NORTH PLATTE RIVER FISH SURVEY CASPER TO THE NEBRASKA STATE LINE

NOT FOR PUBLIC RELEASE

MARCH 2000

Technical Report of the Platte River EIS Team
U.S. Department of the Interior
Bureau of Reclamation
Fish and Wildlife Service

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Mission Statement

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U.S. Department of the Interior
Bureau of Reclamation
Denver Office
Technical Service Center

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INTRODUCTION

The States of Nebraska, Wyoming, and Colorado and the U.S. Department of the Interior (DOI) have signed a Cooperative Agreement which guides the activities of the Platte River Endangered Species Partnership. This partnership is designed to improve and conserve habitat for four threatened and endangered species that use the Platte River in Nebraska. The State of Wyoming's contribution to this effort is the proposed Pathfinder Modification Project. In support of this effort, the U.S. Bureau of Reclamation (Reclamation) conducted an extensive fish survey of the North Platte River from Casper to the Nebraska State line to supplement the Wyoming Game and Fish Department's database for fish communities that may be impacted by this proposed project.

The proposed Pathfinder Modification Project would increase the capacity of the existing Pathfinder Reservoir by 21,649 ha to recapture storage space lost to sediment deposition behind the dam. The existing spillway would be raised approximately 0.73 m with the installation of an inflatable bladder system attached to the spillway. Another option being considered is modifying the operations of the North Platte River Reservoir System which may eliminate or reduce the need for construction of the bladder system. Both the physical structure and modification to operations will be analyzed in the environmental impact statement process being conducted by DOI.

The North Platte River system supports an important sport fishery for the State of Wyoming, and provides habitat for native fish species. Changes in operations of the reservoir system may affect both native and sport fish either positively or negatively. Critical to understanding the potential effects are current data on fish communities throughout the North Platte River. The Wyoming Game and Fish Department (WGFD) has adequate long-term data on fish populations and the sport fishery for the North Platte River from Casper upstream to the headwaters. However, recent data are lacking for the river from Casper downstream to the Wyoming/Nebraska State line, with the exception of Glendo Reservoir. This extensive section of the lower river supplies an important component of overall fish habitat of the North Platte River. Fish can be one of the most sensitive indicators of aquatic ecosystem quality and can reliably reflect conditions that are suitable or unsuitable for their existence (Yoder and Smith 1999). Reclamation was requested by fisheries biologists with the WGFD to focus efforts on the native fish community for which little current information exists.

STUDY AREA

We surveyed fish in the North Platte River from the E. K. Wilkens State Park about 13 km east of Casper, Wyoming, downstream to the Nebraska State line (Figure 1). Maps of each study site are included in the Results section. For study purposes, the river is divided into five reaches: Casper to Douglas; Douglas to the inlet of Glendo Reservoir; Glendo Dam outlet to the inlet of

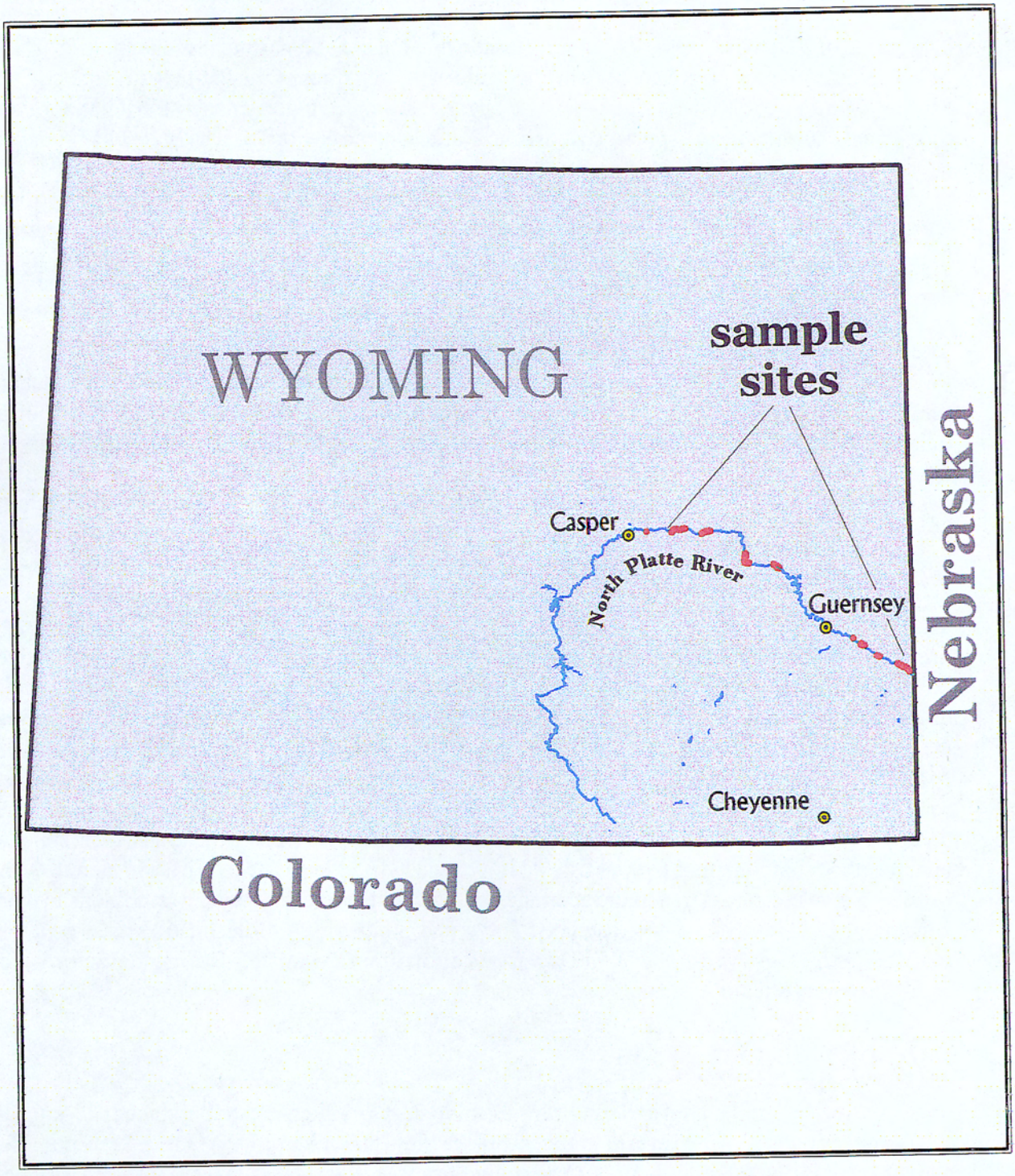


Figure 1. Study area.

Guernsey Reservoir; Guernsey Dam outlet to the Laramie River confluence; and the Laramie River confluence to the Nebraska State line.

METHODS

Boat-mounted electrofishing was conducted in reaches of the North Platte River with adequate flows using a 4.9-m raft equipped with a Honda EX 1000 generator and a Model 1.5-kVA Smith-Root electrofisher delivering pulsed DC current. The crew consisted of an oarsman and two netters. Raft sampling was conducted in the following reaches: Casper to Douglas, Douglas to Glendo inlet, and the Laramie River confluence to the State line. Total minutes of electrofishing ranged from a minimum of 2,000 seconds up to 11,694 seconds for longer sections of river for a total of nine boat-mounted samples. Habitat in areas of large woody debris, rock riprap, and boulders were intensively sampled and were very productive for fish. Shallow edge areas were also sampled extensively for juveniles and smaller fish species. We also sampled some mid-channel habitat. A single pass was made.

Backpack electrofishing with a Smith-Root Model 12-b 400-watt battery-powered electrofisher was conducted in the low flow reaches of Glendo outlet to Guernsey inlet (approximately 10 cfs), and Guernsey outlet to the confluence with the Laramie River (also approximately 10 cfs). Flows were so low that boat-mounted electrofishing was not possible. Sample area ranged from a minimum of 150 m to a maximum of 300 m in length with the width spanning across the entire river channel. We also backpack-sampled shallow communities along the edges of the river in the two high flow reaches from Casper to Douglas and Douglas to Glendo inlet. Sample area covered generally was 300 m long by 2.5 to 3 m wide. The river channel in these reaches became too deep to sample effectively much beyond a 3-m-wide strip along the river's edge. The crew consisted of an operator and two netters. A total of 11 sites were sampled with a minimum of 978 seconds electrofishing conducted at two small sites ranging up to 5,776 seconds at wide channel sites.

Captured fish were placed in a live car and processed frequently. Total lengths; weights; and observations on disease, deformities, injuries, and general condition were recorded. Some of the most numerous species, such as common carp (*Cyprinus carpio*) and longnose dace (*Rhinichthys cataractae*) were tallied after several complete samples were measured. Processed fish were released unharmed on the opposite side of the river in the case of boat-mounted sampling and upstream of the sampling area in the case of backpack sampling to prevent recapturing the same individuals. Notes on the habitat were made at each site and appear in the data sheets in the appendix. Species that could not be positively identified in the field, particularly cyprinids, were preserved for later identification in the lab using a dissecting scope.

Habitat characteristics for each sample area were estimated by percent cover for the entire reach sampled. Substrate classification by particle size followed that described in Armour and Platts (1983) and is summarized below.

	inches	mm
Large boulders	80-40	4096-2048
Medium boulders	40-20	2048-1024
Small boulders	20-10	512-256
Large cobbles	10-5	256-128
Small cobbles	5-2.5	128-64
Coarse gravel	2.5-0.6	64-16
Fine gravel	0.6-0.01	16-4
Sand		
Silt		
Clay		

Macrohabitat was also noted for each sample reach using descriptors adapted from Platania (1993) and is summarized below.

Primary Habitat

Main channel	The section of the river which carries the majority of the flow where the thalweg is located; there can be only one main channel.
Secondary channel	All channels not designated as the main channel may carry appreciable flow or be low velocity habitat; there can be none or several secondary channels at a site.
Backwater	A body of water connected to the main or a secondary channel, with no appreciable flow, often created by a drop in flow which partially isolates a former secondary channel.
Large woody debris	Instream structure such as fallen trees, rootwads.
Island	An area of land surrounded by water.

Secondary Habitat

Flats	A region of relatively uniform depth, moderate velocity, and sand substrate; a flat is determined by the character of the substrate and recognized by the small standing waves it creates.
Rapids	A relatively deep and fast velocity reach characterized by very turbulent water.

Riffle	A shallow and low velocity rapid in open river where water surface is irregular and broken by waves generally indicates gravel-cobble substrate.
Run	A reach of relatively high velocity water with laminar flow and a non-turbulent surface.
Pool	The portion of the river that is deep with relatively little velocity compared to the channel.

We examined the possibility of using seining to supplement the sampling effort, but both the boat-mounted and backpack electrofishing were effective in stunning fish for successful dipnetting. Much of the substrate was either silt or large cobble, making seining less effective. Other methods such as fyke netting were not pursued because of the relatively swift current and scarcity of calm, deeper pools.

Study site maps are all geo-referenced and can be incorporated into GIS systems.

Crew members consisted of myself, Fisheries Biologist; Ed Beddow, Biologist; Ron Sutton, Fisheries Biologist; and Del Smith, Hydrologic Engineer, all with the Bureau of Reclamation in Denver, Colorado; and Dave Felley, Biologist; and Brad Rogers, Biological Technician, with the U.S.Fish and Wildlife Service in Cheyenne, Wyoming.

Five StowAway TidbiT temperature data loggers were placed in selected sites throughout the North Platte River during the fish sampling effort from March 16 through 31, 1999. Loggers were placed as much as possible in the center of the river channel near the stream bottom to prevent seasonal dewatering or tampering by fishermen and other river users. Temperature data were collected hourly for nearly a year. The loggers were retrieved and downloaded on March 2, 2000.

RESULTS

Fish Sampling

Table 1 provides a summary of all sample sites, gear used, effort, catch per unit effort (CPUE), species and numbers collected, relative abundance, and size range.

Casper to Douglas.—Four backpack samples and two raft samples were conducted in this reach. The average flow was approximately 700 cfs. Backpack samples were conducted along the shallow, wadeable edge of the river. Samples were 300 m long by approximately 2.5 m wide, depending on the configuration of the channel.

Table 1. Summary of locations, gear, effort, species captured, and size ranges

Site	Date	Gear (Electro-fishing)	Effort (minutes)	Total #Fish	CPUE fish/ min.	Area Sampled	Species	#	Relative Abundance (%)	Size Range (mm)
CASPER TO DOUGLAS										
E.K. Wilkens State Park	3/26/99	Backpack	29.58	109	3.68	300m x 5m	Brown Trout	5	4.59	81 - 133
							Emerald Shiner	9	8.26	30 - 48
							Fathead Minnow	3	2.75	52 - 54
							Longnose Dace	76	69.72	29 - 67
							Longnose Sucker	10	9.17	39 - 130
							Red Shiner	3	2.75	63 - 65
							Sand Shiner	2	1.83	42 - 47
							White Sucker	1	0.92	60
Cole Creek Bridge (downstream)	3/25/99	Backpack	15.38	48	3.12	300m x 2.5m	Brassy Minnow	2	4.17	56 - 72
							Brown Trout	1	2.08	111
							Longnose Dace	16	33.33	26 - 72
							Longnose Sucker	2	4.17	40 - 60
							Red Shiner	4	8.33	24 - 30
							Sand Shiner	13	27.08	35 - 70
							White Sucker	10	20.83	43 - 67
Cole Creek Bridge (upstream)	3/25/99	Backpack	16.42	25	1.52	300m x 5m	Emerald Shiner	1	4.00	n/a
							Longnose Dace	24	96.00	n/a
Cole Creek Bridge to Monkey Hill Bridge	3/26/99	Raft	194.9	166	0.85	11.1 km x 10m	Brown Trout	6	3.61	132 - 365
							Common Carp	45	27.11	680
							Longnose Dace	14	8.43	34 - 83
							Longnose Sucker	29	17.47	72 - 445
							Rainbow Trout	11	6.63	78 - 450
							Sand Shiner	1	0.60	65
							Shorthead Redhorse	2	1.20	485
							White Sucker	58	34.94	50 - 503
PP&L-Glenrock Access to Bixby	3/25/99	Raft	79.8	354	4.44	7.8 km x 10m	Channel Catfish	3	0.85	470 - 687
Access Area							Common Carp	203	57.34	23 - 630
							Longnose Dace	3	0.85	74 - 87
							Longnose Sucker	64	18.08	81 - 440
							Quillback	13	3.67	350 - 475
							Rainbow Trout	6	1.69	330 - 420
							Sand Shiner	12	3.39	42 - 61

Site	Date	Gear (Electro-fishing)	Effort (minutes)	Total #Fish	CPUE fish/ min.	Area Sampled	Species	#	Relative Abundance (%)	Size Range (mm)
							Shorthead Redhorse	33	9.32	350 - 500
							Walleye	1	0.28	495
							White Sucker	16	4.52	130 - 404
Bixby Access Area	3/25/99	Backpack	16.3	61	3.7	140 m x 2.5 m	Common Shiner	1	1.64	72
							Fathead Minnow	7	11.48	47-72
							Red Shiner	40	65.57	20-52
							Sand Shiner	4	6.56	34-36
							Stonecat	1	1.64	55
							White Sucker	8	13.11	55-435
DOUGLAS TO GLENDO INLET										
Anderson Dairy Bridge to Fitzgerald Access	3/22/99	Raft	70.88	144	2.0	9.7 km x 10 m	Brown Trout	2	1.39	143 - 407
							Common Carp	80	55.56	400 - 605
							Longnose Sucker	6	4.17	330 - 400
							Rainbow Trout	1	0.69	390
							Sand Shiner	16	11.11	29 - 88
							Shorthead Redhorse	12	8.33	385 - 485
							White Sucker	27	18.75	254 - 390
Fitzgerald Access to Wagon Hound Creek	3/23/99	Raft	51.82	145	2.80	1.4 km x 10 m	Channel Catfish	2	1.38	85 - 700
							Common Carp	85	58.62	355 - 470
							Gizzard Shad	1	0.69	n/a
							Longnose Sucker	10	6.90	235 - 390
							Rainbow Trout	1	0.69	310
							Red Shiner.	11	7.59	55 - 69
							Sand Shiner	5	3.45	52 - 59
							Shorthead Redhorse	10	6.90	395 - 440
							Stonecat	5	3.45	n/a
							White Sucker	15	10.34	330 - 400
Wagon Hound Creek Confluence w/N.Platte	3/23	Backpack	49.12	33	0.67	300 m x 3 m	Fathead Minnow	1	3.03	56
							Lohgnose Dace	3	9.09	330 - 400
							Sand Shiner	26	78.79	22 - 66
							Stonecat	3	9.09	50 - 155
Orin Access to Byron Wilson/County Line	3/24/99	Raft	91.52	499	5.45	7.2 km x 10 m	Common Carp	127	25.45	n/a
							Creek Chub	1	0.20	80
							Emerald Shiner	4	0.80	72 - 81
							Flathead Chub	4	0.80	57 - 96

Site	Date	Gear (Electro-fishing)	Effort (minutes)	Total #Fish	CPUE fish/ min.	Area Sampled	Species	#	Relative Abundance (%)	Size Range (mm)
							Longnose Dace	2	0.40	65 - 70
							Longnose Sucker	23	4.61	100 - 320
							Red Shiner	1	0.20	52
							Sand Shiner	49	9.82	46 - 68
							Shorthead Redhorse	90	18.04	n/a
							Walleye	187	37.47	340 - 640
							White Sucker	8	1.60	75 - 350
							Yellow Perch	3	0.60	117 - 134
GLENDO DAM TO GUERNSEY RESERVOIR INLET										
Glendo Powerhouse at Sand Draw	3/15/99	Backpack	96.27	188	1.95	100 m x 25 m	Brown Trout	1	0.53	110
							Channel Catfish	1	0.53	49
							Emerald Shiner	27	14.36	32 - 86
							Longnose Dace	111	59.04	65 - 98
							Longnose Sucker	30	15.96	75 - 153
							Plains Killifish	1	0.53	52
							Rainbow Trout	4	2.13	130 - 165
							Spottail Shiner	7	3.72	50 - 87
							Stonecat	1	0.53	105
							White Sucker	5	2.66	145 - 230
Bull's Bend	3/16/99	Backpack	22.43	68	3.0	200 m x 30 m	Black Crappie	1	1.47	64
							Bluegill	1	1.47	37
							Creek Chub	2	2.94	39 - 113
							Emerald Shiner	11	16.18	36 - 85
							Longnose Dace	6	8.82	43 - 99
							Longnose Sucker	46	66.18	47 - 113
							Sand Shiner	1	1.47	64
							White Sucker	1	1.47	55
Wendover Canyon at Cottonwood Creek	3/16/99	Backpack	33.50	154	4.60	150 m x 25 m	Emerald Shiner	32	20.78	38 - 84
							Johnny Darter	4	2.60	46 - 50
							Longnose Dace	105	68.18	40 - 88
							Longnose Sucker	4	2.60	35 - 74
							Sand Shiner	5	3.25	42 - 63
							White Sucker	4	2.60	45 - 65
GUERNSEY DAM TO LARAMIE RIVER CONFLUENCE										
Guernsey Dam (downstream at RR Br.)	3/17/99	Backpack	19.5	225	11.54	150 m x 40 m	Creek Chub	1	0.44	60

Results

Site	Date	Gear (Electro-fishing)	Effort (minutes)	Total #Fish	CPUE fish/ min.	Area Sampled	Species	#	Relative Abundance (%)	Size Range (mm)
							Emerald Shiner	12	5.33	38 - 59
							Fathead Minnow	3	1.33	43 - 52
							Johnny Darter	3	1.33	48
							Longnose Dace	187	83.11	35 - 85
							Longnose Sucker	3	1.33	72 - 117
							Sand Shiner	7	3.11	32 - 65
							Spottail Shiner	2	0.89	53 - 60
							White Sucker	7	3.11	46 - 59
Camp Guernsey	3/17/99	Backpack	54.2	332	6.13	300 m x 25 m	Central Stoneroller	1	0.30	103
							Creek Chub	2	0.60	152 - 155
							Emerald Shiner	2	0.60	62 - 69
							Johnny Darter	20	6.04	33 - 63
							Longnose Dace	259	78.25	36 - 84
							Longnose Sucker	12	3.63	60 - 226
							Sand Shiner	8	2.42	44 - 77
							Spottail Shiner	4	1.21	50 - 85
							White Sucker	23	6.95	45 - 75
Fort Laramie NPS Bridge	3/18/99	Backpack	56.20	400	7.12	300 m x 30 m	Central Stoneroller	7	1.75	60 - 115
							Creek Chub	5	1.25	52 - 136
							Emerald Shiner	8	2.00	59 - 70
							Johnny Darter	26	6.50	32 - 80
							Longnose Dace	288	72.0	32 - 91
							Longnose Sucker	11	2.75	47 - 150
							Red Shiner	7	1.75	49 - 58
							Sand Shiner	9	2.25	29 - 63
							Stonecat	4	1.00	118 - 200
							White Sucker	34	8.50	45 - 108
							Yellow Perch	1	0.25	65
LARAMIE RIVER CONFLUENCE TO STATELINE										
Grattan Diversion Dam (upstream)	3/22/99	Raft	34.72	33	0.95	1.6 km x 10 m	Central Stoneroller	9	27.27	25 - 58
							Common Carp	2	6.06	593 - 595
							Emerald Shiner	1	3.03	56
							Longnose Dace	3	9.09	27 - 75
							Longnose Sucker	6	18.18	54 - 166
							Spottail Shiner	3	9.09	61 - 75

Results

Site	Date	Gear (Electro-fishing)	Effort (minutes)	Total #Fish	CPUE fish/ min.	Area Sampled	Species	#	Relative Abundance (%)	Size Range (mm)
							White Sucker	9	27.27	40 - 286
Grattan Div. Dam (down to hwy bridge)	3/22/99	Raft	40.17	151	3.76	2.5 km x 10 m	Central Stoneroller	9	5.96	76 - 115
							Common Carp	10	6.62	435 - 592
							Creek Chub	18	11.92	75 - 152
							Emerald Shiner	5	3.31	71 - 100
							Johnny Darter	2	1.32	n/a
							Longnose Dace	30	19.87	60 - 90
							Longnose Sucker	23	15.23	83 - 478
							Quillback	1	0.66	490
							Shorthead Redhorse	2	1.32	412 - 450
							Stonecat	8	5.30	160 - 220
							White Sucker	42	27.81	67 - 430
							Yellow Perch	1	0.66	90
Rawhide Wildlife Hab. Mgmt. Unit	3/19/99	Raft	161.75	224	1.38	3.2 km x 10 m	Central Stoneroller	20	8.93	49 - 146
							Common Carp	52	23.21	450 - 750
							Creek Chub	39	17.41	60 - 193
							Fathead Minnow	1	0.45	52
							Johnny Darter	1	0.45	51
							Longnose Dace	4	1.79	56 - 69
							Longnose Sucker	6	2.68	105 - 370
							Red Shiner	58	25.89	22 - 63
							Sand Shiner	6	2.68	47 - 66
							Shorthead Redhorse	5	2.23	400 - 520
							White Sucker	32	14.29	90 - 440
Torrington Bridge (Hwy. 85) to	3/20/99	Raft	54.17	183	3.38	13.0 km x 10 m	Common Carp	62	33.88	470 - 580
Middlesworth's near State line							Creek Chub	9	4.92	45 - 125
							Emerald Shiner	3	1.64	42 - 61
							Longnose Dace	4	2.19	61 - 82
							Longnose Sucker	22	12.02	70 - 360
							River Carpsucker	1	0.55	470
							Shorthead Redhorse	10	5.46	200 - 530
							Stonecat	1	0.55	200
							White Sucker	71	38.80	<100 - 380

E. K. Wilkens State Park - Backpack.—A total of 109 fish of 8 species was captured with longnose dace comprising nearly 70 percent of the catch, followed by juvenile and subadult longnose sucker (*Catostomus catostomus*) (9 percent), and emerald shiner (*Notropis atherinoides*) (8 percent). The remainder of the catch consisted of brown trout (*Salmo trutta*) (5 percent), fathead minnow (*Pimephales promelas*) (3 percent), red shiner (*Cyprinella lutrensis)* (3 percent), sand shiner (*Notropis stramineus*) (2 percent), and white sucker (*Catostomus commersoni*) (1 percent). The substrate consisted mostly of coarse gravel, small boulders, and large cobbles. The sample reach was 95 percent run and about 5 percent riffle. Figure 2 shows the map of the sample site.

Cole Creek Bridge (downstream) - Backpack.— Two backpack sample sites were selected at this site, one extending 300 m downstream from the Cole Creek Bridge and the other extending 300 m upstream. A total of 48 fish of 7 species was captured at the downstream site, with 33 percent of the catch consisting of longnose dace, 13 percent sand shiners, and 10 percent juvenile white suckers. Smaller numbers of juvenile white suckers, red shiners, and brown trout were also captured. Two brassy minnows (*Hybognathus hankinsoni*) were also collected—the only two individuals of this species collected in this March 1999 sampling effort. Baxter and Stone (1995) indicate this species is found in the tributaries of the North Platte River. Their presence in the mainstem as well as their scarcity in our samples may indicate an unusual finding. They were collected and preserved for later validation. Habitat at this site consisted of 95 percent run and 5 percent riffle. The predominant substrate was silt with a mix of cobble of various sizes and gravel. Abundant moss was observed on the cobbles. The study site map is found in Figure 3.

Cole Creek Bridge (upstream) - Backpack.—This site consisted of 80 percent silt with a scattering of small boulders, cobbles, and gravel. The fish community was much different, probably a result of the silt substrate. Only 25 fish were captured, possibly due to the difficulty in sampling in deep silt and mud. Twenty-four fish were longnose dace with one emerald shiner.

Cole Creek Bridge to Monkey Hill Bridge - Raft.—Compared to raft sample sites further downstream, this site had a cleaner substrate (less silt) and fewer common carp, but overall fewer total fish captured (166) for the extensive level of effort (11,694 seconds in 11.1 km). Primary habitat in this reach consisted of 85 percent main channel and 15 percent secondary channel. Secondary habitat consisted of approximately 10 percent riffle, 85 percent run, and 5 percent pool. Substrate consisted of a mix of large boulders (15 percent), large and small cobbles (20 percent), coarse and fine gravel (20 percent), and 45 percent sand. The catch was comprised of 27 percent common carp, 17 percent longnose suckers, 8 percent longnose dace, 7 percent rainbow trout (*Oncorhynchus mykiss*), and 4 percent brown trout. Sand shiners comprised 1 percent. Trout in this reach were robust and appeared to be free of disease. Figure 3 shows the study site map. Figures 4 and 5 show the habitat in this reach.

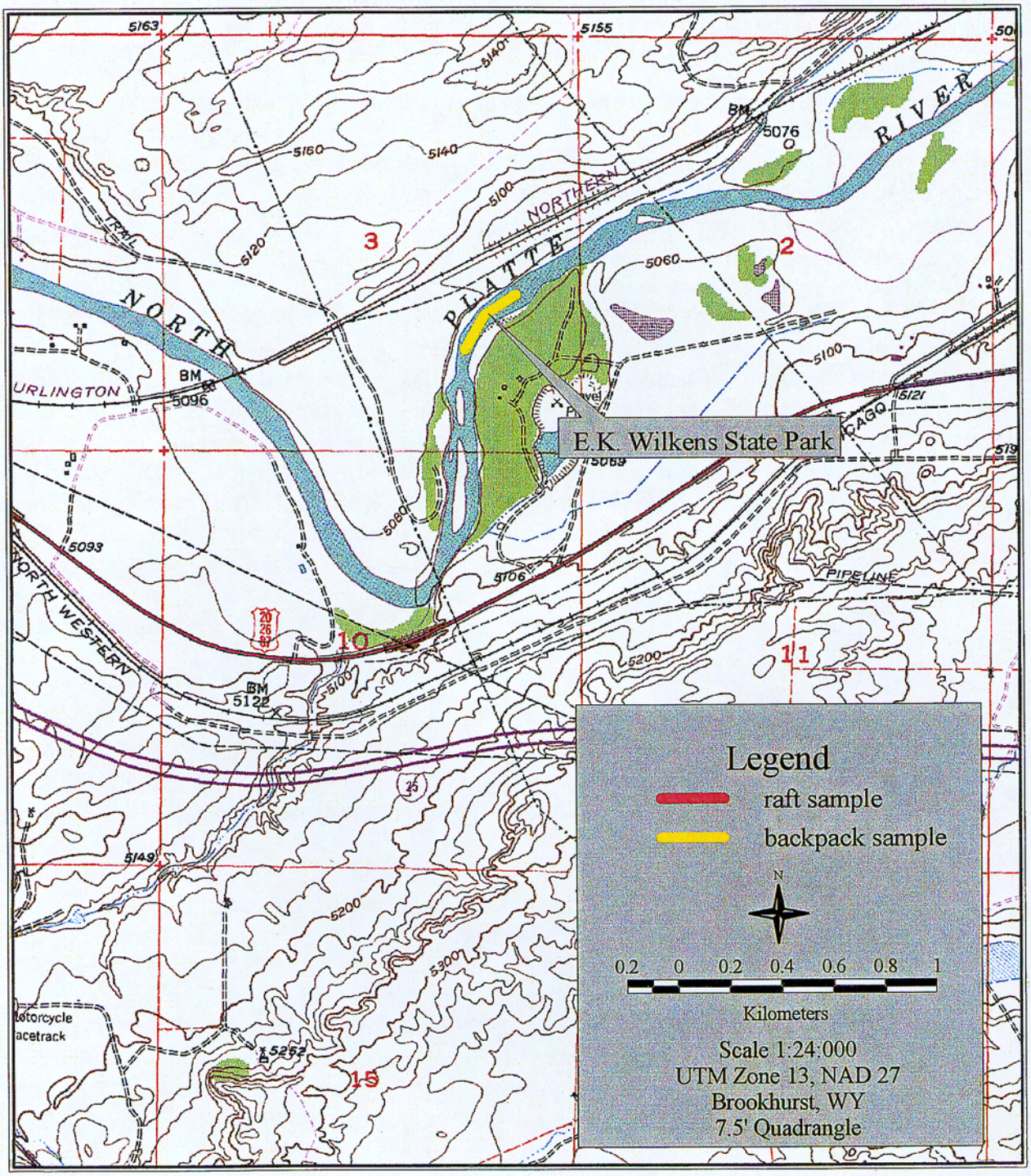


Figure 2. E. K. Wilkens sample site.

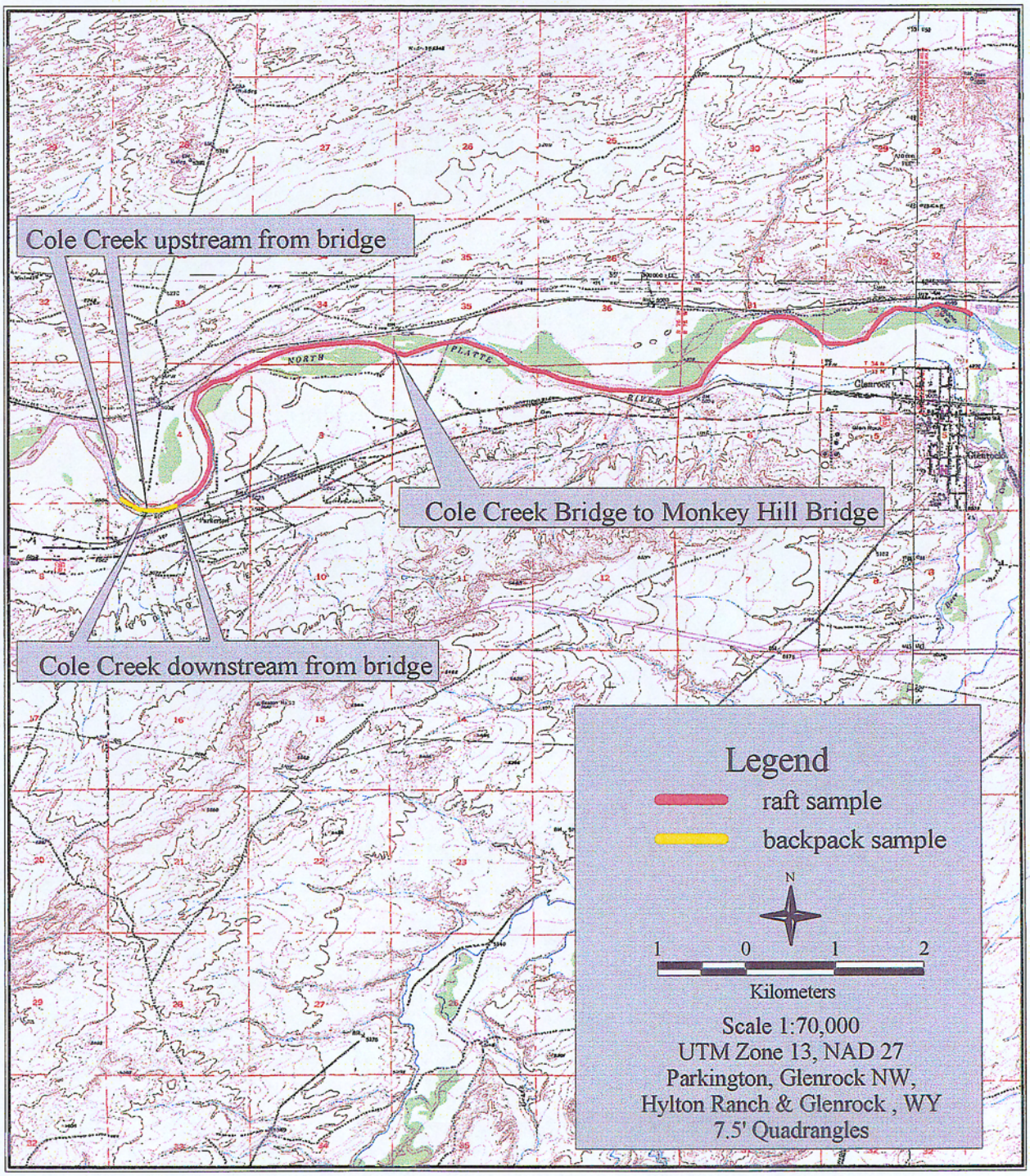


Figure 3. Cole Creek sample sites.

Results

Figure 4. Ed Beddow, Biologist, Reclamation, measures a rainbow trout-Cole Creek Bridge to Monkey Hill Bridge raft electrofishing.

Figure 5. Cole Creek Bridge to Monkey Hill Bridge typical habitat.

PP&L - Glenrock Access to Bixby Access - Raft.—This sample section began at the Pacific Power and Light (PP&L) - Glenrock Access Area and ended at the Bixby Access Area for a length of 7.8 km. Primary habitat in this reach was characterized as approximately 70 percent main channel, 20 percent islands, and 5 percent backwaters. Secondary habitat was characterized as about 80 percent run, 15 percent riffle, and 5 percent pool. Substrate consisted of predominately sand, about 75 percent; 10 percent silt; and a mixture of small boulders, large and small cobbles, and coarse gravel. A total of 354 fish of 10 species was captured. There were several individuals with various anomalies: a 687-mm total length (TL) channel catfish (*Ictalurus punctatus*) with lumps on its pectoral and caudal fins; a 470-mm TL channel catfish with leaches on its caudal and anal fins; a 389-mm longnose sucker with a missing eye (never formed); another 160-mm longnose sucker with an eroded caudal fin; and a 420-mm rainbow trout with eroded dorsal, pectoral, and caudal fins. Common carp dominated the catch (57 percent), followed by longnose sucker (18 percent), shorthead redhorse (*Moxostoma macrolepidotum*) (9 percent), quillback (*Carpiodes cyprinus*) (4 percent), and sand shiners (3 percent). Six rainbow trout ranging from 330 to 420 mm TL, three channel catfish ranging from 470 to 687 mm TL, and a 495-mm walleye (*Stizostedion vitreum*) were captured in this section. Figure 6 shows the map of this site, and Figure 7 shows the habitat.

Bixby Access - Backpack.—This site was characterized as 100 percent main channel with a 90 percent silt substrate. A total of 61 fish from 6 species was captured. Species composition at this site differed significantly from the backpack samples at E.K. Wilkens and Cole Creek. Red shiners dominated this community (66 percent), followed by juvenile and adult white suckers (13 percent fathead minnows (11 percent), and sand shiners (4 percent). A single stonecat (*Noturus flavus*) was captured (1 percent). A common shiner (*Luxilus cornutus*) was also collected. It was preserved as a voucher specimen because of the rarity of this species in our samples. Figure 6 shows the study site location and Figure 8 shows the habitat at this site.

Douglas to Glendo Inlet.—Three raft samples and a backpack sample were conducted in this reach. The South Douglas Access Areas provided excellent entry points to the river for sampling.

Anderson Dairy Access to Fitzgerald Access - Raft.—This 9.7-km section is characterized as 95 percent main channel with 5 percent islands/secondary channels. Secondary habitat consists of roughly 80 percent run and 20 percent riffle. Water clarity was extremely turbid, though we were able to dipnet stunned fish effectively. The substrate is characterized as about 13 percent silt, 10 percent sand, and 50 percent small cobbles with a scattering of small boulders, large cobbles, and coarse gravel. A total of 144 fish of 7 species was captured in 4,253 seconds of electrofishing. The catch was dominated by large common carp (56 percent), adult white sucker (19 percent), sand shiners (11 percent), and adult shorthead redhorse (8 percent). We also captured two brown trout (1.4 percent) and a rainbow trout (0.7 percent). Figure 9 shows the map of this site and Figures 10 and 11 show the catch and habitat in this reach.

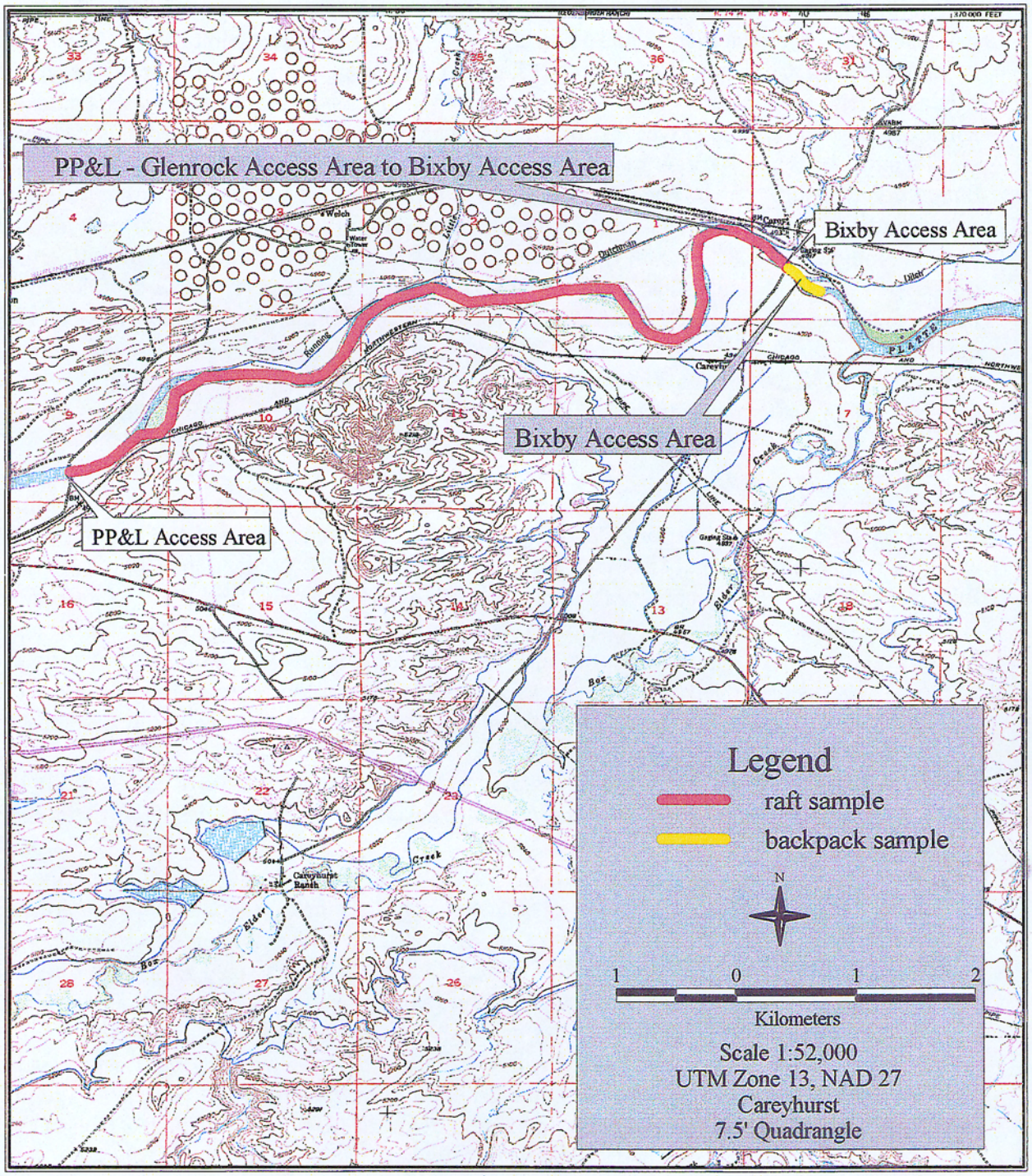


Figure 6. Glenrock and Bixby Access Areas.

Figure 7. PP&L Glenrock access bridge. A water temperature data logger was placed on a piling (second group from right).

Figure 8. Bixby Access Area.

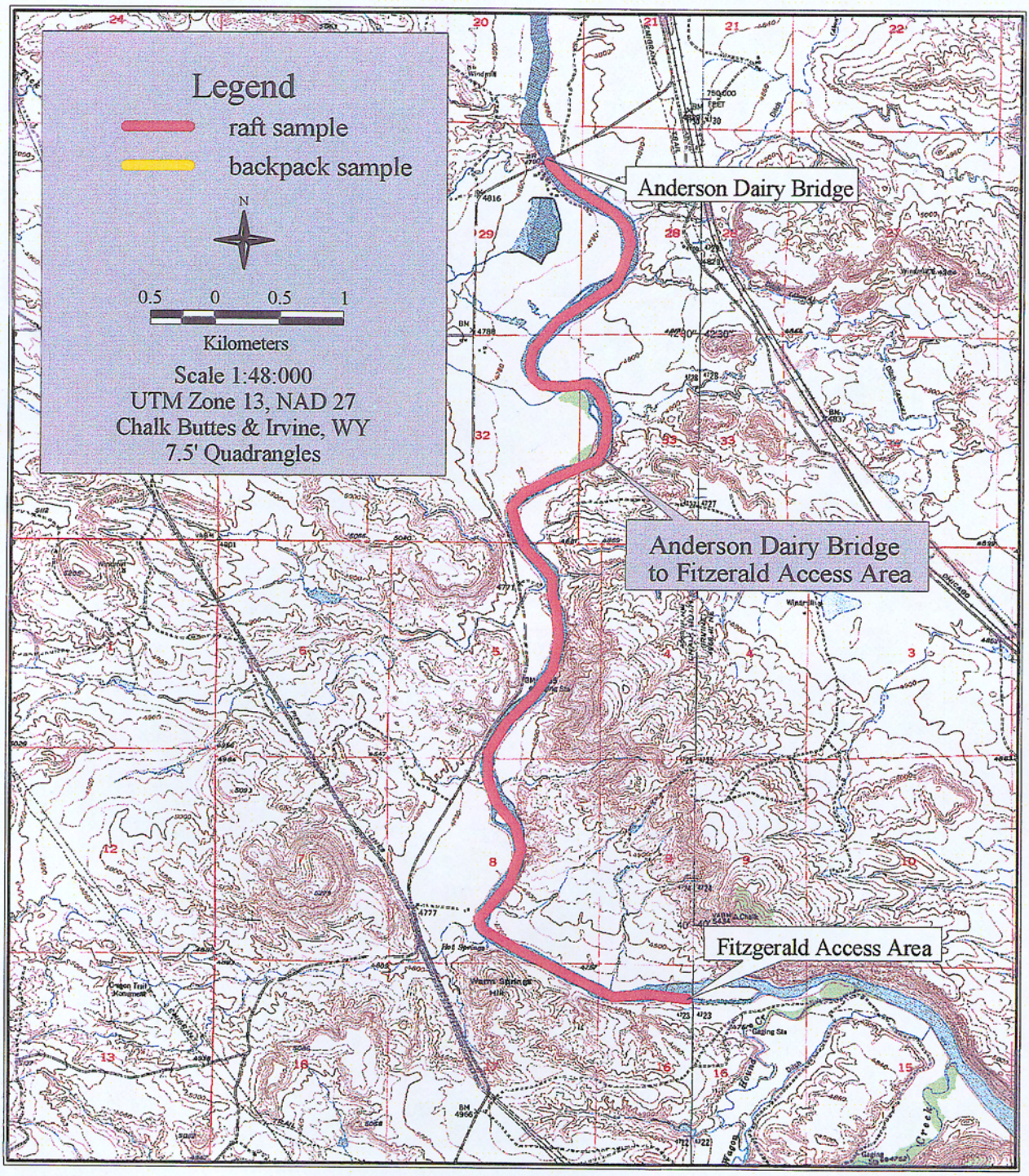


Figure 9. Anderson Dairy Bridge to Fitzgerald Access Area.

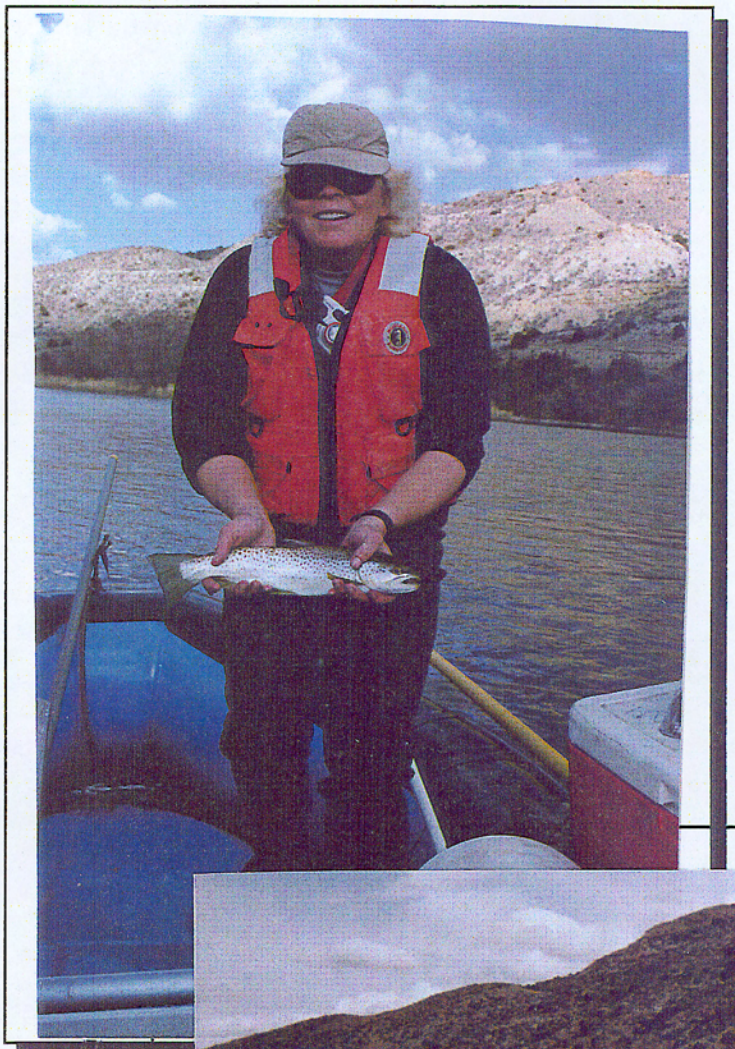


Figure 10. Susan Broderick with a brown trout, Anderson Dairy Bridge to Fitzgerald Access Area section.

Figure 11. Typical habitat at the Anderson Dairy Bridge to Fitzgerald Access Area section.

Fitzgerald Access to Wagon Hound Creek - Raft.—Permission was obtained from the landowner to take out at the confluence of Wagon Hound Creek enabling us to sample this 1.4-km section of river (Figure 12). One of the most unusual observations we made of the entire sampling effort was the presence of extremely noxious sediment in this section. Areas of silt deposits stank of what we believed to be sewage sludge. We also noted several abnormal individuals in our catch: a 415-mm TL common carp with a sore at the pectoral fin insert; a 390-mm TL white sucker with a deformed upper caudal lobe, a 400-mm TL white sucker with malformed scales over its entire body, two adult carp with massive amounts of fungus, and the only rainbow trout that we captured (310 mm) in this section had bulging eyes and red, inflamed fins. We speculate this may indicate a bacterial kidney disease (BKD) infection. We also captured a 390-mm TL longnose sucker with deep wounds (probably from an eagle or osprey encounter). Figure 13 shows typical edge habitat in this section.

The catch consisted of 145 fish of 10 species. As with all of the sample sites above Glendo Reservoir, this catch was dominated by common carp (59 percent). Other species included white sucker (10 percent), red shiners (8 percent), shorthead redhorse (7 percent), longnose sucker (7 percent), and stonecat (3.5 percent). We also captured an adult rainbow trout (0.7 percent) and a gizzard shad (*Dorosoma cepedianum*) (0.7 percent).

Wagon Hound Creek Confluence with North Platte River - Backpack.—Silt deposits at this site were also very noxious. We noted some individual longnose dace and sand shiners had poppyseed-sized black spots scattered throughout their body surface. Microscope examination indicated these black spots consisted of a round sac containing spores. We did not identify this organism.

Figure 12 is a map of the sample site, and Figure 14 shows the habitat and sampling crew. The primary habitat at this site is 100 percent main channel with the secondary habitat consisting of 50 percent riffles, 40 percent run, and 10 percent pool. Substrate consisted mostly of boulders and cobbles. Compared to similar backpack sample sites upstream, this was a depauperate site. This site consisted of a sample area of 300 m by 3 m and had a much greater number of seconds of electrofishing than upstream sites (2,947 seconds). Yet only 33 individuals of 4 species were captured. Most of the catch consisted of sand shiners (79 percent). We also captured stonecats (9 percent), fathead minnows (3 percent), and longnose dace (3 percent).

Orin Access to Byron Wilson/County Line Access - Raft.—Whatever habitat problems existed upstream at the Fitzgerald and Wagon Hound Creek sites have disappeared at this site. Substrate appeared to be clean, and we observed no incidences of disease in individuals captured. This 7.2-km-long is characterized as 100 percent main channel, with secondary habitat characterized as 80 percent run, 10 percent riffle, and 10 percent pool. Substrate consists of 50 percent sand, and a mix of large and small cobbles and coarse and fine gravels. There are some fallen trees and rootwads in this reach. The most significant feature is the pumping station diversion dam downstream of the Highway 319 bridge. We were able to float across one side of the dam

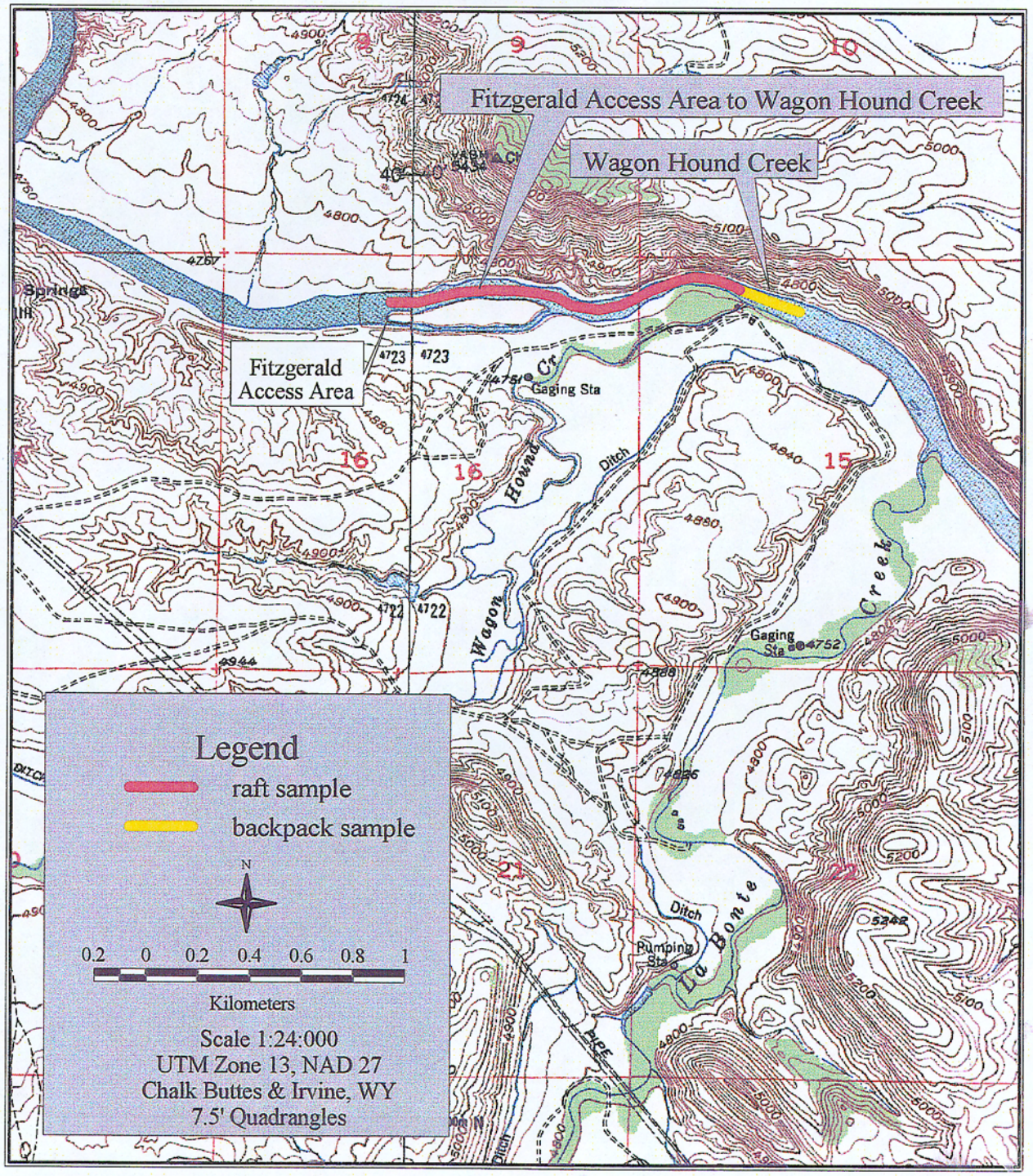


Figure 12. Fitzgerald Access Area to Wagon Hound Creek.

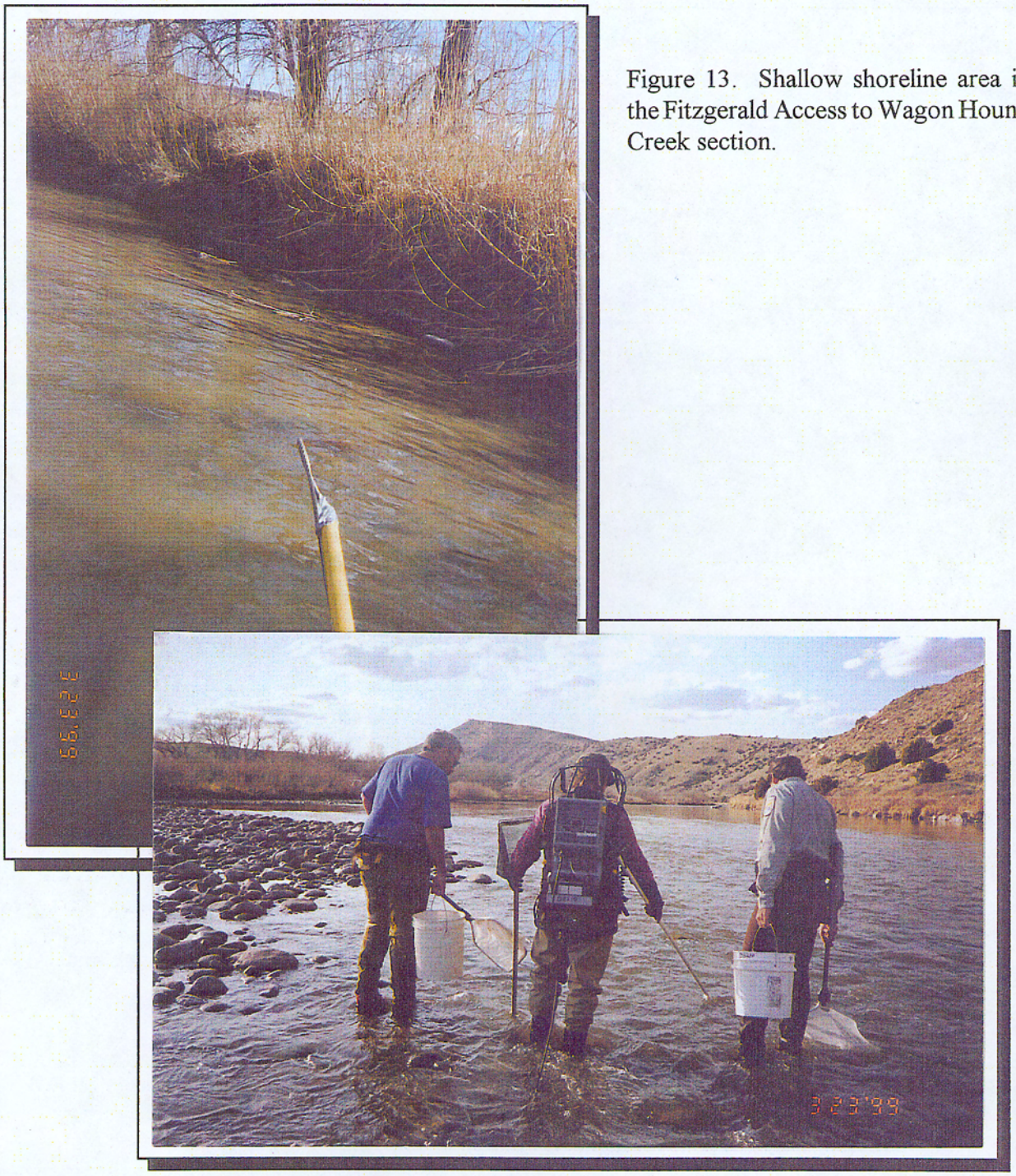


Figure 13. Shallow shoreline area in the Fitzgerald Access to Wagon Hound Creek section.

Figure 14. Confluence of Wagon Hound Creek. Brad Rogers, USFWS; Del Smith, Reclamation; and Dave Felley, USFWS, looking upstream.

without difficulty. However, the drop of several meters and the velocity of the current caused a large number of walleye to "stack up" below the dam. It is unknown whether this is a passage barrier to walleye, or merely causes a delay before fish move upstream.

A total of 499 individuals of 12 species was captured. This site had the highest CPUE of any of the raft sample sites at 5.45 fish/minute. Walleye comprised 37 percent of the catch, with sizes ranging from 340 to 640 mm TL. Males were observed to be freely expressing milt, while females were observed with large bellies, but we were not able to express eggs. This was clearly a spawning run. Common carp comprised 25 percent of the catch, shorthead redhorse 18 percent, sand shiner 10 percent, and longnose sucker 5 percent. We also caught smaller numbers of white sucker (1.6 percent), red shiner (2 percent), emerald shiner (0.8 percent), and longnose dace (0.4 percent). Three new species were encountered—creek chub (*Semotilus atromaculatus*) (0.2 percent), flathead chub (*Platygobio gracilis*) (0.8 percent), and yellow perch (*Perca flavescens*) (0.6 percent). Figure 15 is the study site map and Figures 16 and 17 show the habitat and sampling activities.

Glendo Dam to Guernsey Inlet.—The river below Glendo Dam is largely dewatered (about 10 cfs) after the irrigation season. All three sites were sampled with the backpack electrofisher. The entire width of the river channel was sampled. During the irrigation season, water deliveries are made down the river channel resulting in unusually high flows. Three backpack samples were conducted in this reach.

Glendo Dam Outlet at the Mouth of Sand Draw - Backpack.— Of the 19 sites sampled, this had the largest variety of boulders and cobbles, which composed an estimated 90 percent of the substrate. Primary habitat is classed as main channel, with secondary habitat consisting of 60 percent run, 20 percent pool, and 20 percent rapids. Sampling began in the river channel at the mouth of Sand Draw immediately upstream of a deep pool, and continued upstream 100 m. A total of 188 individuals of 10 species was captured. The catch was dominated by longnose dace (59 percent), followed by juvenile and subadult longnose sucker (16 percent), juvenile and adult emerald shiner (14 percent), and subadult and adult white sucker (3 percent). We also captured four young rainbow trout (2 percent), a brown trout (0.5 percent), and a juvenile channel catfish (0.5 percent). The only plains killifish (*Fundulus zebrinus*) of the sampling effort was captured here, a 52-mm TL individual, as well as a stonecat. Figure 18 is the study site map and Figures 19 and 20 show the habitat and sampling activities.

Bull's Bend - Backpack.—Permission was obtained from the landowner to sample a 200-m section of the river. About 70 percent of the substrate consisted of a mix of large and small cobbles intermixed with sand (10 percent), fine gravel (5 percent), and silt (5 percent). We observed and netted very few fish in this habitat and saw none in a 1-m-deep pool. However, the substrate in the top 50 m of this site consisted of a 50 percent mix of large, medium, and small boulders lying adjacent to a deep pool (which we did not sample). Most of the fish captured in this location came from the boulders along the edge of the pool. A total of 68 individuals of

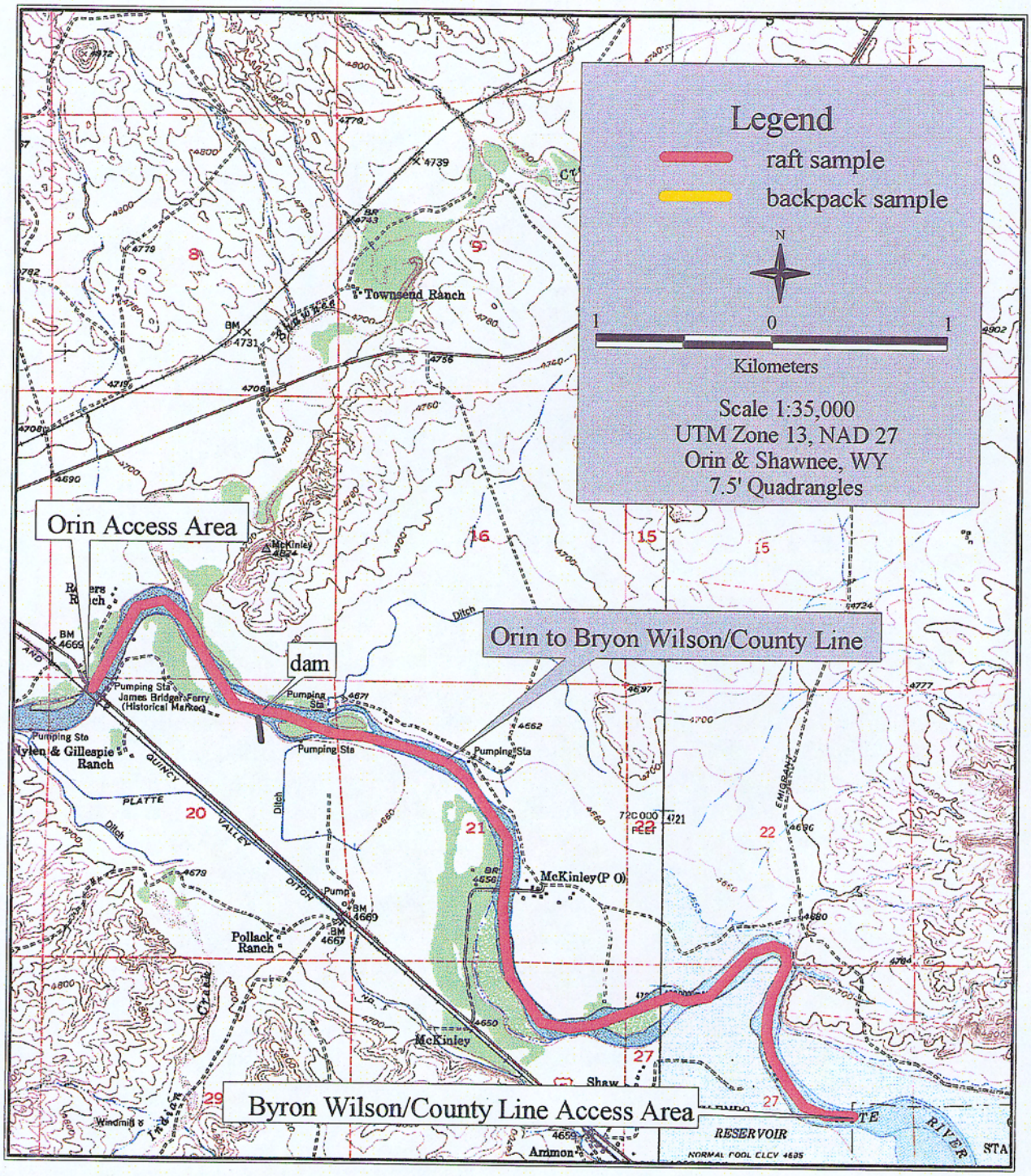


Figure 15. Orin Access to Bryon Wilson/County line Access Area sample site.

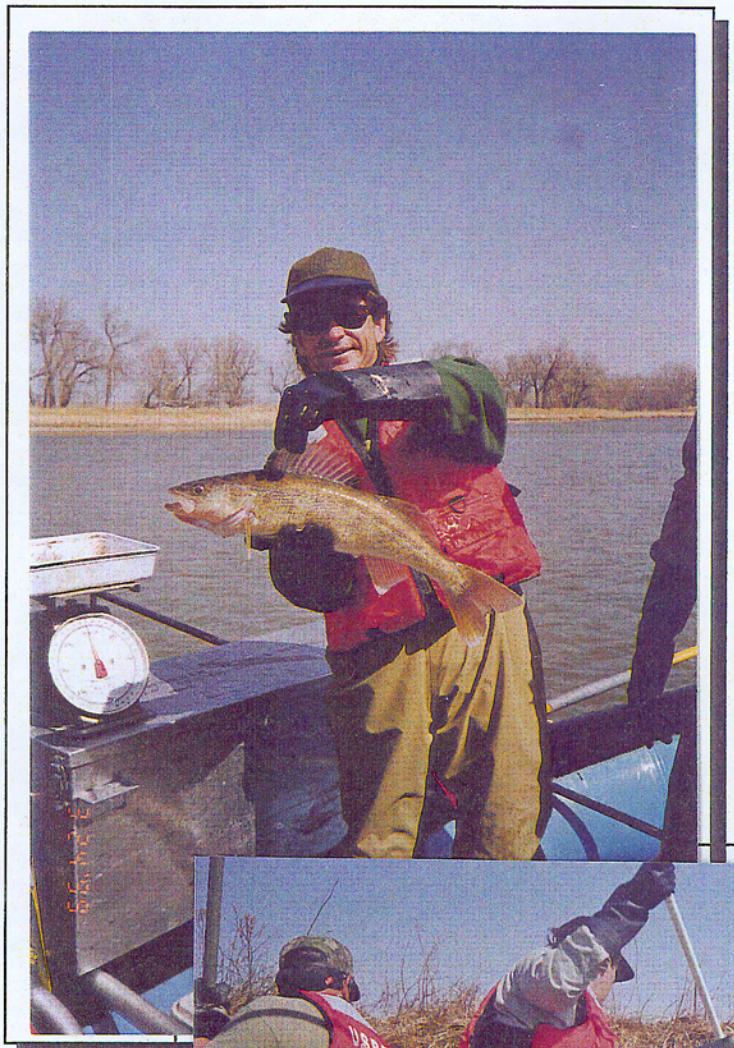


Figure 16. Del Smith with walleye, below the dam at Orin.

Figure 17. Sampling for small fish in edge habitats, Orin section.

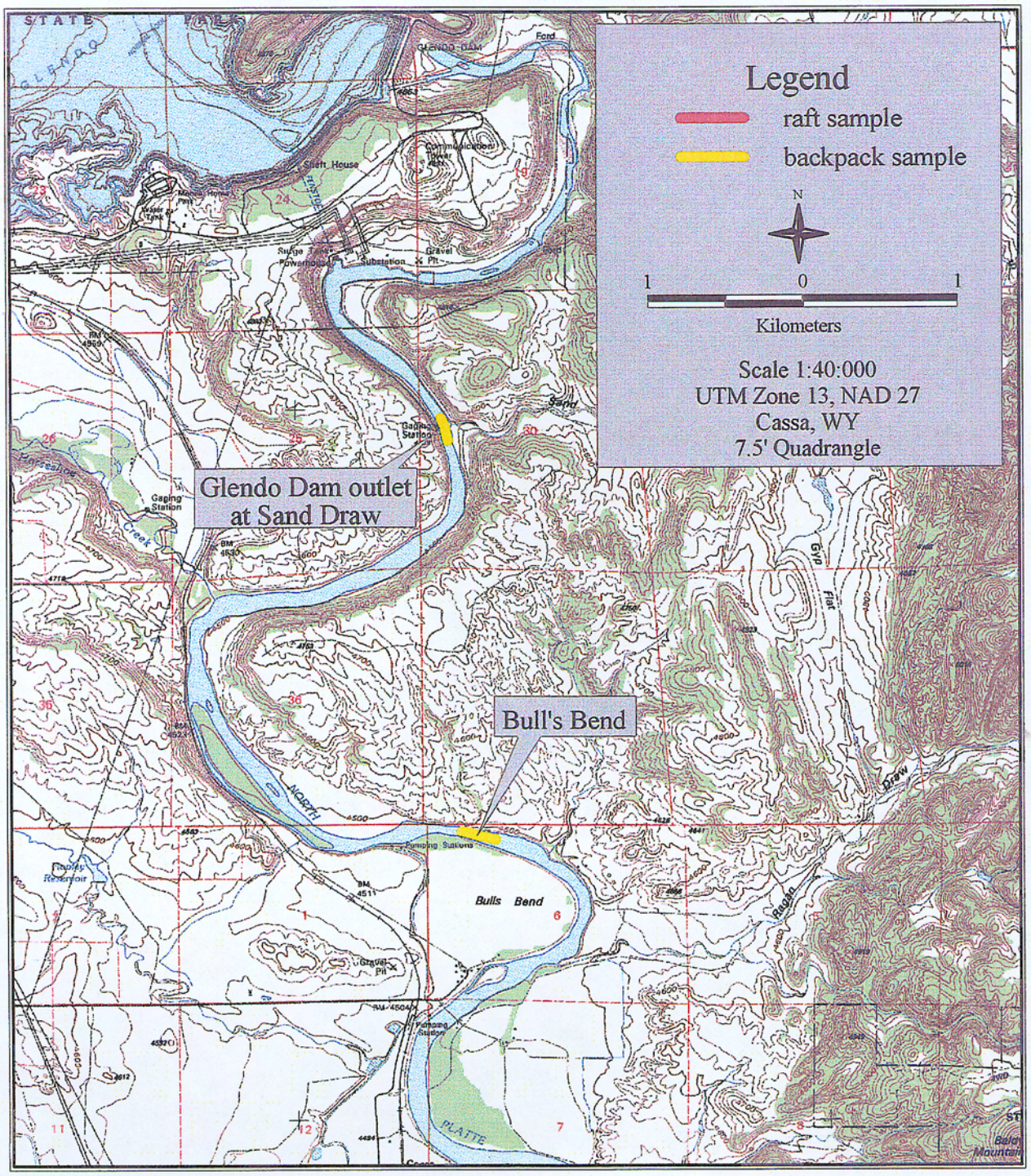


Figure 18. Glendo Dam outlet and Bull's Bend sample sites.

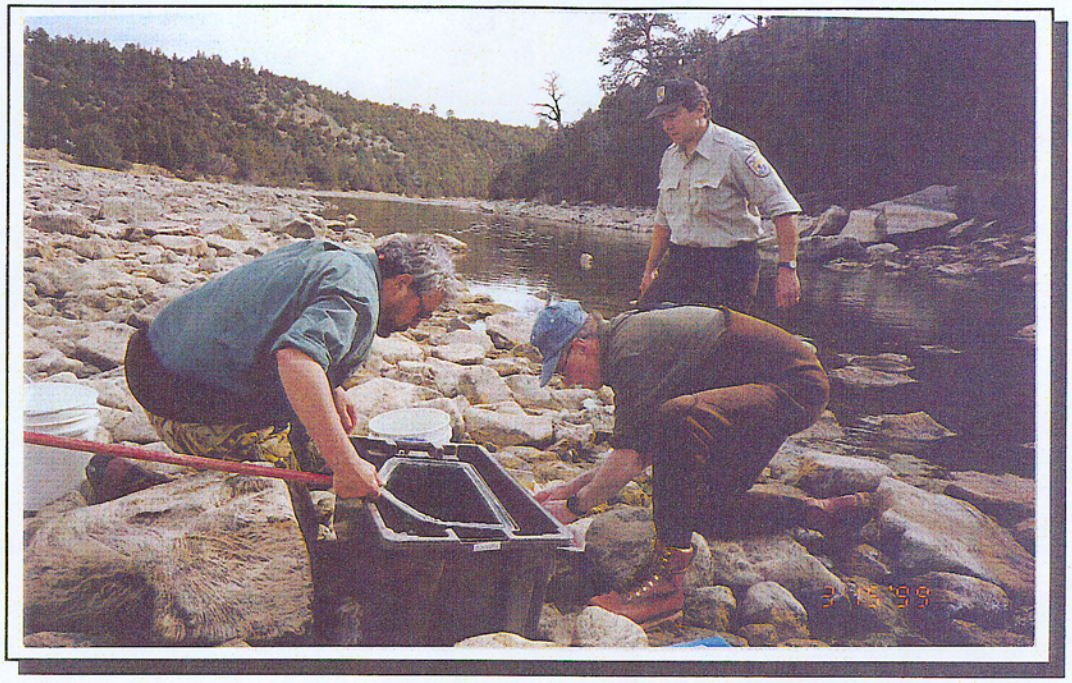


Figure 19. Brad Rogers, Ed Beddow, and Dave Felley process fish in the Glendo Dam outlet section.

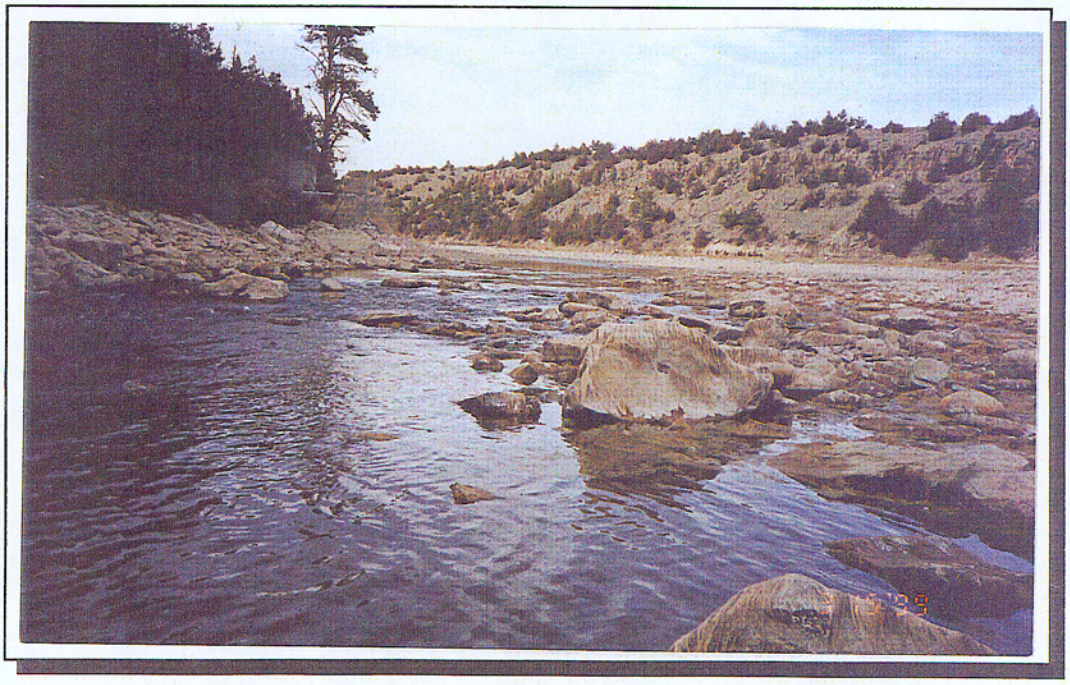


Figure 20. Habitat within the Glendo Dam outlet sample area. The power house is upstream ½ mile.

8 species were captured. Juvenile and subadult longnose suckers dominated the catch (66 percent), followed by emerald shiners (16 percent), and longnose dace (9 percent). A juvenile black crappie (*Pomoxis nigromaculatus*) and a juvenile bluegill (*Lepomis macrochirus*) were also captured. These were not listed as occurring in the North Platte River in this area (Baxter and Stone 1995). However, they were collected and preserved for voucher specimens. A juvenile and adult creek chub, a sand shiner, and a juvenile white sucker were also captured. Figure 18 is the study site map and Figures 21 and 22 show the habitat and sampling activities.

Wendover Canyon at Cottonwood Creek - Backpack.— A 150-m section of the river was sampled at the mouth of Cottonwood Creek. Substrate at this site consisted predominately of a mix of boulders and cobbles with 5 percent sand. The primary habitat is main channel with secondary habitat consisting of 25 percent riffles, 70 percent run, and 5 percent pool. We observed some moss present on the boulders and cobbles. A total of 154 individuals from 6 species was captured. Longnose dace composed most of the catch (68 percent), followed by emerald shiner (21 percent). This was the furthest upstream site in which we captured Johnny darter (*Etheostoma nigrum*) (3 percent). We also captured sand shiner (3 percent) and juvenile white sucker (2.6 percent). Figure 23 is the study site map and habitat photos are in Figures 24 and 25.

Guernsey Dam to Laramie River Confluence.—The river below Guernsey Dam was largely dewatered with only 10 cfs present. Three backpack electrofishing samples were conducted in this reach.

Guernsey Dam Outlet at Railroad Bridge - Backpack.—This 150-m sample site was located at the railroad bridge upstream of the Highway 26 bridge just outside of the town of Guernsey. Substrate at this site consisted of a mix of large to small boulders (36 percent), silt (5 percent), and bedrock (33 percent). This is a main channel site with 80 percent run and 20 percent pool. A total of 225 individuals of 9 species was captured. Most of the catch consisted of longnose dace (83 percent). Emerald shiner (5 percent), sand shiner (3 percent), and juvenile white sucker (3 percent) were the second most abundant species. Johnny darter appears at this site (1.3 percent) as well as longnose sucker (1.3 percent), fathead minnow (1.3 percent), and a juvenile creek chub (0.4 percent). Spottail shiner (*Notropis hudsonius*) (0.9 percent) appears for the first time in this catch. Figure 26 is the study site map and Figures 27 and 28 show the habitat and sampling activities.

Camp Guernsey - Backpack.—Permission from the U.S. Army was obtained to sample at this site though it appeared that the public has free access into this area. The substrate in this 300-m sample site was dominated by small and large cobbles (90 percent). Small boulders (5 percent) and coarse gravel (5 percent) were also present. Moss was very dense, and we also caught the occasional smell of sewage. We observed one longnose dace with an eroded caudal fin, but saw no other evidence of disease. This is a main channel site and consists of 100 percent run. This site was second only to the Fort Laramie Bridge section in numbers of individuals

Figure 21. Ed Beddow and Brad Rogers sample at Bell's Bend.

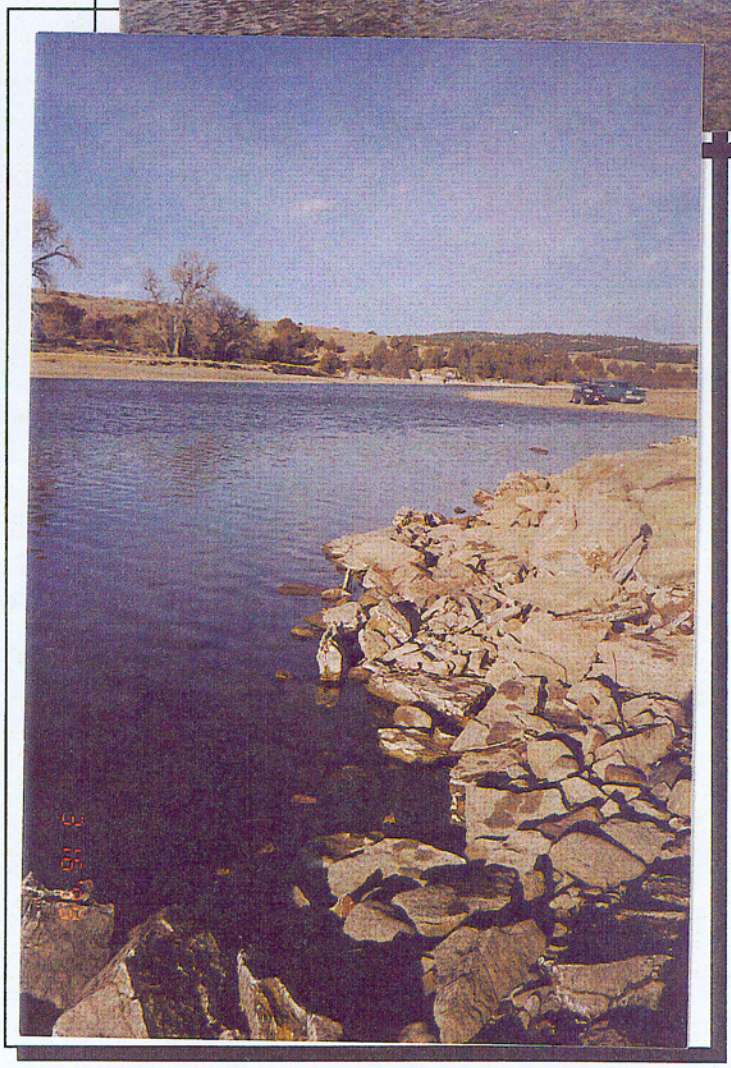


Figure 22. Most fish were captured in this area of larger cobbles and boulders.

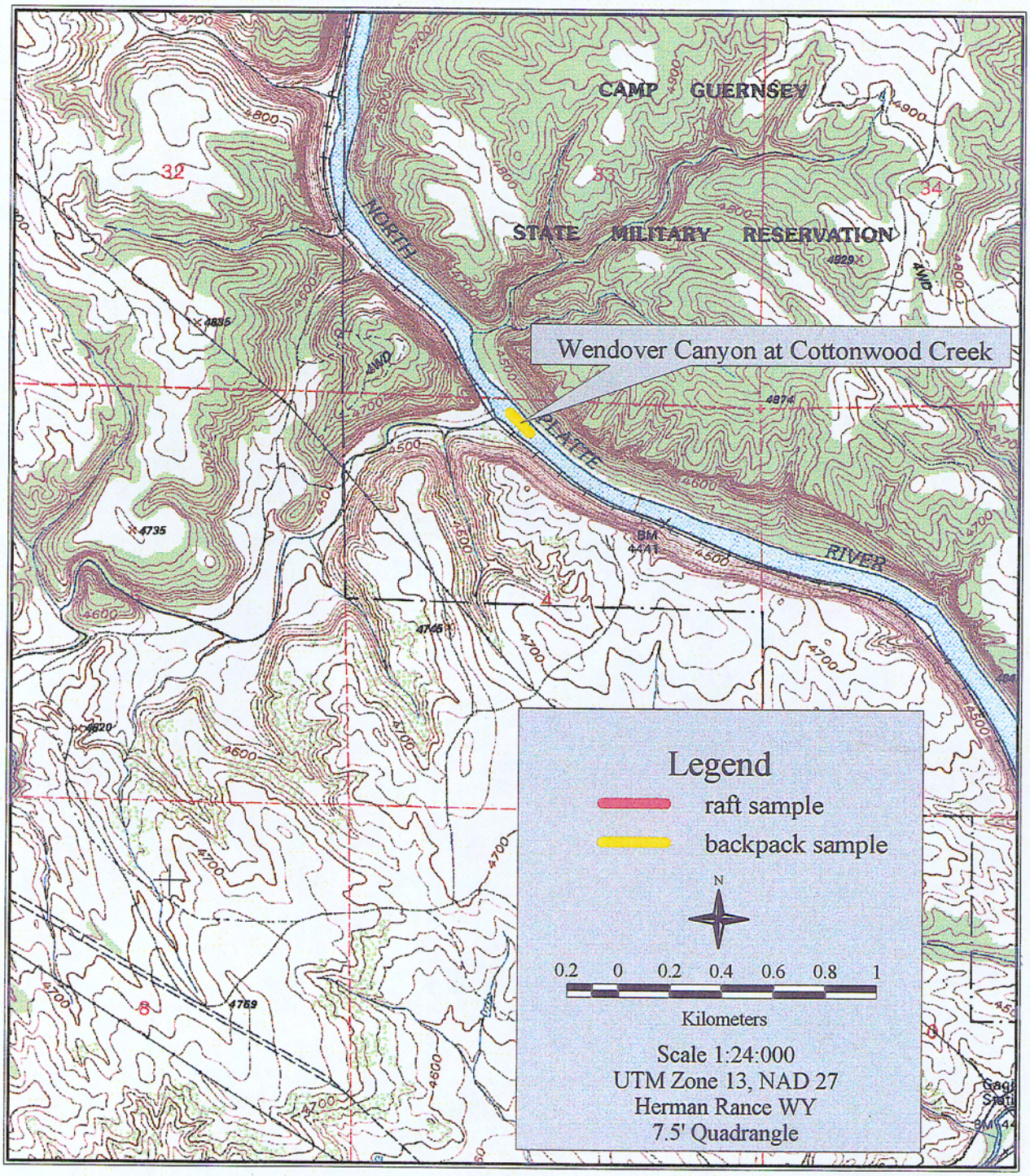


Figure 23. Wendover Canyon sample site.

Figure 24. Wendover Canyon at Cottonwood Creek looking downstream.

Figure 25. Wendover Canyon sample site looking upstream.

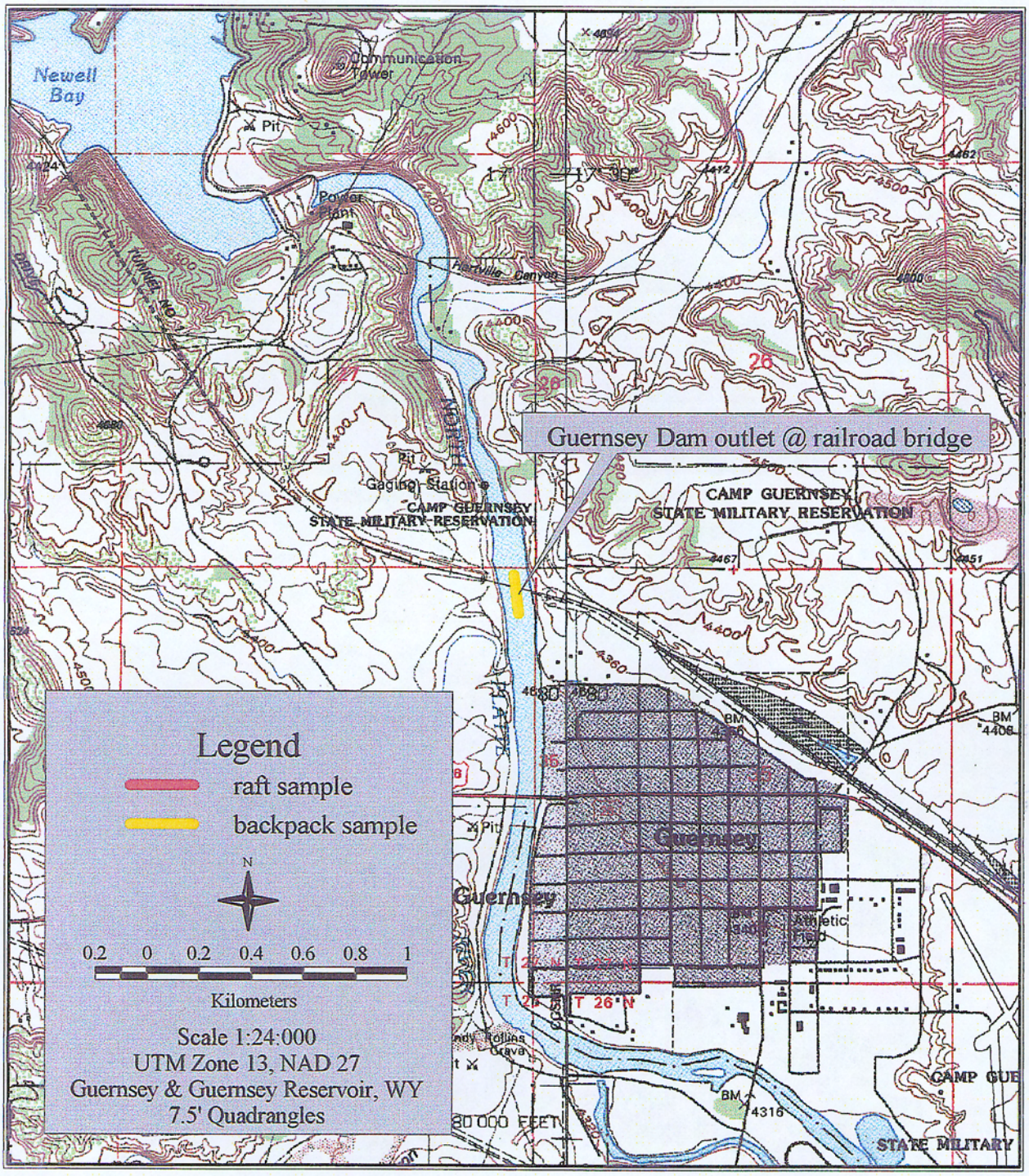


Figure 26. Guernsey Dam outlet sample site.

Figure 27. Dave Felley, Ed Beddow, and Brad Rogers backpack electrofishing, Guernsey Dam outlet.

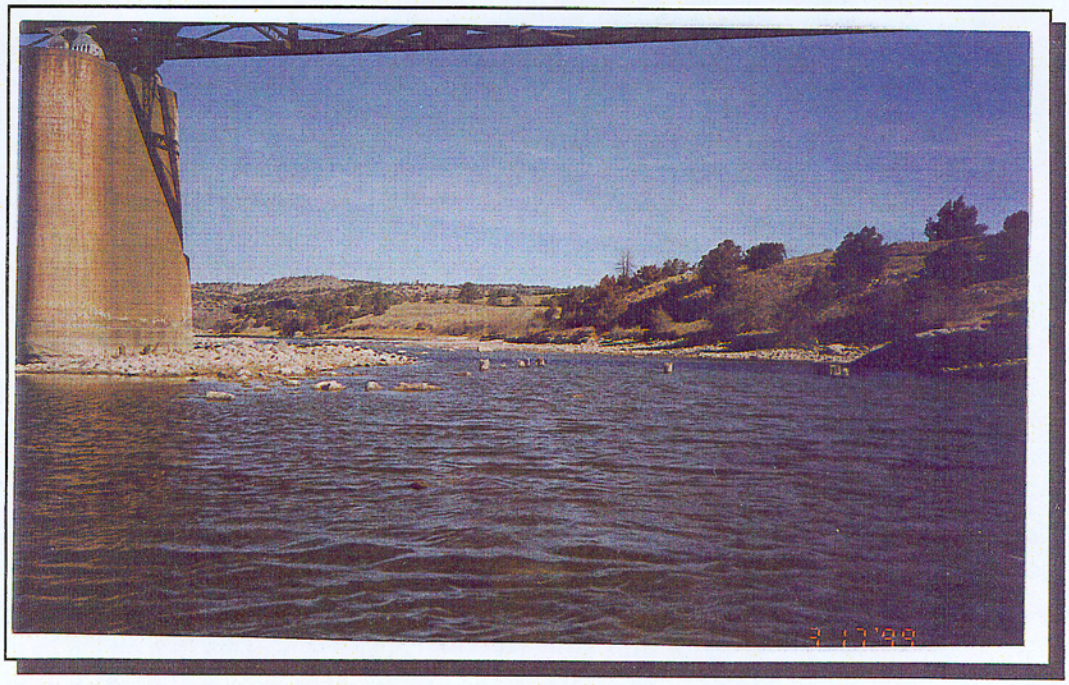


Figure 28. Lower end of Guernsey Dam outlet sample site below Railroad Bridge looking upstream.

caught (332). Nine species were represented in the catch. Longnose dace comprised the most abundant species captured (78 percent) with white sucker (7 percent) and johnny darter (6 percent) comprising the second most abundant species.

Small numbers of central stone roller (0.3 percent), creek chub (0.6 percent), emerald shiner (0.6 percent), longnose sucker (3.6 percent), sand shiner (2.4 percent), and spottail shiner (1.2 percent) were captured. Figure 29 is the Camp Guernsey study site map, and Figures 30 and 31 show the habitat.

Fort Laramie National Park Service (NPS) Bridge - Backpack.— This sample site consisted of a 300-m section characterized as 100 percent main channel, and secondary habitat characterized as 10 percent riffle and 90 percent run. Substrate consisted of a mix of small boulders, and large and small cobbles 60 percent, and 40 percent silt. This sample location yielded the largest number of individuals captured with the backpack electrofisher—400 individuals of 11 species. Longnose dace dominated the catch (72 percent) followed by juvenile and subadult white sucker (8.5 percent) and johnny darter (6.5 percent). Central stoneroller (*Campostoma anomalum*) (1.8 percent), creek chub (1.3 percent), emerald shiner (2 percent), red shiner (1.8 percent), sand shiner (2.3 percent), stonecat (1 percent), and yellow perch (0.25 percent) comprised the remainder of the catch. The stonerollers had nuptial tubercles present on the head. We observed eroded caudal fins on several longnose dace. Figure 32 shows the study site map, and Figures 33 and 34 show the habitat.

Laramie River Confluence to Nebraska State Line.—The Laramie River added approximately 200 cfs to the North Platte River, allowing us to sample this reach of river with the raft. A total of four raft electrofishing samples were conducted for this reach.

Grattan Diversion Dam (upstream) - Raft.—Permission was obtained from the landowner to put the raft in at the Grattan Diversion Dam. We sampled both upstream of the dam and from the dam downstream to the highway bridge. The primary habitat above the dam is 100 percent main channel, with the secondary habitat comprised of 2 percent riffle and 98 percent pool. A total of 1.6 km was sampled. Substrate above the dam consisted of 80 percent silt and 10 percent small cobbles. This was not a particularly productive site with only 33 individuals of 7 species being captured. Part of this may be an artifact of sampling. This was, for the most part, a large deep pool, but we stunned very few fish in the boulders along the edge, which compared to other raft sample sites was unusual. Part of the reason may have been the substrate being predominately silt with very little cover. The catch was dominated by juvenile central stoneroller (27 percent), juvenile and adult white sucker (27 percent), and by juvenile and adult longnose sucker (18 percent). The catch also included common carp (65 percent), emerald shiner (3 percent), longnose dace (9 percent), and spottail shiner (9 percent). We observed one white sucker (102-mm TL) that was blind in one eye, and another 113-mm TL individual with an injured tail.

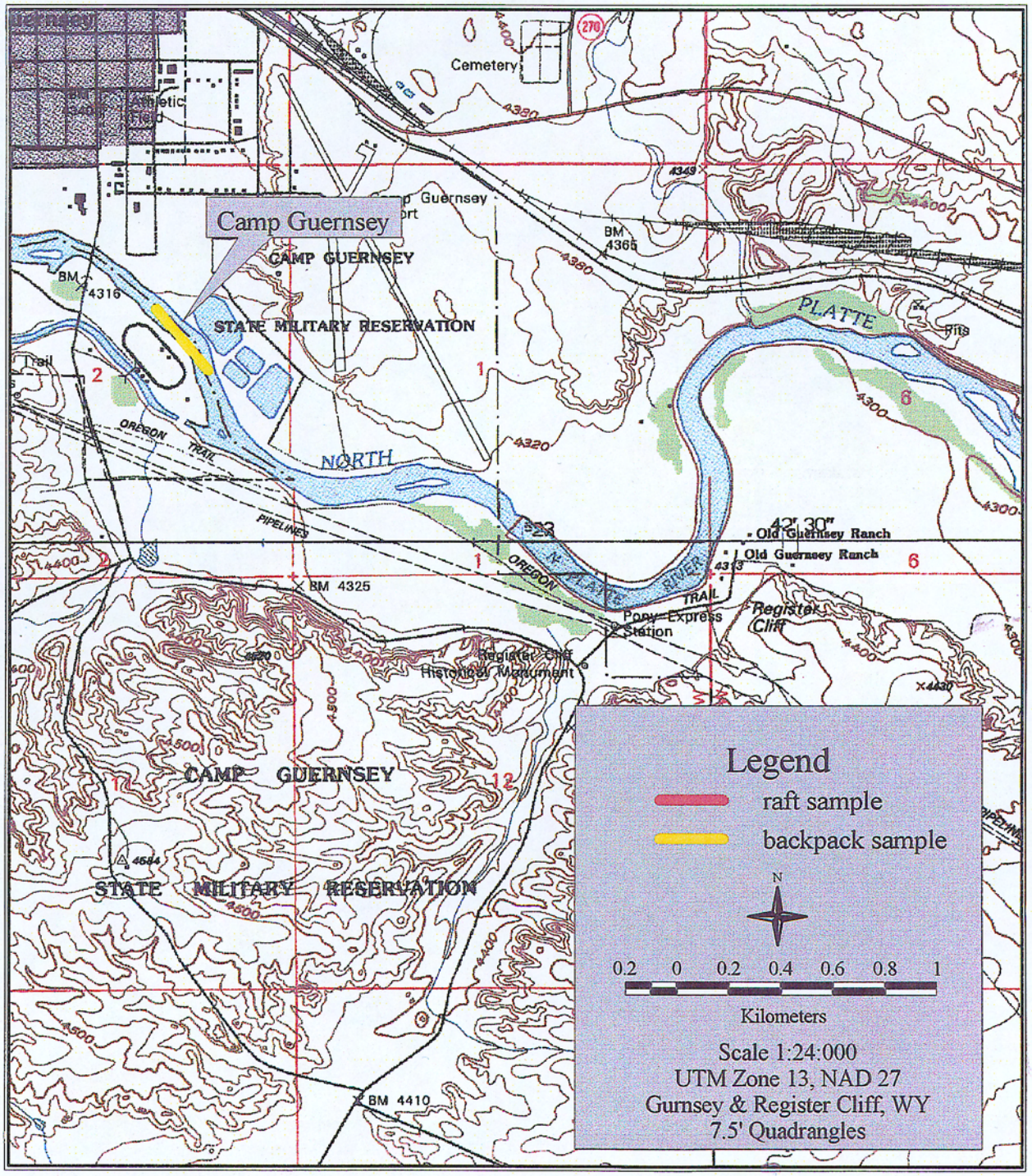


Figure 29. Camp Guernsey sample site.

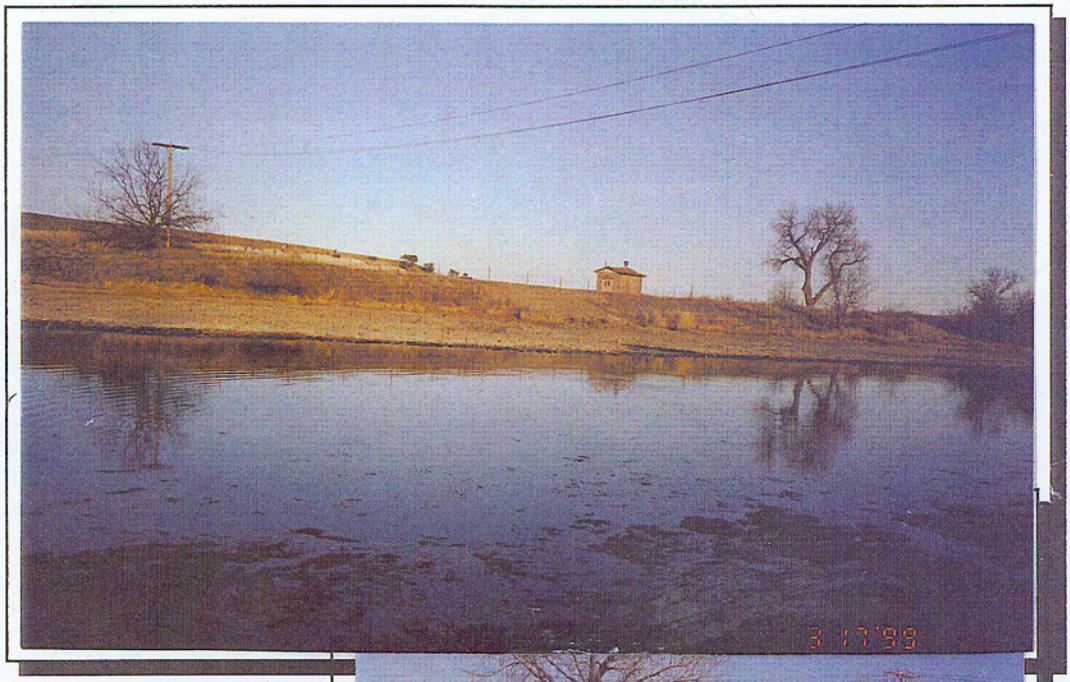


Figure 30. Water temperature data logger was deployed at this site in the Camp Guernsey section.

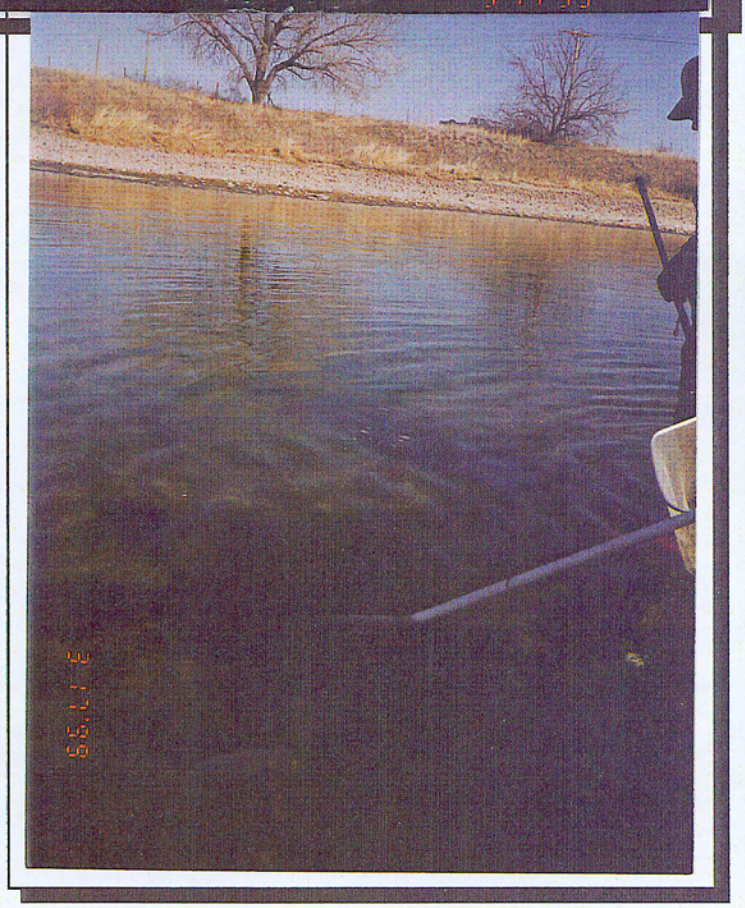


Figure 31. Substrate in the Camp Guernsey section consisted of cobbles with abundant algae.

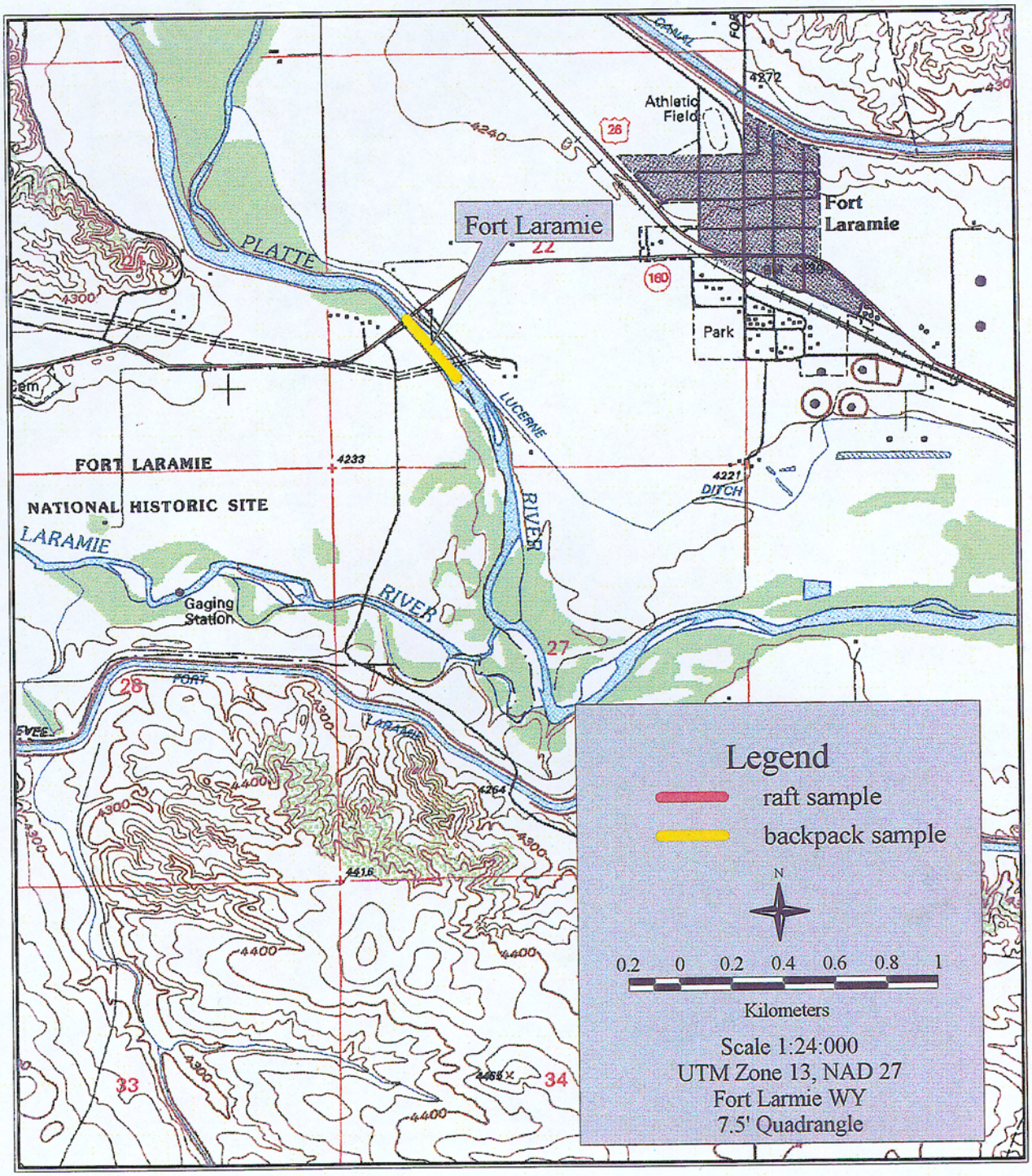


Figure 32. Fort Laramie sample site.

Figure 33. Del Smith, Dave Felley, and Ed Beddow electrofishing at Fort Laramie site.

Figure 34. A deep pool in the Fort Laramie section that may serve as a low water refugia.

Grattan Diversion Dam (downstream to highway bridge) - Raft.—The primary habitat in this reach of river consisted of approximately 70 percent main channel and 30 percent secondary channel/islands. Secondary habitat consisted of approximately 55 percent run, 20 percent riffle, and 25 percent pool. A total of 151 individuals of 12 species was captured in this 2.5-km section. White sucker (28 percent), longnose dace (20 percent), longnose sucker (15 percent), and creek chubs (12 percent) comprised the bulk of the catch. Smaller numbers of central stoneroller (6 percent), common carp (7 percent), emerald shiner (3 percent), johnny darter (1.3 percent), quillback (0.66 percent), stonecat (5 percent), and yellow perch (0.66 percent) were also captured. No disease, abnormalities, or injuries were observed. Figure 35 is the study site map for both the Grattan Diversion Dam upstream and downstream samples, and Figures 36 and 37 show the habitat in these two study sites.

Rawhide Wildlife Habitat Management Unit - Raft.—Permission was obtained from the landowner for access to launch the raft approximately 1.6 km above the Highway 156 bridge south of Lingle to launch the raft. We drifted to the bridge and began sampling from the bridge and continued sampling to the take out between the confluence with Rawhide Creek and the small diversion dam, approximately 3.2 km. This reach contained a large amount of large woody debris (about 15 percent of the river's surface area). Water clarity was good with about 1-m visibility until the confluence with Rawhide Creek which was extremely turbid. The banks were down cut from 3.1 to 4.6 m on both sides of the river. This reach of the river was 100 percent main channel. Secondary habitat was estimated to be 90 percent run, 5 percent riffle, and 5 percent pool. A total of 224 individuals of 11 species was captured. Common carp (23 percent), red shiner (26 percent), creek chub (17 percent), and white sucker (14 percent) dominated the catch. Central stoneroller (9 percent), fathead minnow (0.45 percent), johnny darter (.045 percent), longnose dace (2 percent), longnose sucker (3 percent), sand shiner (3 percent), and shorthead redhorse (2 percent) were also represented in the catch. We observed a tumor on the operculum of a 580-mm TL common carp and a talon injury on the dorsal surface of a 420-mm TL white sucker. The most productive sampling occurred around fallen trees and rootwads in calmer pools. Figure 38 is the study site map and Figures 39 and 40 show the habitat and sampling activities.

Torrington Bridge to Jay Middlesworth's Property - Raft.—This 13-km reach of river is characterized as 70 percent main channel and 29 percent secondary channel. There was <1 percent backwater present. Secondary habitat is an estimated 85 percent run, 10 percent pool, and 5 percent riffle. The areas that were not productive of fish were the sand flats with no cover, no cobbles, and no bank structure. We found that sampling rootwads and fallen trees; rock structure such as cobbles, some boulders; riprap; and scummy backwaters was most productive. Cottonwood snags and rootwads were very productive of young suckers and mature common carp. Shorthead redhorse were only found in deep pools with rootwads and tree trunks with branches. Stonecats on this unit and at Rawhide were captured on outside bends with cobble and riprap banks. We also found that rootwads churned out juvenile and adult creek chub,

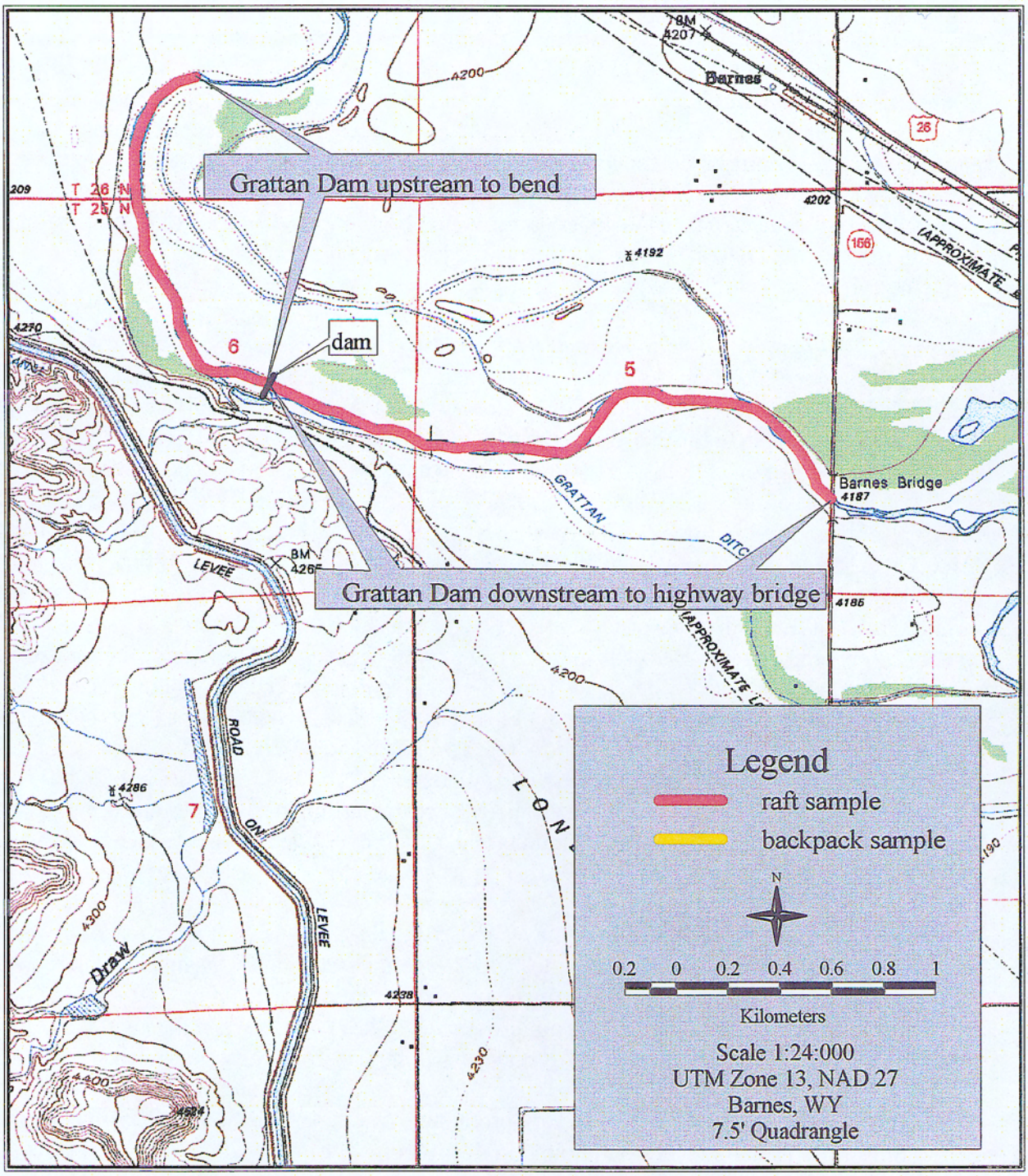


Figure 35. Grattan Dam sample sites.

Figure 36. Looking from Grattan Dam upstream.

Figure 37. Unloading gear at the end of the day, Highway 157 Bridge.

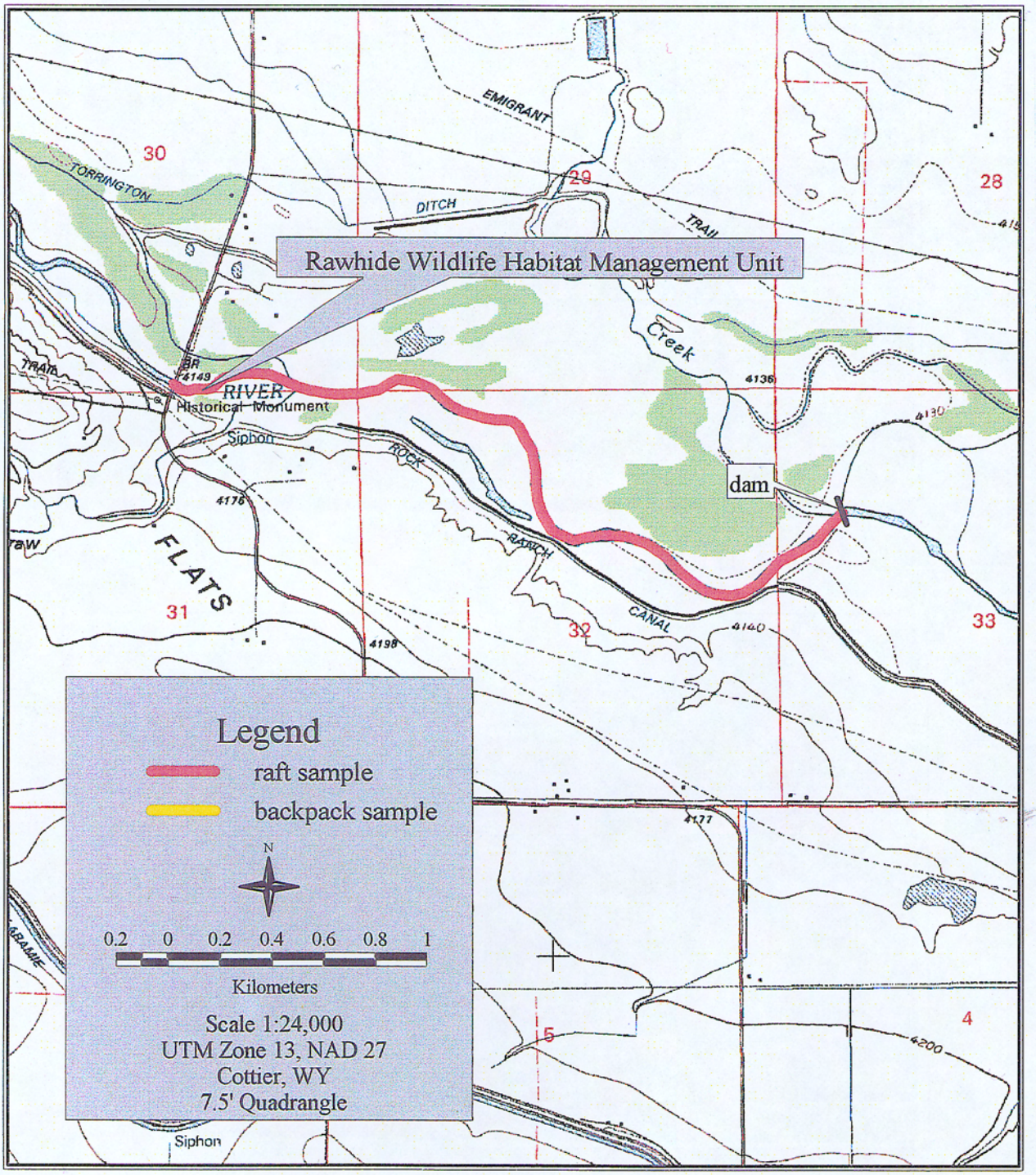


Figure 38. Rawhide Wildlife Habitat Management Unit sample site.

Figure 39. Dave Felley and Del Smith net fish in a deep pool, Rawhide section. A fallen tree provides good cover.

Figure 40. Typical habitat in the Rawhide section.

emerald shiner, and longnose dace. By floating backwards down riffles with cobble substrate, we could effectively net stunned longnose dace and other small species. We captured the only river carpsucker (*Carpiodes carpio*) of the entire sampling effort in this section.

The total catch consisted of 183 individuals of 9 species. Juvenile and adult white sucker (3 percent) and adult common carp (34 percent) were the predominate species, followed by longnose sucker (12 percent), longnose dace (2 percent), creek chub (5 percent), shorthead redhorse (5.5 percent), and stonecat (0.5 percent). We observed a large injury on a 265-mm TL white sucker (probably a bird peck), a talon injury on a 310-mm white sucker, and a 261-mm TL white sucker with a chunk bitten out of its dorsal fin. We also observed fungus on the caudal fin of a 320-mm TL white sucker, fungus on the caudal fin of a 430-mm TL shorthead redhorse, and fungus on the pectoral and anal fins of a 462-mm TL shorthead redhorse, and fungus on the head of an unmeasured large adult common carp. Figure 41 shows the study site map, and Figures 42 and 43 show the habitat and sampling activities.

Water Temperature Monitoring

StowAway TidbiT temperature loggers recorded water temperatures hourly from their launching in mid-March 1999 during the fish survey until they were retrieved and download March 2, 2000. Figures 44 through 48 show only the daily maximum and minimum temperatures for each site. Figures 49 through 53 compare the maximum temperatures for several sites along the river.

PP&L Bridge.—Figure 44 illustrates the minimum and maximum temperatures for the PP&L Bridge site from March 26, 1999, to February 29, 2000. This bridge accesses the PP&L - Glenrock Access Area. A temperature logger was placed near the center of the channel on a bridge piling near the stream bottom. The maximum temperature at this site was 27.67 °C achieved on July 25 at 1500. The minimum temperature was 0.16 °C reached on January 30, 2000. Wide temperature fluctuations occurred from March 26 through May 1. This early season pattern of wide fluctuations is also observed at Anderson Dairy Bridge and Orin. A typical diurnal temperature swing at the PP&L Bridge is represented by the temperatures on July 1. The maximum temperature reached that day was 19.33 °C at 1900 and the minimum temperature was 16.76 °C at 0700—a 2.57 °C temperature swing. Maximum temperatures were typically reached around 1600 while minimum temperatures were typically reached around 0500. The average temperature for the entire sample period was 14.72 °C.

Anderson Dairy Bridge.—The Anderson Dairy Bridge data (Figure 45) show a similar temperature pattern as the PP&L Bridge data, with the exception of the extremely wide fluctuations occurring from September 26 through October 12. This period of wide fluctuation is the result of being dewatered and the logger recording ambient air temperatures. A maximum temperature of 27.18 °C was reached on July 25 at 1700 and the minimum temperature of -1.43 °C was reached on January 10, 2000 at 2000. Several incidences of minus zero degrees

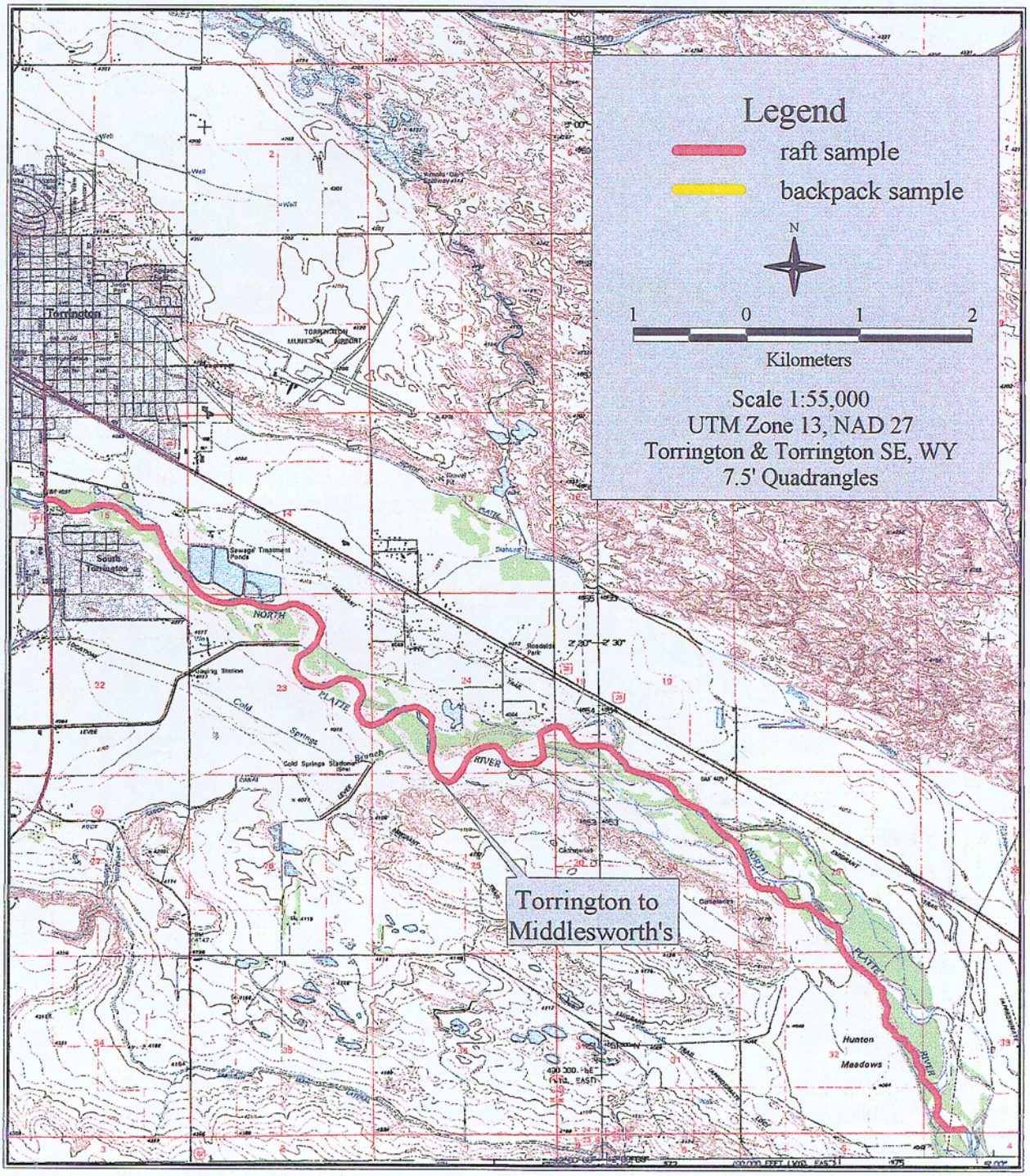


Figure 41. Torrington sample site.

Figure 42. Areas of large woody debris in the Torrington section contained large numbers of fish.

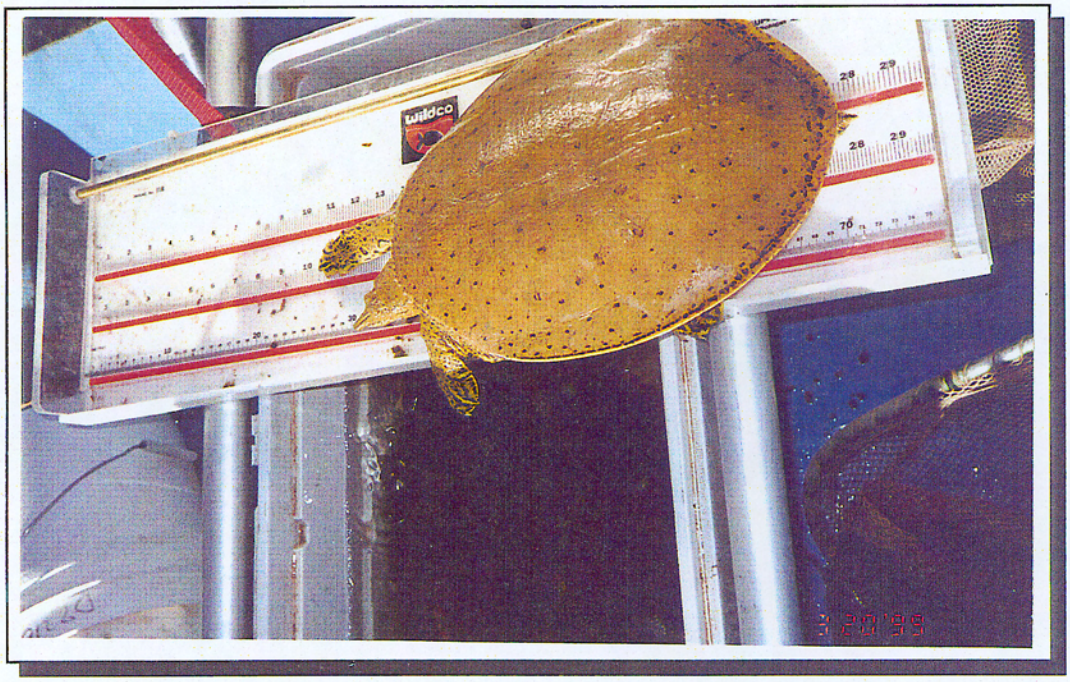


Figure 43. Spiny softshell turtle captured in the Torrington section.

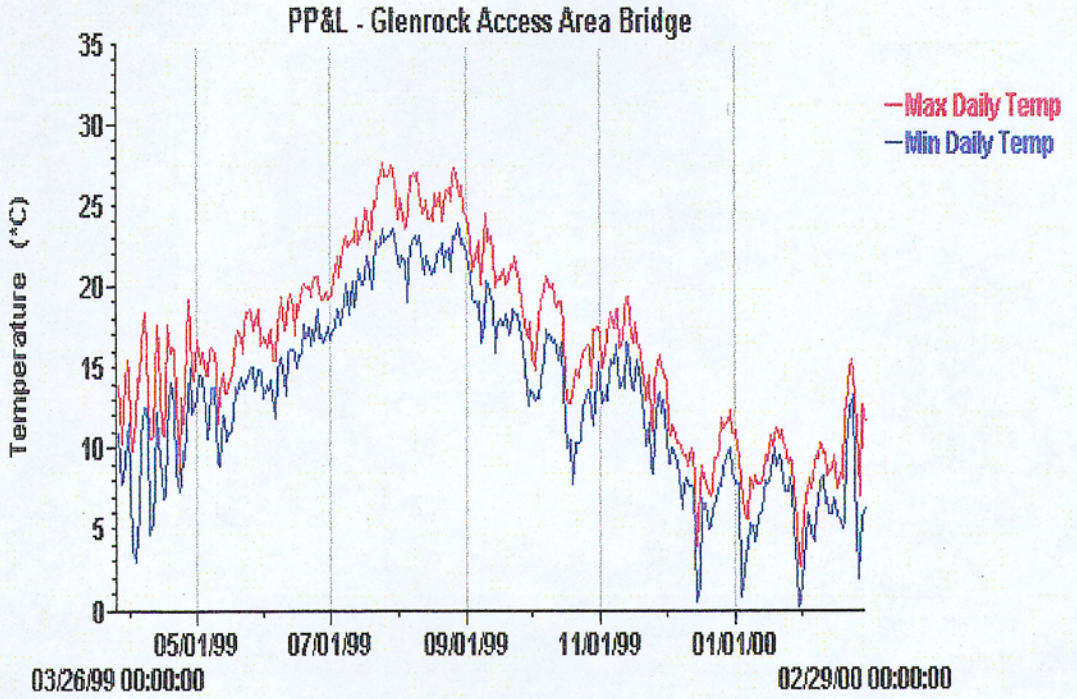


Figure 44. Daily minimum and maximum temperatures - PP&L - Glenrock Access Area Bridge.

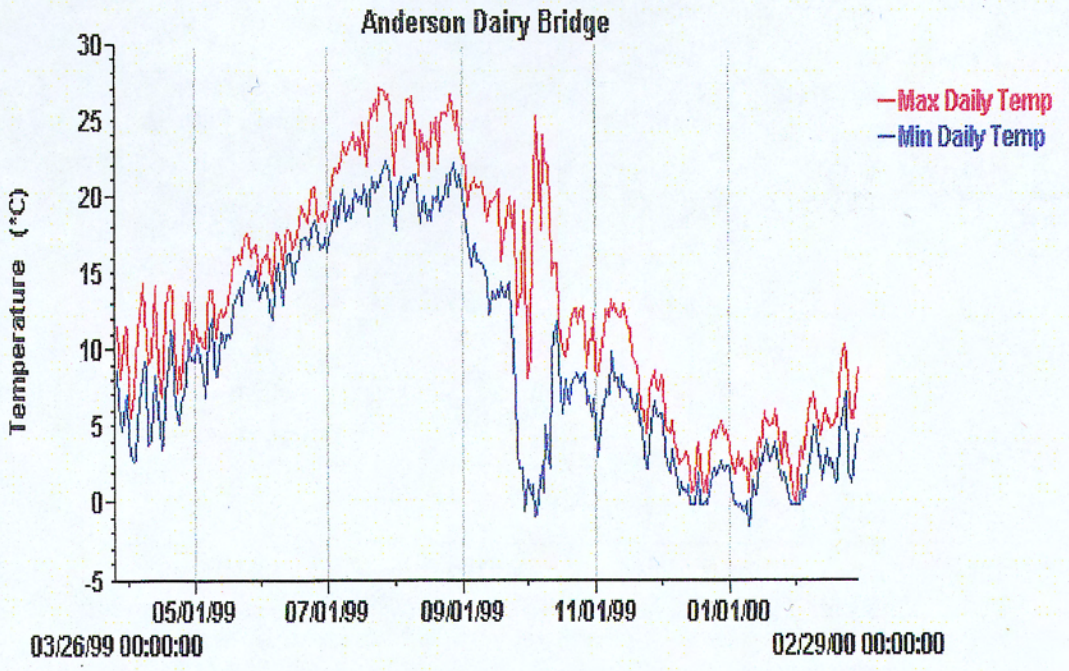


Figure 45. Minimum and maximum temperatures - Anderson Dairy Bridge.

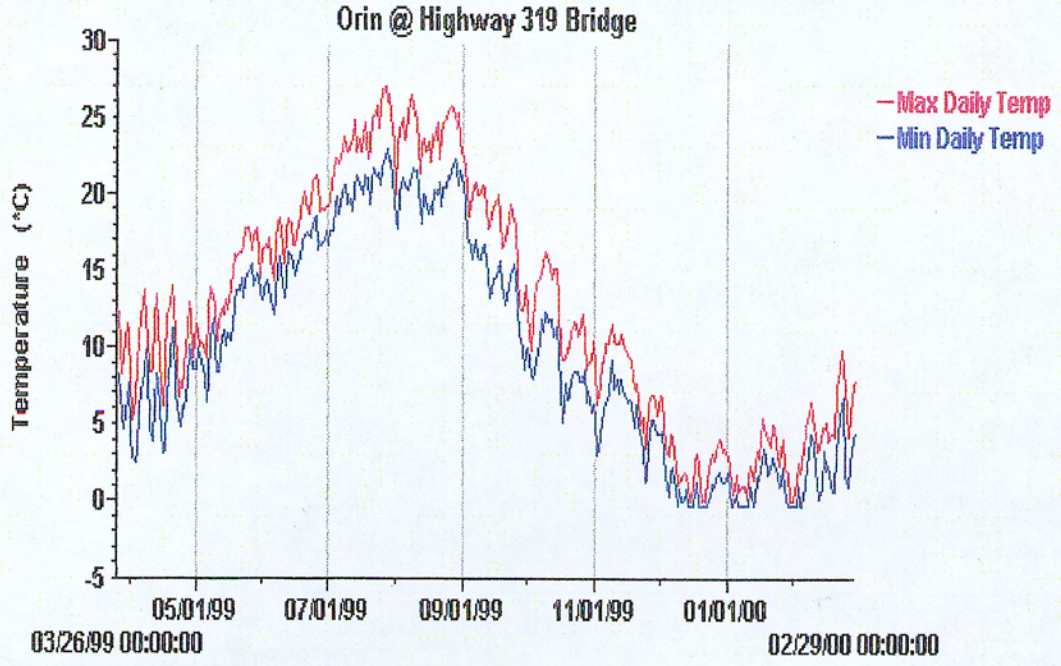


Figure 46. Daily minimum and maximum temperatures - Orin at Highway 319 Bridge.

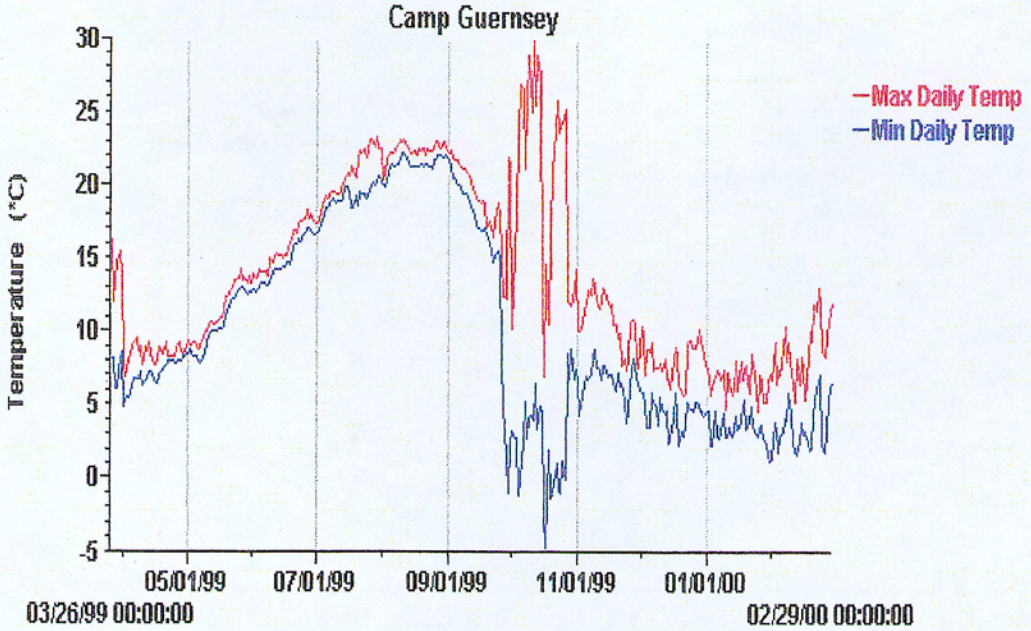


Figure 47. Daily minimum and maximum temperatures - Camp Guernsey.

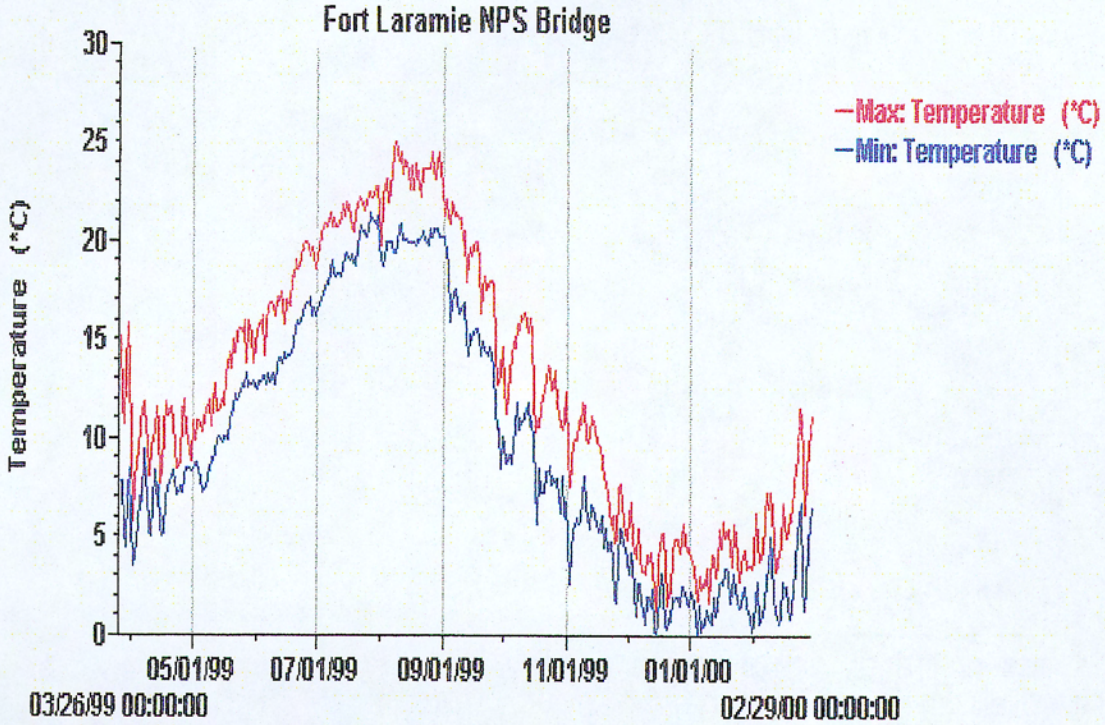


Figure 48. Daily minimum and maximum temperatures - Fort Laramie NPS Bridge.

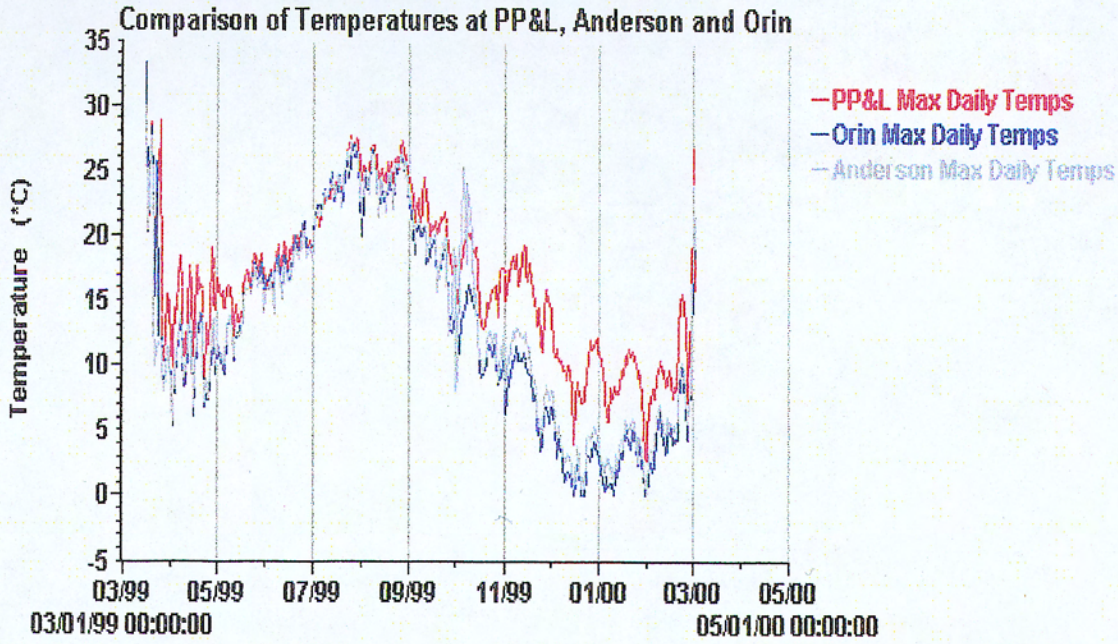


Figure 49. Comparison of daily minimum and maximum temperatures - PP&L, Anderson and Orin.

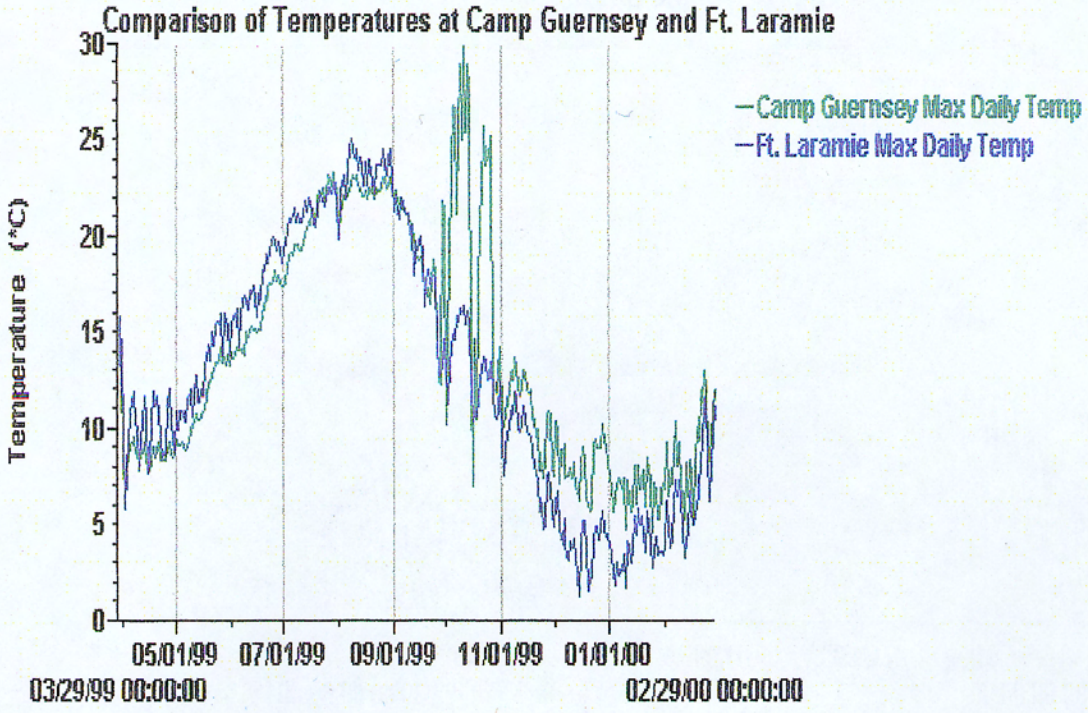


Figure 50. Comparison of temperatures - Camp Guernsey and Fort Laramie.

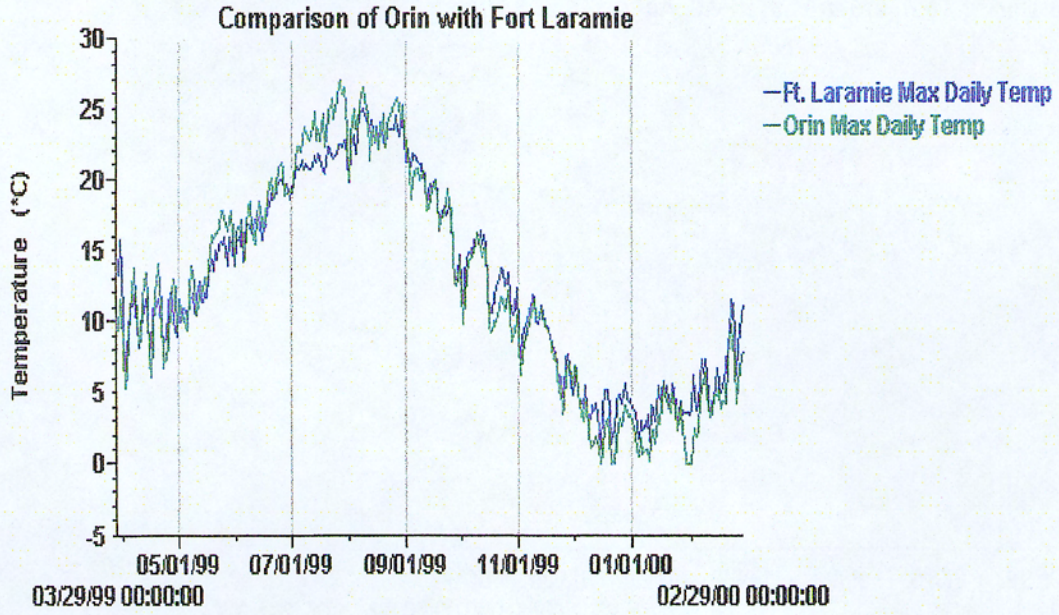


Figure 51. Comparison of temperatures - Orin with Fort Laramie.

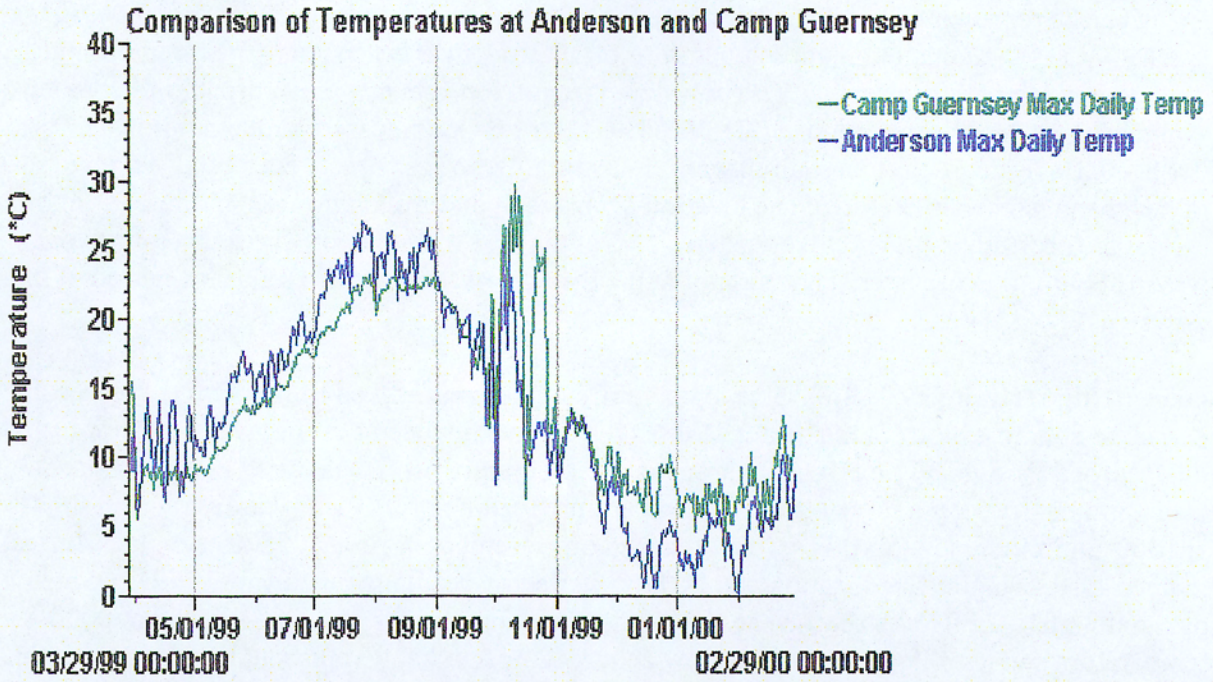


Figure 52. Comparison of temperatures - Anderson and Camp Guernsey.

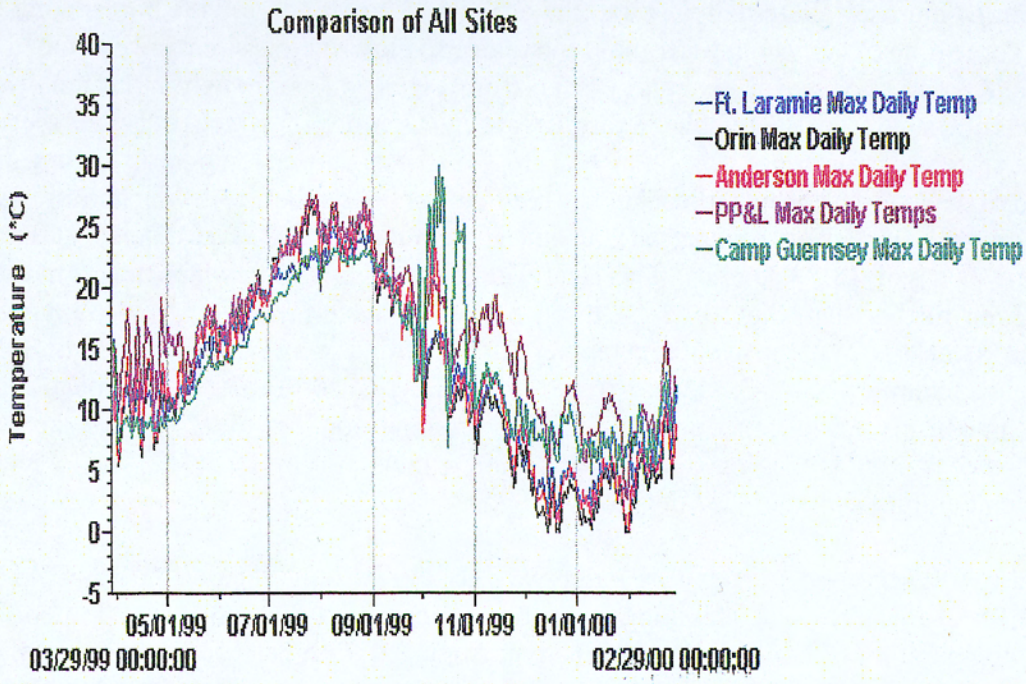


Figure 53. Comparison of all sites.

occurred in January, probably reflecting ice jamming on the bridge. A typical diurnal temperature swing can be represented by the data for July 1 in which a maximum temperature of 19.08 °C was reached at 1900, and a minimum temperature of 16.36 °C was reached at 0700, representing a 2.72 degree temperature swing. The dewatered period represents a much broader temperature swing ranging from a maximum of 21.36 °C at 1200 on October 6 to a minimum of 1.6 °C at 0600—a 19.76 degree temperature swing, reflecting the logger's recording of air temperature rather than water temperature. The location of this temperature logger was on the bottom of a metal gate protruding into the river channel and, at the time of launching, the temperature logger was in about 0.6 m of water. This was not in the thalweg of the river and reflects a period of low flows.

Orin Bridge (Highway 319).—This temperature logger was affixed to rebar on the lower side of a large concrete block in the center of the river channel between the Highway 319 Bridge and the Railroad Bridge. Figure 46 shows a similar temperature profile as the PP&L and Anderson Dairy temperature loggers. A maximum temperature reading of 27.01 °C was reached on July 25 at 1600, and a minimum of -0.18 °C was reached on December 9, 1999 at 0500. A typical diurnal temperature swing at this location can be represented by readings on July 1, 1999, in which a maximum of 19.25 °C was reached at 1700 and a minimum of 16.84 °C was reached at 0600—a temperature swing of 2.41 degrees. Below zero readings probably represent ice jamming at this site. The average temperature for the entire sampling period was 11.14 °C.

Camp Guernsey.—A temperature logger was affixed to a barbed wire fence extending into the river at Camp Guernsey about half way into the channel. It was tied onto the bottom of a fence post and, at the time of launching, was about 0.6 m deep. Flows at this site were estimated to be only around 10 cfs. However, as can be seen from Figure 47, extremely large temperature fluctuations occurred from September 28 through around October 15, which reflect the recording of ambient air temperatures, not water temperatures. A typical diurnal temperature swing during this period of dewatering can be represented by readings on September 29 in which the maximum temperature of 19.08 °C was reached at 1900, and a minimum of -0.3 °C was reached at 0600—a temperature swing of 18.78 degrees. This clearly is a dewatering event, which means riverflows dropped even further than the 10 cfs. During periods in which the temperature logger was submerged (at least 10 cfs), the maximum temperature recorded was 27.18 °C on August 8, 1999, at 1700, and a minimum of -1.43 °C was reached on January 10, 2000 at 2000. A typical summer diurnal temperature swing can be represented by readings on July 1, 1999. A maximum temperature of 19.08 °C was reached at 1800, and a minimum of 16.38 °C was reached at 0700—a temperature swing of 2.7 degrees.

Fort Laramie Bridge.—A temperature logger was attached around the bottom of an old piling in the center of the channel. This logger remained submerged the entire sample period. A maximum temperature of 24.99 °C was reached on August 8, 1999, at 1700, and a minimum of 0.07 °C was reached on December 15 at 0600 (Figure 48). A typical summer diurnal temperature swing can be represented by July 1 readings. A maximum temperature of 19.45 °C was reached

at 1800, and a minimum temperature of 16.54 °C was reached at 0500—a diurnal temperature swing of 2.91 degrees. The average temperature for the sample period was 11.14 °C.

Comparison of Temperature Profiles Above Glendo Reservoir.—Figure 49 overlays the maximum temperature profiles from PP&L, Anderson Dairy, and Orin data loggers. All three temperature profiles follow the same general pattern, reflecting changes in ambient air temperature. The PP&L site recorded the warmest water temperatures of the three locations from October through January.

Comparison of Temperature Profiles Below Guernsey Reservoir.—Maximum temperature profiles for the Camp Guernsey and Fort Laramie sites were overlaid in Figure 50. With the exception of the dewatering event at Camp Guernsey, these two temperature profiles reflect similar patterns. Camp Guernsey tended to have warmer fall and winter temperatures than the Fort Laramie Bridge site, but followed the same general pattern.

Comparison of Temperature Profiles Above and Below the Reservoirs

Maximum temperature profiles for Orin and Fort Laramie were overlaid in Figure 51. The profiles also follow the same general patterns even though two large reservoirs intervene in the river between temperature loggers. This pattern can also be seen in Figure 52 in which Camp Guernsey is compared with Anderson Dairy Bridge. Both these sites had experienced dewatering events at the same general time period and both reflect a similar pattern of temperatures.

Figure 53 compares the maximum temperature profiles of all five sites. This is perhaps the most revealing of all. It can be seen that, in general, all temperature loggers recorded the same temperature patterns (with the exception of the dewatering events at Camp Guernsey and Anderson Dairy). It appears that the amount of flow has little influence on the water temperatures. The largest influence on water temperature appears to be ambient air temperature.

DISCUSSION

This was an extensive survey-level effort, and population estimates were not made. However, enough sampling was conducted across a large section of the North Platte River to allow some preliminary inferences to be made on the species composition and relative abundance of fish communities, and to further refine questions that should be addressed in greater detail in the future.

For analysis and discussion purposes, the North Platte River was divided into five major reaches: Casper to Douglas; Douglas to Glendo Reservoir inlet; Glendo Dam to Guernsey Reservoir inlet; Guernsey Dam to the Laramie River confluence; and from the Laramie River confluence to the Nebraska State line. The most distinguishing features of these five reaches include the following:

- Flows in the Casper and Douglas sections are not subject to large seasonal dewatering as are those found below Glendo Dam and Guernsey Dam. Flows below these two dams routinely are 10 cfs and occasionally lower during the non-irrigation season. The Laramie River contributes a substantial volume of water to the North Platte River.

- Flows in the Casper and Douglas sections tend to be more turbid, at least in March, with more silt deposits in the sediments than in the Glendo and Guernsey sections. Flows below each dam are very clear during the non-irrigation season, and the substrate is mostly composed of cobble, boulders, and sand with very little silt. The Laramie River contributes some turbidity and sediment to the North Platte River, but water clarity remains higher than in the sections above Glendo Reservoir.

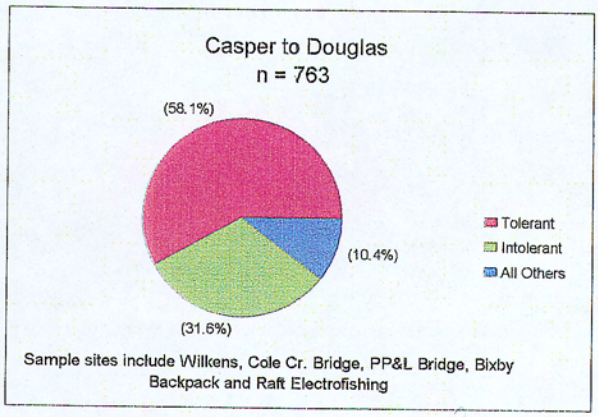
- Substrate below Douglas had areas of extremely foul sediment. Incidences of deformities and disease were observed in captured fish.

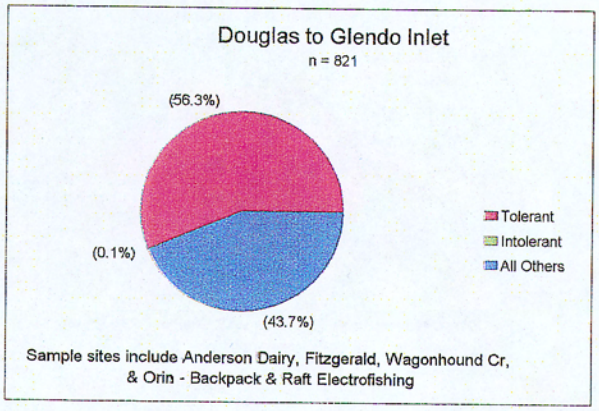
Turbidity Tolerance

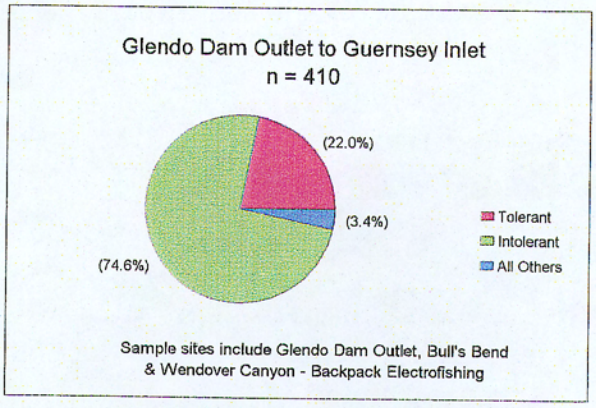
Turbidity tolerance of members of the fish communities at each of the five study reaches was examined. Turbidity tolerance for each species was determined using the descriptions in Barbour et al. (1999) and Baxter and Stone (1995). Samples for each study reach were combined, and the relative abundance of turbidity tolerant and turbidity intolerant individuals determined. A clear pattern can be seen in Figure 54. The relatively turbid river reaches from Casper to Douglas and Douglas to Glendo inlet had 58.1 percent and 56.3 percent, respectively, of the samples composed of turbidity tolerant species. This number of turbidity tolerant species drops off significantly in the Glendo Dam outlet reach (22 percent) and in the Guernsey Dam outlet reach (13.4 percent). Additionally, the relative abundance of turbidity intolerant individuals increase from 31.6 percent in the Casper to Douglas reach and 0 percent in the Douglas to Glendo inlet reach to 74.6 percent intolerant individuals in the Glendo Dam outlet reach and 85.8 percent in the Guernsey outlet reach. From the Laramie River confluence downstream, the community changes back to predominately turbidity tolerant individuals—71.2 percent with only 25.0 percent intolerant species present.

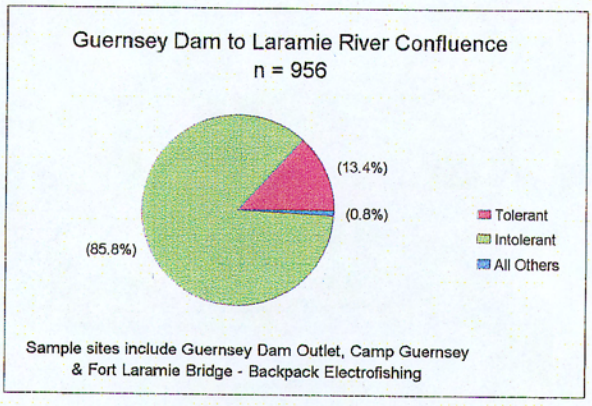
Native Species

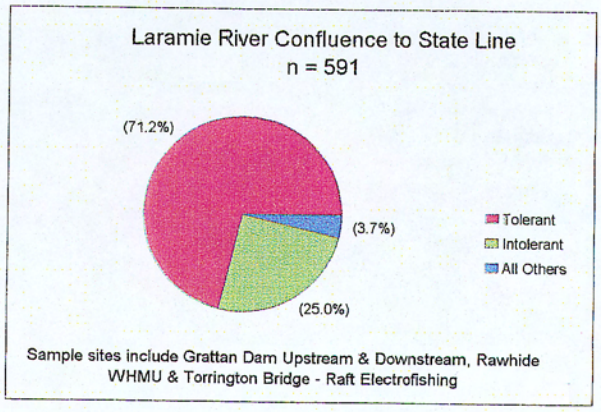
The relative abundance of native fish species was also examined for each study reach. Figure 55 shows that the lowest percentage of native species occurs in the Douglas to Glendo inlet reach (40.2 percent) followed by the Casper to Douglas reach (62.1 percent). The highest relative abundance of native species occurs in the Glendo Dam outlet reach (79.5 percent) and nearly all of the individuals captured in the Guernsey Dam outlet reach were natives (97 percent). The sample composition changes again at the Laramie River confluence with native species dropping to 76.5 percent.











Intolerant Fish Species:

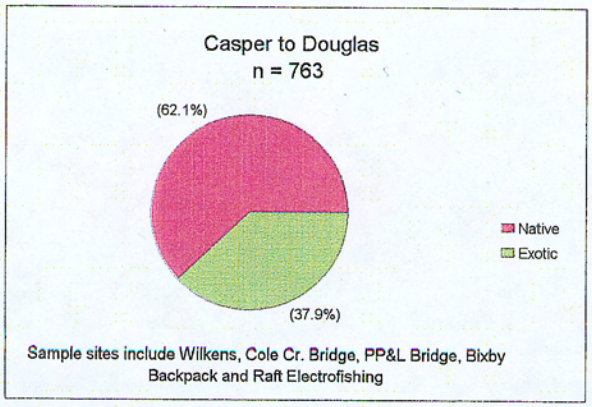
Brassy Minnow	Longnose Dace
Central Stoneroller	Longnose Sucker
Common Shiner	Stonecat
Johnny Darter	

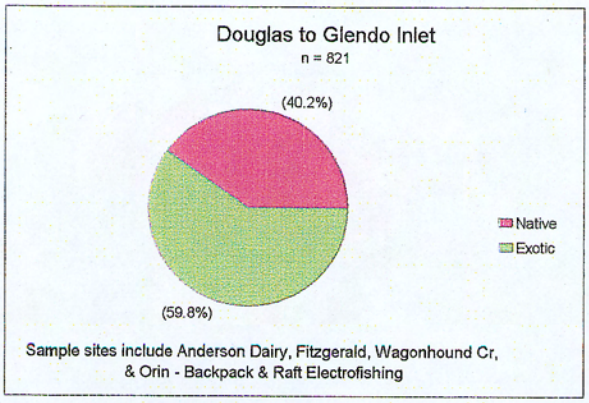
Tolerant Fish Species:

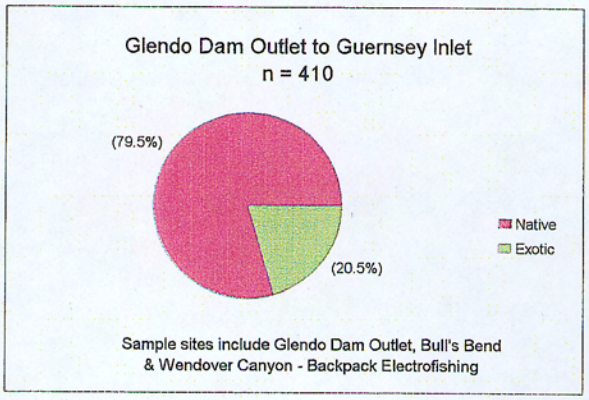
Channel Catfish	Plains Killifish
Common Carp	Red Shiner
Emerald Shiner	Sand Shiner
Fathead Minnow	White Sucker
Flathead Chub	

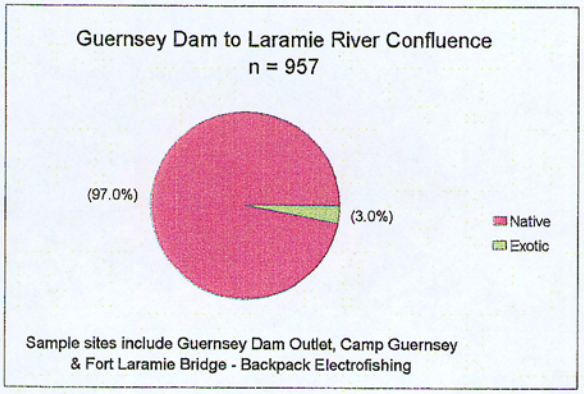
Reference: EPA (1999); Baxter & Stone 1995

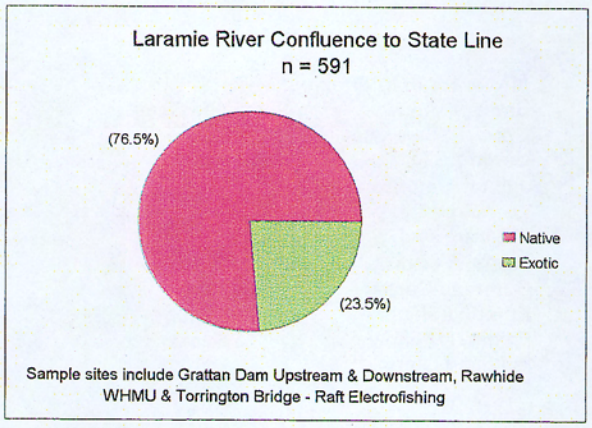
Figure 54. Turbidity tolerance of fish captured by study reach - pooled samples.











Native Species:

Brassy Minnow	Longnose Sucker
Central Stoneroller	Plains Killifish
Channel Catfish	Quillback
Common Shiner	Red Shiner
Creek Chub	River Carpsucker
Fathead Minnow	Sand Shiner
Flathead Chub	Shorthead Redhorse
Johnny Darter	Stonecat
Longnose Dace	White Sucker

Exotic Species:

Black Crappie	Gizzard Shad
Bluegill	Rainbow Trout
Brown Trout	Spottail Shiner
Common Carp	Walleye
Emerald Shiner	Yellow Perch

Reference: Baxter & Stone 1995

Figure 55. Percentage of native versus exotic fish captured by study reach - pooled samples.

There may be a number of explanations for these findings. This was first of all a survey-level effort and extensive sampling was not conducted. Sample methods varied from reach to reach and biases in the sample gear's ability to capture species varies. Perhaps most significantly is that only wadeable reaches of the Glendo Dam outlet and Guernsey Dam outlet were sampled. We did not sample the large deep pools (Figure 34) due to logistical difficulties. Some biologists speculate these large deep pools serve as refugia during low-water periods for these river reaches. Many of the turbidity tolerant species such as common carp are large individuals, and these individuals, if present in these river reaches, would be in these large pools. Longnose dace and johnny darters, both turbidity intolerant species, reached the highest relative abundance in the Glendo Dam outlet and Guernsey Dam outlet reaches. Additionally, the flow regimes, particularly the large seasonal dewatering events and the unusually high summer flow events in these reaches, may also influence species composition.

Species Observations

Table 2 summarizes the catch for each site by species. It can be seen that the Glendo Dam outlet reach and the Guernsey Dam outlet reach have a number of abundant species in common that are not as abundant or not present in other reaches. Emerald shiners reach peak abundance below each dam (70 in the Glendo Dam outlet reach and 22 in the Guernsey Dam outlet reach). Spottail shiners, although relatively small in numbers, reach the maximum abundance immediately below both dams. Baxter and Stone (1995) indicate that both emerald and spottail shiners were stocked in reservoir ecosystems in Wyoming to add an open-water, plankton-feeding forage fish. Johnny darters are first picked up in samples in the Glendo Dam outlet reach (4) and attain peak abundance in the Guernsey Dam outlet reach (74). Notably absent in these two tailwater reaches is the common carp and shorthead redhorse.

Central stonerollers were first picked up in samples in the Guernsey Dam outlet reach (8), and reach peak abundance in the Laramie River confluence to State line reach (38). Creek chub follow a similar pattern, first appearing as a single individual in the Douglas to Glendo reach, two in the Glendo Dam outlet reach, and eight in the Guernsey Dam outlet reach. Peak abundance is reached in the Laramie confluence to State line reach (74). One of the most distinguishing features of the Laramie confluence to State line reach is the abundance of large woody debris in the form of downed cottonwood trees and rootwads. This habitat appears to be very favorable for these two species. However, the opposite trend is observed for game fish species. The only game fish species captured in the Laramie confluence to State line reach was a single yellow perch. Only one brown trout and four rainbow trout were captured in the Glendo Dam outlet reach. Rainbow trout were most abundant in the catch in the Casper to Douglas reach as were brown trout and channel catfish. Walleye dominated the gamefish catch in the Douglas to Glendo reach. Ubiquitous species appearing in all reaches in good numbers included longnose dace, longnose suckers, red shiners, sand shiners, and white suckers.

Table 2. Summary of catch for each species by study reach

SPECIES	*	**	Casper to Douglas						Douglas to Glendo Inlet				Glendo Outlet to Guernsey Inlet			Guernsey Dam to Laramie River			Laramie River to State Line			
			E.K. Wilkens	Cole Cr BP dn	Cole Cr. BP up	Cole Cr. Raft	PPL Raft	Bixby BP	Anderson	Fitz-gerald	Wagon-hound cr.	Orin	Glendo	Buffs	Wendover	Guernsey	Camp G	Ft. Laramie	Grattan up	Grattan down	Rawhide	Torrington
Black Crappie								1						1								
Bluegill														1								
Brassy Minnow	I	N		2																		
Brown Trout		E	5	1		6			2				1									
Central Stoneroller	I	N															1	7	9	9	20	
Channel Catfish	T	N					3			2			1									
Common Carp	T	E				45	203		80	85		127							2	10	52	62
Common Shiner	I	N																				
Creek Chub	T	N										1		2		1	2	5		18	39	9
Emerald Shiner	T	E	9		1							4	27	11	32	12	2	8	1	5		3
Fathead Minnow	T	N	3					7			1					3					1	
Flathead Chub	T	N										4										
Gizzard Shad		E								1												
Johnny Darter	I	N													4	3	20	26		2	1	
Longnose Dace	I	N	76	16	24	14	3				3	2	111	6	105	167	259	288	3	30	4	4
Longnose Sucker	I	N	10	2		29	64		6	10		23	30	45	4	3	12	11	6	23	6	22
Plains Killifish	T	N											1									
Quillback		N					13													1		
Rainbow Trout		E				11	6		1	1			4									
Red Shiner	T	N	3	4				40		11		1						7			58	
Redside Shiner		N															1					
River Carpsucker	T	N																				1
Sand Shiner	T	N	2	13		1	12	4	16	5	26	49		1	5	7	8	9			6	
Shorthead Redhorse		N				2	33		12	10		90								2	5	10
Spottail Shiner		E											7			2	4		3			
Stonecat	I	N						1		5	3		1					4		8		1
Walleye		E					1					187										
White Sucker	T	N	1	10		58	16	8	27	15		8	5	1	4	7	23	34	9	42	32	71
Yellow Perch		E										3						1		1		
*Tolerance to Turbidity			109		48	25	166	354	61	144	145	33	499	188	68	154	225	332	400	33	151	224	183

I=Intolerant T=Tolerant
**Native or Exotic

Temperature maximums reached in the Casper to Douglas and Douglas to Glendo inlet reaches, where both rainbow and brown trout were present in the catch, very nearly reach the upper lethal temperature limit. The upper lethal temperature limit for rainbow trout ranges from 25.0 to 29.4 °C and for brown trout ranges from 26.7 to 29.9 °C (Bjornn and Reiser 1991). The maximum temperature recorded at the PP&L Bridge in the Casper to Douglas reach was 27.67 °C; at the Anderson Dairy Bridge in the Douglas to Glendo inlet reach, the maximum temperature was 27.18 °C; and at the Orin Bridge in the same reach, it was 27.01 °C. It is likely that fish under these circumstances seek cool water refugia either under overhanging banks, deep pools, or near cool springs.

Results of this survey indicate that both raft-mounted electrofishing and backpack electrofishing can be effectively used during the narrow window of time between ice-out and spring runoff which usually occurs in March. By sampling along the shallow edges, raft-mounted electrofishing can be effective in collecting small native fish species, as the raft can be maneuvered slowly along the shoreline. Backpack electrofishing along the shallow edges of river reaches with high flow volumes is also effective in sampling for small native fish species.

Yoder and Smith (1999) observe that the use of block nets at either end of a sampling zone is not necessary for generating species richness, composition, and relative abundance. The majority of fish, when disturbed by the sampling crew, tend to seek adjacent cover instead of continuously moving upstream. Simonson and Lyon (1995) employ a single pass without the use of block nets for wadeable Wisconsin streams.

Potential winter refugia in the dewatered reaches of Glendo Dam outlet and Guernsey Dam outlet should be sampled using a raft that can be portaged in. Readily accessible sites include the large pool below the mouth of Sand Draw below Glendo Dam, although there are numerous fishermen using this pool even in March. Another site is the pool underneath the Fort Laramie NPS bridge. Another pool was identified by NPS personnel as being at the confluence of the Laramie River. This would involve seeking permission of a private landowner for access. Another pool accessible to a fairly easy launch is below Guernsey Dam. Sampling these four pools at a minimum with a large boat-mounted electrofisher would provide an idea of the species composition. In particularly deep pools such as the Guernsey Dam outlet, a trammel net set overnight may be effective in sampling those species lying near the bottom and out of reach of the electrofisher.

Sampling in the spring for larval fish would provide useful information on the timing of spawning for a number of game fish, particularly walleye, as well as native fish. We passed a number of individuals in the Laramie confluence to State line reach that told us years ago they were able to catch channel catfish and other gamefish species in this section of the river, but in recent years have not been able to catch any game species. Preliminary temperature monitoring indicates similar maximum temperatures among the five reaches, thus it does not at least initially appear that temperature is the limiting factor for game fish. Additional temperature monitoring should

be conducted. A StowAway TidbiT temperature logger could be deployed at each sample site with data being collected year round. Particular care must be employed to find a location that will not be dewatered, and yet will not be torn out by spring high flows and summer irrigation releases. This occurred at the Cole Creek Bridge and at the Torrington Bridge in 1999 in which two temperature loggers were torn off their attachments by debris or ice jams.

A number of fish species native to the North Platte River were found in very low numbers or were not collected at all. The presence of only one plains killifish is of concern since it is indigenous to the North Platte River drainage and is considered to be hardy by Baxter and Stone (1995). The plains topminnow (*Fundulus sciadicus*) is also listed as present in the North Platte River drainage, but apparently is declining. The hornyhead chub (*Nocomis bigguttus*) is now very rare in the North Platte River drainage and is listed by the Natural Heritage Program (2000) as a fish species of concern in Wyoming. Only four flathead chubs were captured, but Baxter and Stone (1995) indicate this is a common species in turbid rivers including the North Platte River. Both the common shiner and brassy minnow are described by Baxter and Stone as inhabiting tributaries of the North Platte River. Their small numbers in our catch may not signify any cause for alarm. We found only small numbers of stonecats in our catch. This relative rarity in our catch is borne out by Baxter and Stone's (1995) comment that stonecat populations have been reduced. Also of concern is the presence of foul sediment in the Douglas to Glendo inlet reach, accompanied by what appears to be trout with BKD and other fish species with other infections and deformities.

These reaches of the North Platte River should be regularly monitored to keep track of impacts both positive and negative on fish communities from implementation of operations changes to the North Platte Reservoir System that contemplated to meet Wyoming's obligation under the Platte River Endangered Species Partnership. At a minimum, the sampling effort discussed in this report could be repeated, with results compared year to year. I would recommend using this survey to develop a standard set of sample sections that are comparable from site to site based on the protocols discussed in Yoder and Smith 1999. That is, all backpack sample sites would be at least 150 m but no more than 200 m in length with a minimum of 1500 to 2000 seconds spent sampling each site. Sample distance for raft or boat-mounted electrofishing should be 100 stream widths long, sampled for at least 1 hour. A sample size of 0.5 km to 1.0 km is also considered adequate for determining species richness (Yoder and Smith 1999). Raft-mounted electrofishing would involve a single pass, or the section could be sampled first on one side of the river, then repeated on the other side of the river for a second pass sample. A boat-mounted system with a motor could involve enough passes to thoroughly sample the entire section. Detailed guidelines for developing a monitoring program are discussed in Yoder and Smith (1999) and Barbour et al. (1999). Taking the effort to develop an Index of Biotic Integrity for the North Platte River would provide a powerful tool to understand impacts of river operations, agricultural activities, and nonnative species introductions to both native and game fish communities (Karr and Chu 1999) and Simon (1999).

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APPENDIX

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: E.K. Wilkens State Park
BIOLOGISTS: Rogers, Felley
DATE: March 26, 1999
METHOD: Backpack Electrofisher, 300 M
TOTAL TIME ELECTROFISHED: 1,775 seconds
SUBSTRATE: 5% small boulders (10-20"); 19% large cobbles (5-10"); 40% coarse gravel (2.5-0.6"); 1% fine gravel; 40% silt
CHANNEL WIDTH: 100 ft. ESTIMATED FLOW: 25 cfs
OTHER OBSERVATIONS:
PRIMARY HABITAT: 98% main channel; 2% backwater
SECONDARY HABITAT: 95% run; 5% riffle

SPECIES	TOTAL LENGTH(mm)	WEIGHT(g)	COMMENTS
Brown Trout	125.0		
Brown Trout	121.0		
Brown Trout	133.0		
Brown Trout	115.0		
Brown Trout	81.0		
Emerald Shiner	44.0		
Emerald Shiner	37.0		
Emerald Shiner	44.0		
Emerald Shiner	48.0		
Emerald Shiner	46.0		
Emerald Shiner	43.0		
Emerald Shiner	33.0		
Emerald Shiner	42.0		
Emerald Shiner	30.0		
Fathead Minnow	52.0		
Fathead Minnow			
Fathead Minnow	54.0		
Longnose Dace	64.0		
Longnose Dace	57.0		
Longnose Dace	35.0		
Longnose Dace	34.0		
Longnose Dace	45.0		
Longnose Dace	50.0		
Longnose Dace	37.0		
Longnose Dace	47.0		
Longnose Dace	41.0		
Longnose Dace	46.0		
Longnose Dace	41.0		
Longnose Dace	38.0		
Longnose Dace	47.0		
Longnose Dace	40.0		
Longnose Dace	39.0		
Longnose Dace	39.0		
Longnose Dace	37.0		
Longnose Dace	50.0		
Longnose Dace	39.0		
Longnose Dace	40.0		
Longnose Dace	40.0		
Longnose Dace	48.0		
Longnose Dace	37.0		
Longnose Dace	38.0		
Longnose Dace	38.0		
Longnose Dace	38.0		
Longnose Dace	65.0		
Longnose Dace	37.0		
Longnose Dace	33.0		

Longnose Dace	37.0
Longnose Dace	44.0
Longnose Dace	35.0
Longnose Dace	33.0
Longnose Dace	37.0
Longnose Dace	29.0
Longnose Dace	42.0
Longnose Dace	40.0
Longnose Dace	34.0
Longnose Dace	37.0
Longnose Dace	67.0
Longnose Dace	49.0
Longnose Dace	39.0
Longnose Dace	38.0
Longnose Dace	39.0
Longnose Dace	35.0
Longnose Dace	47.0
Longnose Dace	37.0
Longnose Dace	41.0
Longnose Dace	36.0
Longnose Dace	31.0
Longnose Dace	32.0
Longnose Dace	32.0
Longnose Dace	
Longnose Dace	38.0
Longnose Sucker	75.0
Longnose Sucker	115.0
Longnose Sucker	83.0
Longnose Sucker	78.0
Longnose Sucker	130.0
Longnose Sucker	60.0
Longnose Sucker	66.0
Longnose Sucker	70.0
Longnose Sucker	66.0
Longnose Sucker	39.0
Red Shiner	63.0
Red Shiner	65.0
Red Shiner	63.0
Sand Shiner	42.0
Sand Shiner	47.0
White Sucker	60.0

Tally of individuals: 23

Summary	Totals	Rel. Abun. %
Brown Trout	5	4.59
Emerald Shiner	9	8.26
Fathead Minnow	3	2.75
Longnose Dace	76	69.72
Longnose Sucker	10	9.17
Red Shiner	3	2.75
Sand Shiner	2	1.83
White Sucker	1	0.92
Total # Fish Sampled	109	
Total Minutes Electrofish	29.58	
CPUE (#fish/min.)	3.68	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Cole Creek WGFD Access (downstream of bridge)
BIOLOGISTS: Sutton, Rogers
DATE: March 25, 1999
METHOD: Backpack Electrofisher
TOTAL TIME ELECTROFISHED: 923 seconds
SUBSTRATE: Large cobbles (5-10"); 10% small cobbles (2.5-5"); 10% coarse gravel (2.5-0.6"); 10% fine gravel; 5% sand; 25% silt
CHANNEL WIDTH: 250ft. ESTIMATED FLOW: 500 cfs
OTHER OBSERVATIONS: Abundant moss on boulders
PRIMARY HABITAT: 89% main channel; 10% backwater; 1% debris
SECONDARY HABITAT: 95% run; 5% riffle

SPECIES	TOTAL LENGTH(mm)	WEIGHT(g)	COMMENTS
Brassy Minnow	72.0	2.9	Reference specimen collected for verification.
Brassy Minnow	56.0	-	
Brown Trout	111.0	14.0	
Longnose Dace	46.0	0.9	
Longnose Dace	45.0	0.7	
Longnose Dace	40.0	0.4	
Longnose Dace	40.0	0.5	
Longnose Dace	43.0	0.6	
Longnose Dace	71.0	3.3	
Longnose Dace	50.0	1.1	
Longnose Dace	45.0	0.6	
Longnose Dace	38.0	-	
Longnose Dace	40.0	-	
Longnose Dace	26.0	-	
Longnose Dace	41.0	0.5	
Longnose Dace	34.0	-	
Longnose Dace	70.0	3.2	
Longnose Dace	72.0	1.0	
Longnose Dace	71.0	3.2	
Longnose Sucker	60.0		
Longnose Sucker	40.0		
Red Shiner	30.0	-	
Red Shiner	25.0	-	
Red Shiner	24.0	-	
Red Shiner	26.0	-	
Sand Shiner	36.0	-	
Sand Shiner	40.0	0.4	
Sand Shiner	35.0	0.3	
Sand Shiner	47.0	0.8	
Sand Shiner	52.0	1.2	
Sand Shiner	53.0	1.2	
Sand Shiner	62.0	2.0	
Sand Shiner	65.0	2.3	
Sand Shiner	54.0	1.2	
Sand Shiner	52.0	1.3	
Sand Shiner	56.0	1.5	
Sand Shiner	70.0	2.7	
Sand Shiner	53.0	1.4	
White Sucker	57.0		
White Sucker	43.0		
White Sucker	62.0	2	
White Sucker	67.0	2.0	
White Sucker	54.0		
White Sucker	61.0		
White Sucker	53.0		
White Sucker	60.0		
White Sucker	59.0		
White Sucker	60.0		

Summary	Totals	Rel. Abun. %
Brassy Minnow	2	4.17
Brown Trout	1	2.08
Longnose Dace	16	33.33
Longnose Sucker	2	4.17
Red Shiner	4	8.33
Sand Shiner	13	27.08
White Sucker	10	20.83
Total # Fish Sampled	48	
Total Minutes Electrofish	15.38	
CPUE (#fish/min.)	3.12	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Cole Cr. Bridge (upstream)
BIOLOGISTS: Felley
DATE: March 26, 1999
METHOD: Backpack Electrofisher
TOTAL TIME ELECTROFISHED: 985 seconds
SUBSTRATE: 1% large cobbles (5-10"); 4% small cobbles (2.5-5"); coarse gravel (2.5-0.6"); 4% fine gravel (0.6-.01"); 1% sand; 80% silt
CHANNEL WIDTH: 150 ft. ESTIMATED FLOW: 500 cfs
OTHER OBSERVATIONS:
PRIMARY HABITAT: 99% main channel; 1% backwater
SECONDARY HABITAT: 95% run; 5% riffle

SPECIES	TOTAL LENGTH(mm)	WEIGHT(g)	COMMENTS
Longnose Dace			Tally of individuals: 24
Emerald Shiner			Tally of individuals: 1

Summary	Totals	Rel. Abun. %
Emerald Shiner	1	4.00
Longnose Dace	24	96.00
Total # Fish Sampled	25	
Total Minutes Electrofish	16.42	
CPUE (#fish/min.)	1.52	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Cole Cr. Bridge downstream to Monkey Hill Bridge
BIOLOGISTS: Broderick, Beddow, Sutton
DATE: March 26, 1999
METHOD: Raft Electrofisher
TOTAL TIME ELECTROFISHED: 11,693 seconds
SUBSTRATE: 15% large boulders (40-80"); 5% Large cobbles (5-10"); 15% small cobbles; 10% coarse gravel (2.5-0.6"); 10% fine gravel (0.6-.01"); 45% sand.
CHANNEL WIDTH: 300 ft. ESTIMATED FLOW: 25 cfs
OTHER OBSERVATIONS: <1% large woody debris; 15% overhanging grass on banks.
PRIMARY HABITAT: 85% main channel; 15% secondary channel.
SECONDARY HABITAT: 10% riffle; 85% run, 5% pool.
This is a transition zone - cleaner bottom, few carp, more trout, but with overall fewer fish.

SPECIES	TOTAL LENGTH(mm)	WEIGHT(g)	COMMENTS
Brown Trout	133.0		
Brown Trout	365.0	500.0	
Brown Trout	132.0	-	
Brown Trout	135.0	-	
Brown Trout	135.0	20.0	
Brown Trout	149.0	250.0	
Common Carp			Tally of individuals: 1+8+11+13+11
Common Carp	680.0	-	
Longnose Dace	52.0		
Longnose Dace	45.0		
Longnose Dace	42.0	-	
Longnose Dace	55.0		
Longnose Dace	43.0		
Longnose Dace	34.0		
Longnose Dace	83.0	-	
Longnose Dace	41.0		
Longnose Dace	40.0		
Longnose Dace	60.0		
Longnose Dace	44.0		
Longnose Dace	41.0		
Longnose Dace	53.0		
Longnose Dace	61.0		
Longnose Sucker	171.0	-	
Longnose Sucker	332.0	500.0	
Longnose Sucker	390.0	300.0	
Longnose Sucker			Tally of individuals: 3+1+2+1+2+9
Longnose Sucker	231.0	190.0	
Longnose Sucker	415.0	420.0	
Longnose Sucker	275.0	300.0	
Longnose Sucker	315.0	400.0	
Longnose Sucker	261.0	250.0	
Longnose Sucker	72.0		
Longnose Sucker	445.0	1250.0	
Longnose Sucker	161.0	-	
Rainbow Trout	450.0	1100.0	
Rainbow Trout	390.0	690.0	
Rainbow Trout	448.0	-	
Rainbow Trout	151.0	-	
Rainbow Trout	401.0	910.0	
Rainbow Trout	78.0	-	
Rainbow Trout	351.0	580.0	
Rainbow Trout	365.0	610.0	
Rainbow Trout	320.0	400.0	
Rainbow Trout	331.0	500.0	
Rainbow Trout	395.0	650.0	

Sand Shiner	65.0		
Shorthead Redhorse	485.0	1600.0	
Shorthead Redhorse			Tally of individuals: 1
White Sucker	445.0	1120.0	
White Sucker	342.0	540.0	
White Sucker	352.0	650.0	
White Sucker	437.0	1100.0	
White Sucker	410.0	900.0	
White Sucker	498.0	1900.0	
White Sucker	395.0	880.0	
White Sucker	50.0		
White Sucker	426.0	1250.0	
White Sucker	503.0	1700.0	
White Sucker	356.0	610.0	
White Sucker	70.0		
White Sucker	302.0	380.0	
White Sucker	152.0	-	
White Sucker	350.0	600.0	
White Sucker			Tally of individuals: 5+4+2+5+1+11+1+4+2
White Sucker	145.0	-	
White Sucker	131.0	20.0	
White Sucker	175.0	20.0	
White Sucker	59.0		
White Sucker	233.0	140.0	
White Sucker	351.0	580.0	
White Sucker	275.0	290.0	
White Sucker	55.0		

Summary	Totals	Rel. Abun. %
Brown Trout	6	3.61
Common Carp	45	27.11
Longnose Dace	14	8.43
Longnose Sucker	29	17.47
Rainbow Trout	11	6.63
Sand Shiner	1	0.60
Shorthead Redhorse	2	1.20
White Sucker	58	34.94
Total # Fish Sampled	166	
Total Minutes Electrofish	194.9	
CPUE (#fish/min.)	0.85	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: PPL - Glenrock Access Area to Bixby Access Area
BIOLOGISTS: Broderick, Beddow, Felley
DATE: March 25, 1999
METHOD: Raft Electrofisher
TOTAL TIME ELECTROFISHED: 4,785 seconds
SUBSTRATE: 5% small boulders (10-20"); 5% large cobbles (5-10"); 5% small cobbles (2.5-5"); 2% coarse gravel (2.5-0.6"); 73% sand; 10% silt.
CHANNEL WIDTH: 300 ft. ESTIMATED FLOW: 500 - 700 cfs
OTHER OBSERVATIONS: <1% large woody debris. Water very turbid - < 1 ft. visibility. Grass overhanging most banks.
PRIMARY HABITAT: 70% main channel; 20% island; 5% backwater
SECONDARY HABITAT: 15% riffle; 80% run; 5% pool

SPECIES	TOTAL LEN(mm)	WEIGHT(g)	COMMENTS
Channel Catfish	470.0	1100.0	Leaches on caudal and anal fins.
Channel Catfish	687.0	-	Lumps on pectoral and caudal fins
Channel Catfish	595.0	2400.0	
Common Carp	390.0	680.0	
Common Carp	410.0	800.0	
Common Carp	23.0		Smallest carp collected this trip.
Common Carp			Tally of individuals: 8+16+15+9+26+23+38+26+31
Common Carp	440.0	-	
Common Carp	550.0	2300.0	
Common Carp	420.0	88.0	
Common Carp	430.0	890.0	
Common Carp	430.0	990.0	
Common Carp	410.0	770.0	
Common Carp	630.0	-	
Common Carp	610.0	4150.0	
Longnose Dace	84.0		
Longnose Dace	87.0		
Longnose Dace	74.0		
Longnose Sucker	360.0	690.0	
Longnose Sucker	102.0	10.0	
Longnose Sucker	380.0	620.0	
Longnose Sucker	238.0	320.0	
Longnose Sucker	192.0	120.0	
Longnose Sucker	175.0	80.0	
Longnose Sucker	287.0	260.0	
Longnose Sucker	365.0	720.0	
Longnose Sucker	246.0	190.0	
Longnose Sucker	340.0	160.0	
Longnose Sucker	135.0	-	
Longnose Sucker	390.0	750.0	
Longnose Sucker	375.0	700.0	Nuptial tubercles present.
Longnose Sucker	381.0	740.0	
Longnose Sucker	142.0	-	
Longnose Sucker	156.0	50.0	
Longnose Sucker			Tally of individuals: 11+3+4
Longnose Sucker	202.0	140.0	
Longnose Sucker	389.0	780.0	Deformed - missing an eye.
Longnose Sucker	180.0	70.0	
Longnose Sucker	211.0	120.0	
Longnose Sucker	305.0	370.0	
Longnose Sucker	160.0	30.0	Eroded caudal fin.
Longnose Sucker	370.0	350.0	
Longnose Sucker	259.0	260.0	
Longnose Sucker	380.0	750.0	
Longnose Sucker	370.0	780.0	
Longnose Sucker	270.0	70.0	

Longnose Sucker	382.0	630.0	
Longnose Sucker	390.0	480.0	
Longnose Sucker	360.0	-"	
Longnose Sucker	350.0	480.0	
Longnose Sucker	210.0	120.0	
Longnose Sucker	300.0	340.0	
Longnose Sucker	350.0	480.0	
Longnose Sucker	260.0	180.0	
Longnose Sucker	300.0	310.0	
Longnose Sucker	350.0	400.0	
Longnose Sucker	81.0	-	
Longnose Sucker	290.0	250.0	
Longnose Sucker	420.0	880.0	
Longnose Sucker	390.0	720.0	
Longnose Sucker	440.0	1100.0	
Longnose Sucker	175.0	50.0	
Longnose Sucker	440.0	1050.0	
Longnose Sucker	410.0	680.0	
Longnose Sucker	330.0	210.0	
Quillback	350.0	450.0	
Quillback	421.0	780.0	
Quillback	412.0	980.0	
Quillback	390.0	680.0	
Quillback	390.0	770.0	
Quillback	475.0	1650.0	
Quillback	400.0	970.0	
Quillback	450.0	1100.0	
Quillback	420.0	980.0	
Quillback	406.0	1150.0	
Quillback	400.0	750.0	
Quillback	450.0	1340.0	
Quillback	450.0	-	
Rainbow Trout	360.0	350.0	
Rainbow Trout	330.0		
Rainbow Trout	360.0		
Rainbow Trout	420.0	750.0	Eroded dorsal, pectoral and top lobe of caudal fin.
Rainbow Trout	410.0	680.0	Good condition.
Rainbow Trout	410.0	680.0	
Sand Shiner	61.0	-	
Sand Shiner	60.0	-	
Sand Shiner	60.0	-	
Sand Shiner	57.0	-	
Sand Shiner	57.0	-	
Sand Shiner	57.0	-	
Sand Shiner	54.0		
Sand Shiner	42.0	-	
Sand Shiner	60.0	-	
Sand Shiner	59.0	-	
Sand Shiner	53.0	-	
Sand Shiner	54.0		
Shorthead Redhorse	400.0	690.0	
Shorthead Redhorse	500.0	1600.0	
Shorthead Redhorse	350.0	280.0	
Shorthead Redhorse	410.0	880.0	
Shorthead Redhorse	488.0	1400.0	
Shorthead Redhorse	451.0	1250.0	
Shorthead Redhorse			Tally of individuals: 10+6
Shorthead Redhorse	453.0	1200.0	
Shorthead Redhorse	390.0	800.0	
Shorthead Redhorse	500.0	1650.0	

Shorthead Redhorse	458.0	1390.0	
Shorthead Redhorse	390.0	670.0	
Shorthead Redhorse	362.0	600.0	
Shorthead Redhorse	400.0	750.0	
Shorthead Redhorse	440.0	1000.0	
Shorthead Redhorse	415.0	930.0	
Shorthead Redhorse	380.0	430.0	
Shorthead Redhorse	500.0	1260.0	
Walleye	495.0	1370.0	
White Sucker	170.0	60.0	
White Sucker	130.0	20.0	
White Sucker	320.0	370.0	
White Sucker	275.0	270.0	Nuptial tubercles present.
White Sucker	370.0	700.0	
White Sucker	225.0	150.0	
White Sucker	380.0	470.0	
White Sucker	270.0	250.0	
White Sucker	282.0	320.0	
White Sucker	370.0	440.0	
White Sucker	404.0	950.0	
White Sucker	380.0	750.0	
White Sucker	367.0	600.0	
White Sucker	272.0	280.0	
White Sucker	191.0	111.0	
White Sucker	130.0	20.0	

Summary	Totals	Rel. Abun. (%)
Channel Catfish	3	0.85
Common Carp	203	57.34
Longnose Dace	3	0.85
Longnose Sucker	64	18.08
Quillback	13	3.67
Rainbow Trout	6	1.69
Sand Shiner	12	3.39
Shorthead Redhorse	33	9.32
Walleye	1	0.28
White Sucker	16	4.52
Total # Fish Sampled	354	
Total Minutes Electrofish	79.8	
CPUE (#fish/min.)	4.44	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Bixby Access Area
BIOLOGISTS: Sutton, Rogers
DATE: March 25, 1999
METHOD: Backpack Electrofisher
TOTAL TIME ELECTROFISHED: 979 seconds, 450 ft.
SUBSTRATE: 5% small cobbles (2.5-5"); 5% fine gravel (0.6-.01"); 90% silt.
CHANNEL WIDTH: 300 ft. ESTIMATED FLOW: 500 cfs
OTHER OBSERVATIONS: 5% vegetation in channel; 5% grass and cattails along banks.
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 100% run

SPECIES	TOTAL LENGTH (mm	WEIGHT (g)	COMMENTS
Common Shiner	72.0		narrow; origin of dorsal near pelvic origin. Very uncommon in N.
Fathead Minnow	66.0		Platte mainstem. 23 scales b/4 dorsal fin. Kept specimen for vouch
Fathead Minnow	70.0		10 anal rays, 45 lat line scales, 8 dorsal rays, pharangeals 2-4, hoo
Fathead Minnow	47.0		
Fathead Minnow	57.0		
Fathead Minnow	60.0		
Fathead Minnow	72.0		
Fathead Minnow	49.0		
Red Shiner	27.0		9 anal fin rays.
Red Shiner	29.0		
Red Shiner	27.0		
Red Shiner	29.0		
Red Shiner	26.0		
Red Shiner	24.0		
Red Shiner	23.0		
Red Shiner	23.0		
Red Shiner	26.0		
Red Shiner	25.0		
Red Shiner	30.0		
Red Shiner	21.0		
Red Shiner	26.0		
Red Shiner	21.0		
Red Shiner	25.0		
Red Shiner	25.0		
Red Shiner	20.0		
Red Shiner	24.0		
Red Shiner	24.0		
Red Shiner	25.0		
Red Shiner	26.0		
Red Shiner	22.0		
Red Shiner	25.0		
Red Shiner	28.0		
Red Shiner	26.0		
Red Shiner	25.0		
Red Shiner	25.0		
Red Shiner	47.0		
Red Shiner	48.0		
Red Shiner	55.0		
Red Shiner	42.0		
Red Shiner	50.0		
Red Shiner	40.0		
Red Shiner	21.0		
Red Shiner	44.0		
Red Shiner	52.0		
Red Shiner	47.0		
Red Shiner	25.0		

Red Shiner	24.0
Red Shiner	25.0
Sand Shiner	35.0
Sand Shiner	35.0
Sand Shiner	34.0
Sand Shiner	36.0
Stonecat	55.0
White Sucker	60.0
White Sucker	83.0
White Sucker	76.0
White Sucker	70.0
White Sucker	56.0
White Sucker	435.0
White Sucker	83.0
White Sucker	370.0

Batteries lost power near end of reach. Saw small fish swimming through electric field.

Summary	Totals	Rel. Abun.(%)
Common Shiner	1.0	1.64
Fathead Minnow	7.0	11.48
Red Shiner	40.0	65.57
Sand Shiner	4.0	6.56
Stonecat	1.0	1.64
White Sucker	8.0	13.11
Total # Fish Sampled	61.0	
Total Minutes Electrofish	16.3	
CPUE (#fish/min.)	3.7	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Anderson Dairy Bridge to Fitzgerald WGFD Access
BIOLOGISTS: Broderick, Rogers, Smith
DATE: March 22, 1999
METHOD: Raft Electrofisher
TOTAL TIME ELECTROFISHED: 4253 seconds
SUBSTRATE: 2% small boulders (10-20");10% large cobbles (5-10"); 50% small cobbles (2.5-5"); 15% coarse gravel (2.5-0.6"); 10% sand; 13% silt
CHANNEL WIDTH: 150 ft. ESTIMATED FLOW: 500 - 700 cfs
OTHER OBSERVATIONS: Water is very turbid, visibility 0"
PRIMARY HABITAT: 95% main channel 5% islands/secondary channels
SECONDARY HABITAT: 20% riffle, 80% run

SPECIES	TOTAL LEN(mm)	WEIGHT (g)	COMMENTS
Brown Trout	407.0	600.0	
Brown Trout	143.0	50.0	Fin clipped.
Common Carp	440.0	1000.0	
Common Carp	590.0		
Common Carp			Tally of large individuals: 8+23+12+10+3+12
Common Carp	605.0	2400.0	
Common Carp	430.0	1100.0	
Common Carp	440.0	900.0	
Common Carp	450.0	1200.0	
Common Carp	400.0	1000.0	
Common Carp	410.0	950.0	
Common Carp	455.0	1000.0	
Common Carp	425.0	1100.0	
Common Carp	425.0	1100.0	
Common Carp	485.0	1200.0	
Longnose Sucker	335.0	500.0	
Longnose Sucker	333.0	500.0	
Longnose Sucker	370.0	650.0	
Longnose Sucker	350.0	600.0	
Longnose Sucker	390.0	820.0	
Longnose Sucker	400.0	900.0	
Rainbow Trout	390.0	600.0	
Sand Shiner	88.0		-Make sure this falls within normal length range. OK - up to 95 mm.
Sand Shiner	55.0		-Whirl pac'd for scope i.d.
Sand Shiner	29.0		-
Sand Shiner	67.0		-
Sand Shiner	34.0		
Sand Shiner	60.0		-
Sand Shiner	46.0		
Sand Shiner	57.0	3.2	We were turning fish & stunning them well. The Rainbow Trout got
Sand Shiner	59.0	6.4	turned and stunned well.
Sand Shiner	70.0		
Sand Shiner	55.0		
Sand Shiner	68.0		-
Sand Shiner	40.0		
Sand Shiner	63.0	1.8	
Sand Shiner	64.0		-
Sand Shiner	53.0	0.8	
Shorthead Redhorse	455.0	1250.0	
Shorthead Redhorse			Tally of individuals: 2
Shorthead Redhorse	485.0	1450.0	
Shorthead Redhorse	415.0	1000.0	
Shorthead Redhorse	465.0	1300.0	
Shorthead Redhorse	480.0	1400.0	
Shorthead Redhorse	470.0	1300.0	
Shorthead Redhorse	400.0	800.0	

Shorthead Redhorse	463.0	1320.0	
Shorthead Redhorse	415.0	880.0	
Shorthead Redhorse	385.0	700.0	
White Sucker	390.0	750.0	
White Sucker	378.0	750.0	
White Sucker	413.0	900.0	
White Sucker	370.0	600.0	
White Sucker	370.0	650.0	
White Sucker	368.0	650.0	
White Sucker	254.0	250.0	
White Sucker			Tally of individuals: 5+9+3+2
White Sucker	370.0	500.0	

Summary:	Totals	Rel. Abund. %
Brown Trout	2	1.39
Common Carp	80	55.56
Longnose Sucker	6	4.17
Rainbow Trout	1	0.69
Sand Shiner	16	11.11
Shorthead Redhorse	12	8.33
White Sucker	27	18.75
Total # fish sampled	144	
Total minutes electrofishe	70.88	
CPUE (fish/minute)	2.0	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Fitzgerald WGFD Access to Wagonhound Cr.
BIOLOGISTS: Broderick, Smith, Rogers, Felley
DATE: March 23, 1999
METHOD: Raft Electrofisher
TOTAL TIME ELECTROFISHED: 3,109 seconds
SUBSTRATE: 2% very large boulders (80-160"); 3% large boulders (40-80"); 10% small boulders (10-20"); 10% large cobbles (5-10"); 10% small cobbles (2.5-5"); 20% silt
CHANNEL WIDTH: 150 - 300 ft. ESTIMATED FLOW: 600 cfs
OTHER OBSERVATIONS: silt is extremely noxious, like sewage. Many fish were diseased. Few small fish observed.
PRIMARY HABITAT: 75% main channel; 15% secondary channel; 5% backwater; 5% island
SECONDARY HABITAT: 15% riffle; 75% run; 10% pool

SPECIES	TOTAL LENGTH	WEIGHT	COMMENTS
Channel Catfish	85.0	57.0	
Channel Catfish			Approx 700 mm, but it surfaced just beyond dipnet - positive i.d.
Common Carp	400.0	570.0	
Common Carp	470.0	1200.0	
Common Carp	420.0	1100.0	
Common Carp	355.0	560.0	
Common Carp	440.0	1100.0	
Common Carp	380.0	570.0	2 of the tallied common carp adults had massive amounts of fungus.
Common Carp			Tally of individuals: 34+30 +12
Common Carp	415.0	590.0	Sore or injury over pectoral fin insert
Common Carp	410.0	580.0	
Common Carp	400.0	550.0	
Gizzard Shad	~20		Missed it, but could clearly I.D. it.
Longnose Sucker	390.0	770.0	Deep wound (1 cm deep) may be eagle talon injury on dorsal.
Longnose Sucker	235.0	150.0	
Longnose Sucker	245.0	150.0	
Longnose Sucker	235.0	150.0	
Longnose Sucker	390.0	730.0	
Longnose Sucker			Tally of individuals: 5
Rainbow Trout	310.0	300.0	Goggle-eyed + red fins & brown mossy stuff on caudal peduncle - BK
Red Shiner	69.0	-	
Red Shiner	69.0	-	3 of red shiners had black dots randomly scattered on sides - disease
Red Shiner	63.0	-	Overall very few small fish observed during this sampling effort.
Red Shiner	60.0	-	
Red Shiner	64.0	-	
Red Shiner	56.0	-	
Red Shiner	62.0	-	
Red Shiner	55.0	-	
Red Shiner	60.0	-	
Red Shiner	60.0	-	
Red Shiner	62.0	-	
Sand Shiner	55.0	-	
Sand Shiner	56.0	-	
Sand Shiner	56.0	-	
Sand Shiner	59.0	2.0	
Sand Shiner	52.0	1.4	
Shorthead Redhorse	405.0	790.0	
Shorthead Redhorse	395.0	570.0	
Shorthead Redhorse	405.0	580.0	
Shorthead Redhorse	440.0	1000.0	
Shorthead Redhorse	415.0	850.0	
Shorthead Redhorse	440.0	950.0	
Shorthead Redhorse	420.0	900.0	
Shorthead Redhorse			Tally of individuals: 3
Stonecat	-	-	

Stonecat	11.0	12.8	
Stonecat	-	-	
Stonecat	-	-	
Stonecat	-	-	
White Sucker	375.0	700.0	
White Sucker			Tally of individuals: 5+3
White Sucker	390.0	800.0	
White Sucker	360.0	590.0	
White Sucker	385.0	700.0	
White Sucker	400.0	860.0	Malformed scales throughout body.
White Sucker	390.0	820.0	Deformed caudal - upper lobe.
White Sucker	330.0	450.0	

Summary	Totals	Rel. Abun. %
Channel Catfish	2	1.38
Common Carp	85	58.62
Gizzard Shad	1	0.69
Longnose Sucker	10	6.90
Rainbow Trout	1	0.69
Red Shiner	11	7.59
Sand Shiner	5	3.45
Shorthead Redhorse	10	6.90
Stonecat	5	3.45
White Sucker	15	10.34
Total # Fish Sampled	145	
Total Minutes Electrofish	51.82	
CPUE (#fish/min.)	2.80	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Wagonhound Cr.- Confluence with N. Platte R.
BIOLOGISTS: Broderick, Rogers, Felley, Smith
DATE: March 23, 1999
METHOD: Backpack Electrofisher
TOTAL TIME ELECTROFISHED: 2,947 seconds
SUBSTRATE: 30% small boulders (10-20"); 30% large cobbles (5-10"); 10% small cobbles (2.5-5"); 30% silt
CHANNEL WIDTH: 150 - 300 ft. ESTIMATED FLOW: 600 cfs
OTHER OBSERVATIONS: Substrate evil smelling - sewage sludge maybe
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 50% riffles; 40% run; 10% pool

SPECIES	TOTAL LENGTH(mm)	WEIGHT(g)	COMMENTS
Fathead Minnow	56.0	2.2	
Longnose Dace	50.0	1.1	Has poppy seed-sized black spots - under scope looks like spores
Longnose Dace	61.0	2.2	
Longnose Dace	47.0	9.0	
Sand Shiner	34.0	0.3	
Sand Shiner	42.0	0.5	
Sand Shiner	36.0	0.4	
Sand Shiner	35.0	0.3	
Sand Shiner	39.0	0.4	
Sand Shiner	28.0	0.1	
Sand Shiner	35.0	0.3	
Sand Shiner	22.0	-	
Sand Shiner	24.0	-	
Sand Shiner	23.0	0.1	Black spots on skin.
Sand Shiner	33.0	0.1	
Sand Shiner	34.0	0.1	
Sand Shiner	35.0	4.0	
Sand Shiner	31.0	0.2	
Sand Shiner	33.0	2.0	
Sand Shiner	66.0	2.6	
Sand Shiner	51.0	1.1	
Sand Shiner	61.0	2.4	
Sand Shiner	56.0	1.5	
Sand Shiner	55.0	1.4	
Sand Shiner	55.0	1.5	
Sand Shiner	63.0	2.4	
Sand Shiner	60.0	1.9	
Sand Shiner	58.0	1.6	
Sand Shiner	60.0	1.7	
Sand Shiner	61.0	2.1	
Stonecat	59.0	-	
Stonecat	50.0	-	
Stonecat	155.0	34.5	

Summary	Totals	Rel. Abun. %
Fathead Minnow	1	3.03
Longnose Dace	3	9.09
Sand Shiner	26	78.79
Stonecat	3	9.09
Total # Fish Sampled	33	
Total Minutes Electrofish	49.12	
CPUE (#fish/min.)	0.67	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Orin Access Area to Byron Wilson/County Line Access Area
BIOLOGISTS: Broderick, Rogers, Felley, Smith
DATE: March 24, 1999
METHOD: Raft Electrofisher
TOTAL TIME ELECTROFISHED: 5,491 seconds
SUBSTRATE: 20% large cobbles (5-10"); 20% small cobbles (2.5-5"); 5% coarse gravel (2.5-.6"); 5% fine gravel (.6 - .01"); 50% sand
CHANNEL WIDTH: 300ft. ESTIMATED FLOW: 600 cfs
OTHER OBSERVATIONS: < 1% Large Woody Debris.
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 10% riffle; 80% run; 10% pool

SPECIES	TOTAL LEN (mm)	WEIGHT (g)	COMMENTS
Common Carp			Tally of large individuals: 18+1+3+21+30+12+9+11+10+12
Creek Chub	91.0		
Emerald Shiner	80.0		
Emerald Shiner	72.0	2.1	11 anal rays
Emerald Shiner	75.0		
Emerald Shiner	81.0		
Flathead Chub	79.0		
Flathead Chub	59.0		
Flathead Chub	57.0		
Flathead Chub	96.0		
Longnose Dace	65.0	2.8	
Longnose Dace	70.0		
Longnose Sucker	190.0	120.0	
Longnose Sucker	220.0	150.0	
Longnose Sucker	195.0	75.0	
Longnose Sucker	100.0		
Longnose Sucker	130.0	10.0	
Longnose Sucker	112.0		
Longnose Sucker	130.0	31.2	
Longnose Sucker	190.0	70.0	
Longnose Sucker	250.0	-	
Longnose Sucker	260.0	250.0	Tallied large ones, but measured these smaller ones.
Longnose Sucker	300.0	350.0	
Longnose Sucker	230.0	150.0	
Longnose Sucker	240.0	220.0	
Longnose Sucker	320.0	450.0	
Longnose Sucker	260.0	250.0	
Longnose Sucker	195.0	-	
Longnose Sucker			Tally of adults: 2+1+1+1+1+1
Red Shiner	52.0	0.9	9 anal rays, 33 lat line rays, 8 dorsal rays, 11 mm deep 40 mm SL
Sand Shiner	51.0	1.1	
Sand Shiner	57.0	1.1	
Sand Shiner	56.0	1.4	
Sand Shiner	57.0	1.4	
Sand Shiner	58.0	1.5	
Sand Shiner	57.0	1.4	
Sand Shiner	58.0	1.6	
Sand Shiner	59.0	0.8	
Sand Shiner	51.0	1.0	
Sand Shiner	57.0	1.5	
Sand Shiner	51.0	1.0	
Sand Shiner	48.0	0.8	
Sand Shiner	53.0	1.3	
Sand Shiner	56.0	1.3	
Sand Shiner	50.0	0.9	
Sand Shiner	51.0	1.0	

Sand Shiner	46.0	0.8	
Sand Shiner	56.0	1.4	
Sand Shiner	57.0	1.6	
Sand Shiner	58.0	1.7	
Sand Shiner	59.0	1.6	
Sand Shiner	57.0	1.5	
Sand Shiner	55.0	1.5	
Sand Shiner	55.0	1.6	
Sand Shiner	55.0	1.3	
Sand Shiner	59.0	1.7	
Sand Shiner	54.0	1.4	
Sand Shiner	60.0	1.6	
Sand Shiner	50.0	1.0	
Sand Shiner	54.0	1.3	
Sand Shiner	56.0		
Sand Shiner	50.0		
Sand Shiner	59.0		
Sand Shiner	55.0	1.5	
Sand Shiner	56.0	1.5	
Sand Shiner	56.0	1.4	
Sand Shiner	57.0	1.7	
Sand Shiner	35.0	0.2	
Sand Shiner	56.0	-	
Sand Shiner	57.0	1.0	
Sand Shiner	65.0	-	
Sand Shiner	55.0	1.6	
Sand Shiner	60.0	1.8	
Sand Shiner	68.0	-	
Sand Shiner	60.0	-	
Sand Shiner	59.0	1.8	
Sand Shiner	54.0	-	
Sand Shiner	55.0	1.7	
Sand Shiner	59.0	-	
Shorthead Redhorse			Tally of adults: 11+21+5+8+1+14+5+2+1+1+3
Shorthead Redhorse			'Tally of individuals: 18
Walleye	450.0	1050.0	
Walleye	420.0	800.0	
Walleye	410.0	750.0	
Walleye	400.0	750.0	
Walleye	470.0	1200.0	
Walleye	410.0	800.0	
Walleye	540.0	1800.0	Milt
Walleye	410.0	700.0	
Walleye	400.0	750.0	
Walleye	410.0	650.0	
Walleye	400.0	650.0	
Walleye	390.0	750.0	
Walleye	400.0	650.0	
Walleye	410.0	850.0	
Walleye	420.0	800.0	
Walleye	390.0	650.0	Milt
Walleye	490.0	1300.0	
Walleye	390.0	600.0	
Walleye	490.0	1000.0	
Walleye	400.0	700.0	
Walleye	410.0	800.0	
Walleye	390.0	650.0	
Walleye	500.0	1600.0	
Walleye	460.0	1600.0	
Walleye	340.0	400.0	

Walleye	450.0	-	
Walleye	380.0	550.0	
Walleye	510.0	1650.0	
Walleye	390.0	600.0	
Walleye	440.0	1000.0	Milt
Walleye	420.0	750.0	
Walleye	415.0	700.0	
Walleye	450.0	1200.0	
Walleye	430.0	900.0	Milt
Walleye	440.0	1000.0	
Walleye	440.0	-	
Walleye	490.0	-	
Walleye	480.0	1150.0	
Walleye	640.0	3200.0	
Walleye	610.0		Huge lump on side of dorsal.
Walleye	400.0	750.0	
Walleye	610.0	2700.0	
Walleye	490.0	1500.0	
Walleye			Tally of individuals: 1+16+13+10+33+5+10+15+27
Walleye	400.0	750.0	
Walleye	470.0	1150.0	
Walleye	410.0	800.0	
Walleye	430.0	900.0	
Walleye	440.0	800.0	
Walleye	470.0	1250.0	
Walleye	470.0	1100.0	
Walleye	430.0	750.0	
Walleye	460.0	-	
Walleye	530.0	-	
Walleye	410.0	-	
Walleye	410.0	800.0	
Walleye	400.0	800.0	
Walleye	410.0	750.0	
White Sucker			Tally of adults: 1+2+1
White Sucker	350.0	500.0	
White Sucker	230.0	50.0	
White Sucker	75.0		
White Sucker	330.0	450.0	
Yellow Perch	130.0		
Yellow Perch	117.0		
Yellow Perch	134.0		

Summary	totals	rel. abun. %
Common Carp	127	25.45
Creek Chub	1	0.20
Emerald Shiner	4	0.80
Flathead Chub	4	0.80
Longnose Dace	2	0.40
Longnose Sucker	23	4.61
Red Shiner	1	0.20
Sand Shiner	49	9.82
Shorthead Redhorse	90	18.04
Walleye	187	37.47
White Sucker	8	1.60
Yellow Perch	3	0.60
Total # Fish Sampled	499	
Total Minutes Electrofish	91.52	
CPUE (#fish/min.)	5.45	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Glendo State Park Below Powerhouse @ Mouth of Sand Draw
BIOLOGISTS: Broderick, Beddow, Rogers, Felley
DATE: March 15, 1999
METHOD: Backpack Electrofisher, 100 M
TOTAL TIME ELECTROFISHED: 5,776 seconds
SUBSTRATE: 20% very large boulders (80-160"); 10% large boulders (40-80"); 20% medium boulders (20-40"); 30% small boulders (10-20"); 10% coarse gravel (2.5-0.6"); sand 10%
CHANNEL WIDTH: 50-100 ft. ESTIMATED FLOW: 25 cfs
OTHER OBSERVATIONS: Abundant moss on boulders
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: Rapids 20%; Run 60%; Pool 20%

SPECIES	TOT. LENGTH(mm)	WEIGHT(g)	COMMENTS
Brown Trout	110.0	22.0	
Channel Catfish	49.0	1.5	
Emerald Shiner	40.0	0.4	
Emerald Shiner	65.0	1.6	
Emerald Shiner	46.0	0.5	
Emerald Shiner	76.0	2.0	
Emerald Shiner	72.0	2.5	
Emerald Shiner	86.0	3.4	
Emerald Shiner	86.0	3.4	
Emerald Shiner	38.0	0.2	
Emerald Shiner	83.0	3.1	
Emerald Shiner	97.0	5.8	
Emerald Shiner	95.0	5.0	
Emerald Shiner	75.0	2.3	Following fish keyed with dissecting scope.
Emerald Shiner	66.0	1.2	
Emerald Shiner	76.0	2.4	
Emerald Shiner	43.0	0.3	
Emerald Shiner	50.0	0.7	
Emerald Shiner	45.0	0.4	
Emerald Shiner	45.0	0.6	
Emerald Shiner	50.0	0.7	
Emerald Shiner	43.0	0.5	
Emerald Shiner	51.0	0.5	
Emerald Shiner	42.0	0.4	
Emerald Shiner	32.0	0.1	
Emerald Shiner	43.0	0.3	
Emerald Shiner	47.0	-	
Emerald Shiner	57.0	1.1	
Emerald Shiner	50.0	0.7	
Longnose Dace	96.0	11.0	
Longnose Dace	100.0	11.0	
Longnose Dace			Tally: 92
Longnose Dace			
Longnose Dace	94.0	7.0	
Longnose Dace	64.0	2.2	
Longnose Dace	92.0	-	
Longnose Dace	78.0	5.1	
Longnose Dace	65.0	3.0	
Longnose Dace	95.0	9.0	
Longnose Dace	86.0	7.0	
Longnose Dace	78.0	6.0	
Longnose Dace	88.0	7.0	
Longnose Dace	90.0	9.0	
Longnose Dace	73.0	3.5	
Longnose Dace	90.0	9.0	
Longnose Dace	71.0	4.0	

Longnose Dace	75.0	6.0	
Longnose Dace	98.0	11.0	
Longnose Dace	87.0	7.0	
Longnose Sucker	81.0	7.0	
Longnose Sucker	92.0	10.0	
Longnose Sucker	88.0	8.0	
Longnose Sucker	95.0	11.0	
Longnose Sucker	153.0	33.0	
Longnose Sucker	80.0	7.0	
Longnose Sucker	88.0	8.0	
Longnose Sucker	115.0	15.0	
Longnose Sucker	86.0	7.0	
Longnose Sucker	95.0	10.0	
Longnose Sucker	105.0	14.0	
Longnose Sucker	75.0	6.0	
Longnose Sucker	80.0	6.0	
Longnose Sucker	86.0	8.1	
Longnose Sucker			Tally: 15
Longnose Sucker	94.0	10.2	
Plains Killifish	52.0	1.8	
Rainbow Trout	150.0	38.0	
Rainbow Trout	165.0	40.0	
Rainbow Trout	165.0	40.0	
Rainbow Trout	130.0	22.0	
Spottail Shiner	57.0	1.4	
Spottail Shiner	50.0	1.1	
Spottail Shiner	52.0	1.2	
Spottail Shiner	57.0	1.4	
Spottail Shiner	55.0	1.1	
Spottail Shiner	53.0	1.2	
Spottail Shiner	87.0	4.7	
Stonecat	105.0	13.0	
White Sucker	195.0	182.0	
White Sucker	225.0	130.0	
White Sucker	230.0	140.0	
White Sucker	145.0	30.0	
White Sucker	150.0	40.0	

Summary	totals	rel. abun. %
Brown Trout	1	0.53
Channel Catfish	1	0.53
Emerald Shiner	27	14.36
Longnose Dace	111	59.04
Longnose Sucker	30	15.96
Plains Killifish	1	0.53
Rainbow trout	4	2.13
Spottail Shiner	7	3.72
Stonecat	1	0.53
White Sucker	5	2.66
Total # Fish Sampled	188	
Total # Minutes	96.3	
CPUE (# fish/min.)	1.79	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Bull's Bend
BIOLOGISTS: Broderick, Beddow, Rogers, Felley
DATE: March 16, 1999
METHOD: Backpack Electrofisher, 200 M
TOTAL TIME ELECTROFISHED: 1,346 seconds
SUBSTRATE: 30% large cobbles (5-10"); 40% small cobbles (2.5-5"); 10% coarse gravel (2.5-.6")
5% fine gravel (.6 - .01") ; 10% sand; 5% silt.
CHANNEL WIDTH: 100 ft. ESTIMATED FLOW: 45 cfs
OTHER OBSERVATIONS: very sparse fish #'s on shallow cobbles, none in 3' deep pool, but many more along edges.
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 70% run; 30% pool

SPECIES	TOTAL LEN (mm)	WEIGHT (g)	COMMENTS
Black Crappie	64.0	-	This is not in usual habitat , but have specimen preserved for pos.i.d
Bluegill	37.0	0.8	angle of jaw vert line thru front of eye, dark bars, flex. oper. flap.
Creek Chub	113.0	16.1	60 lat line scales, black spot anterior edge of dorsal fin
Creek Chub	39.0	-	
Emerald Shiner	36.0	-	
Emerald Shiner	42.0	-	
Emerald Shiner	45.0	-	
Emerald Shiner	43.0	-	
Emerald Shiner	78.0	2.3	
Emerald Shiner	47.0	-	
Emerald Shiner	62.0	-	
Emerald Shiner	44.0	-	
Emerald Shiner	59.0	0.7	
Emerald Shiner	85.0	-	Scale got wet, fritzed out.
Emerald Shiner	38.0	-	
Longnose Dace	76.0	-	
Longnose Dace	68.0	-	
Longnose Dace	99.0	-	
Longnose Dace	46.0	-	
Longnose Dace	68.0	1.9	
Longnose Dace	43.0	0.7	
Longnose Sucker	98.0	9.4	11 dorsal rays
Longnose Sucker	65.0	-	
Longnose Sucker	64.0	-	
Longnose Sucker	70.0	-	
Longnose Sucker	75.0	-	
Longnose Sucker	50.0	-	
Longnose Sucker	47.0	-	
Longnose Sucker	59.0	-	
Longnose Sucker	58.0	-	
Longnose Sucker	50.0	-	
Longnose Sucker	48.0	-	
Longnose Sucker	58.0	-	
Longnose Sucker	62.0	-	
Longnose Sucker	60.0	-	
Longnose Sucker	59.0	-	
Longnose Sucker	61.0	-	
Longnose Sucker	64.0	-	
Longnose Sucker	62.0	-	
Longnose Sucker	90.0	-	
Longnose Sucker	79.0	-	
Longnose Sucker	96.0	-	
Longnose Sucker	81.0	-	
Longnose Sucker	98.0	-	
Longnose Sucker	93.0	-	

Longnose Sucker	100.0	-	
Longnose Sucker	85.0	-	
Longnose Sucker	87.0	-	
Longnose Sucker	113.0	-	
Longnose Sucker	86.0	-	
Longnose Sucker	100.0	-	
Longnose Sucker	90.0	-	
Longnose Sucker	78.0	-	
Longnose Sucker	94.0	-	
Longnose Sucker	51.0	-	
Longnose Sucker	47.0	-	
Longnose Sucker	57.0	-	
Longnose Sucker	57.0	-	
Longnose Sucker	69.0	-	
Longnose Sucker	84.0	-	
Longnose Sucker	63.0	-	
Longnose Sucker	84.0	-	
Longnose Sucker	73.0	-	
Longnose Sucker	82.0	-	
Longnose Sucker	82.0	-	
Longnose Sucker	105.0	-	
Sand Shiner	64.0	1.8	
White Sucker	55.0	1.7	65 lat. line scales, 3 large spots

Summary		Rel. Abund. %
Black Crappie	1	1.47
Bluegill	1	1.47
Creek Chub	2	2.94
Emerald Shiner	11	16.18
Longnose Dace	6	8.82
Longnose Sucker	45	66.18
Sand Shiner	1	1.47
White Sucker	1	1.47
Total # Fish Sampled	68.0	100.0
Total Minutes Sampled	22.4	
CPUE (fish/minute)	3.0	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Wendover WGFD Access (Cottonwood Cr).
BIOLOGISTS: Broderick, Beddow, Rogers, Felley
DATE: March 16, 1999
METHOD: Backpack Electrofisher, 150 M
TOTAL TIME ELECTROFISHED: 2,010 seconds
SUBSTRATE: 1% small boulders (10-20)"; 5% large cobbles (5-10"); 40% small cobbles (2-5.5"); 49% coarse gravel; 5% sand
CHANNEL WIDTH: 75 ft. ESTIMATED FLOW: 25 cfs
OTHER OBSERVATIONS: Some moss and algae on boulders
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 25% riffle; 70% run; 5% pool

SPECIES	TOTAL LENGT	WEIGHT	COMMENTS
Emerald Shiner	49.0		Too windy for accurate weight readings.
Emerald Shiner	84.0		
Emerald Shiner	57.0		
Emerald Shiner	38.0		
Emerald Shiner	60.0		
Emerald Shiner	81.0		
Emerald Shiner	42.0		
Emerald Shiner	48.0		
Emerald Shiner	44.0		
Emerald Shiner	50.0		
Emerald Shiner	41.0		
Emerald Shiner	43.0		
Emerald Shiner	51.0		
Emerald Shiner	44.0		
Emerald Shiner	44.0		
Emerald Shiner	51.0		
Emerald Shiner	52.0		
Emerald Shiner	49.0		
Emerald Shiner	55.0		
Emerald Shiner	60.0		
Emerald Shiner	51.0		
Emerald Shiner	50.0		
Emerald Shiner	54.0		
Emerald Shiner	45.0		
Emerald Shiner	45.0		
Emerald Shiner	80.0		
Emerald Shiner	48.0		
Emerald Shiner	40.0		
Emerald Shiner	46.0		
Emerald Shiner	48.0		
Emerald Shiner	48.0		
Emerald Shiner	51.0		
Johnny Darter	50.0		
Johnny Darter	50.0		
Johnny Darter	48.0		
Johnny Darter	46.0		
Longnose Dace	42.0	0.7	
Longnose Dace	46.0	0.8	
Longnose Dace	44.0	-	
Longnose Dace	45.0	0.8	
Longnose Dace	49.0	1.1	
Longnose Dace	43.0	0.7	
Longnose Dace	48.0	0.9	
Longnose Dace	82.0		
Longnose Dace			Tally: 63
Longnose Dace	46.0	0.8	
Longnose Dace	46.0	0.8	

Longnose Dace	41.0	0.5	
Longnose Dace	43.0	0.8	
Longnose Dace	75.0		
Longnose Dace	47.0	0.8	
Longnose Dace	43.0	0.6	
Longnose Dace	43.0	0.6	
Longnose Dace	40.0	0.6	
Longnose Dace	42.0	0.6	
Longnose Dace	45.0	0.8	
Longnose Dace	44.0	0.8	
Longnose Dace	65.0		
Longnose Dace	72.0		
Longnose Dace	70.0		
Longnose Dace	65.0		
Longnose Dace	76.0		
Longnose Dace	66.0		
Longnose Dace	84.0		
Longnose Dace	68.0		
Longnose Dace	71.0		
Longnose Dace	70.0		
Longnose Dace	73.0		
Longnose Dace	68.0		
Longnose Dace	57.0		
Longnose Dace	72.0		
Longnose Dace	66.0		
Longnose Dace	68.0		
Longnose Dace	60.0		
Longnose Dace	88.0		
Longnose Dace	84.0		
Longnose Dace	87.0		
Longnose Dace	75.0		
Longnose Dace	63.0		
Longnose Dace	75.0		
Longnose Dace	84.0		
Longnose Sucker	66.0	2.9	10 dorsal rays, mottled - no large spots. 92 lat line scales
Longnose Sucker	74.0	3.6	
Longnose Sucker	41.0	0.5	
Longnose Sucker	35.0	0.3	
Sand Shiner	63.0	2.0	
Sand Shiner	45.0	1.0	
Sand Shiner	42.0	0.7	
Sand Shiner	62.0	1.8	
Sand Shiner	56.0	1.3	
White Sucker	65.0		
White Sucker	58.0	2.0	3 spots on sides.
White Sucker	45.0	0.9	
White Sucker	53.0	1.3	

Summary	Totals	Rel. Abun.%
Emerald Shiner	32	20.78
Johnny Darter	4	2.60
Longnose Dace	105	68.18
Longnose Sucker	4	2.60
Sand Shiner	5	3.25
White Sucker	4	2.60
Total # Fish Sampled	154	
Total Minutes Electrofish	33.50	
CPUE (#fish/min.)	4.60	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Below Guernsey Dam @ Railroad Bridge (upstream of Hwy. 26 Bridge)
BIOLOGISTS: Broderick, Beddow, Rogers, Felley
DATE: March 17, 1999
METHOD: Backpack Electrofisher, 150 M
TOTAL TIME ELECTROFISHED: 1,167 seconds
SUBSTRATE: 5% very large boulders (80-160"); 5% large boulders (40-80"); 5% medium boulders (20-40"); 30% small boulders (10-20"); 10% large cobble (5-10"); 5% silt; 40% bedrock.
CHANNEL WIDTH: 130 ft. ESTIMATED FLOW: 10 cfs
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 80% run; 20% pool

SPECIES	TOTAL LEN (mm)	WEIGHT (g)	COMMENTS
Creek Chub	60.0		
Emerald Shiner	48.0		
Emerald Shiner	56.0		
Emerald Shiner	59.0		
Emerald Shiner	48.0		
Emerald Shiner	38.0		
Emerald Shiner	49.0		
Emerald Shiner	37.0		
Emerald Shiner	48.0		
Emerald Shiner	51.0		
Emerald Shiner	49.0		
Emerald Shiner	39.0		
Emerald Shiner	46.0		
Fathead Minnow	54.0		
Fathead Minnow	48.0		
Fathead Minnow	52.0		
Johnny Darter	43.0		
Johnny Darter	45.0		
Johnny Darter	48.0		
Longnose Dace	72.0		
Longnose Dace	77.0		
Longnose Dace	64.0		
Longnose Dace	72.0		
Longnose Dace	80.0		
Longnose Dace	70.0		
Longnose Dace	70.0		
Longnose Dace	52.0		
Longnose Dace	85.0		
Longnose Dace	85.0		
Longnose Dace	63.0		
Longnose Dace	82.0		
Longnose Dace	72.0		
Longnose Dace	65.0		
Longnose Dace	76.0		
Longnose Dace	40.0		
Longnose Dace	35.0		
Longnose Dace	81.0		
Longnose Dace	91.0		
Longnose Dace	55.0		
Longnose Dace	43.0		
Longnose Dace	74.0		
Longnose Dace	77.0		
Longnose Dace	39.0		
Longnose Dace			Tally: 160
Longnose Dace	40.0		
Longnose Dace	49.0		
Longnose Dace	65.0		

Longnose Sucker	117.0
Longnose Sucker	72.0
Longnose Sucker	98.0
Sand Shiner	65.0
Sand Shiner	64.0
Sand Shiner	32.0
Sand Shiner	37.0
Sand Shiner	32.0
Sand Shiner	33.0
Sand Shiner	35.0
Spottail Shiner	53.0
Spottail Shiner	60.0
White Sucker	57.0
White Sucker	53.0
White Sucker	59.0
White Sucker	49.0
White Sucker	55.0
White Sucker	46.0
White Sucker	66.0

Summary	Totals	Rel. Abun. %
Creek Chub	1	0.44
Emerald Shiner	12	5.33
Fathead Minnow	3	1.33
Johnny Darter	3	1.33
Longnose Dace	187	83.11
Longnose Sucker	3	1.33
Sand Shiner	7	3.11
Spottail Shiner	2	0.89
White Sucker	7	3.11
Total # Fish Sampled	225	
Total Minutes Electrofish	19.5	
CPUE (#fish/min.)	11.54	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Camp Guernsey
BIOLOGISTS: Broderick, Rogers, Felley, Smith
DATE: March 17, 1999
METHOD: Backpack Electrofisher
TOTAL TIME ELECTROFISHED: 3,250 seconds
SUBSTRATE: 5% small boulders (10-20"); 45% large cobbles (40-80"); 45% small cobbles (2.5-5"); 5% coarse gravel (2.5 - 0.6)
CHANNEL WIDTH: 25 - 50 ft. ESTIMATED FLOW: 10 cfs
OTHER OBSERVATIONS: Abundant moss on boulders, occasional whiffs of sewage
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 100% run

SPECIES	TOTAL LENGTH(mm	WEIGHT(g)	COMMENTS
Central Stoneroller	103.0	12.9	
Creek Chub	152.00		
Creek Chub	155.00	41	
Emerald Shiner	62.0	1.9	
Emerald Shiner	69.0	2.5	
Johnny Darter	63.0	2.3	
Johnny Darter	50.0	1.0	
Johnny Darter	59.0	2.0	
Johnny Darter	33.0	0.3	
Johnny Darter	60.0	2.2	
Johnny Darter	63.0	2.4	
Johnny Darter	53.0	1.6	
Johnny Darter	54.0	1.4	
Johnny Darter	46.0	0.9	
Johnny Darter	54.0	1.2	
Johnny Darter	57.0	2.1	
Johnny Darter	52.0	1.1	
Johnny Darter	60.0	2.1	
Johnny Darter	55.0	-	
Johnny Darter	60.0	1.9	
Johnny Darter	55.0	2.0	
Johnny Darter	50.0	1.3	
Johnny Darter	50.0	1.2	
Johnny Darter	51.0	1.2	
Johnny Darter	47.0	-	
Longnose Dace	35.0	0.7	
Longnose Dace	44.0	1.2	
Longnose Dace			Tally: 236
Longnose Dace	64.0	3.1	
Longnose Dace	40.0	0.7	
Longnose Dace	40.0	0.6	
Longnose Dace	84.0		- Caudal fin eroded.
Longnose Dace	60.0	1.9	
Longnose Dace	44.0	0.6	
Longnose Dace	74.0	3.7	
Longnose Dace	74.0	4.5	
Longnose Dace	44.0	1.7	
Longnose Dace	44.0	1.0	
Longnose Dace	38.0	0.8	
Longnose Dace	74.0		
Longnose Dace	72.0	2.8	
Longnose Dace	77.0	4.3	
Longnose Dace	80.0	3.8	
Longnose Dace	36.0	1.2	
Longnose Dace	79.0	3.8	
Longnose Dace	44.0	0.8	
Longnose Dace	67.0	4.0	
Longnose Dace	74.0	3.1	

Longnose Dace	38.0	0.7	
Longnose Sucker	91.0	8.2	
Longnose Sucker	63.0	2.4	
Longnose Sucker	72.0	4.1	
Longnose Sucker	96.0	9.4	
Longnose Sucker	75.0	4.3	
Longnose Sucker	226.0	133.8	
Longnose Sucker	84.0	5.4	
Longnose Sucker	69.0		
Longnose Sucker	83.0	6.5	
Longnose Sucker	60.0		
Longnose Sucker	84.0		
Longnose Sucker	70.0		
Sand Shiner	66.0		
Sand Shiner	69.0	2.8	
Sand Shiner	63.0	2.6	
Sand Shiner	44.0	0.8	
Sand Shiner	55.0	1.8	
Sand Shiner	52.0	1.2	
Sand Shiner	45.0	0.7	
Sand Shiner	77.0	4.1	
Spottail Shiner	85.0	4.7	
Spottail Shiner			
Spottail Shiner	50.0	-	
Spottail Shiner	54.0	-	
White Sucker	70.0		
White Sucker	60.0		
White Sucker	64.0		3 spots on sides
White Sucker	49.0		
White Sucker	74.0		
White Sucker	56.0		
White Sucker	62.0		
White Sucker	69.0	3.2	
White Sucker	64.0		
White Sucker	61.0		
White Sucker	67.0	3.3	
White Sucker	47.0	1.1	
White Sucker	65.0	3.1	
White Sucker	70.0	8.2	
White Sucker	61.0	2.5	
White Sucker	63.0	2.5	
White Sucker	50.0	1.0	
White Sucker	75.0	3.6	
White Sucker	66.0	3.2	
White Sucker	45.0	-	
White Sucker	56.0	-	
White Sucker	45.0	-	
White Sucker	65.0	2.7	

Summary	Totals	Rel. Abun. %
Central Stoneroller	1	0.30
Creek Chub	2	0.60
Emerald Shiner	2	0.60
Johnny Darter	20	6.04
Longnose Dace	259	78.25
Longnose Sucker	12	3.63
Sand Shiner	8	2.42
Spottail Shiner	4	1.21
White Sucker	23	6.95
Total # Fish Sampled	331	
Total Minutes Electrofi	54.2	
CPUE (#fish/min.)	6.11	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Fort Laramie, downstream of NPS access bridge
BIOLOGISTS: Broderick, Rogers, Felley, Smith (joined us 1/2 way through sampling)
DATE: March 18, 1999
METHOD: Backpack Electrofisher, 300 M
TOTAL TIME ELECTROFISHED: 3,372 seconds
SUBSTRATE: 10% small boulders (10-20"); 30% large cobbles (5-10"); 20% small cobbles (2.5-5"); 40% silt
30% small boulders (10-20"); 10% coarse gravel (2.5-0.6"); sand 10%
CHANNEL WIDTH: 100 ft. ESTIMATED FLOW: 10 cfs
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 10% riffle; 90% run

SPECIES	TOTAL LEN (mm)	WEIGHT (g)	COMMENTS
Central Stoneroller	105.0	13.0	
Central Stoneroller	65.0	3.5	
Central Stoneroller	60.0	2.2	
Central Stoneroller	70.0	4.3	
Central Stoneroller	115.0	-	See whirlpac for this specimen.
Central Stoneroller	110.0	19.5	
Central Stoneroller	140.0	38.5	
Creek Chub	52.0	1.6	
Creek Chub	136.0	43.2	
Creek Chub	70.0	4.0	
Creek Chub	75.0	3.9	
Creek Chub	85.0	6.5	
Emerald Shiner	-	2.5	
Emerald Shiner	70.0	3.0	
Emerald Shiner	65.0	2.6	
Emerald Shiner	62.0	2.1	
Emerald Shiner	70.0	2.4	
Emerald Shiner	70.0	3.5	
Emerald Shiner	62.0	2.1	
Emerald Shiner	59.0	1.5	
Johnny Darter	40.0	0.4	
Johnny Darter	53.0	1.7	
Johnny Darter	50.0	-	
Johnny Darter	54.0	1.0	
Johnny Darter	62.0	1.5	
Johnny Darter	32.0	-	
Johnny Darter	64.0	2.3	
Johnny Darter	66.0	3.1	
Johnny Darter	70.0	4.1	
Johnny Darter			Tally: 1+
Johnny Darter	61.0	2.7	
Johnny Darter	65.0	2.4	
Johnny Darter	69.0	3.6	
Johnny Darter	67.0	2.1	
Johnny Darter	45.0	0.3	
Johnny Darter	54.0	2.3	
Johnny Darter	63.0	1.9	
Johnny Darter	57.0	2.6	
Johnny Darter	80.0	3.1	
Johnny Darter	62.0	3.0	
Johnny Darter	62.0	1.9	
Johnny Darter	51.0	1.2	
Johnny Darter	60.0	1.7	
Johnny Darter	53.0	0.9	
Johnny Darter	62.0	1.9	
Johnny Darter	56.0	2.2	
Longnose Dace	58.0	2.0	

Longnose Dace	64.0	1.6	
Longnose Dace	37.0	0.7	
Longnose Dace	32.0	0.5	
Longnose Dace	66.0	1.9	
Longnose Dace	60.0	1.9	
Longnose Dace	70.0	2.7	
Longnose Dace	57.0	1.3	
Longnose Dace	72.0	3.1	
Longnose Dace	70.0	3.3	
Longnose Dace	37.0	0.6	
Longnose Dace	70.0	2.6	
Longnose Dace	59.0	1.7	
Longnose Dace	68.0	2.8	Eroded caudal fin bottom lobe.
Longnose Dace	-	2.7	
Longnose Dace			Tally: 71
Longnose Dace	68.0	2.8	
Longnose Dace	91.0	7.8	
Longnose Dace	45.0	-	
Longnose Dace			Tally: 4
Longnose Dace	85.0	6.6	
Longnose Dace	70.0		Eroded fins on several dace sampled
Longnose Dace	65.0	-	
Longnose Dace	66.0	-	
Longnose Dace	37.0	-	
Longnose Dace	65.0	1.6	
Longnose Dace			Tally: 123
Longnose Dace	33.0	0.6	
Longnose Dace	61.0	1.8	
Longnose Dace	62.0	2.2	
Longnose Dace	51.0	-	
Longnose Dace			Tally: 62
Longnose Sucker	150.0	35.5	
Longnose Sucker	47.0	1.1	
Longnose Sucker	93.0	9.0	
Longnose Sucker	84.0	6.0	
Longnose Sucker	60.0	2.7	
Longnose Sucker	135.0	23.6	
Longnose Sucker	59.0	2.4	
Longnose Sucker	86.0	7.9	
Longnose Sucker	62.0	2.3	
Longnose Sucker	93.0	7.8	
Longnose Sucker	88.0	6.8	
Red Shiner	58.0	-	
Red Shiner	53.0	1.6	
Red Shiner	49.0	-	
Red Shiner	58.0	-	
Red Shiner	56.0	-	
Red Shiner	56.0	-	
Red Shiner	52.0	-	
Sand Shiner	57.0	0.7	
Sand Shiner	29.0	-	
Sand Shiner	40.0	-	
Sand Shiner	39.0	-	
Sand Shiner	63.0	2.1	
Sand Shiner	40.0	0.5	
Sand Shiner	45.0	0.4	
Sand Shiner	30.0	-	
Sand Shiner	57.0	0.5	
Stonecat	185.0	51.5	
Stonecat	190.0	60.0	

Stonecat	200.0	74.0	
Stonecat	118.0	16.9	
White Sucker	69.0	2.8	
White Sucker	65.0	3.3	
White Sucker	51.0	1.3	
White Sucker	45.0	1.1	
White Sucker	60.0	2.9	
White Sucker	55.0	2.1	
White Sucker	52.0	1.7	
White Sucker	52.0	1.5	
White Sucker	72.0	2.3	
White Sucker	52.0	1.4	
White Sucker	45.0	4.6	
White Sucker	61.0	1.9	
White Sucker	80.0	6.0	
White Sucker	46.0	0.3	
White Sucker	51.0	0.7	
White Sucker	55.0	-	
White Sucker	49.0	0.8	
White Sucker	67.0	2.7	
White Sucker	56.0	1.6	
White Sucker	75.0	4.8	
White Sucker	91.0	8.0	
White Sucker	65.0	2.5	
White Sucker	108.0	13.3	
White Sucker	84.0	6.8	
White Sucker	58.0	1.0	
White Sucker			Tally: 3+1
White Sucker	53.0	1.7	
White Sucker	130.0	22.3	
White Sucker	65.0	3.2	
White Sucker	52.0	1.1	
White Sucker	64.0	2.4	
Yellow Perch	65.0	2.3	

Summary	total	rel. abun. %
Central Stoneroller	7	1.75
Creek Chub	5	1.25
Emerald Shiner	8	2.00
Johnny Darter	26	6.50
Longnose Dace	288	72.00
Longnose Sucker	11	2.75
Red Shiner	7	1.75
Sand Shiner	9	2.25
Stonecat	4	1.00
White Sucker	34	8.50
Yellow Perch	1	0.25
Total # Fish Sampled	400	
Total Minutes Electrofish	56.20	
CPUE (#fish/min.)	7.12	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Grattan Diversion Dam - upstream from dam to H. Trowbridge's barn by bend of river ~ 1/4 mile.
BIOLOGISTS: Broderick, Smith, Rogers
DATE: March 22, 1999
METHOD: Raft Electrofisher
TOTAL TIME ELECTROFISHED: 2083 seconds
SUBSTRATE: 20% small cobbles (2.5-5"); 80% silt;
30% small boulders (10-20"); 10% coarse gravel (2.5-0.6"); sand 10%
CHANNEL WIDTH: 50-100 ft. ESTIMATED FLOW: 100 - 200 cfs
OTHER OBSERVATIONS: Abundant moss on boulders
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: Riffle 2%; Run 60%; Pool 98%

SPECIES	TOTAL LEN.(mm)	WEIGHT (g)	COMMENTS
Central Stoneroller	58.0	2.8	Extremely windy conditions - storm oncoming.
Central Stoneroller	25.0	-	Fish very sparse. Very little cover (large woody debris, rocks), most
Central Stoneroller	37.0	0.9	silt.
Central Stoneroller	47.0	1.1	
Central Stoneroller	38.0	1.0	
Central Stoneroller	52.0	1.6	
Central Stoneroller	49.0	1.9	
Central Stoneroller	54.0	2.0	
Central Stoneroller	36.0	0.3	
Common Carp	595.0	3000.0	
Common Carp	593.0	2700.0	
Emerald Shiner	56.0	1.7	
Longnose Dace	65.0	2.0	
Longnose Dace	27.0	-	
Longnose Dace	75.0	4.1	
Longnose Sucker	146.0	34.5	
Longnose Sucker	151.0	34.6	
Longnose Sucker	98.0	11.1	
Longnose Sucker	166.0	42.1	
Longnose Sucker	54.0	1.7	
Longnose Sucker	80.0	-	
Spottail Shiner	61.0	2.5	
Spottail Shiner	75.0	4.7	
Spottail Shiner	70.0	3.2	
White Sucker	274.0	250.0	
White Sucker	44.0	1.4	
White Sucker	285.0	250.0	
White Sucker	102.0	12.2	Blind in 1 eye.
White Sucker	286.0	250.0	
White Sucker	40.0	0.8	
White Sucker	44.0	1.5	
White Sucker	113.0	17.3	Tail torn up
White Sucker	48.0	1.9	

Summary	totals	rel. abun. %
Central Stoneroller	9	27.27
Common Carp	2	6.06
Emerald Shiner	1	3.03
Longnose Dace	3	9.09
Longnose Sucker	6	18.18
Spottail Shiner	3	9.09
White Sucker	9	27.27
Total # Fish Sampled	33	
Total Minutes Electrofish	34.72	
CPUE (#fish/min.)	0.95	

LOCATION: Grattan Diversion Dam to Hwy. 157 Bridge
BIOLOGISTS: Broderick, Beddow, Rogers, Felley
DATE: March 22, 1999
METHOD: Raft Electrofisher
TOTAL TIME ELECTROFISHED: 2,410 seconds
SUBSTRATE: 5% small boulders (10-20"); 15% large cobbles ((5-10"); 5% small cobbles (2.5-5"); 70% sand; 5% silt.
CHANNEL WIDTH: 75 - 150 ESTIMATED FLOW: 200 cfs
OTHER OBSERVATIONS: 5% large woody debris - fallen cottonwood trees
PRIMARY HABITAT: 70% main channel; 30% secondary channel
SECONDARY HABITAT: 20% riffle; 55% run; 25% pool

SPECIES	TOT. LEN. (mm)	WEIGHT (g)	COMMENTS
Central Stoneroller	67.0	3.1	
Central Stoneroller			Tally of individuals: 2
Central Stoneroller	110.0	15.0	
Central Stoneroller	115.0	14.9	
Central Stoneroller	93.0	11.6	
Central Stoneroller	76.0	5.8	
Central Stoneroller	78.0	5.7	
Central Stoneroller	88.0	9.4	
Common Carp	592.0	2850.0	
Common Carp	520.0	1900.0	
Common Carp	510.0	1770.0	
Common Carp	520.0	2200.0	
Common Carp	495.0	1650.0	
Common Carp	435.0	2410.0	
Common Carp	530.0	2850.0	
Common Carp	480.0	1660.0	
Common Carp	517.0	2000.0	
Common Carp	548.0	2450.0	
Creek Chub	136.0	80.0	
Creek Chub	124.0	20.4	
Creek Chub	75.0	2.8	
Creek Chub	83.0	7.8	
Creek Chub	110.0	16.3	
Creek Chub	110.0	16.4	
Creek Chub	145.0	50.0	
Creek Chub	124.0	21.4	
Creek Chub	140.0	45.0	
Creek Chub	125.0	40.0	
Creek Chub	134.0	25.0	
Creek Chub	148.0	50.0	
Creek Chub			Tally of individuals: 4
Creek Chub	152.0	45.0	
Creek Chub	77.0	5.3	
Emerald Shiner			Tally of iindividuals: 2
Emerald Shiner	71.0	3.5	
Emerald Shiner	80.0	4.9	
Emerald Shiner	100.0	7.1	
Johnny Darter			Tally of individuals: 2
Longnose Dace	63.0	2.7	
Longnose Dace	65.0	2.9	
Longnose Dace	75.0	4.1	
Longnose Dace			Tally of individuals: 3+16
Longnose Dace	60.0	2.3	
Longnose Dace	71.0	4.7	
Longnose Dace	72.0	4.2	
Longnose Dace	90.0	10.3	
Longnose Dace	64.0	2.7	

Longnose Dace	60.0	2.5	
Longnose Dace	60.0	2.6	
Longnose Dace	68.0	3.9	
Longnose Sucker	345.0	500.0	
Longnose Sucker	164.0	70.0	
Longnose Sucker	83.0	7.1	
Longnose Sucker	175.0	60.0	
Longnose Sucker	172.0	60.0	
Longnose Sucker	290.0	290.0	
Longnose Sucker	122.0	21.8	
Longnose Sucker	86.0	8.7	
Longnose Sucker			Tally of individuals: 2+1
Longnose Sucker	85.0	8.6	
Longnose Sucker	125.0	40.0	
Longnose Sucker	138.0	30.5	
Longnose Sucker	256.0	180.0	
Longnose Sucker	165.0	50.0	
Longnose Sucker	335.0	450.0	
Longnose Sucker	310.0	400.0	
Longnose Sucker	366.0	550.0	
Longnose Sucker	325.0	400.0	
Longnose Sucker	215.0	120.0	
Longnose Sucker	360.0	500.0	
Longnose Sucker	478.0	250.0	
Quillback	490.0	1670.0	
Shorthead Redhorse	412.0	800.0	
Shorthead Redhorse	450.0	1100.0	
Stonecat	192.0	70.0	
Stonecat	220.0	100.0	
Stonecat			Tally of individuals: 3
Stonecat	160.0	45.2	
Stonecat			Tally of individuals: 1
Stonecat	210.0	80.0	
White Sucker	315.0	360.0	
White Sucker	375.0	570.0	
White Sucker			Tally of individuals: 2
White Sucker	67.0	3.9	
White Sucker	318.0	430.0	
White Sucker	345.0	450.0	
White Sucker	430.0	420.0	
White Sucker	375.0	590.0	
White Sucker	308.0	300.0	
White Sucker	318.0	390.0	
White Sucker	302.0	350.0	
White Sucker	380.0	680.0	
White Sucker	185.0	50.0	
White Sucker	145.0	36.3	
White Sucker	186.0	90.0	
White Sucker	200.0	80.0	
White Sucker	113.0	18.1	
White Sucker	144.0	34.2	
White Sucker	200.0	83.6	
White Sucker	130.0	30.0	
White Sucker	186.0	70.0	
White Sucker	178.0	45.0	
White Sucker	160.0	50.0	
White Sucker	223.0	110.0	
White Sucker	184.0	30.0	
White Sucker	205.0	100.0	
White Sucker	171.0	51.4	

White Sucker	180.0	80.0
White Sucker	195.0	100.0
White Sucker	136.0	40.0
White Sucker	175.0	70.0
White Sucker	173.0	70.0
White Sucker	190.0	90.0
White Sucker	168.0	70.0
White Sucker	130.0	24.1
White Sucker	235.0	150.0
White Sucker	198.0	100.0
White Sucker	163.0	70.0
White Sucker	193.0	100.0
White Sucker	150.0	38.6
White Sucker	162.0	44.0
Yellow Perch	90.0	-

Summary	Totals	Rel. Abun. %
Central Stoneroller	9	5.96
Common Carp	10	6.62
Creek Chub	18	11.92
Emerald Shiner	5	3.31
Johnny Darter	2	1.32
Longnose Dace	30	19.87
Longnose Sucker	23	15.23
Quillback	1	0.66
Shorthead Redhorse	2	1.32
Stonecat	8	5.30
White Sucker	42	27.81
Yellow Perch	1	0.66
Total # Fish Sampled	151	
Total # Minutes Fished	40.2	
CPUE (#fish/min.)	3.76	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Rawhide Wildlife Habitat Management Unit - put in on private property 1 mile upstream of Hwy. 156 Bridge. Sampled from the bridge downstream to the diversion dam below Rawhide Cr.
BIOLOGISTS: Broderick, Smith, Felley
DATE: March 19, 1999
METHOD: Raft Electrofishing
TOTAL TIME ELECTROFISHED: 9,705 seconds
SUBSTRATE: 5% large cobbles (5-10"); 5% small cobbles (2.5-5"); 90% sand
30% small boulders (10-20"); 10% coarse gravel (2.5-0.6"); sand 10%
CHANNEL WIDTH: 100 - 150 ft. ESTIMATED FLOW: 200 cfs
LARGE WOODY DEBRIS: 15%
OTHER OBSERVATIONS: No bank overhang or overhanging vegetation. Downcutting about 10 to 15 ft.
PRIMARY HABITAT: 100% main channel
SECONDARY HABITAT: 90% run, 5% riffle, 5% pool

SPECIES	TOTAL LEN. (MM)	WEIGHT (G)	COMMENTS
Central Stoneroller	59.0	1.9	
Central Stoneroller	81.0	5.6	
Central Stoneroller	65.0	2.6	
Central Stoneroller	67.0	2.8	
Central Stoneroller	140.0	38.1	
Central Stoneroller	53.0	2.2	
Central Stoneroller	104.0	12.8	
Central Stoneroller	145.0	44.4	
Central Stoneroller	146.0	36.6	
Central Stoneroller	68.0	1.5	
Central Stoneroller	70.0	3.2	
Central Stoneroller	60.0	2.1	
Central Stoneroller	53.0	'	
Central Stoneroller	52.0	1.4	
Central Stoneroller	60.0	1.8	
Central Stoneroller	49.0	'	
Central Stoneroller	50.0	1.1	
Central Stoneroller	60.0	2.2	
Central Stoneroller	74.0	'	Scale defunct once again.
Central Stoneroller	56.0	'	
Common Carp	550.0	2700.0	
Common Carp	560.0	2600.0	
Common Carp	630.0	7000.0	
Common Carp	540.0	2600.0	
Common Carp	550.0	2200.0	
Common Carp	530.0	1900.0	
Common Carp	490.0	1600.0	
Common Carp	640.0	6000+	
Common Carp	750.0	6000+	
Common Carp	570.0	4200.0	
Common Carp	570.0	2900.0	
Common Carp	540.0	2500.0	
Common Carp	580.0	2900.0	
Common Carp	520.0	2400.0	
Common Carp	-	2600.0	
Common Carp	580.0	3200.0	
Common Carp	570.0	2300.0	
Common Carp	580.0	2500.0	
Common Carp	510.0	2100.0	
Common Carp	580.0	3001.0	
Common Carp	580.0	3600.0	
Common Carp	580.0	3600.0	
Common Carp	610.0	6000+	Larger than scale capacity.
Common Carp	550.0	3500.0	
Common Carp	450.0	-	

Common Carp	590.0	5500.0	
Common Carp	460.0	1200.0	
Common Carp	560.0	2900.0	
Common Carp	580.0	3100.0	
Common Carp	580.0	2900.0	Tumor on operculum
Common Carp	560.0	2300.0	
Common Carp	590.0	3000.0	
Common Carp	-	1000.0	
Common Carp	510.0	2400.0	
Common Carp	530.0	2350.0	
Common Carp	500.0	1650.0	
Common Carp	620.0	6000.0	
Common Carp	-	1750.0	
Common Carp	600.0	4100.0	
Common Carp	550.0	2700.0	
Common Carp	540.0	2350.0	
Common Carp	460.0	1200.0	
Common Carp	540.0	2200.0	
Common Carp	560.0	2700.0	
Common Carp	540.0	2700.0	
Common Carp	510.0	1900.0	
Common Carp	500.0	1600.0	
Common Carp	510.0	1700.0	
Common Carp	500.0	2100.0	
Common Carp	470.0	1500.0	
Common Carp	600.0	3000.0	
Common Carp	480.0	1500.0	
Creek Chub	106.0	11.5	
Creek Chub	95.0	9.3	
Creek Chub	77.0	5.5	
Creek Chub	115.0	16.6	
Creek Chub	106.0	12.3	
Creek Chub	83.0	6.3	
Creek Chub	63.0	2.8	
Creek Chub	65.0	3.0	
Creek Chub	76.0	5.4	
Creek Chub	77.0	5.4	
Creek Chub	95.0	9.4	
Creek Chub	116.0	16.0	
Creek Chub	121.0	19.7	
Creek Chub	102.0	12.9	
Creek Chub	80.0	6.3	
Creek Chub	105.0	12.0	
Creek Chub	80.0	5.7	
Creek Chub	75.0	5.6	
Creek Chub	130.0	20.8	
Creek Chub	90.0	16.1	
Creek Chub	68.0	3.2	
Creek Chub	150.0	35.0	
Creek Chub	106.0	14.0	
Creek Chub	131.0	26.6	
Creek Chub	113.0	16.9	
Creek Chub	65.0	3.1	
Creek Chub	92.0	9.6	
Creek Chub	105.0	13.7	
Creek Chub	117.0	16.7	
Creek Chub	60.0	-	
Creek Chub	134.0	23.4	
Creek Chub	105.0	15.1	
Creek Chub	113.0	15.5	

Creek Chub	121.0	22.8	
Creek Chub	-	12.3	
Creek Chub	100.0	10.1	
Creek Chub	-	71.0	
Creek Chub	193.0	11.7	
Creek Chub	130.0	-	
Fathead Minnow	52.0	-	
Johnny Darter	51.0	-	
Longnose Dace	60.0	2.2	
Longnose Dace	60.0	2.2	
Longnose Dace	56.0	2.7	
Longnose Dace	69.0		
Longnose Sucker	370.0	600.0	
Longnose Sucker	360.0	550.0	
Longnose Sucker	105.0	13.1	
Longnose Sucker	240.0	20.0	
Longnose Sucker	340.0	500.0	
Longnose Sucker	370.0	60.0	
Red Shiner	52.0	-	
Red Shiner	58.0	-	
Red Shiner	47.0	-	
Red Shiner	53.0	-	
Red Shiner	59.0	-	
Red Shiner	48.0	-	
Red Shiner	54.0	-	
Red Shiner	47.0	-	
Red Shiner	47.0	-	
Red Shiner	63.0	-	
Red Shiner	51.0	-	
Red Shiner	49.0	-	
Red Shiner	59.0	-	
Red Shiner	44.0	-	
Red Shiner	47.0	-	
Red Shiner	50.0	-	
Red Shiner	43.0	-	
Red Shiner	48.0	-	
Red Shiner	41.0	-	
Red Shiner	48.0	-	
Red Shiner	46.0	-	
Red Shiner	22.0	-	
Red Shiner	46.0	-	
Red Shiner	45.0	-	
Red Shiner	49.0	-	
Red Shiner	44.0	-	
Red Shiner	54.0	-	
Red Shiner	60.0	-	
Red Shiner	51.0	-	
Red Shiner	43.0	-	
Red Shiner	49.0	-	
Red Shiner			Tally of individuals: 25
Red Shiner	66.0	4.2	
Sand Shiner	65.0	-	
Sand Shiner	62.0	-	
Sand Shiner	64.0	-	
Sand Shiner	66.0	2.2	
Sand Shiner	47.0	0.7	
Sand Shiner	66.0	-	
Shorthead Redhorse	520.0	1500.0	
Shorthead Redhorse	510.0	1800.0	
Shorthead Redhorse	450.0	1000.0	

Shorthead Redhorse	410.0	1000.0	
Shorthead Redhorse	400.0	1400.0	
White Sucker	420.0	850.0	Talon injury on back.
White Sucker	240.0	20.0	
White Sucker	180.0	30.0	
White Sucker	310.0	40.0	
White Sucker	200.0	10.0	
White Sucker	310.0	50.0	
White Sucker	330.0	500.0	
White Sucker	320.0	51.0	
White Sucker	330.0	50.0	
White Sucker	380.0	70.0	
White Sucker	-	75.0	
White Sucker	440.0	1300.0	
White Sucker	440.0	1400.0	
White Sucker	-	600.0	
White Sucker	170.0	10.0	
White Sucker	115.0	-	
White Sucker	180.0	65.0	
White Sucker	390.0	850.0	
White Sucker	430.0	900.0	
White Sucker	190.0	100.0	
White Sucker	410.0	1100.0	
White Sucker	400.0	650.0	
White Sucker	-	500.0	
White Sucker	130.0	90.0	
White Sucker	220.0	150.0	
White Sucker	350.0	600.0	
White Sucker	410.0	950.0	
White Sucker	350.0	600.0	
White Sucker	90.0	-	
White Sucker	420.0	-	
White Sucker	140.0	33.0	
White Sucker	200.0	100.0	

Summary	total	rel. abun. %
Central Stoneroller	20	8.93
Common Carp	52	23.21
Creek Chub	39	17.41
Fathead Minnow	1	0.45
Johnny Darter	1	0.45
Longnose Dace	4	1.79
Longnose Sucker	6	2.68
Red Shiner	58	25.89
Sand Shiner	6	2.68
Shorthead Redhorse	5	2.23
White Sucker	32	14.29
Total # Fish Sampled	224	
Total Minutes Electrofish	161.75	
CPUE (fish/minute)	1.38	

NORTH PLATTE RIVER FISH SURVEYS
LOCATION: Torrington Bridge (Hwy. 85) downstream to Jay Middlesworth's Property near state line
BIOLOGISTS: Broderick, Felley, Smith
DATE: March 20, 1999
METHOD: Raft Electrofisher
TOTAL TIME ELECTROFISHED: 3250 seconds
SUBSTRATE: 1% medium boulders (20-40"); 5% large cobbles (5-10"); 5% small cobbles (2.5-5"); 89% sand
CHANNEL WIDTH: 100 - 300 ft. ESTIMATED FLOW: 80 - 100 cfs
OTHER OBSERVATIONS:
PRIMARY HABITAT: 70% main channel 30% secondary channel
SECONDARY HABITAT: 5% riffle; 85% run; 10% pool

SPECIES	TOT.LENGTH (mm)	WEIGHT (g)	COMMENTS
Common Carp	470.0	1000.0	
Common Carp	540.0	2100.0	
Common Carp	520.0	2000.0	
Common Carp	580.0	3000.0	
Common Carp	490.0	1500.0	
Common Carp	560.0	2600.0	
Common Carp	510.0	1850.0	
Common Carp	540.0	2000.0	
Common Carp	530.0	1850.0	
Common Carp	540.0	2500.0	
Common Carp	500.0	1700.0	
Common Carp	-	-	
Common Carp	490.0	1700.0	
Common Carp	580.0	2400.0	
Common Carp	-	1800.0	
Common Carp	510.0	1500.0	
Common Carp	550.0	1800.0	
Common Carp	580.0	-	
Common Carp	520.0	1800.0	
Common Carp	540.0	1800.0	
Common Carp			Tally of large individuals: 7. fungus on head of one individual.
Common Carp	530.0	1700.0	
Common Carp			Tally of large individuals: 10
Common Carp			Tally - large common carp 21
Creek Chub	75.0	4.1	
Creek Chub	80.0	5.7	
Creek Chub	62.0	1.2	
Creek Chub	125.0	-	
Creek Chub	-	4.3	
Creek Chub	125.0	-	
Creek Chub	85.0	55.0	
Creek Chub	124.0	12.4	
Creek Chub	45.0	1.0	
Emerald Shiner	42.0	0.3	
Emerald Shiner	-	-	
Emerald Shiner	61.0	2.2	
Longnose Dace	71.0	3.3	
Longnose Dace	-	-	
Longnose Dace	82.0	-	
Longnose Dace	76.0	5.8	
Longnose Sucker	340.0	350.0	
Longnose Sucker	340.0	300.0	
Longnose Sucker	310.0	400.0	
Longnose Sucker	310.0	120.0	
Longnose Sucker	343.0	450.0	
Longnose Sucker	360.0	450.0	
Longnose Sucker	241.0	250.0	

Longnose Sucker	280.0	300.0	
Longnose Sucker	270.0	200.0	
Longnose Sucker	350.0	300.0	
Longnose Sucker	282.0	250.0	
Longnose Sucker			Tally of individuals: 6
Longnose Sucker	200.0	120.0	
Longnose Sucker	293.0	280.0	
Longnose Sucker	230.0	200.0	
Longnose Sucker	282.0	250.0	
Longnose Sucker	170.0	70.0	
River Carpsucker	470.0	1480.0	
Shorthead Redhorse	462.0	1200.0	Fungus on pectoral and anal fins.
Shorthead Redhorse	530.0	-	
Shorthead Redhorse	450.0	1100.0	
Shorthead Redhorse	425.0	1000.0	
Shorthead Redhorse	400.0	900.0	
Shorthead Redhorse	475.0	1400.0	
Shorthead Redhorse	487.0	1460.0	
Shorthead Redhorse	370.0	670.0	
Shorthead Redhorse	423.0	900.0	
Shorthead Redhorse	460.0	1100.0	Fungus on caudal fin.
Stonecat	200.0	150.0	
White Sucker			Tally of individuals: 3
White Sucker	212.0	130.0	
White Sucker	190.0	120.0	
White Sucker	250.0	250.0	
White Sucker	362.0	560.0	
White Sucker	261.0	230.0	
White Sucker	257.0	200.0	
White Sucker	278.0	350.0	
White Sucker	261.0	260.0	Bite on caudal fin.
White Sucker	328.0	430.0	
White Sucker	540.0	-	
White Sucker	340.0	500.0	
White Sucker	336.0	500.0	
White Sucker	190.0	150.0	
White Sucker	198.0	100.0	
White Sucker	290.0	300.0	
White Sucker	338.0	600.0	
White Sucker	264.0	230.0	
White Sucker	420.0	1000.0	
White Sucker	240.0	180.0	
White Sucker	302.0	400.0	
White Sucker	390.0	750.0	
White Sucker	82.0	20.2	
White Sucker	160.0	23.0	
White Sucker	270.0	300.0	
White Sucker	-	-	Bird scar on dorsal
White Sucker	320.0	500.0	Fungus on caudal fin
White Sucker	86.0	6.1	
White Sucker	360.0	650.0	
White Sucker	82.0		
White Sucker	270.0	100.0	
White Sucker	330.0	250.0	
White Sucker	265.0		
White Sucker	330.0	500.0	
White Sucker	310.0	45.0	
White Sucker	260.0	120.0	
White Sucker	380.0	650.0	
White Sucker	330.0	450.0	

White Sucker	370.0	600.0	
White Sucker	230.0	150.0	
White Sucker	310.0	350.0	
White Sucker	360.0	350.0	
White Sucker	230.0	150.0	
White Sucker	330.0	500.0	
White Sucker	300.0	150.0	
White Sucker	300.0	100.0	
White Sucker	390.0	750.0	
White Sucker	220.0	-	
White Sucker	300.0	450.0	
White Sucker	300.0	350.0	
White Sucker	230.0	150.0	
White Sucker	300.0	400.0	
White Sucker	-	-	
White Sucker	350.0	500.0	
White Sucker	280.0	300.0	
White Sucker	92.0	11.1	
White Sucker	95.0	35.8	
White Sucker	154.0	15.7	
White Sucker	340.0	300.0	
White Sucker	270.0	90.0	
White Sucker	300.0	150.0	
White Sucker	310.0	200.0	Talon injury on back.
White Sucker	320.0	250.0	
White Sucker	320.0	200.0	
White Sucker	360.0	650.0	
White Sucker	270.0	90.0	
White Sucker	250.0	90.0	
White Sucker	-	-	Juvenile.

Summary:	Totals	Rel. Abun. %
Common Carp	62	33.88
Creek Chub	9	4.92
Emerald Shiner	3	1.64
Longnose Dace	4	2.19
Longnose Sucker	22	12.02
River Carpsucker	1	0.55
Shorthead Redhorse	10	5.46
Stonecat	1	0.55
White Sucker	71	38.80
Total # Fish Sampled	183	
Total Minutes Electrofish	54.17	
CPUE (fish/minute)	3.38	