

MONTANA FISH, WILDLIFE & PARKS PROJECT PERFORMANCE REPORT

STATE: Montana
GRANT TITLE: Native Prairie Fish Survey and Inventory (2006)
PERIOD COVERED: November 1, 2005 through December 31, 2006
DATA COLLECTION: Region 4 (Lucas Bateman, Toby Tabor)
Region 5 (Mike Burda, Kayhan Ostovar),
Region 6 (Bob Lipscomb, Nick Wormgoor),
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(Photographs by K. Ostovar)
Date: February 15, 2007

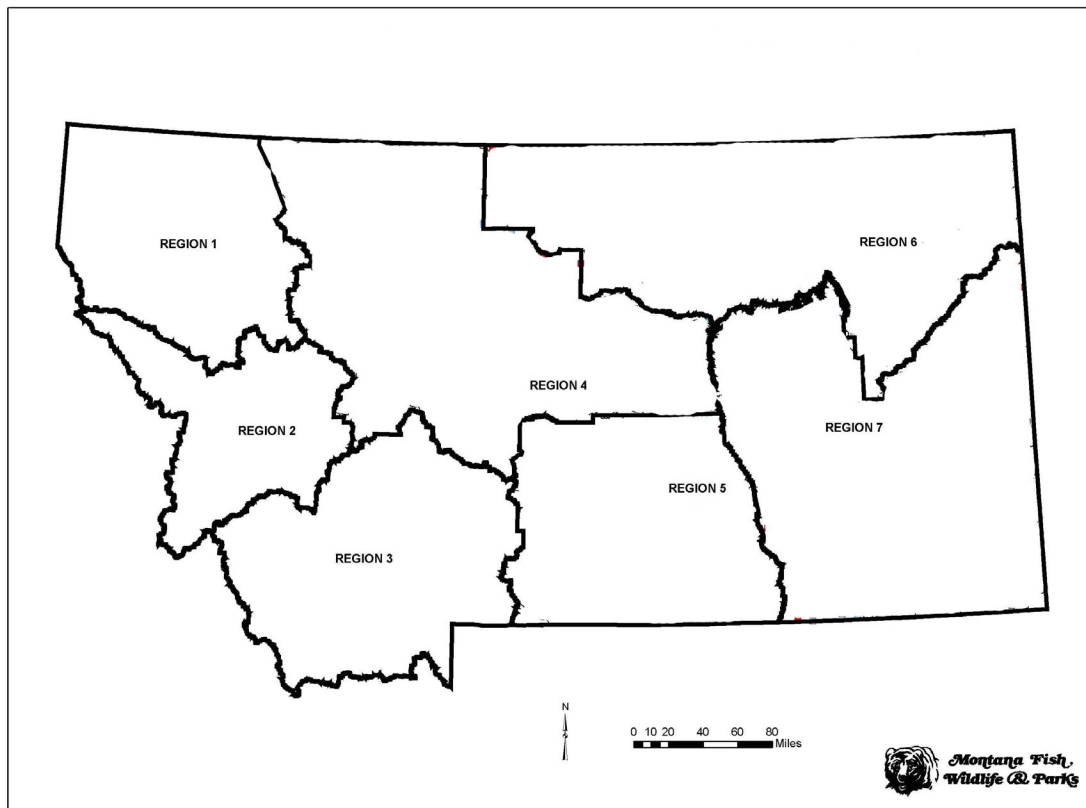


M. Burda on Simmons Creek, Region 5.

Introduction

In 2002, an analysis of Montana Fish, Wildlife and Park's (FWP) Montana Rivers Information System (MRIS) database revealed that more than 4,200 prairie streams, comprising more than 18,000 stream miles in the Montana database, had not been surveyed. The overwhelming majority of these waters are small, warm-water prairie streams located in the eastern half of Montana. (Figure 1 – FWP Regions 4,5,6,7 undertook this survey effort.) Prairie streams are a highly endangered resource (Dodds et al. 2004) in one of the most endangered biomes on the North American continent (Samson and Knopf 1994). There is a strong likelihood that many contain intact, diverse assemblages of native fish, reptiles and amphibian species. Therefore, it was decided that it was important to survey these prairie streams to gain a greater understanding of the fisheries fauna and herpetofauna that occur there. After four years of survey work, a large amount of baseline information has been collected. Some of this information has already been used to generate a comprehensive plan that FWP agreed to develop in compliance with the State Wildlife Grants Program (SWiG). This baseline data will also enable resource managers to better understand and manage prairie species and their habitats (McDonald, 2003).

Figure 1.
Montana Fish, Wildlife and Parks Regions 4, 5, 6 and 7 in eastern Montana.



While some regions still have streams that have not been surveyed, a majority of the streams have been surveyed on at least one site. Some regions decided to gain a better understanding of temporal and elevation differences on species distribution in streams. This was accomplished by setting up multiple sample sites from the mouth to the headwaters and sampling them during different seasons. The results from four years of surveys have raised further questions about prairie fish species assemblages and herpetofauna distributions in eastern Montana. Most importantly, it is now much easier to see where gaps in our knowledge base still exist, and what threats to the fauna are currently present in this ecosystem.

Objective

The primary objective of this project was to inventory and document the occurrence and distribution of native fish species in prairie streams of eastern Montana, and to gather baseline data for developing Montana's comprehensive fish and wildlife plan (McDonald, 2003). A secondary objective was to determine the presence and distribution of reptile and amphibian species in order to better complete the FWP and National Heritage Program's joint Point Observation Database (POD).

Expected Results and Benefits

The expected benefits of this project included:

- Filling in data gaps on distribution and occurrence of native prairie fish, as well as amphibians and reptiles.
- Determining where intact assemblages of native fish species occur.
- Increasing knowledge about the distribution of sensitive species.
- Gathering information on the spatial and temporal use of prairie streams by native fish.
- Gathering baseline data to respond to resource pressures such as land management practices, coal bed methane extraction, bait fish seining and urbanization (McDonald, 2003).

Methods

FWP technicians from administrative Regions 4, 5, 6 and 7 originally set out to survey randomly selected sites. However, it became apparent after the first couple of years that time was wasted with this technique since many of the sites turned out to be dry. Due to an extended drought, it was decided to first survey and scout for sites with water, either on public lands or to seek permission from private landowners, before designating a survey site. Field technicians obtained permission to access sample sites on private land by telephoning or personally meeting with landowners and explain basic survey information. If access was denied or if a site was dry, BLM maps were used to determine the nearest access to a wet section on public land or the Montana Cadastral Mapping Program (<http://gis.doa.state.mt.us/>) was used to determine other landowners to contact on the same drainage.

FWP fisheries staff from all four regions chose survey sites within their region based on various factors. Sites located on public lands that were easily accessible by county roads were sampled. Fisheries staff also chose sample sites in order to update historical data. Each administrative region chose specific sample sites to further the knowledge of land management and stream use. Region 4 selected primarily new sites that had not been previously sampled, although they did resample five streams at different locations and times. From the species composition at their sites it also appears they were looking at the prairie fish/mountain stream transition zone at many of their sites (Tabor 2006). Region 5 included many streams that traditionally serve as irrigation returns to attempt to understand the impact of irrigation and urbanization on species distribution in their region. Region 5 also extended their sampling season until the end of October to survey many of these streams after the ditch water had been shut off. Region 6 focused heavily on better understanding the Redwater River system within their region with over 40% of the fish captured coming from this river. In order to facilitate sampling on a larger body of water they utilized a variety of techniques including boom shocking and gill nets. Region 7 continued to survey new sites within their region as well as focusing on the Powder River Coalbed Methane Basin (CBM) streams, which are currently, or may be, subject to CBM discharge water

After access was granted, sites were located using a Garmin eTrex Vista GPS and BLM maps. Longitude and latitude were taken at the middle of the survey area and pictures of the site were taken with a digital camera. If water was located a survey perimeter of 300 meters was marked off and fish and habitat sampling were completed following Bramblett's prairie stream sampling protocol (2002) (Appendix B). Water quality sampling varied by region but may have included one or all of the following parameters: conductivity, dissolved oxygen, salinity, pH and temperature. All water quality sampling was completed prior to fish sampling in order to ensure accurate readings. Fish were surveyed at each site using, one of three, ¼" mesh seines that was appropriate for the depth and width of the stream channel. A total of 300 meters of the stream was seined at each wetted site. Captured fish were identified using, A Field Guide to Montana

Fishes (Holton and Johnson 2003). Lengths (mm) from 20 randomly selected individuals of each species were recorded. For all unknown fish, *Hybognathus sp.* and *Phoxinus sp.* at least twenty voucher specimens were preserved to take to the lab for later identification. Amphibians and reptiles caught in the seine were identified, counted, documented, and released. All herpetological observations made during the fish and habitat sampling portions of the survey were recorded. Amphibians and Reptiles of Montana (Werner et al. 2004), was used for reference in reptile and amphibian identification. Examination of habitat variables included measuring channel dimension as well as substrate size and type. All of the fish, amphibian, reptile and habitat data was recorded on “Rite in the Rain” data sheets (Appendix C).

Results

The prairie stream field season began in March and ended at the end of October. In about eight months 502 sample sites were visited. Sixty seven percent of the sites were located on private property. The remaining sites were located on Bureau of Land Management (BLM), State, United States Fish and Wildlife Service, National Forest Service and National Park Service Lands. In general, access to private land was granted and only refused five times in all regions combined. Where water was present, fish or herps were located over 80% of the time. Of the 502 sites, 306 contained either fish or herps (Table 1). The data from these 306 sites is listed in detail by region and alphabetically by stream and site number (Appendix A).

Table 1.

2006 PRAIRIE STREAM SUMMARY STATISTICS BY REGION

	R-4	R-5*	R-6	R-7	Total
# of Sites Visited	143	126	131	102	502
# of Sites with Water and Fish and/or Herps **	61	98	90	57	306
#Sites with Water and Fish	56	93	70	48	267
# of Dry Sites	66	20	40	35	161
# of Sites with Water and Nothing Found	21	8	21	11	61
# of Sites where Access Denied	1	3	1	N/A	5
# of Private Sites	113	91	63	70	337
# of Public Sites	30	34	68	32	164
 M. Burda and K. Ostovar seining a side channel, Yellowstone River  Great plains toad – Region 5					
Total # of Fish Sampled	17,669	71,376	59,128	16,711	164,884
Total # Nonnative Fish	482	5,064	609	2,582	8,737
Total # Fish Species	20	35	30	29	45
Total # Native Fish Species	11	21	24	20	27
Percent Native Fish	97.28%	92.91%	98.97%	84.55%	93.43%
Sites with Greater than 25% Nonnative Fish	5	10	3	6	24
Sites with 100% Native Fish Species	36	32	38	23	129
Total # Herpetofauna Species from Sites	5	16	8	10	16

*Two sample sites located within Region 7 boundaries on Tulluck Creek to assist Region 7. See Table 2 for a recalculation of these numbers by region.

** These sites are listed alphabetically by stream and region in data sheets in Appendix A.

Nonnative Fish

A total of 164,884 fish were sampled. The number of fish species recorded per region ranged from a low of 20 in Region 4 to a high of 35 in Region 5 (Table 1). Forty five species of fish were found in all four regions combined. Eighteen species or 6.57% are nonnative to Eastern Montana. Of the 6.57% nonnative fish, 30.87% was composed of green sunfish, 25.36% plains killifish, 18% black bullheads and 14.88% common carp. It is clear that a small number of streams have high numbers of established nonnative fish populations (Sites with greater than 25% nonnative fish are located in only 24 of the 306 sites with fish and/or herps).

Two of these sites with a high number of nonnative fish were surveyed by Region 5 in the territory of Region 7 in order to assist their effort. They were located on Tulluck Creek, which is dominated (59%) by nonnative species such as, common carp, green sunfish, pumpkinseeds, plains killifish and black bullheads. When considering levels of nonnative species presence by region, Tulluck Creek, should be considered part of Region 7 (Table 2, Figure 3).

Table 2.

Native Species Composition for Region 5 and 7.
Tulluck Creek Data included within Region 7 Summary.
For regional evaluations these figures should be used.

	Reg 5	Reg 7
Total # of Fish Sampled	66,619	21,468
Total # Nonnative Fish	2,257	5,389
Total # Fish Species	34	29
Percent Native Fish	96.61%	74.90%
Sites with Greater than 25% Nonnative Fish	8	8

Juvenile channel catfish from
Pryor Creek, Region 5



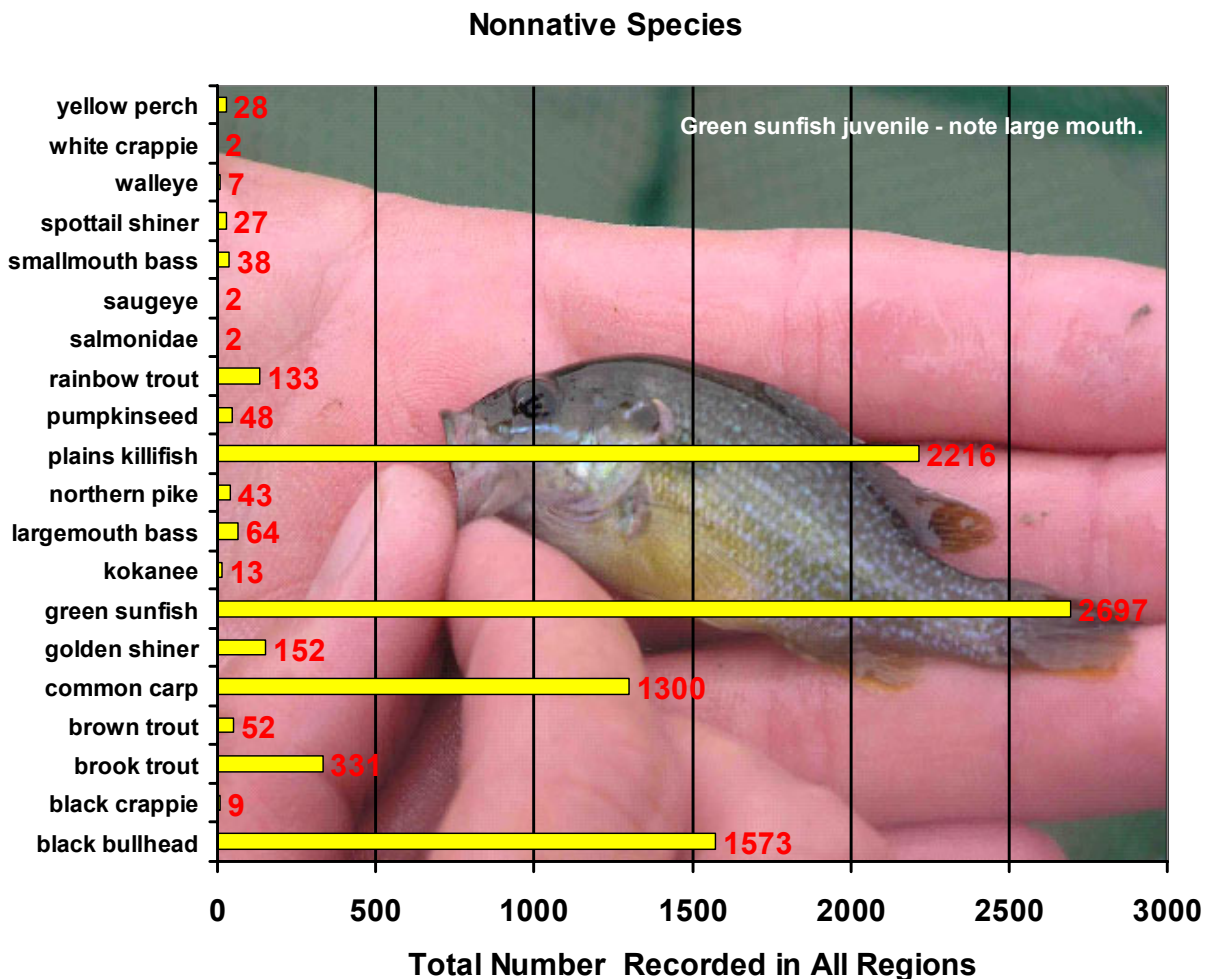
Region 7 had one of the highest numbers of sites with greater than 25% nonnative fish and the highest percentage of nonnative species, with over 25% of all fish found in Region 7 identified as nonnative. The most invasive nonnative species by number in all regions was the green sunfish (2697), with plains killifish (2216), black bullheads (1573) and common carp (1300) not far behind. Green sunfish, plains killifish and black bullheads were often found at high concentrations when they were found (Table 2, 3, and Figure 2, 3).

Figure 2. Common carp caught while spawning in upper Razor Creek, Region 5.



The highest number of nonnative species (seven) recorded at a site was in Region 5 at the mouth of Alkali Creek. Region 7 had six nonnative species recorded at the South Fork of Sandstone Creek and five nonnative species recorded at Smith Creek (Appendix A).

Figure 3. Nonnative species numbers.



Green sunfish were present in all four regions, while black bullheads were not found in Region 4 but present in 5, and 6 and very high in 7. Plains killifish had high numbers but were found only in Region 7. Common carp were by far the most widely distributed nonnative species to be recorded and were found in all four regions, although fairly low in Region 4. Common carp were found at more than 29% of all survey sites containing fish (78 sites out of 267). (Figure 3)

Other nonnative species were found at much lower numbers and had fairly patchy distributions. Yellow perch were found in Regions 4, 5 and 7 only, and golden shiners were only recorded in regions 4 and 7. Spottail shiners were only recorded in Region 4. Largemouth bass were only common in Region 7 and smallmouth bass were regularly recorded from the Musselshell River in Region 5. Only Region 6 and 7 had records of northern pike. Region 4 and 5 recorded brown trout, brook trout and rainbow trout in several streams. This is most likely due to the higher elevation of the locations of some of their samples. Region 5 also picked up kokanee in the drain from Deadman's Basin, which connects to the Musselshell River.

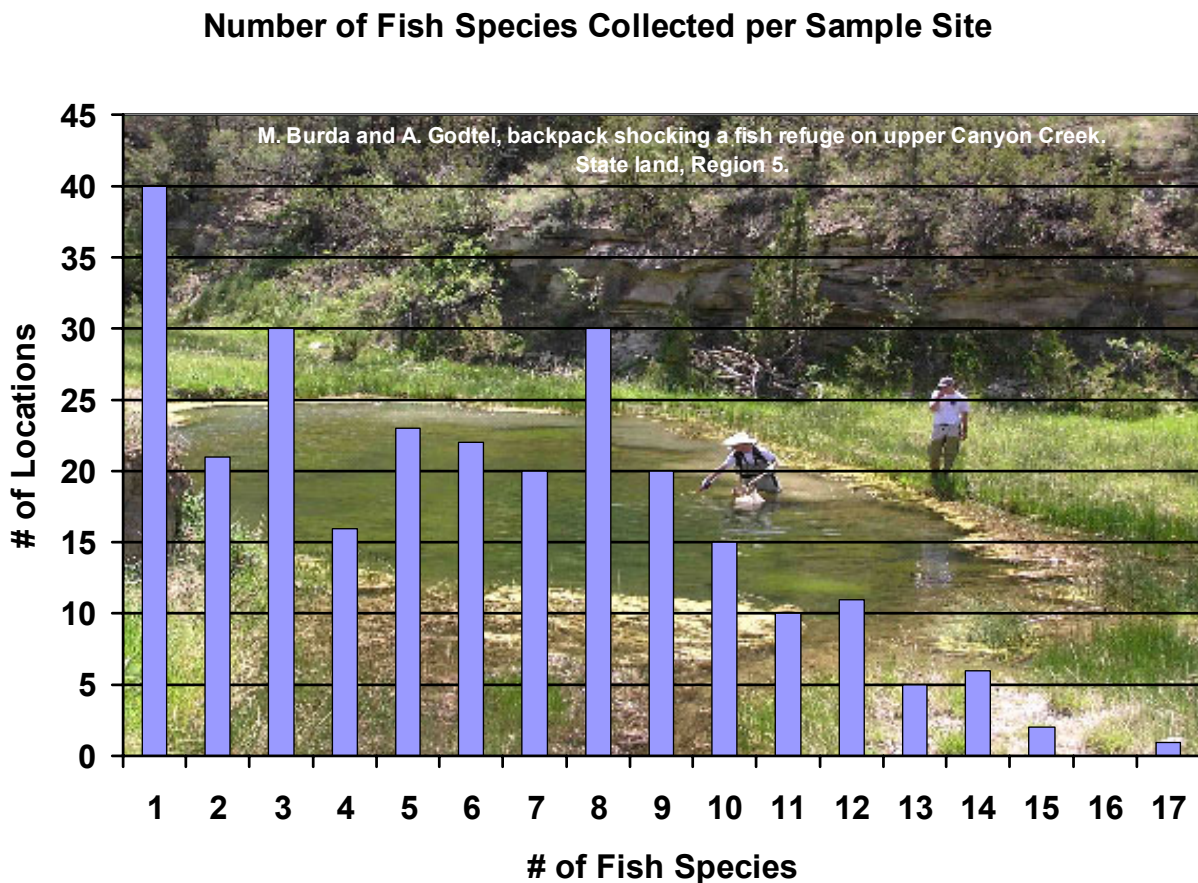
Fish per Site

Of the 267 sites where water and fish were found, the average number of fish species found per site was 6.35. The fathead minnow was the most highly distributed fish, sampled in 212 or 79% of all sites, comprising over 34% of all fish sampled. The white sucker (168 sites, 10.25%), lake chub (116 sites, 9.08%) and flathead chub (64 sites, 9.53%), were the next most prevalent species, although flathead chubs were not recorded in Region 4 (Table 3, Figure 4).

Species Richness at Sites for all Fish

Region 6 had the highest diversity recorded at a single site. This was 17 species located at a site on the Redwater River. Three other sites on the Redwater River had 14 species per site. Region 5 had the next highest diversity of species at a site with 15 species being recorded at the mouth of Alkali Creek and 14 species on a Razor Creek site. Region 7 also recorded 14 species at a site on Smith Creek. These total species per site include both native and nonnative species. Forty six sites or 17.22% had over 1,000 fish recorded per site (Figure 4 and Appendix A).

Figure 4.



Fathead minnow, lake chub, white sucker, longnose dace and brook stickleback were the most widely distributed species found in all four regions with regularity. Brassy minnow and northern redbelly dace were also recorded in all four regions but were very low in number in region 7. Hybrid dace (determined by examining pharyngeal tooth structures of specimens) were positively identified in Region 4, 5 and 6 but not examined in Region 7. Long nose sucker and mountain sucker were common in Region 4 and 5 but rare or nonexistent in Regions 6 and 7.

Of particular interest were native species found only in one region. Region 6 recorded Iowa darter and pearl dace (a Tier I species of concern in Montana), which were found in no other regions (Figure 5). Region 7 found creek chubs to be common, although they were not recorded elsewhere.

Region 5 had the highest species diversity while Region 4 appears depauperate when compared to the other 3 regions with no channel catfish, emerald shiner, plains minnow, river carpsucker, sandshiner, western silvery minnow, stonecat, shorthead redhorse, and goldeye, which were all recorded in Regions 5, 6, and 7. Region 4 recorded nearly half the number of native species that the other three regions documented.

**Figure 5. Pearl dace, *Margariscus margarita*.
A Tier I species of concern in Montana found only in Region 6.**



Table 3. Fish species identified: total # of each species, % of total sample, # of sites and % of sites.

Common Name	Scientific Name	Total #	% of Total	# of Sites	% of Sites
fathead minnow	<i>Pimephales promelas</i>	56924	34.524%	212	79.401%
white sucker	<i>Catostomus commersoni</i>	16905	10.253%	168	62.921%
flathead chub	<i>Platygobio gracilis</i>	15720	9.534%	64	23.970%
lake chub	<i>Couesius plumbeus</i>	14971	9.080%	116	43.446%
sand shiner	<i>Notropis stramineus</i>	13682	8.298%	75	28.090%
longnose dace	<i>Rhinichthys cataractae</i>	8194	4.970%	127	47.566%
western silvery minnow	<i>Hybognathus argyritis</i>	5970	3.621%	29	10.861%
brassy minnow	<i>Hybognathus hankinsoni</i>	4997	3.031%	47	17.603%
northern redbelly dace	<i>Phoxinus eos</i>	4497	2.727%	45	16.854%
brook stickleback	<i>Culaea inconstans</i>	3505	2.126%	64	23.970%
green sunfish *	<i>Lepomis cyanellus</i>	2697	1.636%	42	15.730%
plains killifish *	<i>Fundulus zebrinus</i>	2216	1.344%	8	2.996%
emerald shiner	<i>Notropis atherinoides</i>	1930	1.171%	27	10.112%
Hybognathus sp.	<i>Hybognathus sp.</i>	1638	0.993%	15	5.618%
black bullhead *	<i>Ameiurus melas</i>	1573	0.954%	27	10.112%
longnose sucker	<i>Catostomus catostomus</i>	1430	0.867%	52	19.476%
common carp *	<i>Cyprinus carpio</i>	1300	0.788%	78	29.213%
creek chub	<i>Semotilus atromaculatus</i>	1229	0.745%	27	10.112%
Phoxinus sp.	<i>Phoxinus sp.</i>	882	0.535%	12	4.494%
mountain sucker	<i>Catostomus platyrhynchus</i>	763	0.463%	50	18.727%
shorthead redhorse	<i>Moxostoma macrolepidotum</i>	681	0.413%	62	23.221%
hybrid dace	Hybrid dace	506	0.307%	22	8.240%
river carpsucker	<i>Carpionodes carpio</i>	360	0.218%	29	10.861%
plains minnow	<i>Hybognathus placitus</i>	342	0.207%	21	7.865%
brook trout *	<i>Salvelinus fontinalis</i>	331	0.201%	6	2.247%
channel catfish	<i>Ictalurus punctatus</i>	328	0.199%	28	10.487%
pearl dace	<i>Margariscus margarita</i>	240	0.146%	2	0.749%
golden shiner *	<i>Notemigonus crysoleucas</i>	152	0.092%	3	1.124%
mottled sculpin	<i>Cottus bairdi</i>	148	0.090%	9	3.371%
rainbow trout *	<i>Oncorhynchus mykiss</i>	133	0.081%	11	4.120%
stonecat	<i>Noturus flavus</i>	122	0.074%	32	11.985%
iowa darter	<i>Etheostoma exile</i>	96	0.058%	4	1.498%
largemouth bass *	<i>Micropterus salmoides</i>	64	0.039%	2	0.749%
goldeye	<i>Hiodon alosoides</i>	61	0.037%	14	5.243%
brown trout *	<i>Salmo trutta</i>	52	0.032%	8	2.996%
pumpkinseed *	<i>Lepomis gibbosus</i>	48	0.029%	11	4.120%
northern pike *	<i>Esox lucius</i>	43	0.026%	13	4.869%
smallmouth bass *	<i>Micropterus dolomieu</i>	38	0.023%	5	1.873%
yellow perch *	<i>Perca flavescens</i>	28	0.017%	9	3.371%
spottail shiner *	<i>Notropis hudsonius</i>	27	0.016%	6	2.247%
kokanee *	<i>Oncorhynchus nerka</i>	13	0.008%	1	0.375%
black crappie *	<i>Pomoxis nigromaculatus</i>	9	0.005%	2	0.749%
mountain whitefish	<i>Prosopium williamsoni</i>	9	0.005%	5	1.873%
walleye *	<i>Stizostedion vitreum</i>	7	0.004%	6	2.247%
bigmouth buffalo	<i>Ictiobus cyprinellus</i>	6	0.004%	2	0.749%
smallmouth buffalo	<i>Ictiobus bubalus</i>	6	0.004%	2	0.749%
sauger	<i>Stizostedion canadense</i>	5	0.003%	2	0.749%
Salmonidae *	Salmonidae	2	0.001%	1	0.375%
Saugeye (hybrid) *	<i>Stizostedion canadensis</i> x <i>S. vitreum</i>	2	0.001%	1	0.375%
white crappie *	<i>Pomoxis annularis</i>	2	0.001%	2	0.749%

* indicates nonnative species.

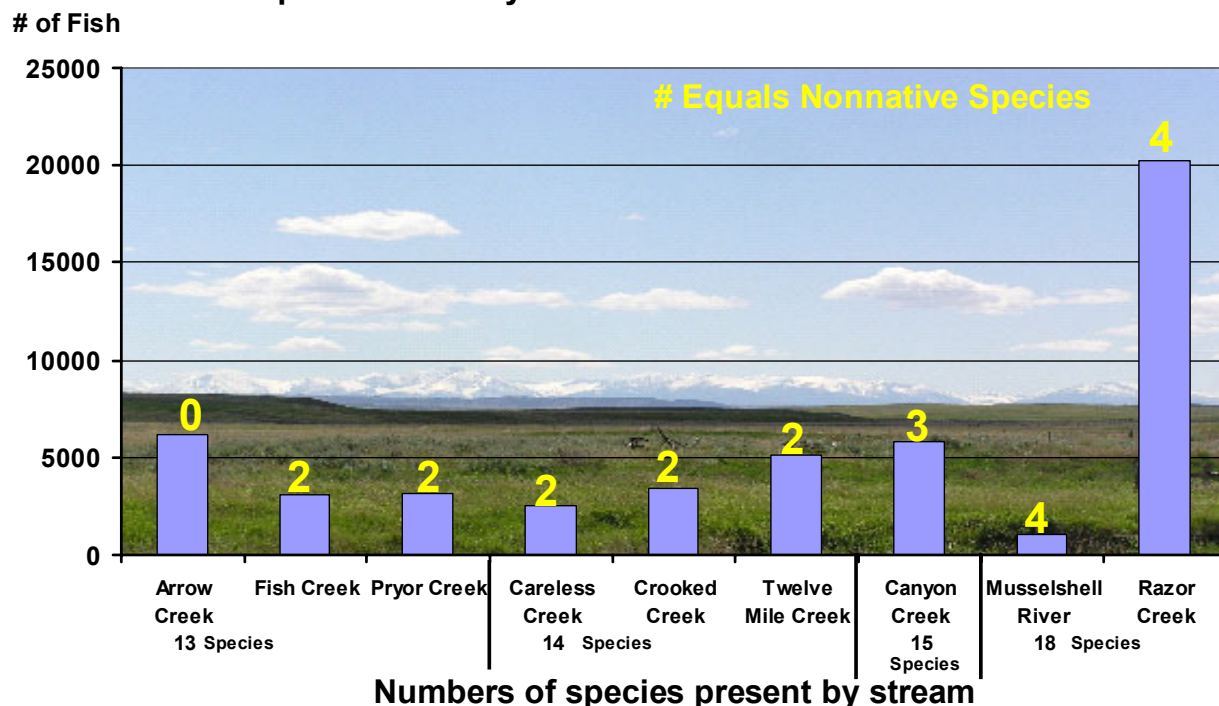
Native Species

When looking at just native species per site, two sites in Region 6 on Redwater River had 14 species and a site in Region 5 on Arrow Creek had 13 species. The highest number of fish sampled at one site was 8,594 recorded in Region 6 at Little Boxelder Creek. This stream is noteworthy with such a high density of fish, which was comprised of nine species that were all native. In addition, it included the rare Iowa darter and a species of interest, the northern redbelly dace. Region 5 had the next highest number of fish recorded at a site with 6,211 fish at Arrow Creek. This sample is of interest as it includes 13 species of fish that were all native. Sites with 100% native fish species were recorded at 36, 32, 38 and 23 sites in Regions 4, 5, 6 and 7, respectively. With all sites combined 27 native fish species were recorded this year with the greatest number (24) recorded in Region 6 and the least (11) recorded in Region 4 (Appendix A, Table 1).

Multiple Site Data Equals Complete Stream Data

All four regions conducted some multiple site visits at different locations on streams and at different periods of the sampling season to look at temporal variation. Region 5 and 6 conducted the most repeat and multiple site visits on particular selected streams. Region 6 had three streams with high sample numbers and fish species richness. Redwater River has a high diversity of fish (24 species, 19 native). While Redwater River is larger than traditionally sampled prairie streams, rivers of this size in eastern Montana have been rarely studied, and provide important data. Little Boxelder Creek resulted in a high catch of 8,594 fish with nine native species. Clear Creek in Region 6 had 2,679 fish (20 species, 19 native). Region 5 had nine streams with over 2,000 fish recorded or 15 species. These streams were sampled at multiple locations from the mouth to their headwaters (April – October) (Figure 6).

Figure 6. Region 5 summary of creeks with the highest species diversity and number of fish recorded.



Irrigation Ditches and Urbanization in Region 5

While analysis of habitat data is still pending, it is clear that small prairie streams are impacted (both negatively and positively) by irrigation in several ways. Ditches can raise the ground water table, increase runoff into streams, provide direct injection into streams or severely deplete water in streams and rivers. Stream morphology is clearly altered and evidence of blowouts into streams was documented in both spring and fall. Blowouts occur when ditch operators use streams as drains to clean out the ditch of debris or to regulate water levels in the ditch or let waters down quickly. Crayfish kills were documented on streams where blowouts had recently occurred. It is not known if mortality was related to trauma from the sheer volume of water, rapid temperature changes or possibly from chemical runoff in the irrigation water.

Urbanization is altering the delivery and use of irrigation water, in some cases resulting in higher in-stream flows during summer months as agricultural land is converted. Region 5 has several streams which flow through Billings. The headwaters or routes of these streams are largely unknown as they flow to a large extent underground. However, they were found to harbor up to eight fish species and potentially could be used as public education stream rehabilitation projects.

Four Years of Prairie Stream Surveys

In the fourth year of this study significant strides were made to complete surveys in some regions. The 164,884 fish, recorded for all four regions in 2006, is more than twice that of the last three years combined. In addition, two of the regions extended their seasons well into the fall and sampled during cooler weather. Data from these fall samples seems to show that species composition in prairie streams may change significantly with the seasons (Table 4, Figure 7).

Table 4.

Year over Year Results in all four eastern Montana Regions

	2003	2004	2005	2006	Totals
# of Sites Visited	299	332	491	501	1623
# of Dry Sites	121	121	259	156	657
# of Sites with Water and Fish	127	161	166	267	721
# of Sites with Water and Nothing Found	51	50	66	66	233
# of Fish Species Identified	46	37	43	45	171
Total # of Fish Sampled	39,693	52,912	62,148	164,884	319,637

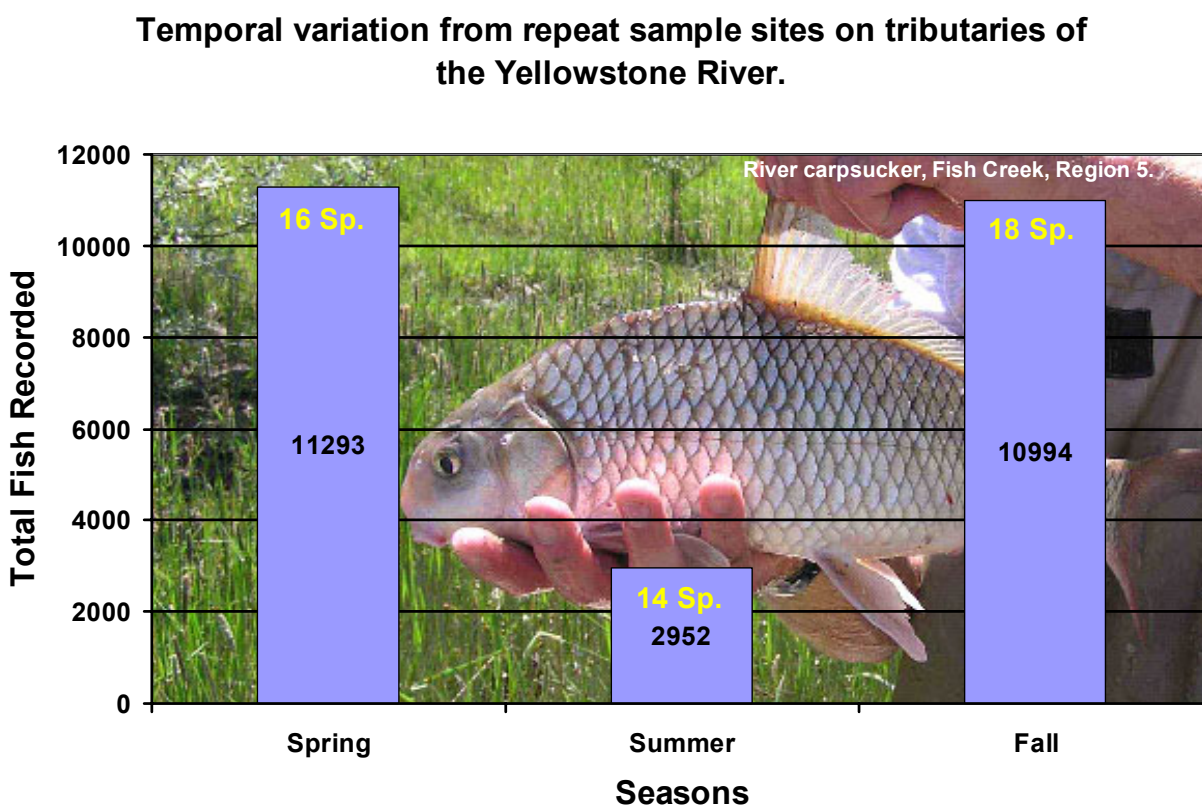


Figure 7. Third and final sample at the middle site of Fish Creek (Musselshell River tributary) in early October snowstorm, Region 5.

Temporal Variation on Streams in Region 5

Region 5 conducted the most repeat and multiple site samples of all regions. While more data is probably still needed to determine temporal variance of species composition in streams, we can make some assumptions based on the data from this year. To ensure consistency in the data we only included sites in the analysis where we conducted spring, summer and fall samples on tributaries of the Yellowstone River. These restrictions only left four streams for analysis; one sample location on Blue Creek (middle reach), one sample location on Five Mile Creek (middle reach), three sample locations on Razor Creek (mouth, middle and upper), and one sample location on Twelve Mile Creek (middle reach) (See Figure 8).

Figure 8. Species recorded per season and number of fish recorded on four tributaries of the Yellowstone River.



The number of fish species and density of fish in streams decreased significantly during the summer months, which also coincides with irrigation season (Figure 8). The sites re-sampled were at exactly the same locations and all had flowing water during each sampling period (spring, summer, and fall). Spring and fall samples were conducted either before or after irrigation ditches were turned on or off. We also examined individual species, increased presence or absence, during each of these sampling periods (See Table 5).

Table 5. Temporal variation of species presence and density in four tributaries of the Yellowstone River, Region 5. (0 = nonexistent, Low, Medium, High, and Very High).

18 Species	Spring	Summer	Fall
river carpsucker	0	0	Low
stonecat	0	Low	Low
emerald shiner	0	Low	Medium
yellow perch	Low	0	Low
green sunfish	Low	0	Low
pumpkinseed	Low	Low	0
common carp	Low	Low	Medium
shorthead redhorse	Low	Low	Medium
mountain sucker	Low	Low	High
brook stickleback	Medium	Low	Low
longnose dace	Medium	Low	Medium
longnose sucker	Medium	Low	High
sand shiner	Medium	Medium	Very high
western silvery minnow	High	0	Very High
fathead minnow	High	Medium	Very High
lake chub	High	Medium	High
white sucker	Very High	Low	Medium
flathead chub	Very High	Medium	High

All species showed marked declines from spring to summer sampling except for shorthead redhorse which had a slight increase and pumpkinseed which were almost nonexistent. The most dramatic increases from summer to fall were longnose sucker (4X), sand shiner (5X), common carp (10X), and mountain sucker (12X).

Western silvery minnow are worth mentioning as they were very prevalent in the spring, nonexistent in the summer and even more numerous in the fall. Fathead minnow and lake chub had a similar pattern but were still picked up in the summer although in much lower numbers. Both flathead chub and white sucker were picked up in the greatest number in the spring, lower in the summer and rising again in the fall. Emerald shiner were not picked up in the spring at all, very rare in the summer and then more prevalent in the fall. Brook stickleback exhibited an inverse relationship of presence from the other fish with the greatest numbers being recorded in the spring with decreased numbers in the summer and fall.

Of final note were two other species recorded at a site on Fish Creek, which is a tributary of the Musselshell River, and where we also sampled in the spring, summer and fall. We found brassy minnows to be at low densities in the spring, high in the summer and very low in the fall. Northern redbelly dace were found at their highest numbers in the spring decreasing in the summer and very low in the fall.

Herpetofauna Records from Survey Sites



• Large paedomorphic tiger salamander.

All four regions combined collected a total of 4,785 herpetofauna, with representation from 16 species, compared with 1,675 last year and 15 species (Table 6).

Eleven species of reptiles and five amphibians were recorded at sites. The northern leopard frog was the most abundant 57.68% and the most widely distributed (111 sites). The tiger salamander comprised over 25% of all herps recorded. Plains gartersnake was the most abundant reptile recorded (95). However, they were only found at 38 sites, with over 90% occurring in Region 6. Painted turtles were encountered at 31 sites in Regions 5, 6, and 7.

Table 6. 2006 Reptile and amphibian species identified at survey sites, listed by Region.

Common Name	Scientific Name	Reg 4	Reg 5	Reg 6	Reg 7	Total #	% of Sample
boreal chorus frog	<i>Pseudacris maculata</i>	11	6	8	36	61	1.27%
boreal chorus frog jv.	<i>Pseudacris maculata</i>	0	0	98	47	145	3.03%
Bufo sp.	<i>Bufo sp.</i>	0	103	0	0	103	2.15%
common gartersnake	<i>Thamnophis sirtalis</i>	3	3	0	6	12	0.25%
common sagebrush lizard	<i>Sceloporus graciosus</i>	0	1	0	0	1	0.02%
eastern racer	<i>Coluber constrictor</i>	0	1	12	0	13	0.27%
gophersnake	<i>Pituophis catenifer</i>	0	1	3	2	6	0.13%
great plains toad	<i>Bufo cognatus</i>	0	5	0	0	5	0.10%
northern leopard frog	<i>Rana pipens</i>	471	674	726	524	2395	50.05%
northern leopard frog jv.	<i>Rana pipens</i>	0	0	201	164	365	7.63%
painted turtle	<i>Chrysemys picta</i>	0	17	38	10	65	1.36%
plains gartersnake	<i>Thamnophis radix</i>	0	1	87	7	95	1.99%
snapping turtle	<i>Chelydra serpentina</i>	0	2	0	3	5	0.10%
spiny softshell	<i>Apalone spinifera</i>	0	31	0	0	31	0.65%
terrestrial gartersnake	<i>Thamnophis elegans</i>	3	20	0	0	23	0.48%
tiger salamander	<i>Ambystoma tigrinum</i>	29	47	34	0	110	2.30%
tiger salamander larvae	<i>Ambystoma tigrinum</i>	0	0	636	545	1181	24.68%
western hog-nosed snake	<i>Heterodon nasicus</i>	0	1	0	0	1	0.02%
western rattlesnake	<i>Crotalus viridis</i>	0	1	0	2	3	0.06%
Woodhouse's toad	<i>Bufo woodhousii</i>	0	14	79	38	131	2.74%
Woodhouse's toad jv.	<i>Bufo woodhousii</i>	0	0	34	0	34	0.71%
		517	928	1956	1384	4785	100.00%

M. Burda and snapping turtle, Razor Creek, Region 5.



Region 5 had the greatest species richness with 16 species of herpetofauna recorded at survey sites. Of these, four are considered Tier I species of concern, including the spiny softshell turtle, snapping turtle, western hog-nosed snake and northern leopard frog. These three reptiles are rarely encountered and serve as important records. Detailed accounts of all herpetofauna records by Region, Stream and Site can be found in (Appendix A). In addition, incidental observations of herpetofauna were recorded and sent to the POD.

Snapping Turtle and Spiny Softshell

Snapping turtle were only recorded in Region 5 and 7. In Region 5 they were only recorded on Razor Creek, but found from the mouth to the headwater pools. In region 7 two were found at Sarpy Creek and one on Pumpkin Creek. Spiny softshell were only recorded in Region 5, where three large congregation sites for spiny softshell were identified, as well as individual sightings.



Two male spiny softshell, Big Coulee Creek, Region 5. •

Trapping Spiny Softshell in Region 5

Trapping efforts were conducted during prairie stream surveys with short 4-5 hour or sometimes overnight sets. A total of 27 spiny softshell were tagged with individual metal number clips as well as four with radio-telemetry tags (Table 7 and Figure 9).

**Table 7. Spiny softshell and one snapping turtle.
Tag numbers (T) and Codes (C) for Frequency 148.480.**

Site	Date	Tag/Code	Sex	Size mm
Fish Creek/Musselshell Confluence	6/13/06	T-1699	M/jv.	small
Fish Creek/Musselshell Confluence	6/14/06	T-1700	F	290x360
Fish Creek/Musselshell Confluence	6/14/06	C-115	F	230x330
Fish Creek/Musselshell Confluence	6/14/06	C-114	F	245x330
Fish Creek/Musselshell Confluence	8/23/06	T-1601	F	310x400
Big Coulee/Musselshell Confluence	6/20/06	T-1620	F	96x90
Big Coulee/Musselshell Confluence	6/20/06	T-1623	M	166x150
Big Coulee/Musselshell Confluence	6/21/06	T-1673	F	320x260
Big Coulee/Musselshell Confluence	6/21/06	T-1671/C-103	F	342x260
Big Coulee/Musselshell Confluence	6/21/06	T-1624/T-1645	F	345x277
Big Coulee/Musselshell Confluence	6/21/06	T-1647	F	357x278
Big Coulee/Musselshell Confluence	6/21/06	T-1675	F	317x255
Big Coulee/Musselshell Confluence	8/23/06	T-1602	M	150x160
Big Coulee/Musselshell Confluence	8/23/06	T-1603	M	140x160
Big Coulee/Musselshell Confluence	8/23/06	T-1604	?	260x320
Big Coulee/Musselshell Confluence	8/23/06	T-1605,6	F	310x380
Big Coulee/Musselshell Confluence	8/23/06	T-1609	?	270x330
Big Coulee/Musselshell Confluence	8/23/06	T-1610	F	270x330
Big Coulee/Musselshell Confluence	8/23/06	T-1611	F	240x300
Big Coulee/Musselshell Confluence	8/23/06	T-1612	F	280x360
Big Coulee/Musselshell Confluence	8/23/06	T-1677	F	280x340
Big Coulee/Musselshell Confluence	8/26/06	Recap T-1673	F	320x260
Shawmut Oxbow	7/4/06	T-1672/C-104	?	275x340
Shawmut Oxbow	7/4/06	T-1622	F	290x372
Shawmut Oxbow	8/26/06	T-1657	?	270x240
Pryor Creek (upper)	7/11/06	T-1626	F	medium
Razor Creek (middle)	7/5/06	T-1670/T-1646	Snapper	380x381

Trapping efficiency CPUE ranged from .05 to .6 spiny softshell per hour at the three locations, with only one recapture recorded during repeated trapping efforts. This indicates high populations of turtles at these concentrated sites on the Musselshell River. Breeding or nesting behavior was not observed but both male and females were caught at the sites as well as juveniles. All three sites are located on private property.

Figure 9. Affixing a radio transmitter on a large female spiny softshell.



Total Richness and Abundance

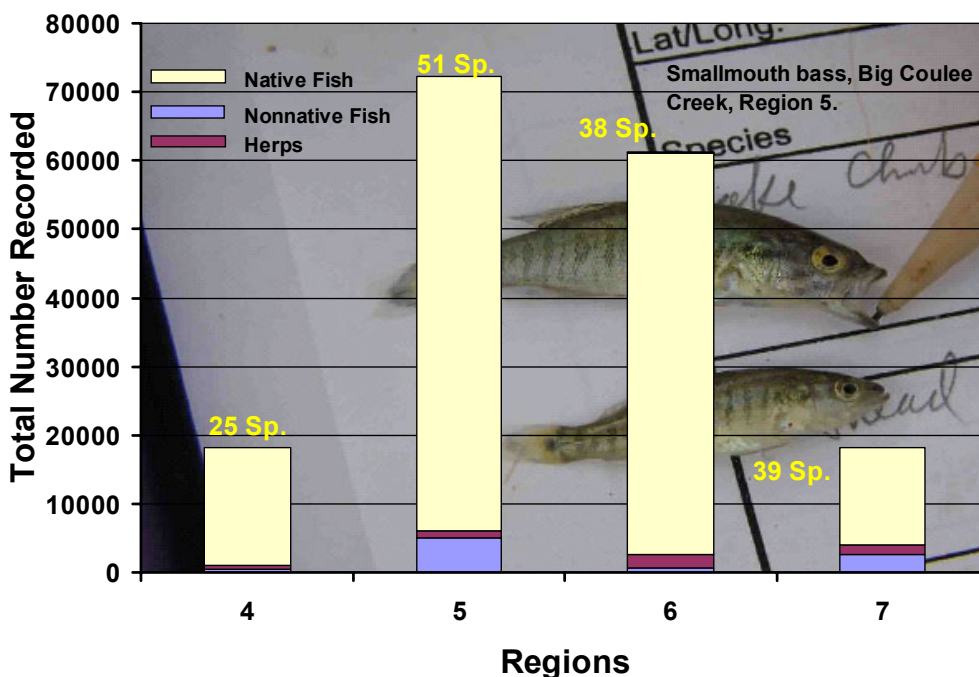
Total richness for each sample site and stream is detailed in Appendix A. Total richness was calculated by adding up all species of fish and herpetofauna recorded per site and per stream when it was sampled more than once. The total richness for all four regions in 2006 was 61 species with 43 of these native to eastern Montana.

The highest richness factor recorded for each region is as follows. Region 4 had a site on Indian Creek with a factor of 11. Region 5 had five streams with a richness of 19 or greater. These were: Canyon Creek 19, Fish Creek 19, Musselshell River 20, Razor Creek 27, and Twelve Mile Creek 19. The site with the greatest richness was found on a site located on the middle of Twelve Mile Creek with a rating of 16. Region 6 had a factor of 12 on a Clear Creek site and Redwater River had a total factor of 29. Region 7 had a site on Smith Creek with a factor of 15, and two streams with high ratings (Boxelder 15, Clear Creek 17) (Appendix A).

Obviously the more sampling periods conducted on a stream the greater the possibility of a higher richness score for the creek. This makes further comparisons between these streams difficult. However, it may be useful to look at overall richness recorded by region (Figure 10).

Figure 10.

Total Fish and Herpetofauna Richness and Abundance by Region



Mollusk Data from Region 5

Region 5 undertook opportunistic mollusk sampling at stream sites and submitted these specimens to Dan Gustafson, Research Scientist at Montana State University, for identification. A total of 102 specimens and seven species were identified. The only significant finding was *Lampsilis siliquioidea* (fatmucket) on Pryor Creek, which has previously not been surveyed. (Table 8). This location represents the furthest upstream location for this species.

Table 8. Mollusk Data from Region 5.

Stream	Date	Latitude	Longitude	Species	Description
Alkali Creek (Billings area)	5/8/06	45.80308	-108.47345	Helisoma anceps	1
Alkali Creek (Billings area)	5/8/06	45.80308	-108.47345	Physella gyrina	2
Arrow Creek (upper)	5/22/06	45.90000	-108.15264	Helisoma anceps	3
Arrow Creek (upper)	5/22/06	45.90000	-108.15264	Physella gyrina	4
Audubon Education Center	9/18/06	45.74180	-108.96710	Physella gyrina	4
Big Coulee Creek (upper)	6/22/06	46.13579	-109.34601	Helisoma anceps	2
Big Coulee Creek (upper)	6/22/06	46.13579	-109.34601	Physella gyrina	4
Big Coulee Creek (upper)	6/22/06	46.13579	-109.34601	Sphaerium striatum	2 valves
Blue Creek	5/18/06	47.71964	-108.51406	Physella gyrina	2
Canyon Creek (upper)	5/24/06	45.79678	-108.94605	Physella gyrina	5 big - 1 diss.
Canyon Creek (upper)	5/25/06	45.78500	-108.70300	Sphaerium striatum	1
Crooked Creek	8/2/06	45.96264	-108.35209	Succinea sp.	1 large
Fish Creek	6/13/06	46.21426	-109.93342	Physella gyrina	4

Five Mile Creek	5/1/06	45.85914	-108.49313	<i>Physella gyrina</i>	4
Musselshell - Selkirk	9/14/06	46.46080	110.22250	<i>Physella gyrina</i>	6
Musselshell River (upper)	8/15/06	46.44258	-109.86302	<i>Stagnicola elodes</i>	1 small
Musselshell River (upper)	8/15/06	46.44258	-109.86302	<i>Succinea</i> sp.	1
Pryor Creek	5/17/06	45.79699	-108.29560	<i>Sphaerium striatum</i>	1 valve
Pryor Creek	7/12/06	45.78977	-108.29866	<i>Sphaerium striatum</i>	6
Pryor Creek	7/12/06	45.78977	-108.29866	<i>Sphaerium striatum</i>	1 valve
Pryor Creek	7/12/06	45.78977	-108.29866	<i>Physella gyrina</i>	7
Pryor Creek	7/12/06	45.71964	-108.51406	<i>Physella gyrina</i>	1
Pryor Creek	7/12/06	45.71964	-108.51406	<i>Sphaerium striatum</i>	1
Pryor Creek (golf course)	5/8/06	45.88552	-108.29995	<i>Lampsilis siliquoidea</i>	Rt V/Sm.old F.
Pryor Creek (golf course)	5/8/06	45.88552	-108.29995	<i>Sphaerium striatum</i>	4
Razor Creek (mouth)	7/17/06	45.95709	-108.28100	<i>Succinea</i> sp.	1
Rock Creek (Musselshell)	5/31/06	46.18904	-109.36060	<i>Stagnicola elodes</i>	2
Silvertip Creek	9/26/06	45.17457	-108.98546	<i>Stagnicola elodes</i>	4
Silvertip Creek	9/26/06	45.17457	-108.98546	<i>Physella gyrina</i>	4
Simmons Creek	8/22/06	46.08498	-109.58907	<i>Physella gyrina</i>	4
South Fork Big Coulee Crk.	8/15/06	46.18464	-108.99185	<i>Physella gyrina</i>	1
South Fork Big Coulee Crk.	8/15/06	46.18464	-108.99185	<i>Planorbella trivolvis</i>	1 - young
Spring Creek (Clark's Fork)	4/24/06	45.63957	-108.71584	<i>Stagnicola elodes</i>	8
Spring Creek (Clark's Fork)	4/24/06	45.63957	-108.71584	<i>Physella gyrina</i>	10 - 1 diss.
Stillwater River (Fireman's)	9/25/06	45.62434	-109.28648	<i>Stagnicola elodes</i>	3
Stillwater River (Fireman's)	9/25/06	45.62434	-109.28648	<i>Physella gyrina</i>	4
Twelve Mile Creek	5/1/06	45.90312	-108.36614	<i>Sphaerium striatum</i>	1 valve

Discussion

The current study occurred during an extended drought cycle and thus the 2006 field season documented a high number of dewatered streams. Normal to wet conditions may show very different sampling results. It is clear that many of the streams sampled are of an ephemeral nature and possibly have reaches that are not currently interconnected. Therefore a single sampling event or location may be inadequate to properly establish satisfactory baseline data. Refuges are of a critical nature in maintaining populations of native fish and many crews searched for and identified these areas for survey locations to get a better understanding of fish assemblages.

Sampling in 2006 resulted in more fish captured than the previous three years combined. We are not certain of the factors, but propose that extended seasons in some regions and increased water in streams may have been a factor. In addition, some regions focused on higher order streams connected to rivers for repeat samples. These higher order streams were also sampled at different reaches which definitely resulted in increased species richness numbers.

It would be interesting to compare numbers of nonnative fish captured in previous years. With the current data it would be possible to conduct an analysis to determine if the percentage of nonnative fish are increasing or remaining stable. However, this analysis was beyond the scope of this paper. Green sunfish were clearly the most prevalent and invasive of the nonnatives encountered in any region and clearly impacted native species distribution and abundance. Green sunfish should therefore be restricted from any stocking permits. While prevalent at low levels in many streams they appear to reach a threshold level where they can dominate a system and severely impact native species richness and abundance.

Region 7 had the highest level of nonnatives and the only region with one of the more prevalent nonnative species, the plains killifish. Region 4 was the only region where spottail shiners were documented. In region 5 we documented the introduction and explosion of green sunfish into what is currently an isolated pool on North Willow Creek. This stream was first sampled in 2003 in June and July. In the June sample no green sunfish were recorded and only 9 smaller sized green sunfish were picked up in the July sample. In the 2006 sample 1,597 green sunfish were recorded at the same site. The green sunfish appear to have significantly altered the guild of native fish species. Lake chub, which had been recorded in July of 2003 were not found in 2006, the number of plains minnow were several factors less than when the site was first sampled in 2003 and white sucker numbers went from 66 to only 1 larger adult. Brassy minnow were recorded for the first time in 2006; however they could easily have been overlooked in previous samples due to the lack of color fish exhibit in these very turbid waters.

There is some evidence that the prevalence of nonnatives, albeit at very low levels, may indicate a source population. We hypothesize that the source for many of these nonnatives are impoundments, higher order rivers, irrigation ditches and upper reaches with standing water. It is now possible for managers to use the data from 2006 (Appendix A) to identify and isolate streams or sites that have a high prevalence of nonnative fish. These sites can then be more carefully monitored in the future to determine expansion of nonnative species. The question at this point exists as to what should be done to address the issue of nonnatives. It would be interesting to further study the level of nonnatives in these streams and try to identify potential source populations. Managers could then decide what course of action would be appropriate to either eliminate or control the spread of the nonnatives. Future surveys should include the percentage of native versus nonnative species per site and/or stream and compare these results with the baseline data recorded in 2006 (Appendix A).

The average number of fish species recorded per site was 6.35 versus 4.9 last year. This is possibly explained by the order of streams sampled and the repeat samples in Region 5 of highly productive streams. Species richness for fish was in line with previous years efforts. However, this year we were able to identify streams that appear to have nearly intact species assemblages. This is useful for managers to continue monitoring these sites to document their continued integrity over time. These streams give us a good idea of healthy assemblages and densities of native prairie fish when comparing surveys in the region. It would be possible from the habitat data collected to examine stream morphology and order to determine the general characteristics of streams with high densities and richness of native species.

Some of the data collected by Region 5, as well as Region 6 lend to some interesting early findings on temporal variation on some of the streams surveyed. It is clear that species richness and fish abundance varies greatly with the time of year. What is most interesting is that the lowest number of fish and species were recorded in the middle of the summer sampling season. While increased water levels at some sites due to irrigation and plant growth (which inhibits capture efficiency) may be contributing factors to these results, it is clear that there are definite seasonal movements of some species in and out of streams.

Irrigation is also tied into the equation on temporal variation in streams as the water level of streams changes due to injection, runoff or water depletion. Fish from larger bodies of water can enter streams through direct injection or possibly runoff, thus altering species composition and numbers in smaller streams. Increased flows of water during the irrigation season can keep

smaller streams flowing at higher levels than would naturally be the case or even keep streams that would normally be dry or exist with intermittent pools, fully running. While this clearly benefits some species of fish, we do not know what the impacts may be on fish that prefer the slower, lower level of water in the summer.

As we are just beginning to understand some of the individual species movements and use of prairie streams it is important for more temporal sampling to be conducted, especially in the early spring, fall and possibly winter months. The use of prairie streams for spawning by some species has been documented or assumed by the seasonal presence of some larger bodied species of fish as well as the presence of fry or juveniles. This is important data which was previous lacking for some species and which is still lacking for many others.

For example, the presence of catfish fry on Pryor Creek was the first documented spawning of catfish in Region 5. What is even more interesting is that Pryor Creek is a relatively isolated higher order stream due to significant manmade barriers, including one right at the confluence of the stream and the Yellowstone River. Pryor Creek still has a diverse assemblage of native species and is the only stream in Region 5 where channel catfish were documented. Pryor Creek has serious dewatering problems and highlights the importance of refuges on streams where populations of fish can survive and repopulate reaches, even without connections to higher order systems. Higher order streams serve as important sources of refugia for native species, especially during prolonged drought.

Herpetofauna records from 2006 were significantly higher; nearly four times that recorded by teams in 2005. Whether this indicates early season moisture, an increased interest or awareness by the survey teams, or an actual increase of herpetofauna numbers is unclear.

Results indicate that simultaneous herpetological and fish surveys by prairie fish crews are highly productive to the overall knowledge of amphibian abundance and species distributions. They may be less effective for some reptiles of concern, such as the milksnake, greater short-horned lizard, common sagebrush lizard, western hog-nosed snake, eastern racer, western rattlesnake, and gophersnake. These species may require specific search efforts to locate them, although western rattlesnake, gophersnake and eastern racer were frequently recorded by teams on the way to a site either in fields or on roadways. It does appear that combined survey efforts are very useful for determining distributions of gartersnakes and all three native turtle populations in Montana. These surveys even resulted in the discovery of a possible breeding population of red-eared sliders, a highly invasive nonnative turtle, in Region 5.

Spiny softshell and snapping turtle are both species of concern and Tier I Species in Montana that lack data regarding distribution, population status and habitat needs. Snapping turtles are recorded in low but predictable numbers by prairie stream crews. In 2006, they were only documented in Region 5 and 7 and then on only three different streams. From the current data it seems clear that the patchy distribution of snapping turtles would make a more in-depth study difficult at this time without further efforts at defining habitat and focused survey methods. With the site and stream data documented by prairie stream crews we now have a very good place to start.

We also have very good information on spiny softshell distributions, including some high concentration areas in Region 5 on the Musselshell River with 27 turtles already tagged, including four with radio transmitters. Use of these sites to start a more in-depth, habitat use,

population status and even dietary and behavioral studies of spiny softshell turtles would be very feasible, and is needed. The discovery of these congregation areas of spiny softshell on the Musselshell River and the documentation of populations further west than previously recorded, points out an opportune time to establish further programs of study. The current practice of using SWiG funds to piggy back spiny softshell data collection with Yellowstone River game fish studies and Prairie Stream surveys has proved very productive in marking and identifying important areas for spiny softshell turtles. What is needed at this point is a more coordinated effort (i.e. person) to use this information and gather further in-depth natural history parameters on spiny softshell turtles in Montana.

Further recommendations for continuation of Prairie Stream (SWiG) work:

- 1) Habitat conservation (easements) of streams with intact native species assemblages and refugia.
- 2) Leases of state lands for native species protection and habitat improvement.
- 3) Leasing of water rights to increase in-stream flows on systems.
- 4) Studies of the distribution of non-game fish in larger order streams and rivers (i.e the Yellowstone River, Clark's Fork and Musselshell River).
- 5) Restoration of urban streams, public awareness of connectivity of streams and rivers.
- 6) Spiny softshell study on identified populations in eastern Montana.
- 7) Specific inventory methods to identify snapping turtle distributions.
- 8) Pryor Creek case study – barrier removal, restoration of a high order prairie stream.
- 9) Studies to specifically address the impacts of barriers and ditch influence in certain systems and develop management guidelines to reduce their impact.
- 10) Studies to examine the impacts of nonnatives and possible methods to eliminate or reduce their presence in some systems.

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APPENDIX A PRAIRIE STREAMS SUNMMARY 2006 - REGIONS 4,5,6,7							
REGION 4							
HUC (Drainage)	Site Name/Number/Region	Dates	Lat/Long	Species (Fish and Herp)	#Native	#NonN	Total
10030104 Adobe Creek	1117195475240	10/3/06	47.47623 -111.783520	brassy minnow	95		
				brook stickleback	1		
				fathead minnow	128		
				lake chub	142		
				longnose dace	21		
				mountain sucker	30		
				northern redbelly dace	132		
				hybrid dace	36		
				white sucker	109		
Total Herp Number	0	Total Fish Number	694	0	694		
Herp Richness	0	Fish Richness			8		
Total Site Richness	8	Native Fish Richness			8		
		Percent Native			100		
10040204 Akins Coulee	1083304470822	7/13/06	47.08164 -108.33226	fathead minnow	67		
				tiger salamander			1
Total Herp Number	1	Total Fish Number	67	0	67		
Herp Richness	1	Fish Richness			1		
Total Site Richness	2	Native Fish Richness			1		
		Percent Native			100		
10030104 Big Coulee	1118756475163	10/3/06	47.52963 -111.922580	fathead minnow	17		
				longnose dace	20		
				mottled sculpin	2		
				mountain whitefish	1		
				northern redbelly dace	2		
				rainbow trout			12
				white sucker	11		
				Total Herp Number	0	Total Fish Number	53
Herp Richness	0	Fish Richness			7		
Total Site Richness	7	Native Fish Richness			6		
		Percent Native			81.54		
10030203 Big Flat Coulee	1119503482159	6/8/06	48.23539 -111.96502	brook stickleback	46		
				fathead minnow	2		
				lake chub	8		
				longnose dace	5		
				spottail shiner			2
				white sucker	3		

Total Herp Number	0	Total Fish Number	64	2	66
Herp Richness	0	Fish Richness			6
Total Site Richness	6	Native Fish Richness			5
		Percent Native			96.97
10030202 Big Rock Coulee (above weir)	8/3/06	48.696	brassy minnow	36	
1123909486830		-112.367880	brook stickleback	1	
			fathead minnow	1165	
			lake chub	6	
			longnose dace	1	
			white sucker	222	
Total Herp Number	0	Total Fish Number	1431	0	1431
Herp Richness	0	Fish Richness			6
Total Site Richness	6	Native Fish Richness			6
		Percent Native			100
10030202 Big Rock Coulee (below weir)	8/3/06	48.696	brassy minnow	32	
1123909486830		-112.367880	brook stickleback	26	
			fathead minnow	62	
			lake chub	56	
			longnose dace	44	
			longnose sucker	2	
			white sucker	62	
Total Herp Number	0	Total Fish Number	284	0	284
Herp Richness	0	Fish Richness			7
Total Site Richness	7	Native Fish Richness			7
		Percent Native			100
Big Rock Creek Coulee Summary		8/3/06	Total Fish Number	1715	
Sampled 2 times at 2 sites		8/3/06	Fish Richness	7	
			Percent Native	100	
			Total Site Richness	7	
10030105 Big Willow Creek	5/23/06	47.45025	brassy minnow	4	
1108782475073		-110.839020	fathead minnow	36	
			lake chub	104	
			longnose dace	3	
			northern redbelly dace	12	
			white sucker	115	
Total Herp Number	0	Total Fish Number	274	0	274
Herp Richness	0	Fish Richness			6
Total Site Richness	6	Native Fish Richness			6

Percent Native						100
10040101 Birch Creek	9/21/06	47.98105	brassy minnow	3		
1095765477472		-109.639280	fathead minnow	3		
			lake chub	1		
			longnose dace	23		
			mountain sucker	13		
			white sucker	79		
Total Herp Number	0	Total Fish Number	122	0	122	
Herp Richness	0	Fish Richness			6	
Total Site Richness	6	Native Fish Richness			6	
		Percent Native			100	
10030104 Blackfoot Coulee	10/16/06	47.53164	brassy minnow	1		
1119039475253		-111.903020	fathead minnow	80		
			lake chub	38		
			longnose dace	75		
			longnose sucker	1		
			northern redbelly dace	29		
			hybrid dace	15		
			rainbow trout		2	
			white sucker	1		
Total Herp Number	0	Total Fish Number	240	2	242	
Herp Richness	0	Fish Richness			8	
Total Site Richness	8	Native Fish Richness			7	
		Percent Native			99.17	
10030102 Blaine Creek	7/20/06	47.19628	fathead minnow	314		
1115907472076		-111.59402	lake chub	434		
			longnose dace	593		
			white sucker	93		
Total Herp Number	0	Total Fish Number	1434	0	1434	
Herp Richness	0	Fish Richness			4	
Total Site Richness	4	Native Fish Richness			4	
		Percent Native			100	
10030205 Blindhorse Creek	8/2/06	47.69109	brassy minnow	67		
		-112.62211	brook stickleback	21		
			fathead minnow	2		
			lake chub	50		
			longnose dace	2		
			northern redbelly dace	871		

			hybrid dace	325		
			white sucker	41		
			common gartersnake		2	
			terrestrial gartersnake		1	
Total Herp Number	3	Total Fish Number	1379	0	1379	
Herp Richness	2	Fish Richness			7	
Total Site Richness	9	Native Fish Richness			7	
		Percent Native			100	
10030102 Box Elder Creek (above waterfall)		7/27/06	47.56552 longnose dace	19		
1110916475671			-111.091300 mottled sculpin	3		
Total Herp Number	0	Total Fish Number	22	0	22	
Herp Richness	0	Fish Richness			2	
Total Site Richness	2	Native Fish Richness			2	
		Percent Native			100	
10030102 Box Elder Creek (below waterfall)		7/27/06	47.56552 brook stickleback	2		
1110916475671			-111.091300 brown trout		7	
			fathead minnow	1		
			longnose dace	20		
			longnose sucker	11		
			mottled sculpin	7		
			rainbow trout		2	
			white sucker	118		
Total Herp Number	0	Total Fish Number	159	9	168	
Herp Richness	0	Fish Richness			8	
Total Site Richness	8	Native Fish Richness			6	
		Percent Native			94.64	
Box Elder Creek Summary		7/27/06	Total Fish Number	190		
Sampled 2 times at 2 sites		7/27/06	Fish Richness	8		
			Percent Native	95.26		
			Total Site Richness	8		
10040103 Boyd Creek		5/16/06	47.06964 fathead minnow	5		
1094262470732			-109.375710 northern redbelly dace	4		
Total Herp Number	0	Total Fish Number	9	0	9	
Herp Richness	0	Fish Richness			2	
Total Site Richness	2	Native Fish Richness			2	
		Percent Native			100	

10030205 Brady Canal		6/21/06	47.96352	brook stickleback	66			
1120691479580			-112.04858	fathead minnow	2			
				white sucker	18			
				yellow perch		2		
Total Herp Number	0	Total Fish Number			86	2	88	
Herp Richness	0	Fish Richness					4	
Total Site Richness	4	Native Fish Richness					3	
		Percent Native					97.73	
10050002 Breed Creek		10/18/06	48.87481	brook trout		75		
1112900489971			-111.24038	lake chub	86			
				longnose dace	79			
				mountain sucker	42			
				white sucker	17			
Total Herp Number	0	Total Fish Number			224	75	299	
Herp Richness	0	Fish Richness					5	
Total Site Richness	5	Native Fish Richness					4	
		Percent Native					74.92	
10040103 Buffalo Creek		7/13/06	46.85268	brassy minnow	1			
1097948468619			-109.763210	fathead minnow	12			
				lake chub	252			
				longnose dace	78			
				mottled sculpin	1			
				northern redbelly dace	131			
				hybrid dace	3			
				white sucker	104			
				northern leopard frog		3		
Total Herp Number	3	Total Fish Number			582	0	582	
Herp Richness	1	Fish Richness					7	
Total Site Richness	8	Native Fish Richness					7	
		Percent Native					100	
10030203 Bullhead Creek		6/7/06	48.3741	brassy minnow	11			
1119994483613			-112.142350	brook stickleback	18			
				fathead minnow	37			
				lake chub	55			
				longnose dace	35			
				longnose sucker	2			
				northern redbelly dace	2			
				spottail shiner		1		
				white sucker	7			
Total Herp Number	0	Total Fish Number			167	1	168	

Herp Richness	0	Fish Richness			9
Total Site Richness	9	Native Fish Richness			8
		Percent Native			99.41
10030103 Cannonball Coulee	7/19/06	47.36215 fathead minnow	348		
1114388473739		-111.435870			
Total Herp Number	0	Total Fish Number	348	0	348
Herp Richness	0	Fish Richness			1
Total Site Richness	1	Native Fish Richness			1
		Percent Native			100
10030102 Castner Coulee	7/19/06	47.37121	brassy minnow	5	
1115063473791		-111.50204	common carp		4
			fathead minnow	545	
			golden shiner		2
			lake chub	12	
			longnose dace	16	
			longnose sucker	20	
			hybrid dace	1	
			pumpkinseed		16
			white sucker	107	
Total Herp Number	0	Total Fish Number	706	22	728
Herp Richness	0	Fish Richness			10
Total Site Richness	10	Native Fish Richness			7
		Percent Native			96.98
10030102 Cherry Coulee	7/20/06	47.21902	tiger salamander		5
1116482472261		-111.64293			
Total Herp Number	5	Total Fish Number	0	0	0
Herp Richness	1	Fish Richness			0
Total Site Richness	1	Native Fish Richness			0
		Percent Native			0
10030103 Clark Creek	7/18/06	47.19527 longnose dace	26		
1113907471950		-111.393960 white sucker	285		
Total Herp Number	0	Total Fish Number	311	0	311
Herp Richness	0	Fish Richness			2
Total Site Richness	2	Native Fish Richness			2
		Percent Native			100
10040103 Coyote Creek	9/20/06	47.28695 fathead minnow	20		

1099729473155		-110.020770 lake chub		16		
		longnose dace		20		
		northern redbelly dace		160		
		hybrid dace		24		
Total Herp Number	0	Total Fish Number	240	0	240	
Herp Richness	0	Fish Richness			4	
Total Site Richness	4	Native Fish Richness			4	
		Percent Native			100	
10030104 Cutting Shed Coulee		10/16/06	47.54123 brown trout	6		
1122975475406		-112.297650 mountain whitefish	1			
		rainbow trout		39		
Total Herp Number	0	Total Fish Number	1	45	46	
Herp Richness	0	Fish Richness			3	
Total Site Richness	3	Native Fish Richness			1	
		Percent Native			2.17	
10040102 Davis Creek		9/5/06	47.37366 fathead minnow	123		
1102362473755		-110.366130 lake chub	43			
		white sucker	142			
Total Herp Number	0	Total Fish Number	308	0	308	
Herp Richness	0	Fish Richness			3	
Total Site Richness	3	Native Fish Richness			3	
		Percent Native			100	
10030203 Dry Fork Marias River (site 1)		6/6/06	48.21488 brassy minnow	1		
1117441483714		-111.944507 brook stickleback	148			
		fathead minnow	16			
		lake chub	59			
		longnose dace	124			
		spottail shiner		12		
		white sucker	36			
Total Herp Number	0	Total Fish Number	384	12	396	
Herp Richness	0	Fish Richness			7	
Total Site Richness	7	Native Fish Richness			6	
		Percent Native			96.97	
10030203 Dry Fork Marias River (site 2)		6/6/06	48.2161 brassy minnow	40		
1117441483714		-111.941830 brook stickleback	124			
		fathead minnow	39			
		lake chub	108			
		longnose dace	19			

		spottail shiner		7	
		white sucker		60	
Total Herp Number	0	Total Fish Number	390	7	397
Herp Richness	0	Fish Richness			7
Total Site Richness	7	Native Fish Richness			6
		Percent Native			98.24
Dry Fork Marias River Summary	6/6/06		Total Fish Number	793	
Sampled 2 times at 2 sites	6/6/06		Fish Richness	7	
			Percent Native	97.6	
			Total Site Richness	7	
10030205 Farmers Coulee	6/21/06	47.98961	brook stickleback	2	
1120382479905		-112.048840	fathead minnow	4	
		boreal chorus frog		1	
Total Herp Number	1	Total Fish Number	6	0	6
Herp Richness	1	Fish Richness			2
Total Site Richness	3	Native Fish Richness			2
		Percent Native			100
10040203 Flatwillow Creek (overflow canal)	5/17/06	46.941	fathead minnow	19	
		-108.2354			
Total Herp Number	0	Total Fish Number	19	0	19
Herp Richness	0	Fish Richness			1
Total Site Richness	1	Native Fish Richness			1
		Percent Native			100
10030205 Gamble Coulee	6/21/06	47.85975	brassy minnow	70	
1120327478424		-112.09105	brook stickleback	7	
			fathead minnow	60	
			longnose dace	5	
			northern redbelly dace	116	
			hybrid dace	7	
Total Herp Number	0	Total Fish Number	265	0	265
Herp Richness	0	Fish Richness			5
Total Site Richness	5	Native Fish Richness			5
		Percent Native			100
10040103 Hamilton Coulee	9/19/06	47.31783	fathead minnow	56	
1096634473538		-109.619480	northern redbelly dace	220	
			hybrid dace	4	
		northern leopard frog		13	

Total Herp Number	13	Total Fish Number	280	0	280
Herp Richness	1	Fish Richness			2
Total Site Richness	3	Native Fish Richness			2
		Percent Native			100
10030102 Huff Creek	7/20/06	47.18923	fathead minnow	64	
1115941471957		-111.60574	longnose dace	1	
			northern redbelly dace	7	
Total Herp Number	0	Total Fish Number	72	0	72
Herp Richness	0	Fish Richness			3
Total Site Richness	3	Native Fish Richness			3
		Percent Native			100
10040103 Indian Creek	9/19/06	47.23447	brassy minnow	3	
1096821472367		-109.683520	brook stickleback	1	
			brown trout		3
			common carp		1
			fathead minnow	9	
			lake chub	41	
			longnose dace	53	
			longnose sucker	11	
			northern redbelly dace	7	
			white sucker	64	
			northern leopard frog		16
Total Herp Number	16	Total Fish Number	189	4	193
Herp Richness	1	Fish Richness			10
Total Site Richness	11	Native Fish Richness			8
		Percent Native			97.93
10030102 Keaster Creek	9/13/06	47.6039	brassy minnow	85	
1105889476141		-110.619840	fathead minnow	190	
			lake chub	329	
			longnose dace	53	
			mountain sucker	45	
			northern redbelly dace	80	
			hybrid dace	19	
			white sucker	379	
Total Herp Number	0	Total Fish Number	1180	0	1180
Herp Richness	0	Fish Richness			7
Total Site Richness	7	Native Fish Richness			7
		Percent Native			100

10030203 Little Flat Coulee		10/17/06	48.27913	brook stickleback	154		
1118187482616			-111.83998				
Total Herp Number	0	Total Fish Number	154	0	154		
Herp Richness	0	Fish Richness			1		
Total Site Richness	1	Native Fish Richness			1		
		Percent Native			100		
10040204 Log Gulch		9/14/06	47.19471	fathead minnow	432		
1090049471878			-109.00434	northern redbelly dace	8		
				hybrid dace	2		
				northern leopard frog	4		
Total Herp Number	4	Total Fish Number	442	0	442		
Herp Richness	1	Fish Richness			2		
Total Site Richness	3	Native Fish Richness			2		
		Percent Native			100		
10040204 Maiden Creek		5/16/06	47.15783	boreal chorus frog	1		
1090472471314			-109.186950				
Total Herp Number	1	Total Fish Number	0	0	0		
Herp Richness	1	Fish Richness			0		
Total Site Richness	1	Native Fish Richness			0		
		Percent Native			0		
10030205 Maucki Coulee		6/21/06	48.05628	tiger salamander	2		
1120058480158			-112.134930				
Total Herp Number	2	Total Fish Number	0	0	0		
Herp Richness	1	Fish Richness			0		
Total Site Richness	1	Native Fish Richness			0		
		Percent Native			0		
10040201 Muddy Creek		7/11/06	46.35617	brook trout	5		
1104179464311			-110.43315	mottled sculpin	12		
Total Herp Number	0	Total Fish Number	12	5	17		
Herp Richness	0	Fish Richness			2		
Total Site Richness	2	Native Fish Richness			1		
		Percent Native			70.59		
10040103 Mutton Coulee		7/10/06	47.62432	northern leopard frog	150		
1096522476474			-109.76151	tiger salamander	15		
Total Herp Number	165	Total Fish Number	0	0	0		
Herp Richness	2	Fish Richness			0		
Total Site Richness	2	Native Fish Richness			0		

Percent Native						0
10030105 North Willow Creek	5/24/06	47.47885 lake chub	15			
	1108582475185	-110.795240				
Total Herp Number	0	Total Fish Number	15	0	15	
Herp Richness	0	Fish Richness			1	
Total Site Richness	1	Native Fish Richness			1	
		Percent Native			100	
10040203 Pike Creek	7/26/06	46.83616 fathead minnow	317			
	1083909468524	-108.51536				
		boreal chorus frog			4	
		northern leopard frog			273	
Total Herp Number	277	Total Fish Number	317	0	317	
Herp Richness	2	Fish Richness			1	
Total Site Richness	3	Native Fish Richness			1	
		Percent Native			100	
10030203 Pondera Coulee	10/17/06	48.17902 brook stickleback	144			
	1110434482738	-111.75364				
		fathead minnow	155			
		lake chub	10			
		spottail shiner		3		
		white sucker	14			
Total Herp Number	0	Total Fish Number	323	3	326	
Herp Richness	0	Fish Richness			5	
Total Site Richness	5	Native Fish Richness			4	
		Percent Native			99.08	
10040102 Possum Run Coulee	7/10/06	47.41063 brassy minnow	80			
	1099515474106	-109.958110 fathead minnow	8			
		lake chub	2			
		northern redbelly dace	3			
Total Herp Number	0	Total Fish Number	93	0	93	
Herp Richness	0	Fish Richness			4	
Total Site Richness	4	Native Fish Richness			4	
		Percent Native			100	
10030105 Red Coulee	5/24/06	47.49795 tiger salamander	6			
	1109548475596	-110.963230				
Total Herp Number	6	Total Fish Number	0	0	0	
Herp Richness	1	Fish Richness			0	
Total Site Richness	1	Native Fish Richness			0	
		Percent Native			0	

10030203 Ringwald Coulee		6/7/06	48.36974	fathead minnow	5				
1121246483707			-112.12402	lake chub	31				
				longnose dace	42				
				longnose sucker	1				
				spottail shiner		1			
				white sucker	26				
Total Herp Number	0	Total Fish Number			105	1	106		
Herp Richness	0	Fish Richness					6		
Total Site Richness	6	Native Fish Richness					5		
		Percent Native					99.06		
10040103 Rock Creek		7/25/06	46.87786	brook trout		236			
1097266470574			-109.53057	mottled sculpin	70				
				rainbow trout		17			
				common gartersnake			1		
				terrestrial gartersnake			1		
Total Herp Number	2	Total Fish Number			70	253	323		
Herp Richness	2	Fish Richness					3		
Total Site Richness	5	Native Fish Richness					1		
		Percent Native					21.67		
10040103 Ross Fork Creek		6/1/06	46.96735	brassy minnow	34				
1097192470725			-109.79946	common carp		3			
				fathead minnow	18				
				lake chub	148				
				longnose dace	289				
				northern redbelly dace	47				
				hybrid dace	8				
				white sucker	45				
Total Herp Number	0	Total Fish Number			589	3	592		
Herp Richness	0	Fish Richness					7		
Total Site Richness	7	Native Fish Richness					6		
		Percent Native					99.49		
10030203 School Section Coulee		10/17/06	48.18031	brook stickleback	2				
1118722481873			-111.87583						
Total Herp Number	0	Total Fish Number			2	0	2		
Herp Richness	0	Fish Richness					1		
Total Site Richness	1	Native Fish Richness					1		
		Percent Native					100		

10030201 Sheep Creek (1)		8/1/06	48.19966	fathead minnow	30		
1124797482019			-112.537170	lake chub	314		
				longnose dace	171		
				white sucker	158		
Total Herp Number	0	Total Fish Number	673	0	673		
Herp Richness	0	Fish Richness			4		
Total Site Richness	4	Native Fish Richness			4		
		Percent Native			100		
10030201 Sheep Creek (2)		8/1/06	48.20144	fathead minnow	5		
1124797482019			-112.513050	lake chub	67		
				longnose dace	129		
				white sucker	69		
				northern leopard frog		12	
Total Herp Number	12	Total Fish Number	270	0	270		
Herp Richness	1	Fish Richness			4		
Total Site Richness	5	Native Fish Richness			4		
		Percent Native			100		
10030201 Sheep Creek (oxbow pond)		8/1/06	48.20127	fathead minnow	12		
1124797482019			-112.495000	northern redbelly dace	303		
				hybrid dace	10		
Total Herp Number	0	Total Fish Number	325	0	325		
Herp Richness	0	Fish Richness			2		
Total Site Richness	2	Native Fish Richness			2		
		Percent Native			100		
Sheep Creek Summary		8/1/06		Total Fish Number	1268		
Sampled 3 times at 3 sites		8/1/06		Fish Richness	5		
		8/1/06		Percent Native	100		
				Total Site Richness	6		
10040103 Smith Creek		7/10/06	47.36678	fathead minnow	371		
1097834473527			-109.894160	northern redbelly dace	172		
Total Herp Number	0	Total Fish Number	543	0	543		
Herp Richness	0	Fish Richness			2		
Total Site Richness	2	Native Fish Richness			2		
		Percent Native			100		
10040204 South Fork Bear Creek		5/16/06	47.22994	fathead minnow	237		
1085431472263			-108.553430	green sunfish		13	
				boreal chorus frog		5	

Total Herp Number	5	Total Fish Number	237	13	250
Herp Richness	1	Fish Richness			2
Total Site Richness	3	Native Fish Richness			1
		Percent Native			94.8
10030205 Spring Coulee	6/22/06	47.89809	brook stickleback	146	
1120072478655		-112.055360	fathead minnow	2	
			lake chub	9	
			longnose dace	26	
			mountain sucker	1	
			hybrid dace	1	
			white sucker	8	
Total Herp Number	0	Total Fish Number	193	0	193
Herp Richness	0	Fish Richness			7
Total Site Richness	7	Native Fish Richness			7
		Percent Native			100
10030203 Spring Creek	6/8/06	48.2108	brook stickleback	26	
1119981482185		-112.046210			
Total Herp Number	0	Total Fish Number	26	0	26
Herp Richness	0	Fish Richness			1
Total Site Richness	1	Native Fish Richness			1
		Percent Native			100
10030203 Unnamed tributary to Dry Fork Marias (site 3)	6/6/06	48.21005	brook stickleback	53	
		-111.941870			
Total Herp Number	0	Total Fish Number	53	0	53
Herp Richness	0	Fish Richness			1
Total Site Richness	1	Native Fish Richness			1
		Percent Native			100
10030203 Unnamed tributary to Dry Fork Marias (site 4)	6/6/06	48.2077	brook stickleback	53	
		-111.928550	fathead minnow	2	
			white sucker	1	
Total Herp Number	0	Total Fish Number	56	0	56
Herp Richness	0	Fish Richness			3
Total Site Richness	3	Native Fish Richness			3
		Percent Native			100
10030105 Williams Creek (upper end)	5/25/06	47.27483	brassy minnow	11	
1107061472657		-110.686310	fathead minnow	62	
			lake chub	372	

				longnose dace	47		
				longnose sucker	28		
				white sucker	117		
				terrestrial gartersnake		1	
Total Herp Number	1	Total Fish Number	637	0	637		
Herp Richness	1	Fish Richness			6		
Total Site Richness	7	Native Fish Richness			6		
		Percent Native			100		
10030105 Williams Creek (lower end)		5/25/06	47.26769	brown trout	10		
1107061472657			-110.704340	mottled sculpin	3		
Total Herp Number	0	Total Fish Number	3	10	13		
Herp Richness	0	Fish Richness			2		
Total Site Richness	2	Native Fish Richness			1		
		Percent Native			23.08		
Williams Creek Summary		5/25/06			Total Fish Number	650	
Sampled 2 times at 2 sites		5/25/06			Fish Richness	8	
					Percent Native	98.46	
					Total Site Richness	9	
10030203 Winginaw Coulee		6/7/06	48.37091	brassy minnow	4		
1121323483733			-112.14036	brook stickleback	15		
				fathead minnow	5		
				lake chub	29		
				longnose dace	2		
				longnose sucker	1		
				spottail shiner	1		
				white sucker	3		
Total Herp Number	0	Total Fish Number	59	1	60		
Herp Richness	0	Fish Richness			8		
Total Site Richness	8	Native Fish Richness			7		
		Percent Native			98.33		
Region 4 Summary				Total Fish Number	17669		
Sites with fish or herps	61			Total Nonnative Fish	482		
Sites with fish	56			Fish Species	20		
Sites with greater than 25% nonnative fish	5	Mostly Salmonidae		Native Fish Species	11		
Sites with equal or greater number nonnative species	5			Percent Native Fish	97.28%		

Sites with 100% native fish species	36		Herp Species	5			
Percentage of sites w/fish and only native fish species	64.29%						
Stream data = multiple sample sites on a stream		Stream Data exists for five streams					
Streams with 100% native fish	2	Streams w/greater than 25% nonnative fish	0				
Streams with 99% or greater native fish	2						
Big Rock Creek Coulee	100%						
Sheep Creek	100%						
REGION 5							
HUC (Drainage)	Site Name/Number/Region	Dates	Lat/Long	Species (Fish and Herp)	#Native	#NonN	Total
Upper Yellowstone Lake Basin 10070004	Alkali Creek YRPA 36A1_R5	5/8/06	45.80308, -108.473454	longnose dace lake chub mountain sucker longnose sucker pumpkinseed terrestrial gartersnake	50 571 1 1	1	2
Total Herp Number	2		Total Fish Number	623	1	624	
Herp Richness	1		Fish Richness			4	
Total Site Richness	5		Native Fish Richness			3	
			Percent Native			99.84	
Upper Yellowstone Lake Basin 10070004	Alkali Creek Mouth 36C1_R5 Too many fish to count. Just species list.	5/11/06	45.80171, -108.47182	common carp lake chub emerald shiner fathead minnow western silvery minnow shorthead redhorse white sucker longnose sucker stonecat black bullhead black crappie white crappie green sunfish pumpkinseed yellow perch	1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1	15
Total Herp Number	0		Total Fish Number	8	7	15	

Herp Richness	0	Fish Richness	15
Total Site Richness	14	Native Fish Richness	8
		Percent Native	NA
Alkali Creek Summary	5/8/06	Total Fish Number	637
Sampled 3 times at 3 sites	5/11/06	Fish Richness	17
One with no fish	5/18/06	Percent Native	NA
		Total Site Richness	19
Upper Yellowstone Arrow Creek (mid) 44B1_R5	6/8/06	45.97787, -108.14311	longnose dace 1
Pompey's Pillar			lake chub 1
10070007			flathead chub 19
			emerald shiner 2
			western silvery minnow 6
			white sucker 4
Total Herp Number	0	Total Fish Number	33 0 33
Herp Richness	0	Fish Richness	7
Total Site Richness	7	Native Fish Richness	7
		Percent Native	100
Upper Yellowstone Arrow Creek (mid) 44B2_R5	10/25/06	45.97787, -108.14311	longnose dace 58
Pompey's Pillar			lake chub 468
10070007			flathead chub 1627
			emerald shiner 769
			sand shiner 23
			fathead minnow 66
			western silvery minnow 2704
			river carpsucker 5
			shorthead redhorse 65
			white sucker 97
			mountain sucker 120
			longnose sucker 182
			stonecat 22
Total Herp Number	0	Total Fish Number	6206 0 6206
Herp Richness	0	Fish Richness	13
Total Site Richness	13	Native Fish Richness	13
		Percent Native	100
Upper Yellowstone Arrow Creek (upper) 44E1_R5	5/22/06	45.90000, -108.15264	longnose dace 55
Pompey's Pillar			lake chub 78
10070007			terrestrial gartersnake 1
Total Herp Number	1	Total Fish Number	133 0 133

Herp Richness	1	Fish Richness	2
Total Site Richness	3	Native Fish Richness	2
		Percent Native	100
Arrow Creek Summary	8/8/06	Total Fish Number	6379
Sampled 3 times at 3 sites	10/25/06	Fish Richness	13
One with no fish	5/22/06	Percent Native	100
		Total Site Richness	14
Upper Musselshell 1004021	Big Coulee Creek 42A1_R5	6/21/06 46.13579, -109.34601	Phoxinus sp. 4 hybrid dace 1 fathead minnow 2
Total Herp Number	0	Total Fish Number	7 0 7
Herp Richness	0	Fish Richness	2
Total Site Richness	2	Native Fish Richness	2
		Percent Native	100
Upper Musselshell 1004021	Big Coulee Creek 42C1_R5	6/20/06 46.26336, -108.95276	common carp 15 longnose dace 1 lake chub 32 northern redbelly dace 1 fathead minnow 11 brassy minnow 66 white sucker 2 painted turtle 1 gophersnake 1
Total Herp Number	2	Total Fish Number	113 15 128
Herp Richness	2	Fish Richness	7
Total Site Richness	9	Native Fish Richness	6
		Percent Native	88.28
Upper Musselshell 1004021	Big Coulee Creek 42C2_R5	8/8/06 46.26336, -108.95276	common carp 87 longnose dace 9 lake chub 1370 Phoxinus sp. 71 northern red belly dace 22 fathead minnow 118 brassy minnow 595 white sucker 5 common gartersnake 1 northern leopard frog 1

Total Herp Number	2		Total Fish Number	2190	87	2277
Herp Richness	2		Fish Richness			7
Total Site Richness	9		Native Fish Richness			6
			Percent Native			96.18
Upper Musselshell 1004021	Big Coulee Creek 42C3_R5	10/10/06	46.26336, -108.95276	common carp	11	
				lake chub	550	
				Phoxinus sp.	2	
				fathead minnow	46	
				brassy minnow	491	
Total Herp Number	0		Total Fish Number	1089	11	1100
Herp Richness	0		Fish Richness			5
Total Site Richness	5		Native Fish Richness			4
			Percent Native			99
Upper Musselshell 1004021	Big Coulee Creek 42D1_R5	6/20/06	46.28082, -108.93583	longnose dace	1	
				lake chub	1	
				Phoxinus sp.	16	
				fathead minnow	12	
				spiny softshell		14
				northern leopard frog		1
Total Herp Number	15		Total Fish Number	30	0	30
Herp Richness	2		Fish Richness			4
Total Site Richness	6		Native Fish Richness			4
			Percent Native			100
Upper Musselshell 1004021	Big Coulee Creek 42D2_R5	7/24/06	46.28082, -108.93583	common carp	17	
				lake chub	3	
				fathead minnow	5	
				white sucker	7	
				smallmouth bass	2	
				Woodhouse's toad		4
				spiny softshell		1
Total Herp Number	5		Total Fish Number	15	19	34
Herp Richness	2		Fish Richness			5
Total Site Richness	7		Native Fish Richness			3
			Percent Native			44.12
Big Coulee Creek Summary		6/20/06	10/10/2006	Total Fish Number	3576	
Sampled 7 times at 3 sites		6/20/06	10/10/2006	Fish Richness	8	

				6/21/06					Percent Native		96.31		
				7/24/06					Total Site Richness		14		
				8/8/06									
Upper Yellowstone Lake Basin 10070004	Blue Creek (Golf Course) 64B1_R5	5/17/06	45.71964,-108.51406	longnose dace	9								
				lake chub	148								
				fathead minnow	25								
				white sucker	69								
				green sunfish		2							
Total Herp Number	0			Total Fish Number	251	2	253						
Herp Richness	0			Fish Richness	5								
Total Site Richness	5			Native Fish Richness	4								
				Percent Native	99.21								
Upper Yellowstone Lake Basin 10070004	Blue Creek (Golf Course) 64B2_R5	6/29/06	45.71964,-108.51406	longnose dace	27								
				lake chub	151								
				fathead minnow	22								
				white sucker	34								
				longnose sucker	11								
Total Herp Number	0			Total Fish Number	245	0	245						
Herp Richness	0			Fish Richness	5								
Total Site Richness	5			Native Fish Richness	5								
				Percent Native	99.23								
Upper Yellowstone Lake Basin 10070004	Blue Creek (Golf Course) 64B3_R5	10/19/06	45.71964,-108.51406	longnose dace	74								
				lake chub	497								
				fathead minnow	85								
				white sucker	95								
				longnose sucker	35								
				mountain sucker	18								
				brook stickleback	6								
				green sunfish		4							
Total Herp Number	0			Total Fish Number	810	4	814						
Herp Richness	0			Fish Richness	8								
Total Site Richness	8			Native Fish Richness	7								
				Percent Native	99.5								
Blue Creek Summary		5/17/06		Total Fish Number		1312							
Sampled 3 times at 1 site		6/29/06		Fish Richness		8							
		10/19/06		Percent Native		99.54							
				Total Site Richness		8							

Upper Yellowstone Lake Basin 10070004	Canyon Creek 37D1_R5	5/24/06	45.76775, -108.78777	lake chub fathead minnow white sucker	48 1487 13		
Total Herp Number	0			Total Fish Number	1548	0	1548
Herp Richness	0			Fish Richness			3
Total Site Richness	3			Native Fish Richness			3
				Percent Native			100
Upper Yellowstone Lake Basin 10070004	Canyon Creek 37E1_R5	5/24/06	45.79678, -108.94605	longnose dace lake chub fathead minnow white sucker painted turtle boreal chorus frog	5 463 1054 481 1 1		
Total Herp Number	2			Total Fish Number	2003	0	2003
Herp Richness	2			Fish Richness			4
Total Site Richness	6			Native Fish Richness			4
				Percent Native			100
Upper Yellowstone Lake Basin 10070004	Canyon Creek 37F1_R5	5/25/06	45.783, -108.783	longnose dace lake chub flathead chub fathead minnow shorthead redhorse white sucker mountain sucker longnose sucker stonecat green sunfish boreal chorus frog great plains toad	349 406 164 763 48 290 28 30 4 1 1 2		
Total Herp Number	3			Total Fish Number	2082	1	2081
Herp Richness	2			Fish Richness			10
Total Site Richness	12			Native Fish Richness			9
				Percent Native			99.95
Upper Yellowstone Lake Basin 10070004	Canyon Creek 37G1_R5	10/25/06	45.71997, -108.59683	longnose dace lake chub flathead chub emerald shiner fathead minnow western silvery minnow	13 2 110 4 4 3		

				shorthead redhorse	1		
				white sucker	13		
				mountain sucker	10		
				longnose sucker	22		
				rainbow trout		1	
				brown trout		1	
				mountain whitefish	1		
				northern leopard frog			3
Total Herp Number	3		Total Fish Number	183	2	185	
Herp Richness	1		Fish Richness			13	
Total Site Richness	14		Native Fish Richness			11	
			Percent Native			98.92	
Canyon Creek Summary	5/24/06		Total Fish Number	5817			
Sampled 4 times at 4 sites	5/25/06		Fish Richness	15			
	5/24/06		Percent Native	99.95			
	10/25/06		Total Site Richness	19			
Upper Musselshell 10040201	Careless Creek 50C_R5	7/24/06	46.34307, -109.21847	common carp		13	
				longnose dace	4		
				lake chub	135		
				flathead chub	2		
				northern redbelly dace	3		
				hybrid dace	17		
				Phoxinus sp.	20		
				fathead minnow	320		
				sand shiner	1		
				brassy minnow	80		
				white sucker	20		
				mountain sucker	29		
				longnose sucker	1		
				stonecat	1		
				painted turtle			3
				northern leopard frog			5
Total Herp Number	8		Total Fish Number	633	13	646	
Herp Richness	2		Fish Richness			12	
Total Site Richness	15		Native Fish Richness			11	
			Percent Native			97.98	
Upper Musselshell 10040201	Careless Creek 502C_R5	10/10/06	46.34307, -109.21847	common carp		9	
				longnose dace	121		

				lake chub	368	
				flathead chub	133	
				fathead minnow	634	
				brassy minnow	333	
				shorthead redhorse	10	
				white sucker	282	
				mountain sucker	12	
				longnose sucker	12	
				stonecat	1	
				black bullhead		1
				northern leopard frog		1
Total Herp Number	1		Total Fish Number	1906	11	1917
Herp Richness	1		Fish Richness			12
Total Site Richness	13		Native Fish Richness			10
			Percent Native			99.43
Careless Creek Summary		7/24/06		Total Fish Number	2563	
Sampled 2 times at 1 site		10/10/06		Fish Richness	14	
				Percent Native	99.06	
				Total Site Richness	16	
Upper Yellowstone	Crooked Creek 22D1_R5	8/7/06	45.94418, -108.29887	common carp		4
Pompey's Pillar				longnose dace	6	
				lake chub	17	
				flathead chub	573	
				sand shiner	8	
				fathead minnow	318	
				white sucker	41	
				mountain sucker	2	
				longnose sucker	12	
				stonecat	2	
				northern leopard frog		2
Total Herp Number	2		Total Fish Number	979	4	983
Herp Richness	1		Fish Richness			10
Total Site Richness	11		Native Fish Richness			9
			Percent Native			99.59
Upper Yellowstone	Crooked Creek 22D2_R5	10/24/06	45.94418, -108.29887	longnose dace	20	
Pompey's Pillar				lake chub	3	
				flathead chub	745	
				sand shiner	1	
				fathead minnow	15	

				western silvery minnow	61		
				shorthead redhorse	5		
				white sucker	18		
				mountain sucker	4		
				longnose sucker	68		
				rainbow trout		2	
Total Herp Number	0		Total Fish Number	940	2	942	
Herp Richness	0		Fish Richness			11	
Total Site Richness	11		Native Fish Richness			10	
			Percent Native			99.79	
Upper Yellowstone	Crooked Creek 22E1_R5	6/19/06	45.96264, -108.35209	longnose dace	5		
Pompey's Pillar				lake chub	52		
				flathead chub	91		
				sand shiner	33		
				fathead minnow	115		
				shorthead redhorse	9		
				white sucker	16		
				mountain sucker	10		
				longnose sucker	5		
				stonecat	2		
				brook stickleback	1		
				terrestrial gartersnake			1
				Woodhouse's toad			6
Total Herp Number	7		Total Fish Number	339	0	339	
Herp Richness	2		Fish Richness			11	
Total Site Richness	13		Native Fish Richness			11	
			Percent Native			100	
Upper Yellowstone	Crooked Creek 22E2_R5	8/2/06	45.96264, -108.35209	common carp		13	
Pompey's Pillar				longnose dace	1		
				lake chub	471		
				flathead chub	4		
				sand shiner	88		
				fathead minnow	115		
				shorthead redhorse	18		
				white sucker	71		
				longnose sucker	19		
				Woodhouse's toad			2
Total Herp Number	2		Total Fish Number	787	13	800	
Herp Richness	1		Fish Richness			9	
Total Site Richness	10		Native Fish Richness			8	
			Percent Native			98.38	

Upper Yellowstone Pompey's Pillar	Crooked Creek 22E3_R5	10/24/06	45.96264, -108.35209	common carp		2			
				longnose dace	2				
				lake chub	200				
				flathead chub	2				
				sand shiner	73				
				fathead minnow	63				
				western silvery minnow	4				
				white sucker	14				
Total Herp Number	0		Total Fish Number	358	2	360			
Herp Richness	0		Fish Richness			8			
Total Site Richness	8		Native Fish Richness			7			
			Percent Native			99.44			
Crooked Creek Summary		6/19/06	10/24/06	Total Fish Number	3424				
Sampled 5 times at 2 sites		8/2/06		Fish Richness	14				
		8/7/06		Percent Native	99.38				
		10/24/06		Total Site Richness	17				
Upper Musselshell 10040201	Deadman's Drain 303A1_R5	9/28/06	46.33905, -109.40413	common carp		43			
				longnose dace	12				
				lake chub	20				
				fathead minnow	112				
				brassy minnow	3				
				white sucker	17				
				rainbow trout		55			
				kokanee		13			
Total Herp Number	0		Total Fish Number	164	111	275			
Herp Richness	0		Fish Richness			8			
Total Site Richness	8		Native Fish Richness			5			
			Percent Native			59.64			
Upper Musselshell 10040201	Fish Creek 49B1_R5	5/31/06	46.23384, -109.47277	longnose dace	272				
				lake chub	347				
				flathead chub	3				
				fathead minnow	5				
				brassy minnow	13				
				white sucker	165				
				mountain sucker	1				
				northern leopard frog		2			
Total Herp Number	2		Total Fish Number	806	0	806			
Herp Richness	1		Fish Richness			7			
Total Site Richness	8		Native Fish Richness			7			

				Percent Native	100
Upper Musselshell 10040201	Fish Creek 49B2_R5	8/8/06	46.23384, -109.47277	longnose dace lake chub shorthead redhorse white sucker mountain sucker common gartersnake northern leopard frog Woodhouse's toad	204 128 1 30 1 1 400 100
Total Herp Number	501		Total Fish Number	364	0 364
Herp Richness	3		Fish Richness		5
Total Site Richness	8		Native Fish Richness		5
				Percent Native	100
Upper Musselshell 10040201	Fish Creek 49B3_R5	10/17/06	46.23384, -109.47277	longnose dace lake chub flathead chub northern redbelly dace fathead minnow white sucker	127 264 5 3 36 123
Total Herp Number	0		Total Fish Number	558	0 558
Herp Richness	0		Fish Richness		6
Total Site Richness	6		Native Fish Richness		6
				Percent Native	100
Upper Musselshell 10040201	Fish Creek 49C1_R5	5/30/06	46.28835, -109.22387	common carp longnose dace lake chub flathead chub northern redbelly dace Phoxinus sp. fathead minnow brassy minnow river carpsucker shorthead redhorse white sucker mountain sucker stonecat spiny softshell northern leopard frog great plains toad	 1 12 1 1
Total Herp Number	14		Total Fish Number	458	1 459

Herp Richness	3		Fish Richness	12	
Total Site Richness	15		Native Fish Richness	11	
			Percent Native	99.78	
Upper Musselshell 10040201	Fish Creek 49C2_R5	7/3/06	46.28835, -109.22387	longnose dace lake chub Phoxinus sp. fathead minnow brassy minnow river carpsucker shorthead redhorse white sucker stonecat spiny softshell	1 1 22 32 62 5 3 37 6 2
Total Herp Number	2		Total Fish Number	169	0 169
Herp Richness	1		Fish Richness	9	
Total Site Richness	10		Native Fish Richness	9	
			Percent Native	100	
Upper Musselshell 10040201	Fish Creek 49C3_R5	10/12/06	46.28835, -109.22387	longnose dace lake chub flathead chub Phoxinus sp. fathead minnow brassy minnow shorthead redhorse white sucker stonecat northern leopard frog	4 35 45 2 41 1 9 40 5 1
Total Herp Number	1		Total Fish Number	182	0 182
Herp Richness	1		Fish Richness	9	
Total Site Richness	10		Native Fish Richness	9	
			Percent Native	100	
Upper Musselshell 10040201	Fish Creek 49D1_R5	6/13/06	46.21426, -109.93342	longnose dace lake chub fathead minnow white sucker brook trout terrestrial gartersnake	380 5 1 37 1 1
Total Herp Number	1		Total Fish Number	423	1 424
Herp Richness	1		Fish Richness	5	
Total Site Richness	6		Native Fish Richness	4	

				Percent Native		99.76	
Upper Musselshell 10040201	Fish Creek 49D2_R5	8/23/06	46.21426, -109.93342	longnose dace	92		
				lake chub	1		
				fathead minnow	6		
				white sucker	19		
				brook trout		1	
Total Herp Number	0		Total Fish Number	118	1	119	
Herp Richness	0		Fish Richness			5	
Total Site Richness	5		Native Fish Richness			4	
			Percent Native			99.16	
Fish Creek Summary		5/30/06	8/8/06	Total Fish Number	3356		
Sampled 8 times at 3 sites		5/31/06	8/23/06	Fish Richness	13		
		6/13/06	10/12/06	Percent Native	99.91		
		7/3/06	10/17/06	Total Site Richness	19		
Upper Yellowstone Pompey's Pillar 10070007	Five Mile Creek 60A1_R5	4/20/06	45.84481, -108.423	longnose dace	33		
				flathead chub	28		
				fathead minnow	3		
				white sucker	42		
				mountain sucker	9		
				longnose sucker	9		
				stonecat	3		
				brook stickleback	3		
				northern leopard frog		3	
				Total Herp Number	3		Total Fish Number
Herp Richness	1		Fish Richness			8	
Total Site Richness	9		Native Fish Richness			8	
			Percent Native			100	
Upper Yellowstone Pompey's Pillar 10070007	Five Mile Creek 60A2_R5	6/26/06	45.84481, -108.423	longnose dace	24		
				flathead chub	36		
				sand shiner	3		
				fathead minnow	4		
				white sucker	1		
				mountain sucker	1		
				spiny softshell			1
				painted turtle			1
				boreal chorus frog			1
				Total Herp Number	3		Total Fish Number

Herp Richness	3		Fish Richness	6	
Total Site Richness	9		Native Fish Richness	6	
			Percent Native	100	
Upper Yellowstone	Five Mile Creek 60A3_R5	10/19/06	45.84481, -108.423	longnose dace	2
Pompey's Pillar				flathead chub	173
10070007				fathead minnow	6
				western silvery minnow	1
				shorthead redhorse	2
				white sucker	10
				mountain sucker	13
				longnose sucker	5
Total Herp Number	0		Total Fish Number	212	0 212
Herp Richness	0		Fish Richness	8	
Total Site Richness	8		Native Fish Richness	8	
			Percent Native	100	
Upper Yellowstone	Five Mile Creek 60B1_R5	5/1/06	45.85714, -108.49313	longnose dace	175
Pompey's Pillar				lake chub	457
10070007				flathead chub	6
				fathead minnow	245
				shorthead redhorse	1
				white sucker	285
				mountain sucker	1
				longnose sucker	20
				pumpkinseed	1
Total Herp Number	0		Total Fish Number	1190	1 1191
Herp Richness	0		Fish Richness	9	
Total Site Richness	9		Native Fish Richness	8	
			Percent Native	99.92	
Upper Yellowstone	Five Mile Creek 60B2_R5	6/28/06	45.85714, -108.49313	longnose dace	32
Pompey's Pillar				lake chub	140
10070007				fathead minnow	131
				shorthead redhorse	30
				white sucker	71
				mountain sucker	6
				longnose sucker	3
				brook stickleback	1
Total Herp Number	0		Total Fish Number	414	0 414
Herp Richness	0		Fish Richness	8	
Total Site Richness	8		Native Fish Richness	8	
			Percent Native	100	

Upper Yellowstone Pompey's Pillar 10070007	Five Mile Creek 60B3_R5	10/16/06	45.85714, -108.49313	longnose dace	123				
				lake chub	270				
				flathead chub	2				
				emerald shiner	91				
				shorthead redhorse	27				
				white sucker	115				
				mountain sucker	22				
				longnose sucker	20				
				brook stickleback	1				
				fathead minnow	111				
				western silvery minnow	46				
				stonecat	1				
Total Herp Number	0			Total Fish Number	829	0		829	
Herp Richness	0			Fish Richness				9	
Total Site Richness	9			Native Fish Richness				9	
				Percent Native				100	
Upper Yellowstone Pompey's Pillar 10070007	Five Mile Creek 60C1_R5	5/25/06	45.87908, -108.53107	tiger salamander				36	
Total Herp Number	36			Total Fish Number	0	0		0	
Herp Richness	1			Fish Richness				0	
Total Site Richness	1			Native Fish Richness				0	
				Percent Native				0	
Five Mile Summary		4/20/06	6/28/2006	Total Fish Number	2845				
Sampled 7 times at 3 sites		5/1/06	10/16/2006	Fish Richness	13				
		5/25/06	10/19/2006	Percent Native	99.97				
		6/26/06		Total Site Richness	16				
Upper Yellowstone Lake Basin 10070004	Iron Springs /Cove Creek	5/9/06	45.8354, -108.7364	tiger salamander				8	
				boreal chorus frog				2	
Total Herp Number	10			Total Fish Number	0	0		0	
Herp Richness	2			Fish Richness				0	
Total Site Richness	2			Native Fish Richness				0	
				Percent Native				0	
Upper Musselshell 10040201	Musselshell River (Selkirk) 302A_R5	9/19/06	46.4608, -110.2225	longnose dace	13				
				lake chub	1				
				Phoxinus sp.	1				

				white sucker	95		
				longnose sucker	33		
				brown trout		3	
Total Herp Number	0		Total Fish Number	143	3	146	
Herp Richness	0		Fish Richness	6			
Total Site Richness	6		Native Fish Richness	5			
			Percent Native	97.95			
Musselshell 10040201	Musselshell R. Barber Bridge 302B_R5	9/28/06	46.3061, -109.38479	common carp		13	
				longnose dace	16		
				lake chub	4		
				fathead minnow	5		
				brassy minnow	3		
				shorthead redhorse	1		
				white sucker	7		
				mountain sucker	1		
Total Herp Number	0		Total Fish Number	37	13	50	
Herp Richness	0		Fish Richness	8			
Total Site Richness	8		Native Fish Richness	7			
			Percent Native	74			
Musselshell 10040201	Musselshell R. Ryegate Bridge 302C_R5	10/16/06	46.62171, -107.82197	longnose dace	36		
				lake chub	1		
				flathead chub	2		
				shorthead redhorse	1		
				white sucker	1		
Total Herp Number	0		Total Fish Number	41	0	41	
Herp Richness	0		Fish Richness	5			
Total Site Richness	5		Native Fish Richness	5			
			Percent Native	100			
Musselshell 10040201	Musselshell R. Green Mt. Angus 302D_R5	9/28/06	46.31175, -109.14395	common carp		10	
				longnose dace	15		
				lake chub	16		
				flathead chub	2		
				fathead minnow	1		
				shorthead redhorse	9		
				white sucker	20		
				northern leopard frog		1	
Total Herp Number	1		Total Fish Number	63	10	73	
Herp Richness	1		Fish Richness	7			
Total Site Richness	8		Native Fish Richness	6			

				Percent Native	86.3	
Musselshell 10040201	Musselshell R. Cushman 302E_R5	9/28/06	46.29924, -109.03618	common carp	2	
				longnose dace	27	
				flathead chub	11	
				shorthead redhorse	6	
				white sucker	8	
				mountain sucker	3	
				longnose sucker	1	
				stonecat	1	
Total Herp Number	0		Total Fish Number	57	2	59
Herp Richness	0		Fish Richness	8		
Total Site Richness	8		Native Fish Richness	7		
			Percent Native	96.61		
Musselshell 10040201	Musselshell R. Lavina Bridge 302F_R5	9/28/06	46.28647, -108.9375	common carp	1	
				lake chub	1	
				flathead chub	3	
				shorthead redhorse	5	
				mountain sucker	2	
				longnose sucker	1	
				smallmouth bass	6	
Total Herp Number	0		Total Fish Number	12	7	19
Herp Richness	0		Fish Richness	7		
Total Site Richness	7		Native Fish Richness	5		
			Percent Native	63.16		
Musselshell 10040201	Musselshell R. Painted Robe 302H_R5	10/5/06	46.28515, -108.84261	common carp	6	
				longnose dace	1	
				flathead chub	29	
				river carpsucker	1	
				shorthead redhorse	3	
				white sucker	11	
				smallmouth bass	25	
				stonecat	1	
Total Herp Number	0		Total Fish Number	46	31	77
Herp Richness	0		Fish Richness	8		
Total Site Richness	8		Native Fish Richness	6		
			Percent Native	59.74		
Musselshell 10040201	Musselshell R. Roundup Bridge 302I_R5	10/5/06		common carp	21	
				sand shiner	4	

				river carpsucker	1	
				shorthead redhorse	4	
				white sucker	1	
Total Herp Number	0		Total Fish Number	10	21	31
Herp Richness	0		Fish Richness			5
Total Site Richness	5		Native Fish Richness			4
			Percent Native			32.26
Musselshell 10040201	Musselshell R.Gage 302J_R5	10/5/06	46.47285, -108.41187	common carp		4
				flathead chub	1	
				sand shiner	135	
				white sucker	1	
Total Herp Number	0		Total Fish Number	137	4	141
Herp Richness	0		Fish Richness			4
Total Site Richness	4		Native Fish Richness			3
			Percent Native			97.16
Musselshell 10040201	Musselshell R.Delphia 302L_R5	10/27/06	46.5088, -108.21574	common carp		8
				sand shiner	50	
				river carpsucker	1	
				white sucker	4	
				shorthead redhorse	33	
Total Herp Number	0		Total Fish Number	88	8	96
Herp Richness	0		Fish Richness			5
Total Site Richness	5		Native Fish Richness			4
			Percent Native			91.67
Musselshell 10040201	Musselshell R.Musselshell Dam 302M_R5	10/27/06	46.52052, -108.08836	sand shiner	28	
				shorthead redhorse	7	
				smallmouth bass		2
Total Herp Number	0		Total Fish Number	35	2	37
Herp Richness	0		Fish Richness			3
Total Site Richness	3		Native Fish Richness			2
			Percent Native			94.59
Musselshell 10040201	Musselshell R.Melstone Bridge 302N_R5	10/27/06	46.62171, -107.82197	common carp		9
				longnose dace	3	
				sand shiner	21	
				fathead minnow	7	
				western silvery minnow	102	
				plains minnow	154	
				river carpsucker	4	

				shorthead redhorse	3		
				white sucker	6		
				green sunfish		9	
				terrestrial gartersnake			1
Total Herp Number	1		Total Fish Number	300	18	318	
Herp Richness	1		Fish Richness			10	
Total Site Richness	11		Native Fish Richness			8	
			Percent Native			94.34	
Musselshell Summary		10/27/06	10/5/06	Total Fish Number	1088		
Sampled 12 times at 12 sites		10/27/06	10/5/06	Fish Richness	18		
		10/27/06	9/28/06	Percent Native	89.06		
		10/5/06	9/28/06	Total Site Richness	20		
9/28/06		9/28/06	10/16/06	9/19/06			
Middle Musselshell	North Willow 40A1_R5	10/27/06	46.68805, -108.01057	common carp		6	
10040202				sand shiner	142		
				fathead minnow	580		
				brassy minnow	16		
				plains minnow	97		
				white sucker	1		
				green sunfish		1599	
				painted turtle			1
Total Herp Number	1		Total Fish Number	836	1605	2441	
Herp Richness	1		Fish Richness			7	
Total Site Richness	8		Native Fish Richness			5	
			Percent Native			34.25	
Upper Yellowstone	Pioneer Park Creek (295_R5)	8/3/06	45.7888, -108.52666	longnose dace	1		
Lake Basin				lake chub	210		
10070004				fathead minnow	14		
				white sucker	34		
				longnose sucker	70		
Total Herp Number	0		Total Fish Number	329	0	329	
Herp Richness	0		Fish Richness			5	
Total Site Richness	5		Native Fish Richness			5	
			Percent Native			100	
Pryor	Pryor Creek 43B1_R5	5/17/06	45.79899, -108.2956	longnose dace	22		
10070008				sand shiner	1		
				fathead minnow	61		
				white sucker	11		

				channel catfish	10			
Total Herp Number	0		Total Fish Number	105	0	105		
Herp Richness	0		Fish Richness	5				
Total Site Richness	5		Native Fish Richness	5				
			Percent Native	100				
Pryor 10070008	Pryor Creek 43B2_R5	7/11/06	45.79899, -108.2956	common carp		6		
				longnose dace	7			
				flathead chub	65			
				sand shiner	1			
				fathead minnow	330			
				western silvery minnow	1			
				shorthead redhorse	53			
				white sucker	81			
				longnose sucker	2			
				stonecat	2			
				channel catfish	55			
				black bullhead		9		
				spiny softshell			1	
				northern leopard frog			7	
Total Herp Number	8		Total Fish Number	597	15	612		
Herp Richness	2		Fish Richness	12				
Total Site Richness	14		Native Fish Richness	10				
			Percent Native	97.55				
Pryor 10070008	Pryor Creek 43C1_R5	5/17/06	45.78977, -108.29866	longnose dace	34			
				flathead chub	1			
				shorthead redhorse	6			
				fathead minnow	19			
				white sucker	54			
				mountain sucker	11			
				stonecat	1			
				channel catfish	63			
				black bullhead		11		
Total Herp Number	0		Total Fish Number	189	11	200		
Herp Richness	0		Fish Richness	9				
Total Site Richness	9		Native Fish Richness	8				
			Percent Native	94.5				
Pryor 10070008	Pryor Creek 43C2_R5	7/12/06	45.78977, -108.29866	longnose dace	148			
				fathead minnow	392			
				shorthead redhorse	50			
				white sucker	441			

			mountain sucker	8		
			longnose sucker	1		
			stonecat	2		
			channel catfish	4		
			northern leopard frog		3	
Total Herp Number	3		Total Fish Number	1046	0	1046
Herp Richness	1		Fish Richness	8		
Total Site Richness	9		Native Fish Richness	8		
			Percent Native	100		
Pryor 10070008	Pryor Creek 43D1_R5	5/8/06	45.88552, -108.29995	common carp		3
			longnose dace	15		
			flathead chub	8		
			sand shiner	11		
			fathead minnow	44		
			white sucker	7		
			northern leopard frog		25	
Total Herp Number	25		Total Fish Number	85	3	88
Herp Richness	1		Fish Richness	6		
Total Site Richness	7		Native Fish Richness	5		
			Percent Native	96.59		
Pryor 10070008	Pryor Creek 43D2_R5	7/12/06	45.88552, -108.29995	common carp		5
			longnose dace	361		
			flathead chub	33		
			sand shiner	19		
			fathead minnow	465		
			shorthead redhorse	1		
			white sucker	204		
			channel catfish	1		
			northern leopard frog		200	
Total Herp Number	200		Total Fish Number	1084	5	1089
Herp Richness	1		Fish Richness	8		
Total Site Richness	9		Native Fish Richness	7		
			Percent Native	99.54		
Pryor Creek Summary		5/8/06	7/11/2006	Total Fish Number	3140	
Sampled 6 times at 3 sites		5/17/06	7/12/2006	Fish Richness	13	
		5/17/06	7/12/2006	Percent Native	98.92	
				Total Site Richness	15	

Upper Yellowstone Pompey's Pillar 10070007	Razor Creek (State) 68A1_R5	4/21/06	45.97096, -10831714	common carp	1		
				longnose dace	127		
				lake chub	156		
				flathead chub	1999		
				sand shiner	192		
				fathead minnow	46		
				shorthead redhorse	3		
				white sucker	263		
				mountain sucker	14		
				longnose sucker	61		
				brook stickleback	54		
				yellow perch		1	
Total Herp Number	0			Total Fish Number	2915	2	2917
Herp Richness	0			Fish Richness			12
Total Site Richness	12			Native Fish Richness			10
				Percent Native			99.93
Upper Yellowstone Pompey's Pillar 10070007	Razor Creek (State) 68A2_R5	7/5/06	45.97096, -10831714	longnose dace	17		
				lake chub	66		
				flathead chub	261		
				sand shiner	56		
				fathead minnow	1		
				shorthead redhorse	1		
				white sucker	94		
				mountain sucker	3		
				longnose sucker	3		
				stonecat	3		
				snapping turtle			1
				terrestrial gartersnake			1
Total Herp Number	2			Total Fish Number	505	0	505
Herp Richness	2			Fish Richness			10
Total Site Richness	12			Native Fish Richness			10
				Percent Native			100
Upper Yellowstone Pompey's Pillar 10070007	Razor Creek (State) 68A3_R5	10/16/06	45.97096, -10831714	common carp		5	
				longnose dace	29		
				lake chub	130		
				flathead chub	1226		
				fathead minnow	95		
				western silvery minnow	427		
				shorthead redhorse	10		
				white sucker	63		

				mountain sucker	9		
				longnose sucker	18		
				emerald shiner	28		
				sand shiner	106		
				green sunfish		1	
				yellow perch		1	
				northern leopard frog			1
Total Herp Number	1			Total Fish Number	2141	7	2148
Herp Richness	1			Fish Richness			12
Total Site Richness	13			Native Fish Richness			9
				Percent Native			99.67
Upper Yellowstone	Razor Creek (Mouth) 68B1_R5	4/25/06	45.95704, -108.281	longnose dace	62		
Pompey's Pillar				lake chub	18		
10070007				flathead chub	2967		
				sand shiner	132		
				fathead minnow	257		
				western silvery minnow	707		
				shorthead redhorse	1		
				white sucker	364		
				mountain sucker	18		
				longnose sucker	38		
				stonecat	2		
				brook stickleback	7		
				northern leopard frog			4
Total Herp Number	4			Total Fish Number	4573	0	4573
Herp Richness	1			Fish Richness			12
Total Site Richness	13			Native Fish Richness			12
				Percent Native			100
Upper Yellowstone	Razor Creek (Mouth) 68B2_R5	7/17/06	45.95704, -108.281	common carp		2	
Pompey's Pillar				longnose dace	22		
10070007				flathead chub	775		
				emerald shiner	5		
				sand shiner	11		
				fathead minnow	8		
				white sucker	2		
				mountain sucker	6		
				longnose sucker	3		
				snapping turtle			1
				northern leopard frog			2
Total Herp Number	3			Total Fish Number	832	2	834
Herp Richness	2			Fish Richness			9

Total Site Richness			11	Native Fish Richness			8
				Percent Native			99.76
Upper Yellowstone	Razor Creek (Mouth) 68B3_R5	10/24/06	45.95704, -108.281	lake chub	1		
Pompey's Pillar				flathead chub	1480		
10070007				emerald shiner	2		
				sand shiner	275		
				fathead minnow	1432		
				western silvery minnow	753		
				river carpsucker	2		
				white sucker	94		
				mountain sucker	20		
				longnose sucker	239		
				brook stickleback	1		
				yellow perch		1	
Total Herp Number			0	Total Fish Number			4299 1 4300
Herp Richness			0	Fish Richness			12
Total Site Richness			12	Native Fish Richness			11
				Percent Native			99.98
Upper Yellowstone	Razor Creek (Mid) 68C1_R5	4/19/06	45.993662, -108.35151	longnose dace	17		
Pompey's Pillar				lake chub	229		
10070007				sand shiner	1		
				fathead minnow	162		
				shorthead redhorse	1		
				white sucker	9		
				brook stickleback	44		
Total Herp Number			0	Total Fish Number			463 0 463
Herp Richness			0	Fish Richness			7
Total Site Richness			7	Native Fish Richness			7
				Percent Native			100
Upper Yellowstone	Razor Creek (Mid) 68C2_R5	6/26/06	45.993662, -108.35151	common carp		1	
Pompey's Pillar				longnose dace	165		
10070007				lake chub	93		
				flathead chub	1		
				sand shiner	235		
				fathead minnow	143		
				white sucker	16		
				longnose sucker	50		
				brook stickleback	21		
				pumpkinseed		1	
Total Herp Number			0	Total Fish Number			724 2 726

Herp Richness	0	Fish Richness	10
Total Site Richness	10	Native Fish Richness	8
		Percent Native	99.72
Upper Yellowstone Pompey's Pillar 10070007	Razor Creek (Mid) 68C3_R5	10/16/06 45.993662, -108.35151	common carp 23 longnose dace 113 lake chub 147 flathead chub 45 emerald shiner 2 sand shiner 1139 fathead minnow 156 shorthead redhorse 1 white sucker 115 mountain sucker 109 longnose sucker 16 brook stickleback 15 green sunfish 14 yellow perch 1
Total Herp Number	1	Total Fish Number	1858 38 1896
Herp Richness	1	Fish Richness	14
Total Site Richness	13	Native Fish Richness	11
		Percent Native	98
Upper Yellowstone Pompey's Pillar 10070007	Razor Creek (Upper) 68D1_R5	5/22/06 46.02237, -108.36622	common carp 1 fathead minnow 1764 brook stickleback 1 green sunfish 39 pumpkinseed 5 painted turtle 5 western hog-nosed snake 1 tiger salamander 53 boreal chorus frog 1 great plains toad 2
Total Herp Number	62	Total Fish Number	1765 45 1810
Herp Richness	5	Fish Richness	5
Total Site Richness	10	Native Fish Richness	2
		Percent Native	97.51
Upper Yellowstone Pompey's Pillar 10070007	Razor Creek (Upper) 68D2_R5	7/5/06 46.02237, -108.36622	fathead minnow 33 brook stickleback 37 green sunfish 3 painted turtle 1 tiger salamander 2

				Woodhouse's toad		2
Total Herp Number	5		Total Fish Number	70	3	73
Herp Richness	3		Fish Richness			3
Total Site Richness	6		Native Fish Richness			2
			Percent Native			95.89
Upper Yellowstone	Razor Creek (Turtle Pond) 68E1_R5	5/22/06	46.01343, -108.36589	common carp		1
Pompey's Pillar	No count - just species list			lake chub	1	
10070007				sand shiner	1	
				fathead minnow	1	
				white sucker	1	
				green sunfish		1
				pumpkinseed		1
				painted turtle		1
Total Herp Number	1		Total Fish Number	4	3	7
Herp Richness	1		Fish Richness			7
Total Site Richness	8		Native Fish Richness			4
			Percent Native			NA
Upper Yellowstone	Razor Creek (Turtle Pond) 68E2_R5	7/5/06	46.01343, -108.36589	common carp		1
Pompey's Pillar	No count - just species list			lake chub	1	
10070007				sand shiner	1	
				fathead minnow	1	
				white sucker	1	
				mountain sucker	1	
				yellow perch		1
				green sunfish		1
				pumpkinseed		1
				Woodhouse's toad		1
Total Herp Number	1		Total Fish Number	5	4	9
Herp Richness	1		Fish Richness			9
Total Site Richness	10		Native Fish Richness			5
			Percent Native			NA
Razor Creek Summary		4/19/06	7/5/2006	Total Fish Number	20261	
Sampled 13 times at 5 sites		4/21/06	7/5/2006	Fish Richness	18	
		4/25/06	7/5/2006	Percent Native	99.47	
		5/22/06	7/17/2006	Total Site Richness	27	
		5/22/06	10/16/2006			
		6/26/06	10/24/2006			
			10/16/2006			

Upper Yellowstone Upper Musselshell 10040201	Rock Creek 303_R5	5/31/06	46.18094, -109.38069	boreal chorus frog			3
Total Herp Number	3		Total Fish Number	0	0	0	
Herp Richness	1		Fish Richness				0
Total Site Richness	1		Native Fish Richness				0
			Percent Native				0
Clark's Fork Yellowstone 10070006	Silvertip Creek 300B_R5	9/26/06	45.0881, -108.9671	tiger salamander			4
				western rattlesnake			1
Total Herp Number	5		Total Fish Number	0	0	0	
Herp Richness	2		Fish Richness				0
Total Site Richness	2		Native Fish Richness				0
			Percent Native				0
Clark's Fork Yellowstone 10070006	Silvertip Creek 299B_R5	9/26/06	45.17457, -108.98546	longnose dace	11		
				lake chub	4		
				white sucker	40		
				mountain sucker	16		
				longnose sucker	22		
				rainbow trout		1	
				mountain whitefish	5		
Total Herp Number	0		Total Fish Number	98	1	99	
Herp Richness	0		Fish Richness				7
Total Site Richness	7		Native Fish Richness				6
			Percent Native				98.99
Silvertip Creek Summary							
		9/26/06		Total Fish Number	99		
Sampled 2 times at 2 sites		9/26/06		Fish Richness	7		
				Percent Native	98.99		
				Total Site Richness	8		
Upper Musselshell 10040201	Simmons Creek 2B_R5	8/22/06	46.08498, -109.58907	longnose dace	128		
				lake chub	498		
				northern redbelly dace	1		
				Phoxinus sp.	2		
				fathead minnow	1		
				white sucker	90		
				mountain sucker	28		
				brook trout		13	
				terrestrial gartersnake			1

Total Herp Number	1		Total Fish Number	748	13	761
Herp Richness	1		Fish Richness			7
Total Site Richness	8		Native Fish Richness			6
			Percent Native			98.29
Upper Musselshell 10040201	South Fork Big Coulee	292A1_R5	6/14/06	46.18464, -108.99185	longnose dace lake chub northern redbelly dace Phoxinus sp. fathead minnow white sucker mountain sucker	48 91 23 113 121 266 16
Total Herp Number	0		Total Fish Number	678	0	678
Herp Richness	0		Fish Richness			6
Total Site Richness	6		Native Fish Richness			6
			Percent Native			100
Upper Musselshell 10040201	South Fork Big Coulee	292A2_R5	8/15/06	46.18464, -108.99185	longnose dace lake chub Phoxinus sp. northen red belly dace hybrid dace fathead minnow white sucker mountain sucker longnose sucker painted turtle	46 56 165 7 3 165 75 14 2 1
Total Herp Number	1		Total Fish Number	533	0	533
Herp Richness	1		Fish Richness			7
Total Site Richness	8		Native Fish Richness			7
			Percent Native			100
S. Fork Big Coulee Creek Summary		6/14/06		Total Fish Number	1211	
Sampled 2 times at 1 site		8/15/06		Fish Richness	7	
				Percent Native	100	
				Total Site Richness	8	
Upper Yellowstone Lake Basin 10070004	Spring Creek Park	296A1_R5	8/3/06	45.77984, -108.55318	common carp lake chub fathead minnow white sucker mountain sucker	1 65 16 2 14

				longnose sucker	34		
				largemouth bass		1	
				rainbow trout		1	
				terrestrial gartersnake			1
Total Herp Number	1		Total Fish Number	131	3	134	
Herp Richness	1		Fish Richness			8	
Total Site Richness	9		Native Fish Richness			5	
			Percent Native			97.76	
Spring Creek Park Summary		8/3/06		Total Fish Number	134		
Sampled 4 times at 4 sites		8/3/06		Fish Richness	8		
Urban subterranean sample for two sites.		8/3/06		Percent Native	97.76		
Open water for two.		8/3/06		Total Site Richness	9		
Clark's Fork	Spring Creek 291A_R5	5/20/06	45.63957, -108.71584	lake chub	3		
Yellowstone				fathead minnow	165		
10070006				brook stickleback	1		
Total Herp Number	0		Total Fish Number	169	0	169	
Herp Richness	0		Fish Richness			3	
Total Site Richness	3		Native Fish Richness			3	
			Percent Native			100	
Spring Creek Summary		5/20/06		Total Fish Number	169		
Sampled 2 times at 2 sites		5/20/06		Fish Richness	3		
One with no fish				Percent Native	100		
				Total Site Richness	3		
Stillwater	Stillwater R. (Firemans Pt) 300A1_R5	9/25/06	45.62434, -109.28648	longnose dace	42		
				lake chub	6		
				white sucker	54		
				mountain sucker	3		
				longnose sucker	24		
				brook stickleback	12		
				mottled sculpin	23		
				rainbow trout		1	
				brown trout		20	
				terrestrial gartersnake			1
Total Herp Number	1		Total Fish Number	164	21	185	
Herp Richness	1		Fish Richness			9	
Total Site Richness	10		Native Fish Richness			7	

			Percent Native		88.65	
Upper Yellowstone 10070002	Sweetgrass Creek (mouth) 298A_R5	9/18/06	45.78607, -109.788658	longnose dace	7	
				lake chub	1	
				emerald shiner	40	
				fathead minnow	1	
				white sucker	10	
				mountain sucker	8	
				longnose sucker	2	
				mottled sculpin	28	
				mountain whitefish	1	
Total Herp Number	0		Total Fish Number	98	0	98
Herp Richness	0		Fish Richness	9		
Total Site Richness	9		Native Fish Richness	9		
			Percent Native	100		
Bighorn Lake 10080010	Trail Creek 293A1_R5	7/20/06	45.1022, -108.22231	smallmouth bass	2	
				Salmonidae	3	
				terrestrial gartersnake		2
Total Herp Number	1		Total Fish Number	0	5	5
Herp Richness	1		Fish Richness	2		
Total Site Richness	3		Native Fish Richness	0		
			Percent Native	0		
Bighorn Lake 10080010	Trail Creek 293B1_R5	7/20/06	45.0975, -108.2185	common sagebrush lizard		1
Total Herp Number	1		Total Fish Number	0	0	0
Herp Richness	1		Fish Richness	0		
Total Site Richness	1		Native Fish Richness	0		
			Percent Native	0		
Trail Creek Summary		7/20/06	7/20/06	Total Fish Number	5	
Sampled 5 times at 5 sites		7/20/06		Fish Richness	2	
		7/20/06		Percent Native	0	
		7/20/06		Total Site Richness	4	
Lower Bighorn 10080015	Tulluck Creek 298A_R5	7/25/06	45.78638, -107.30211	common carp		6
				fathead minnow	220	
				white sucker	47	
				black bullhead		237
				green sunfish		261

				pumpkinseed	10	
				painted turtle		1
Total Herp Number	1		Total Fish Number	267	514	781
Herp Richness	1		Fish Richness			6
Total Site Richness	7		Native Fish Richness			2
			Percent Native			34.19
Lower Bighorn	Tulluck Creek 298B_R5	8/1/06	46.08202, -107.39629	common carp	6	
10080015				sand shiner	25	
				fathead minnow	1647	
				white sucker	9	
				longnose sucker	4	
				black bullhead	95	
				plains killifish	2070	
				green sunfish	125	
				painted turtle		1
				northern leopard frog		5
				Bufo sp.		1
Total Herp Number	7		Total Fish Number	1685	2296	3981
Herp Richness	3		Fish Richness			8
Total Site Richness	11		Native Fish Richness			4
			Percent Native			42.32
Tulluck Creek Summary		7/25/06		Total Fish Number	4762	
Sampled 2 times at 2 sites		8/1/06		Fish Richness	9	
				Percent Native	40.99	
				Total Site Richness	11	
Upper Yellowstone	Twelve Mile Creek 48A1_R5	5/1/06	45.90312, -108.36614	common carp	1	
Pompey's Pillar				longnose dace	15	
10070007				lake chub	620	
				flathead chub	566	
				sand shiner	30	
				fathead minnow	236	
				western silvery minnow	100	
				white sucker	235	
				mountain sucker	4	
				longnose sucker	82	
				brook stickleback	8	
				pumpkinseed	1	
				yellow perch	1	
				terrestrial gartersnake		3

					plains gartersnake	1	
					northern leopard frog	1	
Total Herp Number	5		Total Fish Number	1896	3	1899	
Herp Richness	3		Fish Richness			13	
Total Site Richness	16		Native Fish Richness			10	
			Percent Native			99.84	
Upper Yellowstone	Twelve Mile Creek 48A2_R5	6/30/06	45.90312, -108.36614	longnose dace	18		
Pompey's Pillar				lake chub	46		
10070007				flathead chub	86		
				sand shiner	3		
				fathead minnow	52		
				white sucker	48		
				longnose sucker	8		
				pumpkinseed		1	
				terrestrial gartersnake			3
				northern leopard frog			4
Total Herp Number	7		Total Fish Number	261	1	262	
Herp Richness	2		Fish Richness			7	
Total Site Richness	9		Native Fish Richness			6	
			Percent Native			99.62	
Upper Yellowstone	Twelve Mile Creek 48A3_R5	10/19/06	45.90312, -108.36614	common carp		2	
Pompey's Pillar				longnose dace	3		
10070007				lake chub	250		
				flathead chub	306		
				sand shiner	30		
				fathead minnow	110		
				western silvery minnow	272		
				shorthead redhorse	2		
				white sucker	29		
				mountain sucker	3		
				terrestrial gartersnake			1
Total Herp Number	1		Total Fish Number	1005	2	1007	
Herp Richness	1		Fish Richness			10	
Total Site Richness	11		Native Fish Richness			9	
			Percent Native			99.8	
Upper Yellowstone	Twelve Mile upper 48B1_R5	6/19/06	45.92068, -108.4645	lake chub	29		
Pompey's Pillar				fathead minnow	1085		
10070007				brook stickleback	17		
				terrestrial gartersnake			1
				eastern racer			1

			tiger salamander			1
Total Herp Number	3		Total Fish Number	1131	0	1131
Herp Richness	3		Fish Richness	3		
Total Site Richness	6		Native Fish Richness	3		
			Percent Native	100		
Upper Yellowstone	Twelve Mile upper 48B2_R5	10/3/06	45.92068, -108.4645	lake chub	9	
Pompey's Pillar				fathead minnow	182	
10070007				brook stickleback	18	
Total Herp Number	0		Total Fish Number	209	0	209
Herp Richness	0		Fish Richness	3		
Total Site Richness	3		Native Fish Richness	3		
			Percent Native	100		
Upper Yellowstone	Twelve Mile Pool 48Z1_R5	5/1/06	45.90312, -108.36614	longnose dace	2	
Pompey's Pillar				lake chub	23	
10070007				flathead chub	270	
				sand shiner	18	
				fathead minnow	45	
				western silvery minnow	8	
				white sucker	241	
				longnose sucker	32	
				yellow perch		1
				terrestrial gartersnake		1
Total Herp Number	1		Total Fish Number	639	1	640
Herp Richness	1		Fish Richness	9		
Total Site Richness	10		Native Fish Richness	8		
			Percent Native	99.84		
Twelve Mile Creek Summary		5/1/06	10/3/2006	Total Fish Number	5148	
Sampled 6 times at 3 sites		5/1/06	10/19/2006	Fish Richness	14	
		6/19/06		Percent Native	99.86	
		6/30/06		Total Site Richness	19	
Upper Yellowstone	Valley Creek 301A_R5	9/25/06	45.60833, -108.94315	longnose dace	80	
Lake Basin				emerald shiner	10	
10070004				fathead minnow	8	
				white sucker	66	
				mountain sucker	9	
				longnose sucker	1	
				brook stickleback	2	
				mottled sculpin	1	
				brown trout		2

				common gartersnake	1	
Total Herp Number	1		Total Fish Number	177	2	179
Herp Richness	1		Fish Richness			10
Total Site Richness	11		Native Fish Richness			9
			Percent Native			98.88
Upper Yellowstone	Yellowstone R. Side Channel 294_R5	7/11/06	46.14506, -107.52716	common carp		19
Pompeys Pillar				longnose dace	3	
				flathead chub	4	
				emerald shiner	276	
				sand shiner	3	
				fathead minnow	8	
				western silvery minnow	421	
				shorthead redhorse	6	
				white sucker	14	
				longnose sucker	3	
				green sunfish		1
				pumpkinseed		10
				goldeye	2	
				spiny softshell		1
Total Herp Number	1		Total Fish Number	740	30	770
Herp Richness	1		Fish Richness			13
Total Site Richness	14		Native Fish Richness			10
			Percent Native			96.1
Upper Yellowstone	Yellowstone R. Side Channel 297_R5	8/7/06	45.94613, -108.29599	longnose dace	27	
Pompeys Pillar				lake chub	2	
				flathead chub	276	
				emerald shiner	3	
				sand shiner	6	
				fathead minnow	142	
				western silvery minnow	238	
				river carpsucker	6	
				white sucker	44	
				mountain sucker	20	
				longnose sucker	160	
				Woodhouse's toad		3
Total Herp Number	3		Total Fish Number	924	0	924
Herp Richness	1		Fish Richness			11
Total Site Richness	12		Native Fish Richness			11
			Percent Native			100
Yellowstone Side Channels Summary		7/11/06		Total Fish Number	1694	

				tiger salamander larvae		4
Total Herp Number	19		Total Fish Number	76	8	84
Herp Richness	6		Fish Richness	3		
Total Site Richness	9		Native Fish Richness	1		
			Percent Native	90.48		
Middle Milk	Bean Creek _99_R6	8/2/06	48.43418, -109.19095	fathead minnow	643	
				white sucker	52	
				brassy minnow	62	
				hybrid dace	7	
				northern redbelly dace	19	
				Phoxinus sp.	439	
				pearl dace	7	
				brook stickleback	21	
				painted turtle		1
Total Herp Number	1		Total Fish Number	1250	0	1250
Herp Richness	1		Fish Richness	6		
Total Site Richness	7		Native Fish Richness	6		
			Percent Native	100		
Big Muddy	Beaver Creek_62_R6	6/27/06	48.92426, -104.93623	white sucker	11	
				black bullhead		1
				northern pike		1
				plains gartersnake		3
				northern leopard frog tadpole		1
				northern leopard frog		3
Total Herp Number	7		Total Fish Number	11	2	13
Herp Richness	2		Fish Richness	3		
Total Site Richness	3		Native Fish Richness	1		
			Percent Native	84.62		
Battle	Bennet Coulee_124_R6	8/24/06	48.93985, -109.10878	brook stickleback	29	
Total Herp Number	0		Total Fish Number	29	0	29
Herp Richness	0		Fish Richness	1		
Total Site Richness	1		Native Fish Richness	1		
			Percent Native	100		
Big Sandy	Big Sandy Creek_126_R6	8/25/06	48.45165, 109.91880	fathead minnow	7	
				white sucker	2	
				northern leopard frog		7
Total Herp Number	7		Total Fish Number	9	0	9
Herp Richness	1		Fish Richness	2		

Total Site Richness	3		Native Fish Richness	2	
			Percent Native	100	
Middle Milk	Black Coulee_98_R6	8/20/06	48.53758, -109.22253	eastern racer	4
Total Herp Number	4		Total Fish Number	0	0
Herp Richness	1		Fish Richness		0
Total Site Richness	1		Native Fish Richness		0
			Percent Native		0
Middle Milk	Box Elder Creek_96_R6	8/1/06	48.4049, -109.09022	tiger salamander larvae plains gartersnake	11 1
Total Herp Number	12		Total Fish Number	0	0
Herp Richness	2		Fish Richness		0
Total Site Richness	2		Native Fish Richness		0
			Percent Native		0
Middle Milk	Bullhook Creek_118_R6	8/23/06	48.51109, -109.49717	northern redbelly dace hybrid dace fathead minnow brook stickleback	957 5 91 20
Total Herp Number	0		Total Fish Number	1073	0
Herp Richness	0		Fish Richness		3
Total Site Richness	3		Native Fish Richness		3
			Percent Native		100
Beaver in Milk River	Button Butte Coulee_85_R6	7/19/06	48.07523, -107.87983	fathead minnow iowa darter northern leopard frog northern leopard frog tadpole plains gartersnake	313 50 100 100 4
Total Herp Number	204		Total Fish Number	363	0
Herp Richness	2		Fish Richness		2
Total Site Richness	4		Native Fish Richness		2
			Percent Native		100
Fort Peck Reservoir	Cabin Coulee_52_R6	6/20/06	47.72402, -107.19265	fathead minnow northern leopard frog northern leopard frog tadpole tiger salamander larvae plains gartersnake	374 2 38 103 9
Total Herp Number	152		Total Fish Number	374	0
Herp Richness	3		Fish Richness		1

Total Site Richness			4	Native Fish Richness			1
				Percent Native			100
Middle Milk	Clear Creek_108_R6	8/14/06	48.5708, -109.39152	fathead minnow	511		
				longnose dace	498		
				brook stickleback	54		
				white sucker	561		
				lake chub	311		
				hybrid dace	4		
				northern redbelly dace	453		
				pearl dace	233		
				brassy minnow	51		
				iowa darter	2		
				longnose sucker	1		
				northern leopard frog			34
				plains gartersnake			3
Total Herp Number	37		Total Fish Number	2679	0	2679	
Herp Richness	2		Fish Richness	10			
Total Site Richness	12		Native Fish Richness	10			
			Percent Native	100			
Redwater	Cotter Creek_28_R6	5/30/06	47.35375, -105.85396	plains gartersnake			1
				tiger salamander			1
				tiger salamander larvae			1
				northern leopard frog			7
Total Herp Number	10		Total Fish Number	0	0	0	
Herp Richness	3		Fish Richness	0			
Total Site Richness	3		Native Fish Richness	0			
			Percent Native	0			
Rock	Cow Coulee_81_R6	7/17/06	48.74245, -106.87933	fathead minnow	34		
				lake chub	1		
				boreal chorus tadpole			1
Total Herp Number	1		Total Fish Number	35	0	35	
Herp Richness	1		Fish Richness	2			
Total Site Richness	3		Native Fish Richness	2			
			Percent Native	100			
Redwater	Cow Creek_13_R6	5/16/06	47.71669,-105.63335	fathead minnow	157		
				brook stickleback	34		
				plains gartersnake			4
Total Herp Number	4		Total Fish Number	191	0	191	

Herp Richness	1		Fish Richness	2	
Total Site Richness	3		Native Fish Richness	2	
			Percent Native	100	
Lower Milk	Coyote Creek_16_R6	5/18/06	48.05283, -106.73697	tiger salamander	1
				plains gartersnake	1
				northern leopard frog	2
Total Herp Number	4		Total Fish Number	0	0
Herp Richness	3		Fish Richness		0
Total Site Richness	3		Native Fish Richness		0
			Percent Native		0
Lower Milk	Crooked Creek_26_R6	5/26/06	48.44089, -106.73573	boreal chorus frog tadpole	5
				boreal chorus frog	2
Total Herp Number	7		Total Fish Number	0	0
Herp Richness	1		Fish Richness		0
Total Site Richness	1		Native Fish Richness		0
			Percent Native		0
Lower Milk	Desert Coulee_41_R6	6/5/06	47.84729, -107.09793	fathead minnow	172
				plains gartersnake	1
				boreal chorus frog tadpole	1
				northern leopard frog tadpole	11
				northern leopard frog	2
Total Herp Number	15		Total Fish Number	172	0
Herp Richness	3		Fish Richness		1
Total Site Richness	4		Native Fish Richness		1
			Percent Native		100
Redwater	Dirty Creek_39_R6	6/1/06	47.29537, -105.83208	fathead minnow	5
				brook stickleback	51
				brassy minnow	21
				green sunfish	13
				common carp	3
				painted turtle	1
				Woodhouse's toad	1
				plains gartersnake	1
				tiger salamander larvae	14
Total Herp Number	17		Total Fish Number	77	16
Herp Richness	4		Fish Richness		5
Total Site Richness	9		Native Fish Richness		3
			Percent Native		82.8

Bullwhacker-Dog	Eagle Creek_109_R6	8/15/06	47.92404, -109.92908	fathead minnow	308	
				longnose dace	56	
				brassy minnow	156	
				white sucker	99	
				lake chub	123	
				stonecat	2	
				northern redbelly dace	36	
				mountain sucker	2	
				plains gartersnake		1
				northern leopard frog		44
				gophersnake		1
				painted turtle		1
Total Herp Number	47		Total Fish Number	782	0	782
Herp Richness	4		Fish Richness			8
Total Site Richness	12		Native Fish Richness			8
			Percent Native			100
Redwater	East Duck Creek_37_R6	5/31/06	47.18781, -105.78740	tiger salamander larvae		7
Total Herp Number	7		Total Fish Number	0	0	0
Herp Richness	1		Fish Richness			0
Total Site Richness	1		Native Fish Richness			0
			Percent Native			0
Prairie Elk - Wolf	East Fork Prairie Elk Creek_47_R6	6/8/06	47.6587, -105.83635	fathead minnow	27	
				brassy minnow	28	
				brook stickleback	1	
				tiger salamander larvae		5
				Woodhouse's toad		1
Total Herp Number	6		Total Fish Number	56	0	56
Herp Richness	2		Fish Richness			3
Total Site Richness	5		Native Fish Richness			3
			Percent Native			100
Prairie Elk - Wolf	East Fork Sand Creek_9_R6	5/15/06	47.88691, -105.65852	fathead minnow	16	
				lake chub	33	
				brook stickleback	1070	
				Woodhouse's toad		7
				northern leopard frog		5
				plains gartersnake		4
				painted turtle		1
Total Herp Number	17		Total Fish Number	1119	0	1119

Herp Richness	4		Fish Richness	3	
Total Site Richness	7		Native Fish Richness	3	
			Percent Native	100	
Lower Milk	East Fork Stinky Creek_72_R6	7/11/06	48.66643, -107.40908	fathead minnow	68
				brook stickleback	32
				northern redbelly dace	16
				hybrid dace	8
				northern leopard frog	175
				northern leopard frog tadpole	4
Total Herp Number	179		Total Fish Number	124	0 124
Herp Richness	1		Fish Richness	3	
Total Site Richness	4		Native Fish Richness	3	
			Percent Native	100	
Middle Milk	Eureka Creek_93_R6	7/26/06	48.53501, -108.49372	tiger salamander larvae	1
				plains gartersnake	1
Total Herp Number	2		Total Fish Number	0	0 0
Herp Richness	2		Fish Richness	0	
Total Site Richness	2		Native Fish Richness	0	
			Percent Native	0	
Big Muddy	Ford Creek_64_R6	6/27/06	48.75596, -104.68226	northern pike	7
				white sucker	1
				painted turtle	1
				northern leopard frog	13
				northern leopard frog tadpole	33
				plains gartersnake	14
Total Herp Number	61		Total Fish Number	1	7 8
Herp Richness	3		Fish Richness	2	
Total Site Richness	5		Native Fish Richness	1	
			Percent Native	0.125	
Beaver in Milk River	Fourth Creek_75_R6	7/12/06	48.33214, -107.30397	fathead minnow	96
				tiger salamander	4
				eastern racer	1
Total Herp Number	5		Total Fish Number	96	0 96
Herp Richness	2		Fish Richness	1	
Total Site Richness	3		Native Fish Richness	1	
			Percent Native	100	
Lower Milk	Hard Pan Creek_42_R6	6/5/06	47.89457, -107.07653	fathead minnow	86

Total Herp Number	0		Total Fish Number	86	0	86
Herp Richness	0		Fish Richness			1
Total Site Richness	1		Native Fish Richness			1
			Percent Native			100
Fort Peck Reservoir	Hawley Creek_86_R6	7/24/06	47.61045, -108.05143	fathead minnow	5	
Total Herp Number	0		Total Fish Number	5	0	5
Herp Richness	0		Fish Richness			1
Total Site Richness	1		Native Fish Richness			1
			Percent Native			100
Redwater	Hay Creek_49_R6	6/13/06	47.72955, -105.38247	brook stickleback	28	
				northern leopard frog		1
Total Herp Number	1		Total Fish Number	28	0	28
Herp Richness	1		Fish Richness			1
Total Site Richness	2		Native Fish Richness			1
			Percent Native			100
Redwater	Hell Creek_33_R6	5/31/06	47.36249, -105.55369	tiger salamander larvae		16
				Woodhouse's toad		1
				plains gartersnake		1
				boreal chorus frog tadpole		1
Total Herp Number	19		Total Fish Number	0	0	0
Herp Richness	4		Fish Richness			0
Total Site Richness	4		Native Fish Richness			0
			Percent Native			100
Lower Milk	Little Beaver Creek_58_R6	6/22/06	48.09197, -107.03264	fathead minnow	56	
				tiger salamander larvae		4
Total Herp Number	4		Total Fish Number	56	0	56
Herp Richness	1		Fish Richness			1
Total Site Richness	2		Native Fish Richness			1
			Percent Native			100
Middle Milk	Little Boxelder Creek_111_R6	8/16/06	48.52839, -109.54214	fathead minnow	2892	
				white sucker	4154	
				brassy minnow	411	
				longnose dace	358	
				lake chub	360	
				iowa darter	16	
				northern redbelly dace	176	
				brook stickleback	226	

				mountain sucker	1			
				northern leopard frog tadpole				1
				northern leopard frog				63
Total Herp Number	64		Total Fish Number	8594	0			8594
Herp Richness	1		Fish Richness	9				
Total Site Richness	10		Native Fish Richness	9				
			Percent Native	100				
Lower Milk	Little Brazil Creek_66_R6	6/29/06	48.17397, -106.71518	fathead minnow	1235			
				common carp		69		
				black bullhead		4		
				stonecat	2			
				boreal chorus frog tadpole		5		
				plains gartersnake		2		
Total Herp Number	7		Total Fish Number	1237	73			1310
Herp Richness	2		Fish Richness	4				
Total Site Richness	6		Native Fish Richness	2				
			Percent Native	94.43				
Prairie Elk - Wolf	Long Branch Creek_10_R6	5/15/06	47.909, -105.74163	tiger salamander larvae				48
Total Herp Number	48		Total Fish Number	0	0			0
Herp Richness	1		Fish Richness	0				
Total Site Richness	1		Native Fish Richness	0				
			Percent Native	0				
Redwater	Long Grass Creek_5_R6	5/11/06	47.933, -105.05856	northern leopard frog				5
				painted turtle				1
Total Herp Number	6		Total Fish Number	0	0			0
Herp Richness	2		Fish Richness	0				
Total Site Richness	2		Native Fish Richness	0				
			Percent Native	0				
Big Muddy	Middle Fork Eagle Creek_61_R6	6/26/06	48.79171, -105.05828	fathead minnow	82			
				brook stickleback	8			
				northern redbelly dace	16			
				brassy minnow	7			
				northern leopard frog tadpole		2		
				northern leopard frog		41		
				plains gartersnake		7		
Total Herp Number	50		Total Fish Number	113	0			113
Herp Richness	2		Fish Richness	4				
Total Site Richness	6		Native Fish Richness	4				

			Percent Native		100	
Porcupine	Middle Fork Porcupine Creek_59_R6	6/26/06	48.66334, -106.4332	fathead minnow northern pike	1 7	
Total Herp Number	0		Total Fish Number	1	7	8
Herp Richness	0		Fish Richness	2		
Total Site Richness	2		Native Fish Richness	1		
			Percent Native	100		
Prairie Elk - Wolf	Middle Fork Prairie Elk Creek_23_R6	5/25/06	47.6618, -105.92516	eastern racer		1
Total Herp Number	1		Total Fish Number	0	0	0
Herp Richness	1		Fish Richness	0		
Total Site Richness	1		Native Fish Richness	0		
			Percent Native	0		
Beaver in Milk River	Moss Coulee_77_R6	7/12/06	48.2233, -107.53352	fathead minnow eastern racer shed skin painted turtle	565	 1 1
Total Herp Number	1		Total Fish Number	565	0	565
Herp Richness	1		Fish Richness	1		
Total Site Richness	2		Native Fish Richness	1		
			Percent Native	100		
Redwater	Muskrat Creek_6_R6	5/11/06	47.93965, -105.93965	fathead minnow	4,561	
Total Herp Number	0		Total Fish Number	4561	0	4561
Herp Richness	0		Fish Richness	1		
Total Site Richness	1		Native Fish Richness	1		
			Percent Native	100		
Lower Milk	North Fork Lone Tree Creek_56_R6	6/21/06	48.07272, -107.13520	fathead minnow lake chub common carp northern leopard frog plains gartersnake	153 129	 1 10 6
Total Herp Number	16		Total Fish Number	282	1	283
Herp Richness	2		Fish Richness	3		
Total Site Richness	5		Native Fish Richness	2		
			Percent Native	99.65		
Fort Peck Reservoir	North Fork Mcguire Creek_24_R6	5/25/06	47.62187, -106.04644	fathead minnow tiger salamander larvae Woodhouse's toad	102	 358 2

				boreal chorus frog tadpole	21	
				painted turtle	2	
Total Herp Number	383		Total Fish Number	102	0	102
Herp Richness	4		Fish Richness			1
Total Site Richness	5		Native Fish Richness			1
			Percent Native		100	
Redwater	Pasture Creek_50_R6	6/13/06	47.64503, -105.16696	brook stickleback	129	
				green sunfish	1	
				northern pike	7	
				tiger salamander larvae		2
				eastern racer		2
Total Herp Number	4		Total Fish Number	129	8	137
Herp Richness	2		Fish Richness			3
Total Site Richness	5		Native Fish Richness			1
			Percent Native		94.16	
Peoples	Peoples Creek_100_R6	8/2/06	48.22507, -109.22108	longnose dace	128	
				white sucker	101	
				lake chub	30	
				hybrid dace	4	
				northern redbelly dace	216	
				brook stickleback	38	
				fathead minnow	27	
				brassy minnow	82	
				eastern racer		1
				northern leopard frog		10000+
Total Herp Number	10001		Total Fish Number	626	0	626
Herp Richness	2		Fish Richness			7
Total Site Richness	9		Native Fish Richness			7
			Percent Native		100	
Fort Peck Reservoir	Plum Creek_53_R6	6/20/06	47.78174, -107.20557	fathead minnow	194	
				northern leopard frog		2
				northern leopard frog tadpole		38
				tiger salamander larvae		103
				plains gartersnake		9
Total Herp Number	152		Total Fish Number	194	0	194
Herp Richness	3		Fish Richness			1
Total Site Richness	4		Native Fish Richness			1
			Percent Native		100	

Prairie Elk - Wolf	Porcupine Creek	5/16/06	47.8071, -105.74163	tiger salamander		22
Total Herp Number	22		Total Fish Number	0	0	0
Herp Richness	1		Fish Richness			0
Total Site Richness	1		Native Fish Richness			0
			Percent Native			0
Redwater	Redwater Gill Net 4.2_50_R6	6/13/06	47.92923, -105.25897	goldeye	13	
				shorthead redhorse	4	
				river carpsucker	9	
				white sucker	3	
				common carp		1
Total Herp Number	0		Total Fish Number	29	1	30
Herp Richness	0		Fish Richness			5
Total Site Richness	5		Native Fish Richness			4
			Percent Native			96.67
Redwater	Redwater River Crossing gill-net 4.3_70_R6	7/7/06	47.92923, -105.25897	river carpsucker	9	
				common carp		5
				shorthead redhorse	16	
				channel catfish	1	
				goldeye	8	
				northern pike		2
				walleye		1
Total Herp Number	0		Total Fish Number	34	8	42
Herp Richness	0		Fish Richness			4
Total Site Richness	4		Native Fish Richness			2
			Percent Native			75
Redwater	Redwater Gill Net 4.4_106_R6	8/8/06	47.92923, -105.25897	common carp		3
				river carpsucker	20	
				northern pike		1
				goldeye	6	
				shorthead redhorse	3	
				walleye		1
Total Herp Number	0		Total Fish Number	29	5	34
Herp Richness	0		Fish Richness			6
Total Site Richness	6		Native Fish Richness			3
			Percent Native			85.29
			Percent Native			85.29
Redwater	Redwater Gill Net 4.5_131_R6	9/6/06	47.92923, -105.25897	river carpsucker	10	
				saugeye		2

				northern pike		4	
				goldeye	1		
				green sunfish		1	
				common carp		4	
				shorthead redhorse	2		
Total Herp Number	0		Total Fish Number	13	11	24	
Herp Richness	0		Fish Richness			7	
Total Site Richness	7		Native Fish Richness			7	
			Percent Native			54.17	

Redwater	Redwater River Crossing 1 _1_R6	5/8/06	48.05544, -105.21641	shorthead redhorse	69		
				common carp		3	
				walleye		1	
				white sucker	68		
				northern pike		4	
				goldeye	15		
				channel catfish	4		
				emerald shiner	5		
				sand shiner	23		
				fathead minnow	21		
				flathead chub	15		
				western silvery minnow	3		
Total Herp Number	0		Total Fish Number	223	8	231	
Herp Richness	0		Fish Richness			10	
Total Site Richness	10		Native Fish Richness			8	
			Percent Native			96.86	

Redwater	Redwater River crossing 1.2_43_R6	6/6/06	48.05544, -105.21641	shorthead redhorse	6		
				sauger	4		
				walleye		2	
				goldeye	4		
				channel catfish	1		
				white sucker	7		
				emerald shiner	19		
				flathead chub	16		
				fathead minnow	112		
				river carsucker	6		
				sand shiner	88		
				common carp		1	
				plains minnow	1		
				western silvery minnow	3		
				plains gartersnake			1

				Woodhouse's toad	4	
				Woodhouse's toad larvae	19	
				northern leopard frog	3	
Total Herp Number	27		Total Fish Number	267	3	270
Herp Richness	3		Fish Richness	13		
Total Site Richness	16		Native Fish Richness	11		
			Percent Native	98.85		
Redwater	Redwater River crossing 1.3_467_R6	7/6/06	48.05544, -105.21641	common carp	4	
				sand shiner	132	
				fathead minnow	194	
				flathead chub	76	
				goldeye	2	
				white sucker	43	
				river carpsucker	31	
				channel catfish	72	
				longnose dace	2	
				plains minnow	13	
				shorthead redhorse	2	
				plains gartersnake		2
				northern leopard frog		5
				Woodhouse's toad		31
				unidentified tadpoles		5
Total Herp Number	41		Total Fish Number	567	4	571
Herp Richness	2		Fish Richness	12		
Total Site Richness	15		Native Fish Richness	11		
			Percent Native	99.3		
Redwater	Redwater River crossing 1.4_103_R6	8/7/06	48.05544, -105.21641	fathead minnow	901	
				white sucker	317	
				flathead chub	379	
				sand shiner	267	
				longnose dace	26	
				common carp		37
				channel catfish	14	
				river carpsucker	101	
				brassy minnow	1	
				plains minnow	6	
				shorthead redhorse	4	
				black bullhead		1
				western silvery minnow	1	
				white crappie		1
				emerald shiner	2	

				smallmouth buffalo	4			
				bigmouth buffalo	3			
				plains gartersnake			1	
				eastern racer			1	
				Woodhouse's toad			2	
				northern leopard frog			3	
Total Herp Number		7		Total Fish Number		2026	39	2065
Herp Richness		4		Fish Richness		17		
Total Site Richness		21		Native Fish Richness		14		
				Percent Native		98.11		
Redwater	Redwater River Crossing 1.5_127_R6	9/5/06	48.05544, -105.21641	fathead minnow	693			
				sand shiner	558			
				flathead chub	222			
				white sucker	110			
				common carp			15	
				channel catfish	5			
				river carpsucker	62			
				bigmouth buffalo	3			
				longnose dace	36			
				emerald shiner	1			
				western silvery minnow	19			
				smallmouth buffalo	2			
				plains minnow	9			
				stonecat	1			
				shorthead redhorse	1			
				northern leopard frog				2
				Woodhouse's toad				1
Total Herp Number		3		Total Fish Number		1722	15	1737
Herp Richness		2		Fish Richness		15		
Total Site Richness		17		Native Fish Richness		14		
				Percent Native		99.14		
Redwater	Redwater River Crossing 2_2_R6	5/9/06	48.05281, -105.21501	shorthead redhorse	1			
				white sucker	11			
				flathead chub	6			
				lake chub	4			
				sand shiner	51			
				longnose dace	5			
				fathead minnow	3			
				common carp			1	
				channel catfish	1			
				northern leopard frog				1
Total Herp Number		1		Total Fish Number		82	1	83

Herp Richness	1			Fish Richness	9		
Total Site Richness	10			Native Fish Richness	8		
				Percent Native	98.8		
Redwater	Redwater River Crossing 2.2_44_R6	6/6/06	48.05168, -105.21580	fathead minnow	3		
				channel catfish	10		
				sand shiner	183		
				flathead chub	74		
				longnose dace	9		
				white sucker	6		
				stonecat	2		
				Woodhouse's toad tadpole		10	
				Woodhouse's toad		4	
				northern leopard frog		3	
Total Herp Number	17			Total Fish Number	287	0	287
Herp Richness	2			Fish Richness			7
Total Site Richness	9			Native Fish Richness			7
				Percent Native			100
Redwater	Redwater River Crossing 2.3_68_R6	7/6/06	48.05168, -105.21580	sand shiner	125		
				white sucker	3		
				flathead chub	50		
				river carpsucker	3		
				channel catfish	2		
				stonecat	1		
				northern leopard frog		3	
				Woodhouse's toad		4	
Total Herp Number	7			Total Fish Number	184	0	184
Herp Richness	2			Fish Richness			6
Total Site Richness	8			Native Fish Richness			6
				Percent Native			100
Redwater	Redwater River Crossing 2.4_104_R6	8/7/06	48.05168, -105.21580	sand shiner	128		
				Woodhouse's toad		4	
				northern leopard frog		9	
				eastern racer		1	
Total Herp Number	14			Total Fish Number	128	0	128
Herp Richness	3			Fish Richness			1
Total Site Richness	4			Native Fish Richness			1
				Percent Native			100
Redwater	Redwater River Crossing 2.5_128_R6	9/5/06	48.05168, -105.21580	sand shiner	311		
				fathead minnow	2		

				northern leopard frog		1	
Total Herp Number	1		Total Fish Number	313	0	313	
Herp Richness	1		Fish Richness	2			
Total Site Richness	3		Native Fish Richness	2			
			Percent Native	100			
Redwater	Redwater River Crossing 3_3_R6	5/9/06	47.9283, -105.26184	white sucker	166		
				shorthead redhorse	1		
				emerald shiner	71		
				fathead minnow	344		
				sand shiner	141		
				longnose dace	8		
				brassy minnow	1		
				lake chub	4		
				flathead chub	23		
Total Herp Number	0		Total Fish Number	759	0	759	
Herp Richness	0		Fish Richness	9			
Total Site Richness	9		Native Fish Richness	9			
			Percent Native	100			
Redwater	Redwater River Crossing 3.2_45_R6	6/7/06	47.9283, -105.26184	emerald shiner	146		
				white sucker	62		
				fathead minnow	165		
				sand shiner	237		
				longnose dace	16		
				green sunfish		1	
				channel catfish	1		
				river carpsucker	1		
				shorthead redhorse	3		
				flathead chub	10		
				stonecat	2		
				northern pike		1	
				northern leopard frog		6	
				painted turtle		1	
Total Herp Number	7		Total Fish Number	643	2	645	
Herp Richness	2		Fish Richness	12			
Total Site Richness	14		Native Fish Richness	10			
			Percent Native	99.69			
Redwater	Redwater River Crossing 3.3_69_R6	7/7/06	47.9283, -105.26184	sand shiner	666		
				fathead minnow	613		
				flathead chub	115		
				white sucker	474		

				emerald shiner	81		
				lake chub	3		
				stonecat	24		
				shorthead redhorse	15		
				longnose dace	97		
				walleye		1	
				common carp		33	
				channel catfish	2		
				northern leopard frog			13
				northern leopard frog tadpole			1
				Woodhouse's toad			2
				painted turtle			1
Total Herp Number	17		Total Fish Number	2090	34	2124	
Herp Richness	3		Fish Richness			12	
Total Site Richness	15		Native Fish Richness			10	
			Percent Native			98.4	
Redwater	Redwater River Crossing 3.4_105_R6	8/8/06	47.9283, -105.26184	longnose dace	316		
				fathead minnow	1557		
				sand shiner	1963		
				white sucker	581		
				common carp		9	
				channel catfish	6		
				stonecat	7		
				river carpsucker	28		
				green sunfish		4	
				flathead chub	222		
				lake chub	3		
				shorthead redhorse	8		
				northern leopard frog			21
				Woodhouse's toad			2
Total Herp Number	23		Total Fish Number	4691	13	4704	
Herp Richness	2		Fish Richness			12	
Total Site Richness	14		Native Fish Richness			10	
			Percent Native			99.72	
Redwater	Redwater River Crossing 3.5_129_R6	9/6/06	47.9283, -105.26184	fathead minnow	1231		
				sand shiner	1210		
				white sucker	207		
				channel catfish	3		
				longnose dace	253		
				river carpsucker	7		
				flathead chub	247		

				shorthead redhorse	16		
				stonecat	15		
				green sunfish		38	
				lake chub	5		
				common carp		5	
				northern leopard frog			11
				plains gartersnake			1
Total Herp Number	12		Total Fish Number	3194	43	3237	
Herp Richness	2		Fish Richness			12	
Total Site Richness	14		Native Fish Richness			10	
			Percent Native			98.67	
Redwater	Redwater River Crossing 4_4_R6	5/10/06	47.89953, -105.23597	goldeye	1		
				common carp		1	
				sand shiner	83		
				emerald shiner	34		
				green sunfish		1	
				fathead minnow	35		
				white sucker	15		
				shorthead redhorse	2		
				longnose dace	9		
Total Herp Number	0		Total Fish Number	179	2	181	
Herp Richness	0		Fish Richness			9	
Total Site Richness	9		Native Fish Richness			7	
			Percent Native			98.9	
Redwater	Redwater River Crossing 4.2_46_R6	6/7/06	47.9305, -105.25241	emerald shiner	75		
				fathead minnow	37		
				sand shiner	52		
				white sucker	6		
				goldeye	1		
				channel catfish	2		
				river carpsucker	1		
				northern leopard frog			9
				northern leopard frog tadpole			10
Total Herp Number	19		Total Fish Number	174	0	174	
Herp Richness	1		Fish Richness			7	
Total Site Richness	8		Native Fish Richness			7	
			Percent Native			100	
Redwater	Redwater River Crossing 4.3_70_R6	7/10/06	47.93035, -105.25229	goldeye	3		
				channel catfish	2		
				emerald shiner	97		

				fathead minnow	28		
				sand shiner	107		
				common carp		19	
				white sucker	48		
				longnose dace	6		
				shorthead redhorse	2		
				lake chub	1		
				stonecat	1		
				northern leopard frog			2
				Woodhouse's toad			1
Total Herp Number	3		Total Fish Number	295	19	314	
Herp Richness	2		Fish Richness			11	
Total Site Richness	13		Native Fish Richness			10	
			Percent Native			93.95	
Redwater	Redwater River Crossing 4.4_107_R6	8/9/06	47.93035, -105.25229	sand shiner	737		
				fathead minnow	1756		
				emerald shiner	80		
				channel catfish	4		
				green sunfish		26	
				walleye		1	
				white sucker	201		
				northern pike		1	
				shorthead redhorse	19		
				river carpsucker	12		
				longnose dace	7		
				common carp		9	
				goldeye	2		
				lake chub	1		
				plains gartersnake			1
				northern leopard frog			4
Total Herp Number	5		Total Fish Number	2819	37	2856	
Herp Richness	2		Fish Richness			14	
Total Site Richness	16		Native Fish Richness			10	
			Percent Native			98.7	
Redwater	Redwater River Crossing 4.5_130_R6	9/6/06	47.93035, -105.25229	sand shiner	570		
				fathead minnow	2535		
				white sucker	120		
				emerald shiner	96		
				green sunfish		150	
				common carp		13	
				river carpsucker	13		

				shorthead redhorse	6			
				channel catfish	3			
				northern leopard frog		2		
				painted turtle		2		
				plains gartersnake		1		
Total Herp Number		5		Total Fish Number		3343	163	3506
Herp Richness		3		Fish Richness		9		
Total Site Richness		12		Native Fish Richness		7		
				Percent Native		95.35		
Redwater River Summary			6/13/06	08/08/06	Total Fish Number	24499		
Sampled 24 times at 5 sites.			7/7/06	09/06/06	Fish Richness	24		
			8/8/06	05/10/06	Percent Native	98.97		
			9/6/06	06/07/06	Total Site Richness	29		
09/06/06	06/07/06	9/5/06	07/10/06	7/6/2006				
08/07/06	07/07/06	5/9/06	08/09/06	6/6/2006				
9/5/2006	8/7/2006	7/6/06	6/6/2006	5/9/2006				5/8/2006
Prairie Elk - Wolf	Remuda Creek_14_R6	5/16/06	47.92315, -105.90290	longnose dace	86	1		22 1
				brassy minnow	19			
				fathead minnow	181			
				white sucker	7			
				lake chub	71			
				northern redbelly dace	2			
				brook stickleback	3			
				black bullhead				
				northern leopard frog				
				gophersnake				
Total Herp Number		23		Total Fish Number		369	1	370
Herp Richness		2		Fish Richness		8		
Total Site Richness		10		Native Fish Richness		7		
				Percent Native		99.73		
Fort Peck Reservoir	Rough Prong McGuire Creek_19_R6	5/24/06	47.62139, -106.16909	fathead minnow	3	5 1		
				plains minnow	1			
				tiger salamander larvae				
				plains gartersnake				
Total Herp Number		6		Total Fish Number		4	0	4
Herp Richness		2		Fish Richness		2		
Total Site Richness		4		Native Fish Richness		2		
				Percent Native		100		

Lower Milk	Sage Hen Creek_17_R6	5/18/06	48.0514, -106.74281	boreal chorus frog			1
				northern leopard frog			1
Total Herp Number	2		Total Fish Number	0	0		0
Herp Richness	2		Fish Richness				0
Total Site Richness	2		Native Fish Richness				0
			Percent Native				0
Fort Peck Reservoir	Sand Arroyo Bay_22_R6	5/25/06	47.81656, -106.21105	Woodhouse's toad			10
				boreal chorus frog			3
				tiger salamander larvae			1
Total Herp Number	14		Total Fish Number	0	0		0
Herp Richness	3		Fish Richness				0
Total Site Richness	3		Native Fish Richness				0
			Percent Native				0
Battle	Sand Coulee_125_R6	8/24/06	48.96143	fathead minnow	646		
				brook stickleback	16		
Total Herp Number	0		Total Fish Number	662	0		662
Herp Richness	0		Fish Richness				2
Total Site Richness	2		Native Fish Richness				2
			Percent Native				100
Middle Milk	Snake Creek_95_R6	8/1/06	48.46393, -109.06213	fathead minnow	2224		
				northern redbelly dace	185		
				hybrid dace	2		
				white sucker	105		
				brassy minnow	582		
				lake chub	1		
				northern leopard frog			5
				plains gartersnake			4
Total Herp Number	9		Total Fish Number	3099	0		3099
Herp Richness	2		Fish Richness				5
Total Site Richness	7		Native Fish Richness				5
			Percent Native				100
Fort Peck Reservoir	Soda Creek_27_R6	5/30/06	47.35, -106.06554	tiger salamander larvae			50
				boreal chorus frog tadpole			55
Total Herp Number	105		Total Fish Number	0	0		0
Herp Richness	2		Fish Richness				0
Total Site Richness	2		Native Fish Richness				0
			Percent Native				0

Lower Milk	South Fork Little Beaver Creek_55_R6	6/21/06	48.09026, -107.10647	fathead minnow	244			
				tiger salamander larvae				1
				northern leopard frog				5
				plains gartersnake				5
Total Herp Number	11			Total Fish Number	244	0		244
Herp Richness	3			Fish Richness				1
Total Site Richness	4			Native Fish Richness				1
				Percent Native				100
Big Muddy	South Fork Whitetail Creek_60_R6	6/26/06	48.85492, -105.16801	brook stickleback	80			
				fathead minnow	7			
				lake chub	1			
				white sucker	1			
				plains gartersnake				1
				painted turtle				1
Total Herp Number	2			Total Fish Number	89	0		89
Herp Richness	2			Fish Richness				4
Total Site Richness	6			Native Fish Richness				4
				Percent Native				100
Middle Milk	Squaw Coulee_112_R6	8/22/06	48.50579, -109.76527	northern leopard frog				16
Total Herp Number	16			Total Fish Number	0	0		0
Herp Richness	1			Fish Richness				0
Total Site Richness	1			Native Fish Richness				0
				Percent Native				0
Beaver in Milk River	Ten Trees Creek_54_R6	6/20/06	47.97469, -107.34745	fathead minnow	42			
				lake chub	2			
				boreal chorus frog tadpole				6
Total Herp Number	6			Total Fish Number	44	0		44
Herp Richness	1			Fish Richness				2
Total Site Richness	3			Native Fish Richness				2
				Percent Native				100
Middle Milk	Thirtymile Creek_92_R6	7/26/06	48.55532, -108.80830	fathead minnow	292			
				brook stickleback	45			
Total Herp Number	0			Total Fish Number	337	0		337
Herp Richness	0			Fish Richness				2
Total Site Richness	2			Native Fish Richness				2
				Percent Native				100
Redwater	Trail Creek_38_R6	6/1/06	47.24041, -105.87455	boreal chorus frog tadpole				1

				tiger salamander			2
				tiger salamander larvae			3
Total Herp Number	6		Total Fish Number	0	0	0	
Herp Richness	2		Fish Richness			0	
Total Site Richness	2		Native Fish Richness			0	
			Percent Native			0	
Battle	Unnamed Coulee_123_R6	8/24/06	48.91298, -109.29697	tiger salamander			4
				tiger salamander larvae			2
Total Herp Number	6		Total Fish Number	0	0	0	
Herp Richness	1		Fish Richness			0	
Total Site Richness	1		Native Fish Richness			0	
			Percent Native			0	
Big muddy	Unnamed Creek_65_R6	6/28/06	48.37752, -104.18989	brook stickleback	135		
				fathead minnow	24		
				northern leopard frog			2
Total Herp Number	2		Total Fish Number	159	0	159	
Herp Richness	1		Fish Richness			2	
Total Site Richness	3		Native Fish Richness			2	
			Percent Native			100	
Prairie Elk - Wolf	West Fork Remuda Creek_15_R6	5/17/06	47.91666, -105.92112	white sucker	22		
				fathead minnow	702		
				brassy minnow	1146		
				plains minnow	14		
				lake chub	92		
				black bullhead		77	
				common carp		1	
				northern redbelly dace	25		
				longnose dace	3		
				brook stickleback	2		
				northern leopard frog			8
				Woodhouse's toad			1
Total Herp Number	9		Total Fish Number	2006	78	2084	
Herp Richness	2		Fish Richness			10	
Total Site Richness	12		Native Fish Richness			8	
			Percent Native			96.26	
Rock	West Fork Rock Creek_80_R6	7/17/06	48.9162, -106.91203	fathead minnow	1157		
				brook stickleback	24		
				white sucker	5		

				Iowa darter	28			
				lake chub	53			
				brassy minnow	1			
				northern leopard frog		34		
				painted turtle		1		
				plains gartersnake		2		
Total Herp Number		37		Total Fish Number		1268	0	1268
Herp Richness		3		Fish Richness				6
Total Site Richness		9		Native Fish Richness				6
				Percent Native				100
Fort Peck Reservoir		Winter Creek_90_R6	7/25/06	47.86167, -108.83888	northern leopard frog		12	
Total Herp Number		12		Total Fish Number		0	0	0
Herp Richness		1		Fish Richness				0
Total Site Richness		1		Native Fish Richness				0
				Percent Native				0
Battle		Woodpile Coulee_120_R6	8/23/06	48.95532, -109.49717	fathead minnow	1051		
Total Herp Number		0		Total Fish Number		1051	0	1051
Herp Richness		0		Fish Richness				1
Total Site Richness		1		Native Fish Richness				1
				Percent Native				100
Region 6 Summary					Total Fish Number*	59128		
Sites with fish or herps		90		Total Nonnative Number		609		
Sites with fish		70		Fish Species		30		
Sites with greater than 25% nonnative fish		3		Native Fish Species		24		
Sites with equal or greater number nonnative species		6		Percent Native Fish		98.97%		
Sites with 100% native fish species		38		Herp Species		8		
Percentage of sites w/fish and only native fish species		54.29%						
Stream data. The only repeat sample sites conducted on one stream were on the Redwater River.								
*Unidentified juvenile fish were not included in this Appendix.								
REGION 7								
HUC (Drainage)	Site Name/Number/Region		Dates	Lat/Long	Species (Fish and Herp)	#Native	#NonN	Total
Lower Powder	10 Mile Creek_048A_06_R7		7/10/06	46.65109	fathead minnow	33		
10090209				-105.28862	Hybognathus sp.	23		

			plains minnow	5	
			northern leopard frog		36
			northern leopard frog tadpole		19
			Woodhouse's toad		3
Total Herp Number	58		Total Fish Number	61	0 61
Herp Richness	2		Fish Richness		2
Total Site Richness	4		Native Fish Richness		2
			Percent Native		100
Lower Yellowstone	13 Mile Creek_022A_06_R7	7/13/06	47.277	black bullhead	1
10100004			-104.56069	brook stickleback	23
				common carp	22
				creek chub	418
				fathead minnow	201
				green sunfish	2
				longnose dace	129
				plains killifish	104
				sand shiner	7
				shorthead redhorse	15
				white sucker	196
				northern leopard frog	40
				northern leopard frog tadpole	8
Total Herp Number	48		Total Fish Number	989	129 1118
Herp Richness	1		Fish Richness		11
Total Site Richness	12		Native Fish Richness		7
			Percent Native		88.38
Lower Yellowstone	13 Mile Creek_042B_06_R7	6/21/06	47.33029	creek chub	21
10100004			-104.62119	longnose dace	23
				northern redbelly dace	1
				northern leopard frog	3
Total Herp Number	3		Total Fish Number	45	0 45
Herp Richness	1		Fish Richness		3
Total Site Richness	4		Native Fish Richness		3
			Percent Native		100
13 Mile Creek Summary		6/21/06	Total Fish Number		1163
Sampled 3 times at 3 sites		6/21/06	Fish Richness		12
One with no fish		7/13/06	Percent Native		88.83
			Total Site Richness		14
Lower Yellowstone	Alkali Creek_011D_06_R7	6/1/06	47.56282	fathead minnow	1

10100004			-104.22582	Hybognathus sp. river carpsucker	7 4		
Total Herp Number	0		Total Fish Number	12	0	12	
Herp Richness	0		Fish Richness			3	
Total Site Richness	3		Native Fish Richness			3	
			Percent Native			100	
Alkali Creek Summary	6/1/06		Total Fish Number	12			
Sampled 3 times at 3 sites	6/1/06		Fish Richness	3			
Two with no fish	6/1/06		Percent Native	100			
			Total Site Richness	3			
Beaver	Beaver Creek_013A_06_R7	5/30/06	46.84001	black bullhead		4	
10110204			-104.18562	brassy minnow	1		
				creek chub	21		
				fathead minnow	168		
				golden shiner		148	
				green sunfish		10	
				northern pike		2	
				sand shiner	240		
				stonecat	1		
				white sucker	26		
				northern leopard frog		1	
Total Herp Number	1		Total Fish Number	457	164	621	
Herp Richness	1		Fish Richness			10	
Total Site Richness	11		Native Fish Richness			6	
			Percent Native			70.1	
Big Dry	Big Dry Creek_014A_06_R7	6/6/06	47.08714	tiger salamander larvae		498	
10040105			-107.35713	painted turtle		1	
Total Herp Number	499		Total Fish Number	0	0	0	
Herp Richness	2		Fish Richness			0	
Total Site Richness	2		Native Fish Richness			0	
			Percent Native			0	
Lower Yellowstone	Boxelder Creek_015A_06_R7	6/5/06	47.27433	common carp		2	
10100004			-104.50298	creek chub	47		
				fathead minnow	47		
				flathead chub	4		
				Hybognathus sp.	73		
				plains killifish		3	
				river carpsucker	7		

			sand shiner	142			
			western silvery minnow	2			
			white sucker	6			
			northern leopard frog		2		
Total Herp Number	2		Total Fish Number	328	5	333	
Herp Richness	1		Fish Richness	9			
Total Site Richness	10		Native Fish Richness	7			
			Percent Native	98.5			
Lower Yellowstone	Boxelder Creek_015B_06_R7	7/19/06	47.2273	brook stickleback	6	1	
10100004			-104.50209	common carp			
				creek chub	85	7	
				fathead minnow	638		
				green sunfish		14	
				Hybognathus sp.	19		
				plains killifish		3	
				plains minnow	5		
				sand shiner	165	12	
				western silvery minnow	1		
				white sucker	28	3	
				northern leopard frog			
				Woodhouse's toad		12	
Total Herp Number	15		Total Fish Number	947	22	969	
Herp Richness	2		Fish Richness	10			
Total Site Richness	12		Native Fish Richness	7			
			Percent Native	97.73			
Lower Yellowstone	Boxelder Creek_015C_06_R7	7/19/06	57.16788	northern leopard frog		7	
10100004			-104.41866	painted turtle		6	
Total Herp Number	13		Total Fish Number	0	0	0	
Herp Richness	2		Fish Richness	0			
Total Site Richness	2		Native Fish Richness	0			
			Percent Native	0			
Boxelder Creek Summary		6/5/06		Total Fish Number	1302		
Sampled 3 times at 3 sites		7/19/06		Fish Richness	12		
One with no fish		7/19/06		Percent Native	97.93		
				Total Site Richness	15		
Lower Yellowstone	Cabin Creek_016A_06_R7	6/7/06	46.77163	channel catfish	13		
10100004			-104.78357	creek chub	5		
				fathead minnow	28		

			flathead chub	4		
			Hybognathus sp.	3		
			longnose dace	21		
			plains minnow	1		
			sand shiner	9		
			white sucker	19		
			northern leopard frog		24	
Total Herp Number	24		Total Fish Number	103	0	103
Herp Richness	1		Fish Richness			8
Total Site Richness	9		Native Fish Richness			8
			Percent Native			100
Lower Yellowstone	Cabin Creek_016B_06_R7	6/7/06	46.70254	channel catfish	13	
10100004			-104.68551	fathead minnow	45	
				flathead chub	2	
				Hybognathus sp.	1	
				plains killifish		2
				longnose dace	4	
				plains minnow	1	
				white sucker	8	
				northern leopard frog		20
				Woodhouse's toad		1
Total Herp Number	21		Total Fish Number	74	2	76
Herp Richness	2		Fish Richness			7
Total Site Richness	9		Native Fish Richness			6
			Percent Native			97.37
Lower Yellowstone	Cabin Creek_016C_06_R7	6/7/06	46.66808	creek chub	1	
10100004			-104.68551	fathead minnow	53	
				flathead chub	4	
				Hybognathus sp.	42	
				longnose dace	6	
				plains minnow	2	
				white sucker	1	
				plains gartersnake		1
Total Herp Number	1		Total Fish Number	109	0	109
Herp Richness	1		Fish Richness			6
Total Site Richness	7		Native Fish Richness			6
			Percent Native			100
Cabin Creek Summary		6/7/06		Total Fish Number	288	
Sampled 3 times at 3 sites		6/7/06		Fish Richness	9	

			6/7/06			Percent Native	99.31		
						Total Site Richness	12		
Lower Musselshell 10040205	Calf Creek_017A_06_R7	7/6/2006	47.19083	black bullhead				18	
			-107.92321	brassy minnow		14			
				fathead minnow		263			
				green sunfish				52	
				lake chub		1			
				white sucker		7			
Total Herp Number	0		Total Fish Number		285	70	355		
Herp Richness	0		Fish Richness				6		
Total Site Richness	6		Native Fish Richness				4		
			Percent Native				80.28		
Lower Musselshell 10040205	Calf Creek_017B_06_R7	7/6/2006	47.19083	common carp				1	
			-107.92321						
Total Herp Number	0		Total Fish Number		0	1	1		
Herp Richness	0		Fish Richness				1		
Total Site Richness	7		Native Fish Richness				0		
			Percent Native				0		
Calf Creek Summary		7/6/06			Total Fish Number	356			
Sampled 3 times at 3 sites		7/6/06			Fish Richness	7			
One with no fish					Percent Native	80.05			
					Total Site Richness	7			
Lower Yellowstone 10100004	Cedar Creek_018A_06_R7	6/20/06	46.91383	creek chub		4			
			-104.73013	fathead minnow		66			
				Hybognathus sp.		302			
				plains killifish				4	
				river carpsucker		5			
				sand shiner		30			
				northern leopard frog				20	
Total Herp Number	20		Total Fish Number		407	4	411		
Herp Richness	1		Fish Richness				6		
Total Site Richness	7		Native Fish Richness				5		
			Percent Native				84.57		
Cedar Creek Summary		6/20/06							
Sampled 3 times at 3 sites		8/8/06			Total Fish Number	411			
Two with no fish		8/8/06			Fish Richness	6			
					Percent Native	84.57			
					Total Site Richness	7			

Lower Yellowstone 10100004	Clear Creek_019A_06_R7	6/22/06	46.96004	channel catfish	6				
			-104.80143	common carp				1	
				creek chub	2				
				emerald shiner	8				
				flathead chub	6				
				goldeye	1				
				river carpsucker	1				
				sand shiner	47				
				shorthead redhorse	17				
				western silvery minnow	63				
				northern leopard frog					4
				northern leopard frog tadpole					2
Total Herp Number	6			Total Fish Number	151	1			152
Herp Richness	1			Fish Richness					11
Total Site Richness	12			Native Fish Richness					10
				Percent Native					99.5
Lower Yellowstone 10100004	Clear Creek_019B_06_R7	6/5/06	47.01334	creek chub	52				
			-104.95284	fathead minnow	15				
				northern redbelly dace	4				
				brook stickleback	2				
				white sucker	117				
				northern leopard frog					30
Total Herp Number	30			Total Fish Number	190	0			190
Herp Richness	1			Fish Richness					5
Total Site Richness	6			Native Fish Richness					5
				Percent Native					100
Lower Yellowstone 10100004	Clear Creek_019D_06_R7	7/10/06	47.16588	plains gartersnake					2
			-105.2661	northern leopard frog					10
Total Herp Number	12			Total Fish Number	0				0
Herp Richness	2			Fish Richness					0
Total Site Richness	2			Native Fish Richness					0
				Percent Native					0
Clear Creek Summary		6/5/06							
Sampled 4 times at 4 sites		6/22/06		Total Fish Number	342				
Two with no fish		7/10/06		Fish Richness	15				
		7/10/06		Percent Native	99.74				
				Total Site Richness	17				

Lower Yellowstone 10100004	Cottonwood Creek_55A_06_R7	6/19/06	46.90395 fathead minnow -105.20824 plains killifish plains minnow sand shiner northern leopard frog	9 8 1 2	1	
Total Herp Number	2		Total Fish Number	18	1	19
Herp Richness	1		Fish Richness			4
Total Site Richness	5		Native Fish Richness			3
			Percent Native			94.74
Lower Yellowstone 10100004	Cottonwood Creek_21A_06_R7	7/19/06	47.26223 northern leopard frog -10436429 Woodhouse's toad			10 1
Total Herp Number	11		Total Fish Number	0	0	0
Herp Richness	2		Fish Richness			0
Total Site Richness	2		Native Fish Richness			0
			Percent Native			0
Cottwood Creek Summary		6/19/06				
Sampled 2 times at 2 sites		7/19/06		Total Fish Number	19	
One with no fish				Fish Richness	4	
				Percent Native	94.74	
				Total Site Richness	7	
Upper Tongue 10090101	Deer Creek_001A_06RE_R7	5/25/06	45.05529 Woodhouse's toad -106.70296			2
Total Herp Number	2		Total Fish Number	0	0	0
Herp Richness	1		Fish Richness			0
Total Site Richness	1		Native Fish Richness			0
			Percent Native			0
Lower Yellowstone 10100004	First Hay Creek_026B_06_R7	6/12/06	47.80192 channel catfish -104.06992 emerald shiner fathead minnow Hybognathus sp. longnose dace sand shiner	2 2 1 27 2 2		
Total Herp Number	0		Total Fish Number	36	0	36
Herp Richness	0		Fish Richness			6
Total Site Richness	6		Native Fish Richness			6
			Percent Native			100

First Hay Creek Summary		6/12/06						
Sampled 2 times at 2 sites		6/12/06		Total Fish Number		36		
One with no fish				Fish Richness		6		
				Percent Native		100		
				Total Site Richness		6		
Fort Peck Reservoir Flat Creek_045A_06-R7		7/12/06	47.5135	fathead minnow	265			
10040104			-106.36614	flathead chub	19			
				Hybognathus sp.	263			
				lake chub	1			
				plains minnow	3			
				western silvery minnow	2			
				northern leopard frog		4		
				Woodhouse's toad		7		
				northern leopard frog tadpole		27		
Total Herp Number		38		Total Fish Number		553	0	553
Herp Richness		3		Fish Richness		5		
Total Site Richness		8		Native Fish Richness		5		
				Percent Native		100		
Lower Yellowstone- Hanging Woman Creek_007A		5/17/06	45.22753	black bullhead		2		
Sunday		06_R7	-106.49899	creek chub	1			
10100001				fathead minnow	23			
				green sunfish		101		
				white sucker	4			
				Woodhouse's toad		2		
				gophersnake		1		
Total Herp Number		3		Total Fish Number		28	103	131
Herp Richness		2		Fish Richness		5		
Total Site Richness		7		Native Fish Richness		3		
				Percent Native		21.37		
Upper Tongue Hanging Woman Creek_007B		8/3/06	45.22792	black bullhead		2		
10090101		06_R7	-106.49961	fathead minnow	11			
				green sunfish		2		
				painted turtle			1	
				northern leopard frog		24		
Total Herp Number		25		Total Fish Number		11	4	15
Herp Richness		2		Fish Richness		3		
Total Site Richness		5		Native Fish Richness		1		
				Percent Native		73.33		

Hanging Woman Creek Summary		5/17/06				
Sampled 2 times at 2 sites		8/3/06		Total Fish Number	146	
				Fish Richness	5	
				Percent Native	26.71	
				Total Site Richness	9	
Lower Tongue	Johnson Creek_051A-06_R7	6/29/06	46.22699	tiger salamander larvae		9
10090102			-105.54591	western rattlesnake		1
Total Herp Number	10		Total Fish Number	0	0	0
Herp Richness	2		Fish Richness	0		
Total Site Richness	2		Native Fish Richness	0		
			Percent Native	0		
Little Dry	Little Dry Creek_029A_06-R7	6/27/06	47.06277	black bullhead		1
10100004			-106.42033	brook stickleback	1	
				common carp		1
				creek chub	8	
				fathead minnow	235	
				Hybognathus sp.	484	
				longnose dace	8	
				plains minnow		2
				sand shiner	135	
				white sucker	46	
				northern leopard frog		12
Total Herp Number	12		Total Fish Number	917	4	921
Herp Richness	1		Fish Richness	9		
Total Site Richness	10		Native Fish Richness	6		
			Percent Native	99.57		
Little Powder	Little Powder River_009A_06_R7	5/16/06	45.10466	black bullhead		2
10090208			-105.33071	channel catfish	5	
				common carp		3
				fathead minnow	139	
				green sunfish		8
				longnose dace	5	
				sand shiner	625	
				shorthead redhorse	4	
				stonecat	1	
				white sucker	21	
				northern leopard frog		2
Total Herp Number	2		Total Fish Number	800	13	813

Herp Richness	1		Fish Richness	10	
Total Site Richness	11		Native Fish Richness	7	
			Percent Native	98.41	
Little Powder 10090208	Little Powder River_009B_06_R7	7/27/06	45.10466	black bullhead	4
			-105.33071	channel catfish	23
				common carp	211
				creek chub	7
				fathead minnow	391
				green sunfish	48
				sand shiner	1367
				shorthead redhorse	8
				white sucker	44
Total Herp Number	0		Total Fish Number	1840	263 2103
Herp Richness	0		Fish Richness		9
Total Site Richness	6		Native Fish Richness		6
			Percent Native		87.49
Little Powder River Summary		5/16/06			
Sampled 2 times at 1 site		7/27/06			
			Total Fish Number	2916	
			Fish Richness	11	
			Percent Native	90.54	
			Total Site Richness	11	
Lower Musselshell 10040205	Lodgepole Creek_030A_06_R7	7/5/06	47.2976	common carp	25
			-107.89516	fathead minnow	38
				sand shiner	5
				boreal chorus frog	16
				common gartersnake	1
				northern leopard frog	2
Total Herp Number	19		Total Fish Number	68	0 68
Herp Richness	3		Fish Richness		3
Total Site Richness	6		Native Fish Richness		2
			Percent Native		100
Lower Musselshell 10040205	Lodgepole Creek_069B_06_R7	7/6/06	47.32141	common carp	103
			-107.93108	creek chub	140
				fathead minnow	229
				green sunfish	25
				Hybognathus sp.	126
				plains minnow	3
				sand shiner	94
				western silvery minnow	2

				boreal chorus frog	20	
				boreal chorus frog tadpole	47	
				northern leopard frog tadpole	100	
				northern leopard frog	100	
				Woodhouse's toad	2	
				tiger salamander larvae	2	
				plains gartersnake	1	
				painted turtle	1	
Total Herp Number		273		Total Fish Number	594	128 722
Herp Richness		6		Fish Richness		7
Total Site Richness		12		Native Fish Richness		5
				Percent Native		82.27
Lodgepole Creek Summary			7/5/06		Total Fish Number	790
Sampled 3 times at 3 site			7/6/06		Fish Richness	7
One without fish					Percent Native	83.8
					Total Site Richness	14
Lower Yellowstone	M. Fork Bad Route Crk_058A	8/8/06	47.10686	brook stickleback	1	
10100004	06_R7		-105.42166	creek chub	186	
				white sucker	79	
				common gartersnake		1
				northern leopard frog		25
Total Herp Number		26		Total Fish Number	266	0 266
Herp Richness		2		Fish Richness		3
Total Site Richness		5		Native Fish Richness		3
				Percent Native		100
Lower Yellowstone	O'Brien Creek_032A_06_R7	7/18/06	47.60305	black bullhead		5
10100004			-104.18739	brassy minnow	45	
				common carp		4
				creek chub	7	
				fathead minnow	54	
				stonecat	2	
				white sucker	3	
				northern leopard frog		50
Total Herp Number		50		Total Fish Number	111	9 120
Herp Richness		1		Fish Richness		7
Total Site Richness		8		Native Fish Richness		5
				Percent Native		92.5
LowerTongue	Pumpkin Creek 081A 06-R7	5/18/06	46.07641	fathead minnow	61	

10090102			-105.5521	green sunfish	10	
				white sucker	2	
				plains gartersnake		1
Total Herp Number		1	Total Fish Number		63	10 73
Herp Richness		1	Fish Richness			3
Total Site Richness		4	Native Fish Richness			2
			Percent Native			86.3
LowerTongue	Pumpkin Creek_081B_06-R7	8/9/06	46.07594	common carp	2	
10090102			-105.55361	fathead minnow	870	
				green sunfish		45
				sand shiner	11	
				western silvery minnow	12	
				white sucker	2	
				snapping turtle		1
Total Herp Number		1	Total Fish Number		895	47 942
Herp Richness		1	Fish Richness			6
Total Site Richness		7	Native Fish Richness			4
			Percent Native			95.01
Pumpkin Creek Summary		5/18/06	Total Fish Number		1014	
Sampled 2 times at 2 site		8/9/06	Fish Richness		7	
			Percent Native		94.38	
			Total Site Richness		9	
Lower Musselshell	Rattlesnake Creek	7/11/00	46.81223	black bullhead	1	
10040205			-107.6871	common carp	23	
				creek chub	1	
				fathead minnow	44	
				green sunfish		3
				Hybognathus sp.	241	
				plains minnow	5	
				sand shiner	1	
Total Herp Number		0	Total Fish Number		292	27 319
Herp Richness		0	Fish Richness			7
Total Site Richness		7	Native Fish Richness			4
			Percent Native			91.54
Rosebud	Rosebud Creek_03A_06_R7	5/22/06	45.2201	creek chub	41	
10100003			-106.95171	fathead minnow	135	
				mountain sucker	1	
				white sucker	62	

				northern leopard frog		1
Total Herp Number	1		Total Fish Number	239	0	239
Herp Richness	1		Fish Richness	4		
Total Site Richness	5		Native Fish Richness	4		
			Percent Native	100		
Rosebud	Rosebud Creek_03B_06_R7	8/1/06	45.21995	northern leopard frog		4
10100003			-106.95178			
Total Herp Number	4		Total Fish Number	0	0	0
Herp Richness	1		Fish Richness	0		
Total Site Richness	1		Native Fish Richness	0		
			Percent Native	0		
Rosebud	Rosebud Creek_04A_06_R7	5/22/06	45.21564	creek chub	28	
10100003			-106.97564	fathead minnow	5	
				white sucker	1	
				gophersnake		1
Total Herp Number	1		Total Fish Number	34	0	34
Herp Richness	1		Fish Richness	3		
Total Site Richness	4		Native Fish Richness	3		
			Percent Native	100		
Rosebud	Rosebud Creek_04B_06_R7	8/1/06	45.21564	creek chub	1	
10100003			-106.97564	fathead minnow	7	
				western rattlesnake		1
				northern leopard frog		5
				common gartersnake		2
Total Herp Number	8		Total Fish Number	8	0	8
Herp Richness	3		Fish Richness	2		
Total Site Richness	5		Native Fish Richness	2		
			Percent Native	100		
Rosebud	Rosebud Creek_05A_06_R7	5/22/06	45.21363	fathead minnow	265	
10100003			-107.00193	lake chub	185	
				longnose dace	13	
				white sucker	66	
Total Herp Number	0		Total Fish Number	529	0	529
Herp Richness	0		Fish Richness	4		
Total Site Richness	3		Native Fish Richness	4		
			Percent Native	100		
Rosebud	Rosebud Creek_05B_06_R7	8/1/06	45.21363	creek chub	2	

10100003			-107.00193	fathead minnow	641		
				lake chub	178		
				longnose dace	13		
				white sucker	78		
				paintred turtle			1
Total Herp Number	1		Total Fish Number		912	0	912
Herp Richness	1		Fish Richness				5
Total Site Richness	6		Native Fish Richness				5
			Percent Native				100
Rosebud Creek Summary	5/22/06		Total Fish Number		1722		
Sampled 6 times at 3 sites	5/22/06		Fish Richness		6		
Two with no fish	5/22/06		Percent Native		100		
	8/1/06		Total Site Richness		11		
	8/1/06	8/1/06					
Lower Yellowstone	Sand Creek_036A_06_R7	6/21/06	47.04094	flathead chub	21		
10100004			-104.81094	longnose dace	3		
				sand shiner	1		
				western silvery minnow	1		
Total Herp Number	0		Total Fish Number		26	0	26
Herp Richness	0		Fish Richness				4
Total Site Richness	4		Native Fish Richness				4
			Percent Native				100
Lower Yellowstone - Sarpy Creek_80A_06RE_R7	5/15/06		45.85068	northern leopard frog			1
Sunday			-107.106	snapping turtle			2
10100001				tiger salamander larvae			15
Total Herp Number	18		Total Fish Number		0	0	0
Herp Richness	3		Fish Richness				0
Total Site Richness	3		Native Fish Richness				0
			Percent Native				0
Lower Yellowstone - Sarpy Creek_80B_06RE_R7	7/24/06		45.85045	northern leopard frog			20
Sunday			-107.10529	plains gartersnake			1
10100001							
Total Herp Number	21		Total Fish Number		0	0	0
Herp Richness	2		Fish Richness				0
Total Site Richness	2		Native Fish Richness				0
			Percent Native				0

Sarpy Creek Summary		5/15/06		Total Fish Number		0			
Sampled 2 times at 2 sites		7/24/06		Fish Richness		0			
Two with no fish				Percent Native		NA			
				Total Site Richness		4			
Lower Yellowstone	Sears Creek_037A_06_R7	7/18/06	47.54731	flathead chub	6				
10100004			-104.27169	goldeye	2				
				sand shiner	2				
				sauger	1				
				stonecat	1				
Total Herp Number		0		Total Fish Number		12	0	12	
Herp Richness		0		Fish Richness		5			
Total Site Richness		5		Native Fish Richness		5			
				Percent Native		100			
Lower Yellowstone	Sears Creek_037B_06_R7	7/18/06	47.53212	brook stickleback	120				
10100004			-104.31071	creek chub	67				
				fathead minnow	40				
				longnose dace	6				
				white sucker	102				
				northern leopard frog tadpole				8	
Total Herp Number		8		Total Fish Number		335	0	335	
Herp Richness		1		Fish Richness		5			
Total Site Richness		6		Native Fish Richness		5			
				Percent Native		100			
Sears Creek Summary		7/18/06		Total Fish Number		347			
Sampled 2 times at 2 sites		7/18/06		Fish Richness		10			
				Percent Native		100			
				Total Site Richness		11			
Lower Powder	Sheep Creek_046A_06_R7	7/17/06	46.30221	black bullhead				57	
10090209			-105.27711	common carp				266	
				fathead minnow	327				
				green sunfish				6	
				Hybognathus sp.	25				
				plains minnow	6				
				white sucker	1				
				Woodhouse's toad				8	
Total Herp Number		8		Total Fish Number		359	329	688	
Herp Richness		1		Fish Richness		6			

Total Site Richness			7	Native Fish Richness			3
				Percent Native			52.18
Lower Yellowstone 10100004	Smith Creek_039A_06_R7	6/26/06	47.42756	black bullhead		3	
			-104.31219	brassy minnow	1		
				brook stickleback	1		
				common carp		8	
				creek chub	2		
				fathead minnow	445		
				golden shiner		2	
				green sunfish		25	
				Hybognathus sp.	2		
				northern pike		1	
				river carpsucker	4		
				sand shiner	241		
				shorthead redhorse	5		
				white sucker	33		
				common gartersnake			1
Total Herp Number		1	Total Fish Number		734	39	773
Herp Richness		1	Fish Richness		14		
Total Site Richness		15	Native Fish Richness		9		
			Percent Native		94.95		
O'Fallon 10100005	S. Fork Sandstone Creek_067B 06_R7	8/10/06	46.32714	black bullhead		957	
			-104.46957	black crappie		8	
				green sunfish		26	
				largemouth bass		63	
				northern pike		5	
				yellow perch		18	
				northern leopard frog			15
Total Herp Number		15	Total Fish Number		0	1077	1077
Herp Richness		1	Fish Richness		6		
Total Site Richness		7	Native Fish Richness		0		
			Percent Native		0		
S. Fork Sandstone Creek Summary		8/9/06		Total Fish Number	1077		
Sampled 2 times at 2 sites		8/10/06		Fish Richness	6		
One with no fish				Percent Native	0		
				Total Site Richness	7		
Lower Powder 10090209	Spring Creek_060B_06_R7	7/26/06	45.8196	black bullhead		67	
			-104.85271	fathead minnow	3		

			green sunfish	4		
			sand shiner	1		
			northern leopard frog		20	
			plains gartersnake		1	
Total Herp Number	21		Total Fish Number	4	71	75
Herp Richness	2		Fish Richness	4		
Total Site Richness	6		Native Fish Richness	2		
			Percent Native	5.3		
Lower Powder	Spring Creek_060A_06_R7	4/13/06	45.82289	black bullhead	5	
10090209			-104.85794	creek chub	11	
				fathead minnow	81	
				green sunfish		13
				plains killifish		18
				sand shiner	40	
				white sucker	1	
Total Herp Number	0		Total Fish Number	133	36	169
Herp Richness	0		Fish Richness	7		
Total Site Richness	7		Native Fish Richness	4		
			Percent Native	78.7		
Spring Creek Summary		4/13/06		Total Fish Number	244	
Sampled 2 times at 2 sites		7/26/06		Fish Richness	7	
				Percent Native	56.15	
				Total Site Richness	7	
Fort Peck Reservoir	Squaw Creek_040A_06_R7	7/5/06	47.46141	creek chub	36	
10040104			-107.80096	fathead minnow	66	
				plains minnow	3	
Total Herp Number	0		Total Fish Number	105	0	105
Herp Richness	0		Fish Richness	3		
Total Site Richness	3		Native Fish Richness	3		
			Percent Native	100		
Lower Tongue	Squaw Creek_053B_06_R7	6/8/06	46.27506	plains minnow	3	
10090102			-107.71805	tiger salamander larvae		21
Total Herp Number	21		Total Fish Number	3	0	3
Herp Richness	1		Fish Richness	1		
Total Site Richness	2		Native Fish Richness	1		
			Percent Native	100		
Lower Yellowstone-St Unnamed Creek	007A_06_R7	5/17/06	45.22753	creek chub	1	

10100001		-106.49899				
Total Herp Number	0		Total Fish Number	1	0	1
Herp Richness	0		Fish Richness	1		
Total Site Richness	1		Native Fish Richness	1		
			Percent Native	100		
Upper Tongue 10090101	Youngs Creek_002A_06_R7	5/23/06	45.01468 creek chub	28		
			-106.97492 longnose dace	15		
			white sucker	8		
Total Herp Number	0		Total Fish Number	51	0	51
Herp Richness	0		Fish Richness	3		
Total Site Richness	3		Native Fish Richness	3		
			Percent Native	100		
Upper Tongue 10090101	Youngs Creek_002B_06_R7	8/2/06	45.01468 creek chub	6		
			-106.97492 fathead minnow	7		
			white sucker	4		
			common gartersnake		1	
			northern leopard frog		7	
Total Herp Number	8		Total Fish Number	17	0	17
Herp Richness	2		Fish Richness	3		
Total Site Richness	5		Native Fish Richness	3		
			Percent Native	100		
Youngs Creek Summary		5/23/06		Total Fish Number	68	
Sampled 2 times at 1 site		8/2/06		Fish Richness	4	
				Percent Native	100	
				Total Site Richness	6	
Region 7 Summary						
Sites with fish or herps	57		Total Fish Number	16,711		
Sites with fish	48		Nonnative Fish Numbers	2582		
Sites with greater than 25% nonnative fish	6		Fish Species	26		
Sites with equal or greater number nonnative species	3		Native Fish Species	19		
Sites with 100% native fish species	23		Percent Native Fish	84.55%		

Percentage of sites w/fish and only native fish species	48%	Herp Species	10
Stream data = multiple sample sites on a stream		Stream Data exists for 19 streams	
Streams with 100% native fish	5	Streams w/greater than 25% nonnative fish	3
Streams with 99% or greater native fish	7		
Cabin Creek	99.31%	Sears Creek	100%
Clear Creek	99.74%	Youngs Creek	100%
Alkali Creek	100%	First Hay Creek	100%
Rosebud Creek	100%		
REGION 4,5,6,7 SUMMARY			
Sites with fish or herps	306	Total Fish Number	164,884
Sites with fish	268	Nonnative Fish	8737
Sites with greater than 25% nonnative fish	24	Total Fish Species	45
Sites with equal or greater number nonnative species	18	Native Fish Species	27
Sites with 100% native fish species	129	Nonnative Species	18
Percentage of sites w/fish and only native fish species	48.51%	Percent Native Fish	94.70%
		Herp Species	16
Stream data = multiple sample sites on a stream	*		
Streams with greater than 25% nonnative fish	5		
Streams with 100% native fish species	11	*This data includes only region 4, 5 and 7	
Streams with 99% or greater native fish	19		

Appendix B. Fish and Habitat Sampling Protocol for Prairie Streams

1. **Site location.** -Locate the sampling site using GPS for random sites, or by convenience for non-random sites. The GPS location will be the center of the reach, this is where you place the “F” flag (see Step 2). If the site is dry, shift the reach up or downstream to capture the most wetted channel possible on the parcel of land where you have permission for sampling.
2. **Laying out the sample reach.** -Lay out a 300 m sample reach using a measuring tape and a set of 11 pin flags (labeled A-K). Follow the curves in the stream channel with the measuring tape; do not cut across curves. To avoid spooking fish, walk along the bank, not in the stream. Place a flag every 30 m. The “A” flag will be at the downstream end; the “K” flag will be at the upstream end of the reach. The “F” flag will go in the center of the reach.
3. **Block nets.** -Place block nets (these can be old seines, 1/4” mesh) at the upstream (K flag) and downstream (A flag) ends of the sample reach if the water in the channel is continuous, deeper than 25 cm, and relatively clear. This prevents fish from leaving the sample reach.
4. **Seining.** -Select the seine based on the size of the stream to be sampled. The seine length to be used should be approximately equal to or slightly greater than the stream width, and the seine height should be about 1.5 to 2 times greater than the depth of the stream. Dip nets can be used in very shallow, small habitats. Seining begins at the upstream end (K flag) and proceeds downstream to the A flag. Two people perform seining, one on each end of the seine. In pools, the seine is pulled down the stream channel, using the shore and other natural habitat features as barriers. Begin with the seine rolled up on each seine brail. The seine is typically set perpendicular to shore and hauled downstream parallel to shore. As you proceed, let out enough seine so that the seine forms a “U” shape, but not so much that the net is hard to control. Adjust the length of the seine by rolling or un-rolling net on the seine brail. The speed of seining should be fast enough to maintain the “U” shape, but not so fast that the floats become submerged, or that the seine’s lead line come way up off the bottom of the stream. If rocks or other snags are on the bottom, the seine can be lifted off the bottom for a moment to avoid the snag, or one of the netters can bring the seine around the snag to avoid it, all the while maintaining the forward progress of the seine. Similarly, areas of dense aquatic vegetation can be avoided. It is important not to stop the forward progress, because fish will swim out of the seine. It is better to avoid a snag while keeping moving than to become snagged, which will allow fish to escape. In “snaggy” waters, keep more of your seine rolled up for better control.

Proceed downstream while seining. In narrow streams, the entire channel width is spanned with the seine. In wider streams, one person walks along the shore, while the other wades through the channel. The length of each seine haul will depend on the natural features of the stream channel and shoreline, but seine hauls should not normally be more than 60 or 90 m long. Side channel bars or the end of a standing pool are good areas to haul out or “beach” the seine. Where a large bar or end of a standing pool is present both netters can simply run the net up on the shore. In streams with steep banks or lack of obvious seine beaching areas the “snap” technique can be used. At the end of the haul, the person near shore stops, while the person farthest out turns into shore, quickly,

until the seine is up against the bank. The two netters then walk away from each other, taking the slack out of the seine, and keeping the seine's lead line up against the bank.

In riffles, with moderate to fast current, the "kick seine" technique can be used. The seine is held stationary in a "U" shape, while the other team member disturbs the substrate immediately upstream of the net. Then the net is quickly "snapped" out of the water by both team members using an upstream scooping motion.

Seine the entire 300 m reach, covering the linear distance at least once. If part of the 300 m is dry, just skip it. If the stream is much wider than your seine, do extra seine hauls in the large pools to cover the extra width. Sample all habitat types (shoreline, thalweg, side channels, backwaters).

After each seine haul, place fish in a bucket. If the water is warm, or you have captured many fish, place fish in a fish bag to keep them alive until seining is completed. If you have to work up fish before seining is completed, release processed fish in an area that has already been seined, as far away from the area remaining to be seined as possible (or outside of the block nets). Large fish such as northern pike, common carp, white sucker, shorthead redhorse, or channel catfish, can be measured, given a small clip to the lower caudal fin and released immediately.

4. **Processing captured fish.** -Record the species of each fish captured, and measure 20 "randomly" selected fish to the nearest millimeter, total length. If the species of fish is unknown, try to at least record it as Unknown type 1, Unknown type 2, etc. Keep track of and record the minimum and maximum length of each species.

For each species, preserve a sub sample of at least 10 individuals per site to serve as voucher specimens. Record a small letter "v" next to the recorded length of the fish that is vouchered to allow for later validation. For *Hybognathus* spp., voucher up to 20 individuals per site. Kill the fish to be vouchered by placing them in a small bucket or 1000 ml nalgene jar with an overdose solution of MS-222. After fish processing is completed, drain the MS-222 solution and place the fish in a 1000 ml nalgene jar with a 10% solution of formalin (in clear water, if possible). For specimens longer than 150 mm, an incision should be made on the right ventral side of the abdomen after death, to allow fixative to enter the body cavity. The volume of formalin solution should be approximately equal to the twice the volume of fish tissue to be preserved, and the fish volume should be considered water when concentrations are determined. For example, if the fish take up 250 ml of the 1000 ml volume, you need about 500 ml of 10 % formalin solution (75 ml formalin and 425 ml water) in the 1000 ml nalgene jar. If necessary, use a second jar to accommodate all of the specimens. Use safety glasses and gloves when pouring formalin. Do not let the fish "cook" in the sun for a while and preserve them later, do it as soon as possible. Label all jars inside and out with Site, Site Number, Lat/Long, Date, Collectors names. Use pencil on Write-In-the-Rain or high rag paper for inside labels (just put the label right in with the fish), use a sticker label on the outside, cover it with clear (ScotchPad high performance packing tape pad 3750-P). Fish specimens should be left in formalin solution for at least 2-7 days. Fish specimens must have formalin solution soaked out before being handled extensively. Specimens should be soaked in water for at least 2 days, and water should be changed at least four times during this period. After

soaking out the formalin, the fish specimens should be placed in either 70% ethanol or 40% isopropanol for long-term storage.

6. **Habitat survey.** -Channel width, depth of water, and substrate will be measured at 11 transects perpendicular to the stream channel (located at Flags A-K), and along the thalweg in 10 thalweg intervals between transects (deepest part of channel). Stream width is measured to the nearest 0.1 m, depth is measured to the nearest cm, and substrate sizes and codes are on the data sheet. One person will be in the stream taking measurements while the other records data. Record the Latitude and Longitude (in decimal degrees) of the F flag, the stream name, site number, the date, the flow status (flowing, continuous standing water, or interrupted standing water) and the names of the crewmembers on the data sheet. Take photographs of the site, capturing as much of the sampling reach as possible. Make sure the date feature on the camera is turned on, to allow for later identification of site photographs.

Transects. -Start on the left bank (facing downstream) at Flag A. Measure and record the wetted width of the channel to the nearest 0.1 m. Measure and record (separated by a comma on the data sheet) five equally spaced depth and substrate measurements across the wetted stream channel:

1. Left Bank-5 cm from the left bank;
2. Left Center-halfway between the Center and the Left Bank;
3. Center-center of the wetted stream;
4. Right Center-halfway between the Center and the Right Bank;
5. Right Bank-5 cm from the right bank

Thalweg. -Begin by recording the depth and substrate 3 m upstream of the transect, in the deepest part of the channel (thalweg). Proceed up the thalweg to Flag B, recording depth and substrate every 3 m along the thalweg. You will record a total of 10 depths and substrates between each pair of transects. If the stream channel is dry, record a 0 for depth, and record the substrate. The last thalweg measurement point should fall on the next upstream transect. The 3 m interval can be estimated, and it is helpful if the data recorder helps to keep the person in the stream from “squeezing” or “stretching” the thalweg measurements.

Repeat this procedure until all 11 transects and 10 thalweg intervals are completed.

Appendix B continued.

Gear List

- o 20', x 6' x ¼" heavy delta seine
- o 15' x 4' x ¼" heavy delta seine
- o 30' x 6' x ¼" heavy delta seine (or delta) with 6' x 6' x 6' bag
- o Fish bags: nylon diver's bags, ¼" mesh 18" x 30"
- o Mudders – \$109.00 at Ben Meadows
- o Lug sole wading boots (Cabelas)
- o Habitat pole (I make habitat poles out of 1.0" OD PVC pipe. 1.5 m long including caps. Score the pipe every 10 cm with a pipe cutter, then use a Sharpie to mark rings around the pole at the scores, and label the pole 10, 20, 30, etc. 5 cm marks are made between the 10 cm rings, you can visually estimate between the 5 cm marks to get to the nearest cm. Spray or brush a Urethane finish on the pole or your marks will come off fast with sunscreen and bug dope.)
- o Metric 30 m tape (Ace Hardware actually carries a tape with metric on one side)
- o Labels and tape pads for fish samples
- o 1000 ml Nalgene jars
- o Formalin (buffered is great, but more expensive-I throw a Roloids in each jar of fish to neutralize the acidity)
- o Block nets, Tent stakes
- o Stream Conductivity meter
- o Thermometer
- o Turbidity meter (LaMotte, Ben Meadows 224805, \$795.00-might try the "transparency tube" Ben Meadows 224196, \$52.95)
- o Waders (breathable waders are essential for this work-Cabelas has them for about \$100/pair), hip boots are usually too low
- o Measuring boards, one short 300 mm (half a 6" PVC works well for *Hybognathus* "fin flotation", one long, ~0.5-1 m, you can just use a meter stick for the odd big fish)
- o Hand lens
- o Small 1 gallon red bucket from Ace for doping fish
- o 5 gallon buckets
- o MS-222
- o Clipboard
- o 11 Pin flags labeled A-F

Appendix C. Sample of habitat data sheet.

Site: _____

Date: _____

Water Flowing _____

Lat/Long: _____

Observers: _____

Continuous Standing Water _____

Interrupted Standing Pools _____

Transect Cross Section

Transect	Width (XX.Xm)	Left Bank Depth/Sub	Left Center Depth/Sub	Center Depth/Sub	Right Center Depth/Sub	Right Bank Depth/Sub	Temp _____ °C O ₂ _____ mg/L Conductivity _____ US	Ph _____ Salinity _____ PPT
A		/	/	/	/	/	BR=Bedrock(>4000mm) (larger than a car)	
B		/	/	/	/	/	BL=Boulder(250 to 4000mm) (basketball to car)	
C		/	/	/	/	/	CB=Cobble(64-254mm) (tennis ball to basketball)	
D		/	/	/	/	/	CG=Coarse Gravel(16 - 64mm) (marble to tennis ball)	
E		/	/	/	/	/	FG=Fine Gravel(2 to 16mm) (ladybug to marble)	
F		/	/	/	/	/	SA=Sand(0.06 to 2 mm) (gritty up to ladybug size)	
G		/	/	/	/	/	FN=Silt/Clay/Muck (not gritty)	
H		/	/	/	/	/	HP=Hardpan(Firm, Consolidated, Fine Substrate)	
I		/	/	/	/	/	WD=Wood (any size)	
J		/	/	/	/	/	OT=Other (describe in comments)	
K		/	/	/	/	/		

Thalweg Profile

Station	A-B Depth/Sub	B-C Depth/Sub	C-D Depth/Sub	D-E Depth/Sub	E-F Depth/Sub	F-G Depth/Sub	G-H Depth/Sub	H-I Depth/Sub	I-J Depth/Sub	J-K Depth/Sub
1	/	/	/	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/	/	/	/
7	/	/	/	/	/	/	/	/	/	/
8	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/

Comments/Observations:

Appendix C. Sample of fish data sheet

Site: _____		Date: _____		water flowing? _____			
Page ____ of ____				continuous standing water? _____			
Lat/Long: _____		Observers: _____		interrupted standing pools? _____			

Species	Total Count	Total Lengths (mm)					
							max length
							min length
							max length
							min length
							max length
							min length
							max length
							min length
							max length
							min length
							max length
							min length
							max length
							min length