature is important to both terrestrial wildlife and avian species.

R2CROSS Results:

During 2014, CPW, CWCB, and City of Fort Collins personnel collected R2CROSS data at one site within the proposed ISF segment. Due to the gradient of Graves Creek, the water velocity at the cross section did not reach the 1.00 fps criterion so the resulting flow recommendations were developed using only the average depth and percent wetted perimeter criteria. The results of the R2CROSS modeling is summarized below:

Date	Q Measured	250% - 40%	Flow meeting two criteria
6/11/2014	0.10 cfs	0.3 – 0.0 cfs	0.17 cfs

Due to the spring driven nature of Graves Creek’s hydrology and the nature of the natural environment present, CPW is of the opinion that it is appropriate to recommend a single year-round instream flow amount of 0.17 cfs to be sufficient to preserve the natural environment to a reasonable degree. Site specific water availability data collected by CWCB staff suggests this water to be available.

FACT SHEET

Spottlewood Ponds 1 - 4

Locations: Refer to the attached Recommendation Summary Table for the surveyed and projected locations of Spottlewood Ponds 1-4

Natural Environment:

The Spottlewood Pond complex consists of 12-15 individual ponds located directly east of the Rawhide Power Generation Station. It is believed that the flow that exists some distance upstream in Spottlewood Creek re-emerges to form the pond complex. Review of aerial photographs suggests that these ponds persist even in normal and below normal hydrologic years. This belief is reinforced by the natural environment data for the ponds. While some of the fish species present in the ponds were recently stocked, other species were not stocked which leads to the conclusion that these ponds are permanent features on the prairie landscape. The ponds have populations of brassy minnow, Iowa darter and fathead minnow; all of these species are native plains fishes. In 2012, CPW introduced northern redbelly dace and plains topminnow to the ponds; sampling in 2013 and 2014 show all species present. Northern leopard frogs have also been observed in the pond complex. Due to the permanent nature of this relatively rare water feature on the high prairie, it is reasonable to expect that these ponds are important to both terrestrial species and avian species.

Lake Level Elevations and Volumes:

As stated above, there are 12-15 ponds in the complex of varying size. CPW and City of Fort Collins personnel decided that due to the hydraulic connection between all the ponds, it was not necessary to develop NLL recommendations for all of the ponds. We decided that functionally, the entire complex would be protected if the CWCB was to appropriate NLL water rights on 1) the uppermost pond, and 2) the lowest pond in the complex, and 3) the larger ponds in between. We utilized standard surveying techniques to determine the volumes of the ponds and the true elevations of the ponds. Pond cross-section measurements and water depth were fed into a CAD system and volumes were estimated. City engineering crews determined the true water surface elevations using standard methods.

Historically, it has been the practice of CPW and CWCB to recommend and appropriate the entire volume of natural lakes as being necessary to preserve the natural environment to a reasonable degree. Therefore, the following volumes and elevations are CPW's recommendations with respect to the Spottlewood Ponds:

<u>Pond #1:</u>	0.19 acre – feet at elevation 5634.6 feet above MSL
<u>Pond #2:</u>	0.12 acre – feet at elevation 5645.8 feet above MSL
<u>Pond #3:</u>	0.17 acre – feet at elevation 5647.6 feet above MSL
<u>Pond #4:</u>	0.16 acre – feet at elevation 5659.2 feet above MSL

Water Body	Proposed Upper Terminus	LAT LONG/UTM Coordinates	Proposed Lower Terminus	LAT LONG/UTM Coordinates	Length/Elevation	Counties	Water Division	Major Drainage Basin	USGS Map(s)	Natural Environment Information	Sources and References	Biological Flow/Lake Level Recommendation	Additional Information and/or Supporting Data
Spottlewood Creek	A point Located at:	4537937.85 N 495521.89 E	A point Located at:	4534887.62 N 498663.70 E	3.53 miles	Larimer	1	South Platte/Cache la Poudre	Round Butte	Upper Spottlewood Creek has been an area of interest to CPW and the City of Fort Collins since the city's acquisition of the Soapstone NA. Many of the streams on this property are both unique and isolated and thus offer unique opportunities for native fish management. Flows in these creeks are spring fed and are therefore very consistent in flow and temperature making them ideal for a variety of native species. In 2012, Spottlewood Creek was stocked with northern redbelly dace. These fish seem to be persisting; reproduction has not been verified. At least 158 different taxa of aquatic invertebrates have been documented in Spottlewood Creek including several sensitive species and some uncommon and previously undescribed species. The Spottlewood Creek riparian zone also has the federally threatened plant, the Colorado butterfly plant.	A.G. Hansen and K.T. Bentley (Colorado State University, 2008); R.D. Stoaks and B.C. Kondratieff (Colorado State University, 2012); Colorado Parks and Wildlife (Boyd Wright, Area Aquatic Biologist)	CPW and CWCB staff collected R2CROSS information in June, 2014 at 2 sites on Spottlewood Creek. Due to the low gradient of the channel, the average velocity criterion was not met at either site. Due to the spring driven hydrology of this system and the natural environment present, CPW is of the opinion that a year-round ISF recommendation is appropriate for this creek. The average depth and wetted perimeter criteria were met at flows of 0.05 cfs and 0.15 cfs at the 2 sites and both of these values were "in-range" for the Manning's n estimate, therefore we average these values and arrive at a year-round ISF recommendation of: 0.10 cfs (1/1 - 12/31)	
Graves Creek	The Colorado - Wyoming Stateline	45385.60.12 N 498477.70 E	The Confluence with an Unnamed Tributary	4535421.23 N 500624.89 E	2.76 miles	Larimer	1	South Platte/Cache la Poudre	Round Butte	While Graves Creek does not presently have any fish, CPW and Fort Collins are investigating the re-introduction of native fish. Currently, the species under consideration are northern redbelly dace and common shiner. Graves Creek currently provides habitat for a federally listed plant (the Colorado butterfly plant) and aquatic macroinvertebrates (58 species of aquatic insects) including several species that experts considered to be uncommon for the region.	A.G. Hansen and K.T. Bentley (Colorado State University, 2008); R.D. Stoaks and B.C. Kondratieff (Colorado State University, 2012); Colorado Parks and Wildlife (Boyd Wright, Area Aquatic Biologist)	In June, 2014, CPW and CWCB staff collected R2CROSS data at one site on Graves Creek. The R2CROSS results were similar to those on Spottlewood Creek yeilding only a two of three criteria flow recommendation - the average velocity criterion was never met due to the low gradient of the channel. The two criteria flow recommendation from the R2CROSS staging table is 0.17 cfs. In light of the natural environment data and the spring driven hydrology of this system, CPW recommends a year round instream flow of 0.17 cfs (1/1 - 12/31).	
Spottlewood Ponds 1-4						Larimer	1	South Platte/Cache la Poudre	Round Butte	The lower Spottlewood Pond complex is a unique and persistent feature on the Soapstone NA landscape. The ponds seem to persist during normal and dry year hydrology and thus provide habitat for native plains fish species such as the brassy minnow, fathead minnow, and Iowa darter. CPW biologists have stocked northern redbelly dace and plains topminnow in these ponds. Northern leopard frogs have also been collected in this pond complex. The persistent open water provided by the Spottlewood Ponds is undoubtedly important to terrestrial wildlife and avian species.	A.G. Hansen and K.T. Bentley (Colorado State University, 2008); R.D. Stoaks and B.C. Kondratieff (Colorado State University, 2012); Colorado Parks and Wildlife (Boyd Wright, Area Aquatic Biologist)	While there are 12-15 small perennial ponds on lower Spottlewood Creek, CPW and City of Fort Collins staff decided to survey and develop natural lake level recommendations on the highest and lowest ponds in the system and two of the larger ponds in the middle of the pond complex. We believed that if protection was secured on these 4 then the others were also protected due to their connectivity. Pond surface area, volume, and elevation were determined by field survey and CAD engineering techniques.	
Pond #1	N/A	4524450.31 N 500088.64 E	N/A	N/A	5634.6 ft	Larimer	1	South Platte/Cache la Poudre	Round Butte			0.19 Acre - feet	
Pond #2	N/A	4524806.62 N 500159.81 E	N/A	N/A	5645.8 ft	Larimer	1	South Platte/Cache la Poudre	Round Butte			0.12 Acre - feet	
Pond #3	N/A	4524786.50 N 500226.24 E	N/A	N/A	5647.6 ft	Larimer	1	South Platte/Cache la Poudre	Round Butte			0.17 Acre - feet	
Pond #4	N/A	4524912.38 N 500530.95 E	N/A	N/A	5659.2 ft	Larimer	1	South Platte/Cache la Poudre	Round Butte			0.16 Acre - feet	

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME: Spottlewood Creek
XS LOCATION: upper upper
XS NUMBER: 0

DATE: 6.11.14
OBSERVERS: 0

1/4 SEC: 0
SECTION: 0
TWP: 0
RANGE: 0
PM: 0

COUNTY: 0
WATERSHED: 0
DIVISION: 0
DOW CODE: 0

USGS MAP: 0
USFS MAP: 0

SUPPLEMENTAL DATA

*** NOTE ***

Leave TAPE WT and TENSION
at defaults for data collected
with a survey level and rod

TAPE WT: 0.0106
TENSION: 99999

CHANNEL PROFILE DATA

SLOPE: 0.013

INPUT DATA CHECKED BY:DATE.....

ASSIGNED TO:DATE.....

STREAM NAME: Spottlewood Creek
 XS LOCATION: upper upper
 XS NUMBER: 0

DATA POINTS= 18

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
1 gl	0.00	5.75		
	1.00	6.10		
	2.00	6.30		
	3.00	6.35		
wl	4.10	6.47	0.00	0.00
	4.50	6.65	0.15	0.10
	4.90	6.70	0.20	0.10
	5.30	6.75	0.25	0.10
	5.70	6.70	0.15	0.10
	6.10	7.10	0.55	0.10
	6.50	6.85	0.30	0.10
	6.90	6.90	0.35	0.10
	7.30	6.95	0.50	0.10
	7.70	6.65	0.20	0.10
wl	8.00	6.47	0.00	0.00
	8.70	6.45		
	9.90	6.20		
1 gl	10.70	6.00		

TOTALS -----

WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.44	0.15	0.06	0.01	5.7%
0.40	0.20	0.08	0.01	7.6%
0.40	0.25	0.10	0.01	9.5%
0.40	0.15	0.06	0.01	5.7%
0.57	0.55	0.22	0.02	21.0%
0.47	0.30	0.12	0.01	11.4%
0.40	0.35	0.14	0.01	13.3%
0.40	0.50	0.20	0.02	19.0%
0.50	0.20	0.07	0.01	6.7%
0.35		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

4.34 0.55 1.05 0.11 100.0%
 (Max.)

Manning's n = 0.6577
 Hydraulic Radius= 0.24185522

STREAM NAME: Spottlewood Creek
 XS LOCATION: upper upper
 XS NUMBER: 0

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	1.05	1.20	14.2%
6.22	1.05	2.80	166.6%
6.24	1.05	2.64	151.1%
6.26	1.05	2.48	136.1%
6.28	1.05	2.32	121.4%
6.30	1.05	2.17	107.0%
6.32	1.05	2.03	93.4%
6.34	1.05	1.90	80.7%
6.36	1.05	1.77	68.8%
6.38	1.05	1.65	57.6%
6.40	1.05	1.54	46.9%
6.42	1.05	1.44	36.7%
6.43	1.05	1.38	31.8%
6.44	1.05	1.33	27.1%
6.45	1.05	1.29	22.5%
6.46	1.05	1.24	18.1%
6.47	1.05	1.20	14.2%
6.48	1.05	1.16	10.5%
6.49	1.05	1.12	6.8%
6.50	1.05	1.08	3.2%
6.51	1.05	1.05	-0.4%
6.52	1.05	1.01	-3.9%
6.54	1.05	0.94	-10.9%
6.56	1.05	0.86	-17.7%
6.58	1.05	0.79	-24.4%
6.60	1.05	0.72	-31.0%
6.62	1.05	0.66	-37.4%
6.64	1.05	0.59	-43.6%
6.66	1.05	0.53	-49.7%
6.68	1.05	0.47	-55.4%
6.70	1.05	0.41	-60.8%
6.72	1.05	0.36	-65.7%

WATERLINE AT ZERO
 AREA ERROR = 6.509

STREAM NAME: Spottlewood Creek
 XS LOCATION: upper upper
 XS NUMBER: 0

Constant Manning's n

GL = lowest Grassline elevation corrected for sag

WL = Waterline corrected for variations in field measured water surface elevations and sag

STAGING TABLE

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.00	9.99	0.48	1.10	4.81	10.52	100.0%	0.46	0.74	0.15
	6.01	9.92	0.48	1.09	4.73	10.46	99.4%	0.45	0.72	0.15
	6.06	9.58	0.44	1.04	4.24	10.10	96.0%	0.42	0.61	0.14
	6.11	9.22	0.41	0.99	3.77	9.72	92.4%	0.39	0.52	0.14
	6.16	8.77	0.38	0.94	3.32	9.26	88.0%	0.36	0.43	0.13
	6.21	8.31	0.35	0.89	2.89	8.80	83.6%	0.33	0.35	0.12
	6.26	7.82	0.32	0.84	2.49	8.30	78.8%	0.30	0.29	0.12
	6.31	7.20	0.29	0.79	2.11	7.66	72.8%	0.28	0.23	0.11
	6.36	6.05	0.29	0.74	1.78	6.51	61.9%	0.27	0.19	0.11
	6.41	5.36	0.28	0.69	1.49	5.81	55.2%	0.26	0.16	0.10
	6.46	4.39	0.28	0.64	1.24	4.83	45.9%	0.26	0.13	0.10
WL	6.51	3.75	0.28	0.59	1.05	4.17	39.6%	0.25	0.11	0.10
	6.56	3.55	0.24	0.54	0.87	3.95	37.6%	0.22	0.08	0.09
	6.61	3.36	0.21	0.49	0.69	3.73	35.5%	0.19	0.06	0.08
	6.66	3.12	0.17	0.44	0.53	3.47	32.9%	0.15	0.04	0.07
	6.71	2.57	0.15	0.39	0.39	2.89	27.5%	0.13	0.03	0.07
	6.76	1.80	0.16	0.34	0.28	2.08	19.8%	0.14	0.02	0.07
	6.81	1.68	0.12	0.29	0.19	1.92	18.3%	0.10	0.01	0.06
	6.86	1.48	0.08	0.24	0.11	1.68	16.0%	0.07	0.00	0.04
	6.91	0.88	0.06	0.19	0.06	1.03	9.8%	0.05	0.00	0.04
	6.96	0.37	0.07	0.14	0.03	0.47	4.4%	0.06	0.00	0.04
	7.01	0.24	0.05	0.09	0.01	0.30	2.9%	0.04	0.00	0.03
	7.06	0.11	0.02	0.04	0.00	0.14	1.3%	0.02	0.00	0.02

0.15

STREAM NAME: Spottlewood Creek
XS LOCATION: upper upper
XS NUMBER: 0

SUMMARY SHEET

MEASURED FLOW (Qm)=	0.11 cfs
CALCULATED FLOW (Qc)=	0.11 cfs
(Qm-Qc)/Qm * 100 =	-2.7 %

MEASURED WATERLINE (WLm)=	6.47 ft
CALCULATED WATERLINE (WLc)=	6.51 ft
(WLm-WLc)/WLm * 100 =	-0.6 %

MAX MEASURED DEPTH (Dm)=	0.55 ft
MAX CALCULATED DEPTH (Dc)=	0.59 ft
(Dm-Dc)/Dm * 100	-7.5 %

MEAN VELOCITY=	0.10	ft/sec
MANNING'S N=	0.658	
SLOPE=	0.013	ft/ft

.4 * Qm =	0.0 cfs
2.5 * Qm=	0.3 cfs

RECOMMENDED INSTREAM FLOW:

FLOW (CFS)

PERIOD

RATIONALE FOR RECOMMENDATION:

RECOMMENDATION BY: _____ AGENCY: _____ DATE: _____

CVCB REVIEW BY: _____ DATE: _____

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME: Spottlewood Creek
XS LOCATION: Upper lower
XS NUMBER: 0

DATE: 6.11.14
OBSERVERS: 0

1/4 SEC: 0
SECTION: 0
TWP: 0
RANGE: 0
PM: 0

COUNTY: 0
WATERSHED: 0
DIVISION: 0
DOW CODE: 0

USGS MAP: 0
USFS MAP: 0

SUPPLEMENTAL DATA

*** NOTE ***

Leave TAPE WT and TENSION
at defaults for data collected
with a survey level and rod

TAPE WT: 0.0106
TENSION: 99999

CHANNEL PROFILE DATA

SLOPE: 0.012

INPUT DATA CHECKED BY:DATE.....

ASSIGNED TO:DATE.....

STREAM NAME: Spottlewood Creek
 XS LOCATION: Upper lower
 XS NUMBER: 0

DATA POINTS= 18

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
1 gl	0.00	5.95		
	0.50	6.50		
	1.00	6.90		
	2.00	7.05		
wl	3.00	7.45		
	3.70	7.63	0.00	0.00
	4.10	7.80	0.15	0.02
	4.50	7.90	0.25	0.02
	4.90	8.10	0.45	0.02
	5.30	8.10	0.45	0.02
	5.70	8.10	0.50	0.02
	6.10	8.15	0.50	0.02
wl	6.50	7.90	0.30	0.02
	7.20	7.63	0.00	0.00
	7.70	7.35		
	8.80	6.90		
1 gl	9.80	6.30		
	11.00	6.00		

TOTALS -----

VALUES COMPUTED FROM RAW FIELD DATA

WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.43	0.15	0.06	0.00	5.5%
0.41	0.25	0.10	0.00	9.2%
0.45	0.45	0.18	0.00	16.6%
0.40	0.45	0.18	0.00	16.6%
0.40	0.50	0.20	0.00	18.4%
0.40	0.50	0.20	0.00	18.4%
0.47	0.30	0.17	0.00	15.2%
0.75		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

3.72	0.5	1.09	0.02	100.0%
(Max.)				

Manning's n = 3.5800
 Hydraulic Radius= 0.29172713

STREAM NAME: Spottlewood Creek
 XS LOCATION: Upper lower
 XS NUMBER: 0

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	1.09	1.10	1.1%
7.38	1.09	2.15	97.7%
7.40	1.09	2.05	88.9%
7.42	1.09	1.96	80.3%
7.44	1.09	1.86	71.8%
7.46	1.09	1.77	63.5%
7.48	1.09	1.69	55.3%
7.50	1.09	1.60	47.4%
7.52	1.09	1.52	39.7%
7.54	1.09	1.43	32.2%
7.56	1.09	1.36	24.9%
7.58	1.09	1.28	17.8%
7.59	1.09	1.24	14.4%
7.60	1.09	1.20	11.0%
7.61	1.09	1.17	7.6%
7.62	1.09	1.13	4.3%
7.63	1.09	1.10	1.1%
7.64	1.09	1.06	-2.1%
7.65	1.09	1.03	-5.3%
7.66	1.09	0.99	-8.4%
7.67	1.09	0.96	-11.5%
7.68	1.09	0.93	-14.5%
7.70	1.09	0.86	-20.4%
7.72	1.09	0.80	-26.1%
7.74	1.09	0.74	-31.7%
7.76	1.09	0.68	-37.0%
7.78	1.09	0.63	-42.2%
7.80	1.09	0.57	-47.2%
7.82	1.09	0.52	-52.0%
7.84	1.09	0.47	-56.5%
7.86	1.09	0.43	-60.8%
7.88	1.09	0.38	-64.9%

WATERLINE AT ZERO
 AREA ERROR = 7.633

STREAM NAME: Spottlewood Creek
 XS LOCATION: Upper lower
 XS NUMBER: 0

Constant Manning's n

GL = lowest Grassline elevation corrected for sag

WL = Waterline corrected for variations in field measured water surface elevations and sag

STAGING TABLE

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.50	8.97	0.94	1.65	8.42	9.71	100.0%	0.87	0.35	0.04
	6.63	8.58	0.85	1.52	7.25	9.24	95.1%	0.78	0.28	0.04
	6.68	8.43	0.81	1.47	6.83	9.06	93.3%	0.75	0.26	0.04
	6.73	8.29	0.77	1.42	6.41	8.88	91.5%	0.72	0.23	0.04
	6.78	8.14	0.74	1.37	6.00	8.71	89.7%	0.69	0.21	0.04
	6.83	7.99	0.70	1.32	5.59	8.53	87.8%	0.66	0.19	0.03
	6.88	7.85	0.66	1.27	5.20	8.35	86.0%	0.62	0.17	0.03
	6.93	7.50	0.64	1.22	4.81	7.98	82.2%	0.60	0.16	0.03
	6.98	7.04	0.63	1.17	4.45	7.51	77.3%	0.59	0.14	0.03
	7.03	6.59	0.62	1.12	4.11	7.04	72.5%	0.58	0.13	0.03
	7.08	6.27	0.60	1.07	3.79	6.71	69.1%	0.56	0.12	0.03
	7.13	6.02	0.58	1.02	3.48	6.44	66.3%	0.54	0.11	0.03
	7.18	5.77	0.55	0.97	3.19	6.17	63.6%	0.52	0.09	0.03
	7.23	5.53	0.53	0.92	2.90	5.91	60.8%	0.49	0.08	0.03
	7.28	5.28	0.50	0.87	2.63	5.64	58.1%	0.47	0.07	0.03
	7.33	5.03	0.47	0.82	2.38	5.37	55.3%	0.44	0.06	0.03
	7.38	4.81	0.44	0.77	2.13	5.13	52.8%	0.42	0.05	0.03
	7.43	4.59	0.41	0.72	1.89	4.89	50.4%	0.39	0.05	0.02
	7.48	4.33	0.39	0.67	1.67	4.61	47.5%	0.36	0.04	0.02
	7.53	4.05	0.36	0.62	1.46	4.31	44.3%	0.34	0.03	0.02
	7.58	3.76	0.34	0.57	1.27	4.00	41.2%	0.32	0.03	0.02
WL	7.63	3.48	0.31	0.52	1.08	3.70	38.1%	0.29	0.02	0.02
	7.68	3.24	0.28	0.47	0.92	3.43	35.4%	0.27	0.02	0.02
	7.73	2.99	0.25	0.42	0.76	3.17	32.6%	0.24	0.01	0.02
	7.78	2.74	0.23	0.37	0.62	2.90	29.9%	0.21	0.01	0.02
	7.83	2.44	0.20	0.32	0.49	2.58	26.6%	0.19	0.01	0.01
	7.88	2.11	0.18	0.27	0.37	2.24	23.0%	0.17	0.01	0.01
	7.93	1.88	0.15	0.22	0.28	1.98	20.4%	0.14	0.00	0.01
	7.98	1.70	0.11	0.17	0.19	1.78	18.3%	0.10	0.00	0.01
	8.03	1.52	0.07	0.12	0.11	1.57	16.2%	0.07	0.00	0.01
	8.08	1.34	0.03	0.07	0.03	1.37	14.1%	0.02	0.00	0.00
	8.13	0.16	0.01	0.02	0.00	0.17	1.7%	0.01	0.00	0.00

0.05

STREAM NAME: Spottlewood Creek
XS LOCATION: Upper lower
XS NUMBER: 0

SUMMARY SHEET

MEASURED FLOW (Qm)=	0.02 cfs
CALCULATED FLOW (Qc)=	0.02 cfs
(Qm-Qc)/Qm * 100 =	-0.3 %

MEASURED WATERLINE (WLm)=	7.63 ft
CALCULATED WATERLINE (WLc)=	7.63 ft
(WLm-WLc)/WLm * 100 =	0.0 %

MAX MEASURED DEPTH (Dm)=	0.50 ft
MAX CALCULATED DEPTH (Dc)=	0.52 ft
(Dm-Dc)/Dm * 100	-3.3 %

MEAN VELOCITY=	0.02	ft/sec
MANNING'S N=	3.580	
SLOPE=	0.012	ft/ft

.4 * Qm =	0.0 cfs
2.5 * Qm=	0.1 cfs

RECOMMENDED INSTREAM FLOW:
=====

FLOW (CFS)	PERIOD
=====	=====

RATIONALE FOR RECOMMENDATION:
=====

RECOMMENDATION BY: _____ AGENCY: _____ DATE: _____

CWCB REVIEW BY: _____ DATE: _____





















5

4

3









































Inventory of fishes inhabiting Spottlewood, Graves, and Sand Creeks on Meadow Springs Ranch and Soapstone Prairie Natural Area, Larimer County, CO



Iowa darter *Etheostoma exile*; Kelly Stockton Photo (2008)

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4 December 2008

Abstract – Information regarding aquatic systems is essential to the development of natural resource management plans for protected lands. Limited information exists about the fishes inhabiting key transition zone streams on Soapstone Prairie Natural Area (2004 purchase by City of Fort Collins Natural Areas Program) and Meadow Springs Ranch (MSR; 1990 purchase by City of Fort Collins Utilities), Larimer County, CO; a necessity for the adequate characterization of fauna on each property. Key streams included Spottletwood, Sand (and Jack Springs tributary), and Graves Creek. October 2008, fish presence-absence data were obtained from each creek using backpack electrofishing (single pass), seining (single pass), and minnow trapping (single overnight set). Entire segments of each stream, except Graves, holding surface water were sampled by targeting pools. Two historic sampling locations, designated by the Colorado Division of Wildlife (CDOW), were sampled on Graves. No surface water was located on Sand or Jack Springs and could not be sampled. No fishes were captured in either CDOW site on Graves. Native brassy minnows *Hybognathus hankinsoni* (state threatened), fathead minnows *Pimephales promelas*, Iowa darters *Etheostoma exile* (species of special concern), and northern leopard frogs *Rana pipiens* (species of special concern) were captured in Spottletwood Creek on MSR. Relative abundances of captured fishes were 20.55%, 77.74%, and 1.71%, respectively.

Introduction

Baseline inventories of aquatic resources are essential to the development of comprehensive land management plans aimed at conserving the biotic and abiotic components of an ecological system while simultaneously providing recreational opportunities to the public. For example, aquatic systems and inhabitants must be considered when formulating attuned cattle grazing regimes, recreational trail systems, and other infrastructure (e.g., roads, parking lots, and services) for the facilitation of public use, due to potential direct or indirect impacts.

The Soapstone Prairie Natural Area (SPNA; owned by the City of Fort Collins Natural Areas Program) and Meadow Springs Ranch (MSR; owned by City of Fort Collins Utilities) properties, being positioned within the transition zone of Colorado's Front Range, house unique riparian, wetland, marsh, spring, and stream habitats critical to the conservation of aquatic organisms (City of Fort Collins Natural Areas Program 2007). The Colorado Division of Wildlife (CDOW) recognizes riparian corridors, streams, and wetlands to be key habitats for the perpetuation of the most threatened aquatic species in the state (Colorado Division of Wildlife 2006). Furthermore, eastern plains rivers, transition zone streams, and plains streams are becoming increasingly degraded, with the majority considered to be in poor condition (Colorado Division of Wildlife 2006). Primary contributing factors include ground water depletion (ground water critical to base flow maintenance), water quality deterioration (e.g., excess nitrogen), poor grazing practices (e.g., over-grazing in riparian vegetation), invasive species (e.g., western mosquito fish *Gambusia affinis*, Russian olive *Elaeagnus angustifolia*), and instream barriers (e.g., road or trail culverts; Colorado Division of Wildlife 2006).

The primary objective of the present study was to inventory (i.e., qualitative presence-absence) the fishes inhabiting (currently unknown) the principal intermittent streams on SPNA and MSR as outlined in the 2007 *Soapstone Prairie Natural Area Management Plan*, developed by the City of Fort Collins Natural Areas Program. This plan placed wetlands and riparian systems as key conservation targets, with native fishes considered nested (City of Fort Collins

Natural Areas Program 2007). The anticipated use of this information was for its integration into the finalization process of SPNA's management plan, as well as its consideration within the context of current land use on MSR by City of Fort Collins Utilities.

Methods

Survey Sites

Soapstone Prairie Natural Area and Meadow Springs Ranch – Soapstone Prairie Natural Area is 18,728 acres in size, and located approximately 25 miles north of Fort Collins, Larimer County, CO. Its northern border is delineated by the CO-WY state line, with its western border lying juxtaposed to the 13,500 acre Red Mountain Open Space, owned by Larimer County (Figure 1; City of Fort Collins Natural Areas Program 2007). Meadow Springs Ranch borders the eastern and southern edges of SPNA and extends further to the south (Figure 1). Elevations in SPNA range from 6000 to 7200ft and are similar in MSR (City of Fort Collins Natural Areas Program 2007). Both areas, particularly SPNA, house diverse plant (globally rare) and wildlife communities, especially when pertaining to riparian, transition zone stream, and wetland habitats (City of Fort Collins Natural Areas Program 2007). Management on SPNA will incorporate both recreational and ecological values (open to public in 2009; City of Fort Collins Natural Areas Program 2007). The primary use of the 26,000 acre MSR is for the application of biosolids accumulated in Fort Collins Utilities wastewater treatment facilities. Soil and ground water are routinely sampled to monitor application procedures and to comply with state and federal regulations (City of Fort Collins Utilities 2008). Streams designated to be sampled were Spottlewood, Sand, including Jack Springs tributary, and Graves Creek. Spottlewood Creek flows (north to south) through both SPNA and MSR, extending approximately 12 miles (Figure 1). Portions of Sand Creek and Jack Springs on MSR, flowing (north to south) approximately 2.5 miles (Figure 1), were targeted. Graves Creek flows (north to south) approximately 4.5 miles on both SPNA and MSR, with portions on SPNA being of primary interest (Figure 2). All streams are intermittent with portions of Spottlewood and Graves holding surface water more frequently than Sand and Jack Springs (City of Fort Collins Natural Areas Program 2007).

Fish Sampling and Habitat Measurements

Spottlewood Creek on Soapstone Prairie Natural Area – On 5 October 2008, pools (designated with ID numbers 1 – n) along the entire section of Spottlewood on SPNA containing surface water, excluding wetland and non-distinct channel segments (approximately 2 miles; determined by Erica Saunders, Environmental Planner for City of Fort Collins Natural Resources Department, summer 2008), were targeted for sampling using backpack electrofishing units (Smith-Root LR-24, 200v pulsed DC current). Given the time of year and flow level (not measured), pools were considered to be the habitat unit most likely to contain fish. The wetted stream section (located approximately 2 miles north of southern SPNA-MSR border; Figure 3) was traversed by two sampling crews, with one electrofishing pass being conducted through, and GPS coordinates (UTM's, NAD83, WGS84) recorded at every pool encountered (Table 1A Appendix A). One electrofishing pass was assumed to be sufficient for documenting all species present. Pools were defined as units with relatively deep water and slow flow following a flow break within a run or riffle (Hawkins et al. 1993). Captured fish ≥ 30 mm (identification difficult

< 30 mm) were identified, enumerated by pool, and measured (total length in mm; up to 30 individuals with remainder being counted). Formalin solution (10% formaldehyde) was carried to collect unidentifiable specimens for validation in the laboratory. A single stream surface temperature (°F) was measured in the morning. No other habitat measurements were recorded.

Graves Creek on Soapstone Prairie Natural Area – Two historic sampling reaches [standardized sites 259 (E0499362, N4537255, 13N, NAD83) and 267 (E499939, N4536083, 13N, NAD83); Figure 2], designated by the CDOW, were selected to be sampled on Graves Creek (5 October 2008). Both sites were located on SPNA (Figure 2). Sampling protocol followed that outlined by Colorado Division of Wildlife (2008), which involved depletion sampling using backpack electrofishing and seining. However, due to the absence of fish, only one electrofishing pass (Smith-Root LR 24, 200v pulsed DC current, 28W) was conducted through each site, and the full protocol was not completed. Water temperatures and conductivity measurements for sites 259 and 267 were 41°F, 41°F, 390 µS/cm, and 410 µS/cm, respectively. No other habitat measurements were recorded.

Spottlewood Creek on Meadow Springs Ranch – On 5 October 2008, the entire section of Spottlewood on MSR (approximately 6 miles; Figure 1) was navigated by foot to establish stream segments containing surface water, with the goal of following the same section wide electrofishing procedures as described above for Spottlewood on SPNA. However, surface water was only located just north of the southernmost MSR border (near Rawhide Power Plant), extending approximately 0.5 miles (Figures 4 and 6), and consisted of a series of fifteen large pools (likely continuous during high flow periods) uncondusive to backpack electrofishing (large water volume, unfeasible to wade, and densely vegetated; Figure 7). The remaining channel extending north (approximately 7 miles) was either dry or unrecognizable (i.e., no distinct stream channel inferring subsurface flow) until the section of surface water sampled on SPNA was reached (Figure 5). Therefore, a sampling protocol involving the use of beach seines (6ft x 25ft, 3/8in mesh) and collapsible soft meshed minnow traps (15in x 9.5in x 9.5in) was developed.

During the evening of 17 October 2008, each pool was designated an ID number ranging from 1 – 15. A single minnow trap (assumed sufficient), containing dog food and a green glow stick (12hr duration) as attractants, was deployed in the deepest point of each pool, except 2 and 15, which were not sampled with traps, and 3, 6, 8, and 14, in which two traps were positioned (eighteen total; Figure 7). Traps were pulled the morning of 18 October 2008. Using the random number generator in Microsoft Excel®, six pools were randomly selected (1, 3, 5, 11, 12, and 15) to be seined on 18 October 2008 after the removal of fish captured in minnow traps (Figure 7). Seines were fixed with tow ropes (connected to brails) and flattened concrete weights (connected to lead line) to facilitate hauling through the deep, densely vegetated pools. A single, continuous seine haul was conducted in each pool (assumed sufficient). Again, captured fish were processed as outlined previously. Data collected were purely qualitative, and quantitative measures (e.g., pool specific species density) could not be computed. Additionally, catch per unit effort indices from seine hauls were confounded due to the initial removal of fish from minnow traps. Lastly, GPS coordinates (UTM's, WGS84; Table 2A Appendix A), total length (ft), width (ft), and maximum observed depth (ft; stadia rod) measurements were recorded for each pool to quantify habitat. Travelling upstream to downstream, width measurements were

taken every 30ft and averaged to compute pool surface area (ft²). A single stream surface temperature (°F) was recorded midday on 18 October 2008.

Sand Creek and Jack Springs on Meadow Springs Ranch – On 5 October 2008, Sand Creek and Jack Springs flowing through MSR was surveyed in order to establish stream segments containing surface water for sampling. No flowing water was located and could not be sampled.

Results

Spottlewood and Graves Creek on Soapstone Prairie Natural Area – Overall, thirty-eight pools were sampled on Spottlewood Creek, none of which contained fish (Table 1A Appendix A). Nonnative mudpuppies *Necturus spp.* were captured in pools 37 and 38 (Table 1A Appendix A). Surface water temperature was measured at 43°F. Again, no fish were captured in either CDOW historic site on Graves Creek.

Spottlewood Creek on Meadow Springs Ranch – Only three species of native fish, Iowa darter *Etheostoma exile* (IOD), fathead minnow *Pimephales promelas* (FHM), and brassy minnow *Hybognathus hankinsoni* (BMW) were captured. Total length measurements ranged between 30 – 81 mm for all species (Figure 8). Each species was captured in every pool sampled except 2 (not sampled), 4 (no captured BMW), 7 (no captured BMW), 9 (no fish captured), 10 (no IOD captured), 12 (no IOD captured), 13 (no fish captured), 14 (no IOD or BMW captured), and 15 (no IOD captured; Table 1). Overall, 15 IOD's, 681 FHM's, and 180 BMW's were captured (summed across seine haul, minnow trap, and pool; Table 1), corresponding to relative abundances of (assuming equal capture probability across pool, species, and sampling method) 1.71%, 77.74%, and 20.55%, respectively. Northern leopard frogs *Rana pipiens* were captured in minnow traps within pools 3 (one total), 8 (one total), 9 (two total), and 14 (one total; Table 1). No mudpuppies were captured in any pools, contrary to sections of Spottlewood Creek on SPNA (Table 1). Pool surface area and maximum observed pool depth ranged from 822.1 – 8098.0 ft² and 1.3 – 8.0 ft, respectively (Table 1). Surface water temperature was measured at 39°F.

Discussion

According to Colorado Division of Wildlife (2006), the BMW and IOD are tier 1 (i.e., highest conservation priority) state threatened species, and tier 2 (i.e., lower priority relative to tier 1) species of special concern, respectively. Additionally, population status for the BMW is considered to be low (in terms of abundance; continuum of three levels: low, medium, and abundant), with current population trend being unknown (insufficient data), but have declined during recent decades (Scheurer et al 2003a). Current distribution primarily consists of eastern plains stream tributaries within the South Platte and Republican River Basins (e.g., Arikaree River; Colorado Division of Wildlife 2006; Scheurer et al. 2003b). Conversely, population status of the IOD is considered to be medium, with a stable population trend (Colorado Division of Wildlife 2006). The FHM is highly tolerant of a wide range of environmental conditions and is currently not considered a species of high conservation need in the state (Colorado Division of Wildlife 2006). Furthermore, northern leopard frogs are a tier 1 species of special concern, with a low population status, and declining population trend (Colorado Division of Wildlife 2006).

Primary habitats include eastern plains and transition zone rivers, streams, and wetlands (Colorado Division of Wildlife 2006). Since Spottlewood Creek on MSR contains sensitive populations of both fish and amphibian species, ever important in the face of continued habitat fragmentation and loss on Colorado's Front Range, consideration must be taken in the context of future land use decisions by City of Fort Collins Utilities. It is recommended that instream water quality be surveyed and monitored.

Given the absence of fish in the wetted section of Spottlewood Creek on SPNA, BMW and northern leopard frog (not targeted in the present study and absence not confirmed) reintroductions can be considered as a potential management action aimed at restoring native fauna. The BMW was historically distributed throughout the main stem of the South Platte River, including its western transition-zone tributaries near the foothills of the Rocky Mountains (Scheurer et al. 2003a). The establishment of an additional population within the western transition zone would represent one of few. The undistinguishable channel section separating the two wetted sections sampled on SPNA and MSR, may infer perennial separation of the two sites, providing a refuge for reintroduced BMW's. However, increased habitat connectivity is particularly important for the fulfillment of all life history (high movement and recolonization rates) requirements, and persistence of the BMW (Scheurer et al. 2003b). Efforts should be taken to assess flow and connectivity within all sampled streams (especially Sand and Jack Springs), and other tributaries, during high flow periods (i.e., spring). If established, actions should be taken to protect ground water, instream connectivity (i.e., removal or modification of barriers such as road culverts), riparian vegetation through grazing management, and water quality (e.g., appropriately position access roads and trails). Interactions between reintroduced BMW's and northern leopard frogs with mudpuppies would be uncertain.

The SPNA and MSR properties contain unique aquatic ecosystems and organisms. The baseline information collected from the present study should be a valuable addition to the finalization process of SPNA's management plan and future land use consideration on MSR. Furthermore, the present study sets the foundation for a future monitoring program critical to the conservation of the properties' native fishes and amphibians.

Acknowledgments

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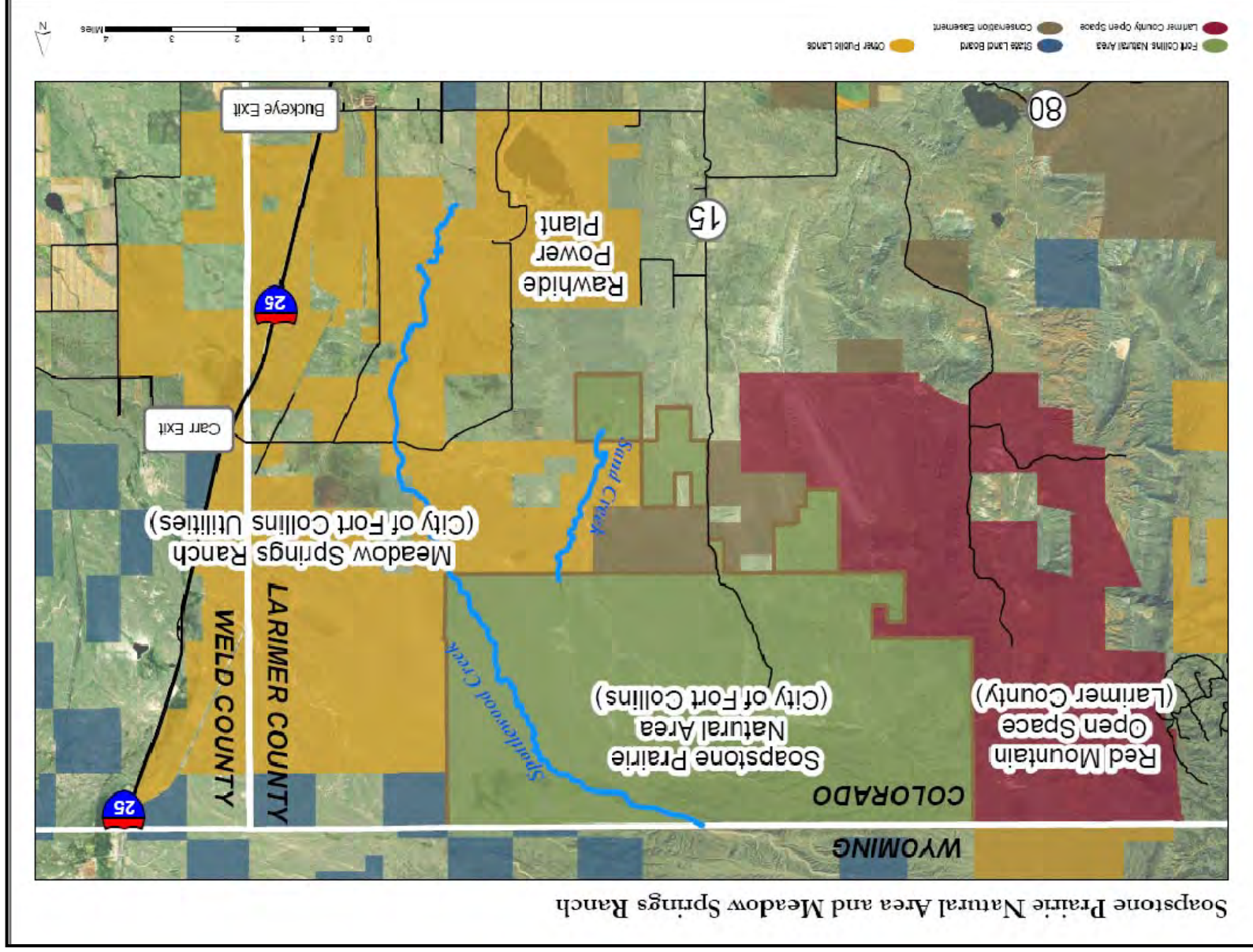
Tables

Table 1. Summary of the number of each fish and amphibian species captured (by sampling gear) in pools from Spottlewold Creek on Meadow Springs Ranch, Larimer County, CO (18 October 2008). Abbreviations IOD, FHM, and BMW denote Iowa darter *Etheostoma exile*, fathead minnow *Pimephales promelas*, and brassy minnow *Hybognathus hankinsoni*, respectively.

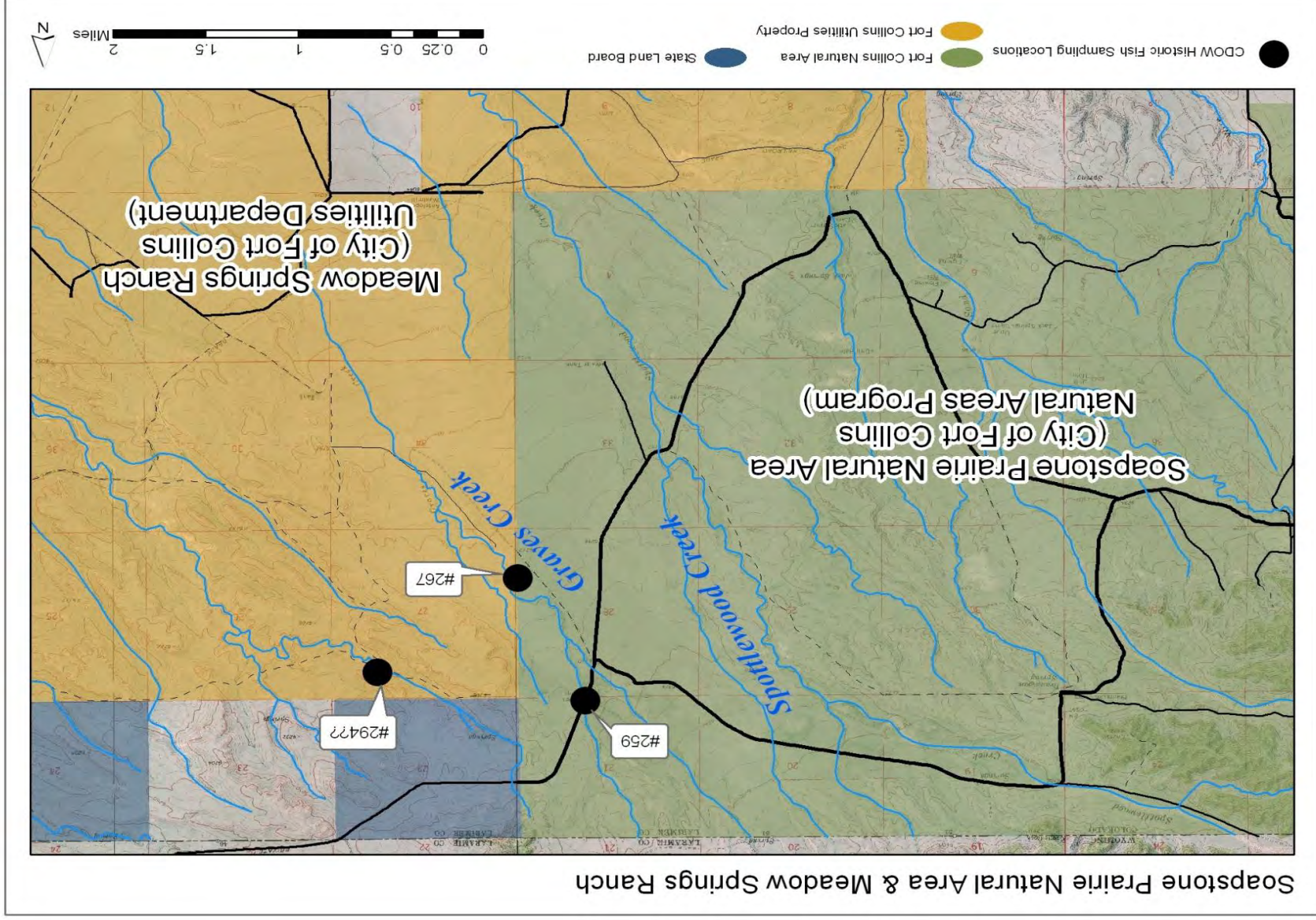
Pool ID	Sample Date	Beach Seine (# Captured)			Minnow Trap (# Captured)			Northern Leopard Frogs Captured	Mudpuppies Captured	Pool Surface Area (ft ²)	Max. Pool Depth (ft)
		IOD	FHM	BMW	IOD	FHM	BMW				
1 [*]	10/18/2008	0	91	14	2	17	0	0	0	7763.7	3.5
2	10/18/2008	NS	NS	NS	NS	NS	NS	0	0	2092.0	1.5
3 ^{*+}	10/18/2008	0	27	19	1	111	0	1	0	4184.9	3.0
4	10/18/2008	-	-	-	1	25	0	0	0	2334.2	5.0
5 [*]	10/18/2008	0	103	9	1	24	0	0	0	1173.9	4.3
6 ⁺	10/18/2008	-	-	-	1	29	6	0	0	8098.0	4.0
7	10/18/2008	-	-	-	1	40	0	0	0	2446.2	7.4
8 ⁺	10/18/2008	-	-	-	1	61	1	1	0	2560.3	5.1
9	10/18/2008	-	-	-	0	0	0	2	0	822.1	1.4
10	10/18/2008	-	-	-	0	24	1	0	0	3593.1	6.0
11 [*]	10/18/2008	7	33	30	0	0	0	0	0	2640.4	5.0
12 [*]	10/18/2008	0	13	6	0	0	0	0	0	2789.6	3.0
13	10/18/2008	-	-	-	0	0	0	0	0	2313.4	1.3
14 ⁺	10/18/2008	-	-	-	0	3	0	1	0	8027.2	5.1
15 [*]	10/18/2008	0	80	94	NS	NS	NS	0	0	5667.0	8.0
Total		7	347	172	8	334	8	5	0	-	-

⁺Pool sampled with 2 minnow traps. All others except 2 (not sampled) and 15 (seine only) sampled with one trap (eighteen total).

^{*}Pool randomly selected to be seined (six total).



Figure



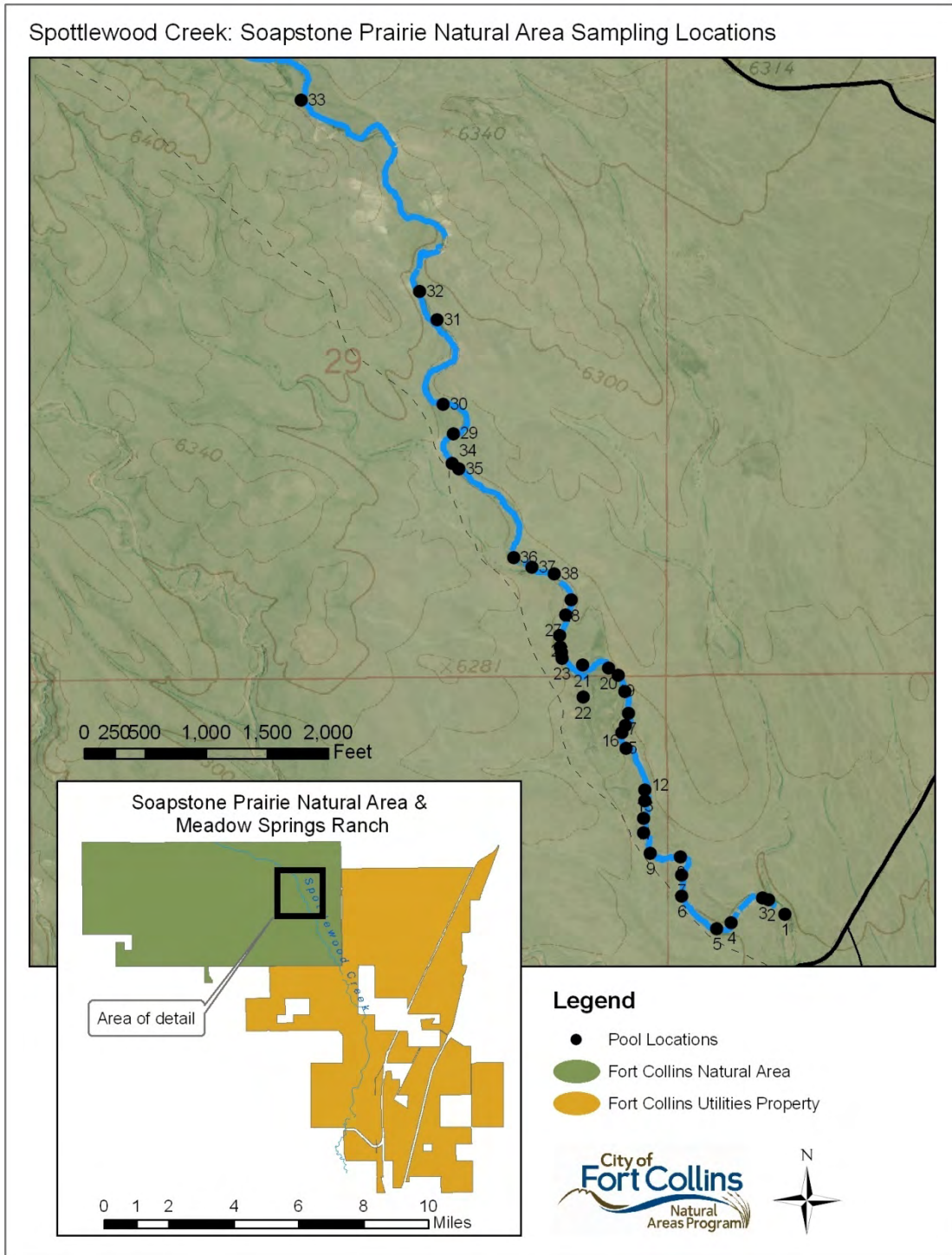


Figure 3. Map showing locations of the thirty-eight pools sampled (5 October 2008) in Spottewood Creek on Soapstone Prairie Natural Area, Larimer County, CO. Pools were sampled with backpack electrofishing units (map courtesy of Erica Saunders, Environmental Planner for City of Fort Collins Natural Resources Department).

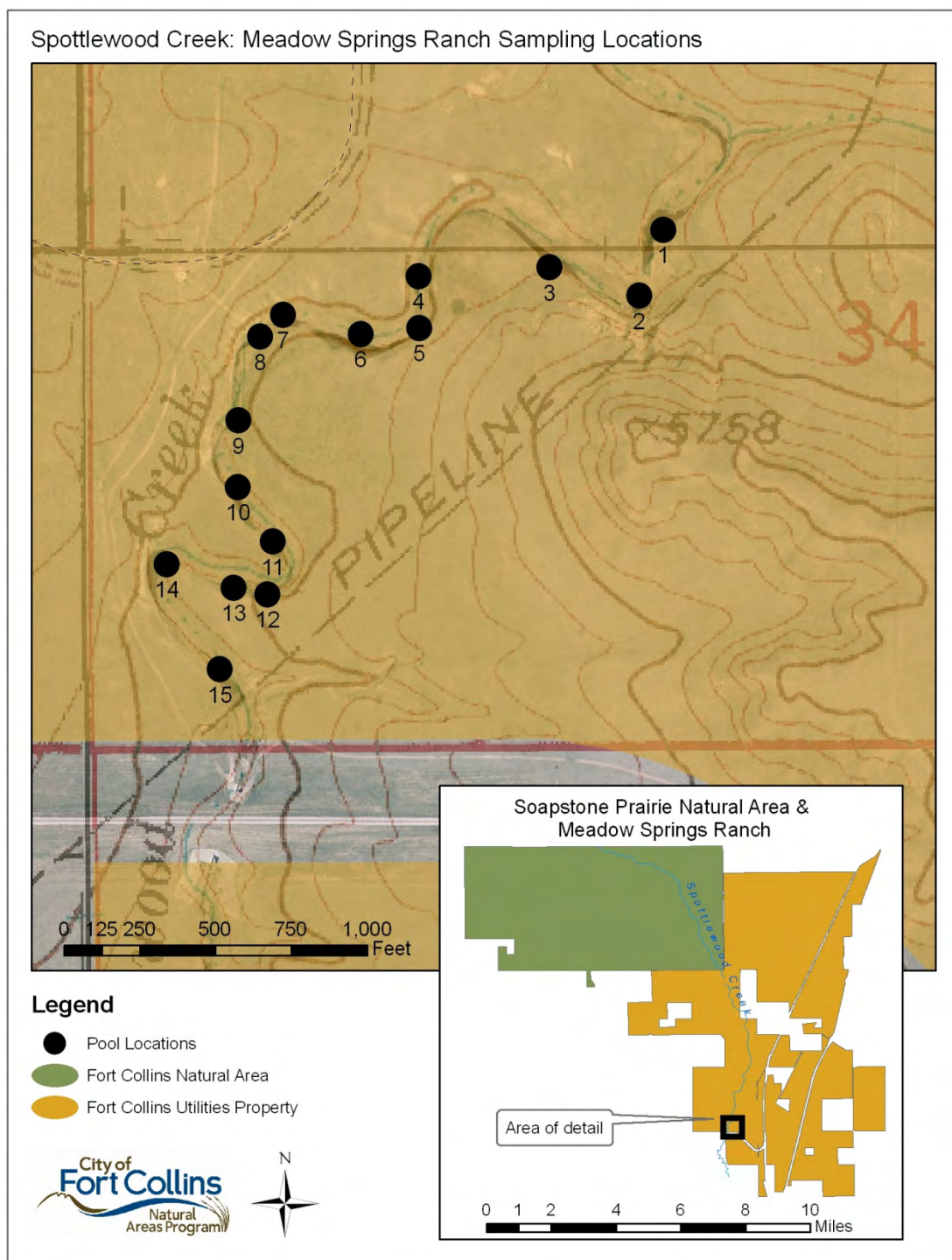


Figure 4. Map showing locations of the fifteen pools sampled (18 October 2008) in Spottlewood Creek on Meadow Springs Ranch, Larimer County, CO. Pools were sampled with beach seines and minnow traps (map courtesy of Erica Saunders, Environmental Planner for City of Fort Collins Natural Resources Department).

Sampled Areas on MSR and SPNA



Figure 5. Locations of sites sampled on Soapstone Prairie Natural Area (thirty-eight pools; 5 October 2008) and Meadow Springs Ranch (fifteen pools; 18 October 2008; see Figure 7) on Spotlewood Creek, Larimer County, CO. Black dashed lines represent dry stream channel during October 2008.

Spottlewood Creek on Meadow Springs Ranch

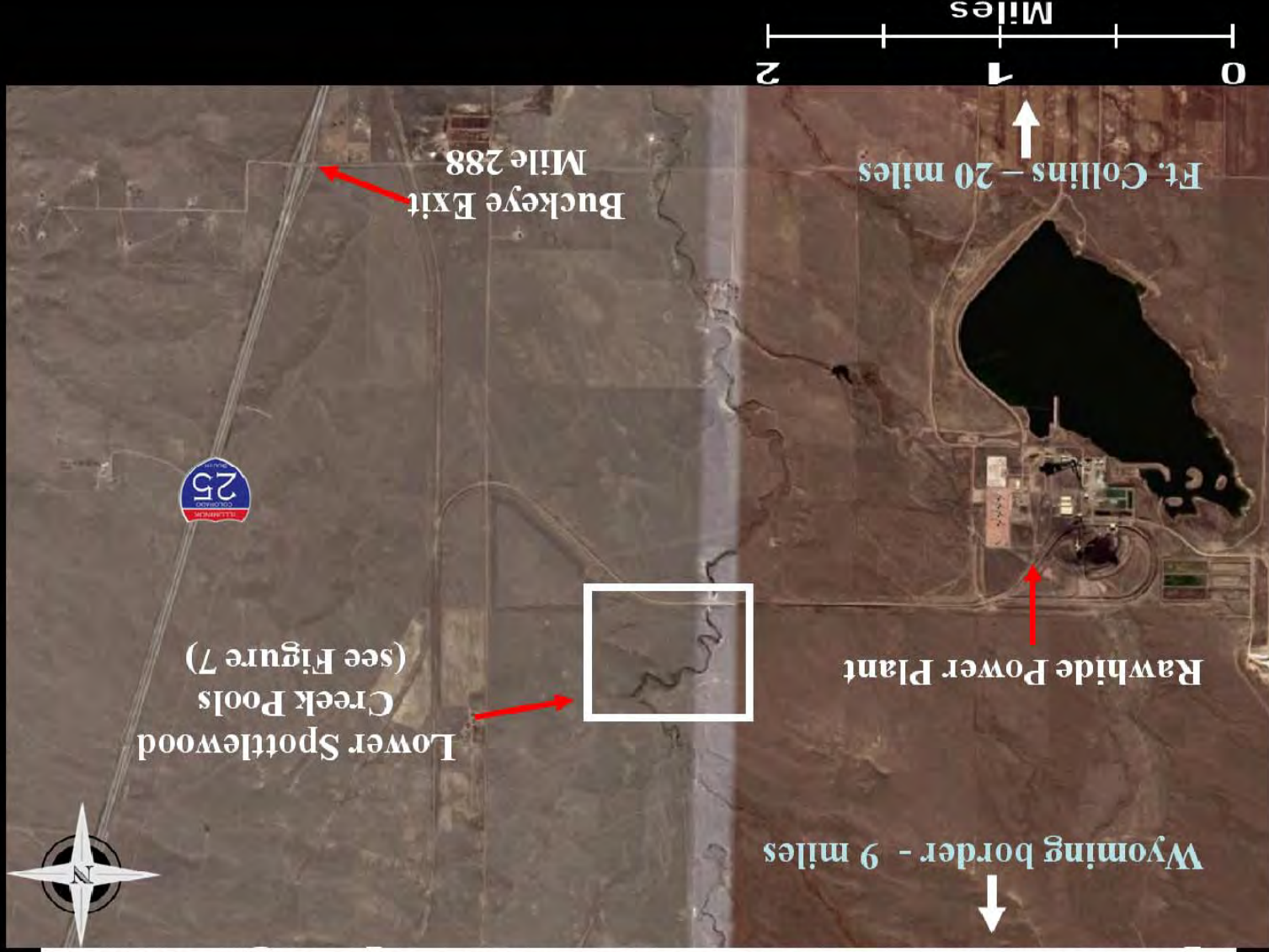


Figure 6. Location of fifteen large pools sampled (18 October 2008) in Spottlewood Creek on Meadow Springs Ranch, Larimer County, CO, in relation to the Rawhide Power Plant. Pools are located near the southern border of Meadow Springs Ranch.



Figure 7. Fifteen pools and sampling design used on the lower section of Spotlewood Creek on Meadow Springs Ranch, Larimer County, CO (18 October 2008).

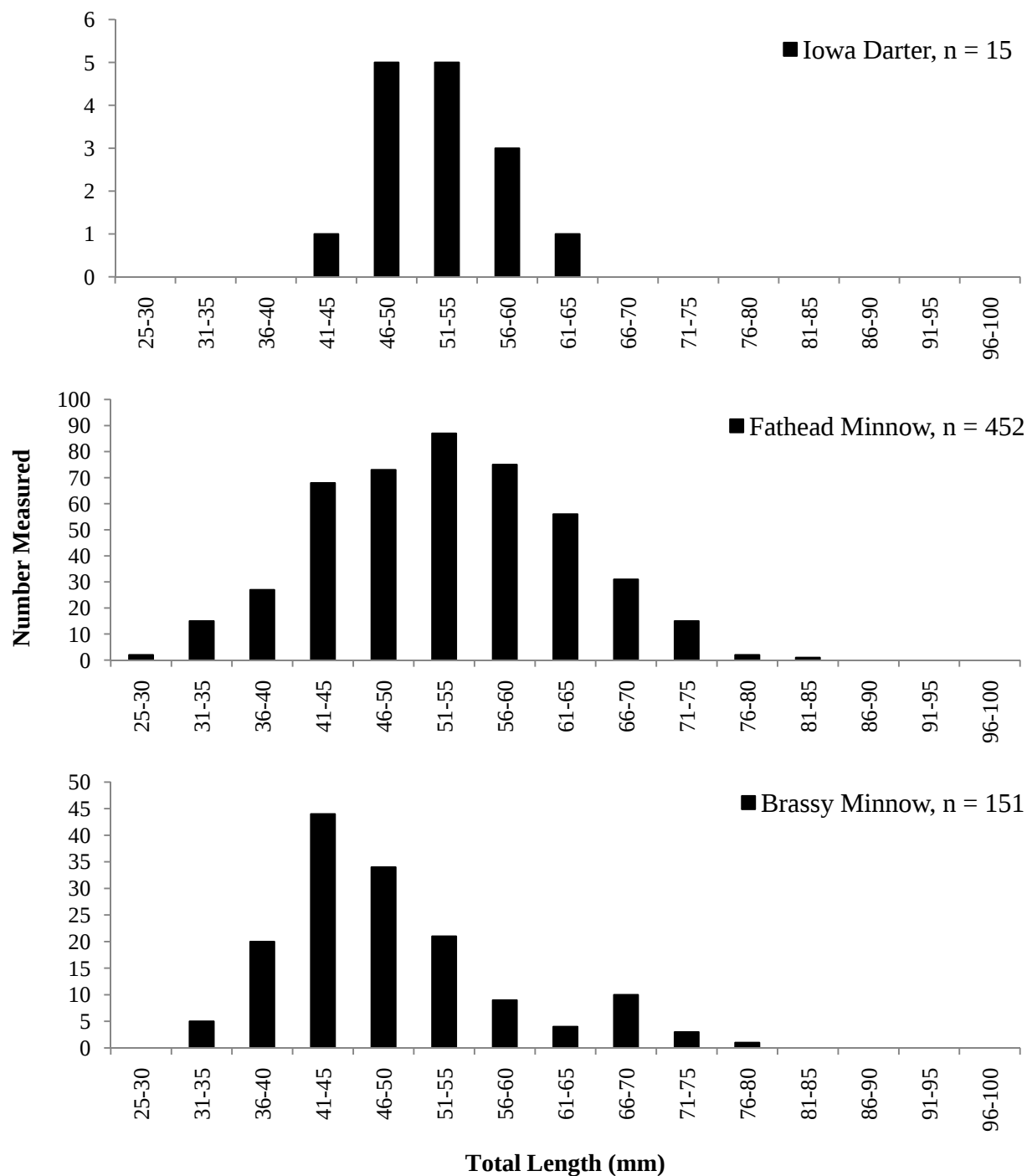


Figure 8. Length-frequency histograms for measured Iowa darters *Etheostoma exile*, fathead minnows *Pimephales promelas*, and brassy minnows *Hybognathus hankinsoni* captured from fifteen pools in Spottlewood Creek on Meadow Springs Ranch, Larimer County, CO. Data were collected on 18 October 2008 using minnow traps and beach seines. Length data were compiled across minnow trap, seine haul, and pool.

Appendix A.

Pool GPS Coordinates

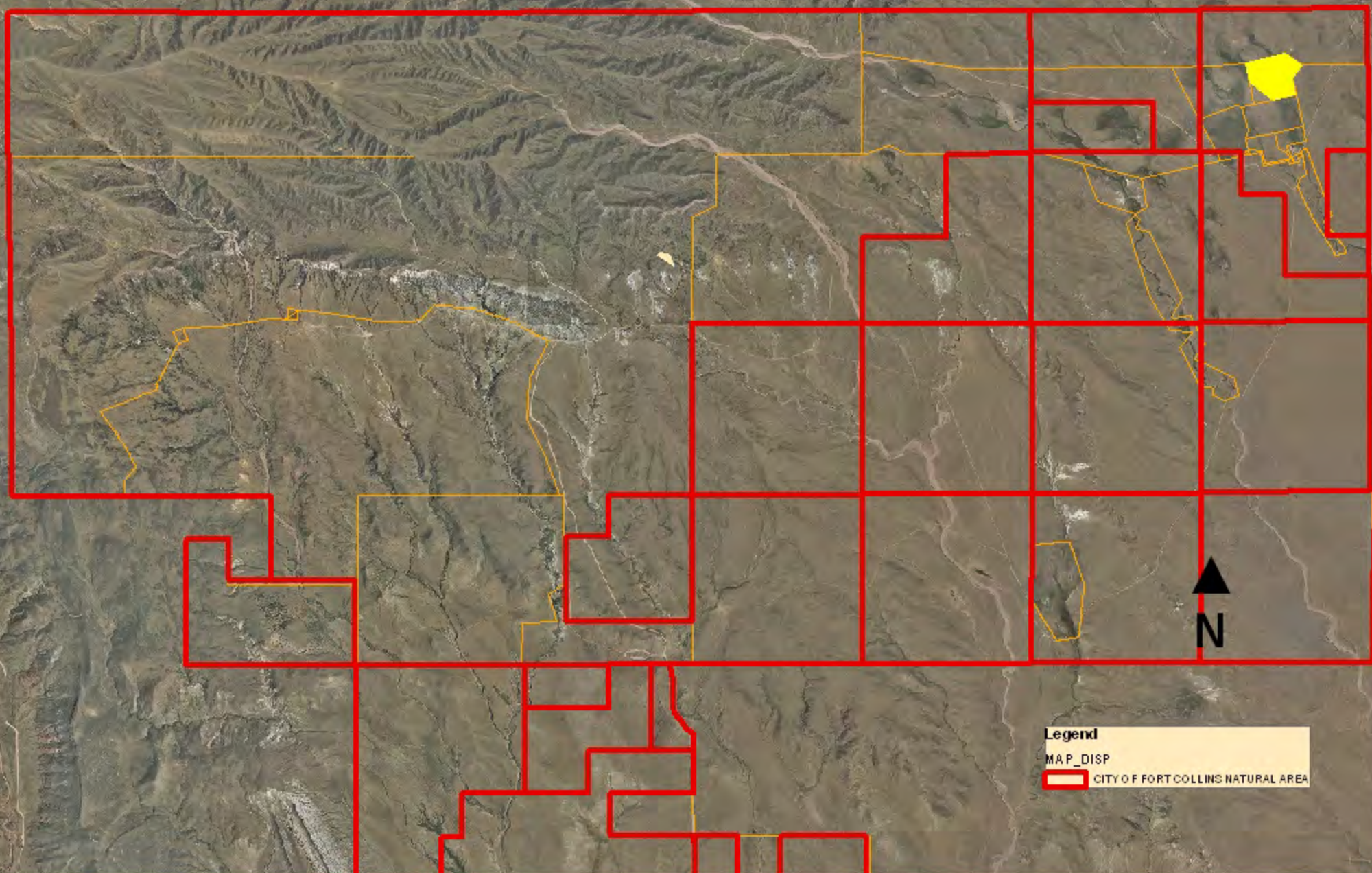
Table 1A. GPS coordinates (UTM's) from all pools sampled (backpack electrofishing) in Spottlewood Creek on Soapstone Prairie Natural Area, Larimer County, CO. Map datum used was NAD83 for pools 1 – 28 and WGS84 for pools 29 – 38. Species refers to all taxa (i.e., fish and amphibians).

Pool ID	Sample Date	Property	Creek	UTM Zone	Easting	Northing	Species Found
1	10/5/2008	Soapstone NA	Spottlewood	13N	0498653	4535017	None
2	10/5/2008	Soapstone NA	Spottlewood	13N	0498613	4535054	None
3	10/5/2008	Soapstone NA	Spottlewood	13N	0498597	4535058	None
4	10/5/2008	Soapstone NA	Spottlewood	13N	0498518	4534997	None
5	10/5/2008	Soapstone NA	Spottlewood	13N	0498483	4534982	None
6	10/5/2008	Soapstone NA	Spottlewood	13N	0498395	4535064	None
7	10/5/2008	Soapstone NA	Spottlewood	13N	0498395	4535116	None
8	10/5/2008	Soapstone NA	Spottlewood	13N	0498393	4535162	None
9	10/5/2008	Soapstone NA	Spottlewood	13N	0498318	4535171	None
10	10/5/2008	Soapstone NA	Spottlewood	13N	0498302	4535223	None
11	10/5/2008	Soapstone NA	Spottlewood	13N	0498301	4535259	None
12	10/5/2008	Soapstone NA	Spottlewood	13N	0498305	4535302	None
13	10/5/2008	Soapstone NA	Spottlewood	13N	0498305	4535329	None
14	10/5/2008	Soapstone NA	Spottlewood	13N	0498259	4535434	None
15	10/5/2008	Soapstone NA	Spottlewood	13N	0498248	4535473	None
16	10/5/2008	Soapstone NA	Spottlewood	13N	0498257	4535491	None
17	10/5/2008	Soapstone NA	Spottlewood	13N	0498265	4535521	None
18	10/5/2008	Soapstone NA	Spottlewood	13N	0498256	4535575	None
19	10/5/2008	Soapstone NA	Spottlewood	13N	0498240	4535617	None
20	10/5/2008	Soapstone NA	Spottlewood	13N	0498216	4535635	None
21	10/5/2008	Soapstone NA	Spottlewood	13N	0498151	4535642	None
22	10/5/2008	Soapstone NA	Spottlewood	13N	0498152	4535621	None
23	10/5/2008	Soapstone NA	Spottlewood	13N	0498100	4535660	None
24	10/5/2008	Soapstone NA	Spottlewood	13N	0498099	4535675	None
25	10/5/2008	Soapstone NA	Spottlewood	13N	0498096	4535688	None
26	10/5/2008	Soapstone NA	Spottlewood	13N	0498095	4535717	None
27	10/5/2008	Soapstone NA	Spottlewood	13N	0498110	4535768	None
28	10/5/2008	Soapstone NA	Spottlewood	13N	0498124	4535805	None
29	10/5/2008	Soapstone NA	Spottlewood	13N	0497854	4536082	None
30	10/5/2008	Soapstone NA	Spottlewood	13N	0497852	4536095	None
31	10/5/2008	Soapstone NA	Spottlewood	13N	0497842	4536300	None
32	10/5/2008	Soapstone NA	Spottlewood	13N	0497797	4536369	None
33	10/5/2008	Soapstone NA	Spottlewood	13N	0497503	4536847	None
34	10/5/2008	Soapstone NA	Spottlewood	13N	0497874	4535940	None
35	10/5/2008	Soapstone NA	Spottlewood	13N	0497893	4535925	None
36	10/5/2008	Soapstone NA	Spottlewood	13N	0498028	4535701	None
37	10/5/2008	Soapstone NA	Spottlewood	13N	0498073	4535679	mudpuppies
38	10/5/2008	Soapstone NA	Spottlewood	13N	0498129	4535661	mudpuppies

Table 2A. GPS coordinates (UTM's) from all pools sampled (beach seines and minnow traps) in Spottlewood Creek on Meadow Springs Ranch, Larimer County, CO. Map datum used was WGS84.

Pool ID	Sample Date	Property	Creek	UTM Zone	Easting	Northing
1	10/18/2008	Meadow Springs R	Spottlewood	13N	0500540	4524896
2	10/18/2008	Meadow Springs R	Spottlewood	13N	0500515	4524830
3	10/18/2008	Meadow Springs R	Spottlewood	13N	0500425	4524859
4	10/18/2008	Meadow Springs R	Spottlewood	13N	0500294	4524851
5	10/18/2008	Meadow Springs R	Spottlewood	13N	0500294	4524799
6	10/18/2008	Meadow Springs R	Spottlewood	13N	0500235	4524793
7	10/18/2008	Meadow Springs R	Spottlewood	13N	0500157	4524813
8	10/18/2008	Meadow Springs R	Spottlewood	13N	0500134	4524791
9	10/18/2008	Meadow Springs R	Spottlewood	13N	0500112	4524707
10	10/18/2008	Meadow Springs R	Spottlewood	13N	0500111	4524640
11	10/18/2008	Meadow Springs R	Spottlewood	13N	0500146	4524585
12	10/18/2008	Meadow Springs R	Spottlewood	13N	0500140	4524532
13	10/18/2008	Meadow Springs R	Spottlewood	13N	0500106	4524539
14	10/18/2008	Meadow Springs R	Spottlewood	13N	0500039	4524563
15	10/18/2008	Meadow Springs R	Spottlewood	13N	0500092	4524457

Soapstone Prairie Natural Area
May 5, 2011 Rx Burn
35 acres



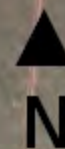
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Soapstone Prairie Natural Area
2008 Colorado Butterfly Plant (GANEC)
Population

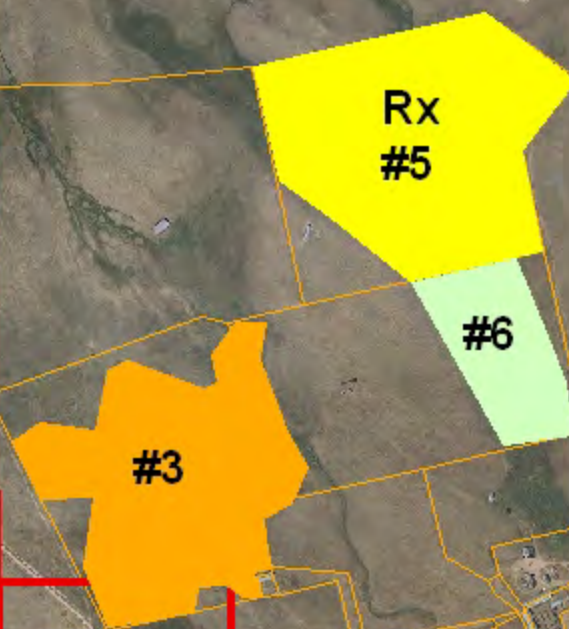
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- GANEC Polygons
- SSN Pasture Lines
- GANEC Individuals

0 1,250 2,500 3,750 Feet



**Soapstone Prairie Natural Area
Colorado Butterfly Plant Populations**



Legend
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CITY OF FORT COLLINS NATURAL AREA
SSN Pasture Lines

Rare Plant Monitoring 2008 Annual Report

Project Synopsis

Management Goal: To provide habitat for rare, sensitive, threatened and endangered plant species.

Management Objective: To maintain or increase current individual plant numbers and/or acres of rare, sensitive, threatened or endangered plant species that occur on the Natural Areas.

Parameter(s) and method(s): Visual surveys to assess resource presence/absence, distribution and approximate individual numbers. Use of a GPS unit to get locations (point and polygon) and numbers of individuals.

Results

This year the *Gaura neomexicana* ssp. *coloradensis* population was monitored at Soapstone Prairie Natural Area. This year a total of 6,225 bolted plants were counted. Within polygons 6,170 were captured and within points 55 individuals were captured. A total of 17 acres was calculated for the area where the plants are currently found.

Bolted plant numbers have decreased 47% since 2006. The total area that the bolted plants are found has decreased by 70% since 2006.

Discussion/Management Implications:

I believe the reduction in bolted plants this year is due in part to drier soil conditions and the decadent vegetation in the *Gaura* habitat. A burn or mowing should be performed in order to initiate bolting for upcoming years.

The rosettes looked very healthy. The leaves were whole, thick, lush and large as compared to 2007. In 2007 the rosettes were attacked by an insect that left the leaves looking like lace. We found many rosettes this year. Approximately twice as many as bolted plants. The bolted plants did have some herbivory, but it didn't seem to affect seed production. I didn't check viability of the capsules, but I did find between 15-25 capsules per plant.

I found a caterpillar munching on the *Gaura* seed capsules this year. I took a photo of the caterpillar, the damage and collected one to be identified. The caterpillar was identified as *Schinia gaurae*. I saw only about 15 caterpillars in the HQ pastures and as many as 3 caterpillars on one plant. I don't believe that this insect is connected to the reduction in 2008 bolted plants due to the caterpillars being found on seed capsules and not on vegetation.

The only change that we will make for upcoming vegetation monitoring is that volunteers will be utilized. Weed populations should be controlled around *Gaura* population in 2009.

Appendices. See folder for map of population and 2008 field notes.

Notes on 2008 *Gaura neomexicana* ssp. *coloradensis* Population

ID of Gaura

We found some plants blooming in some drier areas this year. We had to be very careful with identification because there were several *G. mollis* growing side by side with *G. neomexicana* ssp. *coloradensis*.

Telling the difference between them is rather difficult if neither one is blooming. I used the following characteristics to help me id them, but it isn't a very solid method.

G. mollis – sessile flowers, flowers not subtended by bract.

G. neomexicana – pedicelled flowers, flowers subtended by bract

Report of New Populations

We had reports of *G. neomexicana* ssp. *coloradensis* occurring in Jack Springs from Holzwarth and Erica. Laura and I went looking, but we didn't find any plants (rosettes or bolted). The cattle were camped in this area when we were looking for plants and the vegetation was very short, so that may be why we didn't see anything.

Flodman's Thistle Companion Plant

I noticed this year that it was very important to look in all areas where Flodman's thistle occurred for *Gaura*. Usually it can be found in a little drier area than the *Gaura*, but since the *Gaura* was in drier areas this year we usually found it by the Flodman's. The Flodmans' was the only consistent companion plant this year.

Caterpillars

Found a caterpillar munching on the *Gaura* seed capsules this year. I took a photo of the caterpillar, the damage and collected one to be identified. Boris at CSU id the caterpillar as a *Schinia* sp. I contacted Bonnie Heidel at WDDb and she said that the specimen was more than likely *Schinia gaurae*. Bonnie had collected one herself and took it through the chrysalis stage to id the adult. I saw only about 15 caterpillars in the HQ pastures and as many as 3 caterpillars on one plant. I saw them in the same pasture as the *Campanula parryi* and over in the original pasture where we first id the *Gaura*.

Weed Control

This year was the first year that we attempted Canada thistle control in and around the *Gaura* population. We mowed and sprayed. It will be interesting to see how it helped.

For the next *Gaura* Survey

- No cattle in wet areas from July-October.
- Use volunteers.
- Need to mow or burn year before next survey.

Overall Population

I didn't find as many bolted plants this year. The rosettes looked very healthy this year. The leaves were whole, thick, lush and large. We found a bunch of rosettes this year. Probably twice as many as bolted plants. The bolted plants did have some herbivory this

year, but it didn't seem to affect seed production. I didn't check viability of the capsules but I did find between 15-25 capsules per plant.

Rare Plant Monitoring 2011 Annual Report

Project Synopsis

Management Goal: To provide habitat for rare, sensitive, threatened and endangered plant species.

Management Objective: To maintain or increase current individual plant numbers and/or acres of rare, sensitive, threatened or endangered plant species that occur on the Natural Areas.

Parameter(s) and method(s): Visual surveys to assess resource presence/absence, distribution and approximate individual numbers. Use of a GPS unit to get locations (point and polygon) and numbers of individuals.

Results

This year the *Gaura neomexicana* ssp. *coloradensis* population was monitored at Soapstone Prairie Natural Area. A total of 26,194 bolted plants were counted throughout Soapstone Prairie. Within polygons 25,985 individual bolted plants were captured and within points 209 individuals were captured. A total of 27 acres was calculated for the area where the plants are currently found.

	2006	2008	2011
Numbers of Bolted Plants	11,689	6,225	26,194
Acreage	55 acres	17 acres	27 acres

Discussion/Management Implications:

Overall the Colorado butterfly population is healthy and thriving. The cold wet spring that occurred enhanced the bolting of the Colorado butterfly plant.

A prescribed burn took place on May 5th 2011 on 35 acres of Colorado butterfly plant habitat (see map). Within the burn area a significant increase in Grass-of-Parnassus (*Parnassia fimbriata* and *Parnassia parviflora*) and green bog orchid (*Limnorchis hyperborea*) were documented, especially along the drainages. In fact, there was an increase in native forbs throughout the burn area. It is hard to say now whether or not the burn encouraged bolting or germination of the Colorado butterfly plant. It would more beneficial to survey the area in the next 1-3 years to see how the population is responding.

Canada thistle was sprayed with Mulesone in August 2010 in the Colorado butterfly plant population. A decrease in Canada thistle occurrences was noted. There did not seem to be a difference between the Rx burn area and other areas with Canada thistle.

There were very few caterpillars (10) or other insects documented on the Colorado butterfly plant this year. Herbivory on the leaves and seeds from insects were also low. During the Colorado butterfly plant survey another rare plant within the wet meadow area was found, prairie goldenrod (*Oligoneuron album*) G5 S2S3. The existence of 6 rare plants in this wet meadow signifies how important this area is and that new rare plants are still being found shows the need to keep it intact.

A new population of Colorado butterfly plant at Jack Springs was surveyed in 2011. Approximately 250 bolted plants were counted. The population is on approximately .39 acres. The potential habitat area (92 acres) was fenced to keep cattle out prior to the 2011 growing season.

Appendices. See folder for map of population and 2011 field notes.

Notes on 2011 Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) Population

Survey Dates – 5/25/11 & 7/15/11 (Rx area), August 29th – September 20th, 2011 (GANEC Survey)

New Population at Jack Springs

A new population of Colorado butterfly plant was found during a rare plant survey (*Liatris ligulistylis*, Rocky Mountain blazingstar) in 2010 and approximately 20-25 plants were found. The population was in a heavily grazed area and was immediately fenced off to keep cattle out.

A complete survey of the new area was done in 2011. Approximately 250 plants were found in Jack Springs. The Jack Springs population is approximately 2.5 miles away from the southern most point of the Wet Meadow population, which makes it a totally different population. According to CNHP a population it is considered to be different if the populations are found a mile apart. The population is on approximately .39 acres. The potential habitat area (92 acres) was fenced to keep cattle out prior to the 2011 growing season. I am assuming that is why we are seeing more bolted plants this year and can expect to see an even larger population in 2014 when the next survey is scheduled to be performed.

The plants are found on the hummock areas with little other vegetation, the soil appears to be whiter than the surrounding soil. The plants appear to be healthy and there are many rosettes in the area around the bolted plants. Canada thistle does not appear to be a big problem in the potential habitat area or in the population itself.

Flodman's thistle (*Cirsium flodmanii*) is in the area, but other companion plants such as Rocky Mountain blazingstar (*Liatris ligulistylis*) are not present and very few Rocky Mountain iris (*Iris missouriensis*) can be found. With the grazing pressure released from the area I believe that these species will begin to resemble the vegetation in Wet Meadow and HQ area.

Prescribed Burn Spring 2011

A prescribed burn took place on May 5th 2011 on 35 acres of Colorado butterfly plant habitat (see map). The purpose of the burn was to remove some decadent vegetation that was growing in the area. Colorado butterfly plant needs sunlight in order to germinate and bolt. I was hoping to open up more of the potential habitat in the area that wasn't growing Colorado butterfly plant, but was covered with the decadent vegetation and allow the Colorado butterfly plant to establish.

The area was still pretty much dormant when the burn occurred, because we had a late, wet and cold spring. I surveyed the area a few weeks following the burn, then in July and again in Aug/Sept.

I was interested to see if there would be a lot of damage to the rosettes following the Rx burn. To my surprise it seemed like the plant was set up to handle such occurrences. The rosettes which are very close to the ground, had litter the built up under the out stretched leaves, forming a pocket for the center of the rosette. This pocket was far enough away from the heat of the fire to allow the very center of the rosette to escape damage. Some of the outer leaves were singed but the core of the plant remained undamaged.

There were a few fatalities with rosettes, but not many, probably fewer than 25 individuals.

The burn consumed the decadent vegetation in the area. A mosaic pattern was evident between extremely wet areas, potential habitat areas and the upland. The potential habitat areas were almost completely consumed and it looked great.

The fire crews did an extremely fine job at keeping out of the habitat areas and it was evident that they took special care in where they drove and how much. I could hardly tell they were there at all.

During the actual survey in Aug-Sept., I noticed a significant increase in bolted plants of Colorado butterfly plant across the entire population. Within the burn area I noticed a significant increase in Grass-of-Parnassus (*Parnassia fimbriata* and *Parnassia parviflora*) and green bog orchid (*Limnorchis hyperborea*), especially along the drainages. These three plants were very far and few between prior to the burn. In fact, there was an increase in native forbs throughout the area. I also noticed a decrease in Canada thistle in the area, but it is hard to say if it was because of the burn or because of the targeted thistle control that we performed in fall 2010. I saw a decrease in Canada thistle in other parts of the Colorado butterfly plant population beside the Rx burn area as well. Below is a comparison of the amount of bolted plants in the Rx burn area and two other areas that were not burned (see map).

Population Areas	2006 Bolted Plants	2008 Bolted Plants	2011 Bolted Plants
Rx Area Pasture #5 (35 acres)	6,073	4099	10,600
Pasture #6 (11 acres)	341	152	590
Pasture #3 (34 acres)	4625	1101	12,351

It was an extremely successful year for bolting for the Colorado butterfly plant. Across the entire population numbers doubled, tripled or even more from the 2008 populations. It is hard to say now whether or not the burn encouraged bolting or germination of the Colorado butterfly plant. It would more beneficial to survey the area in the next 1-3 years to see how the population is responding. I think that since this plant is a biennial, we will have better information by monitoring it and comparing it to other sections of the population in the future.

I can say that the Rx burn did not hurt the population and it helped increase biodiversity and health of the area. The Rx burn also allowed staff to move around easier and safer during the Colorado butterfly plant survey. We were able to see uneven ground and ditches much better in the burn area than the rest of the population. I would recommend future burns for the Colorado butterfly plant populations.

Weed Control

Canada thistle was sprayed with Mulesone at 7oz/acre in August – September 2010 in the Colorado butterfly plant population. The NE part of HQ#3 was sprayed until staff ran into the Colorado butterfly plant and then they stopped. HQ#5 was also sprayed on the eastern edge of the pasture. Overall I saw a decrease in Canada thistle in both pastures and the application was performed with enough care to not damage the Colorado butterfly plant or the native Flodman's thistle. In the future, I think that if we are able to mark Canada thistle populations that don't have the Colorado butterfly plant or even just a few it would be worth spraying those populations.

Insects

I did not notice very many caterpillars (10) or other insects on the Colorado butterfly plant this year. I also did not notice much herbivory on the leaves from insects.

Overall

Overall the Colorado butterfly population is healthy and thriving. I believe that the cold wet spring that occurred enhanced the bolting of the Colorado butterfly plant this year. Since those are the same conditions that also enhance germination of the plant, I would expect another large bolting flush in 2013, given that all of the other environmental factors are appropriate. During the Colorado butterfly plant survey I found another rare plant within the wet meadow area. The plant is prairie goldenrod (*Oligoneuron album*) G5 S2S3. This plant is a tall grass prairie remnant. I think that the existence of 6 rare plants in this wet meadow signifies how important this area is and that I am still finding new rare plants in this area shows the need to keep it intact.

Next Colorado butterfly plant Survey

The next survey is scheduled to occur in 2014. I would recommend that at least the entire HQ pasture be surveyed in years 2012 & 2013 to see the results of the Rx burn.

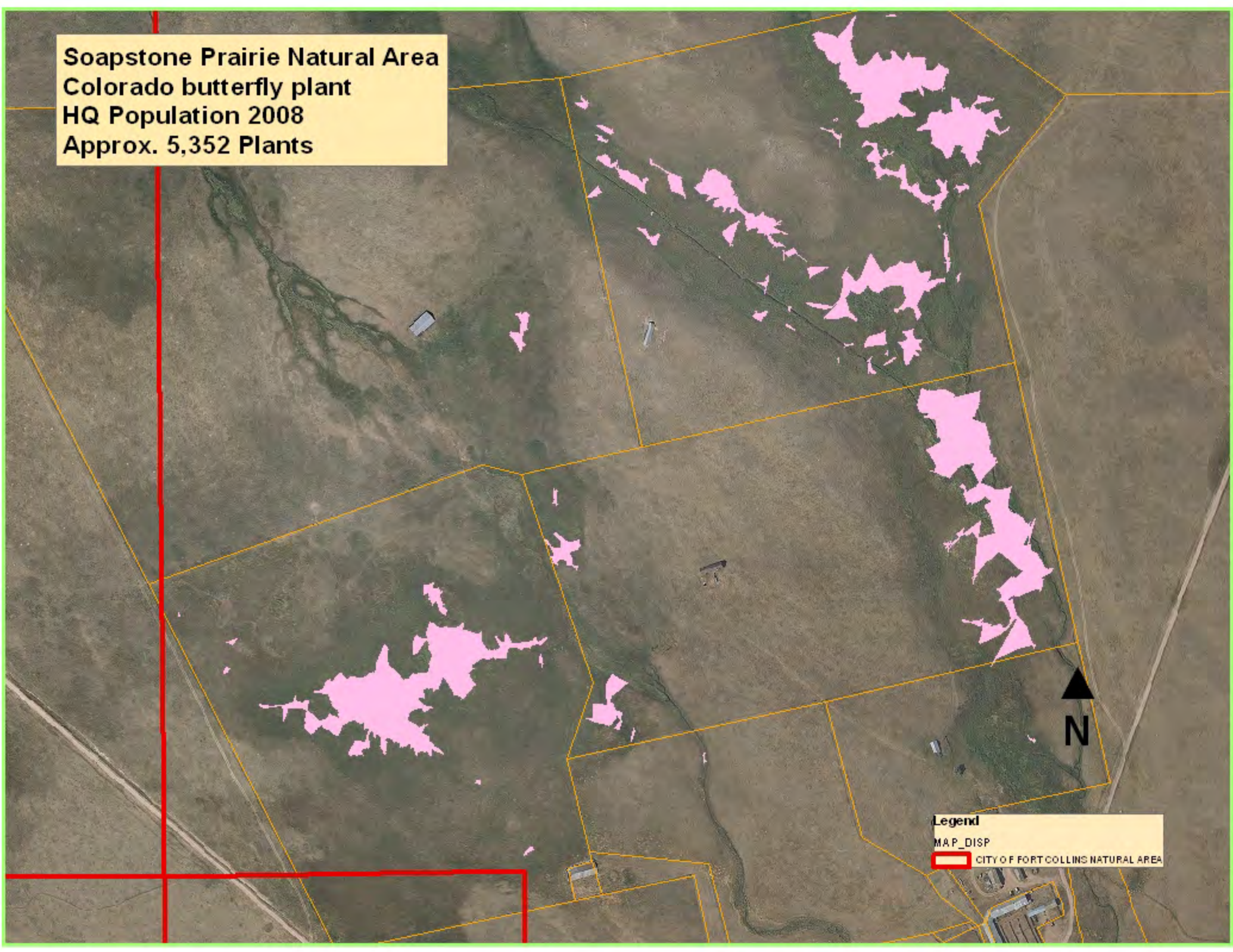
Soapstone Prairie Natural Area
Colorado butterfly plant
HQ Population 2008
Approx. 5,352 Plants

N

Legend

MAP_DISP

CITY OF FORT COLLINS NATURAL AREA



Soapstone Prairie Natural Area
Colorado butterfly plant
HQ Population 2011
Approx. 23,541 Plants

N

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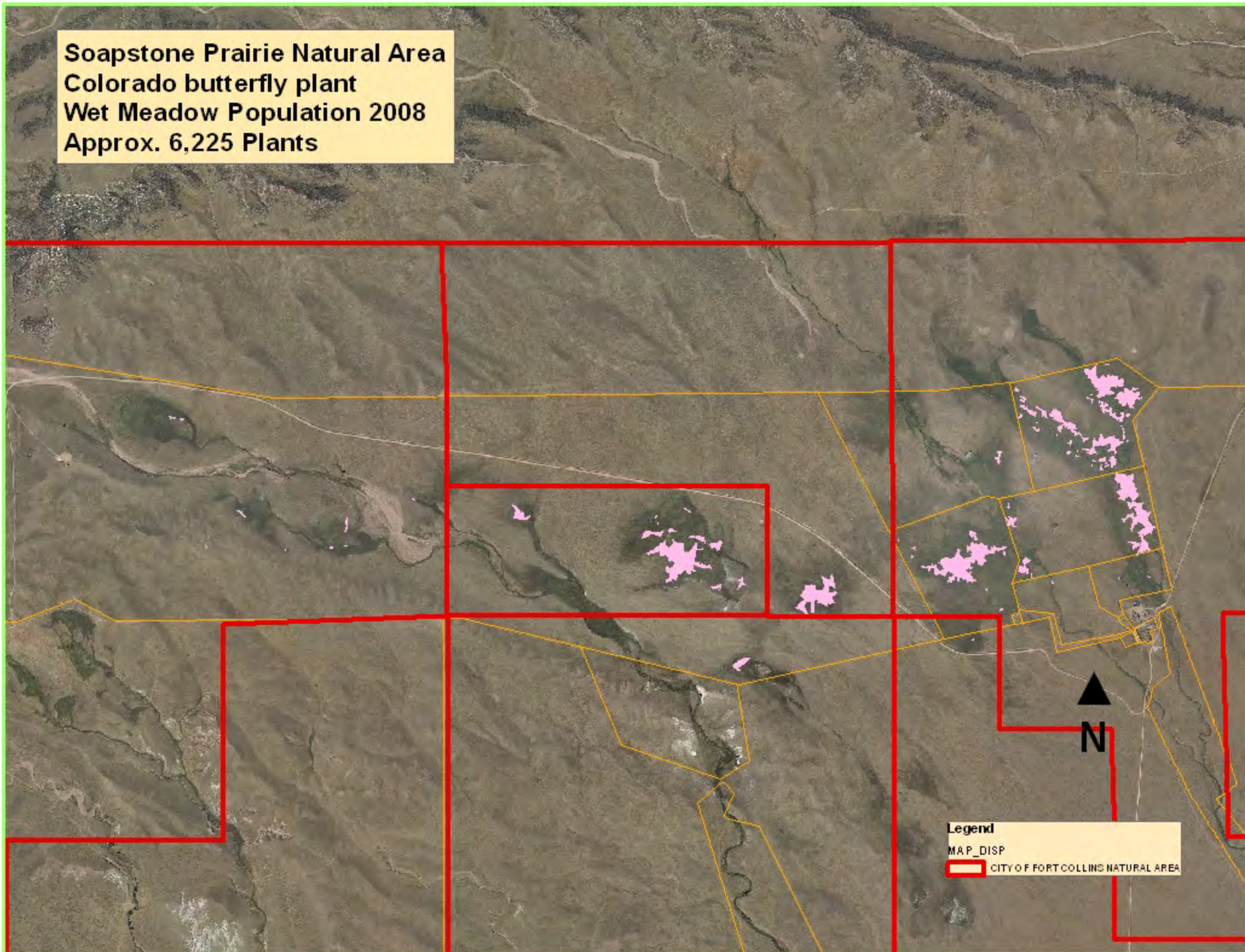
CITY OF FORT COLLINS NATURAL AREA

Soapstone Prairie Natural Area
Colorado butterfly plant
Jack Springs Population 2011
250 Plants



Legend
MAP_DISP
 CITY OF FORT COLLINS NATURAL AREA

Soapstone Prairie Natural Area
Colorado butterfly plant
Wet Meadow Population 2008
Approx. 6,225 Plants



Legend
MAP_DISP
CITY OF FORT COLLINS NATURAL AREA

Soapstone Prairie Natural Area
Colorado butterfly plant
Wet Meadow Population 2011
25,944 Plants

N

Legend

MAP_DISP

CITY OF FORT COLLINS NATURAL AREA

Final Report on Insect Survey of
Soapstone Prairie Natural Area
Larimer County, Colorado

Ralph D. Stoaks and Boris C. Kondratieff
Department of Bioagricultural Sciences and Pest Management
Colorado State University
Fort Collins, Colorado 80523

April 30, 2012



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Cover photograph: Malaise trap over run of Spottlewood Creek, Soapstone Prairie Natural Area, Larimer County, Colorado.

ABSTRACT

This is our third and final insect survey of Soapstone Prairie Natural Area (SPNA) from June to October 2011. We collected at three sites with emphasis on sampling aquatic macroinvertebrates. Original site 1 at Graves Creek (GC) and site 2 at Spottlewood Creek (SpC) were sampled for the third year and site 11 at Jack Spring (JSp) continued for the second year. These sites exhibited a typical regional assemblage of taxa, with several uncommon taxa. No threatened or endangered species were found as listed by the state of Colorado or Federal agencies. In 2011 we report 2 families, 130 genera and 97 species in addition to our 2009-2010 collections. In 2011 the 4,905 individuals collected represented 128 families, 329 genera, and 254 species. Additionally, we report uncommon taxa in 6 families, 25 genera and 26 species including four undescribed fly (Diptera) species. We recommended that additional efforts be made to protect the ecological integrity of the aquatic systems of SPNA, primarily limiting or preventing all livestock access. We additionally recommend the initiation of a long-term ecological monitoring program, sampling every 3 years the unique aquatic communities of Soapstone Prairie Natural Area to increase the effectiveness of management strategies.

INTRODUCTION

Background

A survey of Soapstone Prairie Natural Area (SPNA) insects at three headwater streams was approved at a meeting with Ralph Stoaks, Colorado State University (CSU), Chris Metz and Daylan Figgs, Department of Natural Resources (DNR), City of Fort Collins, Colorado in December 2010.

It was also agreed at the meeting that RS would collaborate with Boris Kondratieff on the survey. A DNR permit to access sites and collect insects at SPNA was renewed for Ralph Stoaks and Boris Kondratieff, visiting scientists, assisting university students and other volunteers.

At this meeting the survey was financially approved by Damon Figgs for the 2011 field year for basic equipment and gas mileage to conduct insect collections at Graves Creek (GC), Spottlewood Creek (SpC) and Jack Spring (JSp). SPNA is the largest Natural Area (18,728 acres) operated by the DNR.

The SpC site had a solar powered fence prior to 2009. However, GC and JSp were unprotected from livestock until prior to the 2011 surveys and typical impacts of livestock activity occurred.

Prior to our 2011 collections, new solar powered fences were constructed at GC and JSp. Recovery of the aquatic habitats was evident until electricity was lost sometime in September and cattle entered the protected areas.

Reporting

The insects collected from the aquatic habitats of SPNA are listed in Appendix 1 and were mostly collected in 2011, but include recently identified specimens from 2009 and 2010. Appendix 2 represents dominant insect taxa for 2009-2011 surveys. Qualitative collection methods (Nos.1-9) are listed in Table 1 and a quantitative collection method (No. 10) was added using a Surber sampler.

Outlook

Effective management of natural resources depends on knowledge of macroinvertebrate community structure and function under natural conditions (see methods and discussion sections). Because of their small size and difficulty in observing their behavior, insects are easily overlooked and their roles often underestimated. In SPNA, insects are a vital source of food for other animals and serve as pollinators and decomposers.

OBJECTIVES

The objectives were to: 1) complete a multiyear insect survey of SPNA concentrating on aquatic habitats; 2) locate sites to monitor the most insect diversity (sites with greatest number of species per unit area) such as springs and streams and at interfaces of associated grasslands; 3) evaluate potential impacts; 4) determine if rare, endangered, or threatened species occurred; 5) report findings to the DNR to enhance future conservation planning.

Secondary objectives were to: 1) establish a reference collection of SPNA insects found during the survey; 2) plan future surveys that may have been missed. Many insects and other invertebrates have lifecycles that require two or more years to complete, adults may not have been present at the time of sampling conditions; 3) apply for funds to support our research efforts.

PHYSICAL SETTING

Location

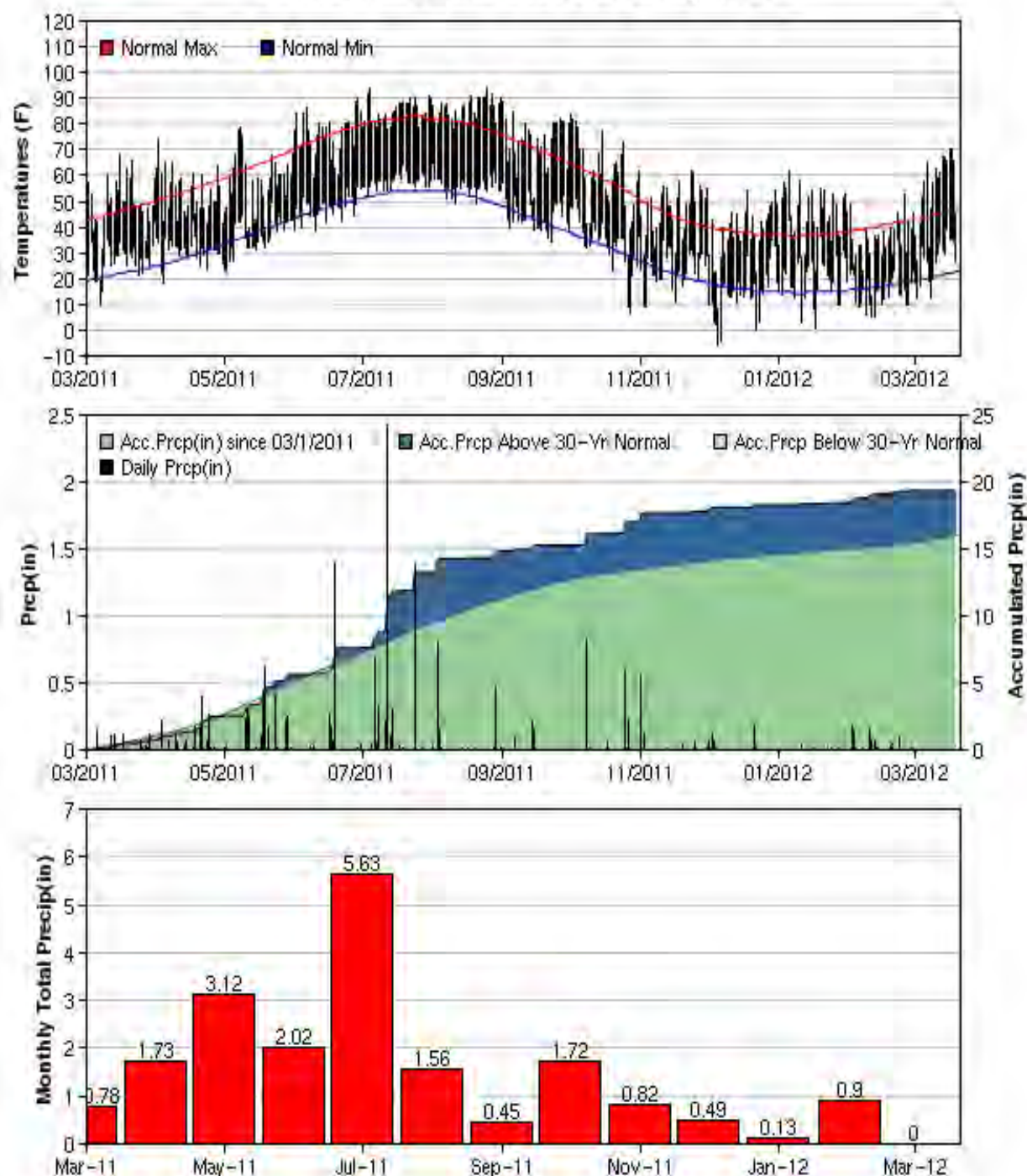
The SPNA is located in northeastern Larimer County. The northern border of SPNA is the Wyoming state line. The SPNA is approximately 35 mi (56 km) north of Fort Collins and east of the Rocky Mountains that abruptly rise from the Laramie Foothills. The short grass steppe increases in elevation from east to west 6,080 ft to 7,201 ft (1848-2189 m)(Mary Mosier, City of Fort Collins). Higher elevations are occupied by ponderosa pine, mountain mahogany, and mixed grasses on mesas and rolling hills. Road cuts and canyons expose mostly shale, sandstone, conglomerate, and other sedimentary rock and soil.

Climate

Climate information is summarized from: 1) Cheyenne, Wyoming airport (U.S. Weather Bureau 2011) which is about 10 mi (16 km) northeast of our study sites; 2) the High Plains Regional Climatic Center (HPRCC 2011), University of Nebraska, Lincoln, Nebraska (Fig.1). According to the HPRCC, the nearest weather station to SPNA is located in Cheyenne, Wyoming.

During the 2011 study period, temperatures exceeded the 30 year normal maximum. Precipitation was normal from the start of the study period in June to late July (total monthly precipitation was 5.63 in or 14.3 cm) when it was highest. From late July to the end of the study period, precipitation slightly declined and followed the 30 year normal. However, this is equivalent to drought at SPNA because the average precipitation from late July to early October was a monthly total of 1.00 in (2.54 cm) in hottest months. These climatic data correlated closely with a drop in water flow on 4 September 2011 at SpC causing a dry stream channel near the Malaise trap and slightly reduced flow at JkS but no impact at GC.

CHEYENNE MUNI AP, WY



Normals based up 1971-2000 Normals, if available

Grey Shading indicates where data are flagged as "Missing"

Accumulated Precip (where available) may not reflect actual deviations from normal if data are missing <http://hprcc.unl.edu>

"Experimental" May Contain Preliminary Data

High Plains Regional Climate Center

Figure 1. Temperature and precipitation 2011. Graphs based on data from High Plains Regional Climate Center, University of Nebraska.

Soapstone Collection Sites

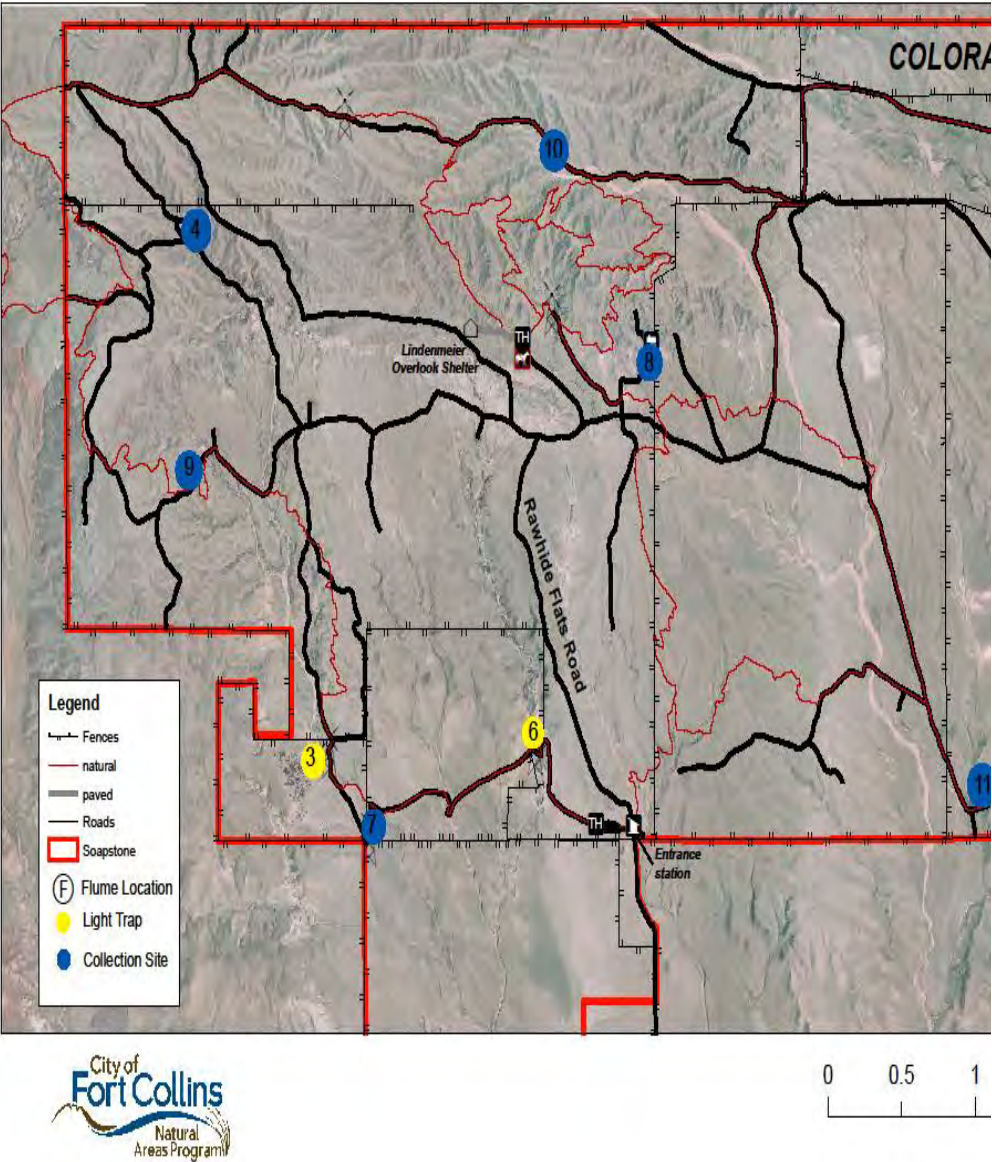


Figure 2. Map showing 2011 collection sites 1, 2 and 11, Soapstone Prairie Natural Area, Larimer Co., Colorado.

Table 1. Survey Dates, Collectors and Methods at Sites June-October 2011, Soapstone Prairie Natural Area, Larimer Co. Colorado.

Day	Month	Collectors*	Methods**			Conditions
			Site 1 Graves Creek	Site 2 Spottlewood Creek	Site 11 Jack Spring	
1	Jun	RS, BK, CM	S HC	S HC D O ₂	S	Dry roads
12	Jun	RS, DH	S HC	S HC Set MT Set BT	S Set BT	Dry roads
14	Jun	RS, SW	HC	S MT BT SP	S BT SP	Dry roads
9	Jul	RS, DH	S Set BT	S Set BT	S Set MT	Dry roads
10	Jul	RS, PC	S BT SP	S Set MT BT SP	S MT	Approaching storm
6	Aug	RS, DH	S HC Set BT	S Set MT Set BT	S Set MT	Dry roads
7	Aug	RS, WC	S HC BT SP	S MT BT SP	SMT	Mostly dry roads
4	Sep	RS, BK, DH	S D SS O ₂	S Set MT D	S	Dry roads
5	Sep	RS, WJ	S	S MT	S	Dry roads
18	Sep	RS, DH	S	S HC		Water on ranch roads From recent rains
2	Oct	RS, DH	S	S		Mostly dry roads

*Trips by Collector

PC	Philip Cafaro	1
WC	Whitney Cranshaw	1
DH	Danny Hesser	6
WJ	William Jacobi	1
BK	Boris Kondratieff	2
CM	Chirs Metz	1
RS	Ralph Stoaks	11
SW	Steve Wilkin	1

**Collection Methods

1	D	D-net	6	HC	Hand collection
2	S	Sweep net	7	BT	Bottle trap
3	PFT	Pitfall trap	8	O ₂	Collect live, lab rear
4	MT	Malaise trap	9	SP	Screen pan
5	BLT	Black light trap	10	SS	Surber sampler

Table 2. Sampling sites and coordinates June-October 2011, Soapstone Prairie Natural Area, Larimer Co., Colorado.

Site #	Description	Latitude	Longitude
1	Graves Creek	40° 59' 10.121"N	105° 0' 26.863"W
2	Spottlewood Creek	40° 58' 0.829"N	105° 0' 55.662"W
11	Jack Spring	40° 56' 42"N	105° 2' 0.0"W

Geology and Groundwater

The SPNA is included within the Ogallala Aquifer (or High Plains Aquifer in northeastern Colorado (USGS 2009). The aquifer consists of near-surface deposits of unconsolidated or partly consolidated gravel, sand, silt or clay of Tertiary or Quaternary age. Ground water in the aquifer contains calcium magnesium bicarbonate due to the substrate. Dissolved solids in the aquifer in eastern Colorado are generally less than 500 mg/l, but may exceed 1000 mg/l (USGS 2009).

The DNR constructed a flume to measure discharge at GC and indicated that discharge was a continuous mean flow of 0.26 cfs (7.3 l/sec) in 2010 and had similar low flow in 2011 with only slightly reduced discharge in summer-fall of both years (C. Metz, personal communication).

METHODS AND MATERIALS

Day visits to sites and field data were recorded on a field data sheet with summary of stream temperature measurements and general stream conditions, sites visited, collecting method/site and other data (Table 1). Sites with coordinates are in Table 2 and numbered 1, 2, and 11 on the map of collection sites (Fig. 2).

Day insect collections were mostly conducted with a standard 15 in (27 cm) sweep net, and by a Malaise trap (Fig. 3) containing vaponal as a killing agent. Specimens collected in nets were placed in killing jars, labeled and returned to the lab in zip-lock bags for identification. Sweeping was conducted with an aerial net (Fig. 4) over vegetation along stream banks and emergent plants in streams. Hand collections were made on vegetation, rock and the ground next to streams. Sampling was mainly conducted during sunny to cloudy days and occasionally in rain. Live immature specimens were transported from streams and occasionally from pools in daylight by D-net and or by hand. The stream water was oxygenated by small, battery powered pumps during transport. In the lab, specimens were



Figure 3. Malaise trap in use at Spottlewood Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado.



Figure 4. Sweep netting along Spottlewood Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado.



Figure 5. "Living stream" used to rear aquatic insects in lab, Colorado State University, Fort Collins, Colorado.



Figure 6. Bottle trap set in Graves Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado.

placed in a "living stream" (Fig. 5) that approximated natural stream conditions (Frigid Units, Toledo, Ohio). Immature specimens were reared to adults for identification, labeled and stored in vials in 80% alcohol. In lieu of black light traps utilized in 2009, we collected specimens from stream pools using standard one gallon bottle traps (BT) (Fig. 6). The contents of the BTs were poured into a white bottomed pan over a wire mesh window screen as we slowly added about 0.5 in (1 cm) of water, then collected stranded specimens with forceps by tilting the pan from side-to-side. On 4 September 2011, we conducted 3 Surber sample replicates (Fig. 7 and Fig. 8) from the substrate at two sites south of the road culvert on Graves Creek.



Figure 7. Surber sampler in Graves Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado.



Figure 8. Surber sampler showing capture net and frame, Graves Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado.

Table 3. Insect identification experts for selected specimens that were not specifically identified by B. C. Kondratieff, Soapstone Prairie Natural Area, Larimer Co., Colorado.

Order	Consultant	Location	Family & Species
Coleoptera	D. E. Bright	Colorado State University Fort Collins, CO dbright@mail.colostate.edu	Curculionidae
	S. M. Clark	Life Sciences Museum Brigham Young University Provo, UT shawn_clark@byu.edu	Chrysomelidae
	D. Hume	Agriculture Canada Ottawa, Canada DouglasH@inspection.gc.ca	Elateridae
Diptera	R. H. Disney	Zoology Department Cambridge University Cambridge, England CAMBRIDGE CB2 3EJ rhld2@hermes.cam.ac.uk	Phoridae
Hemiptera	A. Hicks	University of Colorado Museum of Natural History Boulder, CO Andrew.Hicks@Colorado.edu	Cicadellidae
Hymenoptera	C. McEwen	Entomological Department University of Maryland College Park, MD clm.c.ewen@Gmail.com	Some Chalcidoidea
	V. Scott	University of Colorado Museum of Natural History Boulder, CO Virginia.Scott@Colorado.edu	Apoidea
	W. van Steenis	Utrecht, Netherlands w.v.stennis@casema.nl	Syrphidae
	D. Wahl	American Entomological Institute Gainesville, FL aei@aei.cfcoxmail.com	Ichneumonidae
	K. Williams	Zoology Department UT State University Logan, UT Kevin.Williams@usu.edu	Mutillidae
Orthoptera	T. J. McNary	USDA, PPQ, WR Fort Collins, CO Timothy.J.McNary@aphis.usda.gov	All
Trichoptera	D. Ruiter	Centennial, CO druiter@msn.com	All

Table 4. Uncommon Insect Taxa identified in 2011, Soapstone Prairie Natural Area, Larimer County, Colorado. Genera and species listed were uncommon and families marked with an asterisk.

Order	Family	Genus & Species	Reference	Special feature
Coleoptera	*Apionidae	<i>Apion punctinasum</i> Smith	(Bright, Table 3)	Difficult to Identify
		<i>Apion wickhami</i> Kissinger	(Bright, Table 3)	Difficult to identify
Diptera	*Acroceridae	<i>Ogcodes pallidipennis</i> Loew	Schlenger 1960	
	Anthomyiidae	<i>Hydrophoria borealis</i> Malloch	Huckett 1971	Lower latitude of range
		<i>Hydrophoria frontosa</i> Zetterstedt	Huckett 1971	Lower altitude of range
		<i>Hydrophoria wierzekii</i> Mik	Huckett 1971	Lower altitude of range
	Conopidae	<i>Phytocephala texana</i> Williston	Buchmann 2010	
	*Diopsidae	<i>Sphyracephala subbifasciata</i> Fitch	Feijen 1989, Stoaks & Scott 2011	
	Ephydriidae	<i>Philotelma alaskense</i> Becker	Zatwarniki & Baez 1991	Lower altitude of range
	Phoridae	<i>Megaselia</i> n. sp. 1	(Disney, Table 3)	New species
		<i>Megaselia</i> n. sp. 2	(Disney, Table 3)	New species
		<i>Megaselia longiseta</i> Wood	(Disney, Table 3)	
	*Psilidae	<i>Loxocera fumipennis</i> Coquillett	Buck & Marshall 2006	
	Ptychopteridae	<i>Ptychoptera</i> sp.	McAlpine et al. 1986	New species
	Tachinidae	<i>Colorodomyia eucosmaphaga</i> Arnaud	Arnaud 1978, O'Hare & Wood 2004	New addition to CSUC
Hemiptera	Berytidae	<i>Neoneides muticus</i> Say	Uncommon	
	*Cydnidae	<i>Pangaeus</i> sp.	Smith & Holmes 2002	
	Nabidae	<i>Nabacula nigrovittata nearctica</i> Kerzhwer	Uncommon	Uncommon species
Hymenoptera	Andrenidae	<i>Panurginus</i> sp.	Scott 2011	
		<i>Pseudopanugus</i> sp.	Scott 2011	
		<i>Hylaeus leptcephalus</i> (Moran)	Scott 2011	
		<i>Hylaeus mesillae</i> (Cockerell)	Scott 2011	
	Ichneumonidae	<i>Banchus</i> sp.	CSUC, Wall, Table 3)	
		<i>Diadegma</i> sp.	CSUC, (Wall, Table 3)	
	*Sapygidae	<i>Sapyga</i> sp.	Johnson & Triplehorn 2005	
Neuroptera	Hemerobiidae	<i>Sympherobris perparvus</i> McLachlan	Nakahara 1965	
Plecoptera	Perlodidae	<i>Isoperla quinquepunctata</i> complex	Kondratieff & Baumann 2002	Rare in study area
Trichoptera	Hydropsychidae	<i>Cheumatopsyche campyla</i> Ross	Herrmann, Ruiter & Unzicker 1986	
	Limnephilidae	<i>Anabolia consocius</i> (Walker)	Herrmann, Ruiter & Unzicker 1986	Westernmost range limit
		<i>Clistoronia maculata</i> (Banks)	Herrmann, Ruiter & Unzicker 1986	
		<i>Limnephilus acnestus</i> Banks	Herrmann, Ruiter & Lavigne 1986	Rare throughout range

Table 5 Aquatic insects collected at Graves Creek, Spottlewood Creek and Jack Spring, Soapstone Prairie Natural Area, Larimer Co., Colorado 2009-2011.

Order	Family	Genus & Species	Graves Creek	Spottlewood Creek	Jack Spring
Coleoptera	Dryopidae	<i>Helichus striatus</i> LeConte	x	x	
	Dytiscidae	<i>Agabus affinis</i> Paykull		x	
		<i>Agabus ambiguus</i> Say		x	
		<i>Agabus disintegratus</i> (Crotch)		x	
		<i>Agabus griseipennis</i> LeConte		x	
		<i>Agabus semivittatus</i> LeConte		x	
		<i>Agabus seriatus</i> Say	x		
		<i>Colymbetes exaratus incognitus</i> Zimmerman		x	
		<i>Coptotomus longulus longulus</i> LeConte		x	
		<i>Hydroporus notabilis</i> LeConte		x	x
		<i>Hygrotus impressopunctatus</i> (Schaller)		x	
		<i>Hygrotus marklini</i> (Gyllenthal)		x	
		<i>Hygrotus nubilus</i> (LeConte)		x	
		<i>Hygrotus patruelis</i> (LeConte)		x	
		<i>Ilybius biguttulus</i> (Germar)		x	
		<i>Laccophilus maculosus decipiens</i> LeConte	x	x	x
		<i>Liodessus abjectus</i> (Sharp)	x	x	x
		<i>Neoporus obscurellus</i> (LeConte)		x	
		<i>Neoporus dimidiatus</i> Gemminger & Harold	x	x	
		<i>Rhantus binotatus</i> Harris		x	
		<i>Rhantus gutticollis</i> (Say)	x	x	
		<i>Stictotarsus striatellus</i> (LeConte)		x	
	Elmidae	<i>Optioservus castanipennis</i> (Fallen)	x	x	
		<i>Optioservus divergens</i> (LeConte)	x	x	
	Haliplidae	<i>Haliplus deceptus</i> Matheson		x	
		<i>Haliplus fulvus</i> (Fabricius)		x	
		<i>Haliplus immaculicollis</i> Harris	x	x	
		<i>Peltodytes callosus</i> LeConte		x	
	Hydrophilidae	<i>Anacena</i> sp.	x	x	x
		<i>Berosus fraternus</i> LeConte		x	
		<i>Berosus stylifer</i> Horn		x	
		<i>Cercyon</i> sp.		x	
		<i>Cymbiodyta</i> sp.	x		
		<i>Cymbiodyta beckeri beckeri</i> Smetana		x	
		<i>Enochrus hamiltoni</i> (Horn)	x	x	
		<i>Helophorus orientalis</i> Motschulsky		x	
		<i>Helophorus robertsi</i> Smetana		x	
		<i>Laccobius agilis</i> Randall		x	
		<i>Laccobius mexicanus</i> Orchymont		x	
		<i>Tropisternus affinis</i> Motschulsky		x	
		<i>Tropisternus columbianus</i> Brown	x	x	x
		<i>Tropisternus ellipticus</i> LeConte	x		
		<i>Tropisternus lateralis limbalis</i> (LeConte)		x	
		<i>Tropisternus lateralis nimbatus</i> (Say)		x	
		<i>Tropisternus sublaevis</i> (LeConte)		x	x
Diptera	Ceratopogonidae	sp.	x	x	
		<i>Atrichopogon fuscus</i> Coquillett		x	x
		<i>Culicoides</i> sp.		x	
		<i>Culicoides cockerelli</i> Coquillett			x

Order	Family	Genus & Species	Graves Creek	Spottlewood Creek	Jack Spring
		<i>Dasyhella</i> sp.			x
		<i>Forcipomyia</i> sp.			x
	Chironomidae	sp.	x	x	x
		<i>Apedilum</i> sp.	x	x	
		<i>Cricotopus</i> sp.	x	x	
		<i>Diamesa</i> sp.		x	
		<i>Dicrotendipes</i> sp.		x	
		<i>Micropsecta</i> sp.		x	
		<i>Odontomesa</i> sp.		x	
		<i>Orthocladius</i> sp.	x		
		<i>Paracladius</i> sp.		x	
		<i>Parametriacnemus</i> sp.	x	x	
		<i>Paraphaenocladius</i> sp.	x		
		<i>Psectrocladius</i> sp.		x	
		<i>Pseudochironomus</i> sp.		x	
		<i>Rhadotanypus</i> sp.		x	
	Culicidae	<i>Aedes</i> sp.		x	
		<i>Aedes dorsalis</i> (Meigen)		x	
		<i>Aedes increpitus</i> Dyar		x	
		<i>Aedes nigromaculis</i> (Ludlow)	x		x
		<i>Culiseta</i> sp.		x	
		<i>Culiseta impatiens</i> (Walker)	x	x	
		<i>Culiseta inornata</i> (Williston)			x
		<i>Culiseta morsitans</i> (Theobald)		x	
	Dixidae	<i>Dixella</i> sp.		x	
	Dolichopodidae	<i>Chrysotus leucostoma</i> (Loew)		x	
		<i>Dolichopus bifractus</i> Loew		x	
		<i>Dolichopus cuprinus</i> Wiedemann	x	x	
		<i>Dolichopus obcordatus</i> Aldrich		x	
		<i>Dolichopus palustris</i> Melander & Brues		x	
		<i>Dolichopus ramifer</i> Loew		x	
		<i>Hydroporus</i> sp.		x	
		<i>Medetera</i> sp.		x	
		<i>Medetera veles</i> Loew		x	
		<i>Pelastroneurus vagans</i> Loew		x	
		<i>Rhapium nr. exile</i> Curran		x	
		<i>Rhapium effilatum</i> Wheeler		x	
		<i>Scellus exustus</i> Walker		x	
		<i>Scellus monstrosus</i> Osten Sacken		x	
		<i>Syntormon clavatum</i> Van Duzee		x	
	Ephydriidae	sp.		x	x
		<i>Athyroglossa</i> sp.			x
		<i>Calocoenia</i> sp.		x	
		<i>Coenia</i> sp.		x	
		<i>Ephydra</i> sp.			x
		<i>Ephydra (Hydropyrus)</i> sp.	x		
		<i>Mosillus</i> sp.	x	x	x
		<i>Notophilia (Dichaeta)</i> sp.	x		x
		<i>Notophila (Notiphila)</i> sp.	x	x	x
		<i>Ochthera</i> sp.		x	x
		<i>Paralimna</i> sp.	x	x	x
		<i>Parydra (Parydra)</i> sp.		x	x

Order	Family	Genus & Species	Graves Creek	Spottlewood Creek	Jack Spring
		<i>Pelina</i> sp.		x	
		<i>Philotelma alaskense</i> Becker			x
		<i>Scatophila</i> sp.	x	x	x
	Ptychopteridae	<i>Ptychoptera</i> sp.	x	x	x
	Sciomyzidae	<i>Dictya</i> sp.	x	x	
		<i>Dictya texensis</i> Curran		x	x
		<i>Limnia ottawensis</i> Melander		x	
		<i>Sepedon armipes</i> Loew		x	x
		<i>Tetanocera</i> sp.		x	x
		<i>Tetanocera ferruginea</i> Fallen		x	x
		<i>Tetanocera plebeja</i> Loew		x	
	Simuliidae	<i>Prosimulium</i> sp.		x	
		<i>Simulium</i> sp.	x	x	x
		<i>Simulium decorum</i> Walker	x	x	x
	Stratiomyidae	<i>Anoplodonta nigriostriis</i> Loew		x	
		<i>Euparyphus cinctus</i> (Osten Sacken)		x	
		<i>Euparyphus mutabilis</i> Adams	x	x	x
		<i>Hedriodiscus binotatus</i> Loew		x	x
		<i>Microchrysa polita</i> Linnaeus			x
		<i>Nemotelus</i> sp.		x	x
		<i>Nemotelus beameri</i> James		x	
		<i>Odontomyia</i> sp.		x	
		<i>Odontomyia cincta</i> Olivier		x	
		<i>Stratiomys barbata</i> Loew		x	
		<i>Stratiomys normula</i> Loew		x	
	Tabanidae	<i>Chrysops fulvaster</i> Osten Sacken		x	
		<i>Chrysops mitis</i> Osten Sacken		x	
		<i>Hybomitra</i> sp.	x	x	
	Tipulidae	sp.	x		
		<i>Limonius fulviopilis</i> Candenze		x	
		<i>Limonius nitidulus</i> Horn		x	
		<i>Tipula</i> sp.	x	x	
Ephemeroptera	Baetidae	<i>Baetis magnus</i> McCafferty & Waltz	x	x	
		<i>Baetis tricaudatus</i> Dodds		x	
		<i>Callibaetis ferrugineus hageni</i> Eaton	x		
		<i>Fallceon quilleri</i> (Dodds)	x	x	x
	Leptohyphidae	<i>Tricorythodes explicatus</i> (Eaton)	x	x	
Hemiptera	Belostomatidae	<i>Belostoma fluminea</i> Say		x	
	Corixidae	<i>Cenocorixa utahensis</i> (Hungerford)		x	
		<i>Sigara alternata</i> (Say)		x	
		<i>Sigara grossolineata</i> Hungerford		x	
		<i>Trichocorixa borealis</i> Sailor		x	
	Gerridae	<i>Aquarius remigis</i> (Say)		x	
		<i>Gerris gillettei</i> Lethierry & Severin	x	x	
	Macroveliidae	<i>Macrovelia horni</i> Uhler	x		
	Notonectidae	<i>Notonecta kirbyi</i> (Hungerford)		x	
		<i>Notonecta undulata</i> Say		x	
Odonata	Aeshnidae	<i>Aeshna palmata</i> Hagen	x		
	Coenagrionidae	<i>Amphiagrion abbreviatum</i> Selys	x	x	x
		<i>Argia alberta</i> (Hagen)		x	
		<i>Argia vivada</i> Hagen		x	
		<i>Enallagma anna</i> Williamson		x	

Order	Family	Genus & Species	Graves Creek	Spottlewood Creek	Jack Spring
		<i>Enallagma civile</i> (Hagen)		x	
		<i>Ischnura</i> sp.		x	
		<i>Ischnura damula</i> Calvert		x	
		<i>Ischnura perparva</i> McLachlan	x	x	
		<i>Ischnura verticalis</i> Say		x	
	Libellulidae	<i>Libellula pulchella</i> Drury		x	
		<i>Plathemis subornata</i> (Hagen)		x	
		<i>Sympetrum obtrusum</i> (Hagen)		x	
		<i>Sympetrum semicinctum fuscicatum</i> (Say)		x	x
	Lestidae	<i>Lestes congener</i> Hagen		x	
		<i>Lestes disjunctus</i> Selys	x	x	
Plecoptera	Perlodidae	<i>Isoperla quinquepunctata</i> (Banks)		x	
	Nemouridae	<i>Malenka coloradensis</i> (Banks)	x		
Trichoptera	Helicopsychidae	<i>Helicopsyche</i> n. sp.	x	x	
	Hydropsychidae	<i>Cheumatopsyche analis</i> Banks	x	x	
		<i>Cheumatopsyche campyla</i> Ross		x	
	Leptoceridae	<i>Oecetis disjuncta</i> (Banks)	x	x	
		<i>Ylodes frontalis</i> Banks		x	
	Limnephilidae	<i>Anabolia bimaculatus</i> (Walker)		x	
		<i>Anabolia consocius</i> (Walker)	x		
		<i>Clistronia maculata</i> (Banks)		x	
		<i>Hesperophylax</i> sp.	x	x	
		<i>Hesperophylax designatus</i> (Walker)	x	x	x
		<i>Hesperophylax magnus</i> Banks	x		
		<i>Hesperophylax occidentalis</i> (Banks)	x		
		<i>Limnephilus acnestus</i> Ross	x	x	x
		<i>Limnephilus castor</i> Ross & Merkeley		x	
		<i>Limnephilus diversus</i> (Banks)		x	x
		<i>Limnephilus frijole</i> Ross		x	
		<i>Limnephilus spinatus</i> Banks		x	
		<i>Limnephilus taloga</i> Ross		x	
	Philopotamidae	<i>Chimarra utahensis</i> Ross		x	

In Table 1, collecting sites and in Appendix 1, site and collection methods are summarized. For example, sites use 2009 and 2010 numbering at GC (site 1) and SpC (site 2) and JSp (site 11). The criteria to rate specimens as uncommonly collected were if: 1) a county record, 2) considered regionally uncommon, 3), indicated by an expert (e.g., Table 3), or 4) uncommon as reported in the literature. These uncommon specimens are identified with an asterisk in Appendices 1-2 and in Tables 4-5.

Identification and Verification

Insect specimens were initially sorted to orders. There is no single source or reference available to identify North American insects to genus and species. Primary taxonomic literature available at the C.P. Gillette Museum of Arthropod Diversity (CSUC) was used. Specimens were sent to experts for identification in specific groups (Table 3). Insect specimens collected are deposited in the CSUC. Scientific names, distribution and synonyms were verified according to Poole and Gentili (1996-1997) or more current literature. Pinned specimens are stored in Cornell

drawers in fumigated steel cabinets. Specimens are stored in 80% alcohol or on mounted insect pins. A specifically equipped lab for rearing immature stream insects to adults is located in the Plant Sciences building on the CSU campus. New species of Phoridae specimens were determined by Dr. Henry Disney, Cambridge University, England.

Table 6. Relative abundance of macroinvertebrates/m² using a Surber sample on 4 September 2011, Graves Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado.

Taxa	Site 1			Site 2		
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
<i>Lumbriculus</i> sp.(aquatic worms)	10	10	10			
<i>Dugesia dortocephala</i> (planaria)		10	80	60	90	20
<i>Erobdella parva</i> (leech)	10					
<i>Mooreobdella fervida</i> (leech)		10				
<i>Baetis magnus</i> (mayfly nymphs)	20	120	510	460	180	590
<i>Optioservus</i> sp. (elmid beetle adults)	10	20	140	280	10	320
<i>Optioservus</i> sp. (elmid beetle larvae)	300	90	150	100	90	320
<i>Hesperophylax</i> sp. (caddisfly larvae)	50	80	80	20	20	10
<i>Hesperophylax</i> sp. pupae				60		40
<i>Paraphaenocladus</i> sp. (chironomid larvae)		10	10			
<i>Simulium decorum</i> (blackfly larvae)	20	40	30	60	110	30
Ephydriidae (shore fly larvae)			10			
<i>Sigara</i> sp. (water boatman)			10			
<i>Gammarus lacustris</i> (scuds)	30	110	180	210	90	40
Total Number/m ²	450	510	1,210	1,260	610	1,370

Site 1, 30m south of Graves Creek culvert

Site 2, 60m south of Graves Creek culvert

RESULTS

For 2011, we report a total of 128 families, 329 genera, 254 species and 4,905 specimens in addition to those by reported Stoaks and Kondratieff (2009, 2010). Additionally, we report 6 uncommon families, 25 genera and 26 species for 2011. The combined total of specimens for three years is 17,709. The 2011 total for Rare/uncommon taxa not reported in 2009 and 2010 were: 6 families, 25 genera and 26 species.

Rare or uncommon insects collected are indicated by an asterisk in Appendices 1-2, but no threatened or endangered species were found as listed by the state of Colorado or Federal agencies.

Surber samples at GC on 4 September 2011 yielded mostly: mayfly larvae of *Baetis magnus* McCafferty and Waltz, caddisfly larvae and pupae of *Hesperphylax occidentalis* (Banks) and riffle beetle adults and larvae of *Optioservus* spp. Aquatic insects collected by Surber samples are listed in Table 6 (Aquatic taxa) and their ecology is explained in the Discussion below. Table 4 includes the stalk eyed fly, *Sphyracephala subbifasciata* Fitch (Feijen 1989)(Figs. 9 -10)(Stoaks and Shaw 2011). Single specimens were collected in tall grasses at SpC near the stream by sweep net in October 2010 and by malaise trap over the stream in October 2011. The undescribed species of phantom crane fly discovered in 2009 (Stoaks and Kondratieff 2010), were recollected at JkS on 1 June 2011.



Figure 9. Lateral view, Stalk eyed fly, *Sphyracephala subbifasciata* Fitch from Spottlewood Creek, Soapstone Prairie Natural Area, Larimer Co. Colorado. Photo credit: Todd Gilligan, CSU.



Figure 10. Head, frontal view, Stalk eyed fly, *Sphyracephala subbifasciata* Fitch from Spottlewood Prairie Natural Area, Larimer Co., Colorado. Photo credit: Todd Gilligan, CSU.

DISCUSSION

Surveys of the biological conditions of U.S. streams have indicated that most are influenced by chemical, physical or flow alterations. As a consequence "natural" biological communities continue to be altered despite federal legislation mandating their protection. The city of Fort Collins Natural Areas Program (fcgov.com/naturalareas) is concerned with the aquatic resources on landscapes being currently managed, and in particular, the long-term maintenance of the biotic integrity of these resources. A component of this is the ability to anticipate and predict possible future impacts to specific aquatic resources. Resource inventory and monitoring are essential elements in this process, since they provide the basis for verifying predicted impacts as well as assessing the pace and extent of any changes in the status of the resource. Stream biota reflect the chemical, physical, and biological conditions in which they evolved. Biological community changes, and therefore biological evaluation, reflect many environmental conditions and anthropogenic impacts.

This report includes an inventory of the aquatic macroinvertebrates of GC, SpC, and JkS of the Soapstone Prairie Natural Area. These aquatic habitats have had a long and continued history of impacts mostly from livestock grazing. Armour et al. (1994), Fleischner (1994), and Belsky et al. (1999), provide reviews of the numerous deleterious impacts of livestock grazing on aquatic ecosystems. The headwater region of SpC is still being grazed as well as other sections of the stream. It is suggested that a long-term monitoring program of the aquatic resources of Soapstone Prairie Natural Area using biological criteria should be implemented to follow recovery or continued degradation of these unique ecological systems.

Karr et al. (1986) defined five classes of environmental factors that affect aquatic ecosystems: energy source, water quality, habitat quality, flow regime, and biotic interactions (Table 7). They stress that these classes are interrelated and the biological community may be altered by changes in any one of the factors. Therefore, the components and structure of the biological community reflect many environmental factors, making biological monitoring a powerful tool. Additionally, the integration of many environmental factors suggests that approaches to water resource management problems be broad-based. Solutions that consider many aspects of the watershed, and manage the ultimate cause of a problem, are likely to be more effective and more economical than solutions which only consider proximate causes (Karr et al. 1986).

Table 7. Environmental factors that affect aquatic biota (modified from Karr et al. 1986)

1. Food (Energy) Source
 - type, amount, and particle size of organic material entering a stream from the riparian zone versus primary production in the stream
 - seasonal pattern of available energy
 2. Water Quality
 - temperature
 - turbidity
 - dissolved oxygen
 - nutrients (primarily nitrogen and phosphorus)
 - organic and inorganic chemicals, natural and synthetic
 - heavy metals and toxic substances
 - pH
 3. Habitat Structure
 - substrate type
 - water depth and current velocity
 - spawning, nursery, and hiding places
 - diversity (pools, riffles, woody debris)
 - basin size and shape
 4. Flow Regime
 - water volume
 - temporal distribution of floods and low flows
 5. Biotic Interactions
 - competition
 - predation
 - disease
-

Quantitative Sampling Design

A Surber square-foot bottom sampler was used to obtain quantitative samples from Graves Creek. Three replicate samples were taken at each site, 30 m and 60 m below road culvert by the ranch house.

The Surber sampler is commonly used to sample shallow streams. All organisms within the area of the sampler on the natural stream bottom are collected. Quantitative sampling yields numerical estimates of the absolute abundance of each species per unit area for the habitat sampled (Platts et al. 1983, Hauer and Lamberti 1996, Merritt et al. 2008). This methodology provides data on population densities which may be used to detect variations over time and space. The Surber sampler consisted of a capture net and frame, which supports the net and defines the sampling area (Fig. 8). The sampling area was 0.0929 m² (1 square foot), and capture net was nylon with 1.050 mm openings (Wildco, Wildlife Supply Company, Saginaw, Michigan). The sampler was placed on the stream bottom in areas where depth and current were sufficient to wash dislodged organisms into the capture net. The substrate within the sampler frame was disturbed with a garden cultivator to a depth of 8-10 cm in order to dislodge organisms.

Individual rocks were brushed with a vegetable brush and then visually inspected in order to free any clinging organisms. The catch net was washed several times to concentrate the contents into the end. Contents were placed into a labeled plastic bag by inverting the net and preserved by 80% ethanol. Macroinvertebrates were enumerated, and identified to the lowest practical taxonomic level. Final storage of samples was in 80% ethanol.

Analysis

A sample was defined as the mean number of organisms of each taxon found in the three Surber replicate samples at each site and date. Data from the macroinvertebrate samplers were analyzed to obtain basic benthic aquatic community data including taxa richness and density of macroinvertebrates.

Results of Quantitative Benthic Macroinvertebrate Sampling, Graves Creek

Table 6 presents the total number of macroinvertebrate taxa collected using the Surber sampler on 4 September 2011 from two sites GC, 11 total taxa. These are typical taxa for groundwater fed systems of the immediate geographical region (B. C. Kondratieff, personal observation). However, the original macroinvertebrate fauna of these systems was not documented prior to the impacts of irrigated agriculture and livestock grazing. Additionally, no studies have been published on the macroinvertebrate composition of springs of the High Plains of Colorado. A single species of baetid mayfly, *Baetis magnus* McCafferty and Waltz, the riffle beetle genus *Optioservus* (mostly *O. castanipennis* (Fall) and few *O. divergens* (LeConte)), the amphipod *Gammarus lacustris* Sars, and the limnephilid caddisfly, *Hesperophylax* spp. (including *H. designatus* Banks and *H. occidentalis* (Banks)) composed 87% of the total number of individuals/m² collected on 4 September 2011. The freshwater planarian *Dugesia dorotocephala* (Woodworth) and blackflies (*Simulium decorum* Walker) contributed an additional 10% of the total numbers of individuals. Two taxa, the mayfly *B. magnus*, averaging 313/m² individuals and the riffle beetle *Optioservus* spp. larvae and adults (averaging 305/m²) dominated along with *G. lacustris* (averaging 110/m²) on the sampling date. The limnephilid caddisfly *Hesperophylax* spp. (60 larvae & pupae/ m²) was the next most numerous macroinvertebrates. The major taxa in regard to feeding guilds (Cummins et al. 2008) were collector-gatherer taxa (*B. magnus*, *Optioservus* spp. larvae) or shredder taxa (*Hesperophylax* spp. *Optioservus* spp. adults, *G. lacustris*), no doubt making use of ample living vascular material of *Veronica anagallis-aquatica* L.) and the presence of large amounts of decaying in stream organic material.

Graves Creek

Graves Creek is a unique system originating from a groundwater source near the ranch house. There is no developed riparian vegetation zone associated with the drainage, but vegetation is ample in stream beds of the emergent macrophyte *Veronica anagallis-aquatica* L. Additionally, inputs from livestock grazing (Gary et al. 1983) and wind deposited organic material enrich the rheocrene. The macroinvertebrate community is composed of at least 58 insect taxa (Table 5), many well-known associates of rheocrenes. Several taxa occur in large numbers throughout the year, the baetid mayfly, *Baetis magnus* McCafferty and Waltz, the riffle beetle genus *Optioservus* (including mostly adults and larvae *O. castanipennis* (Fall), but a few *O.*

divergens (LeConte)), the amphipod *Gammarus lacustris* Sars, and the limnephilid caddisfly, *Hesperophylax* spp. (including *H. designatus* Banks and *H. occidentalis* (Banks)). Near the head of the spring, by the road culvert, a small population of the regionally uncommon nemourid stonefly *Malenka coloradensis* (Banks) occurs. A population of the generally eastern North American limnephilid caddisfly, *Anabolia consocius* (Walker), an uncommon species found in the eastern half of Colorado. Additional taxa of aquatic worms, leeches, planarians, and crustaceans occur throughout Graves Creek, especially the amphipod *G. lacustris*.

Spottlewood Creek

At least 158 different insect taxa were collected from SpC during the three years of sampling (Table 5). The majorities of these are lentic or standing water species and are usually geographically widespread and common western North American species. During the summer months, especially in dry years, running water reaches of SpC dry (Fig.11) (or leave or form isolated pools. Several of these pools along the length of the stream are fed by groundwater inputs (Fig. 12), Several of the pools were 0.5 to 1.0 m deep, with ample emergent and submergent macrophytes and filamentous algae, supporting high densities of aquatic macroinvertebrates. These pools often have relatively high densities of pond damselflies (Coenagrionidae), meadowhawks (*Sympetrum* spp.) and darners (*Aeshna palmata* Hagen)(Fig. 13), waterboatman (Corixidae), back swimmers (Notonectidae), giant water bugs (*Belostoma flumineum* Say), predaceous diving beetles (Dytiscidae), water scavenger beetles (Hydrophilidae), and crawling water beetles (Haliplidae) (Table 5). In the few riffle sections, the small baetid mayfly *Fallceon quilleri* (Dodds) is often abundant. It is interesting to note, that despite the grazing impacts, a small remnant population of the perlodid stonefly, known as the “Fivespot Stripetail,” *Isoperla quinquepunctata* (Banks) occurred in a few riffle sections.



Figure 11. Spottlewood Creek with seasonal low flow and small pools on 6 August 2011, Soapstone Prairie Natural Area, Larimer Co., Colorado.



Figure 12. A bottle trap being used at spring sources at Spottlewood Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado.



Figure 13. The Paddle-tailed Darner, *Aeshna palmata* Hagan, a species found at pools in Spottlewood Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado. Photo Credit: Ed McAskill, BugGuide.Net.



Figure 14. Typical snail-like case of the caddisfly, *Helicopsyche* found at Graves Creek, Soapstone Prairie Natural Area, Larimer Co., Colorado. Photo Credit: Mike Quinn, BugGuide.Net.

Stoneflies are usually sensitive to perturbations such as cattle grazing (Scrimgeour and Kendall. 2003) Several relatively uncommon regional caddisflies exist in SpC, including an undescribed species of snail case caddis fly genus *Helicopsyche* (Fig. 14), the limnephild *Clistoronia maculata* (Banks), and the philopotamid caddisfly *Chimarra utahensis* Ross (Stoaks and Kondratieff 2010, 2011).

Jack Spring

As Van Kamp (1995) indicated, springs are points of concentrated discharge from groundwater flow systems. Usually springs, in terms of water temperatures and chemistry, are relatively constant. Relatively little information is known about the aquatic insect communities of the High Plains of western North America (Ferrington 1995). At least 42 insect taxa were collected in the three years of sampling (Table 5). Approximately, 70% of these species were flies (Table 5). No unique taxa were collected during the three year survey at this location. The uncommon limnephild caddisfly *Limnephilus acnestus* Ross was found in relatively large numbers. The spring source and its drainage have been severely impacted by livestock grazing (Fig.15) It could be plausible that other unique invertebrate taxa may have been associated with High Plains springs, such as JkS before livestock grazing impacts.



Figure 15. Livestock impact on stream at Jack Spring, Soapstone Prairie Natural Area, Larimer Co., Colorado.



Figure 16. Operational electric fence at Jack Spring, Soapstone Prairie Natural Area, Larimer Co., Colorado.

RECOMMENDATIONS

We recommend that solar fences be routinely checked to exclude livestock from aggregating in stream habitats especially during grazing rotation (Fig 16). We recommend the initiation of a long term monitoring program, sampling every 3 years, using both qualitative and quantitative sampling methods as described in the report. This program will ensure the long term integrity of the unique aquatic resources at SPNA.

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Appendix 1. 2011 Insect Species List, Soapstone Prairie Natural Area, Larimer Co., Colorado.

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
Coleoptera	Anobiidae	sp.	29-May-10	1	2	1
		sp.	25-Jul-10	11	2	1
	*Apionidae	sp.	9-Jul-11	11	4	2
		sp.	4-Sep-11	2	2	3
		*Apion sp.	5-Sep-11	2	2	2
		Apion sp.	7-Aug-11	2	2	2
		*Apion punctinasum Smith	14-Jun-11	2	4	1
		*Apion wickhami Kissinger	12-Jun-11	11	2	1
		*Apion wickhami Kissinger	5-Sep-11	2	2	2
	Brachypteridae	Brachypterolus pulicarius (Linnaeus)	7-Aug-11	1	2	1
	Buprestidae	Taphocerus schaefferi Nicolay and Weiss	12-Jun-11	2	2	1
	Cantharidae	Chauliognathus basalis (LeConte)	5-Sep-11	2	2	6
		Podabrus sp.	1-Jun-11	2	2	2
		sp.	12-Jun-11	2	2	1
	Carabidae	sp.	12-Jun-11	11	2	1
		sp.	28-Jul-10	2	3	1
		sp.	31-Jul-10	2	4	1
		sp.	12-Jun-11	2	2	1
		sp.	18-Sep-11	2	6	3
		Agonum sp.	18-Sep-11	2	6	2
		Bembidion	12-Jun-11	2	2	1
		Bembidion	28-Jul-11	2	3	1
		Harpalus sp.	18-Sep-11	2	6	2
	Cerambycidae	Crossidius discoideus (Say)	4-Sep-11	2	2	3
	Chrysomelidae	sp.	6-Jun-10	2	2	1
		sp.	31-Jul-10	2	3	1
		sp.	8-Aug-11	1	2	1
		Acanthoscelides sp.	8-Aug-09	2	2	1
		Altica sp.	4-Sep-09	2	3	1
		Chaetocnema opulenta Horn	12-Jul-10	11	2	1
		Chaetocnema opulenta Horn	25-Jul-10	11	2	1
		Chaetocnema opulenta Horn	4-Sep-11	2	2	2
		Chaetocnema subviridis LeConte	4-Sep-11	2	2	1
		Chaetocnema subviridis LeConte	29-May-10	12	2	1
		Cryptocephalus confluentus Say	4-Sep-11	2	2	1
		Diabrotica virgifera LeConte	7-Aug-11	1	2	2
		Diabrotica virgifera LeConte	7-Aug-11	2	2	3
		Diabrotica virgifera LeConte	7-Aug-11	11	2	1
		Dibolia borealis Chevrolat	12-Jun-11	2	2	1
		Epitrix sp.	6-Aug-11	2	2	1
		Glyptina sp.	6-Jun-10	2	2	1
		Glyptina sp.	1-Jun-11	2	2	1
		Glyptina sp.	6-Jun-11	2	2	1
		Glyptotina atriventris Horn	25-Jul-10	2	3	1
		Longitarsus sp.	27-Jun-09	9	2	1
		Monoxia sp.	7-Aug-11	1	2	1

	Pachybrachis sp.	4-Sep-09	2	2	1
	Pachybrachis h. hepatica Melsheimer	16-Aug-10	12	2	1
	Phylliodes sp.	6-Jun-10	2	2	1
	Phyllotreta sp.	27-Jun-09	6	2	1
	Phyllotreta sp.	9-Sep-09	2	4	1
	Phyllotreta sp.	12-Jun-10	1	2	1
	Phyllotreta sp.	29-May-10	2	2	1
	Phyllotreta sp.	12-Jun-11	1	2	1
	Phyllotreta sp.	12-Jun-11	11	2	1
	Phyllotreta sp.	7-Aug-11	1	2	1
	Phyllotreta sp.	4-Sep-11	1	2	1
	Phyllotreta conjuncta Gentner	7-Aug-11	2	4	3
	Zygogramma heterothecae Linell	7-Aug-11	11	4	4
Cicindelidae	Cicindela punctulata Olivier	14-Jun-11	2	4	1
	Cicindela purpurea audubonii LeConte	4-Sep-11	2	2	1
Coccinellidae	sp.	2-Jun-10	1	2	1
	sp.	12-Jun-11	11	2	1
	sp.	9-Jul-11	1	2	31
	sp.	6-Aug-11	2	2	1
	Anatis lecontei Casey	12-Jun-11	11	2	1
	Brachiacantha sp.	12-Jun-11	2	2	1
	Brachiacantha sp.	9-Jul-11	2	2	1
	Brachiacantha decora Casey	12-Jun-11	11	4	1
	Brachiacantha decora Casey	9-Jul-11	1	2	4
	Brachiacantha tau LeConte	10-Jul-11	2	4	2
	Coccidula lepida LeConte	12-Jun-11	11	2	4
	Coccinella septempunctata Linnaeus	10-Jul-11	11	2	8
	Coccinella septempunctata Linnaeus	7-Aug-11	11	4	1
	Coccinella septempunctata Linnaeus	7-Aug-11	2	4	4
	Coccinella septempunctata Linnaeus	9-Jul-11	1	2	2
	Coccinella septempunctata Linnaeus	9-Jul-11	1	2	13
	Coccinella transversoguttata Fabricius	9-Jul-11	1	2	2
	Coccinella transversoguttata Fabricius	10-Jul-11	11	2	11
	Coccinella transversoguttata Fabricius	7-Aug-11	11	4	2
	Coccinella transversoguttata Fabricius	5-Sep-11	2	2	1
	Coccinella transversoguttata Fabricius	3-Oct-11	1	2	1
	Coccinella transversoguttata Fabricius	3-Oct-11	2	2	1
	Coleomegilla maculata De Geer	6-Aug-11	2	2	2
	Hippodamia apicalis Casey	6-Aug-11	2	2	2
	Hippodamia apicalis Casey	9-Jul-11	1	2	2
	Hippodamia convergens Guerin-Meneville	9-Jul-11	1	2	13
	Hippodamia convergens Guerin-Meneville	9-Jul-11	2	2	1
	Hippodamia convergens Guerin-Meneville	10-Jul-11	11	2	11
	Hippodamia convergens Guerin-Meneville	28-Jul-11	11	4	1
	Hippodamia convergens Guerin-Meneville	6-Aug-11	2	2	1
	Hippodamia convergens Guerin-Meneville	6-Aug-11	2	2	1
	Hippodamia convergens Guerin-Meneville	7-Aug-11	11	4	1
	Hippodamia convergens Guerin-Meneville	4-Sep-11	2	2	2
	Hippodamia convergens Guerin-Meneville	5-Sep-11	2	2	5
	Hippodamia convergens Guerin-Meneville	2-Oct-11	1	2	2

	Hippodamia convergens Guerin-Meneville	2-Oct-11	2	2	2
	Hippodamia expurgata Casey	10-Jul-11	11	4	1
	Hippodamia sinuata crotochi Casey	7-Aug-11	11	4	1
	Mulsantina picta (Randall)	28-Jul-10	2	4	1
	Mulsantina picta (Randall)	4-Sep-11	2	2	1
	Scymnus sp.	7-Jun-11	11	2	1
Curculionidae	sp.	12-Jun-11	1	2	1
	sp.	2-Oct-11	2	2	3
	sp.	12-Jun-11	1	2	1
	sp.	9-Jul-11	1	2	5
	Anthonomus squamosus LeConte	2-Oct-11	2	2	1
	Ceutorhynchus americanus Buchanan	5-Sep-11	2	2	1
	Ceutorhynchus americanus Buchanan	2-Oct-11	1	2	3
	Hylurgops piniplex (Finch)	4-Sep-11	2	2	1
	Tychius sp.	1-Jun-11	2	2	4
	Tychius sp.	9-Jul-11	1	2	2
	Tychius sp.	4-Sep-11	2	6	1
	Tychius sp.	5-Sep-11	2	2	1
Dryopidae	Helichus striatus LeConte	4-Sep-11	2	2	2
Dytiscidae	Agabus ambiguus Say	1-Jun-11	2	1	1
	Agabus griseipennis LeConte	1-Jun-11	2	1	1
	Colymbetes exaratus incognitus Zimmerman	4-Sep-11	2	6	1
	Coptotomus longulus LeConte	1-Jun-11	2	1	3
	Coptotomus longulus LeConte	12-Jun-11	12	2	1
	Coptotomus longulus LeConte	4-Sep-11	2	1	2
	Hygrotus impressopunctatus (Schaller)	14-Jun-11	2	7	2
	Laccophilus maculosus decipiens LeConte	1-Jun-11	1	1	1
	Laccophilus maculosus decipiens LeConte	12-Jun-11	11	2	1
	Neoporus dimidiatus Gemminger & Harold	1-Jun-11	2	6	3
	Neoporus dimidiatus Gemminger & Harold	4-Sep-11	2	1	1
	Rhantus gutticollis (Say)	1-Jun-11	2	1	4
	Rhantus gutticollis (Say)	7-Aug-11	1	7	1
Elmidae	Optioservus sp.	7-Aug-11	1	7	3
	Optioservus sp.	4-Sep-11	1	10	145
	Optioservus castanipennis (Fall)	1-Jun-11	2	2	4
Hydrophilidae	Anacena sp.	6-Aug-11	2	2	4
	Cercyon sp.	31-Jul-10	2	4	1
	Cercyon sp.	16-Aug-10	12	2	1
	Cercyon sp.	12-Jun-10	2	2	1
	Cymbiodyta sp.	7-Aug-11	1	2	4
	Hydrobius fuscipes Linnaeus	1-Jun-11	1	1	1
	Hydrobius fuscipes Linnaeus	4-Sep-11	2	2	6
	Tropisternus sublaevis LeConte	1-Jun-11	2	1	9
	Tropisternus sublaevis LeConte	4-Sep-11	2	2	1
Lampyridae	Pyropyga minuta LeConte	12-Jun-11	11	2	1
	Pyropyga minuta LeConte	6-Aug-11	2	2	4
	Pyropyga minuta LeConte	7-Aug-11	1	2	2
	Pyropyga minuta LeConte	7-Aug-11	2	2	5
Meloidae	Epicauta stuarti LeConte	6-Aug-11	2	2	3
	Epicauta pensylvanica (De Geer)	4-Sep-11	2	2	1

Diptera	Melyridae	Epicauta pensylvanica (De Geer)	5-Sep-11	11	2	2
		Epicauta pensylvanica (De Geer)	2-Oct-11	2	2	1
		Zontis sayi Wickham	6-Jun-09	1	2	5
		Zonitis sayi Wickham	4-Sep-11	2	2	1
		sp.	12-Jun-11	1	2	3
		Collops sp.	12-Jun-11	11	2	1
		Collops sp.	9-Jul-11	2	2	1
		Collops bipunctatus (Say)	6-Aug-11	2	2	3
		Collops bipunctatus (Say)	6-Aug-11	11	2	1
		Collops bipunctatus LeConte	4-Sep-11	2	2	1
		Malachius aeneus (Linnaeus)	1-Jun-11	2	2	1
		Malachius aeneus (Linnaeus)	12-Jun-11	1	2	3
		Malachius aeneus (Linnaeus)	14-Jun-11	2	4	1
	Mordellidae	Trichochrous sp.	7-Aug-11	1	2	4
		Mordella sp.	29-May-10	1	2	1
		Mordellistena sp.	29-May-10	2	2	1
		Mordellistena sp.	2-Jun-10	2	2	1
		Mordellistena sp.	6-Jun-10	11	2	1
		Mordellistena sp.	6-Jun-10	12	2	1
		Mordellistena sp.	28-Jul-10	2	4	1
	Nitidulidae	Mordellistena sp.	12-Jun-11	2	2	5
		Epuraea sp.	1-Jul-09	2	2	1
		Carpophilus sp.	12-Jun-11	1	2	2
	Orsodacnidae	Carpophilus sp.	12-Jun-11	2	2	1
		Orsodacne atra (Ahrens)	29-May-09	2	2	1
		Orsodacne atra (Ahrens)	4-Sep-11	2	2	1
	Phalacridae	Orsodacne atra (Ahrens)	22-Sep-11	2	4	1
		sp.	2-Jun-10	11	2	1
		sp.	5-Sep-10	2	4	1
		sp.	1-Jun-11	11	2	1
		sp.	14-Jun-11	2	4	1
		sp.	6-Aug-11	2	2	1
		sp.	7-Aug-11	1	2	1
		sp.	4-Sep-11	1	2	1
	Scarabaeidae	sp.	2-Oct-11	2	2	1
		Euphoria inda (Linnaeus)	1-Jun-11	2	2	1
	Scaptiidae	Anaspis sp.	6-Aug-11	11	2	1
	Staphylinidae	sp.	7-Aug-11	1	2	1
		sp.	1-Jun-11	2	2	1
		sp.	1-Jun-11	2	2	2
		sp.	12-Jun-11	11	2	1
	Tenebrionidae	sp.	5-Sep-11	2	2	1
		Eleodes carbonaria obsoleta (Say)	5-Sep-11	11	2	2
	*Acroceridae	sp.	29-May-10	11	2	1
		*Ogcodes pallidipennis Loew	14-Jun-11	2	4	1
		Pterodontia misella Osten Sacken	10-Jun-11	11	2	1
	Agromyzidae	sp.	7-Aug-11	11	4	2
	Anthomyiidae	sp.	10-Jul-11	11	4	1
		sp.	7-Aug-11	1	2	1
		sp.	7-Aug-11	2	4	1

sp.	18-Sep-11	2	2	1
sp	19-Sep-11	1	2	1
sp.	14-Jun-11	11	2	1
sp.	7-Aug-11	11	4	14
sp.	6-Aug-11	1	2	1
Acrostilpna sp.	5-Sep-11	2	2	1
Calythea sp.	5-Sep-11	11	2	1
Calythea pratincola (Panzer)	2-Oct-11	2	2	1
Calythea pratincola (Panzer)	14-Jun-11	2	4	1
Calythea pratincola (Panzer)	14-Jun-11	11	2	8
Calythea pratincola (Panzer)	9-Jul-11	1	2	5
Calythea micropteryx Thompson	9-Jul-11	2	2	6
Calythea micropteryx Thompson	6-Aug-11	2	2	9
Calythea micropteryx Thompson	7-Aug-11	1	2	1
Calythea micropteryx Thompson	7-Aug-11	1	4	64
Calythea micropteryx Thompson	7-Aug-11	2	2	5
Calythea micropteryx Thompson	7-Aug-11	2	4	6
Calythea micropteryx Thompson	7-Aug-11	2	4	3
Calythea micropteryx Thompson	12-Jun-11	11	2	3
Calythea micropteryx Thompson	9-Jul-11	2	2	2
Calythea micropteryx Thompson	10-Jul-11	11	2	1
Chelisia elegans Stein	12-Jun-11	1	2	1
Chelisia elegans Stein	9-Jul-11	2	2	2
Chelisia elegans Stein	10-Jul-11	11	2	1
Chelisia elegans Stein	6-Aug-11	1	2	1
Chelisia elegans Stein	4-Sep-11	1	2	1
Circia tinctipennis	22-Sep-10	2	3	1
Coenosopia prima Malloch	6-Aug-11	1	2	3
Crinurina sp.	6-Aug-11	1	2	1
Crinurina sp.	1-Jun-11	1	2	1
Eummesomyia sp.	10-Jul-11	2	2	1
Eummesomyia sp.	2-Oct-11	11	2	3
Eummesomyia sp.	9-Jul-11	2	2	1
Eustalomyia sp.	12-Jul-10	11	2	1
Eustalomyia sp.	14-Jun-11	11	2	1
Eustalomyia sp.	10-Jul-11	1	2	2
Eustalomyia vittipes Zetterstedt	15-Jul-10	2	2	1
Fuscillia sp.	6-Aug-11	1	2	3
Fuscillia sp.	6-Aug-11	11	2	1
Fuscillia sp.	4-Sep-11	1	2	1
Fuscillia sp.	5-Sep-11	11	2	1
Fuscillia sp.	18-Sep-11	2	2	1
Fuscillia sp.	29-May-10	1	2	3
Fuscillia sp.	22-Sep-10	11	4	38
Fuscillia sp.	1-Jun-11	11	2	1
Hydrophoria sp.	1-Jun-11	2	2	2
Hydrophoria sp.	12-Jun-11	1	2	4
Hydrophoria sp.	14-Jun-11	2	2	1
Hydrophoria sp.	14-Jun-11	2	4	20
Hydrophoria sp.	9-Jul-11	1	2	9

Hydrophoria sp.	9-Jul-11	11	2	21
Hydrophoria sp.	10-Jul-11	2	2	7
Hydrophoria sp.	10-Jul-11	2	4	8
Hydrophoria sp.	10-Jul-11	11	2	14
Hydrophoria sp.	31-Jul-11	2	3	1
Hydrophoria sp.	6-Aug-11	1	2	31
Hydrophoria sp.	6-Aug-11	2	2	2
Hydrophoria sp.	6-Aug-11	2	6	3
Hydrophoria sp.	7-Aug-11	1	2	20
Hydrophoria sp.	7-Aug-11	2	2	7
Hydrophoria sp.	7-Aug-11	2	4	10
Hydrophoria sp.	7-Aug-11	11	2	5
Hydrophoria sp.	4-Sep-11	2	4	8
Hydrophoria sp.	5-Sep-11	1	2	1
Hydrophoria sp.	5-Sep-11	2	2	5
Hydrophoria sp.	5-Sep-11	2	4	2
Hydrophoria sp.	18-Sep-11	2	2	2
Hydrophoria sp.	18-Sep-11	11	2	4
Hydrophoria sp.	2-Oct-11	1	2	5
Hydrophoria sp.	2-Oct-11	2	2	2
Hydrophoria sp.	2-Oct-11	2	2	3
Hydrophoria sp.	18-Sep-11	11	2	6
Hydrophoria sp.	6-Aug-11	2	2	1
Hydrophoria sp.	7-Aug-11	11	2	1
Hydrophoria sp.	18-Sep-11	11	4	2
Hydrophoria ambigua Malloch	12-Jun-11	2	6	1
Hydrophoria ambigua Malloch	14-Jun-11	2	2	1
Hydrophoria ambigua Malloch	29-May-10	11	2	1
Hydrophoria ambigua Malloch	14-Jun-11	2	2	1
*Hydrophoria borealis Malloch	9-Jul-11	11	2	2
Hydrophoria flavohaltera Malloch	10-Jul-11	1	2	1
Hydrophoria flavohaltera Malloch	10-Jul-11	11	4	1
Hydrophoria flavohaltera Malloch	6-Aug-11	11	2	1
Hydrophoria flavohaltera Malloch	7-Aug-11	1	2	1
Hydrophoria flavohaltera Malloch	14-Jun-11	2	2	1
Hydrophoria flavohaltera Malloch	7-Aug-11	2	2	2
Hydrophoria flavohaltera Malloch	31-Jul-11	2	2	1
*Hydrophoria frontata (Zetterstedt)	14-Jun-11	2	4	4
*Hydrophoria frontata (Zetterstedt)	12-Jun-11	11	2	1
Hydrophoria subpellucida Malloch	6-Aug-11	11	2	1
Hydrophoria subpellucida Malloch	6-Aug-11	1	2	3
Hydrophoria subpellucida Malloch	7-Aug-11	2	2	2
Hydrophoria subpellucida Malloch	18-Sep-11	1	3	5
Hydrophoria subpellucida Malloch	6-Aug-11	11	2	1
Hydrophoria subpellucida Malloch	7-Aug-11	1	2	11
Hydrophoria subpellucida Malloch	7-Aug-11	1	2	1
Hydrophoria uniformis Malloch	6-Aug-11	11	4	3
Hydrophoria uniformis Malloch	7-Aug-11	11	2	1
Hydrophoria uniformis Malloch	7-Aug-11	1	2	1
Hydrophoria uniformis Malloch	7-Aug-11	11	4	2

	Hydrophoria uniformis Malloch	6-Aug-11	11	4	5
	Hydrophoria uniformis Malloch	14-Jun-11	2	2	5
	Hydrophoria uniformis Malloch	5-Sep-10	2	2	1
	Hydrophoria uniformis Malloch	6-Aug-11	11	2	2
	*Hydrophoria wiezejskii Mik	5-Sep-11	1	2	1
	Hylemyza partita (Meigan)	18-Sep-11	2	2	5
	Hylemyza partita (Meigan)	2-Oct-11	2	2	5
	Hylemyza partita (Meigan)	29-May-10	11	2	1
	Hylemyza partita (Meigan)	1-Jun-11	2	2	1
	Hylemyza partita (Meigan)	2-Oct-11	2	2	1
	Leucophora fusca Hockett	9-Jul-11	1	2	1
	Leucophora fusca Hockett	10-Jul-11	11	2	1
	Paregle sp.	25-Jul-10	11	2	1
	Paregle sp.	12-Jul-10	11	2	1
	Paregle sp.	14-Jun-11	11	2	1
	Pegomya palposa Stein	14-Jun-11	11	2	1
	Pegoplata palposa Stein	6-Aug-11	1	2	3
	Pegoplata palposa Stein	6-Aug-11	2	2	2
	Pegoplata palposa Stein	7-Aug-11	1	2	1
	Pegoplata palposa Stein	7-Aug-11	11	2	2
	Pegoplata palposa Stein	7-Aug-11	11	2	1
	Pegoplata palposa Stein	18-Sep-11	2	2	1
	Pegoplata palposa Stein	14-Jun-11	11	2	1
	Pegoplata palposa Stein	9-Jul-11	2	4	1
	Pegoplata palposa Stein	6-Aug-11	1	2	3
Asilidae	Asilus sp.	6-Aug-11	11	2	2
	Asilus sp.	4-Sep-11	2	2	1
	Asilus sp.	18-Sep-11	2	2	1
	Backomyia limpidipennis Wilcox	9-Jul-11	1	2	3
	Backomyia limpidipennis Wilcox	10-Jul-11	11	4	2
	Backomyia limpidipennis Wilcox	7-Aug-11	1	2	2
	Backomyia limpidipennis Wilcox	7-Aug-11	11	4	2
	Leptogaster alticola Kieffer	9-Jul-11	1	2	3
	Leptogaster alticola Kieffer	9-Jul-11	2	2	1
	Leptogaster alticola Kieffer	4-Sep-11	2	2	1
	Leptogaster alticola Kieffer	5-Sep-11	2	2	1
	Leptogaster arida Cole	12-Jun-11	1	2	2
	Leptogaster arida Cole	12-Jun-11	2	2	1
	Leptogaster arida Cole	10-Jul-11	11	2	1
	Leptogaster arida Cole	4-Sep-11	2	2	1
	Machimus prairiensis Tucker	9-Jul-11	11	2	5
Bibionidae	Bibio sp.	1-Jun-11	2	2	3
	Bibio albipennis Say	12-Jun-11	1	2	6
	Dilophus sp.	4-Sep-11	2	4	7
Bombyliidae	Exprosopa decora Loew	6-Aug-11	2	2	1
	Exprosopa decora Loew	10-Jul-11	2	2	2
	Stoechus sp.	7-Aug-11	2	4	4
	Poecilanthrax alcyon Say	7-Aug-11	11	4	5
	Villa sp.	7-Aug-11	11	4	2
Calliphoridae	Cochliomya hominivorax Fabricius	6-Aug-11	2	2	1

	Lucilia silvarum (Meigan)	9-Jul-11	1	2	1
	Lucilia silvarum (Meigan)	10-Jul-11	11	4	3
	Lucilia silvarum (Meigan)	6-Aug-11	2	2	3
	Lucilia silvarum (Meigan)	7-Aug-11	2	2	1
	Lucilia silvarum (Meigan)	7-Aug-11	2	4	6
	Lucilia silvarum (Meigan)	7-Aug-11	11	2	1
	Phormia regina (Meigan)	10-Jul-11	11	4	9
	Pollenia pediculata Macquart	6-Aug-11	2	2	1
	Pollenia pediculata Macquart	7-Aug-11	2	4	2
	Protophormia terranovae Robineau-Desvoidy	12-Jun-11	2	2	1
	Protophormia terranovae Robineau-Desvoidy	10-Jul-11	11	4	1
	Protophormia terranovae Robineau-Desvoidy	7-Aug-11	11	4	1
Ceratopogonidae	sp.	7-Aug-11	1	2	2
	sp.	9-Jul-11	2	4	2
	sp.	9-Jul-11	1	2	2
	sp.	7-Aug-11	2	2	2
	Atrichopogon fuscus Coquillett	14-Jun-11	11	2	35
	Atrichopogon fuscus Coquillett	9-Jul-11	2	2	3
	Atrichopogon fuscus Coquillett	7-Aug-11	2	4	17
	Culicoides sp.	7-Aug-11	6	2	1
Chironomidae	sp.	1-Jun-11	2	2	3
	sp.	12-Jun-11	11	2	3
	sp.	14-Jun-11	2	4	9
	sp.	9-Jul-11	2	7	1
	sp.	10-Jul-11	2	2	2
	sp.	10-Jul-11	11	4	4
	sp.	7-Aug-11	2	7	1
	sp.	7-Aug-11	1	2	5
	sp.	7-Aug-11	2	4	6
	sp.	4-Sep-11	11	4	14
	sp.	2-Oct-11	2	2	3
	Chironomus sp.	7-Aug-11	2	10	2
Chloropidae	Paraphaenocladus sp.	4-Sep-11	2	10	1
	sp.	14-Jun-11	1	2	3
	sp.	4-Sep-11	2	4	1
	Atropina sp. or near	12-Jun-11	2	2	1
	Chlorops sp.	9-Jul-11	2	2	1
	Chlorops sp.	7-Aug-11	2	2	1
	Chlorops sp.	10-Jul-11	2	4	2
	Chlorops sp.	9-Jul-11	1	2	6
	Meromyza sp.	9-Jul-11	2	2	2
	Meromyza sp.	10-Jul-11	2	2	8
	Meromyza sp.	7-Aug-11	2	4	6
	Meromyza sp.	7-Aug-11	1	2	3
	Meromyza sp.	2-Oct-11	2	2	3
	Meromyza sp.	9-Jul-11	2	2	14
	Meromyza sp.	10-Jul-11	1	2	1
	Meromyza sp.	6-Aug-11	2	4	1

	Oscellia sp.	7-Aug-11	11	2	11
	Oscellia sp.	7-Aug-11	1	2	29
	Oscellia sp.	9-Jul-11	2	2	16
	Oscellia sp.	9-Jul-11	2	4	6
	Oscellia sp.	1-Jun-11	1	2	1
	Pseudopachychaeta sp.	12-Jun-11	2	2	6
	Pseudopachychaeta sp.	14-Jun-11	1	1	1
	Thaumatomyia sp.	9-Jul-11	2	4	1
	Thaumatomyia sp.	10-Jul-11	1	2	2
	Thaumatomyia sp.	10-Jul-11	2	2	1
	Thaumatomyia sp.	10-Jul-11	11	2	1
	Thaumatomyia sp.	7-Aug-11	2	2	3
	Thaumatomyia sp.	2-Oct-11	2	2	1
	Thaumatomyia sp.	2-Oct-11	11	2	1
	Thaumatomyia sp.	7-Aug-11	1	2	32
	Thaumatomyia sp.	7-Aug-11	2	4	1
	Thaumatomyia sp.	2-Oct-11	11	2	23
Conopidae	*Phytocephala texana Williston	7-Aug-11	11	4	1
	Theophora propinqua (Adams)	10-Jul-11	11	4	4
	Theophora propinqua (Adams)	7-Aug-11	11	4	9
	Theophora occidentis (Walker)	10-Jul-11	11	4	2
	Theophora occidentis (Walker)	6-Aug-11	2	4	1
	Theophora occidentis (Walker)	7-Aug-11	2	4	2
	Theophora occidentis (Walker)	7-Aug-11	11	4	2
	Theophora occidentis (Walker)	2-Oct-11	2	2	1
	Zodion fulvifrons Say	10-Jul-11	11	4	6
	Zodion fulvifrons Say	7-Aug-11	2	4	5
	Zodion fulvifrons Say	4-Sep-11	2	2	1
Culicidae	sp.	7-Aug-11	1	2	1
	sp.	14-Jun-11	11	2	4
	Aedes sp.	14-Jun-11	2	4	1
*Diopsidae	*Sphyracephala subbifasciata Fitch	12-Jun-11	2	4	1
	Dixa sp.	14-Jun-11	2	4	3
Dixidae	sp.	14-Jun-11	2	7	1
Dolichopidae	sp.	10-Jul-11	11	2	3
	sp.	2-Oct-11	2	2	8
	sp.	10-Jul-11	2	2	2
	sp.	4-Sep-11	11	4	1
	sp.	25-Jul-10	2	2	1
	Diaphous sp.	5-Sep-11	2	2	1
	Paraclius sp.	12-Sep-11	2	2	2
	Dolichopus sp.	12-Jun-11	2	2	9
	Dolichopus curpinus (Wiedemann)	9-Jul-11	1	2	1
	Hercostomus sp.	9-Jul-11	1	2	1
	Rhapium sp.	6-Aug-11	2	2	1
Empedidae	sp.	7-Aug-11	2	4	1
	sp.	7-Aug-11	1	2	12
	sp.	12-Jun-11	11	4	4
	sp.	14-Jun-11	2	2	3
	sp.	14-Jun-11	11	2	1

Ephydridae	sp.	14-Jun-11	11	2	1
	Athyroglossa sp. or near	15-Jul-10	11	2	1
	Callinapaea sp. or near	2-Oct-11	2	2	2
	Calocoenia sp.	9-Jul-11	2	2	1
	Cirrula sp.	14-Jul-11	2	4	1
	Coenia sp.	14-Jun-11	2	1	1
	Coenia sp.	25-Jul-10	1	2	1
	Coenia sp.	15-Jul-10	12	2	1
	Coenia sp.	10-Jul-11	11	2	1
	Ephydra sp.	3-Oct-11	11	2	6
	Ephydra (Hydropyru) sp.	9-Jul-11	1	2	1
	Mosilius sp.	9-Jul-11	2	2	1
	Mosillus sp.	2-Oct-11	2	2	1
	Mosillus sp. or near	6-Aug-11	2	2	1
	Mosillus sp. or near	7-Aug-11	11	2	5
	Notiphila sp.	6-Aug-11	1	2	1
	Notiphila sp.	12-Jun-11	11	2	12
	Notiphila sp.	7-Aug-11	2	2	1
	Notiphila sp.	10-Jul-11	1	2	4
	Notiphila sp.	18-Jul-11	11	2	11
	Notiphila (Dichaeta) sp.	10-Jul-11	11	4	1
	Notiphila (Dichaeta) sp.	6-Aug-11	11	2	12
	Notiphila (Notiphila) sp.	2-Oct-11	1	2	1
	Notiphila (Notiphila) sp.	6-Aug-11	2	2	19
	Ochthera sp.	7-Aug-11	2	2	6
	Ochthera sp.	7-Aug-11	11	4	1
	Oedenops nuda (Coquette)	7-Aug-11	1	2	2
	Paralimna sp.	7-Aug-11	1	2	1
	Paralimna sp.	2-Oct-11	2	2	2
	Paralimna sp.	6-Aug-11	2	2	2
	Parylimna sp.	7-Aug-11	11	2	1
	Parylimna sp.	5-Sep-11	1	2	2
	Paralimna (Parylimna) sp.	18-Sep-11	2	2	4
	Paralimna (Parylimna) sp.	2-Oct-11	1	2	6
	Paralimna (Parylimna) sp.	2-Oct-11	1	2	1
	Paralimna (Parylimna) sp.	25-Jul-11	2	2	1
	Paralimna (Parylimna) sp.	7-Aug-11	1	2	1
	Parylimna (Parylimna) sp.	5-Sep-11	1	2	1
	Parylimna (Parylimna) sp.	5-Sep-11	2	2	1
	Parydra (Parydra) sp.	2-Oct-11	11	2	2
	Parydra (P.) sp.	6-Aug-11	2	2	45
	Pelina sp.	2-Oct-11	2	2	1
	Pelina sp.	12-Jun-11	2	2	1
	Pelina sp.	9-Jul-11	2	2	1
	Pelina sp.	10-Jul-11	2	2	1
	*Philotelma alaskense Becker	7-Aug-11	11	2	2
	Scatophila sp.	29-Sep-10	2	2	1
	Scatophila sp.	7-Aug-11	1	2	1
	Scatophila sp.	5-Sep-11	2	2	1
	Scatophila sp.	12-Jul-11	1	2	1

	Scatophila sp.	12-Jul-11	2	2	1
	Scatophila sp.	2-Oct-11	2	2	1
	Rhysophora robusta Cresson	2-Oct-11	11	2	1
Heleomyzidae	Heleomyza sp.	10-Jul-11	11	2	4
	Pseudoleria sp.	14-Jun-11	2	4	2
	Pseudoleria sp.	6-Aug-11	2	2	1
	Pseudoleria sp.	7-Aug-11	12	2	1
	Pseudoleria sp.	18-Sep-11	2	2	1
	Pseudoleria sp.	2-Oct-11	2	2	1
	Pseudoleria sp.	12-Jun-11	2	2	5
	Pseudoleria sp.	7-Aug-11	1	2	5
	Pseudoleria sp.	2-Oct-11	1	2	6
Lauxanidae	sp.	15-Jul-11	11	4	1
	sp.	7-Aug-11	11	4	1
Lonchopteridae	Lonchoptera furcata Fallen	12-Jun-11	2	2	2
	Lonchoptera furcata Fallen	9-Jul-11	11	2	7
	Lonchoptera furcata Fallen	2-Oct-11	1	2	2
Micropizidae	Compsobata pallipes (Say)	14-Jun-11	2	2	2
	Compsobata pallipes (Say)	9-Jul-11	2	4	1
	Compsobata pallipes (Say)	10-Jul-11	2	2	3
Milichidae	Madiza glabra Fallen	9-Jul-11	1	2	3
	Madiza glabra Fallen	9-Jul-11	2	2	2
	Madiza glabra Fallen	31-Jul-10	11	2	1
	Madiza glabra Fallen	6-Aug-11	11	4	4
	Madiza glabra Fallen	7-Aug-11	11	2	1
	Madiza glabra Fallen	7-Aug-11	1	2	1
	Madiza glabra Fallen	4-Sep-11	2	2	1
	Madiza glabra Fallen	5-Sep-11	11	2	1
Muscidae	spp.	14-Jun-11	2	2	246
	Caricea erythroceras Robineau-Desvoidy	25-Jul-10	2	2	1
	Caricea erythroceras Robineau-Desvoidy	12-Jun-11	2	4	1
	Caricea erythroceras Robineau-Desvoidy	10-Jul-11	2	2	1
	Caricea erythroceras Robineau-Desvoidy	6-Aug-11	1	2	1
	Caricea erythroceras Robineau-Desvoidy	6-Aug-11	11	4	1
	Caricea erythroceras Robineau-Desvoidy	5-Sep-11	2	4	2
	Haemotobia irritans (Linnaeus)	18-Sep-11	2	2	1
	Helina negropennis (Walker)	8-Aug-09	2	2	1
	Lispe sp.	10-Jul-11	2	2	1
	Lispe sp.	10-Jul-11	11	4	20
	Lispe sp.	12-Jun-11	11	4	6
	Lispe sp.	5-Jun-11	1	2	2
	Stomoxys calcitrans (Linnaeus)	14-Jun-11	1	2	1
	Stomoxys calcitrans (Linnaeus)	10-Jul-11	11	4	12
	Stomoxys calcitrans (Linnaeus)	7-Aug-11	11	4	4
	Stomoxys calcitrans (Linnaeus)	4-Sep-11	2	2	1
	Thricops sp.	10-Jul-11	2	4	1
Mycetophilidae	Diadacidia sp.	2-Jun-10	12	2	1
	sp.	12-Jun-11	1	2	1
	sp.	12-Jun-11	2	2	4
	sp.	14-Jun-11	2	4	1

	sp.	9-Jul-11	1	2	1
	sp.	7-Aug-11	2	4	4
	sp.	2-Oct-11	2	2	1
Phoridae	sp.	14-Jun-11	11	2	1
	sp.	7-Aug-11	11	4	2
	<i>Diploneura funebris</i> (Meigen)	10-Oct-10	2	3	1
	* <i>Megaselia longiseta</i> Wood	6-Jun-10	2	3	2
	* <i>Megaselia</i> n. sp.	10-Oct-10	2	3	1
	* <i>Megaselia</i> n. sp. near <i>folliculorum</i>	19-Jun-09	2	3	2
Pipunculidae	<i>Tomosvaryella</i> sp.	14-Jun-11	2	4	1
	<i>Tomosvaryella</i> sp.	9-Jul-11	2	2	1
	<i>Tomosvaryella</i> sp.	10-Jul-11	11	4	4
	<i>Tomosvaryella</i> sp.	7-Aug-11	2	4	1
	<i>Tomosvaryella</i> sp.	2-Oct-11	2	2	1
*Psilidae	* <i>Loxocera fumipennis</i> Coquillett	7-Aug-11	2	2	1
Ptychopteridae	* <i>Ptychoptera</i> n. sp.	1-Jun-11	11	2	5
	* <i>Ptychoptera</i> n. sp.	12-Jun-11	11	2	4
	* <i>Ptychoptera</i> n. sp.	10-Jul-11	11	4	2
	* <i>Ptychoptera</i> n. sp.	9-Jul-11	1	2	1
	* <i>Ptychoptera</i> n. sp.	7-Aug-11	1	2	3
	* <i>Ptychoptera</i> n. sp.	7-Aug-11	2	4	1
Rhagionidae	<i>Chrysophilus falvibarbis</i> Adams	9-Jul-11	11	2	1
	<i>Chrysophilus falvibarbis</i> Adams	5-Sep-10	2	2	7
	<i>Chrysophilus falvibarbis</i> Adams	12-Jul-10	2	4	1
	<i>Chrysophilus falvibarbis</i> Adams	25-Jul-10	11	2	1
	<i>Chrysophilus falvibarbis</i> Adams	22-Sep-10	1	2	3
Sarcophagidae	sp.	2-Oct-11	1	2	3
	sp.	12-Jun-11	2	2	1
	sp.	2-Oct-11	1	2	2
	<i>Neosarcophaga</i> sp.	7-Aug-11	1	2	1
	<i>Ravinia</i> sp.	10-Jul-11	2	3	1
	<i>Ravinia</i> sp.	12-Jul-11	11	2	5
	<i>Ravinia</i> sp.	25-Jul-11	11	2	1
	<i>Sarcophaga</i> sp. or near	6-Aug-11	2	4	3
	<i>Sarcophaga</i> sp.	10-Jul-11	1	2	27
	<i>Sarcophaga</i> sp.	6-Jun-10	1	2	1
	<i>Sarcophaga</i> sp.	12-Jun-11	1	2	1
	<i>Sarcophaga</i> sp.	7-Aug-11	2	4	2
Scathophagidae	<i>Ceratinostoma</i> cf. <i>ostiorum</i> (Curtis)	7-Aug-11	1	2	1
	<i>Cordillura</i> sp.	12-Jun-11	1	2	1
	<i>Cordillura</i> (<i>Scoliaphieps</i>) cf. <i>ustulata</i> Becker	14-Jun-11	1	2	1
	<i>Scathophaga stercoraria</i> Linnaeus	9-Jul-11	2	4	4
	<i>Scathophaga stercoraria</i> Linnaeus	7-Aug-11	2	4	2
	<i>Scathophaga stercoraria</i> Linnaeus	7-Aug-11	2	2	2
	<i>Scathophaga stercoraria</i> Linnaeus	6-Jun-10	11	4	7
	<i>Stenotania rubiventris</i> (Maquart)	22-Sep-10	1	2	1
Sciaridae	<i>Schwenkfeldina</i> sp.	7-Aug-11	2	4	1
	<i>Schwenkfeldina</i> sp.	12-Jun-11	11	2	23
Sciomyzidae	<i>Dictya</i> sp.	12-Jun-11	1	2	1
	<i>Dictya</i> sp.	12-Jun-11	2	2	3

	Dictya sp.	14-Jun-11	2	4	1
	Dictya sp.	9-Jul-11	1	2	1
	Dictya sp.	18-Sep-11	1	2	1
Sepsidae	sp.	14-Jun-11	2	2	2
	sp.	2-Oct-11	2	2	3
	Saltella sphondylli (Schank)	9-Jul-11	2	2	2
	Saltella sphondylli (Schank)	9-Jul-11	1	2	68
	Saltella sphondylli (Schank)	10-Jul-11	2	2	18
	Saltella sphondylli (Schank)	14-Jun-11	2	4	1
	Saltella sphondylli (Schank)	10-Jul-11	11	2	1
	Saltella sphondylli (Schank)	7-Aug-11	11	4	427
	Saltella sphondylli (Schank)	2-Oct-11	2	2	4
	Sepsidimorpha sp.	7-Aug-11	2	2	2
	Sepsidimorpha sp.	22-Sep-10	1	2	4
	Sepsidimorpha sp.	7-Aug-11	2	4	1
	Sepsidimorpha sp.	7-Aug-11	2	4	7
	Themira sp.	2-Oct-11	2	2	25
Simuliidae	Simulium sp.	7-Aug-11	11	4	6
	Simulium sp.	7-Aug-11	2	4	1
	Simulium piperi Dyar and Shannon	1-Jun-11	1	10	30
Sphaeroceridae	Leptocera sp.	12-Jun-11	2	1	15
Stratiomyidae	sp.	7-Aug-11	2	2	1
	sp.	2-Oct-11	2	2	2
	Anoplodonta nigrirostris Loew	4-Sep-11	2	2	7
	Euparyphus mutabilis Adams	31-Jul-10	2	4	1
	Euparyphus mutabilis Adams	12-Jun-11	2	2	1
	Euparyphus mutabilis Adams	9-Jul-11	2	1	1
	Euparyphus mutabilis Adams	10-Jul-11	11	2	9
	Euparyphus mutabilis Adams	6-Aug-11	1	2	1
	Euparyphus mutabilis Adams	6-Aug-11	2	2	1
	Euparyphus mutabilis Adams	6-Aug-11	11	2	1
	Euparyphus mutabilis Adams	7-Aug-11	1	2	1
	Euparyphus mutabilis Adams	7-Aug-11	2	2	1
	Euparyphus mutabilis Adams	7-Aug-11	2	4	4
	Euparyphus mutabilis Adams	18-Sep-11	2	2	1
	Heterodiscus binotatus (Linnaeus)	6-Aug-11	2	2	1
	Heterodiscus binotatus (Linnaeus)	4-Sep-11	2	2	1
	Nemotelus sp.	31-Jul-10	2	4	1
	Nemotelus sp.	7-Aug-11	11	4	1
	Nemotelus beameri James	6-Aug-11	2	2	1
	Nemotelus beameri James	6-Aug-11	11	2	1
	Sargus cuprarius (Linnaeus)	7-Aug-11	11	4	1
Syrphidae	Zabrachia sp.	12-Jun-11	2	2	1
	sp.	7-Aug-11	2	2	1
	sp.	7-Aug-11	11	4	4
	sp.	7-Aug-11	2	4	7
	sp.	12-Jun-11	11	4	24
	sp.	14-Jun-11	1	2	3
	sp.	14-Jun-11	2	4	1
	sp.	7-Aug-11	11	2	4

<i>Allographa exotica</i> Wiedemann)	9-Sep-09	2	4	1
<i>Copestylum</i> sp.	31-Jul-10	2	4	1
<i>Copestylum caudatum</i> Curran	4-Sep-09	2	2	1
<i>Copestylum caudatum</i> Curran	10-Jul-10	2	3	1
<i>Copestylum caudatum</i> Curran	25-Jul-10	2	3	1
<i>Copestylum caudatum</i> Curran	25-Jul-10	11	2	1
<i>Copestylum caudatum</i> Curran	10-Oct-10	2	3	1
<i>Copestylum caudatum</i> Curran	31-Jul-10	2	4	1
<i>Copestylum fasciata</i> Macquart	12-Jul-10	12	2	1
<i>Copestylum fasciata</i> Macquart	15-Jul-10	11	2	1
<i>Copestylum fasciata</i> Macquart	10-Oct-10	11	2	1
<i>Copestylum satr</i> Osten Sacken	12-Jun-09	2	4	1
<i>Copestylum satr</i> Osten Sacken	1-Jul-09	2	2	1
<i>Copestylum satr</i> Osten Sacken	8-Aug-09	2	4	2
<i>Copestylum vittatum</i> Thompson	8-Aug-09	2	4	1
<i>Eristalis hirta</i> (Loew)	23-Aug-10	2	2	1
<i>Eumerus</i> sp.	11-Jul-09	2	2	1
<i>Eumerus</i> sp.	6-Jun-10	1	2	2
<i>Eumerus</i> sp.	12-Jun-11	1	2	1
<i>Eumerus</i> sp.	12-Jun-11	11	2	9
<i>Eumerus</i> sp.	14-Jun-11	11	2	5
<i>Eumerus</i> sp.	10-Jul-11	11	4	1
<i>Eumerus</i> sp.	6-Aug-11	2	2	1
<i>Eupodes</i> sp.	8-May-09	2	2	1
<i>Eupodes</i> sp.	12-Jun-09	2	3	1
<i>Eupodes</i> sp.	26-Sep-09	2	3	1
<i>Eupodes</i> sp.	27-Jun-09	9	2	1
<i>Eupodes</i> sp.	10-Jul-11	11	4	1
<i>Eupodes</i> sp.	6-Aug-11	2	2	1
<i>Eupeodes</i> sp.	7-Aug-11	11	4	4
<i>Eupeodes volucris</i> Osten Sacken	31-Jul-10	2	4	1
<i>Helophilus latifrons</i> Loew	5-Jun-09	2	2	1
<i>Helophilus latifrons</i> Loew	4-Sep-09	2	2	1
<i>Helophilus latifrons</i> Loew	25-Jul-10	11	2	3
<i>Neoascia metallica</i> (Williston)	27-Jun-09	6	2	1
<i>Neoascia metallica</i> (Williston)	29-May-10	11	2	1
<i>Neoascia metallica</i> (Williston)	12-Jun-11	1	2	2
<i>Neoascia metallica</i> (Williston)	12-Jun-11	2	2	2
<i>Neoascia metallica</i> (Williston)	12-Jun-11	11	2	5
<i>Neoascia metallica</i> (Williston)	14-Jun-11	11	2	7
<i>Neoascia metallica</i> (Williston)	10-Jul-11	11	2	5
<i>Ocyptamus lemur</i> Osten Sacken	1-Aug-11	2	4	3
<i>Ocyptamus lemur</i> Osten Sacken	7-Aug-11	1	2	1
<i>Ocyptamus lemur</i> Osten Sacken	7-Aug-11	2	2	1
<i>Ocyptamus lemur</i> Osten Sacken	7-Aug-11	11	4	1
<i>Orthonevra</i> sp.	5-Jun-09	2	2	3
<i>Orthonevra</i> sp.	26-Jun-09	2	4	1
<i>Orthonevra</i> sp.	6-Jun-10	1	2	1
<i>Orthonevra</i> sp.	1-Jun-11	2	2	1
<i>Orthonevra</i> sp.	12-Jun-11	1	2	1

Orhonevra sp.	12-Jun-11	2	2	1
Orhonevra sp.	12-Jun-11	11	2	1
Orhonevra sp.	10-Jul-11	11	4	1
Orhonevra pictipennis (Loew)	1-Jul-09	2	2	3
Orhonevra robusta (Shannon)	26-Jun-09	2	4	1
Paragus bicolor (Fabricius)	9-Jul-11	2	2	1
Paragus bicolor (Fabricius)	9-Jul-11	11	4	2
Paragus bicolor (Fabricius)	10-Jul-11	11	4	2
Paragus bicolor (Fabricius)	18-Sep-11	2	2	1
Paragus variabilis Volkeroth	9-Jul-11	2	2	1
Paragus (Paragus) sp	5-Jun-11	2	2	2
Paragus (Paragus) sp.	26-Jun-11	2	4	1
Paragus (Paragus) sp.	6-Aug-11	2	2	1
Paragus (Paragus) sp.	7-Aug-11	2	2	1
Phytoptera sp. or near	31-Jul-10	2	4	1
Platychirus sp.	5-Jun-09	2	2	1
Platychirus sp.	5-Jun-09	2	3	1
Platychirus sp.	4-Aug-09	2	2	1
Platychirus sp.	8-Aug-09	2	2	1
Platychirus sp.	6-Jun-10	1	2	1
Platychirus sp.	12-Jul-10	1	2	1
Platychirus sp.	25-Jul-10	1	2	1
Platychirus sp.	6-Aug-11	1	2	1
Platycheirus sp.	6-Aug-11	2	2	3
Platycheirus sp.	7-Aug-11	11	4	1
Platycheirus quadratus (Say)	5-Jun-09	1	2	1
Platycheirus quadratus (Say)	11-Jul-09	2	2	1
Platycheirus quadratus (Say)	8-Aug-09	2	2	1
Platycheirus quadratus (Say)	6-Aug-11	2	2	1
Platycheirus quadratus (Say)	7-Aug-11	1	2	3
Platycheirus immarginatus (Zetterstedt)	25-Jul-10	2	2	1
Platycheirus luteipennis (Curran)	1-Jul-09	2	2	1
Polydontomyia curvipes (Wiedeman)	6-Aug-11	2	2	3
Polydontomyia curvipes (Wiedeman)	6-Aug-11	11	2	1
Sphaerophoria contigua Macquart	18-Jul-09	2	4	1
Sphaerophoria contigua Macquart	23-Jul-09	2	4	1
Sphaerophoria contigua Macquart	4-Aug-09	2	3	1
Sphaerophoria contigua Macquart	7-Aug-11	2	4	3
Sphaerophoria contigua Macquart	7-Aug-11	11	4	2
Syrirta pipiens (Linnaeus)	8-Aug-09	2	2	2
Syrirta pipiens (Linnaeus)	6-Aug-11	11	2	2
Syrirta pipiens (Linnaeus)	4-Sep-11	2	2	1
Syrirta pipiens (Linnaeus)	18-Sep-11	2	2	1
Toxomerus marginalis (Say)	5-Jun-09	2	2	1
Toxomerus marginalis (Say)	8-Aug-09	2	4	2
Toxomerus marginalis (Say)	29-May-10	1	2	1
Toxomerus marginalis (Say)	29-May-10	11	2	1
Toxomerus marginalis (Say)	6-Jun-10	1	2	1
Toxomerus marginalis (Say)	31-Jul-10	2	3	1
Toxomerus marginatus (Say)	9-Jul-11	2	2	2

Tabanidae	Toxomerus marginalis (Say)	6-Aug-11	2	2	3
	Toxomerus marginalis (Say)	7-Aug-11	2	2	3
	Toxomerus marginatus (Say)	7-Aug-11	11	4	7
	Toxomerus marginalis (Sasy)	5-Sep-11	2	2	2
	Chrysops fulgaster Osten Sacken	10-Jul-11	2	4	2
	Chrysops fulgaster Osten Sacken	7-Aug-11	2	4	9
	Chrysops fulgaster Osten Sacken	25-Jul-10	2	4	1
	Hybomitra phaenops (Osten Sacken)	25-Jul-10	1	2	1
	Hybomitra phaenops (Osten Sacken)	25-Jul-10	2	2	1
	sp.	25-Jul-10	1	2	1
Tachinidae	sp.	31-Jul-10	2	4	1
	sp.	4-Sep-10	12	2	1
	sp.	5-Sep-11	2	2	1
	Admontia sp.	12-Jun-11	2	2	1
	Admontia sp.	14-Jun-11	2	4	4
	Admontia sp.	10-Jul-11	11	4	1
	Admontia sp.	7-Aug-11	11	4	2
	Archytas sp.	7-Aug-11	11	4	11
	Arctophyto sp.	6-Jun-10	2	4	1
	Atactopis reinhardi Sabrosky and Arnaud	27-Aug-10	2	3	1
	Carcelia sp.	12-Jun-11	11	2	1
	Carcelia sp.	7-Aug-11	2	4	3
	Ceracia dentata (Coquillett)	7-Aug-11	2	4	1
	Chaetocrania antennalis (Coquiette)	10-Jul-11	11	4	1
	*Coloradomyia eucosmaphaga Arnaud	7-Aug-11	11	4	1
	Copecrypta sp.	26-Sep-09	2	3	1
	Cylindromyia sp.	2-Oct-11	2	2	1
	Deopalpus sp.	12-Jun-09	2	3	1
	Deopalpus sp.	1-Jul-09	2	4	1
	Deopalpus sp.	5-Sep-09	2	4	1
	Deopalpus sp.	26-Sep-09	2	3	1
	Dinera sp.	9-Sep-09	2	3	3
	Dinera sp.	28-Jul-10	2	4	1
	Dinera sp.	31-Jul-10	2	4	1
	Dinera sp.	6-Aug-11	2	2	1
	Dinera sp.	7-Aug-11	11	4	4
	Exorista sp.	10-Jul-11	11	4	1
	Gonia sp.	26-Jun-09	2	4	1
	Gonia sp.	29-May-10	1	2	1
	Gonia sp.	29-May-10	11	2	1
	Gonia sp.	1-Jun-11	2	2	1
	Gymnochaeta occidentalis Townsend	7-Aug-11	11	4	2
	Gymnoclydia sp.	7-Aug-11	11	4	2
	Gymnosoma fulginosa Desvoidy	10-Jul-11	2	2	1
	Hemdra aurata Robineau-Desvoidy	18-Sep-11	1	2	1
	Leskia sp.	19-Jun-09	2	3	1
	Leskia sp.	12-Jun-11	2	2	1
	Leskia sp.	6-Aug-11	2	2	1
	Leskia sp.	5-Sep-11	2	4	1
	Lydina sp.	5-Sep-10	2	3	2

	Microchaetina sp.	14-Jun-11	2	4	2
	Microchaetina sp.	7-Aug-11	11	4	1
	Ochrocera vaginalis Townsend	25-Jul-10	2	2	1
	Paradidyma sp. or near	6-Aug-11	2	2	1
	Peleteria sp.	7-Aug-11	11	4	1
	Phasia sp.	4-Sep-09	2	2	1
	Phasia sp.	5-Sep-10	2	3	2
	Phasia sp.	7-Aug-11	2	4	4
	Phasia sp. near aldrechi (Townsend)	7-Aug-11	11	4	11
	Phytomyptera sp.	10-Jul-11	11	4	1
	Ptilodexia sp.	31-Jul-10	2	4	1
	Tachina sp.	12-Jun-11	11	2	5
	Tachina sp.	10-Jul-11	11	4	1
	Thelaria americana Brooks	9-Sep-09	2	4	1
	*Vanderwulpia sp.	10-Jul-11	11	4	1
	Xanthomelodes sp.	11-Jul-10	2	4	1
Tephritidae	Neaspilota appendulata Freiberg and Mathis	12-Jun-11	11	2	1
	Neaspilota appendulata Freiberg and Mathis	9-Jul-11	1	2	1
	Neaspilota appendulata Freiberg and Mathis	10-Jul-11	11	2	1
	Neaspilota appendulata Freiberg and Mathis	6-Aug-11	1	2	1
	Neaspilota appendulata Freiberg and Mathis	6-Aug-11	2	2	1
	Neaspilota appendulata Freiberg and Mathis	6-Aug-11	11	2	1
	Neaspilota appendulata Freiberg and Mathis	7-Aug-11	1	2	2
	Neaspilota appendulata Freiberg and Mathis	7-Aug-11	2	2	1
	Neaspilota appendulata Freiberg and Mathis	7-Aug-11	2	4	3
	Neaspilota appendulata Freiberg and Mathis	7-Aug-11	11	4	1
	Neaspilota appendulata Freiberg and Mathis	4-Sep-11	2	2	1
	Neaspilota appendulata Freiberg and Mathis	18-Sep-11	2	2	1
	Paracanthus gentilis Hering	9-Jul-11	1	2	1
	Paracantha gentilis Hering	9-Jul-11	11	2	1
	Paracanthus gentilis Hering	4-Sep-11	2	2	2
Therevidae	Rhagoletis sp.	9-Jul-11	2	2	1
	Ozodiceromya sp.	9-Jul-11	1	2	2
	Ozodiceromya sp.	10-Jul-11	11	2	1
	Ozodiceromya sp.	10-Jul-11	11	4	1
	Ozodiceromya sp.	5-Sep-11	11	2	1
Tipulidae	Erioptera sp.	12-Jun-11	1	2	2
	Erioptera sp.	12-Jun-11	11	2	6
	Erioptera sp.	14-Jun-11	2	4	4
	Erioptera sp.	9-Jul-11	2	2	1
	Erioptera sp.	10-Jul-11	11	4	3
	Erioptera sp.	6-Aug-11	1	2	1
	Erioptera sp.	6-Aug-11	2	2	1
	Erioptera sp.	7-Aug-11	2	2	2
	Erioptera sp.	7-Aug-11	2	4	1
	Erioptera sp.	4-Sep-11	1	2	1
	Erioptera sp.	4-Sep-11	2	2	1
	Erioptera sp.	5-Sep-11	11	2	3
	Erioptera sp.	2-Oct-11	11	2	1
	Nephrotoma sp.	5-Sep-11	11	2	1

		Pseudolimnophila sp.	10-Jul-11	4	4	2
		Tipula sp.	9-Jul-11	2	2	2
		Tipula sp.	6-Aug-11	2	2	3
		Tipula sp.	7-Aug-11	2	2	7
		Tipula sp.	7-Aug-11	2	4	2
		Tipula sp.	2-Oct-11	2	2	3
		Chaetopsis sp.	6-Jun-10	1	2	1
	Ulididae	Euxesta notata Weidemann	31-Jul-10	2	4	1
		Euxesta sp.	14-Jun-11	11	4	1
		Euxesta sp.	9-Jul-11	2	4	1
Ephemeroptera	Baetidae	Baetis magnus McCafferty and Waltz	1-Jun-11	1	2	1
		Baetis magnus McCafferty and Waltz	7-Aug-11	2	8	27
		Baetis magnus McCafferty and Waltz	4-Sep-11	1	10	184
		Fallceon quilleri (Dodds)	1-Jun-11	2	8	21
		Fallceon quilleri (Dodds)	12-Jun-11	11	2	1
		Fallceon quilleri (Dodds)	7-Aug-11	1	2	2
		Fallceon quilleri (Dodds)	4-Sep-11	2	2	1
		Fallceon quilleri (Dodds)	18-Sep-11	1	2	2
		Fallceon quilleri (Dodds)	2-Oct-11	1	2	4
		Tricorythodes explicatus (Eaton)	7-Aug-11	2	7	2
Hemiptera	Aphalaridae	Craspedolepta sp.	10-Jul-11	11	4	1
		Craspedolepta sp.	7-Aug-11	1	2	1
		Craspedolepta sp.	5-Sep-11	11	2	1
		Craspedolepta sp.	2-Oct-11	1	2	1
		Livia sp.	1-Jun-11	1	2	1
		Livia sp.	6-Aug-11	11	2	3
		Livia sp.	2-Oct-11	1	2	1
	Aphididae	sp.	12-Jun-11	1	2	3
		sp.	12-Jun-11	2	2	1
		sp.	12-Jun-11	11	2	1
	Berytidae	*Neoneides muticus (Say)	12-Jun-11	11	2	1
	Cercopidae	Clastoptera sp.	7-Aug-11	11	4	1
		Philaenarcys bilineata (Say)	9-Jul-01	1	2	3
		Philaenarcys bilineata (Say)	7-Aug-11	1	2	1
		Philaenarcys bilineata (Say)	7-Aug-11	2	6	21
		Philaenarcys bilineata (Say)	7-Aug-11	11	2	1
		Philaenarcys bilineata (Say)	9-Jul-11	1	2	3
		Philaenarcys bilineata (Say)	7-Aug-11	1	2	6
	Cicadellidae	Balclusa neglecta Delong and Davidson	1-Jun-11	11	2	2
		Balclusa neglecta Delong and Davidson	14-Jun-11	2	2	5
		Balclusa neglecta Delong and Davidson	9-Jul-11	11	2	3
		Balclusa neglecta Delong and Davidson	10-Jul-11	1	2	15
		Balclusa neglecta Delong and Davidson	7-Aug-11	2	4	8
		Balclusa neglecta Delong and Davidson	5-Sep-11	2	2	71
		Balclusa neglecta Delong and Davidson	5-Sep-11	11	2	66
		Cuerna striata (Walker)	6-Aug-11	11	2	1
		Cuerna striata (Walker)	7-Aug-11	11	2	1
		Cuerna striata (Walker)	4-Sep-11	2	2	1
		Cuerna striata (Walker)	18-Sep-11	1	2	1
		Cuerna striata (Walker)	18-Sep-11	2	2	1

	Cuerna striata (Walker)	18-Sep-11	2	6	1
	Cuerna striata (Walker)	2-Oct-11	11	4	2
	Dracunculus noveboracensis (Fitch)	6-Aug-11	2	2	1
	Dracunculus noveboracensis (Fitch)	7-Aug-11	11	4	7
	Dracunculus noveboracensis (Fitch)	4-Sep-11	2	2	1
	Dracunculus noveboracensis (Fitch)	5-Sep-11	11	2	1
	Helochara communis(Fitch)	7-Aug-11	11	4	7
Cixiidae	Oliarius sp.	12-Jun-11	11	2	1
	Oliarius sp.	2-Oct-11	2	2	1
Corixidae	Hesperocorixa laevigata (Uhler)	1-Jun-11	11	2	2
	Hesperocorixa sp.	7-Aug-11	2	1	4
*Cydnidae	*Pangaeus sp.	12-Jun-11	11	2	1
Delphacidae	Pentagramma longistylata Penner	8-Aug-11	2	2	1
Geocoridae	Geocoris sp.	7-Aug-11	11	2	1
	Cymus sp.	1-Jun-11	1	2	1
	Cymus sp.	6-Aug-11	2	2	3
	Cymus sp.	5-Sep-11	2	2	3
	Cymus angustatus Stal	29-May-10	11	2	1
	Cymus angustatus Stal	12-Jun-11	2	2	2
	Cymus angustatus Stal	6-Aug-11	2	2	1
	Cymus lurida Stal	12-Jun-11	2	2	1
	Cymus lurida Stal	6-Aug-11	2	2	2
	Cymus lurida Stal	5-Sep-11	2	2	5
Lygaeidae	Lygaeus kalmii Stål	29-May-10	2	2	2
	Lygaeus kalmii Stål	1-Jun-11	2	2	3
	Lygaeus kalmii Stål	12-Jun-11	2	2	5
	Lygaeus kalmii Stål	2-Oct-11	2	2	1
	Nysius sp.	12-Jun-11	1	2	1
	Nysius sp.	7-Aug-11	1	2	5
	Nysius sp.	7-Aug-11	2	2	1
	Nysius sp.	7-Aug-11	11	4	6
	Nysius sp.	4-Sep-11	2	2	1
	Nysius sp.	5-Sep-11	11	2	2
	Nysius sp.	18-Sep-11	2	2	1
	Phlegyas abbreviatus (Uhler)	7-Aug-11	1	2	1
	Slaterobius insignis (Uhler)	18-Sep-11	11	6	1
	Sphragisticus nebulosus Fallen	12-Jun-11	2	2	1
	Sphragisticus nebulosus Fallen	7-Aug-11	11	4	1
	Sphragisticus nebulosus Fallen	2-Oct-11	2	2	1
Membracidae	sp.	7-Aug-11	2	2	3
	sp.	9-Jul-11	2	2	1
	sp.	7-Aug-11	1	2	11
	Campylenchia latipes (Say)	7-Aug-11	1	2	1
	Publicia modesta (Uhler)	18-Sep-11	2	2	2
	Publicia modesta (Uhler)	2-Oct-11	2	2	1
	Stictocephala sp.	6-Aug-11	2	2	1
	Tortistilus cinermis	4-Sep-11	2	2	2
Miridae	sp.	12-Jun-11	1	2	1
	sp.	12-Jun-11	2	2	6
	sp.	12-Jun-11	11	2	1

	sp.	14-Jun-11	2	4	1
	sp.	9-Jul-11	1	2	2
	sp.	9-Jun-11	2	2	5
	sp.	10-Jul-11	11	2	1
	sp.	6-Aug-11	2	2	2
	sp.	7-Aug-11	1	2	1
	sp.	7-Aug-11	2	2	2
	sp.	4-Sep-11	2	2	1
	sp.	5-Sep-11	2	2	1
	Irbissia sp.	12-Jun-11	11	2	1
	Irbissia sp.	9-Jul-11	1	2	1
	Lygus sp.	8-Sep-11	11	2	1
	Mimoceps insignis Uhler	14-Jun-11	2	4	1
	Mimoceps insignis Uhler	10-Jul-11	11	2	2
	Mimoceps insignis Uhler	4-Sep-11	1	2	2
	Stenodema sp.	12-Jun-11	1	2	4
	Stenodema sp.	12-Jun-11	2	2	2
	Stenodema sp.	9-Jun-11	1	2	4
	Stenodema sp.	9-Jun-11	2	2	1
	Stenodema sp.	10-Jun-11	11	2	5
	Stenodema sp.	6-Aug-11	2	2	3
	Stenodema sp.	7-Aug-11	1	2	4
Nabiidae	*Nabicula nigrovittata nearctica Kerzhner	10-Jul-11	2	2	2
	Nabicula subcoleoprata (Kirby)	9-Jul-11	2	2	2
	Nabis alternatus Parshley	9-Jul-11	1	2	1
	Nabis alternatus Parshley	6-Aug-11	2	2	1
	Nabis alternatus Parshley	7-Aug-11	2	4	1
	Nabis alternatus Parshley	5-Sep-11	2	2	2
	Nabis alternatus Parshley	5-Sep-11	11	2	1
	Nabis alternatus Parshley	2-Oct-11	1	2	1
Pachygranthidae	Phlegyas abbreviatus (Uhler)	7-Aug-11	1	2	1
Pentatomidae	Chinavia hilaris (Say)	4-Sep-11	2	2	1
	Chlorochroa sp.	4-Sep-11	2	2	1
	Eurygaster alternata (Say)	6-Jun-11	1	2	2
	Holcostethus limbolarius (Stal)	5-Sep-11	11	2	1
	Thyanta custator (Fabricius)	4-Sep-11	11	2	1
Psyllidae	Cacopsylla sp.	15-Jul-10	11	4	1
	Cacopsylla sp.	10-Jul-11	11	4	1
	Cacopsylla sp.	6-Aug-11	11	2	1
	Cacopsylla sp.	7-Aug-11	1	2	2
	Cacopsylla maculata (Crawford)	6-Aug-11	2	2	3
	Cacopsylla maculata (Crawford)	6-Aug-11	11	2	2
	Cacopsylla maculata (Crawford)	18-Sep-11	2	6	1
	Cacopsylla ribesiae (Crawford)	12-Jun-11	2	2	1
	Cacopsylla ribesiae (Crawford)	6-Aug-11	2	2	1
	Calcophya trizomina Swartz	6-Aug-11	2	2	5
	Calcophya trizomina Swartz	6-Aug-11	11	2	10
	Calcophya trizomina Swartz	7-Aug-11	1	2	1
	Calcophya trizomina Swartz	18-Sep-11	2	6	1
	Corythucha sp.	1-Jun-11	11	2	1

Hymenoptera	Rhopalidae	Trioza sp.	7-Aug-11	2	6	3
		Trioza sp.	10-Jul-11	1	2	8
		Trioza sp.	2-Oct-11	1	2	1
		Trioza sp.	2-Oct-11	2	4	6
		Aryssus sp.	12-Jun-11	1	2	1
		Aryssus sp.	12-Jun-11	11	2	1
		Aryssus sp.	9-Jul-11	1	2	1
		Aryssus sp.	5-Sep-11	2	2	1
		Boisea trivitattus (Say)	6-Aug-11	2	2	1
		Harmostes reflexulus (Say)	12-Jun-11	11	2	1
	Saldulidae	Harmostes reflexulus (Say)	5-Sep-11	2	2	1
		Saldula pallipes (Fabricius)	7-Aug-11	2	2	2
	Scutelleridae	Saldula pallipes (Fabricius)	10-Jul-11	1	2	1
		Erygaster altenata (Say)	6-Aug-11	11	2	1
		Eurygaster alternatus (Say)	7-Aug-11	2	2	1
		Eurygaster alternatus (Say)	5-Sep-11	1	2	2
	Tingidae	Eurygaster alternatus (Say)	1-Jun-11	11	2	2
		Corythucha arcuata Say	6-Aug-11	2	2	1
	Thyrecoridae	Galgupha sp.	4-Sep-11	2	2	1
	Vellidae	Rhagovelia distincta Uhler	15-Jul-10	2	2	2
Hymenoptera	Andrenidae	Andrena sp.	31-Jul-10	2	2	1
		Andrena sp.	1-Jun-11	2	2	1
		Andrena sp.	16-Aug-10	2	4	1
		*Panurginus sp.	27-Aug-10	12	2	1
		*Pseudopanurgus sp.	25-Jul-10	2	2	1
	Apidae	Bombus griseocollis (DeGeer)	6-Aug-11	2	2	1
		Bombus griseocollis (DeGeer)	7-Aug-11	11	2	2
		Bombus griseocollis (DeGeer)	22-Jul-10	2	2	2
		Bombus huntii Greene	6-Aug-11	11	2	1
		Bombus huntii Greene	18-Sep-11	11	2	1
		Bombus huntii Greene	25-Jun-10	11	2	2
		Bombus nevadensis Cresson	1-Jun-11	2	2	1
		Bombus nevadensis Cresson	6-Aug-11	2	2	1
		Bombus nevadensis Cresson	12-Jul-10	11	2	1
		Bombus pensylvanicus (DeGeer)	6-Aug-11	2	2	1
		Bombus pensylvanicus (DeGeer)	31-Jun-10	2	2	1
		Bombus rufocinctus Cresson	7-Aug-11	2	2	1
		Bombus rufocinctus Cresson	4-Sep-11	11	4	1
		*Diadasia enavata (Cresson)	16-Aug-10	2	2	1
		Melissodes sp.	2-Oct-10	2	2	1
		Melissodes sp.	1-Jun-11	12	2	1
		Melissodes sp.	9-Jul-12	2	3	1
		Melissodes sp.	4-Sep-11	2	2	1
		Melissodes sp.	29-May-10	12	2	1
	Braconidae	Nomada sp.	1-Jun-11	2	2	3
		Nomada sp.	10-Jul-11	12	2	1
		sp.	31-Jul-10	2	2	2
		sp.	8-Aug-09	2	4	8
		Chelomus sp.	8-Aug-09	2	2	1
	Bethylidae	Epyris sp.	7-Aug-11	2	2	1

Chalcididae	sp.	1-Jun-11	2	2	2
	sp.	6-Aug-11	11	4	1
	sp.	7-Aug-11	2	2	1
	sp.	6-Aug-11	2	2	1
Colletidae	Chalcis sp.	21-Jul-10	11	4	1
	Colletes sp.	25-Jul-10	2	2	1
	Colletes sp.	25-Jul-10	2	4	1
	Colletes sp.	28-Jul-10	2	2	2
	Colletes sp.	31-Jul-10	2	4	4
	Colletes sp.	9-Jul-11	2	4	1
	Colletes sp.	2-Oct-11	2	2	3
	Hylaeus sp.	7-Aug-11	2	2	1
	*Hylaeus leptcephalus (Moran)	1-Jun-11	2	2	1
	*Hylaeus mesilla (Cockerell)	28-Jul-10	1	2	1
Formicidae	sp.	1-Jun-11	2	2	1
	sp.	12-Jun-11	1	2	10
	sp.	12-Jun-11	2	2	3
	sp.	12-Jun-11	11	2	5
	sp.	9-Jul-11	1	2	2
	sp.	10-Jul-11	11	2	2
	sp.	6-Aug-11	2	2	7
	sp.	6-Aug-11	11	2	5
	sp.	7-Aug-11	1	2	5
	sp.	7-Aug-11	2	2	8
	sp.	4-Sep-11	2	2	6
	sp.	5-Sep-11	2	2	4
	sp.	5-Sep-11	11	2	6
	sp.	18-Sep-11	1	2	3
	sp.	18-Sep-11	2	2	4
	sp.	2-Oct-11	2	2	4
	Formica sp.	31-Jul-10	2	4	3
	Formica sp.	4-Sep-11	2	4	8
	Formica sp.	6-Aug-11	11	4	1
	Formica sp.	7-Aug-11	1	2	1
	Formica sp.	2-Oct-11	11	2	2
	Formica sp.	1-Jun-11	1	2	7
Halictidae	sp.	9-Jul-11	2	2	1
	sp.	7-Aug-11	2	2	1
	sp.	7-Aug-11	2	2	1
	sp.	27-Jul-10	1	2	3
	Agapostemon sp.	9-Jul-11	11	4	9
	Agapostemon sp.	27-Jul-10	2	2	1
	Agapostemon sp.	28-Jul-10	2	3	2
	Agapostemon sp.	16-Aug-10	2	4	1
	Agapostemon sp.	23-Aug-10	2	4	1
	Agapostemon sp.	10-Oct-10	12	2	3
	Agapostemon sp.	4-Sep-10	2	3	2
	Agapostemon sp.	9-Sep-09	2	3	9
	Halictus sp.	15-Jul-10	2	2	1
	Halictus sp.	25-Jul-10	2	4	1

Halictus sp.	31-Jul-10	2	4	5
Halictus sp.	6-Aug-10	11	2	2
Halictus sp.	1-Jun-11	2	2	2
Halictus sp.	12-Jun-11	2	2	2
Halictus sp.	7-Aug-11	2	2	3
Halictus sp.	15-Jul-10	1	2	1
Halictus confusus Smith	10-Oct-10	11	4	1
Halictus confusus Smith	1-Jun-10	11	2	1
Halictus ligatus Say	25-Jul-10	2	3	13
Halictus ligatus Say	25-Jul-10	1	2	1
Halictus ligatus Say	1-Jun-11	1	2	1
Halictus ligatus Say	15-Jul-10	2	3	2
Halictus tripartitus Cockerell	25-Jul-10	2	2	1
Halictus tripartitus Cockerell	25-Jul-10	11	2	1
Halictus tripartitus Cockerell	28-Jul-10	11	2	1
Halictus tripartitus Cockerell	6-Aug-10	11	3	1
Lasioglossum sp.	6-Aug-10	2	3	1
Lasioglossum sp.	29-May-10	2	4	1
Lasioglossum sp.	2-Jun-10	11	4	1
Lasioglossum sp.	6-Jun-10	2	2	5
Lasioglossum sp.	6-Jun-10	2	2	2
Lasioglossum sp.	12-Jun-10	2	2	1
Lasioglossum sp.	12-Jun-10	12	2	2
Lasioglossum sp.	15-Jun-10	1	2	1
Lasioglossum sp.	25-Jul-10	2	2	4
Lasioglossum sp.	25-Jul-10	11	2	3
Lasioglossum sp.	25-Jul-10	2	2	5
Lasioglossum sp.	25-Jul-10	2	3	5
Lasioglossum sp.	28-Jul-10	11	2	5
Lasioglossum sp.	28-Jul-10	12	2	8
Lasioglossum sp.	16-Aug-10	2	3	2
Lasioglossum sp.	23-Aug-10	2	4	3
Lasioglossum sp.	27-Aug-10	12	2	1
Lasioglossum sp.	31-Jul-10	2	2	1
Lasioglossum sp.	31-Jul-10	2	2	2
Lasioglossum sp.	23-Aug-10	2	3	2
Lasioglossum sp.	10-Oct-10	11	4	4
Lasioglossum sp.	4-Sep-10	11	2	1
Lasioglossum sp.	5-Sep-10	2	3	27
Lasioglossum sp.	22-Sep-10	12	2	1
Lasioglossum sp.	1-Jun-11	2	4	1
Lasioglossum sp.	12-Jun-11	2	3	1
Lasioglossum sp.	12-Jun-11	2	2	2
Lasioglossum sp.	7-Aug-11	1	2	1
Lasioglossum sp.	7-Aug-11	2	2	5
Lasioglossum sp.	7-Aug-11	1	2	2
Lasioglossum sp.	7-Aug-11	2	2	5
Lasioglossum sp.	15-Jul-10	11	2	1
Lasioglossum (Dialictus) sp.	15-Jul-10	11	4	8
Lasioglossum (Dialictus) sp.	15-Jul-10	2	4	3

	Lasioglossum (Dialictus) sp.	25-Jul-10	11	4	1
	Lasioglossum (Dialictus) sp.	31-Jul-10	12	2	1
	Lasioglossum (Dialictus) sp.	31-Jul-10	11	2	1
	Lasioglossum (Dialictus) sp.	6-Aug-10	2	3	1
	Lasioglossum (Dialictus) sp.	18-Sep-10	11	4	1
	Lasioglossum (Dialictus) sp.	31-Jul-10	2	2	7
	Sphecodes sp.	12-Jul-10	2	2	1
	Sphecodes sp.	15-Jul-10	2	2	1
	Sphecodes sp.	15-Jul-10	1	2	1
	Sphecodes sp.	25-Jul-10	2	4	1
	Sphecodes sp.	25-Jul-10	1	2	2
	Sphecodes sp.	25-Jul-10	2	2	3
	Sphecodes sp.	25-Jul-10	2	3	5
	Sphecodes sp.	28-Jul-10	11	4	3
	Sphecodes sp.	28-Jul-10	2	3	1
	Sphecodes sp.	28-Jul-10	2	4	2
	Sphecodes sp.	31-Jul-10	11	2	6
	Sphecodes sp.	7-Aug-11	2	4	3
	Sphecodes sp.	4-Sep-11	2	4	7
	Sphecodes sp.	15-Jul-10	11	4	1
Ichneumonidae	sp.	12-Jun-11	2	4	1
	sp.	14-Jun-11	1	2	2
	sp.	9-Jul-11	2	2	3
	sp.	10-Jul-11	2	4	5
	sp.	7-Aug-11	1	2	8
	sp.	4-Sep-11	2	4	25
	sp.	5-Sep-11	1	2	1
	sp.	18-Sep-11	2	2	1
	sp.	2-Oct-11	2	2	2
	sp.	27-Jun-09	1	2	2
	*Banchus sp.	26-Jun-09	6	2	1
	*Diadegma sp.	1-Jul-09	2	4	1
	sp.	1-Jul-09	2	2	2
	sp.	8-Aug-09	2	4	1
	sp.	11-Jul-09	2	4	1
Megachilidae	sp.	7-Aug-11	2	2	1
	sp.	4-Sep-11	2	4	5
	sp.	2-Oct-11	11	2	6
	sp.	25-Jul-10	2	2	18
	Megachile sp.	25-Jul-10	2	2	1
	Megachile sp.	2-Oct-11	2	2	1
	Megachile sp.	12-Jun-09	11	2	1
Mutillidae	Dasymutilla vesta (Cresson)	4-Sep-09	2	3	1
	Dasymutilla vesta (Cresson)	9-Sep-09	2	3	1
	Dasymutilla vesta (Cresson)	26-Sep-09	2	3	3
	Monomorium minimum (Buckley)	2-Oct-11	2	2	1
	Pseudomethoca frigidus Smith	10-Jun-11	2	3	1
	Timulla subhyalina Mickel	7-Aug-11	1	2	1
	Timulla subhyalina Mickel	7-Aug-11	11	4	1
Pompilidae	Anoplius sp.	14-Jun-11	11	4	1

Lepidoptera		Anoplius sp.	6-Aug-11	11	2	1
		Anoplius sp.	6-Aug-11	2	4	2
		Anoplius sp.	6-Aug-11	2	2	3
		Anoplius marginatus Say	7-Aug-11	11	2	1
		Anoplius marginatus Say	7-Aug-11	2	2	7
		Anoplius marginatus Say	4-Sep-11	11	2	1
		Anoplius marginatus Say	7-Aug-11	11	4	1
		Ceropales brevicornis (Patton)	4-Sep-11	2	2	2
		Ceropales brevicornis (Patton)	31-Jul-10	2	2	1
	*Sapygidae	*Sapyga sp.	10-Jul-11	2	2	1
	Scelionidae	sp.	10-Jul-11	11	4	6
		sp.	31-Jul-10	2	4	1
	Sphecidae	Ammophila azteca Cameron	28-Jul-10	2	4	1
		Ammophila azteca Cameron	4-Sep-11	2	3	1
		Ammophila azteca Cameron	10-Jul-11	2	2	1
		Astata sp.	9-Jul-11	11	2	1
		Bembix sayii Cresson	6-Aug-11	2	2	8
		Cerceris sp.	31-Jul-10	2	4	1
		Ectemnis sp.	7-Aug-11	11	4	1
		Ectemnius spiniferus (Fox)	4-Sep-11	2	2	2
		Lindenius columbianus(Kohl)	4-Sep-11	2	3	1
		Mimesa sp.	31-Jul-10	1	2	1
		Mimesa cressoni (Packard)	25-Jul-10	2	2	2
		Oxybelus sp.	28-Jul-10	2	2	1
		Oxybelus sp.	18-Jun-11	2	3	1
		Solierella sp.	19-Jun-10	2	4	1
	Tenthredinidae	sp.	15-Jul-10	11	4	1
	Tiphiidae	Acanthetropis aequalis (Fox)	25-Jul-10	11	4	1
		Acanthetropis aequalis (Fox)	23-Aug-10	2	3	1
		Acanthetropis aequalis (Fox)	31-Jul-10	2	4	2
		Acanthetropis aequalis (Fox)	18-Sep-11	2	4	1
		Acanthetropis aequalis (Fox)	23-Jul-09	2	2	1
		Brachyistius sp.	7-Aug-11	2	2	6
	Vespidae	sp.	28-Jul-10	1	2	12
		Euodynerus sp.	25-Jun-10	11	4	1
		Polistes fuscatus (Fabricius)	9-Jul-11	2	4	1
	Lasiocampidae	Malcosoma californicum (Packard)	12-Jun-11	2	4	1
	Lycaenidae	Plebejus melissa (Edwards)	9-Jul-10	1	2	1
		Plebejus melissa (Edwards)	10-Jul-11	11	2	6
		Plebejus melissa (Edwards)	7-Aug-11	2	2	1
		Plebejus melissa (Edwards)	7-Aug-11	2	4	8
		Lucania sp.	7-Aug-11	2	4	1
		Lucania sp.	7-Aug-11	2	4	1
	Noctuidae	sp.	25-Aug-11	11	4	3
	Nymphalidae	Cercyonis pegala Fabricius	12-Jun-11	1	2	9
		Coenonympha tullia (Muller)	7-Aug-11	11	2	1
		Phiciodes tharos (Drury)	25-Jul-11	2	2	1
	Pieridae	Colias eurytheme Boisduval	25-Aug-11	2	4	1
		Colias philodice Godart	7-Aug-11	11	2	1
		Pieris rapae (Linnaeus)	7-Aug-11	11	2	1

		Pieris rapae (Linnaeus)	25-Aug-11	2	4	2
		Pieris rapae (Linnaeus)	14-Jun-11	11	4	2
Neuroptera	Chrysopidae	Chrysopa nigricornis Burmeister	9-Jul-11	11	2	1
		Chrysopa nigricornis Burmeister	7-Aug-11	2	4	4
	Hemerobiidae	*Sympherobius perparvus (McLachlan)	7-Aug-11	1	2	1
		sp.	9-Jul-11	2	4	3
Odonata	Coenagrionidae	Amphiagrion abbreviatum Selys	12-Jul-11	2	4	1
		Amphiagrion abbreviatum Selys	6-Aug-11	2	2	8
		Amphiagrion abbreviatum Selys	9-Jul-11	2	2	39
		Enallagma anna Willianson	11-Jul-09	2	2	6
		Ischnura perparva McLachlan and Selys	9-Jul-11	2	2	30
		Ischnura perparva McLachlan and Selys	8-Aug-09	1	2	5
		Ischnura verticalis Say	4-Sep-09	2	2	1
		Ischnura verticalis Say	6-Aug-11	2	2	1
	Libellulidae	Sympetrum semicinctum (Say)	18-Sep-11	11	2	2
		Sympetrum semicinctum (Say)	21-Aug-09	2	2	1
	Lestidae	Lestes disjunctus Selys	4-Sep-11	2	2	2
Orthoptera	Acrididae	Ageneotettix decorum (Scudder)	4-Sep-11	1	2	1
		Camnula pellucida (Scudder)	4-Sep-11	2	2	3
		Chordillacris crenulata (Bruner)	4-Sep-11	2	2	2
		Chorthippus curtipennis (Harris)	4-Sep-11	2	2	1
		Dissosteira carolina (Linnaeus)	4-Sep-11	2	2	1
		Encoptolophus costalis (Scudder)	4-Sep-11	2	2	8
		Hesperotettix viridis (Thomas)	4-Sep-11	2	2	2
		Melanoplus agustipennis (Dodge)	4-Sep-11	2	2	4
		Melanoplus infantilis Scudder	4-Sep-11	2	2	5
		Opeia obscura (Thomas)	4-Sep-11	2	2	4
		Paropomala wyomingensis (Thomas)	4-Sep-11	2	2	7
		Spharagemon equale (Say)	4-Sep-11	2	2	4
		Trachyrhachys aspera Scudder	1-Jun-11	2	2	1
Plecoptera	Perlodidae	*Isoperla quinquepunctata complex	1-Jun-11	2	8	8
Trichoptera	Hydropsychidae	Cheumatopsyche sp.	1-Jun-11	2	6	5
		*Cheumatopsyche campyla Ross	7-Aug-11	2	2	2
	Limnephilidae	Anabolia bimaculatus (Walker)	4-Sep-11	2	2	1
		*Anabolia consocius (Walker)	1-Jun-11	1	2	6
		*Clistronia maculata (Banks)	1-Jun-11	2	2	3
		Hesperophylax occidentalis (Banks)	1-Jun-11	1	2	9
		Hesperophylax sp.	14-Jun-11	2	7	2
		Hesperophylax sp.	14-Jun-11	1	6	3
		Hesperophylax sp.	10-Jul-11	2	6	10
		Hesperophylax sp.	7-Aug-11	1	6	5
		Hesperophylax sp.	7-Aug-11	1	6	17
		Hesperophylax sp.	4-Sep-11	2	6	1
		Hesperophylax sp.	4-Sep-11	1	10	41
		Hesperophylax sp.	4-Sep-11	2	2	4
		Hesperophylax sp.	1-Jun-11	2	6	1
		*Limnephilus acnestus Ross	4-Sep-11	2	2	2
		Limnephilus spinatus Banks	7-Aug-11	2	4	1
Thysanoptera	Phlaeothripidae	Hapothrips sp.	7-Aug-11	2	2	2

Appendix 2. Insect Species List Soapstone Prairie Natural Area, Larimer Co., Colorado, 2009 -2011.

Order	Family	Scientific Name	Author
Coleoptera	Anobiidae	sp.	
		Ptinus sp.	
	Anthicidae	sp.	
		Anthicus sp.	
		Notoxus sp.	
	Anthribidae	Trigonorhinus sticticus	(Boheman)
	*Apionidae	sp.	
		*Apion sp.	
		*Apion punctinasum	Smith
		*Apion wickhami	Kissinger
	Brachypteridae	Brachypterolus pulicarius	(Linnaeus)
	Buprestidae	sp.	
		Agrilus cyanescens	(Ratzeburg)
		Taphrocercus chevrolati	Obenberger
		Taphrocercus schaefferi	Nicolay and Weiss
	*Byrrhidae	*Byrrhus eximius	LeConte
		*Cytillus alternatus	(Say)
	Cantharidae	sp.	
		Cantharis sp.	
		Chauliognathus basalis	(LeConte)
		Podabrus sp.	
	Carabidae	sp.	
		Agonum sp.	
		Agonum extensicollis	Say
		Agonum placidum	Say
		Amara sp.	
		Amara capinata	LeConte
		Amara confusa	LeConte
		Amara convexa	LeConte
		Amara cupreolata	Putzeys
		Amara quenseli	Schönherr
		Amara rubica	Haldeman
		Axinopalpus sp.	
		Bembidion sp.	

	<i>Bembidion carinata</i>	(Leconte)
	<i>Bembidion impotens</i>	Casey
	<i>Bembidion quadrimaculata</i>	Linnaeus
	<i>Bembidion rapidum</i>	(LeConte)
	<i>Bembidion rupicola</i>	(Kirby)
	<i>Bradycellus congener</i>	LeConte
	<i>Cratacanthus dubius</i>	(Beauvois)
	<i>Chlaenius</i> sp.	
	<i>Chlaenius nebraskensis</i>	LeConte
	<i>Chlaenius sericeus</i>	Foster
	<i>Clivina impressifrons</i>	LeConte
	<i>Cratacanthus dubius</i>	(Beauvois)
	<i>Cymindis planipennis</i>	LeConte
	<i>Euryderus grossa</i>	(Say)
	<i>Discoderus parallelus</i>	LeConte
	<i>Harpalus</i> sp.	
	<i>Harpalus amputatus</i>	(Say)
	<i>Harpalus compar</i>	LeConte
	<i>Harpalus desertus</i>	De Jean
	<i>Lebia viridis</i>	Say
	<i>Microlestes linearis</i>	(LeConte)
	<i>Pasimachus elongatus</i>	LeConte
	<i>Piosoma setosum</i>	(Fabricius)
	<i>Platynus extensicollis</i>	(Say)
	<i>Poecilus scitulus</i>	LeConte
	<i>Stenolophus comma</i>	(Fabricius)
	<i>Stenolophus conjunctus</i>	Say
	<i>Tachys anceps</i>	LeConte
Cerambycidae	<i>Crossidius discoideus</i>	(Say)
	<i>Prionus emarginatus</i>	Say
	<i>Moneilema annulata</i>	
	<i>Tetraopes annulatus</i>	LeConte
Chrysomelidae	sp.	
	<i>Acanthoscelides</i> sp.	
	<i>Altica</i> sp.	
	<i>Brachypnoea leonti</i>	LeConte
	<i>Chaetocnema opulenta</i>	Horn
	<i>Chaetocnema subviridis</i>	LeConte
	<i>Chrysolina flavomarginata</i>	(Say)
	<i>Coleothorpa dominicana franciscana</i>	(LeConte)
	<i>Coleothorpa</i> v. <i>vittigera</i>	(Say)
	<i>Cryptocephalus</i> c. <i>confluentus</i>	Say
	<i>Cryptocephalus notatus</i>	Barber
	<i>Diabrotica undecimpunctata howardi</i>	Barber

	<i>Diabrotica v. virgifera</i>	LeConte
	<i>Dibolia borealis</i>	Blake
	<i>Disonycha alternata</i>	Illiger
	<i>Disonycha triangularis</i>	(Say)
	<i>Epitrix</i> sp.	
	<i>Exema</i> sp.	
	<i>Exochomus aethiops</i>	(Bland)
	<i>Gastrophysa cyanea</i>	Horn
	<i>Glyptina</i> sp.	
	<i>Glyptina atriventris</i>	Horn
	<i>Longitarsus</i> sp.	
	<i>Monoxia</i> sp.	
	<i>Ophraella americana</i>	(Fabricius)
	<i>Ophraella bilineata</i>	Kirby
	<i>Neochlamisus</i> sp.	(Say)
	<i>Pachybrachis</i> sp.	
	<i>Pachybrachis h. hepatica</i>	Melscheimer
	<i>Phylliodes</i> sp.	
	<i>Phyllotrea</i> sp.	
	<i>Phyllotrea conjuncta</i>	Gentner
	<i>Phyllotreta armipes</i>	(Koch)
	<i>Physonota unipunctata</i>	(Schaeffer)
	<i>Plateumaris robusta</i>	(Schaeffer)
	<i>Trirhabda nitidicollis</i>	LeConte
	<i>Zygogramma conjuncta</i>	(Rogers)
	<i>Zygogramma heterothecae</i>	Linell
Cicindelidae	<i>Cicindela punctulata</i>	Olivier
	<i>Cicindela purpurea audubonii</i>	LeConte
Cleridae	<i>Enoclerus cordifer</i>	LeConte
	<i>Phyllobaenus</i> sp.	
Coccinellidae	sp.	
	<i>Anatis lecontei</i>	Casey
	<i>Anisosticta bitriangularis</i>	Say
	<i>Brachiacantha</i> sp.	
	<i>Brachiacantha decora</i>	Casey
	<i>Brachiacantha tau</i>	LeConte
	<i>Coccidula lepida</i>	LeConte
	<i>Coccinella novemnotata</i>	Herbst
	<i>Coccinella</i> (C.) <i>septempunctata</i>	Linnaeus
	<i>Coccinella transversoguttata</i>	Falderman
	<i>Coccinella richardsoni</i>	Brown
	<i>Coleomegilla maculata</i>	(DeGeer)
	<i>Hippodamia apicalis</i>	Casey
	<i>Hippodamia convergens</i>	Guerin-Meneville

	<i>Hippodamia expurgata</i>	Casey
	<i>Hippodamia parenthesis</i>	(Say)
	<i>Hippodamia sinuata crotochi</i>	Casey
	<i>Hyperaspidius</i> sp.	
	<i>Hyperaspidius minus</i>	Casey
	<i>Mulsantina</i> (c.) <i>picta</i>	(Randall)
	<i>Multitina picta</i>	(Randall)
	<i>Scymus</i> sp	
Curculionidae	sp.	
	<i>Anthonomus</i> sp.	
	<i>Anthonomus sphaeralciae</i>	Fall
	<i>Anthonomus squamosus</i>	LeConte
	<i>Calandrinus obsoletus</i>	Casey
	<i>Ceutorhynchus</i> sp.	
	<i>Ceutorhynchus americanus</i>	Buchanan
	<i>Dorytomus</i> sp.	
	<i>Dyslobus luteus</i>	(Horn)
	<i>Epimechus</i> sp.	
	<i>Gerstaeckeria basalis</i>	(LeConte)
	<i>Hylurgops pinifex</i>	(Finch)
	<i>Hylurgops porosus</i>	(LeConte)
	<i>Hypera postica</i>	(Gyllenhal)
	<i>Larinus plannus</i>	(Fabricius)
	<i>Listronotus grypidioides</i>	(Dietz)
	<i>Notiodes</i> sp.	
	<i>Orchestes alni</i>	(Linnaeus)
	<i>Pityogenes</i> sp.	
	<i>Pityogenes knechteli</i>	Swaine
	<i>Rhinocyllus conicus</i>	(Froelich)
	<i>Rhinusa tetrum</i>	(Fabricius)
	<i>Scaphomorphus trivittatus</i>	(Say)
	<i>Scolytus schevyrewi</i>	Semenov
	<i>Sitona cylindricollus</i>	(Fabricius)
	<i>Sphenophorus cicatristriatus</i>	Fahraeus
	<i>Tachypterellus</i> sp.	
	<i>Tychius</i> sp.	
	<i>Tychius lineellus</i>	LeConte
	<i>Tychius stephensi</i>	Schönherr
Dermestidae	<i>Dermestes caninus</i>	Germar
	<i>Dermestes fasciatus</i>	LeConte
	<i>Orphilus</i> sp.	
	<i>Trogoderma variabilis</i>	Ballion
Dryopidae	<i>Helichus striatus</i>	LeConte

Dytiscidae	Agabus sp.	
	Agabus affinis	Paykull
	Agabus ambiguus	Say
	Agabus disintegratus	(Crotch)
	Agabus griseipennis	LeConte
	Agabus semivittatus	LeConte
	Agabus seriatus	Say
	Colymbetes extaratus incognitus	Zimmerman
	Coptotomus l. longulus	LeConte
	Hydroporus notabilis	LeConte
	Hygrotus impressopunctatus	(Schaller)
	Hygrotus marklini	(Gyllenthal)
	Hygrotus nubilus	(LeConte)
	Hygrotus patruelis	(LeConte)
	Ilybius biguttulus	(Germar)
	Laccophilus maculosus decipiens	LeConte
	*Liodessus abjectus	(Sharp)
	Liodessus obscurellus	(LeConte)
	Neoporus dimidiatus	(Gemminger and Harold)
	Neoporus obscurellus	(LeConte)
	Rhantus binotatus	Harris
	Rhantus gutticollis	(Say)
	Stictotarsus striatellus	(LeConte)
Elateridae	Aeolus sp.	
	Ampedus sp.	
	Ctenicera sp.	
	Dalopius sp.	
	Hadromorphus sp.	
	Hadromorphus glaucus	(Germar)
	*Paradonus pectoralis	(Say)
Elmidae	Optioservus sp.	
	Optioservus castanipennis	(Fall)
	Optioservus divergens	(LeConte)
Halipidae	Haliplus sp.	
	Haliplus deceptus	Matheson
	Haliplus fulvus	(Fabricius)
	Haliplus immaculicollis	Harris
	Peltodytes callosus	(LeConte)
Heteroceridae	Neoheterocerus gnathos	LeConte
*Histeridae	*Xerosaprinus sp.	

Hydrophilidae	Anacaena sp.	
	Berosus fraternus	LeConte
	Berosus stylifer	Horn
	Cercyon sp.	
	Cymbiodyta sp.	
	Cymbiodyta b. beckeri	Smetana
	Enochrus hamiltoni	(Horn)
	Helophorus sp.	
	Helophorus orientalis	Motschulsky
	*Helophorus robertsi	Smetana
	Hydrobius fucipes	(Linnaeus)
	Laccobius sp.	
	Laccobius agilis	Randall
	*Laccobius mexicanus	Orchymont
	Sphaeridium scarabaeoides	(Linnaeus)
	Tropisternus affinis	Motschusky
	Tropisternus columbianus	Brown
	Tropisternus ellipticus	LeConte
	Tropisternus lateralis limbalis	(LeConte)
	Tropisternus lateralis nimbatus	(Say)
	Tropisternus sublaevis	(LeConte)
Lampyridae	Ellychina corrusca complex	
	*Photinus sp.	
	Pyropyga minuta	LeConte
Latridiidae	sp.	
Meloidae	Epicauta sp.	
	Epicauta ferruginea	(Say)
	Epicauta pensylvanica	DeGeer
	Epicauta sericans	LeConte
	Epicauta stuarti	Leconte
	Lytta viridana	LeConte
	Nemognatha lurida	LeConte
	Pyrota insulata	(LeConte)
	Zontis sayi	Wickham
Melyridae	sp.	
	Amecocerus sp.	
	Amecoscercus coloradensis	Blaisdell
	Amecoscercus senilis	LeConte
	Collops sp.	
	Collops bipunctatus	(Say)
	Collops viridis	LeConte
	Cradytes serricollis	(LeConte)

	Malachius aeneus	(Linnaeus)
Mordellidae	sp. Mordella sp. Mordellistena sp.	
Nitidulidae	Carpophilus sp. Epuraea sp. Meligethes sp. Nitidula sp.	
Orsodacnidae	Orsodachne atra	(Ahrens)
Phalacritidae	sp.	
Ptilinidae	Ptenidium sp.	
Pyrrochroidae	Pedilus lewisii	Horn
Scarabaeidae	sp. Aphodius sp. Copris minutus Diplotaxis haydeni Euphoria inda Phyllophaga crassissima Rhyssalus sonatus	(Drury) LeConte (Linnaeus) (Blanchard) LeConte and Horn
Scaptidae	sp. Anaspis sp. Anaspis rufa	Say
Silphidae	Aclypea bituberosa Heterosilpha ramosa Nicrophorus guttula Nicrophorus marginatus Nicrophorus obscurus Thanatophilus lapponicus Thanatophilus sagax	(LeConte) (Say) Motschulsky Fabricius Kirby (Herbst) (Mannerheim)
Staphylinidae	sp.	
Tenebrionidae	Blapstinus substriatus Bothrotes plumbeus Eleodes carbonaria obsoleta Eleodes extricata Eleodes hispilabris Eleodes longicollis	Champion LeConte (Say) (Say) (Say) LeConte

		Eleodes obscura	Say
		Embaphion contusum LeConte	LeConte
		Embaphion fusiformis	Casey
		Eusattus convexus	(LeConte)
	Zopheridae	Glyptasida sordidus	(LeConte)
Collembola	Entomobryiidae	sp.	
	Sminthuridae	sp.	
Dermaptera	Forficulidae	Forficula auricularia	Linnaeus
Diptera	*Acroceridae	sp.	
		*Acrocera sp.	
		Ogcodes sp.	
		*Ogcodes pallidipennis	(Loew)
		Pterodontia missela	Osten Sacken
	Agromyzidae	sp.	
		Liriomyza sp.	
	Anthomyiidae	sp.	
		spp.	
		Acrostilpna sp.	
		Calythea sp.	
		Calythea pratincta	(Panzer)
		Calythea micropteryx	Thompson
		Chelisia elegans	Stein
		Circia tinctipennis	Malloch
		Coenosopia prima	Malloch
		Crinurina sp.	
		Eummesomyia sp.	
		Eustalomyia sp.	
		Eustalomyia vittipes	Zetterstedt
		Fuscillia sp.	
		Hydrophoria sp.	
		Hydrophoria ambigua	Malloch
		*Hydrophoria borealis	Malloch
		Hydrophoria flavohaltera	Malloch
		*Hydrophoria frontata	(Zetterstedt)
		Hydrophoria subpellucida	Malloch
		Hydrophoria uniformis	Malloch
		*Hydrophoria wiezejskii	Mik
		Hylemyza partita	(Meigan)
		Leucophora fusca	Huckett
		Paregle sp.	
		Pegomya palposa	Stein

Asilidae	Asilus sp.	
	Backomyia limpidipennis	Wilcox
	Dicropaltum pawneeae	Martin
	Efferia sp.	
	Efferia staminea	(Williston)
	Holopogon atripennis	Back
	Holopogon seniculus	Loew
	Leptogaster alticola	Kieffer
	Leptogaster aridus	Cole
	Machimus sp.	
	Machimus prairensis	(Tucker)
	Scleropogon picticornis	(Loew)
Athericidae	Atherix pachypus	Bigot
Bibionidae	Bibio sp.	
	Bibio albipennis	Say
	Bibio xanthopus	Wiedemann
	Dilophus sp.	
Bombyliidae	Bombylius sp.	
	Exprosopa dorcadion	Osten Sacken
	Exprosopa decora	Loew
	Geron argutus	Painter
	Hemipenthes jaennickeana	Osten Sacken
	Phthiria sp.	
	Poecilanthrax alcyon	Say
	Poecilognathus scolopax	Osten Sacken
	Stoechus sp.	
	Toxophora sp.	
	Villa sp.	
Calliphoridae	Calliphora vicina	(Robineau-Desvoidy)
	Cochliomya hominivorax	Fabricius
	Lucilia silvarum	(Meigen)
	Phormia regina	(Meigen)
	Pollenia pediculata	Macquart
	Protophormia terraenovae	(Robineau-Desvoidy)
Cecidomyiidae	sp.	
Ceratopogonidae	sp.	
	*Atrichopogon fuscus	Coquillett
	Culicoides sp.	
	*Culicoides cockerellii	Coquillett
	*Dasyhelea sp.	
	*Forcipomyia sp.	

Chamaemyiidae	sp.	
Chironomidae	sp. spp. Apedilum sp. Chironomus sp. Cricotopus sp. Diamesa sp. Dicrotendipes sp. Eukiefferiella sp. Micropsecta sp. Odontomesa sp. Orthocladius sp. Paracladius sp. Parametriacnemus sp. Paraphaenocladius sp. Psectrocladius sp. Psectrotanypus sp. Pseudochironomus sp. Rhadotanytus sp.	
Chloropidae	sp. Atropina sp. or near Chlorops sp. Meromyza sp. Meromyza americana Oscinella sp. Pseudopachychaeta sp. Thaumatomyia sp.	Fitch
Conopidae	Physocephala sp. *Physocephala texana Thecophora sp. Thecophora nigripes Thecophora occidentalis Thecophora propinqua Zodion cinereiventris Zodion fulvifrons	(Williston) (Camras) (Walker) (Adams) Van Duzee Say
Culicidae	sp. Aedes sp. Aedes dorsalis Aedes increpitus Aedes nigromaculis Culiseta sp. Culiseta impatiens Culiseta inornata	(Meigen) Dyar (Ludlow) (Walker) (Williston)

	Culiseta morsitans	(Theobald)
*Diopsidae	*Sphyracephala subbifasciata	Fitch
Dixidae	sp. Dixa sp. Dixella sp.	
Dolichopodidae	sp. Chrysotus leucostoma Diaphous sp. Dolichopus sp. Dolichopus bifractus Dolichopus cuprinus Dolichopus obcordatus Dolichopus palustris Dolichopus plumipes Dolichopus ramifer Hercostomus sp. *Hydrophorus sp. Medetera sp. Medetera veles Paraclius sp. Pelastoneurus vagans Rhapium sp. Rhapium near but not exile Rhapium effilatum Scellus exustus Scellus monstrosus Scutellus sp. Syntormon clavatum	(Loew) Loew Wiedemann Aldrich Melander and Brues Scolopi Loew Loew Loew Curran Wheeler (Walker) Osten-Sacken Van Duzee
Empedidae	sp. Platypalpus sp.	
Ephydriidae	sp. Athroglossa sp. or near Callinapaea sp. or near Calocoenia sp. Coenia sp. Ephydra sp. Ephydra (Hydropyrus) sp. Mosilius sp. Mosillus sp. or near Notiphila sp. Notiphila (Dichaeta) sp. Notiphila (Notiphila) sp. Ochthera sp.	

	Oedenops nuda	(Coquette)
	Paralimna sp.	
	Paralimna (Parylimna) sp.	
	Parydra (Parydra) sp.	
	Parydra (P.) sp.	
	Pelina sp.	
	*Philotelma alaskense	Becker
	Scatophila sp.	
Heleomyzidae	Heleomyza sp.	
	Pseudoleria sp.	
	Trixoscelis fumipennis	Melander
*Hippoboscidae	*Lipoptena depressa	(Say)
Lauxanidae	sp.	
	Camproprosopella sp.	
Lonchopteridae	Lonchoptera sp.	
	Lonchoptera furcata	Fallen
Micropezidae	Compsobata pallipes	(Say)
	Micropezia sp.	
	Micropezia turcana	Townsend
Milichiidae	sp.	
	Madiza glabra	Fallen
Muscidae	spp.	
	Caricea erythrocer	Robineau-Desvoidy
	Coenosia sp.	
	Haemotobia irritans	(Linnaeus)
	Helina negropennis	(Walker)
	Lispe sp.	
	Musca sp.	
	Stomoxys calcitrans	(Linnaeus)
	Thricops sp	
Mycetophilidae	sp.	
	Diadacidia sp.	
Phoridae	sp.	
	Diplonerva funebris	(Meigen)
	*Megaselia longiseta	Wood
	*Megaselia n. sp. 1 near folliculorum	
	*Megaselia n. sp. 2	
Pipunculidae	Tomosvaryella sp.	

*Psilidae	*Loxocera fumipennis	Coquillett
Ptychopteridae	*Ptychoptera n. sp. Ptychoptera lentis	Osten Sacken
Rhagionidae	Chrysophilus flavibarbis Chrysophilus flavifrons Chrysophilus testaceipes	Adams Marquart Bigot
Sarcophagidae	sp. Neosarcophaga sp. Ravinia sp. Sarcofahrtiopsis sp. or near Sarcophaga sp.	
Scathophagidae	sp. Ceratinostoma cf. ostiorum Cordillura sp. Cordilura (Pseudacicephala) pilocella Cordillura (Scoliaphieps) cf. ustulata Scathophaga sp. Scathophaga stercoraria Stenotania rubiventris	(Curtis) Malloch Becker (Linnaeus) (Maquart)
Sciaridae	Bradysia sp. Lycoriella sp. *Schwenkfeldina sp.	
Sciomyzidae	sp. Dictya sp. Dictya texensis Eurygaster alternata Limnia ottawensis Sepedon sp. Sepedon armipes Tetanocera sp. Tetanocera ferruginea Tetanocera plebeja	Curran (Say) Melandner Loew Fallen Loew
Sepsidae	sp. Saltella sphondylli Sepsis sp. Sepsidimorpha sp. Themira sp.	(Schank)
Simuliidae	sp. Prosimulium fulvum Simulium sp.	(Coquillett)

	<i>Simulium decorum</i>	Walker
	<i>Simulium piperi</i>	Dyar and Shannon
Sphaeroceridae	<i>Leptocera</i> sp.	
Stratiomyidae	sp.	
	<i>Anoplodonta nigrirostris</i> Loew	
	<i>Euparyphus cictus</i>	(Osten Sacken)
	<i>Euparyphus mutabilis</i>	Adams
	<i>Hedriodiscus binotatus</i>	Loew
	<i>Microchrysa polita</i>	Linnaeus
	<i>Nemotelus</i> sp.	
	<i>Nemotelus beameri</i>	James
	<i>Nemotelus nigriventris</i>	Loew
	<i>Ocyptamus lemur</i>	Osten Sacken
	<i>Odontomyia</i> sp.	
	<i>Odontomyia cincta</i> Oliver	
	<i>Sargus cuprarius</i>	(Linnaeus)
	<i>Stratiomys barbata</i>	Loew
	<i>Stratiomys normuba</i>	Loew
	<i>Zabrachia</i> sp.	
Synnuridae	<i>Synneura decepiens</i>	Hutson
Syrphidae	sp.	
	<i>Allographa exotica</i>	(Wiedemann)
	<i>Cheilosia</i> sp.	
	<i>Copestylum</i> sp.	
	<i>Copestylum caudatum</i>	Curran
	<i>Copestylum fasciata</i>	Maquart
	<i>Copestylum lentum</i>	Williston
	<i>Copestylum marginatum</i>	(Say)
	<i>Copestylum satr</i>	Osten Sacken
	<i>Copestylum vittatum</i>	Thompson
	<i>Eristalis hirtus</i>	Loew
	<i>Eumerus</i> sp.	
	<i>Eupeodes</i> sp.	
	<i>Eupeodes volucris</i>	Osten Sacken
	<i>Helophilus</i> sp.	
	<i>Helophilus latifrons</i>	Loew
	<i>Neoascia metallica</i>	(Williston)
	<i>Ocyptamus lemur</i>	Osten Sacken
	<i>Orthonevra</i> sp.	
	<i>Orthonevra parva</i>	Shannon
	<i>Orthonevra pictipennis</i>	(Loew)
	<i>Orthonevra robusta</i>	(Shannon)
	<i>Paragus</i> sp.	

	Paragus bicolor	(Fabricius)
	Paragus haemorrhous	Meigen
	Paragus variabilis	Vockeroth
	Phytoptera sp. or near	
	Platycheirus sp.	
	Platycheirus quadratus	(Say)
	Platycheirus immarginatus	(Curran)
	Platycheirus luteipennis	(Curran)
	Polydontomyia curvipes	(Wiedeman)
	Sphaerophoria contigua	Macquart
	Sphaerophoria philanthus	(Meigen)
	Syrirta pipens	(Linnaeus)
	Toxomerus marginatus	(Say)
Tabanidae	Chrysops sp.	
	Chrysops fulvaster	Osten Sacken
	Chrysops mitis	Osten Sacken
	Hybomitra phaenops	(Osten Sacken)
Tachinidae	sp.	
	spp.	
	Admontia sp.	
	Archytas sp.	
	Arctophyto sp.	
	Atactopis reinhardi	Sabrosky and Arnaud
	Carcelia sp.	
	Ceracia dentata	(Coquillett)
	Chaetocrania antennalis	(Coquillett)
	*Coloradomyia eucosmaphaga	Arnaud
	Copecrypta sp.	
	Cylindromyia sp.	
	Deopalpus sp.	
	Dinera sp.	
	Exorista sp.	
	Gonia sp.	
	Gymnochaeta occidentalis	Townsend
	Gymnoclydia sp.	
	Gymnosoma fulginosa	Desvoidy
	Gymnosoma fuliginosum	Robineau-Desvoidy
	Hemdra aurata	Robineau-Desvoidy
	Leskia sp.	
	Lydina sp.	
	Microchaetina sp.	
	Ochrocera vaginalis	Townsend
	Paradidyma sp. or near	
	Peleteria sp.	
	Phasia sp.	
	Phasia aldrechii	(Townsend)
	Phasia sp. near aldrechi	(Townsend)

	Phytomyptera sp.	
	Ptilodexia sp.	
	Tachina sp.	
	Thelaria americana	Brooks
	Trochiloleskia loriola	(Reinhard)
	Vanderwulpia sp.	
	Xanthomelodes sp.	
Tephritidae	Dioxya sororcula	(Weidmann)
	Euaresta sp.	
	Euaresta bella	(Lowe)
	Evarestoides acutangulus	(Thompson)
	Neaspilota appendulata	Freiberg and Mathis
	Neotephritis finalis	(Loew)
	Paracantha cultaris	Coquillette
	Paracantha gentilis	Hering
	Paroxyna clathrata	(Loew)
	Paroxyna pygmaea	Novak
	Procecidochares minuta	(Snow)
	Trupanea sp.	
	Trupanea actinobola (Lowe)	
	Trupanea jonesi Curran	
	Urophora cardui	(Linnaeus)
Therevidae	Ozodiceromyia sp.	
Tethinidae	*Tethina sp.	
Tipulidae	sp.	
	Erioptera sp.	
	Limonius sp.	
	Nephrotoma sp.	
	Pseudolimnophila sp.	
	Tipula sp.	
Trioxscleridae	sp.	
Ulidiidae	Chaetopsis sp.	
	*Euxesta sp.	
	Euxesta notata	Weidemann
	Meliera cana	Loew
	Otites sp.	
	Physiphora sp.	
	Tritoxa cuneata	Loew
	Tritoxa incurva	Loew
Ephemeroptera	Baetidae	
	Baetis magnus	McCafferty & Waltz

Hemiptera		Baetis tricaudatus	Dodds
		Callibaetis ferrugineus hageni	Eaton
		Fallceon quilleri	(Dodds)
	Caenidae	Caenis bajaensis	Allen and Murvosh
	Leptohyphidae	Tricorythodes explicatus	(Eaton)
	Alydidae	Alydus eurinus	(Say)
	Anthocoridae	Anthocoris sp.	
	Aphalaridae	Craspedolepta angustipennis	Crawford
		Livia sp.	
		*Livia caricis	Crawford
		*Livia maculipennis	Fitch
	Aphididae	sp.	
	Belostomatidae	Belostoma fluminea	Say
	Berytidae	Jalysus spinosus	(Say)
		Jalysus wickhami	Van Duzee
		Jalysus wickhami	Van Duzee
		*Neoneides muticus	(Say)
	Blissidae	Blissus sp.	
	Caliscelidae	Aphelonema rugosa	Ball
		Brucomorpha sp.	
		Brucomorpha sututuralis	Melichar
	Cercopidae	Clastoptera sp.	
		*Clastophora lineatocollis group	
		Philaenarcys bilineata	(Say)
	Cicadellidae	Aceratagallia sp.	
		Anoscopus serratulae	(Fabricius)
		Athysanella sp.	
		Athysanella (A.) argenteola	(Uhler)
		Athysanella attenuata	Baker
		Athysanella (A.) magdalena	Baker
		*Attenuipyga (Dorycara) minor	Osborn
		Balclutha neglecta	DeLong and Davidson
		Cuerna striata	(Walker)
		Dikraneura carneola	(Stal)
		Dracunculus noveboracensis	(Fitch)

	Draeculacephala sp.	
	Draeculacephala noveboracensis	Fitch
	*Driotura gammoides	(Van Duzee)
	Empoasca sp	
	Endria inimica	(Say)
	Gilletteiella labiata	(Gillette)
	Graphocephala sp.	
	Gypona sp or near	
	Gyponana hasta	DeLong
	Hebecephalus sp.	
	Hebecephalus occidentalis	Beamer and Tuthill
	Hebecephalus rostratus	Beamer and Tuthill
	Hecalus sp.	
	Hecallus near curtis	(Shaw)
	Hecalus vindis	(Uhler)
	Helochara communis	Fitch
	Idiocerus sp.	
	Idiocerus amabilis	(Ball)
	Laccocera obesa	Van Duzee
	Laevicephalus or near	
	Limotettix frigidus	(Ball)
	Macropsis sp.	
	Macrosteles sp.	
	Macrosteles quadrilineatus	(Forbes)
	Mocuellus caprillus	Ross and Hamilton
	*Prairiana subta	(Ball)
	Psammotettix lividellus	(Zetterstedt)
	Rosenus sp.	
	Streptanus sp.	
Cicadidae	Okanagana synodica	(Say)
Cixiidae	Cixius sp.	
	Oliarius sp.	
Coreidae	Catorintha mendica	Stal
	Chelinidea vittiger	Uhler
	Leptoglossus clypealis	Heidemann
Corixidae	Cenocorixa sp.	
	Cenocorixa utahensis	(Hungerford)
	Hesperocorixa sp.	
	Hesperocorixa laevigata	(Uhler)
	Sigara alternata	(Say)
	Sigara grossolineata	Hungerford
	Trichocorixa borealis	Sailer
*Cydnidae	*Pangaeus sp.	

Cymidae	Cymus angustatus	Stal
	Cymus lurida	Stal
Delphacidae	sp.	
	Delphacodes or near	
	Delphacodes sp.	
	Delphacodes sp.	
	Laccocera obesa	Van Duzee
	Mocuellus caprillus	Ross and Hamilton
	Pentagramma longistylata	Penner
Geocoridae	Geocoris sp.	
	Geocoris uliginosa	Say
Gerridae	Aquarius remigis	(Say)
	Gerris gillettei	Lethierry & Severin
Issidae	Aphelonema rugosus	(Ball)
	Bruchomorpha suturalis	Melichar
Lygaeidae	Emblethis vicarius	Horvath
	Lygaeus kalmii	Stal
	Melanopleurus pyrrhopterus	Stål
	Nysius sp.	
	Phlegyas abbreviatus	(Uhler)
	Slaterobius insignis	(Uhler)
	Sphragisticus nebulosus	Fallen
	Xyonysius californicus	Stål
Macroveliidae	Macrovelia horni	Uhler
Membracidae	sp.	
	Campylenchia latipes	(Say)
	Publilia modesta	(Uhler)
	Stictocephala sp.	
	Stictocephala bisonia	Kapp and Yonke
	Tortistilus cinermis	
	Tortistilus collina	Van Duzee
	Tortistilus inermis	Fabricius
Miridae	sp.	
	Coquillettia insignis	Uhler
	Cyrtopeltocoris albofasciatus	Reuter
	Hadronema sp.	
	Hadronema militaris	Uhler
	Irbissia sp.	
	Irbisia brachycerus	(Uhler)

	Labops sp.	
	Labops hesperius	Uhler
	Lygus sp.	
	Lygus elisus	Van Duzee
	Metriorrhynchomiris sp.	
	Metriorrhynchomiris dislocatus	(Say)
	Mimoceps insignis	Uhler
	Phytocoris sp.	
	Prepops sp.	
	Stenodema sp.	
	Stenodema pilosipes	Kelton
	Stenodema vicinus	(Provancher)
Nabiidae	Nabica nigrovittata nearctica	Kerzhner
	Nabica subcoleoptrata	(Kirby)
	Nabis alternatus	Parchley
	Nabis amerocoferus	Carayon
Notonectidae	Notonecta kirbyi	(Hungerford)
	Notonecta undulata	Say
Oxycarenidae	Crophius sp.	
Pentatomidae	Anthemina remota	Horvath
	Chinavia hilaris	(Say)
	Chlorochroa sp.	
	Chlorochroa viridicata	(Walker)
	Cosmopepla lintneriana	Kirkaldy
	Holcostethus limbolarius	Stal
	Murgantia histrionica	Hahn
	Thyanta custator	(Fabricius)
Psyllidae	sp.	
	Cacopsylla sp.	
	Cacopsylla maculata	(Crawford)
	Cacopsylla ribesiae	(Crawford)
	Calophya trizomina	Swartz
	Corythucha sp.	
	Trioza sp.	
Reduviidae	Rhynocoris ventralis	Say
	Zelus luridus	Stahl
Rhopalidae	Aryssus sp.	
	Arhyssus lateralis	(Say)
	Boisea trivitatus	(Say)
	Harmostes reflexulus	(Say)
	Liorhyssus hyalinus	(Fabricius)

		Rhopalus tigrinus	Schilling
	Salididae	Saldula sp. Saldula pallipes	(Fabricius)
	Scutelleridae	Eurygaster alternatus Homaemus bijugis Homaemus parvulus	(Say) Uhler (Germar)
	Thyreocoreidae	Galgupha sp.	
	Tingidae	Corythucha arcuata Corythucha areutus Corythaica venusta	Say Say (Champion)
	Thyrecoridae	Galgupha sp.	
	Vellidae	Rhagovelia sp.	
Hymenoptera	Andrenidae	Andrena sp. Calliopsis sp. Perdita sp. *Panurginus sp. *Pseudopanurgus sp.	
	Apidae	Anthophora sp. Anthophora montana Anthophora walshii Bombus sp. Bombus appositus Bombus fervidus Bombus griseocollis Bombus huntii Bombus fraternus Bombus huntii Bombus nevadensis Bombus pensylvanicus Bombus rufocinctus Ceratina neomexicana Diadasia sp. *Diadasia enavata Epeolus sp. Melissodes sp. Nomada sp. Triepeolus sp.	Cresson Cresson Cresson (Fabricius) (DeGeer) Greene (Smith) Greene Cresson (DeGeer) Cresson Cockerell (Cresson)
	Bethylidae	sp.	

	*Epyris sp.	
Braconidae	sp.	
Cephidae	Cephus sp.	
	Cephus cinctus	Norton
	Hartigia trimaculata	(Say)
Chalcidae	sp.	
	Brachymeria sp.	
	Chalcis sp.	
	Chalcis megalomis	Burks
Chrysididae	sp.	
	Stenodyneris abnormis	Say
Colletidae	Colletes sp.	
	Hylaeus sp.	
	*Hylaeus leptcephalus	(Moran)
	*Hylaeus mesilla	(Cockerell)
Cynipidae	sp.	
*Diapriidae	sp.	
Eulophidae	sp.	
Eupelmidae	sp.	
Formicidae	sp.	
	Crematogaster sp.	
	Formica sp.	
	Formica coloradensis rufa	Creighton
	Formica neoclara	Emery
	Formica obscuripes	Forel
	Formica pallidefulva group	
	Lasius sp.	
	*Lasius (Acanthomyops) latipes	(Walsh)
	Lasius niger	(Linnaeus)
	Lasius latipes	(Walch)
	Lasius sp.	
	Monomorium minimum	(Buckley)
	Myrmica sp.	
	Myrmica brevinodis	Emery
	Pheidole sp.	
	Solenopsis molesta	(Say)
	Tapinoma sessile	(Say)

Halictidae	sp.	
	Agapostemon sp.	
	Agapostemon angelicus	Cockerell
	Agapostemon texanus	Cresson
	Agapostemon virescens	(Fabricius)
	Dialictus sp.	
	Halictus sp.	
	Halictus confusus	Smith
	Halictus ligatus	Say
	Halictus tripartitus	Cockerell
	Lasioglossum sp.	
	Lasioglossum (Dialictus) sp.	
	Lasioglossum pavonotus	Cockerell
	Sphecodes sp.	
Ichneumonidae	sp.	
	*Banchus sp.	
	Coccygomimus pedalis	Cresson
	*Diadegma sp.	
	Ichneumon laetus	Brulle
	Ophion bilineata	Say
	Therion longipes	Provancher
Megachilidae	sp.	
	Anthidium sp.	
	Ceratina sp.	
	Dianthidium sp.	
	Hoplitis sp.	
	*Hoplitis fulgida	Cresson
	Lithurge apicalis	Cresson
	Megachile sp.	
	Osmia sp.	
Mutillidae	*Stelis sp.	
	sp.	
	Dasymutilla occidentalis	(Linnaeus)
	Dasymutilla vesta	(Cresson)
	Dasymutilla vestita	(Lepeleiter)
	Monomorium minimum	(Buckley)
	Pseudomethoca frigidus	Smith
	Pseudomethoca propinqua	(Cresson)
Mymaridae	Timulla subhyalina	Mickel
	Mymarinae sp.	
Pompilidae	Anoplius sp.	

	Anophilus (ss) dreisbachi	Evans
	Anophilus (A.) marginatus	(Say)
	Arachnospila cf dakota	(Dreisbach)
	Arachnospila arcta	(Cresson)
	Arachnospila (D.) dakota	(Dreisbach)
	Ceropales brevicornis	Patton
	Cryptocheilus idoneum	Banks
	Cryptocheilus terminatus	Say
	Episyron oregon	Evans
Pteromalidae	sp.	
*Sapygidae	*Sapyga sp.	
Scelionidae	sp.	
Sphecidae	sp.	
	Ammophila sp.	
	Ammophila azteca	Cameron
	Ammophila kennedyi	(Murray)
	Ammophila placida	Smith
	Ammophila varipes	Cresson
	Astata sp.	
	Astata nubecula	Cresson
	Bembix sp.	
	Bembix spinolae	Lepeletier
	Bembix sayi	Mickel
	Cerceris nigrescens	Smith
	Crabro lacteipennis	Rohwer
	Crossocerus impressifrons	Smith
	Didineis peculiaris	Fox
	Ectemnius sp.	
	*Ectemnius dilectus	Cresson
	Ectemnius rufifemur	Packard
	Ectemnius spiniferus	(Fox)
	Eucerceris sp.	
	Eucerceris cressoni	Schetterer
	Eucerceris fulvipes	Cresson
	Lindenius columbianus	(Kohl)
	Mimesa sp.	
	Mimesa sp. near cheyenne or uncinata	
	Mimesa cressoni	Packard
	Oxybelus sp.	
	Philanthus crabroniformis	Smith
	Podalonia argentifrons	Cresson
	Podalonia atriceps	(Smith)
	Podalonia luctuosa	Smith
	Podalonia mickeli	Murray

		<i>Podalonia valida</i>	(Cresson)
		<i>Prionyx canadensis</i>	(Provencher)
		<i>Scolierella</i> sp.	
	Tenthredinidae	sp.	
		<i>Aphilodyctium fidus</i>	(Cresson)
		<i>Dolerus</i> sp.	
		<i>Pachynematus aurantiacus</i>	Marlatt
		<i>Pachynematus jamesi</i>	Ross
		<i>Pachynematus kirbyi</i>	(Dahlbom)
	Tiphiidae	<i>Acanthetropis aequalis</i>	Fox
		<i>Brachyistius</i> sp.	
	Vespidae	sp.	
		<i>Euodynerus</i> sp.	
		<i>Euodynerus annulatus</i>	(Say)
		<i>Euodynerus auranus</i>	(Cameron)
		<i>Leptochilus rufinodus</i>	(Cresson)
		<i>Polistes fuscata</i>	Fabricius
		<i>Stenodynerus anormis</i>	(Say)
Lepidoptera	Crambidae	sp.	
		<i>Jocara trabalis</i>	(Grote)
	Coleophoridae	sp.	
	Gelechiidae	spp.	
	Geometridae	<i>Macariini</i>	
		<i>Hesperumia sulphuraria</i>	Packard
	Hesperiidae	<i>Hesperia leonardus pawnee</i>	Harris
		<i>Hesperia colorado ochracea</i>	(Scudder)
		<i>Hesperia juba</i>	(Scudder)
		<i>Hesperia uncas</i>	Edwards
		<i>Pyrgus communis</i>	Grote
	Lasiocampidae	<i>Malacosoma californicum</i>	(Packard)
		<i>Tolyte</i> sp.	
	Lycaenidae	<i>Echinargus isola</i>	(Reakirt)
		<i>Euphilotes ancilla barnsi</i>	(Barnes, McDunnough)
		<i>Leucania</i> sp.	
		<i>Plebejus melissa</i>	(Edwards)
		<i>Strymon melinus</i>	(Hubner)
	Noctuidae	sp.	

	<i>Agrotis ipsilon</i>	(Hunagel)
	<i>Apamea</i> sp.	
	<i>Apamea devastator</i>	(Brace)
	<i>Caenurgina erechtea</i>	(Cramer)
	<i>Condica discistriga</i>	(Smith)
	<i>Copablephraron</i> sp.	
	<i>Cucullia</i> sp.	
	<i>Discestra oregonia</i>	(Grote)
	<i>Drasteria howlandi</i>	(Grote)
	<i>Drasteria inepta</i>	Henry Edwards
	<i>Drasteria pallescens</i>	Grote and Robinson
	<i>Eucosma fernaldana</i>	(Grote)
	<i>Euxoa auxiliaris</i>	(Grote)
	<i>Euxoa linefrons/annulipes</i>	
	<i>Euxoa obeliscoides</i>	(Grote)
	<i>Euxoa ridingsiana</i>	Grote
	<i>Euxoa servitus</i>	(Smith)
	<i>Feltia jaculifera</i>	Guenée
	<i>Faronta diffusa</i>	(Walker)
	<i>Hypercompe permaculata</i>	(Packard)
	<i>Lacanobia</i> sp.	
	<i>Leucania insuet</i>	Guenée
	<i>Naphelodes minians</i>	Guenée
	<i>Neleucania patricia</i>	(Grote)
	<i>Noctua pronuba</i>	(Linnaeus)
	<i>Paectes abrostoloides</i>	(Grote)
	<i>Spaelotis clandestina</i>	(Harris)
	<i>Tarachidia</i> sp.	
	<i>Thersea agustipennis</i>	(Grote)
	<i>Ulonche disticha</i>	(Morrison)
	<i>Virbia fragilis</i>	(Strecker)
Nymphalidae	<i>Cercyonis pegala</i>	Fabricius
	<i>Chlosyne gorgone</i>	(Huber)
	<i>Coenonympha tullia</i>	(Muller)
	<i>Euphydryas anicia</i>	Doubleday
	<i>Euptoieta claudia</i>	(Cramer)
	<i>Phiciodes tharos</i>	(Drury)
	<i>Vanessa cardui</i>	(Linnaeus)
Pieridae	<i>Colias alexandra</i>	Edwards
	<i>Colias eurytheme</i>	Boisduval
	<i>Colias philodice</i>	(Godart)
	<i>Euchloe olympia</i>	W.H. Edwards
	<i>Pieris rapae</i>	(Linnaeus)
	<i>Pontia occidentalis</i>	Reakirt
	<i>Pontia protodice</i>	(Boisduval, LeConte)
Prodoxidae	<i>Tegeticula yuccasella</i>	(Rieley)

	Pterophoridae	sp.	
	Pyrilidae	Diatraea sp. Loxostege sticticollis Melitara dentata Prorasea sp.	(Linnaeus) (Grote)
	Sphingidae	Hyles lineata Paonias myops Sphinx vashti	Fabricius (J.E. Smith) Strecker
	Tortricidae	Archips argyrospila Eucosma ragonoti Olethreutinae	(Walker) (Walsingham)
Mantodea	Mantidae	Litaneutria minor Mantis religiosus	(Scudder) Linnaeus
Neuroptera	Chrysopidae	Chrysopa sp. Chrysopa nigricornis Chrysopa plorabunda Eremochrysa sp. Eremochrysa puntinervis Eremochrysa sabulosa	Burmeister (Fitch) (McLachlan) (Banks)
	Hemerobiidae	sp. Hemerobius sp. *Sympherobius perparvus *Wesmaelius sp.	 (McLachlan)
	Myrmeleonitidae	Brachynemurus abdominalis Brachynemurus nigrilabris	(Say) Hagen
Odonata	Aeshnidae	Aeshna palmata	Hagen
	Coenagrionidae	Amphiagrion abbreviatum Amphiagrion palmata Argia alberta Argia immundum Argia vivida Enallagma anna Enallagma civile Ischnura sp. Ischnura damula Ischnura perparva Ischnura verticalis	Selys Hagen (Hagen) Kennedy Hagen Williamson (Hagen) Calvert Selys Say
	Lestidae	Lestes congener	Hagen

		Lestes disjunctus	Selys
	Libellulidae	Libellula pulchella	Drury
		*Plathemis subornata	(Hagen)
		Sympetrum corruptum	Hagen
		Sympetrium obtrusum	(Hagen)
		Sympetrium semicinctum	(Say)
	Lestidae	Lestes disjunctus	Selys
Orthoptera	Acrididae	Aeropedellus clavatus	(Thomas)
		Ageneotetix decorum	(Scudder)
		Arphia conspersa	Scudder
		Arphia pseudonietana	Bruner
		Camnula pellucida	Scudder
		Chorthippus curtipennis	Harris
		Cordillacris crenulata	(Bruner)
		Dissosteira carolina	(Linnaeus)
		Encoptolophus costalis	(Thomas)
		Encoptolophus subgracilus	Caudell
		Eritettix simplex	(Scudder)
		Hesperotettix viridis	(Scudder)
		Melanoplus sp.	
		Melanoplus agustipennis	(Dodge)
		Melanoplus bivittatus	(Say)
		Melanoplus femurrubrum	(DeGeer)
		Melanoplus gladstoni	Scudder
		Melanoplus infantilis	(Scudder)
		Melanoplus sanguinipes	(Fabricius)
		Opeia obscura	(Thomas)
		Paropomala wyomingensis	(Thomas)
		Psoloessa delicatula	(Scudder)
		Spharagemon equale	(Say)
		Trachyrhachys aspera	Scudder
		Xanthippus corallipes	(Haldeman)
	Gryllidae	Gryllus sp.	
	Oecanthidae	Oecanthus quadripunctatus	Beutenmuller
	Tetrigidae	Tettix ornata	(Say)
		Tetrix subulata	(Linnaeus)
	Tettigoniidae	Conocephalus fasciata	De Geer
		Orchelimum gladiator	Brunner
Phasmatodea	Phasmatidae	Parabacillus hesperus	Hebard
		Parabacillus coloradus	(Scudder)

Plecoptera	Perlodidae	Isoperla quinquepunctata	(Banks)
	Nemouridae	*Malenka coloradensis	(Banks)
Psocoptera	Psocidae	sp.	
Trichoptera	Hydropsychidae	Cheumatopsyche analis	Banks
		Cheumatopsyche campyla	Ross
	Helicopsychidae	*Helicopsyche n. sp.	
	Hydropsychidae	Cheumatopsyche analis	Banks
	Leptoceridae	Oecetis disjuncta	(Banks)
		Trienodes frontalis	(Banks)
	Limnephilidae	Anabolia bimaculatus	(Walker)
		*Anabolia consocius	(Walker)
		*Clistronia maculata	(Banks)
		Hesperophylax sp.	
		Hesperophylax designatus	(Walker)
		Hesperophylax magnus	Banks
		Hesperophylax occidentalis	(Banks)
		*Limnephilus acnestus	Ross
		Limnephilus castor	Ross & Merkeley
		Limnephilus diversus	(Banks)
		Limnephilus frijole	Ross
		Limnephilus spinatus	Banks
		Limnephilus taloga	Ross
	Philopotamidae	Chimera utahensis	Ross
Thysanoptera	Phlaeothripidae	Haplothrips sp.	
		*Uncommonly collected	

Appendix 1. 2010 Insect Species List, Soapstone Prairie Natural Area, Larimer Co. and Meadow Springs Ranch, Weld Co., Colorado.

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
Coleoptera	Anthicidae	sp.	6-Jun-10	11	4	1
		sp.	10-Oct-10	2	3	2
		Anthicus sp.	19-Jun-09	2	3	1
		Anthicus sp.	25-Jul-09	12	2	1
		Anthicus sp.	26-Sep-09	2	3	1
		Notoxus sp.	25-Jul-10	11	2	1
		Notoxus sp.	25-Jul-10	12	2	1
		Notoxus sp.	22-Sep-10	2	3	2
		Notoxus sp.	10-Oct-10	2	3	2
	Anthribidae	Trigonorhinus sticticus (Boheman)	8-Aug-09	2	2	1
	Brentidae	Apion sp.	2-Jun-10	2	2	1
	Buprestidae	sp.	6-Jun-10	2	2	1
		Taphrocerus chevrolati Obenberger	5-Jun-09	2	2	1
	*Byrrhidae	*Byrrhus eximius LeConte	25-Jul-10	2	3	1
		*Byrrhus eximius LeConte	25-Jul-10	12	2	1
		*Cytillus alternatus (Say)	29-May-10	2	2	1
	Cantharidae	Cantharis sp.	5-Jun-09	2	2	1
		Cantharis sp.	29-May-10	1	2	1
		Cantharis sp.	29-May-10	11	2	1
		Cantharis sp.	2-Jun-10	2	2	4
		Cantharis sp.	2-Jun-10	11	4	1
		Cantharis sp.	6-Jun-10	2	2	2
		Cantharis sp.	6-Jun-10	11	2	2
	Carabidae	Agonum extensicollis Say	25-Jul-10	2	3	1
		Amara sp.	29-May-10	1	2	1
		Amara sp.	2-Jun-10	12	2	1
		Amara sp.	12-Jul-10	2	2	1
		Amara sp.	10-Oct-10	2	3	1
		Amara cupreolata Putzeys	29-May-10	1	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Amara quenseli Schönherr	9-Sep-09	2	3	1
		Amara quenseli Schönherr	10-Oct-10	2	3	4
		Axinopalpus sp.	26-Sep-09	2	3	1
		Bembidion sp.	25-Jul-10	2	3	2
		Bembidion impotens Casey	26-Sep-09	2	2	1
		Bembidion quadrimaculata Linnaeus	28-Jul-10	2	3	2
		Bembidion rapidum (LeConte)	4-Oct-09	2	4	1
		Bembidion rapidum (LeConte)	28-Jul-10	2	4	3
		Bembidion rapidum (LeConte)	31-Jul-10	2	4	3
		Bradycellus congener LeConte	2-Jun-10	11	4	1
		Bradycellus congener LeConte	6-Jun-10	2	4	1
		Chlaenius sp.	25-Jul-10	2	3	1
		Chlaenius nebraskensis LeConte	25-Jul-10	2	3	1
		Chlaenius sericeus Foster	25-Jul-10	2	3	1
		Chlaenius sericeus Foster	23-Aug-10	2	3	2
		Clivina impressifrons LeConte	23-Aug-10	2	3	2
		Cratacanthus dubius (Beauvois)	31-Jul-10	2	3	1
		Euryderus grossa (Say)	4-Sep-09	2	3	1
		Harpalus sp.	23-Aug-10	2	3	1
		Harpalus amputatus (Say)	25-Jul-10	2	3	6
		Harpalus amputatus (Say)	28-Jul-10	2	3	2
		Harpalus amputatus (Say)	31-Jul-10	2	3	9
		Lebia viridis Say	29-May-10	1	2	1
		Lebia viridis Say	6-Jun-10	2	2	1
		Microlestes linearis (LeConte)	6-Jun-10	12	2	1
		Microlestes linearis (LeConte)	25-Jul-10	2	3	5
		Platynus extensicollis (Say)	25-Jul-10	2	2	3
		Platynus extensicollis (Say)	10-Oct-10	2	3	2
		Poecilus scitulus LeConte	25-Jul-10	2	3	1
		Stenolophus comma (Fabricius)	10-Oct-10	2	3	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Tachys anceps LeConte	25-Jul-10	12	2	1
		Tachys anceps LeConte	28-Jul-10	2	3	1
	Cerambycidae	Tetraopes annulatus LeConte	25-Jul-10	2	2	2
		Tetraopes annulatus LeConte	25-Jul-10	12	2	2
	Cerylonidae	Ceryon sp.	25-Jul-10	2	3	1
	Cicindelidae	Cicindela punctulata Olivier	25-Jul-10	11	2	2
		Cicindela punctulata Olivier	31-Jul-10	2	4	1
		Cicindela punctulata Olivier	31-Jul-10	11	2	1
	Chrysomelidae	Acanthoscelides sp.	29-May-10	1	2	1
		Acanthoscelides sp.	6-Jun-10	2	2	1
		Acanthoscelides sp.	12-Jul-10	11	2	1
		Acanthoscelides sp.	25-Jul-10	2	2	1
		Acanthoscelides sp.	25-Jul-10	11	2	1
		Altica sp.	4-Sep-10	2	2	1
		Chaetocnema opulenta Horn	11-Jul-10	2	2	1
		Chaetocnema opulenta Horn	8-Aug-09	2	2	2
		Chaetocnema opulenta Horn	4-Sep-10	2	2	1
		Chaetocnema subviridis LeConte	12-Jul-10	12	2	1
		Chaetocnema subviridis LeConte	25-Jul-10	11	2	1
		Chrysolina flavomarginata (Say)	12-Jul-10	2	2	1
		Diabrotica undecimpunctata howardi Barber	25-Jul-10	2	2	1
		Diabrotica undecimpunctata Mannerheim	29-May-10	11	2	1
		Diabrotica virgifera LeConte	25-Jul-10	2	2	1
		Disonycha alternata Illiger	6-Jun-10	1	2	1
		Disonycha triangularis (Say)	6-Jun-10	1	2	1
		Exochomus aethiops (Bland)	8-Aug-09	2	2	1
		Exochomus aethiops (Bland)	26-Sep-09	2	2	2
		Glyptina sp.	29-May-10	12	2	1
		Glyptina sp.	2-Jun-10	11	2	1
		Glyptina sp.	6-Jun-10	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Glyptina atriventris Horn	29-May-10	2	2	1
		Longitarsus sp.	8-Aug-09	2	2	1
		Ophraella americana (Fabricius)	2-Jun-10	2	2	1
		Ophraella bilineata Kirby	6-Jun-10	1	2	1
		Pachybrachis sp.	4-Sep-09	2	2	1
		Pachybrachis sp.	2-Jun-10	2	2	1
		Pachybrachis sp.	25-Jul-10	12	2	8
		Phyllotreta sp.	6-Jul-10	2	2	1
		Phyllotreta sp.	25-Jul-10	12	2	1
		Phyllotreta sp.	8-Aug-09	2	2	1
		Phyllotreta sp.	12-Jul-10	1	2	1
		Phyllotreta sp.	4-Oct-09	2	2	1
		Phyllotreta sp.	29-May-10	2	2	1
		Phyllotreta sp.	4-Sep-10	2	2	1
		Phyllotreta armipes (Koch)	23-Aug-10	2	4	1
		Plateumaris robusta (Shaeffer)	19-Jun-09	2	2	1
		Plateumaris robusta (Shaeffer)	6-Jun-10	2	2	1
		Plateumaris robusta (Shaeffer)	25-Jul-10	2	2	1
		Trirhabda nitidicollis LeConte	4-Sep-10	12	2	1
		Zygogramma conjuncta Rogers	6-Jun-10	1	2	1
	Bruchinae	sp.	29-May-10	1	2	1
		sp.	6-Jun-10	2	2	2
		sp.	6-Jun-10	12	2	1
	Cleridae	Enoclerus cordifer LeConte	31-Jul-10	11	4	1
		Phyllobaenus sp.	12-Jul-10	12	2	1
		Phyllobaenus sp.	12-Jul-10	11	4	1
		Phyllobaenus sp.	15-Jul-10	11	2	1
		Phyllobaenus sp.	15-Jul-10	11	4	1
		Phyllobaenus sp.	15-Jul-10	12	2	1
		Phyllobaenus sp.	25-Jul-10	11	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Coccinellidae	Phyllobaenus sp.	31-Jul-10	11	4	1
		Anisosticta bitriangularis Say	2-Jun-10	1	2	1
		Anisosticta bitriangularis Say	2-Jun-10	2	2	3
		Anisosticta bitriangularis Say	2-Jun-10	11	4	1
		Brachiacantha tau LeConte	2-Jun-10	2	2	1
		Coccidula lepida LeConte	2-Jun-10	11	2	5
		Coccidula lepida LeConte	6-Jun-10	11	2	3
		Coccinella septempunctata Linnaeus	29-May-10	11	2	1
		Coccinella novemnotata Herbst	4-Sep-09	2	2	1
		Coccinella transversoguttata Falderman	26-Jun-09	2	2	1
		Coleomegilla maculata De Geer	6-Jun-10	2	2	2
		Coleomegilla maculata De Geer	2-Jun-10	11	2	2
		Hippodamia convergens Guerin-Meneville	29-May-10	12	2	1
		Hippodamia convergens Guerin-Meneville	2-Jun-10	1	2	3
		Hippodamia parenthesis (Say)	27-Jun-09	5	2	2
		Hyperaspidius minus Casey	5-Jun-09	2	2	1
		Mulsantina picta (Randall)	2-Jun-10	1	2	1
		Mulsantina picta (Randall)	15-Jul-10	12	2	1
		Scymus sp	19-Jul-09	2	4	1
	Curculionidae	Anthonomus sp.	31-Jul-10	2	4	1
		Calandrinus obseletus Casey	4-Sep-09	2	3	1
		Calandrinus obseletus Casey	22-Sep-10	2	3	1
		Ceutorhynchus sp.	29-May-10	11	2	2
		Ceutorhynchus sp.	2-Jun-10	11	2	1
		Dorytomus sp.	25-Jul-10	2	3	2
		Epimechus sp.	25-Jul-10	12	2	1
		Gynetrom tetum (Fabricius)	23-Aug-10	2	2	1
		Hylurgops porosus (LeConte)	2-Jun-10	12	2	1
		Larinus plannus (Fabricius)	29-May-10	11	2	1
		Larinus plannus (Fabricius)	6-Jun-10	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Larinus plannus (Fabricius)	12-Jul-10	1	2	2
		Larinus plannus (Fabricius)	22-Aug-10	2	6	1
		Notiodes sp.	5-Jun-09	2	2	1
		Orchestes alni Linnaeus	25-Jul-10	2	2	1
		Orchestes alni Linnaeus	25-Jul-10	2	4	1
		Orchestes alni Linnaeus	25-Jul-10	11	2	1
		Pityogenes sp.	12-Jul-10	1	2	1
		Pityogenes knechteli Swaine	6-Jun-10	12	2	1
		Rhinocyllus conicus (Froelich)	2-Jun-10	2	2	1
		Scaphomorphus trivittatus (Say)	2-Jun-10	1	2	1
		Scaphomorphus trivittatus (Say)	15-Jul-10	11	4	1
		Scaphomorphus trivittatus (Say)	25-Jul-10	11	2	2
		Scolytus schevyrewi Semenov	2-Jun-10	11	4	1
		Sitona cylindricollus (Fabricius)	2-Jun-10	2	2	1
		Sitona cylindricollus (Fabricius)	25-Jul-10	2	3	1
		Sphenophorus cicatristriatus Fahraeus	27-Aug-10	2	3	1
		Tachypterellus sp.	27-Jun-09	6	2	1
		Trachypoeus sp.	25-Jul-10	2	3	1
		Tychius sp.	2-Jun-10	11	2	1
		Tychius sp.	2-Jun-10	12	2	1
		Tychius sp.	6-Jul-10	2	2	2
		Tychius sp.	6-Jul-10	11	2	1
		Tychius sp.	12-Jul-10	1	2	1
		Tychius sp.	12-Jul-10	11	2	1
		Tychius sp.	15-Jul-10	12	2	2
		Tychius sp.	25-Jul-10	2	2	3
		Tychius sp.	25-Jul-10	11	2	5
		Tychius sp.	16-Aug-10	12	2	1
		Tychius lineellus LeConte	2-Jun-10	2	2	1
	Dryopidae	Helichus striatus LeConte	21-Jul-10	2	6	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Dytiscidae	Agabus affinis Paykull	23-Aug-10	2	7	2
		Agabus disintegratus (Crotch)	22-Sep-10	2	9	2
		Agabus griseipennis LeConte	23-Aug-10	2	7	2
		Agabus semivittatus LeConte	23-Aug-10	2	7	1
		Agabus semivittatus LeConte	22-Sep-10	2	9	2
		Hydroporus notabilis LeConte	25-Jul-10	11	1	1
		Hydroporus notabilis LeConte	23-Aug-10	2	7	1
		Laccophilus maculosus decipiens LeConte	22-Sep-10	2	9	2
		Liodessus obscurellus (LeConte)	5-Sep-09	2	4	1
		Liodessus obscurellus (LeConte)	25-Jul-10	2	3	1
		Liodessus obscurellus (LeConte)	31-Jul-10	2	3	1
		Liodessus obscurellus (LeConte)	31-Jul-10	11	4	1
		Neoporus dimidiatus (Gemminger and Harold)	22-Sep-10	2	9	1
		Rhantus binotatus Harris	22-Sep-10	2	9	1
		Rhantus gutticollis (Say)	22-Sep-10	2	9	17
		Stictotarsus striatellus (LeConte)	22-Sep-10	2	9	1
	Elateridae	Aeolus sp.	23-Jun-10	2	4	1
		Ampedus sp.	29-May-10	2	2	1
		Ctenicera sp.	11-Jul-09	2	2	1
		Dalopius sp.	2-Jun-09	2	4	1
		Dalopius sp.	5-Jun-09	2	2	3
		Dalopius sp.	23-Jul-09	2	5	1
		Hadromorphus sp.	6-Jun-10	2	4	1
		Hadromorphus glaucus (Gemar)	11-Jul-09	2	2	1
		*Paradonus pectoralis (Say)	5-Sep-10	2	3	1
		*Paradonus pectoralis (Say)	10-Oct-10	2	3	1
	Halipidae	Halipus sp.	28-Jul-10	2	4	1
		Halipus immaculicollis Harris	6-Jun-10	12	2	1
	Helophoridae	Helophorus sp.	25-Jul-10	2	3	1
		Helophorus sp.	31-Jul-10	2	4	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Helophorus orientalis Motschulsky	25-Jul-10	11	1	1
	Heteroceridae	Neoheterocerus gnathos LeConte	6-Jun-10	2	4	1
		Neoheterocerus gnathos LeConte	6-Jun-10	11	2	1
		Neoheterocerus gnathos LeConte	26-Jul-10	2	3	1
	*Histeridae	*Xerosaprinus sp.	1-Jul-09	2	3	1
	Hydrophilidae	Anacaena sp.	12-Jul-10	2	6	1
		Anacaena sp.	25-Jul-10	11	1	1
		Cymbiodyta beckeri beckeri Smetana	21-Jul-10	2	6	1
		Enochrus hamiltoni (Horn)	23-Aug-10	2	6	1
		Laccobius sp.	6-Jun-10	12	2	1
		Laccobius sp.	22-Sep-10	2	7	1
		Laccobius agilis (Randall)	31-Jul-10	2	3	1
		Sphaeridium scarabaeoides (Linnaeus)	25-Jul-10	11	2	6
		Tropisternus affinus Motschulsky	22-Sep-10	2	9	6
		Tropisternus columbianus Brown	25-Jul-10	11	1	3
		Tropisternus columbianus Brown	5-Sep-10	2	7	1
		Tropisternus columbianus Brown	22-Sep-10	2	9	6
		Tropisternus ellipticus LeConte	5-Jun-10	1	2	1
		Tropisternus lateralis Fabricius	28-Jul-10	2	4	1
		Tropisternus sublaevis (LeConte)	25-Jul-10	11	1	2
	Lampridae	Ellychina corrusca complex	19-Jun-10	2	2	1
		Ellychina corrusca complex	29-May-10	1	2	1
		Ellychina corrusca complex	29-May-10	11	2	1
		Ellychina corrusca complex	2-Jun-10	1	2	1
		Ellychina corrusca complex	2-Jun-10	2	2	3
		Ellychina corrusca complex	2-Jun-10	11	4	1
		Ellychina corrusca complex	6-Jun-10	1	2	2
		Ellychina corrusca complex	6-Jun-10	2	2	1
		Ellychina corrusca complex	6-Jun-10	11	2	2
		Ellychina corrusca complex	19-Jun-10	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		*Photinus sp.	2-Jun-10	2	2	5
		Pyropyga minuta LeConte	12-Jul-10	2	2	1
		Pyropyga minuta LeConte	15-Jul-10	2	2	2
		Pyropyga minuta LeConte	15-Jul-10	2	4	1
		Pyropyga minuta LeConte	25-Jul-10	1	2	1
		Pyropyga minuta LeConte	25-Jul-10	2	2	13
		Pyropyga minuta LeConte	25-Jul-10	2	3	6
		Pyropyga minuta LeConte	8-Aug-10	2	2	1
	Latridiidae	sp.	26-Jun-09	2	4	1
		sp.	12-Jul-10	12	2	1
		sp.	15-Jul-09	11	4	1
		sp.	31-Jul-10	11	4	2
		sp.	8-Aug-09	2	4	1
		sp.	27-Aug-09	2	2	1
		sp.	9-Sep-09	2	4	2
	Meloidae	Epicauta sp.	15-Jul-10	11	4	1
		Epicauta ferruginea (Say)	8-Aug-09	2	2	1
		Epicauta ferruginea (Say)	8-Aug-09	2	3	1
		Epicauta ferruginea (Say)	26-Sep-09	2	3	5
		Epicauta ferruginea (Say)	16-Aug-10	12	2	8
		Epicauta ferruginea (Say)	23-Aug-10	2	2	1
		Epicauta ferruginea (Say)	23-Aug-10	2	4	1
		Epicauta pensylvanica DeGeer	25-Jul-10	11	2	1
		Epicauta pensylvanica DeGeer	28-Jul-10	2	4	1
		Epicauta pensylvanica DeGeer	31-Jul-10	2	4	1
		Epicauta pensylvanica DeGeer	16-Aug-10	12	2	3
		Epicauta pensylvanica DeGeer	23-Aug-10	2	2	3
		Epicauta pensylvanica DeGeer	23-Aug-10	2	4	1
		Epicauta sericans LeConte	15-Jul-10	11	4	1
		Epicauta sericans LeConte	25-Jul-10	2	3	11

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Epicauta sericans LeConte	28-Jul-10	2	3	4
		Epicauta sericans LeConte	31-Jul-10	2	3	12
		Epicauta stuarti (Say)	23-Aug-10	11	2	1
		Lytta virdana LeConte	6-Jun-10	2	2	5
		Nemognatha lurida LeConte	1-Jul-09	2	2	2
		Nemognatha lurida LeConte	1-Jul-09	2	3	1
		Pyrota insulata (LeConte)	5-Jun-09	2	2	4
		Pyrota insulata (LeConte)	6-Jun-10	2	2	2
	Melyridae	Amecocerus sp.	25-Jul-10	11	2	1
		Amecocerus sp.	25-Jul-10	12	2	1
		Amecocerus sp.	16-Aug-10	12	2	3
		Amecoscerus coloradensis Blaisdell	26-Jun-09	10	2	1
		Amecoscerus senilis LeConte	4-Sep-09	2	2	1
		Amecoscerus senilis LeConte	9-Sep-09	2	4	1
		Amecoscerus senilis LeConte	4-Oct-09	2	3	1
		Collops sp.	6-Jun-10	2	2	4
		Collops sp.	6-Jun-10	11	2	1
		Collops sp.	25-Jul-10	12	2	1
		Collops bipunctatus (Say)	25-Jul-10	1	2	1
		Collops bipunctatus (Say)	25-Jul-10	2	2	1
		Collops bipunctatus (Say)	25-Jul-10	11	2	6
		Collops bipunctatus (Say)	25-Jul-10	12	2	1
		Collops viridis LeConte	6-Jun-10	2	2	1
		Malachius aeneus (Linnaeus)	2-Jun-10	1	2	1
		Malachius aeneus (Linnaeus)	6-Jun-10	1	2	1
	Mordellidae	Mordellistena sp.	29-May-10	2	2	1
		Mordellistena sp.	6-Jun-10	2	4	2
		Mordellistena sp.	25-Jul-10	12	2	1
	Nitidulidae	Carpophilus sp.	15-Jul-10	11	2	1
		Carpophilus sp.	25-Jul-10	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Carpophilus sp.	25-Jul-10	2	3	5
		Carpophilus sp.	28-Jul-10	2	3	2
		Carpophilus sp.	31-Jul-10	11	2	1
		Carpophilus sp.	10-Oct-10	2	3	10
		Meligethes sp.	1-Jul-09	2	2	2
		Nitidula sp.	10-Oct-10	2	3	1
	Phalacritidae	sp.	5-Jun-09	2	2	1
		sp.	26-Jun-09	10	2	1
		sp.	27-Jun-09	6	2	1
		sp.	4-Aug-09	2	2	1
		sp.	9-Sep-09	2	4	1
		sp.	29-May-10	12	2	2
		sp.	2-Jun-10	11	2	1
		sp.	6-Jun-10	2	2	1
		sp.	25-Jul-10	2	2	4
	Pyrrochroidae	Pedilus lewisii Horn	27-Jun-09	10	2	2
	Scarabaeidae	Aphodius sp.	2-Jun-10	11	2	1
		Aphodius sp.	15-Jul-10	1	2	1
		Euphoria inda (Linnaeus)	27-Aug-10	2	2	5
		Euphoria inda (Linnaeus)	27-Aug-10	2	3	1
		Euphoria inda (Linnaeus)	10-Oct-10	2	3	1
		Phyllophaga crassissima (Blanchard)	2-Jun-10	11	4	2
		Rhyssalus sonatus LeConte and Horn	25-Jul-10	2	3	1
	Scaptidae	sp.	9-Sep-09	2	4	1
		sp.	23-Aug-10	2	4	2
		Anaspis sp.	15-Jul-10	2	4	1
		Anaspis rufa Say	5-Sep-10	2	2	1
	Silphidae	Aclypea bituberosa (LeConte)	29-May-10	1	2	1
		Heterosilpha ramosa (Say)	29-May-10	2	2	1
		Heterosilpha ramosa (Say)	28-Jul-10	2	4	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Staphylinidae	Nicrophorus marginatus Fabricius	4-Sep-09	2	3	1
		Thanatophilus lapponicus (Herbst)	31-Jul-10	2	4	1
		Thanatophilus sagax (Mannerheim)	28-Jul-10	2	3	1
		sp.	2-Jun-10	2	2	1
		sp.	2-Jun-10	11	4	1
		sp.	2-Jun-10	11	2	1
		sp.	2-Jun-10	11	4	2
		sp.	6-Jun-10	1	2	1
		sp.	6-Jun-10	2	2	1
	Tenebrionidae	Blapstinus substriatus Champion	9-Sep-09	2	3	1
		Blapstinus substriatus Champion	6-Jun-10	11	2	1
		Bothrotes plumbeus (LeConte)	23-Aug-10	2	4	1
		Eleodes extricata Say	4-Sep-09	2	3	5
		Eleodes hispilabris (Say)	19-May-10	2	3	1
		Eleodes hispilabris (Say)	25-Jul-10	2	6	1
		Eleodes hispilabris (Say)	27-Aug-10	2	3	1
		Eleodes obscura Say	31-Jul-10	11	3	1
		Eusattus convexus (LeConte)	4-Sep-09	2	3	1
Collembola	Entomobryiidae	sp.	25-Jul-10	2	3	11
	Smithuridae	sp.	25-Jul-10	2	3	6
Dermaptera	Forficulidae	Forficula auricularia Linnaeus	28-Jul-10	2	4	1
Diptera	*Acroceridae	*Acrocera sp.	25-Jul-10	2	2	1
		*Ogcodes pallidipennis (Loew)	27-Aug-10	2	2	1
	Anthomyidae	sp.	15-Jul-10	2	4	110
		sp.	25-Jul-10	2	2	3
		sp.	25-Jul-10	1	2	56
		sp.	28-Jul-10	11	4	26
		sp	31-Jul-10	2	4	3
		sp	16-Aug-10	12	2	21
	Asilidae	Backomya limpidipennis (Wilcox)	21-Sep-10	12	2	1
		Backomya limpidipennis (Wilcox)	22-Sep-10	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Backomya limpidipennis (Wilcox)	22-Sep-10	2	3	1
		Dicropaltum pawneeae Martin	12-Jul-10	1	2	1
		Dicropaltum pawneeae Martin	15-Jul-10	1	2	2
		Dicropaltum pawneeae Martin	25-Jul-10	11	2	1
		Efferia sp.	25-Jul-10	11	2	1
		Efferia sp.	25-Jul-10	12	2	1
		Efferia staminea (Williston)	28-Jul-10	2	4	1
		Holopogon atripennis Back	27-Jun-09	2	2	1
		Holopogon seniculus Loew	25-Jul-10	12	2	7
		Leptogaster aridus Cole	12-Jul-10	12	2	2
		Machimus prairiensis (Tucker)	4-Aug-10	12	2	2
		Machimus prairiensis (Tucker)	23-Aug-10	12	2	2
	Athericidae	Atherix pachypus Bigot	6-Jun-10	12	1	1
	Bibionidae	Bibio albipennis Say	29-May-10	1	2	4
		Bibio albipennis Say	29-May-10	2	2	3
		Bibio albipennis Say	29-May-10	11	2	1
		Bibio albipennis Say	2-Jun-10	11	2	6
		Bibio albipennis Say	2-Jun-10	12	2	1
		Bibio albipennis Say	6-Jun-10	1	2	1
		Bibio albipennis Say	6-Jun-10	2	4	3
		Bibio albipennis Say	5-Sep-10	11	2	1
	Bombyliidae	Exoprosopa dorcadion Osten Sacken	1-Jul-09	2	2	1
		Geron argutus Painter	23-Aug-10	2	4	1
		Hemipenthes jaennickeana Osten Sacken	6-Jun-10	2	2	1
		Toxophora sp.	23-Aug-10	2	4	1
		Villa sp.	2-Jun-10	1	2	1
	Calliphoridae	Calliphora vincina (Robineau-Desvoidy)	6-Jun-10	2	4	1
		Cochliomyia macellaria (Fabricius)	4-Sep-09	2	2	3
		Lucilia silvarum (Meigen)	4-Sep-09	2	2	1
		Lucilia silvarum (Meigen)	4-Sep-09	12	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Lucilia silvarum (Meigen)	4-Oct-09	2	2	1
		Lucilia silvarum (Meigen)	25-Jul-10	1	2	1
		Lucilia silvarum (Meigen)	25-Jul-10	11	2	2
		Lucilia silvarum (Meigen)	25-Jul-10	12	2	1
		Lucilia silvarum (Meigen)	31-Jul-10	2	4	1
		Phormia regina (Meigen)	4-Sep-09	2	2	2
		Phormia regina (Meigen)	15-Jul-10	11	4	2
		Phormia regina (Meigen)	25-Jul-10	2	2	1
		Phormia regina (Meigen)	28-Jul-10	2	4	1
		Phormia regina (Meigen)	31-Jul-10	2	4	1
		Phormia regina (Meigen)	5-Sep-10	2	4	5
		Protophormia terraenovae (Robineau-Desvoidy)	2-Jun-10	11	4	12
		Protophormia terraenovae (Robineau-Desvoidy)	6-Jun-10	2	4	4
	Cecidiomyiidae	sp.	2-Jun-10	2	2	1
		sp.	28-Jul-10	2	4	1
		sp.	5-Sep-10	2	4	1
	Ceratopogonidae	*Atrichopogon fuscus Coquillett	28-Jul-10	11	4	20
		Culicoides sp.	23-Aug-10	2	4	10
		Culicoides sp.	22-Sep-10	2	2	1
		Culicoides sp.	3-Oct-10	2	2	2
		*Culicoides cockerellii Coquillett	28-Jul-10	11	4	16
		*Dasyhelea sp.	28-Jul-10	11	4	1
		*Forcipomyia sp.	28-Jul-10	11	4	2
	Chironomidae	sp.	2-Jun-10	11	4	9
		sp.	6-Jun-10	12	1	12
	Chloropidae	sp.	6-Jun-10	1	2	16
		sp.	6-Jun-10	2	2	6
		sp.	6-Jun-10	11	2	1
		sp.	25-Jul-10	12	2	1
		sp.	31-Jul-10	11	4	4

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		sp.	8-Aug-10	2	2	3
	Conopidae	Physocephala sp.	31-Jul-10	2	4	1
		Thecophora sp.	26-Jun-09	2	4	1
		Thecophora nigripes (Camras)	19-Jun-09	2	2	1
		Thecophora nigripes (Camras)	26-Jun-09	2	4	1
		Thecophora nigripes (Camras)	9-Sep-09	2	3	1
		Thecophora nigripes (Camras)	15-Jul-10	2	2	1
		Thecophora nigripes (Camras)	25-Jul-10	2	2	1
		Thecophora nigripes (Camras)	25-Jul-10	11	2	1
		Thecophora occidentis (Walker)	12-Jul-10	11	2	1
		Thecophora occidentis (Walker)	25-Jul-10	2	2	1
		Thecophora occidentis (Walker)	25-Jul-10	11	2	1
		Thecophora occidentis (Walker)	28-Jul-10	2	4	1
		Thecophora propinqua Adams	15-Jul-10	11	2	1
		Thecophora propinqua Adams	15-Jul-10	11	4	2
		Thecophora propinqua Adams	25-Jul-10	11	2	6
		Thecophora propinqua Adams	28-Jul-10	11	4	1
		Thecophora propinqua Adams	31-Jul-10	2	4	1
		Thecophora propinqua Adams	23-Aug-10	2	2	1
		Thecophora propinqua Adams	23-Aug-10	2	3	1
		Zodion cinereiventris Van Duzee	15-Jul-10	2	4	2
		Zodion cinereiventris Van Duzee	25-Jul-10	2	2	1
		Zodion cinereiventris Van Duzee	25-Jul-10	2	4	1
		Zodion cinereiventris Van Duzee	25-Jul-10	11	2	1
		Zodion cinereiventris Van Duzee	23-Aug-10	11	2	1
		Zodion fulvifrons Say	31-Jul-10	2	4	1
	Culicidae	Aedes sp.	28-Jul-10	2	4	1
		Aedes dorsalis (Meigen)	29-May-10	2	2	1
		Aedes nigromaculis (Ludlow)	1-Jul-09	11	2	1
		Aedes nigromaculis (Ludlow)	15-Jul-10	1	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Culiseta sp.	23-Aug-10	2	4	1
		Culiseta impatiens (Walker)	6-Jun-10	1	2	1
		Culiseta impatiens (Walker)	10-Oct-10	2	3	1
		Culiseta inornata (Williston)	2-Jun-10	11	4	1
		Culiseta morsitans (Theobald)	6-Jun-10	2	2	1
	*Diopsidae	*Sphyracephala subbifasciata Fitch	3-Oct-10	2	2	1
	Dolichopodidae	Chrysotus leucostoma (Loew)	26-Jun-09	2	4	2
		Dolichopus bifractus Loew	4-Sep-09	2	2	1
		Dolichopus cuprinus Wiedemann	8-Aug-09	2	2	1
		Dolichopus obcordatus Aldrich	26-Jun-09	2	2	1
		Dolichopus palustrus Melander and Brues	5-Jun-09	2	2	2
		Dolichopus palustrus Melander and Brues	19-Jun-09	2	2	1
		Dolichopus plumipes Scolopi	5-Jun-09	2	2	1
		Dolichopus plumipes Scolopi	15-Jul-10	2	2	1
		Dolichopus ramifer Loew	19-Jun-09	2	2	1
		Dolichopus ramifer Loew	26-Jun-09	2	2	1
		Dolichopus ramifer Loew	2-Jul-09	2	2	1
		Dolichopus ramifer Loew	8-Aug-09	2	2	1
		*Hydrophorus sp.	15-Jul-10	2	4	1
		Medetera sp.	25-Jul-10	2	2	1
		Medetera sp.	25-Jul-10	2	3	1
		Medetera veles Loew	8-Jun-09	2	2	1
		Medetera veles Loew	18-Jun-09	2	2	1
		Pelastoneurus vagans Loew	15-Jul-10	2	2	1
		Rhapium near but not exile Curran	5-Jun-09	2	2	1
		Rhapium effilatum Wheeler	12-Jul-09	2	2	1
		Rhapium effilatum Wheeler	23-Jul-09	2	2	1
		*Scellus exustus (Walker)	6-Jun-09	2	2	1
		*Scellus exustus (Walker)	19-Jun-09	2	2	1
		*Scellus exustus (Walker)	26-Jun-09	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		*Scellus exustus (Walker)	1-Jul-09	2	2	5
		*Scellus exustus (Walker)	4-Aug-09	2	2	1
		*Scellus exustus (Walker)	8-Aug-09	2	2	8
		*Scellus exustus (Walker)	12-Jul-10	2	2	1
		*Scellus exustus (Walker)	12-Jul-10	12	2	2
		*Scellus exustus (Walker)	25-Jul-10	12	2	1
		*Scellus exustus (Walker)	28-Jul-10	2	3	1
		*Scellus exustus (Walker)	31-Jul-10	2	3	1
		*Scellus exustus (Walker)	23-Aug-10	2	2	1
		*Scellus exustus (Walker)	23-Aug-10	2	3	1
		*Scellus exustus (Walker)	27-Aug-10	2	3	4
		*Scellus exustus (Walker)	4-Sep-10	2	2	3
		Syntormon clavatum Van Duzee	6-Jun-09	2	2	8
	Empididae	Platypalpus sp.	6-Jun-10	11	2	1
	Ephydriidae	sp.	6-Jun-10	2	2	7
		sp.	15-Jul-10	1	2	68
		sp.	15-Jul-10	2	2	11
		sp.	15-Jul-10	2	4	38
		sp.	15-Jul-10	11	2	99
		sp.	3-Oct-10	11	4	65
		Ochthera anatolikos Clausen	6-Jun-10	2	4	1
		Ochthera anatolikos Clausen	12-Jul-10	2	2	4
		Ochthera anatolikos Clausen	31-Jul-10	2	4	1
		Ochthera anatolikos Clausen	21-Sep-10	12	2	1
	Heleomyzidae	Pseudoleria sp.	2-Jun-10	11	2	1
		Trixoscelis fumipennis Melander	9-Sep-09	2	3	1
		Trixoscelis fumipennis Melander	15-Jul-10	2	4	1
	*Hippoboscidae	*Lipoptenna depressa (Say)	2-Jun-10	11	4	1
	Lonchopteridae	Lonchoptera furcata Fallen	4-Sep-10	1	2	1
		Lonchoptera furcata Fallen	4-Sep-10	11	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Lonchoptera furcata Fallen	4-Sep-10	12	2	8
	Micropezidae	Compsobata pallipes Say	5-Jun-10	11	2	4
		Micropezia sp.	6-Jun-10	11	2	1
		Micropezia turcana Townsend	25-Jul-10	2	2	1
	Milichiidae	sp.	29-May-10	11	2	1
		Madiza glabra Fallen	6-Jun-10	2	2	2
		Madiza glabra Fallen	28-Jul-10	11	4	28
		Madiza glabra Fallen	31-Jul-10	11	4	23
	Muscidae	Coenosia sp.	6-Jun-10	2	2	1
		Coenosia sp.	15-Jul-10	2	4	16
		Coenosia sp.	15-Jul-10	11	4	2
		Coenosia sp.	28-Jul-10	11	4	111
		Coenosia sp.	31-Jul-10	2	4	41
		Coenosia sp.	31-Jul-10	11	4	22
		Coenosia sp.	23-Aug-10	2	4	3
	Phoridae	Cremersia sp.	6-Jun-10	11	2	8
		Cremersia sp.	6-Jun-10	3	4	12
		Cremersia sp.	15-Jul-10	11	4	10
		Cremersia sp.	28-Jul-10	11	4	11
		Cremersia sp.	31-Jul-10	2	4	14
		Cremersia sp.	31-Jul-10	11	4	18
	Pipunculidae	Tomosvaryella sp.	2-Jun-10	11	4	1
		Tomosvaryella sp.	25-Jul-10	2	4	1
	*Psilidae	*Loxocera fumipennis Coquillett	25-Aug-10	2	4	1
	Ptychopteridae	*Ptychoptera n. sp.	25-Jul-10	11	2	1
		Ptychoptera lentis Osten Sacken	6-Jun-10	11	2	2
		Ptychoptera lentis Osten Sacken	6-Jun-10	12	2	1
	Rhagionidae	Chrysophilus falvibarbis Adams	6-Jun-10	2	2	2
		Chrysophilus falvibarbis Adams	6-Jun-10	12	2	1
		Chrysophilus falvibarbis Adams	25-Jul-10	2	2	3

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Chrysophilus falvibarbis Adams	25-Jul-10	12	2	1
		Chrysophilus flavifrons Marquart	12-Jul-10	1	2	4
		Chrysophilus testaceipes Bigot	11-Jul-09	2	4	1
	Sarcophagidae	Sarcophaga sp.	6-Jun-10	2	2	1
		Sarcophaga sp.	15-Jul-10	11	4	3
		Sarcophaga sp.	25-Jul-10	1	2	9
		Sarcophaga sp.	28-Jul-10	11	4	3
		Sarcophaga sp.	31-Jul-10	2	4	1
		Sarcophaga sp.	23-Aug-10	2	4	5
		Sarcophaga sp.	5-Sep-10	12	2	4
	Scathophagidae	sp.	6-Jun-10	11	2	2
		Cordilura (Pseudacicephala) pilocella Malloch	6-Jun-10	2	2	4
		Scathophaga stercoraria Linnaeus	2-Jun-10	1	2	2
		Scathophaga stercoraria Linnaeus	2-Jun-10	2	2	2
		Scathophaga stercoraria Linnaeus	2-Jun-10	11	4	2
		Scathophaga stercoraria Linnaeus	6-Jun-10	1	2	2
		Scathophaga stercoraria Linnaeus	6-Jun-10	2	2	1
		Scathophaga stercoraria Linnaeus	6-Jun-10	12	2	1
		Scathophaga stercoraria Linnaeus	12-Jul-10	1	2	1
		Scathophaga stercoraria Linnaeus	25-Jul-10	2	2	2
		Scathophaga stercoraria Linnaeus	23-Aug-10	2	2	1
		Scathophaga stercoraria Linnaeus	4-Sep-10	12	2	2
		Scathophaga stercoraria Linnaeus	5-Sep-10	11	2	1
		Scathophaga stercoraria Linnaeus	21-Sep-10	2	2	6
		Scathophaga stercoraria Linnaeus	21-Sep-10	12	2	9
		Scathophaga stercoraria Linnaeus	3-Oct-10	2	2	3
		Scathophaga stercoraria Linnaeus	10-Oct-10	2	3	1
	Sciaridae	Bradysia sp.	28-Jul-10	11	4	1
	Sciomyzidae	Dictya sp.	29-May-10	2	2	1
		Dictya sp.	6-Jun-10	2	2	3

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Dictya sp.	6-Jun-10	12	2	3
		Dictya sp.	4-Sep-10	2	2	1
		Dictya texensis Curran	27-Jun-09	6	2	1
		Dictya texensis Curran	8-Aug-09	2	2	1
		Dictya texensis Curran	29-May-10	2	1	3
		Dictya texensis Curran	6-Jun-10	2	2	1
		Dictya texensis Curran	6-Jun-10	11	2	1
		Sepedon sp.	8-Aug-09	2	2	1
		Sepedon sp.	4-Sep-09	2	2	1
		Sepedon armipes Loew	6-Jun-10	2	2	3
		Tetanocera sp.	12-Jul-10	2	2	2
		Tetanocera ferruginea Fallen	12-Jul-10	1	2	1
		Tetanocera ferruginea Fallen	25-Jul-10	2	2	2
		Tetanocera ferruginea Fallen	23-Aug-10	2	2	1
		Tetanocera ferruginea Fallen	3-Oct-10	2	2	1
	Sepsidae	sp.	29-May-10	2	2	2
		Saltella sphondylii (Schrank)	29-May-10	11	2	1
		sp.	12-Jul-10	11	2	1
		sp.	15-Jul-10	12	2	2
		sp.	25-Jul-10	1	2	6
		sp.	4-Sep-10	12	2	7
		sp.	3-Oct-10	2	2	4
	Simuliidae	sp.	6-Jun-10	1	1	11
		sp.	15-Jul-10	11	4	46
		Simulium decorum Walker	2-Jun-10	11	4	8
	Stratiomyidae	Euparyphus cinctus (Osten Sacken)	26-Jun-09	2	2	1
		Euparyphus cinctus (Osten Sacken)	26-Jun-09	2	4	1
		Euparyphus cinctus (Osten Sacken)	11-Jul-09	2	2	1
		Euparyphus cinctus (Osten Sacken)	11-Jul-09	2	4	1
		Euparyphus cinctus (Osten Sacken)	6-Jun-10	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Euparyphus cinctus (Osten Sacken)	12-Jul-10	2	2	1
		Euparyphus cinctus (Osten Sacken)	15-Jul-10	2	4	1
		Euparyphus cinctus (Osten Sacken)	28-Jul-10	2	4	1
		Euparyphus cinctus (Osten Sacken)	31-Jul-10	2	4	1
		Euparyphus mutabilis Adams	29-May-10	2	2	3
		Euparyphus mutabilis Adams	8-Aug-09	2	4	2
		Euparyphus mutabilis Adams	15-Jul-10	2	2	1
		Euparyphus mutabilis Adams	15-Jul-10	2	4	1
		Euparyphus mutabilis Adams	25-Jul-10	1	2	10
		Euparyphus mutabilis Adams	25-Jul-10	2	2	5
		Euparyphus mutabilis Adams	25-Jul-10	11	2	3
		Euparyphus mutabilis Adams	25-Jul-10	12	2	8
		Euparyphus mutabilis Adams	28-Jul-10	2	4	2
		Euparyphus mutabilis Adams	31-Jul-10	11	4	2
		Hedriodiscus binotata Loew	25-Jul-10	2	2	1
		Hedriodiscus binotata Loew	25-Jul-10	11	2	1
		Hedriodiscus binotata Loew	25-Jul-10	12	2	2
		Microchrysa polita Linnaeus	2-Jun-10	11	4	1
		Nemotelus sp.	8-Aug-09	2	2	1
		Nemotelus sp.	12-Jul-10	2	4	1
		Nemotelus sp.	15-Jul-10	11	2	1
		Nemotelus sp.	31-Jul-10	2	4	1
		Nemotelus nigriventris Loew	15-Jul-10	12	2	2
		Odontomyia sp.	25-Jul-10	2	2	1
		Odontomyia sp.	25-Jul-10	12	2	1
		Odontomyia cincta Oliver	6-Jun-10	2	4	1
		Stratiomys normuba Loew	23-Aug-10	2	4	1
	Synneuridae	Synneura decepiens Hutson	2-Jun-10	1	2	1
	Syrphidae	Copestylum sp.	27-Jun-09	10	2	1
		Copestylum sp.	4-Oct-09	2	3	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Copestylum sp.	15-Jul-10	11	2	1
		Copestylum sp.	31-Jul-10	2	4	1
		Copestylum sp.	10-Oct-10	2	3	1
		Copestylum caudatum Curran	4-Sep-09	2	2	1
		Copestylum caudatum Curran	15-Jul-10	11	2	1
		Copestylum caudatum Curran	10-Oct-10	2	3	1
		Copestylum fasciata Maquart	25-Jul-10	2	3	1
		Eumerus sp.	6-Jun-10	1	2	1
		Eupeodes sp.	8-May-09	2	2	1
		Eupeodes sp.	27-Jun-09	6	2	1
		Eupeodes sp.	26-Sep-09	2	3	1
		Helophilus sp.	4-Sep-09	2	2	1
		Helophilus latifons Loew	5-Jun-09	6	2	1
		Orthonevra sp.	19-Jun-09	2	2	1
		Orthonevra sp.	2-Jun-10	11	2	3
		Orthonevra sp.	6-Jun-10	1	2	5
		Orthonevra sp.	15-Jul-10	11	4	4
		Orthonevra sp.	25-Jul-10	12	2	3
		Orthonevra sp.	31-Jul-10	2	4	1
		Orthonevra parva Shannon	29-May-10	1	2	1
		Orthonevra parva Shannon	26-Jun-10	2	4	1
		Paragus sp.	27-Jun-09	6	2	1
		Paragus sp.	1-Jul-09	2	2	1
		Paragus sp.	11-Jul-09	2	2	3
		Paragus sp.	25-Jul-10	11	2	1
		Paragus sp.	23-Aug-10	2	4	2
		Paragus haemorrhous Meigen	5-Jun-09	6	2	1
		Paragus variabilis Vockeroth	9-Sep-09	2	4	2
		Platycheirus sp.	6-Jun-10	1	2	1
		Platycheirus sp.	12-Jul-10	1	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Platycheirus sp.	25-Jul-10	1	2	1
		Platycheirus quadrata (Say)	11-Jul-10	2	2	1
		Platycheirus quadrata (Say)	8-Aug-09	2	2	1
		Sphaerophoria philonthus Marquart	23-Jul-09	2	4	1
		Sphaerophoria philonthus Marquart	4-Sep-09	2	2	1
		Syrirta pipiens (Linnaeus)	15-Jul-10	2	2	1
		Syrirta pipiens (Linnaeus)	25-Jul-10	1	2	1
		Syrirta pipiens (Linnaeus)	25-Jul-10	2	4	1
		Syrirta pipiens (Linnaeus)	25-Jul-10	11	2	4
		Syrirta pipiens (Linnaeus)	10-Oct-10	2	3	1
		Toxomerus marginatus (Say)	23-Jul-09	2	4	1
		Toxomerus marginatus (Say)	29-May-10	2	2	3
		Toxomerus marginatus (Say)	2-Jun-10	11	2	1
		Toxomerus marginatus (Say)	6-Jun-10	1	2	3
		Toxomerus marginatus (Say)	6-Jun-10	2	2	1
		Toxomerus marginatus (Say)	6-Jun-10	11	2	1
		Toxomerus marginatus (Say)	12-Jul-10	2	2	1
		Toxomerus marginatus (Say)	15-Jul-10	1	2	1
		Toxomerus marginatus (Say)	15-Jul-10	2	2	6
		Toxomerus marginatus (Say)	15-Jul-10	11	2	1
		Toxomerus marginatus (Say)	15-Jul-10	12	2	1
		Toxomerus marginatus (Say)	25-Jul-10	1	2	2
		Toxomerus marginatus (Say)	25-Jul-10	2	2	1
		Toxomerus marginatus (Say)	25-Jul-10	11	2	4
		Toxomerus marginatus (Say)	25-Jul-10	12	2	3
		Toxomerus marginatus (Say)	31-Jul-10	2	4	3
	Tabanidae	Chrysops sp.	12-Jul-10	2	6	1
		Chrysops fulvaster Osten Sacken	25-Jul-10	2	2	14
	Tachinidae	Admontia sp.	2-Jun-10	11	4	1
		Admontia sp.	15-Jul-10	11	4	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Tephritidae	Admontia sp.	31-Jul-10	11	4	1
		Admontia sp.	22-Sep-10	2	2	1
		Archytas sp.	15-Jul-10	11	4	1
		Archytas sp.	25-Jul-10	11	2	1
		Archytas sp.	31-Jul-10	11	4	1
		Cylindomyia sp.	6-Jun-10	2	4	1
		Cylindomyia sp.	12-Jul-10	2	2	1
		Cylindomyia sp.	25-Jul-10	11	2	1
		Cylindomyia sp.	4-Sep-10	2	2	2
		Cylindomyia sp.	10-Oct-10	2	3	2
		Gonia sp.	6-Jun-10	2	4	1
		Gymnosoma fulginosa Desvoidy	12-Jul-10	2	2	1
		Gymnosoma fulginosa Desvoidy	25-Jul-10	11	2	2
		Gymnosoma fulginosa Desvoidy	23-Aug-10	2	2	1
		Microphasia sp.	25-Jul-10	11	2	1
		Microphasia sp.	23-Aug-10	11	4	1
		Peletaria sp.	15-Jul-10	11	4	2
		Phasia aldrechii (Townsend)	25-Jul-10	11	2	1
		Dioxyna sororcula (Weidmann)	15-Jul-10	11	2	2
		Dioxyna sororcula (Weidmann)	25-Jul-10	2	2	1
		Dioxyna sororcula (Weidmann)	29-Jul-10	11	2	1
		Euaresta sp.	15-Jul-10	11	4	1
		Euaresta bella (Lowe)	25-Jul-10	11	2	1
		Evarestoides acutangulus (Thomas)	2-Jun-10	12	2	1
		Evarestoides acutangulus (Thomas)	6-Jun-10	2	2	1
		Evarestoides acutangulus (Thomas)	6-Jun-10	11	2	1
		Evarestoides acutangulus (Thomas)	15-Jul-10	2	2	2
		Evarestoides acutangulus (Thomas)	25-Jul-10	1	2	3
		Euarestoides acutangulus (Thomas)	25-Jul-10	2	2	4
		Evarestoides acutangulus (Thomas)	25-Jul-10	11	2	4

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Evarestoides acutangulus (Thomas)	25-Jul-10	12	2	1
		Neotephritis finalis (Loew)	16-Aug-10	12	2	1
		Neotephritis finalis (Loew)	27-Aug-10	2	2	2
		Paracantha gentilis Hering	15-Jul-10	11	4	1
		Paracantha gentilis Hering	25-Jul-10	2	2	2
		Paracantha gentilis Hering	25-Jul-10	11	2	1
		Paracantha gentilis Hering	25-Jul-10	12	2	1
		Paracantha gentilis Hering	23-Aug-10	2	2	1
		Paracantha gentilis Hering	27-Aug-10	2	2	1
		Paroxyna clathrata (Loew)	15-Jul-10	12	2	1
		Paroxyna pygmaea Novak	25-Jul-10	11	2	1
		Procecidochares minuta (Snow)	4-Sep-10	2	2	1
		Trupanea sp.	25-Jul-10	2	2	1
		Trupanea actinobola (Lowe)	4-Sep-09	2	2	1
		Trupanea jonesi Curran	2-Jun-10	2	2	1
		Trupanea jonesi Curran	6-Jun-10	2	2	1
		Trupanea jonesi Curran	27-Aug-10	11	2	1
		Urophora cardui (Linnaeus)	6-Jun-10	1	2	2
	Therevidae	Ozodiceramya sp	6-Jun-10	1	2	1
		Ozodiceramya sp	15-Jul-10	12	2	1
		Ozodiceramya sp	28-Jul-10	2	4	2
		Ozodiceramya sp	23-Aug-10	2	4	1
	Tipulidae	Limonius fulvipilis Candeze	19-Jun-09	2	2	1
		Limonius nitidulus Horn	27-Jun-09	6	2	1
		Tipula sp.	2-Jun-10	1	2	2
		Tipula sp.	6-Jun-10	1	2	2
		Tipula sp.	21-Sep-10	1	2	5
		Tipula sp.	22-Sep-10	1	3	1
		Tipula sp.	10-Oct-10	2	3	2
	Trioxosceleridae	sp.	6-Jun-10	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity	
Ephemeroptera	Ulidiidae	sp.	12-Jul-10	1	2	1	
		sp.	31-Jul-10	11	4	1	
		*Euxesta sp.	25-Jul-10	2	2	1	
		Otites sp.	19-Jun-09	2	2	1	
		Otites stigma (Hendel)	12-Jul-10	11	2	1	
		Tritoxa incurva Loew	27-Aug-10	2	2	1	
	Baetidae	Baetis magnus McCafferty and Waltz	2-Jun-10	1	2	1	
		Baetis magnus McCafferty and Waltz	6-Jun-10	1	2	1	
		Callibaetis ferrugineus Walsh	25-Jul-10	2	2	29	
		Fallceon quilleri (Dodds)	6-Jun-10	2	2	6	
		Fallceon quilleri (Dodds)	6-Jun-10	12	1	48	
		Fallceon quilleri (Dodds) Reared to adults	6-Jun-10	12	1,8	76	
		Caenidae	Caenis bajaensis Allen and Murvosh	6-Jun-10	12	1	8
		Leptohyphidae	Tricorythodes explicatus (Eaton)	6-Jun-10	12	1	3
			Tricorythodes explicatus (Eaton) Reared to adult	6-Jun-10	12	1,8	1
			Tricorythodes explicatus (Eaton)	25-Jul-10	2	1	5
			Tricorythodes explicatus (Eaton)	25-Jul-10	12	2	2
			Tricorythodes explicatus (Eaton) Reared to adults	25-Jul-10	12	1,8	29
Hemiptera	Alydidae		Alydus eurinus (Say)	25-Jul-10	2	2	1
		Alydus eurinus (Say)	5-Sep-10	2	3	1	
	Aphalaridae	Craspedolepta angustipennis Crawford	5-Jun-09	2	2	1	
		Craspedolepta angustipennis Crawford	27-Jun-09	3	2	1	
		Craspedolepta angustipennis Crawford	15-Jul-10	1	2	1	
		Livia sp.	12-Jul-10	2	2	4	
		Livia sp.	12-Jul-10	12	2	2	
		Livia sp.	16-Aug-10	11	2	1	
		*Livia caricis Crawford	11-Jul-09	2	2	1	
		*Livia caricis Crawford	23-Jul-10	11	2	1	
		*Livia caricis Crawford	5-Sep-10	12	2	1	
		*Livia maculipennis Fitch	15-Jul-10	2	2	1	

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Aphididae	sp.	6-Jun-10	11	2	1
	Berytidae	Jalysus spinosus (Say)	31-Jul-10	2	4	1
		Jalysus wickhami Van Duzee	31-Jul-10	2	4	1
		Jalysus wickhami Van Duzee	4-Sep-10	12	2	1
	Blissidae	Blissus sp.	11-Jul-09	2	2	1
	Caliscelidae	Aphelonema rugosa Ball	19-Jun-09	2	2	2
		Aphelonema rugosa Ball	1-Jul-09	2	2	1
		Aphelonema rugosa Ball	4-Sep-09	2	2	1
		Brucomorpha sp.	26-Jun-09	2	3	1
		Brucomorpha sututuralis Melichar	5-Jun-09	2	2	1
	Cercopidae	*Clastophora lineatocollis group	31-Jul-10	11	4	1
		Philaenarcys bilineata (Say)	19-Jun-10	2	2	3
		Philaenarcys bilineata (Say)	12-Jul-10	2	2	5
		Philaenarcys bilineata (Say)	12-Jul-10	11	2	3
		Philaenarcys bilineata (Say)	12-Jul-10	12	2	6
		Philaenarcys bilineata (Say)	15-Jul-10	2	2	2
		Philaenarcys bilineata (Say)	15-Jul-10	12	2	2
		Philaenarcys bilineata (Say)	25-Jul-10	2	2	402
		Philaenarcys bilineata (Say)	25-Jul-10	11	2	1
		Philaenarcys bilineata (Say)	16-Aug-10	12	2	3
		Philaenarcys bilineata (Say)	23-Aug-10	11	2	3
		Philaenarcys bilineata (Say)	23-Aug-10	12	2	3
		Philaenarcys bilineata (Say)	4-Sep-10	12	2	3
	Cicadellidae	Aceratagallia sp.	29-May-10	2	2	2
		Aceratagallia sp.	12-Jul-10	11	2	1
		Anoscopus serratulae (Fabricius)	31-Jul-10	2	3	1
		*Attenuipyga (Dorycara) minor Osborn	19-Jun-09	2	2	1
		*Attenuipyga (Dorycara) minor Osborn	6-Jun-10	2	2	1
		Balclutha neglecta Delong and Davidson	29-May-10	2	2	1
		Balclutha neglecta Delong and Davidson	12-Jul-10	12	2	7
		Balclutha neglecta Delong and Davidson	25-Jul-10	2	2	823

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Balclutha neglecta Delong and Davidson	28-Jul-10	2	4	1
		Balclutha neglecta Delong and Davidson	31-Jul-10	11	4	4
		Balclutha neglecta Delong and Davidson	16-Aug-10	12	2	6
		Cuerna striatus (Walker)	12-Jul-10	12	2	2
		Cuerna striatus (Walker)	25-Jul-10	2	2	61
		Dikraneura carneola (Stal)	29-May-10	2	2	2
		Dikraneura carneola (Stal)	2-Jun-10	11	2	1
		Dikraneura carneola (Stal)	31-Jul-10	11	4	1
		Dikraneura carneola (Stal)	16-Aug-10	12	2	1
		Dikraneura carneola (Stal)	4-Sep-10	2	2	1
		Driotura gammaroides Van Duzee	19-Jun-09	2	3	1
		Draeculacephala noveboracensis Fitch	16-Aug-10	12	2	1
		*Driotura gammoides (Van Duzee)	25-Jul-10	2	2	1
		Empoasca sp.	2-Jun-10	11	4	1
		Endria inimica (Say)	18-Jul-10	2	4	1
		Gypona sp or near	4-Sep-09	2	2	2
		Hebecephalus sp.	9-Sep-09	2	3	1
		Hebecephalus sp.	31-Jul-10	2	4	1
		Hebecephalus occidentalis Beamer and Tuthill	29-May-10	11	2	1
		Hecalus sp.	8-Aug-09	2	2	1
		Hecalus sp.	4-Sep-10	2	2	1
		Hecallus near curtis (Shaw)	12-Jul-10	12	2	1
		Hecallus near curtis (Shaw)	16-Aug-10	12	2	2
		Helochara communis Fitch	2-Jun-10	2	2	4
		Helochara communis Fitch	6-Jun-10	11	2	2
		Helochara communis Fitch	16-Aug-10	12	2	2
		Idiocerus sp.	31-Jul-10	11	4	2
		Idiocerus amabilis (Bzll)	9-Sep-09	2	4	1
		Idiocerus amabilis (Bzll)	21-Sep-10	2	2	1
		Laccocera obesa Van Duzee	25-Jul-10	12	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Laevincephalus or near	15-Jul-10	11	4	1
		Limotettix frigidus (Ball)	28-Jul-10	2	4	1
		Limotettix uneolus (Ball)	31-Jul-10	11	2	1
		Macrosteles sp.	2-Jun-10	2	2	1
		Macrosteles sp.	12-Jul-10	11	2	2
		Macrosteles sp.	28-Jul-10	2	4	1
		Macrosteles sp.	31-Jul-10	11	2	1
		Macrosteles sp.	16-Aug-10	12	2	1
		Psammottix lividellus Zetterstedt	29-May-10	2	2	6
		Psammottix lividellus Zetterstedt	2-Jun-10	2	2	1
		Psammottix lividellus Zetterstedt	16-Aug-10	12	2	1
		Rosenus sp.	29-May-10	12	2	2
		Rosenus sp.	15-Jul-10	12	2	1
		Streptanus sp.	2-Jun-10	2	2	1
	Cixiidae	Cixius sp.	6-Jun-10	1	2	1
		Cixius sp.	21-Sep-10	2	2	1
	Coreidae	Chariesterus antennator Fabricius	6-Jun-10	2	2	1
		Chariesterus antennator Fabricius	25-Jul-10	2	3	1
		Chelindea vittiger (Uhler)	2-Jun-10	2	2	3
		Chelindea vittiger (Uhler)	6-Jun-10	1	2	1
	Cymidae	Cymus angustatus Stål	27-Jun-09	10	2	1
		Cymus angustatus Stål	8-Aug-09	2	2	2
		Cymus angustatus Stål	19-May-10	2	2	1
		Cymus angustatus Stål	2-Jun-10	2	2	2
		Cymus angustatus Stål	6-Jun-10	2	2	1
		Cymus angustatus Stål	12-Jul-10	1	2	1
		Cymus angustatus Stål	25-Jul-10	2	2	2
		Cymus angustatus Stål	23-Aug-10	2	2	2
		Leptoglossus clypealis Heidemann	4-Sep-10	12	2	1
	Delphacidae					

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Delphacinae	sp.	4-Sep-10	2	2	1
		Delphacodes or near	6-Jun-10	11	2	1
		Delphacodes or near	25-Jul-10	2	2	61
		Laccocera obesa Van Duzee	15-Jun-10	2	2	1
		Mocuellus caprillus Ross and Hamilton	2-Jun-10	2	2	1
		Mocuellus caprillus Ross and Hamilton	12-Jul-10	12	2	1
	Dictyopharidae	Scolops sp.	16-Aug-10	12	2	2
	Geocoridae	Geocoris uliginosa Say	4-Oct-09	2	3	1
	Gerridae	Gerris gilletti Lethierry and Severin	6-Jun-10	12	1	3
	Issidae	Calophya triozomima Schwarz	15-Jul-10	1	2	1
	Lygaeidae	Melanopleurus pyrrhopterus Stål	26-Jun-09	8	2	1
		Nysius sp.	15-May-09	12	2	1
		Nysius sp.	5-Jun-09	2	2	1
		Nysius sp.	1-Jul-09	2	2	2
		Nysius sp.	11-Jul-09	2	2	1
		Nysius sp.	9-Aug-09	2	2	2
		Nysius sp.	4-Oct-09	2	4	1
		Nysius sp.	6-Jun-10	1	2	1
		Nysius sp.	12-Jul-10	11	2	3
		Nysius sp.	15-Jul-10	11	2	3
		Nysius sp.	25-Jul-10	2	2	1
		Nysius sp.	25-Jul-10	12	2	1
		Nysius sp.	28-Jul-10	2	4	1
		Nysius sp.	27-Aug-10	2	2	2
		Nysius sp.	3-Oct-10	2	2	1
		Slaterobius insignis (Uhler)	5-Jun-09	2	2	2
		Slaterobius insignis (Uhler)	5-Jun-09	12	2	1
		Slaterobius insignis (Uhler)	19-Jun-09	2	3	1
		Slaterobius insignis (Uhler)	4-Aug-09	2	3	1
		Slaterobius insignis (Uhler)	4-Sep-09	2	2	2

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Slaterobius insignis (Uhler)	9-Sep-09	2	3	15
		Slaterobius insignis (Uhler)	26-Sep-09	2	1	1
		Slaterobius insignis (Uhler)	2-Oct-09	2	6	1
		Slaterobius insignis (Uhler)	25-Jul-10	2	3	2
		Sphragisticus nebulosus Fallen	4-Aug-09	2	3	1
		Sphragisticus nebulosus Fallen	6-Jun-10	11	2	1
		Xyonysius californicus Stål	6-Jun-10	2	2	1
		Xyonysius californicus Stål	16-Aug-10	12	2	1
	Membracidae	Campylenchia latipes (Say)	15-Jul-10	2	2	4
		Campylenchia latipes (Say)	25-Jul-10	2	2	4
		Campylenchia latipes (Say)	25-Jul-10	12	2	8
		Campylenchia latipes (Say)	16-Aug-10	2	2	1
		Campylenchia latipes (Say)	16-Aug-10	12	2	1
		Campylenchia latipes (Say)	23-Aug-10	2	2	4
		Campylenchia latipes (Say)	27-Aug-10	2	2	2
		Campylenchia latipes (Say)	4-Sep-10	2	2	1
		Publilia modesta McEvoy	5-Jun-09	2	2	1
		Publilia modesta McEvoy	4-Sep-10	2	2	1
		Stictocephala bisonia Kapp and Yorke	25-Jul-10	12	2	10
		Stictocephala bisonia Kapp and Yorke	27-Aug-10	2	2	1
		Tortistilus collina Van Duzee	2-Jun-10	2	2	2
		Tortistilus collina Van Duzee	6-Jun-10	2	2	1
		Tortistilus inermis Fabricius	8-Aug-09	2	2	2
		Tortistilus inermis Fabricius	12-Jul-10	2	2	1
		Tortistilus inermis Fabricius	25-Jul-10	2	2	7
		Tortistilus inermis Fabricius	25-Jul-10	11	2	1
	Miridae	Coquillettia insignis Uhler	26-Jun-09	2	4	1
		Coquillettia insignis Uhler	6-Jun-10	2	4	2
		Coquillettia insignis Uhler	4-Sep-10	2	2	1
		Cryptopeltocoris albofuscatus Reuter	27-Jun-09	10	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Hadronema sp.	29-May-10	2	2	2
		Hadronema sp.	5-Jun-09	2	2	6
		Hadronema sp.	29-May-10	2	2	2
		Hadronema sp.	2-Jun-10	2	2	1
		Hadronema sp.	6-Jun-10	2	2	8
		Hadronema militaris Uhler	5-Jun-09	2	2	1
		Hadronema militaris Uhler	19-Jun-10	2	2	1
		Irbisia brachycerus (Uhler)	29-May-10	2	2	2
		Irbisia brachycerus (Uhler)	29-May-10	11	2	1
		Irbisia brachycerus (Uhler)	2-Jun-10	2	2	1
		Irbisia brachycerus (Uhler)	2-Jun-10	12	2	1
		Irbisia brachycerus (Uhler)	25-Jul-10	2	3	1
		Labops sp.	29-May-10	11	2	1
		Labops sp.	29-May-10	12	2	1
		Labops hesperius Uhler	5-Jun-09	1	2	1
		Labops hesperius Uhler	5-Jun-09	2	2	1
		Labops hesperius Uhler	29-May-10	12	2	1
		Labops hesperius Uhler	6-Jun-10	1	2	1
		Metriorrhynchomiris sp.	26-Jun-09	2	2	1
		Phytocoris sp.	21-Sep-10	2	2	1
		Prepops sp.	15-Jul-10	2	2	1
		Stenodema pilosipes Kelton	5-Jun-09	2	2	1
		Stenodema pilosipes Kelton	8-Aug-09	2	2	1
		Stenodema pilosipes Kelton	6-Jun-10	2	1	2
		Stenodema pilosipes Kelton	19-Jun-10	2	2	1
		Stenodema pilosipes Kelton	12-Jul-10	2	2	1
		Stenodema pilosipes Kelton	12-Jul-10	11	2	1
		Stenodema pilosipes Kelton	12-Jul-10	12	2	1
		Stenodema pilosipes Kelton	25-Jul-10	2	2	2
		Stenodema vicinus (Provencher)	26-Jun-09	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Stenodema vicinus (Provencher)	26-Jun-09	8	2	2
		Stenodema vicinus (Provencher)	27-Jun-09	10	2	1
		Stenodema vicinus (Provencher)	1-Jul-09	2	2	1
		Stenodema vicinus (Provencher)	11-Jul-09	2	2	5
		Stenodema vicinus (Provencher)	15-Jul-09	1	2	4
		Stenodema vicinus (Provencher)	15-Jul-09	11	2	1
		Stenodema vicinus (Provencher)	15-Jul-09	12	2	1
		Stenodema vicinus (Provencher)	2-Jun-10	2	2	1
		Stenodema vicinus (Provencher)	6-Jun-10	1	2	1
		Stenodema vicinus (Provencher)	12-Jul-10	1	2	3
		Stenodema vicinus (Provencher)	12-Jul-10	11	2	2
		Stenodema vicinus (Provencher)	12-Jul-10	12	2	4
		Stenodema vicinus (Provencher)	15-Jul-10	1	2	6
		Stenodema vicinus (Provencher)	15-Jul-10	11	2	2
		Stenodema vicinus (Provencher)	15-Jul-10	12	2	1
		Stenodema vicinus (Provencher)	25-Jul-10	1	2	4
		Stenodema vicinus (Provencher)	25-Jul-10	2	2	1
	Nabidae	Nabis alternatus Parshley	26-Sep-09	2	2	1
		Nabis alternatus Parshley	29-May-10	2	2	1
		Nabis alternatus Parshley	29-May-10	12	2	1
		Nabis alternatus Parshley	6-Jun-10	2	2	1
		Nabis alternatus Parshley	6-Jun-10	2	4	1
		Nabis alternatus Parshley	6-Jun-10	12	2	1
		Nabis alternatus Parshley	25-Jul-10	12	2	2
		Nabis alternatus Parshley	31-Jul-10	2	4	2
		Nabis alternatus Parshley	21-Sep-10	2	2	1
		Nabis amerocoferus Carayon	6-Jun-10	2	2	2
	Notonectidae	Notonecta kirbyi (Hungerford)	5-Sep-10	12	2	1
		Notonecta kirbyi (Hungerford)	22-Sep-10	2	9	1
		Notonecta undulata Say	23-Aug-10	2	7	2

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Oxycarenidae	Notonecta undulata Say	22-Sep-10	2	7	1
		Crophius sp.	15-May-09	1	2	2
		Crophius sp.	5-Jun-09	2	2	5
		Crophius sp.	12-Jun-09	2	3	1
		Crophius sp.	26-Jun-09	2	2	1
		Crophius sp.	1-Jul-09	2	2	1
		Crophius sp.	11-Jul-09	2	2	2
		Crophius sp.	23-Jul-09	2	5	1
		Crophius sp.	4-Aug-09	2	3	1
		Crophius sp.	27-Aug-09	2	2	1
		Crophius sp.	4-Sep-09	2	2	5
		Crophius sp.	26-Sep-09	2	2	1
		Crophius sp.	4-Oct-09	2	3	1
		Crophius sp.	2-Jun-10	2	2	1
		Crophius sp.	6-Jun-10	2	2	3
		Crophius sp.	5-Sep-10	11	2	1
	Pentatomidae	Anthemina remota Horvath	25-Jul-10	12	2	1
		Cosmopepla lintneriana Kirkaldy	16-Aug-10	2	2	1
		Holcostethus limbolarius Stal	12-Jul-10	12	2	1
		Holcostethus limbolarius Stal	4-Sep-10	12	2	5
		Murgantia histrionica Hahn	4-Sep-10	12	2	1
		Thyanta custator (Fabricius)	12-Jul-10	1	2	1
		Thyanta custator (Fabricius)	12-Jul-10	2	2	1
		Thyanta custator (Fabricius)	12-Jul-10	12	2	2
		Thyanta custator (Fabricius)	15-Jul-10	12	2	1
		Thyanta custator (Fabricius)	25-Jul-10	2	2	1
		Thyanta custator (Fabricius)	25-Jul-10	11	2	2
		Thyanta custator (Fabricius)	25-Jul-10	12	2	1
		Thyanta custator (Fabricius)	27-Jul-10	11	2	1
		Thyanta custator (Fabricius)	16-Aug-10	12	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Psyllidae	sp.	29-May-10	2	2	2
		sp.	6-Jun-10	1	2	3
		sp.	6-Jun-10	11	2	1
		Cacopsylla maculata (Crawford)	5-Jun-09	2	2	1
		Cacopsylla maculata (Crawford)	1-Jul-09	2	2	1
		Cacopsylla maculata (Crawford)	15-Jul-09	2	4	1
		Cacopsylla maculata (Crawford)	15-Jul-09	11	4	1
		Cacopsylla maculata (Crawford)	9-Sep-09	2	4	2
		Cacopsylla maculata (Crawford)	15-Jul-10	2	4	1
		Cacopsylla maculata (Crawford)	5-Sep-10	2	4	1
		Cacopsylla ribesiae (Crawford)	4-Aug-09	2	3	1
		Cacopsylla ribesiae (Crawford)	6-Jun-10	11	2	1
		Cacopsylla ribesiae (Crawford)	6-Jun-10	12	2	2
		Cacopsylla ribesiae (Crawford)	15-Jul-10	2	4	1
		Cacopsylla ribesiae (Crawford)	31-Jul-10	2	4	1
		Calophya trizomina Swartz	15-Jul-10	11	2	1
		Trioza sp.	27-Jun-09	10	2	1
		Trioza sp.	23-Jul-09	2	4	1
		Trioza sp.	8-Aug-09	2	4	1
		Trioza sp.	29-May-10	2	2	1
		Trioza sp.	15-Jul-10	2	4	2
		Trioza sp.	15-Jul-10	11	4	3
		Trioza sp.	31-Jul-10	2	4	1
		Trioza sp.	31-Jul-10	11	4	1
		Trioza sp.	5-Sep-10	11	2	1
	Rhopalidae	Arhyssus lateralis (Say)	2-Jun-10	11	2	1
		Arhyssus lateralis (Say)	4-Sep-10	12	2	1
		Liorhyssus hyalinus Fabricius	6-Jun-10	2	2	2
		Rhopalus tigrinus Schilling	29-May-10	12	2	1
		Rhopalus tigrinus Schilling	2-Jun-10	1	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Rhopalus tigrinus Schilling	2-Jun-10	11	2	1
		Rhopalus tigrinus Schilling	12-Jul-10	12	2	8
		Rhopalus tigrinus Schilling	15-Jul-10	1	2	1
		Rhopalus tigrinus Schilling	15-Jul-10	12	2	1
		Rhopalus tigrinus Schilling	25-Jul-10	1	2	1
		Rhopalus tigrinus Schilling	25-Jul-10	12	2	1
	Salididae	Saldula sp.	6-Jun-10	1	2	1
		Saldula sp.	11-Jul-10	2	4	1
		Saldula sp.	15-Jul-10	1	2	1
		Saldula sp.	15-Jul-10	2	2	2
		Saldula sp.	15-Jul-10	2	3	1
		Saldula sp.	15-Jul-10	2	4	1
		Saldula sp.	25-Jul-10	2	3	1
	Scutelleridae	Eurygaster alternata (Say)	11-Jul-09	2	2	1
		Eurygaster alternata (Say)	6-Jun-10	11	2	1
		Homaeus bijugis Uhler	12-Jul-10	1	2	1
		Homaeus bijugis Uhler	12-Jul-10	11	2	1
		Homaeus bijugis Uhler	12-Jul-10	12	2	4
		Homaeus bijugis Uhler	25-Jul-10	2	2	2
		Homaeus bijugis Uhler	25-Jul-10	12	2	1
		Homaeus bijugis Uhler	4-Sep-10	2	2	1
		Homaeus bijugis Uhler	21-Sep-10	2	2	1
		Homaeus parvulus (Gemal)	12-Jul-10	12	2	3
		Homaeus parvulus (Gemal)	15-Jul-10	2	2	1
		Homaeus parvulus (Gemal)	25-Jul-10	2	2	1
		Homaeus parvulus (Gemal)	4-Sep-10	2	2	1
		Homaeus parvulus (Gemal)	21-Sep-10	2	2	1
	Thyreocoridae	Galgupha sp.	11-Jul-09	2	2	2
		Galgupha sp.	8-Aug-09	2	2	1
	Tingidae	Corythucha arcuata Say	1-Jul-09	2	4	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
Hymenoptera	Andrenidae	Corythucha arcuata Say	25-Jul-10	2	3	1
		Corythaica venusta (Champion)	25-Jul-10	2	3	1
		Andrena sp.	19-Jun-09	2	3	1
		Andrena sp.	27-Jun-09	6	2	1
		Andrena sp.	6-Jun-10	12	2	4
		Andrena sp.	1-Jul-10	2	2	1
		Calliopsis sp.	9-Sep-09	2	3	2
		Perdita sp.	9-Sep-09	2	3	1
		Perdita sp.	25-Jul-10	2	2	1
	Apidae	Pseudopangurus sp.	8-Aug-09	2	2	1
		Anthophora sp.	26-Sep-09	2	3	1
		Anthophora montana Cresson	25-Jul-10	12	2	3
		Anthophora walshii Cresson	26-Sep-09	2	3	1
		Bombus fervidus (Fabricius)	29-May-10	2	2	1
		Bombus fervidus (Fabricius)	22-Sep-10	2	3	1
		Bombus fraternus Smith	9-Sep-09	2	3	2
		Bombus fraternus Smith	26-Sep-09	2	3	2
		Bombus griseocollis (DeGeer)	22-Sep-10	2	3	1
		Bombus huntii Greene	29-May-10	2	2	1
		Bombus huntii Greene	10-Oct-10	2	3	1
		Bombus rufocinctus Cresson	31-Jul-10	2	3	2
		Bombus rufocinctus Cresson	31-Jul-10	2	4	3
		Ceratina neomexicana Cockerell	26-Jun-09	2	3	1
		Ceratina neomexicana Cockerell	26-Jun-09	2	4	2
		Ceratina neomexicana Cockerell	27-Jun-09	6	2	1
		Ceratina neomexicana Cockerell	9-Sep-09	2	4	1
		Ceratina neomexicana Cockerell	26-Sep-09	2	2	1
		Diadasia sp.	18-Jul-09	2	3	2
		Diadasia sp.	18-Jul-09	2	4	1
		Diadasia sp.	23-Jul-09	2	5	2

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Diadasia sp.	26-Sep-09	2	3	1
		Epeolus sp.	26-Sep-09	2	3	1
		Melissodes sp.	23-Jul-09	2	3	5
		Melissodes sp.	23-Jul-09	2	5	1
		Melissodes sp.	9-Sep-09	2	3	1
		Melissodes sp.	26-Sep-09	2	3	5
		Melissodes sp.	26-Sep-09	2	5	1
		Melissodes sp.	10-Oct-10	2	3	1
		Nomada sp.	1-Jul-09	2	2	1
		Nomada sp.	4-Sep-09	2	2	1
		Nomada sp.	29-May-10	12	2	1
		Triepeolus sp.	26-Sep-09	2	3	2
	Braconidae	Chelonus sp.	29-May-10	2	3	3
		Chelonus sp.	2-Jun-10	2	2	2
		Chelonus sp.	6-Jun-10	2	2	1
		Chelonus sp.	6-Jun-10	11	2	1
		Chelonus sp.	6-Jun-10	12	2	1
		Chelonus sp.	12-Jul-10	11	2	1
		Chelonus sp.	25-Jul-10	12	2	3
		Chelonus sp.	28-Jul-10	2	4	7
		Chelonus sp.	31-Jul-10	11	4	1
		Chelonus sp.	23-Aug-10	2	4	1
		Chelonus sp.	4-Sep-10	12	2	1
	Cephidae	Cephus cinctus Norton	2-Jun-10	11	4	1
		Cephus cinctus Norton	6-Jun-10	2	2	1
	Chalcididae	spp.	23-Aug-10	2	4	96
		sp.	4-Oct-09	2	3	1
		Brachymeria sp.	27-Aug-10	2	2	1
		Chalcis megalomis Burks	23-Sep-10	2	2	1
	Chrysididae	sp.	12-Jul-10	1	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		sp.	25-Jul-10	1	2	1
		sp.	25-Jul-10	2	2	2
		sp.	25-Jul-10	2	3	2
		sp.	25-Jul-10	11	2	1
	*Colletidae	*Colletes sp.	1-Jul-09	2	3	1
		*Colletes sp.	9-Sep-09	2	3	1
		*Hylaeus sp.	19-Jul-09	2	4	1
	Cynipidae	sp.	25-Jul-10	12	2	1
	*Diapriidae	sp.	10-Oct-10	2	3	5
	Eulophidae	sp.	25-Jul-10	2	2	1
	Formicidae	Crematogaster sp.	26-Jun-09	10	2	1
		Formica sp.	15-May-09	1	2	2
		Formica sp.	5-Jun-09	2	2	1
		Formica sp.	27-Jun-09	6	2	1
		Formica sp.	1-Jul-09	2	4	1
		Formica sp.	9-Sep-09	2	3	3
		Formica sp.	26-Sep-09	2	2	1
		Formica sp.	4-Oct-09	2	3	9
		Formica sp.	4-Oct-09	2	4	1
		Formica sp.	29-May-10	11	2	1
		Formica sp.	2-Jun-10	2	2	2
		Formica sp.	6-Jun-10	1	2	3
		Formica sp.	15-Jul-10	12	2	2
		Formica sp.	25-Jul-10	1	2	1
		Formica sp.	25-Jul-10	2	2	14
		Formica sp.	25-Jul-10	2	3	7
		Formica sp.	25-Jul-10	11	2	5
		Formica sp.	25-Jul-10	12	2	23
		Formica sp.	28-Jul-10	2	3	18
		Formica sp.	31-Jul-10	11	3	3

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Formica sp.	23-Aug-10	2	2	2
		Formica sp.	27-Aug-10	2	3	5
		Formica sp.	4-Sep-10	2	2	3
		Formica sp.	21-Sep-10	2	2	1
		Formica sp.	3-Oct-10	2	2	6
		Formica sp.	10-Oct-10	2	3	3
		Formica coloradensis rufa Creighton	25-Jul-10	2	2	1
		Formica obscuripes Forel	6-Jun-10	2	2	1
		Formica obscuripes Forel	25-Jul-10	2	2	24
		Formica pallidefulva group	10-Oct-10	2	3	14
		Lasius sp.	4-Oct-09	2	4	1
		*Lasius (Acanthomyops) latipes (Walsh)	5-Sep-10	2	3	1
		Monomorium minimum (Buckley)	9-Sep-09	2	3	1
		Myrmica brevispinosa Wheeler	4-Sep-09	2	3	1
		Myrmica brevispinosa Wheeler	29-May-10	2	2	12
		Myrmica brevispinosa Wheeler	12-Jun-09	2	2	1
		Myrmica brevispinosa Wheeler	4-Aug-09	2	3	1
		Myrmica brevispinosa Wheeler	9-Sep-09	2	3	1
		Myrmica brevispinosa Wheeler	26-Sep-09	2	3	4
		Myrmica brevispinosa Wheeler	4-Oct-09	2	3	1
		Myrmica brevispinosa Wheeler	28-Jul-10	2	2	1
		Myrmica brevispinosa Wheeler	31-Jul-10	11	2	5
		Pheidole sp.	26-Sep-09	2	3	2
		Pheidole sp.	4-Oct-09	2	3	2
		Pheidole sp.	25-Jul-10	2	2	24
		Tapinoma sessile (Say)	26-Sep-09	2	3	1
		Tapinoma sessile (Say)	4-Oct-09	2	3	5
		Tapinoma sessile (Say)	4-Oct-09	12	2	4
	Halictidae	Agapostemon angelicus or texanus	26-Jun-09	2	4	1
		Agapostemon angelicus or texanus	11-Jul-09	2	4	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Agapostemon texanus Cresson	19-Jun-09	2	3	1
		Agapostemon texanus Cresson	2-Jun-10	12	2	1
		Agapostemon texanus Cresson	12-Jul-10	1	2	1
		Agapostemon texanus Cresson	12-Jul-10	2	2	1
		Agapostemon texanus Cresson	12-Jul-10	11	2	1
		Agapostemon texanus Cresson	25-Jul-10	11	2	1
		Agapostemon texanus Cresson	10-Oct-10	2	3	6
		Agapostemon virescens (Fabricius)	10-Oct-10	2	3	1
		Dialictus sp.	26-Jun-09	2	2	1
		Dialictus sp.	1-Jul-09	2	2	1
		Dialictus sp.	23-Jul-09	2	5	1
		Halictus confusus Smith	12-Jun-09	2	3	1
		Halictus confusus Smith	19-Jun-09	2	3	1
		Halictus confusus Smith	1-Jul-09	2	3	1
		Halictus confusus Smith	9-Sep-09	2	3	7
		Halictus confusus Smith	26-Sep-09	2	3	7
		Lasioglossum sp. SI	25-Jul-10	2	2	2
		Lasioglossum sp. SS	12-Jul-10	11	2	10
		Lasioglossum pavonotus Cockerell	29-May-10	2	2	5
		Sphecodes sp.	8-Aug-09	2	2	3
		Sphecodes sp.	9-Sep-09	2	3	3
	Ichneumonidae	Coccygomimus pedalis Cresson	12-Jun-09	2	2	1
		Coccygomimus pedalis Cresson	1-Jul-09	2	2	1
		Coccygomimus pedalis Cresson	6-Jun-10	2	2	1
		Ichneumon laetus Brulle	25-Jul-10	2	2	1
		Ophion bilineata Say	2-Jun-09	1	2	1
		Ophion bilineata Say	6-Jun-10	2	4	2
		Ophion bilineata Say	12-Jun-09	2	2	3
		Ophion bilineata Say	26-Jun-09	2	2	1
		Ophion bilineata Say	26-Jun-09	2	4	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Ophion bilineata Say	27-Jun-09	10	2	2
		Ophion bilineata Say	1-Jul-09	2	2	2
		Ophion bilineata Say	11-Jul-09	2	4	2
		Ophion bilineata Say	4-Sep-09	2	2	1
		Ophion bilineata Say	15-Jul-10	11	4	1
		Therion longipes Provancher	26-Jun-09	2	4	1
		Therion longipes Provancher	4-Sep-10	12	2	1
	Megachilidae	Anthidium sp.	9-Sep-09	2	3	1
		Ceratina sp.	10-Oct-10	2	3	1
		Dianthidium sp.	18-Jul-09	2	4	1
		Dianthidium sp.	4-Sep-09	2	3	1
		Dianthidium sp.	9-Sep-09	2	3	1
		Dianthidium sp.	26-Sep-09	2	3	1
		Hoplitis sp.	12-Jun-09	2	3	1
		Hoplitis sp.	27-Jun-09	6	2	1
		Hoplitis *fulgida Cresson	1-Jul-09	2	4	1
		Lithurge apicalis Cresson	11-Jul-09	2	4	1
		Lithurge apicalis Cresson	18-Jul-09	2	4	1
		Lithurge apicalis Cresson	25-Jul-10	2	2	1
		Megachile sp.	1-Jul-09	2	3	1
		Megachile sp.	18-Jul-09	2	4	1
		Megachile sp.	26-Sep-09	2	3	1
		Osmia sp.	12-Jun-09	2	2	2
		Osmia sp.	12-Jun-09	2	3	1
		Osmia sp.	1-Jul-09	2	3	1
		*Stelis sp.	1-Jul-09	2	4	1
	Mutillidae	sp.	26-Sep-09	2	3	1
		sp.	4-Oct-09	2	3	1
		Dasymutilla vestita (Lepeleiter)	4-Sep-09	2	3	4
		Pseudomethoca frigidus Smith	26-Sep-09	2	3	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
	Pompilidae	Pseudomethoca propinqua (Cresson)	12-Jun-09	2	3	1
		Anophilus (ss) dreisbachi Evans	5-Jun-09	2	2	1
		Anophilus (ss) dreisbachi Evans	1-Jul-09	2	2	1
		Anophilus (ss) dreisbachi Evans	11-Jul-09	1	2	1
		Anophillus (A.) marginata Say	1-Jul-09	2	2	1
		Arachnospila arcta (Cresson)	19-Jun-09	2	2	1
		Arachnospila (D.) dakota (Dreisbach)	26-Jun-09	10	2	1
		Arachnospila (D.) dakota (Dreisbach)	8-Aug-09	2	4	1
		Arachnospila (D.) dakota (Dreisbach)	23-Aug-09	2	4	1
		Ceropales brevicornis Patton	5-Sep-10	2	3	1
		Cryptocheilus idoneum Banks	9-Sep-09	2	4	1
		Episyron oregon Evans	19-Jun-09	2	2	1
		Episyron oregon Evans	26-Jun-09	2	4	1
		Episyron oregon Evans	1-Jul-09	2	4	1
	Sphecidae	Ammophila sp.	5-Sep-10	2	3	1
		Ammophila azteca Cameron	23-Jul-10	11	2	2
		Ammophila azteca Cameron	5-Sep-10	2	3	1
		Ammophila placida Smith	20-Jul-09	2	5	1
		Ammophila kennedyi Murray	26-Jun-09	2	4	1
		Ammophila kennedyi Murray	11-Jul-09	2	4	1
		Ammophila kennedyi Murray	22-Aug-09	2	2	1
		Ammophila kennedyi Murray	9-Sep-09	2	3	2
		Ammophila kennedyi Murray	26-Sep-09	2	3	1
		Ammophila kennedyi Murray	31-Jul-10	2	3	1
		Ammophila kennedyi Murray	23-Aug-10	2	3	1
		Ammophila kennedyi Murray	27-Aug-10	2	3	1
		Ammophila kennedyi Murray	28-Aug-10	2	3	1
		Astata nubecula Cresson	11-Jul-09	2	2	1
		Bembix sayi Cresson	25-Jul-10	2	2	1
		Bembix sayi Cresson	25-Jul-10	12	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Bembix sayi Cresson	31-Jul-10	2	4	2
		Crabro lacteipennis Rohwer	9-Sep-09	2	3	1
		Crossocerus impressifrons Smith	11-Jul-09	2	4	1
		Ectemnius dialectus Cresson	26-Jun-09	2	4	1
		Ectemnius dialectus Cresson	7-Jul-09	2	3	1
		Ectemnius dialectus Cresson	11-Jul-09	2	2	1
		Ectemnius dialectus Cresson	27-Aug-09	2	3	1
		Ectemnius dialectus Cresson	9-Sep-09	2	3	1
		Ectemnius rufifemur Packard	1-Jul-09	2	4	1
		Eucerceris cressoni (Schletterer)	15-Jul-10	11	2	1
		Eucerceris cressoni (Schletterer)	25-Jul-10	2	3	1
		Mimesa sp. near cheyenne or uncinata	15-Jul-10	11	2	1
		Mimesa cressoni Packard	4-Sep-09	2	2	1
		Philanthus crabroniformis Smith	9-Sep-09	2	3	1
		Podalonia argentifrons (Cresson)	1-Jul-09	2	2	2
		Podalonia argentifrons (Cresson)	25-Jul-10	2	2	1
		Podalonia argentifrons (Cresson)	25-Jul-10	11	2	1
		Podalonia atriceps Smith	12-Jul-09	2	3	1
		Podalonia atriceps Smith	11-Jul-09	2	2	1
		Podalonia atriceps Smith	26-Sep-09	2	3	2
		Podalonia luctuosa Smith	11-Jul-09	2	4	2
		Podalonia luctuosa Smith	15-Jul-10	11	4	1
		Podalonia mickeli Murray	26-Jun-09	2	4	1
		Podalonia mickeli Murray	25-Jul-10	2	3	1
		Podalonia valida (Cresson)	9-Sep-09	2	3	1
		Podalonia valida (Cresson)	10-Oct-10	2	3	2
		Prionyx canadensis (Provencher)	8-Aug-09	2	4	1
		Prionyx canadensis (Provencher)	9-Sep-09	2	3	1
	Tenthredinidae	Aphilodyctium fidus (Cresson)	26-Jun-09	2	4	1
		Dolerus sp.	5-Jun-09	2	2	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
Lepidoptera	Tiphidae	Pachynematus aurantiacus Marlatt	2-Jun-10	2	2	1
		Pachynematus jamesi Ross	27-Jun-09	10	2	3
		Pachynematus jamesi Ross	1-Jul-09	2	2	1
		Pachynematus jamesi Ross	23-Jul-09	2	5	1
		Pachynematus kirbyi (Dahlbom)	27-Jun-09	10	2	1
		Acanthetropis aequalis Fox	15-Jul-10	1	4	1
		Acanthetropis aequalis Fox	25-Jul-10	2	3	1
		Acanthetropis aequalis Fox	25-Aug-10	2	4	1
	Vespididae	Euodynerus annulatus (Say)	29-May-10	11	4	1
		Euodynerus annulatus (Say)	31-Jul-10	2	4	1
		Euodynerus annulatus (Say)	31-Jul-10	11	3	1
		Leptochilus rufinodius (Cresson)	9-Sep-09	2	4	1
		Polistes fuscata Fabricius	23-Aug-10	2	4	1
	Hesperiidae	Stenodynerus anormis (Say)	15-Jul-10	11	2	1
		Hesperia juba (Scudder)	27-Aug-10	2	3	4
		Hesperia juba (Scudder)	28-Aug-10	2	2	1
		Pyrgus communis Grote	28-Jul-10	2	2	1
		Pyrgus communis Grote	5-Sep-10	11	2	1
	Lycaenidae	Plebejus melissa (Edwards)	6-Jun-10	2	2	9
		Plebejus melissa (Edwards)	31-Jul-10	11	4	2
	Nymphalidae	Coenonympha tullia (Muller)	6-Jun-10	2	2	1
	Pieridae	Colias alexandra Edwards	29-May-10	2	2	1
		Colias eurytheme Boisduval	5-Jun-10	11	2	4
		Colias eurytheme Boisduval	28-Jul-10	11	2	5
		Colias philodice (Godart)	29-May-10	11	2	1
		Euchloe olympia Edwards	29-May-10	2	2	1
		Pontia occidentalis Reakirt	29-May-10	2	2	1
		sp.	28-Jul-10	11	4	1
Mantodea	Mantidae	Litaneutria minor (Scudder)	31-Jul-10	2	3	1
		Litaneutria minor (Scudder)	9-Sep-09	2	3	1

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
Neuroptera	Chrysopidae	Chrysopa nigricornis Burmeister	2-Jun-10	2	2	1
		Chrysopa nigricornis Burmeister	6-Jun-10	2	2	1
		Chrysopa nigricornis Burmeister	6-Jun-10	11	2	1
		Chrysopa nigricornis Burmeister	6-Jun-10	12	2	1
		Chrysopa nigricornis Burmeister	12-Jul-10	1	2	1
		Chrysopa nigricornis Burmeister	15-Jul-10	1	2	2
		Chrysopa nigricornis Burmeister	15-Jul-10	11	2	2
		Chrysopa nigricornis Burmeister	25-Jul-10	11	2	1
		Chrysopa nigricornis Burmeister	25-Jul-10	12	2	1
		Chrysopa nigricornis Burmeister	31-Jul-10	2	4	1
		Chrysopa nigricornis Burmeister	8-Aug-10	2	2	1
		Eremochrysa sp.	5-Sep-10	2	4	1
	Hemerobiidae	Hemerobius sp.	6-Jun-10	2	2	1
		Hemerobius sp.	5-Sep-10	2	4	1
		Hemerobius sp.	3-Oct-10	2	2	1
		*Wesmaelius sp.	5-Sep-10	2	4	1
	Myrmeleonitidae	Brachynemurus abdominalis (Say)	11-Jul-09	2	2	1
		Brachynemurus abdominalis (Say)	25-Jul-10	2	2	1
		Brachynemurus abdominalis (Say)	28-Jul-10	2	4	1
		Brachynemurus abdominalis (Say)	28-Jul-10	11	4	1
		Brachynemurus abdominalis (Say)	31-Jul-10	2	4	4
		Brachynemurus nigrilabris Hagen	28-Jul-10	11	4	1
Odonata	Aeshnidae	Aeshna palmata Hagen	25-Jul-10	2	2	1
		Aeshna palmata Hagen	5-Sep-10	2	2	1
	Coenagrionidae	Amphiagrion abbreviatum Selys	6-Jun-10	12	1	2
		Amphiagrion abbreviatum Selys	2-Jun-10	1	2	1
		Amphiagrion abbreviatum Selys	6-Jun-10	2	2	8
		Amphiagrion abbreviatum Selys	6-Jun-10	12	2	1
		Amphiagrion abbreviatum Selys	12-Jul-10	2	2	9
		Amphiagrion abbreviatum Selys	25-Jul-10	2	2	16

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
Orthoptera	Lestidae Libellulidae	Amphiagrion abbreviatum Selys	25-Jul-10	12	2	15
		Argia alberta Kennedy	23-Aug-10	2	2	1
		Ischnura sp.	22-Sep-10	2	9	1
		Lestes congener Hagen	4-Sep-10	2	2	1
		Sympetrium obtrusum (Hagen)	4-Sep-10	2	2	1
		Sympetrium semicinctum (Say)	25-Jul-10	2	2	1
		Sympetrium semicinctum (Say)	25-Jul-10	12	2	1
		Sympetrium semicinctum (Say)	5-Sep-10	2	2	2
	Acrididae	Ageneotetix decorum (Scudder)	25-Jul-10	12	2	1
		Arphia conspersa Scudder	10-Oct-10	2	3	2
		Arphia pseudonietana (Thomas)	10-Oct-10	2	3	2
		Camnula pellucida Scudder	25-Jul-10	11	2	1
		Camnula pellucida Scudder	4-Sep-10	12	2	1
		Chorthippus curtipennis (Harris)	25-Jul-10	11	2	2
		Chorthippus curtipennis (Harris)	4-Sep-10	2	2	1
		Chorthippus curtipennis (Harris)	4-Sep-10	12	2	1
		Chorthippus curtipennis (Harris)	5-Sep-10	2	3	1
		Chorthippus curtipennis (Harris)	5-Sep-10	11	2	2
		Chorthippus curtipennis (Harris)	21-Sep-10	12	2	1
		Chorthippus curtipennis (Harris)	23-Sep-10	11	2	1
		Dissosteira carolina (Linnaeus)	10-Oct-10	2	3	1
		Encoptolophus costalis (Thomas)	4-Oct-09	2	3	1
		Hesperotettix viridis (Scudder)	23-Aug-10	11	2	1
		Melanoplus sp.	23-Aug-10	11	2	1
		Melanoplus bivittatus (Say)	23-Aug-10	11	2	3
		Melanoplus bivittatus (Say)	4-Sep-10	2	2	1
		Melanoplus femurrubrum (DeGeer)	23-Aug-10	2	4	1
		Melanoplus femurrubrum (DeGeer)	23-Aug-10	11	2	4
		Melanoplus femurrubrum (DeGeer)	4-Sep-10	2	2	2
		Melanoplus femurrubrum (DeGeer)	4-Sep-10	12	2	2

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Melanoplus femurrubrum (DeGeer)	5-Sep-10	11	2	1
		Melanoplus infantilis Scudder	3-Oct-10	2	2	1
		Melanoplus sanguinipes (Fabricius)	23-Aug-10	2	3	1
		Melanoplus sanguinipes (Fabricius)	23-Aug-10	11	2	1
		Melanoplus sanguinipes (Fabricius)	4-Sep-10	2	2	1
		Melanoplus sanguinipes (Fabricius)	21-Sep-10	2	2	1
		Melanoplus sanguinipes (Fabricius)	22-Sep-10	2	4	1
		Melanoplus sanguinipes (Fabricius)	22-Sep-10	2	4	1
		Melanoplus sanguinipes (Fabricius)	10-Oct-10	2	3	3
		Opeia obscura (Thomas)	23-Aug-10	11	2	1
		Psoloessa delicatula (Scudder)	6-Jun-10	2	2	1
		Psoloessa delicatula (Scudder)	23-Aug-10	2	2	1
	Gryllidae	Gryllus sp.	5-Sep-10	2	3	1
	Oecanthidae	Oecanthus quadripunctatus Beutenmuller	8-Aug-09	2	2	1
		Oecanthus quadripunctatus Beutenmuller	4-Sep-09	2	2	1
		Oecanthus quadripunctatus Beutenmuller	26-Sep-09	2	3	1
	Tetrigidae	Tetrix ornata (Say)	25-Jul-10	2	3	4
		Tetrix ornata (Say)	31-Jul-10	2	3	1
		Tetrix ornata (Say)	27-Aug-10	2	3	1
		Tetrix ornata (Say)	22-Sep-10	2	3	2
		Tetrix ornata (Say)	10-Oct-10	2	3	1
		Tetrix subalata (Linnaeus)	6-Jun-10	12	2	1
	Tettigoniidae	Conocephalus fasciata De Geer	8-Aug-09	2	2	1
		Conocephalus fasciata De Geer	23-Aug-10	2	2	1
		Conocephalus fasciata De Geer	5-Sep-10	2	2	1
Phasmatodea	Phasmatidae	Parabacillus hesperus Hebard	25-Jul-10	12	2	1
Plecoptera	Nemouridae	*Malenka coloradensis (Banks)	29-May-10	1	1	1
Trichoptera	Helicopsychidae	*Helicopsyche n. sp.	8-Aug-10	2	4	1
	Hydropsychidae	Cheumatopsyche analis (Banks)	6-Jun-10	2	4	1
		Cheumatopsyche analis (Banks)	6-Jun-10	12	1	2

Order	Family	Scientific Name	Date Collected	Site Number	Collection Method	Quantity
		Cheumatopsyche analis (Banks)	25-Jul-10	12	2	5
	Leptoceridae	Oecetis disjuncta (Banks)	15-Jul-10	2	4	1
		Oecetis disjuncta (Banks)	25-Jul-10	2	2	4
		Oecetis disjuncta (Banks)	23-Aug-10	2	2	1
		Oecetis disjuncta (Banks)	27-Aug-10	2	2	1
	Limnephilidae	Hesperophylax designatus (Walker)	6-Jun-10	1	2	1
		Hesperophylax designatus (Walker)	5-Sep-10	2	2	2
		Hesperophylax occidentalis (Banks)	6-Jun-10	1	2	1
		*Limnephilus acnestus Ross	29-May-10	11	2	1
		*Limnephilus acnestus Ross	6-Jun-10	1	2	2
		*Limnephilus acnestus Ross	6-Jun-10	2	4	1
		*Limnephilus acnestus Ross	6-Jun-10	11	2	7
		*Limnephilus acnestus Ross	6-Jun-10	11	4	2
		*Limnephilus acnestus Ross	15-Jul-10	11	4	1
		Limnephilus diversus (Banks)	6-Jun-10	2	4	2
		Limnephilus diversus (Banks)	6-Jun-10	11	2	1
		Limnephilus diversus (Banks)	6-Jun-10	12	2	1
		Limnephilus diversus (Banks)	23-Aug-10	2	2	8
		Limnephilus diversus (Banks)	5-Sep-10	2	2	4
		Limnephilus frijole Ross	23-Aug-10	2	2	1
		Limnephilus spinatus Banks	23-Aug-10	2	2	7
		Limnephilus spinatus Banks	27-Aug-10	2	2	1
		Limnephilus spinatus Banks	5-Sep-10	2	2	1
Thysanoptera	Phlaeothripidae	Haplothrips sp.	25-Jul-10	2	3	5

*Uncommonly collected